

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

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

JUNE, 1940.

(i) GENERAL ANATOMY AND MORPHOLOGY.

"Subformicale organ" (intercolumnar tubercle) of human third ventricle. W. DANNHEIMER (*Anat. Anz.*, 1939, 88, 351—358).—The organ is a transparent colourless mass of pin's-head size on the under surface of the fornix where the body joins the anterior crura. It is covered by the choroid plexuses of the third and lateral ventricles where these join at the interventricular foramen. A glial network contains numerous cells belonging to four types. Its function is unknown.

R. W. H.

Morphology of platysma. G. S. LIGHTOLLER (*J. Anat.*, 1940, 74, 390—396).—It is suggested that the primate trachelo-platysma (Ruge's "Hals-platysma") is derived from the sphincter colli profundus of lower mammals.

J. D. B.

Morphology of *M. caninus*. G. S. LIGHTOLLER (*J. Anat.*, 1940, 74, 397—402).—The *m. caninus* of primates, together with the *m. incisivus sup.*, is a specialised part of the deep portion of the *m. maxillo-naso-labialis*. It is not derived from the *m. orbicularis oris* and is not peculiar to primates, being frequently found in other mammalian types.

J. D. B.

Inner surface of right ventricle. E. WEINBERG (*Anat. Anz.*, 1939, 88, 381—387).—Three types of arrangement of the trabecula septo-marginalis in relation to the anterior papillary muscle are described.

R. W. H.

Demonstration of lymphatics by trypan-blue. W. PFUHL (*Anat. Anz.*, 1939, 89, 177—186).—Injection of 1% trypan-blue in aq. solution causes an inflammatory oedema, and the lymph vessels of the neighbourhood are filled. The contents are stained blue. The smaller lymphatics are very minute and need an oil immersion lens for their examination.

R. W. H.

Regeneration of lymphatic vessels. J. H. GRAY (*J. Anat.*, 1940, 74, 309—334).—Observations on human material and experiments on rabbits were made to investigate the stimuli capable of causing regenerative growth of lymph vessels and the subsequent differentiation of the new lymphatics into functionally adequate channels. Trauma does not cause thrombosis, but a cut in a lymphatic trunk becomes sealed up unless the lymph flow is unrestricted. Regeneration is by sprouting for both capillaries and trunks, the stimuli found adequate being cutting, altered pressure-flow conditions, and hypertrophy of dermal papillæ. The remodelling of definite lymphatic trunks occurs in response to altered conditions

of pressure and flow, but is hampered by fibrous connective tissue.

E. E. H.

Senile changes in bony and cartilaginous apparatus of joints. I. L. KLONER (*Comp. rend. Acad. Sci. U.R.S.S.*, 1939, 24, 804—806).—Involutionary changes were studied by X-rays (106 senile invalids, aged 60—92) and on post-mortem macroscopic and microscopic examinations of joints (125 people, aged 60—96). The results are held to demonstrate the existence of a senile form of osteoarthritis which should be distinguished from other forms. It is an involutionary change primarily affecting articular cartilage, the bony changes being secondary.

J. D. B.

"Notch" shadows seen in lateral roentgenograms of vertebræ of infants. G. WAGONER and E. P. PENDERGRASS (*Amer. J. Roentgenol.*, 1939, 42, 663—670).—The posterior notches are the points of entry and exit of the posterior arteries and veins. The anterior notches are due to sinusoidal spaces within the vertebræ.

W. F. F.

Transmutation of vertebræ in lumbo-sacral region of human spine. M. YOUNG and J. G. H. INCE (*J. Anat.*, 1940, 74, 369—373).—Pelvic radiograms of young married women show that sacralisation of the 5th lumbar vertebra was 3 times as frequent as lumbarisation of the 1st sacral, indicating a greater tendency to shortening than to lengthening of the presacral spine.

E. E. H.

Radiographic comparison of male and female pelvis. M. YOUNG and G. H. INCE (*J. Anat.*, 1940, 74, 374—385).—Pelvic radiographic measurements in unselected individuals show that the most important characters of distinction between male and female types are the size and proportion of the pelvic inlet and outlet, the size of the sacro-sciatic notch, and the size of the subpubic angle. The characters vary more or less independently of one another.

E. E. H.

X-Ray pelvimetry. E. G. REUTER and R. J. REEVES (*Amer. J. Roentgenol.*, 1939, 42, 847—856).—A method for measurement of the bi-ischial diameter is illustrated.

W. F. F.

Correlation between nutrition and organs of mastication of some *Xenarthra*. F. KUEHLHORN (*Morph. Jahrb.*, 1939, 84, 55—85).—A correlation is described between the masticatory organs of some *Dasypodidæ* and *Myrmecophagidæ* and their type of nutrition. The skull and mandible of the omnivores like *Dasypus sextinctus* is shorter than that of the insectivores which have a short ramus mandibulæ,

i.e., *Myrmecophaga jubata*. The masticatory muscles of the latter group are shorter and smaller than those of the omnivora. A gradual reduction in no. of teeth among the insectivores was established. The tongue of the Myrmecophagidæ can be far protruded and is adapted to the specialised type of nutrition by its elongated shape, the structure of the papillæ, and a highly viscous saliva. W. J.

Secondary sexual characters in *Timarchas*. M. ABELOOS (Compt. rend. Soc. Biol., 1939, 131, 563—565).—Differences in the dimensions of the feet in the 2 sexes in *T. tenebricosa*, Fab., and *T. coriaria*, Laich, are described. P. C. W.

Anomalies of renal rotation. H. M. WEYRAUCH (Surg. Gynec. Obstet., 1939, 69, 183—199).—Four types of renal rotation occur. They are probably due more to intrarenal than to extrarenal mechanical influence. C. R. S.

Congenital hypoplasia of one kidney with compensatory hyperplasia of other kidney. C. VASILESCU and E. TEODORESCU (Bull. Mém. Soc. méd. Hôp. Bucarest, 1939, 21, 552—560).—A case is reported; additional findings were: branching of the hypoplastic renal artery soon after its origin and cartilagenous deposits in the affected kidney. H. L.

Case of complicated extrophy of the bladder presenting many unusual features. K. F. RUSSELL (Brit. J. Urol., 1939, 11, 31—47).—The main features were: presence of anterior wall of bladder, but absence of roof; two vermiform appendices; almost complete absence of large intestine; no evidence of external genitalia; cyst of caudal end of neurenteric canal. B. T.

Congenital vesico-vaginal fistula with imperforate hymen; hydrops fetalis and erythroblastosis and polydactyly. F. P. WEBER and M. SCHOLTZ (Brit. J. Child. Dis., 1939, 36, 131—133).—A case report. C. J. C. B.

Effect of fluorine on solubility of enamel and dentine. J. F. VOLKER (Proc. Soc. Exp. Biol. Med., 1939, 42, 725—727).—Solubility of powdered dentine and enamel in acetic acid-Na acetate buffer of p_H 4 was reduced by previous treatment with NaF solution. V. J. W.

[Prevention of mottled enamel of teeth; rôle of fluoride.] J. W. HAWKINS and J. E. GORDON (Amer. J. med. Sci., 1940, 199, 431—445).—Mottled enamel is a hypoplastic dental abnormality, caused by ingestion of F compounds at any age between infancy and 16 years. The no. of teeth involved depends on the time and duration of the exposure. The severity of mottling depends on the amount of F taken into the body during the period of calcification of the enamel. The disease primarily affects the permanent and not the deciduous teeth. Once developed, the condition is permanent. Water supplies are the principal source of the causative agent, but others, such as foods, must be considered. All of the things that give rise to mottled enamel enter into the life of people of all ages. Therefore, a programme for control must be conceived on a community basis. C. J. C. B.

Inhibition of experimental dental caries by fluorine in absence of saliva. V. D. CHEYNE (Proc. Soc. Exp. Biol. Med., 1940, 43, 48—61).—3 mg. of F administered to 31-day-old rats greatly diminished incidence of caries even after extirpation of salivary glands. V. J. W.

(ii) DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Early looping of alimentary canal in the mammalian and human foetus. G. ENBOM (Anat. Rec., 1939, 75, 409—414).—Evidence is submitted of the important part played by the vitelline artery in the development of the shape and position of the stomach and intestine. The artery prevents the pyloric part of the stomach from sinking caudally and gives rise to changes in the position of the primordium of the stomach, and also acts as the principal axis around which the intestinal bundle rotates. W. F. H.

Changes in position of spinal nerves and their roots during embryonic development. A. BECKER (Morph. Jahrb., 1939, 84, 17—38).—As the spine grows faster in width and length than the spinal nerves, their roots are shifted from a sagittal and horizontal course into a transversal and caudal direction. W. J.

Development of patella. R. WALMSLEY (J. Anat., 1940, 74, 360—368).—In a 20-mm. human embryo a precartilaginous patella is present in the deeper part of the quadriceps. At 30 mm. the patella is cartilaginous and interrupts the continuity of the quadriceps except for a superficial layer which remains undifferentiated. An articular disc is secondarily formed at the 35—40-mm. stage between the patella and the femoral condyles. Later a patello-femoral synovial cavity develops in this disc in a manner typical of diarthroses. Growth changes in the patella and in the femoral articular surfaces are discussed. J. D. B.

Effect of *dl*-methionine and *l*-cysteine on the cleavage rate of mammalian eggs. B. J. MILLER and S. P. REINMANN (Arch. Path., 1940, 29, 181—188).—Ova cultured in 1 c.c. of serum containing 0.6 mg. of *dl*-methionine show a more rapid increase in the no. of blastomeres over a period of 5 hr. than ova grown as controls. Ova in 2-cell condition are likewise stimulated to rapid blastomere proliferation. Ova cultured in 1 c.c. of serum containing 0.26 mg. of *l*-cysteine show an immediate and rapid increase in blastomere proliferation; ova cultured in the same amount of serum containing 0.52 mg. of *l*-cysteine are not so effectively stimulated. Ova cultured in Carrel flasks show a rapid increase in diameter when 0.25 mg. of *l*-cysteine is added to each c.c. of fresh rabbit serum but 0.50 mg. of *l*-cysteine is not such an effective stimulant. Ova grown under the same conditions in the presence of 0.125 mg. of *dl*-methionine were also stimulated and showed a definite increase in diameter. C. J. C. B.

Structure of uterus and placenta of Indian elasmobranchs. J. MAHADEMN (Proc. Indian Acad. Sci., 1940, B, 11, 1—43). J. D. B.

Regularities in growth of chicken embryos. I. J. PRITZKER (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 823—827).—Chick embryos grow more rapidly when incubated at 40° than at 37° up to approx. the 18th day, after which the reverse is true. The stimulating effect of temp. is greatest during the first 6 days. E. M. W.

Bio-electric potentials of the hen's egg. A. L. ROMANOFF and C. L. COTTRELL (Science, 1939, 90, 471—472).—A p.d. up to 8 mv. was observed with a valve voltmeter type of recorder and fluid electrodes in contact with albumin and yolk of incubated eggs. The p.d. increased with incubation in the first 24 hr. from about 1 mv. to 8 mv. W. F. F.

Lens-forming properties of body epithelium in *Triton vittatus*. T. A. SICHARULIDZE (Compt. rend. Acad. Sci. U.R.S.S., 1939, 23, 975—977).—Body epithelium in *T. vittatus* develops into a normal lens when in contact with a transplantate which has developed into a regular cup. The eye vesicle itself rarely develops into a regular cup when transplanted under body epithelium. W. F. F.

Data on determination of ear in *Triton taeniatus*. A. S. GINSBURG (Compt. rend. Acad. Sci. U.R.S.S., 1939, 22, 370—373).—Ectoderm from the ear region of an embryo of *T. taeniatus*, at the stage of an early or middle neurula, transplanted to the eye region of an older embryo of the same species, forms only undifferentiated epithelial vesicles. The same material forms a lens if put in contact with the optic cup. At the later stages of late neurula and of closure of the neural folds, the same ectodermal tissue is sp. and, when transplanted to the eye region, forms vesicles with characteristic ear structure, e.g., endolymphatic duct. W. F. F.

Physiological effects of nitro- and halogen-substituted phenols on *Arbacia* eggs in presence of ammonia. J. O. HUTCHENS, M. E. KRAHL, and G. H. A. CLOWES (J. Cell. Comp. Physiol., 1939, 14, 313—325; cf. A., 1938, III, 424).—Cytoplasmic p_{H_2} of the eggs was raised by aq. NH_3 from 6.8 to 7.2. Substituted phenols became more effective in stimulating O_2 consumption but their inhibiting effect on cell division was not modified, nor was their optimum concn. as respiratory stimulants. V. J. W.

Effect of vital dyes on changes in form and in skeleton of Echinoderm larvæ. G. BOHN and A. DRZEWINA (Compt. rend., 1939, 209, 246—248).—Gastrulæ of *Strongylocentrotus lividus* with methyl-blue (1 in 50,000) form stunted pleuteus. The digestive tube develops normally but the oesophageal contractions are more marked and twice as numerous as in untreated specimens. Calcification is at first diminished but later increased, frequently giving rise to skeletal asymmetry. In dye concns. of 1 in 10,000, calcification is completely inhibited; a concn. of 1 in 100,000 has no effect. This effect occurs only at gastrulation, earlier developmental stages being unaffected. Acid fuchsin (1 in 7000 to 15,000) is without effect on the shape or skeleton but modifies the development of the digestive tube, particularly the proximal portion. J. L. D.

Synthesis of cleavage chromosomes. T. S. PAINTER (Proc. Nat. Acad. Sci., 1940, 26, 95—100).—A review of the evidence available for the discussion of the problem of whence comes the material necessary for the synthesis of the chromosomes in rapidly segmenting eggs. W. F. F.

Chromosome complement in buffalo. G. M. POHAKADZE (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 794—795).—One of the reasons for the incrossability of buffalo with cattle is the difference in the chromosome no. of these species. The difference amounts to 4 in a diploid complement. The same is true of the yak which possesses 60 diploid chromosomes. J. D. B.

Radiogenetics. N. W. TIMOFE'EFF-RESSOVSKY and K. G. ZIMMER (Strahlenther., 1939, 66, 684—711).—A review. E. M. J.

New inherited character in man. A. H. STURTEVANT (Proc. Nat. Acad. Sci., 1940, 26, 100—102).—The inheritance of the ability to turn up the lateral edges of the tongue is demonstrated. W. F. F.

Outbreeding and separation of sexes. K. MATHER (Nature, 1940, 145, 484—486).—A review. W. F. F.

Divergent pathways in sexual development. W. R. COE (Science, 1940, 91, 175—182).—A review. W. F. F.

Chronological sex-ratios in *Drosophila*. G. ELOFF (Nature, 1940, 145, 463—464).—Daily counts of offspring from *Drosophila* cultures showed variations in the sex-ratio with time. W. F. F.

Spontaneous inverted exchange between X and Y in *Drosophila melanogaster*. F. A. E. CREW and R. LAMY (J. Genetics, 1940, 39, 273—283). W. F. H.

Genetic studies in poultry. X. Linkage data for sex chromosome. R. C. PUNNETT (J. Genetics, 1940, 39, 335—342).—Data concerning 4 sex-linked genes, for silver, slow feathering, barring, and light shank, are given. W. F. H.

Colour-producing structure in the "dominant grey" budgerigar. L. AUBER (Nature, 1939, 144, 157—158).—Feather structure is described. W. F. F.

Linkage of pea comb and blue egg in the fowl. J. H. BRUCKNER and F. B. HUTT (Science, 1939, 90, 88).—A linkage of type of comb with egg colour is reported in *Araucanas*. W. F. F.

(iii) PHYSICAL ANTHROPOLOGY.

Human genera and species. S. ZUCKERMAN (Nature, 1940, 145, 510—511).—A discussion on classification. W. F. F.

South African fossil anthropoid apes and origin of human dentition. P. ADLOFF (Anthrop. Anz., 1939, 16, 72—76). W. F. H.

Mandible of child from Ziegenrück, Thuringia. G. HEBERER (Anthrop. Anz., 1939, 16, 77—80).—The geological position of the find is given and a comparison with similar finds from Tübingen and Jena made. W. F. H.

Cranio-facial union in man. W. M. COBB (Amer. J. phys. Anthrop., 1940, 26, 87—111).—The form and mode of interlocking of the two units, cranial and axial, composing the cranio-facial union are fully described. W. F. H.

Determination of certain facial measurements in racial investigations. E. JACOBSHAGEN (Anthrop. Anz., 1939, 16, 101—104). W. F. H.

Community economic status and dental problem of school children. H. KLEIN and C. E. PALMER (U.S. Publ. Health Repts., 1940, 55, 187—205).—Analyses of findings derived from a study of 200,000 children in 40 urban communities of New Jersey are given regarding the dental status of school children living under fairly representative conditions in the eastern section of the United States. C. G. W.

(iv) CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Vascularisation of mucous membrane of lip. P. SICONOMISKI (Anat. Anz., 1939, 88, 405—416).—Two types of capillary are found: (a) those which enter and leave the epithelium at almost the same point, and (b) those which form anastomosing arcades in the epithelium, giving a typical vascularised epithelium with intra-epithelial vessels. R. W. H.

Histology of lips in Macaques. G. LANDRA (Z. Morph. Anthrop., 1940, 38, 529—553).—A short account of the muscular, submucous, and mucous strata. Comparisons with man are drawn. W. F. H.

Epithelial cell shapes in first segment of the proximal tubule of cat nephron. A. L. GRAFFLIN and J. J. FOOTE (Amer. J. Anat., 1939, 65, 179—198).—The proximal tubule is divisible on the basis of cell shape into two segments between which there is an abrupt demarcation. Near the lumen in the first segment the cell outlines have a complex wavy character but become relatively simple at an intermediate level. More basally the outlines again exhibit an irregularity which increases towards the level of the basement membrane. In lateral view the cell wall shows alternating ridges and furrows in the apical and basal regions. W. F. H.

Cells of pancreatic islets. G. GOMORI (Anat. Rec., 1939, 74, 439—459; cf. A., 1940, III, 89).—The islets of several animal species and man are described and the staining properties of the cells noted. A new staining property of the β -cells of the guinea-pig and one sp. for the α -cells of all animal species are recorded together with a new modification of the Mallory-Heidenhain azan stain for general purposes. W. F. H.

Glomus structure of carotid body. H. N. GOORMAGHTIGH (Bull. Acad. Méd. Belg., 1939, 6, 406—408).—A review.

Structure of peripheral nerves in straight and curved parts of their course. L. PETROVITS and Z. SZABÓ (Anat. Anz., 1939, 89, 25—34).—Where nerves are curved, or lie in close contact with bone, the no. of nerve bundles and the amount of connective tissue are reduced in comparison with the straight parts of the same nerve. R. W. H.

Intra-epithelial nerves in calf's foot. A. PIEPER (Anat. Anz., 1939, 89, 86—92).—True intra-epithelial nerve fibres lie in the most basal layer of the epithelium. R. W. H.

Regeneration of central stem of obturator nerve grafted in bladder wall. G. OTTAVIANI and A. BINOTTO (Boll. Soc. ital. Biol. sperim., 1939, 14, 623—625).—Histological observations (dog) are discussed. F. O. H.

Nerves of testis and interstitial gland. H. DE WINTWARTER (Bull. Histol. Tech. micr., 1940, 17, 25—27).—The cells related to the nerves described by Okkels and Sand as "interstitial" are in reality paraganthionic. E. E. H.

Structure of connective involucrem of rami communicantes of thoracic sympathetic nerve. G. BRUGI (Boll. Soc. ital. Biol. sperim., 1939, 14, 744—746).—The presence of elastic fibres is demonstrated. F. O. H.

Study of fibrillogenesis in connective tissue by the method of dissociation with potassium hydroxide. H. E. JORDAN (Amer. J. Anat., 1939, 65, 229—251).—In 10—15-mm. embryos primary connective tissue fibrils produce the finer fibrils of older fibroblasts by longitudinal splitting. "Tonofibrils" (Maximow) and fibrogia fibrils (Mallory) are ancestral to reticulum fibres and to collagen fibrils of definitive connective tissue. Extracellular collagen fibrils of areolar and white fibrous tissue have their primary origin in the exoplasm of the fibroblasts and become subsequently separated, leaving a nucleated endoplasm as a definitive fibrocyte. Intercellular fibrils are formed by separation of fibrillar exoplasm from nucleated endoplasm and liberation of the fibres through liquefaction of exoplasm. In embryonic cords fibrils are argyrophil; near term they are unstained with Foot's technique. W. F. H.

Acceleration of wound healing. W. G. WAUGH (Brit. Med. J., 1940, I, 249—252).—Epicutan (protein derivative of embryonic tissue adsorbed to kaolin) increased the rate of wound healing in 4 cases (comparison with Carrel's calc. graph of normal epithelisation). C. A. K.

Roller bottle tissue culture system. D. T. SHAW, L. C. KINGSLAND, and A. M. BRUES (Science, 1940, 91, 148—149).—Full details are given suitable for tissue culture experiments lasting a few weeks. W. F. H.

Culture flask for circulation of large quantity of fluid medium. C. A. LINDBERGH (J. Exp. Med., 1939, 70, 231—238).—A culture flask is described in which numerous tissue fragments can be cultivated in a constantly circulating oxygenated medium. A. C. F.

Occurrence of intranuclear inclusions in cultures of foetal leptomeninges. C. F. FISCHMANN and D. S. RUSSELL (J. Path. Bact., 1940, 50, 53—59).—Acidophilic intranuclear inclusion bodies appeared spontaneously in cultures of human foetal leptomeninges although absent from the tissues from which the cultures were made. They also developed in cultures of leptomeninges from chick and rat embryos and in fibroblast cultures from the lungs of both human

and rat foetuses. Attempts to influence the development of the inclusion bodies by modifying the media used for culture and by altering the environment of the experiments were unsuccessful. (4 photomicrographs.)

C. J. C. B.

Effect of ouabain on fibroblasts in culture. W. HEUBNER and E. SCHREIBER (Arch. exp. Path. Pharm., 1939, 194, 78—97).—Ouabain (*g*-strophanthin) has no stimulating effect on the growth of chick fibroblast in culture. H. BL.

Effect of copper salts on fibroblasts in culture. W. HEUBNER and E. SCHREIBER (Arch. exp. Path. Pharm., 1939, 194, 98—104).—CuSO₄ has no stimulating action on the growth of fibroblasts. H. BL.

Effect of histamine on growth of fibroblasts *in vitro*. W. HEUBNER and E. SCHREIBER (Arch. exp. Path. Pharm., 1939, 194, 105—108).—0.03% histamine has no effect on the growth of fibroblasts in Carrel flasks; 0.3% causes a degeneration of cells. An experiment in which bacterial contamination caused cell growth in an otherwise incomplete medium is described. H. BL.

Cultivation of *R. diaporica* in tissue culture and in tissues of developing chick embryos. H. R. COX and E. J. BELL (U.S. Publ. Health Repts., 1939, 54, 2171—2178).—Experiments are described in which *R. diaporica* was cultivated in a variety of tissue cultures consisting of various chick embryonic tissues in different suspension media. C. G. W.

Pure strain of *Trichomonas eberthi* in tissue culture. E. TENENBAUM (Nature, 1939, 144, 78).—180 passages of *T. eberthi* have been made on chicken fibroblasts. W. F. F.

New material for mounting nerve tissue sections in paraffin for silver staining or restaining. R. SPOERRI (Science, 1939, 90, 260).—A fixative material was prepared with starch and traces of HCl with thymol as a preservative. W. F. F.

Modification of Cajal's silver impregnation of peripheral nerves. A. TSCHERNJACHIVSKI (J. méd. Ukraine, 1939, 9, 93—98).—A method claimed to give good results in tissues difficult to impregnate is described. H. L.

Modification of Masson's tetrachrome stain for routine paraffin sections of tissue fixed in solution of formaldehyde and saline solution. C. P. LARSON (Arch. Path., 1940, 29, 272). C. J. C. B.

Controllable modification of Mallory's trichromic staining method. A. C. LENDRUM and D. MCFARLANE (J. Path. Bact., 1940, 50, 381—384). C. J. C. B.

Reliable one hour method for preparation of paraffin sections of tissues. J. G. PASTERNAK (Amer. J. clin. Path., Tech. Sect., 1940, 4, 8—12). C. J. C. B.

Fixing and staining methods for lead and copper in tissues. F. B. MALLORY and F. PARKER, jun. (Amer. J. Path., 1939, 15, 517—522).—The technique used is described, the importance of fixation with alcohol, especially in the case of Pb, being stressed. (6 photomicrographs.) C. J. C. B.

Root-tip smear method for difficult material. P. C. BURRELL (Stain Tech., 1939, 14, 147—149).—Fresh clean root-tips are cut freehand into thin cross-sections, fixed and stained in strong aceto-carmin solution, then differentiated in 50% HCl in 95% alcohol, and mounted in diaphane. This method gives polar views of the metaphase plate instead of the equatorial view obtained by the usual smear methods. E. E. H.

Procedure for staining filamentous algae and fungi on slide. J. E. ADAMS (Stain Tech., 1940, 15, 15—16).—The killed, washed material is spread on a slide smeared with gelatin fixative (gelatin 1.5 g., in water 100 c.c. + glycerin 5 c.c. + phenol 2 g.). The material is then fixed in formalin vapour and stained, being ultimately dehydrated, cleared in xylol, and mounted in Canada balsam. E. E. H.

(v) BLOOD AND LYMPH.

Avian bone marrow with particular reference to red cell development. J. G. McDONALD (Amer. J. Anat., 1939, 65, 291—307).—The sinusoids of normal pigeon bone marrow are lined by large basophilic cells. These are chiefly proerythroblasts and basophilic erythroblasts. The megaloblast series is not represented. Induced hypoplastic marrows undergoing restoration show hypertrophy of the reticulo-endothelial elements of the erythrocytopoietic sinusoids. Proerythroblasts form from sinusoidal lining cells without showing the myeloblast stage. "Intersinusoidal capillaries" are intercellular stromal spaces and open into the venous sinusoids. Red cell development within these spaces resembles that observed in the sinusoids of regenerating marrows. W. F. H.

Action of anti-anæmic preparations on bone marrow *in vitro*. P. J. GAILLARD, G. A. OVERBEEK, and TAN HONG YAM (Arch. int. Pharmacodyn., 1940, 64, 33—45).—Anti-anæmic extracts of liver and products of gastric digests of beef added to marrow cultures caused migration of the cells out of the culture. Non-hæmopoietic substances proved inert until liver extract was added. Previous thyroidectomy rendered the bone marrow refractory like that from cases of pernicious anæmia. Increased migration is not accompanied by increased O₂ consumption. D. T. B.

Blood of Arthropods. N. S. RUSTUM-MALUF (Quart. Rev. Biol., 1939, 14, 149—191).—A review. J. D. B.

Breed, age, and sex variations in blood value of rabbits. C. B. ALPEROVITSCH (Compt. rend. Acad. Sci. U.R.S.S., 1939, 25, 410—413).—Hæmoglobin val. is high in new-born rabbits, decreases up to 2 months, and then increases up to maturity. The size of erythrocytes is high at birth and decreases with age whilst their no. is low at birth and increases with age. The no. of erythrocytes is higher in males than in females. The larger breeds (White Giant and Flandre) have higher hæmoglobin but a smaller no. of erythrocytes than the Ermine rabbit. E. M. W.

New indexes demonstrating degree of anisocytosis in human blood. L. VAN DEN BERGHE

(Amer. J. med. Sci., 1940, 199, 478—481).—3 new hæmatological indexes are introduced which, by the simple calculation of the diameters of the blood cells and the recording of the latter in 3 groups according to their size, allow a numerical val. to be given to anisocytosis. C. J. C. B.

Diameter of red blood cells in healthy young women. E. G. DONELSON, J. M. LEICHSENRING, and L. M. WALL (Amer. J. Physiol., 1940, 128, 382—389).—In 250 blood samples of healthy young women, the mean red cell diameter was 7.35 μ . (range of means 6.53—7.76 μ). The mean difference between the smallest and largest cells in each blood sample was 3.56 μ . A frequency distribution based on the measurement of 20,000 cells showed a max. spread of 3.96—10.80 μ ., with a mean and standard deviation of 7.31 and 0.62 μ ., respectively. M. W. G.

Error of estimate of blood cell count as made with the hæmocytometer. J. BERKSON, T. B. MAGATH, and M. HURU (Amer. J. Physiol., 1940, 128, 309—323).—Formulae are given in great detail for the errors in individual determination of blood counts. M. W. G.

Variations in reticulocyte count. H. BARBIER (Klin. Woch., 1939, 18, 1496—1497).—Several persons living under the same conditions showed similar and synchronous variations attributed to atm. pressure fluctuations. M. K.

Effect of vitamins and hormones on formation of blood. A. QUERIDO (Chem. Weekblad, 1940, 37, 175—180).—A review. Vitamin-C probably and part of the -B complex (-M) certainly take part in blood formation. It is improbable that the thyroid gland has a direct effect. The anterior pituitary contains a hormone which accelerates the destruction of blood. S. C.

Induced reticulocytosis in rat and its relation to life duration of red blood cell. O. G. HARNE, J. F. LUTZ, and C. L. DAVIS (J. Lab. clin. Med., 1940, 25, 333—344).—The span of life of the red blood cell in the albino rat was determined by the rate of blood replacement following hæmorrhage, using the spontaneous reticulocyte showers which follow hæmorrhage as the index. By this method the life of the red cell is between 8 and 9 days. C. J. C. B.

Statistical study of cobalt polycythæmia in dog. G. BREWER (Amer. J. Physiol., 1940, 128, 345—348).—Co in sufficient dosage causes an increase in erythrocyte no., hæmoglobin concn., and % vol. of packed erythrocytes in the dog without toxic symptoms. 5 mg.-% Co per kg. body-wt. is close to the crit. concn. required to increase erythrocyte no. and hæmoglobin concn.; the hæmatoerit is increased only by larger doses. M. W. G.

Treatment of polycythæmia vera with X-rays. I. I. KAPLAN (Radiology, 1939, 33, 166—169).—High-voltage irradiation of sternum and ribs reduced the red cell count to normal, the effect persisting for 20 weeks. W. F. F.

[Factors in] pernicious anæmia. P. FORMJNE (Chem. Weekblad, 1940, 37, 171—175).—The extrinsic factor (from meat extract) is sol. in 80% but is inactivated by 96% alcohol. It is not extracted from

water by ether, but is ultrafilterable and is partially removed by adsorption and by pptn. with $(\text{NH}_4)_2\text{SO}_4$. After incubation with intrinsic factor (gastric fluid) the product is still sensitive to 70% alcohol and to high temp. (80°); this is due to the instability of the intrinsic factor. Thus the liver factor is not produced *in vitro* and the mechanism of the action *in vivo* is still unknown. S. C.

Serum-iron in pernicious anæmia treated by liver. J. LEDERER (Sang, 1940, 14, 27—42).—Serum-Fe is above normal in pernicious anæmia and becomes lowered to normal *pari passu* with the recovery of the anæmia under liver treatment. C. J. C. B.

Agastric anæmias. G. MONASTERIO (Klin. Woch., 1939, 18, 1385—1389).—The blood count (peripheral and bone-marrow blood) in 59 patients with partial or total gastrectomy showed in most cases anæmia of the normochromic normocytic type. Characteristic changes of erythroblasts were found in the bone marrow even if the red cell count was normal. M. K.

Treatment of anæmias occurring in premature birth and after infections [with nicotinamide and lactoflavin]. O. GOEBELL (Klin. Woch., 1939, 18, 1319—1323). M. K.

Method of obtaining leucocytes from a small quantity of blood. J. HANAUSEK (Sang, 1940, 14, 20—26).—A capillary plunger system is described. C. J. C. B.

Atypical manifestations of leukæmia. M. M. WINTROBE and D. M. MITCHELL (Quart. J. Med., 1940, 9, 67—90).—15 cases of leukæmia are described, in which, owing to infiltration of various organs, the original diagnosis was wrong, e.g., osteomyelitis, miliary tuberculosis, new growths, paraplegia, root pains, osteoarthritis. Enlargement of liver, spleen, or lymph nodes is rarely prominent, but retinal hæmorrhages (10 cases), petechiæ (9 cases), and severe anæmia or unexplained fever should lead to a search for immature white blood cells, which are usually present although the total count in the early stages may not be raised. R. K.

Hyperplasia of blood-forming organs. II. Monocytic leukæmia. III. Chloroma, myeloid sarcoma, and multiple myeloma. K. HAGIO (Acta Sch. med. Univ. Kyoto, 1939, 33, 113—125, 126—153; cf. A., 1940, III, 183).—II. A case is reported. Monoblasts and monocytes were formed mainly in bone marrow and spleen; these organs also showed considerable erythropoiesis. Oxidase reaction was more strongly positive in the neutrophil cells than in the monocytes. The monocytes were larger in size in films obtained by sternal puncture during life than in those taken post mortem.

III. 6 cases are reported. The cells of the chloroma were oxidase-positive and are regarded as myeloid cells; the pigment was identified as a porphyrin by fluoroscopic and spectroscopic examination. The myeloid sarcoma was composed of multinuclear giant cells and cells resembling monocytes; both these cell types were oxidase-negative and did not form reticulin fibrils. The myelomatous tissue was composed of

plasma and reticulum cells; the former are thought to be derived from the latter. H. L.

Prevention of X-ray leucopenia. C. CARRIÉ and O. SCHNETTLER (Strahlenther., 1939, 66, 149—154).—Repeated injections of 200 mg. of vitamin-C after X-irradiation (600 r.) of rabbits improved the ensuing leucopenia. Premedication caused a leucocytosis with a return to normal after the irradiation. E. M. J.

Urinary suppression after intravascular hæmolytic. S. R. M. BUSHBY, E. W. HART, A. KEKWICK, and L. E. H. WHITBY (Lancet, 1940, 238, 355—358).—K citrate was given to normal subjects and its effect on p_H of the urine was studied. By mouth, it produces a definite rise of p_H in $\frac{1}{2}$ hr., the duration effect being proportional to the dose. To prevent urinary suppression after intravascular hæmolytic, e.g., with incompatible blood transfusion, the p_H should be over 6.4 and the urinary vol. (in 24 hr.) more than 1500 c.c. C. A. K.

Inhibiting effect of snake bloods on hæmorrhagic action of viper venom on mice. S. ROSENFELD and S. GLASS (Amer. J. med. Sci., 1940, 199, 482—486).—King snake and rattlesnake bloods protect against the hæmorrhagic action of viper venoms but do not prevent death. The bloods of mammals are not protective against the hæmorrhagic action of rattlesnake venom. The action of snake blood in protecting against the hæmorrhages produced by viper venoms is not identical with that afforded by antitoxin (antivenin). The toxic and anti-hæmorrhagic properties of snake blood are stable to heating at 56° for $\frac{1}{2}$ hr. Blood from both venomous and non-venomous snakes is toxic, but the resultant death, unlike that produced by viper venoms, is not accompanied by hæmorrhages. C. J. C. B.

Lysolecithin fragility test. K. SINGER (Amer. J. med. Sci., 1940, 199, 466—477).—Normal serum contains a hæmolytic substance, lysolecithin, which can be extracted and its hæmolytic power measured. The spherocytes of congenital hæmolytic jaundice are less resistant towards this lysin than normal erythrocytes; in the spherocytosis of various acquired and symptomatic types of hæmolytic icterus, the lysolecithin fragility is normal although the saline fragility is altered. Certain cases of sickle-cell anæmia and of chronic non-hæmolytic jaundice show increased resistance to lysolecithin. C. J. C. B.

In vitro experiments on effect of addition of serum and plasma on sedimentation rate. R. R. STRUTHERS and H. L. BACAL (Canad. Med. Assoc. J., 1940, 42, 354—356).—In rheumatic fever in 17 out of 27 cases the addition of normal plasma to the sick sedimentation rate set-ups resulted in a decrease of the sedimentation rate. C. J. C. B.

Comparative study of erythrocyte sedimentation test with Hellige-Volmer (Langer) micro-sedimeter and modified Westergren method. E. W. GOLDBERGER (J. Lab. clin. Med., 1940, 25, 657—660).—The micro-sedimeter vals. compare favourably with results obtained by the macro-method in 304 cases. The erythrocyte sedimentation test with the micro-sedimeter is simple, requires only

2—3 drops of blood, and therefore can be repeated on infants and children with the min. of fear and distress. C. J. C. B.

Normal adult hæmoglobin. M. DOR and L. DUMONT (Sang, 1940, 14, 1—11).—The hæmoglobin figures for normal adults in various parts of Belgium are detailed. C. J. C. B.

Simple bedside test for control of vitamin-K therapy. S. E. ZIFFREN, V. A. OWEN, G. R. HOFFMAN, and H. P. SMITH (Amer. J. clin. Path., Tech. Sect., 1940, 4, 13—16).—The clotting time of the patient's blood to which thromboplastin has been added is compared with a normal control. C. J. C. B.

Vitamin-K for pediatrician [physiologic hypoprothrombinæmia of newborn infants]. A. M. GROSSMAN (J. Pediat., 1940, 16, 239—253).—A crit. review. C. J. C. B.

Oral and parenteral toxicity of vitamin-K₁, phthiocol, and 2-methyl-1:4-naphthaquinone. H. MOLITOR and H. J. ROBINSON (Proc. Soc. Exp. Biol. Med., 1940, 43, 125—128).—50% of mice were killed by 0.2 g. per kg. of phthiocol or 0.5 g. per kg. of 2-methyl-1:4-naphthaquinone. Vitamin-K₁ was not toxic up to 25 g. per kg. V. J. W.

Prothrombin levels and synthetic vitamin-K in obstructive jaundice of rats. J. E. FLYNN and E. D. WARNER (Proc. Soc. Exp. Biol. Med., 1940, 43, 190—194).—The common bile duct was ligatured in vitamin-K-deficient rats and blood-prothrombin determined before and after administration of phthiocol or 2-methyl-1:4-naphthaquinone. The latter compound is 500 times as effective as phthiocol but is not stored unless a very large dose is given or small doses over a considerable time. V. J. W.

Prothrombin in newborn. W. E. BRAY and O. R. KELLEY (Amer. J. clin. Path., 1940, 10, 150—167).—The prothrombin time in the newborn is not significantly related to the platelet count. It is very variable, is within the normal adult range on the 1st day, rises to a peak, higher than the normal adult range, between the 2nd and 5th days, falls within the adult range after the 5th day, then becomes stabilised. The prothrombin time is very high in hæmorrhagic disease of the newborn, and it may be high without evidence of any tendency to bleed. No bleeding tendency was observed in cases with a low prothrombin time. C. J. C. B.

Micro-prothrombin test with capillary whole blood: modification of Quick's quantitative method. K. KATO (Amer. J. clin. Path., 1940, 10, 147—153).—This new method requires only 10 cu. mm. of whole blood for a single test. C. J. C. B.

Prothrombin time determination. O. R. KELLEY and W. E. BRAY (J. Lab. clin. Med., 1940, 25, 527—530).—A modification of Quick's method (cf. A., 1938, III, 709). C. J. C. B.

Plasma-prothrombin and effects of vitamin-K in patients with liver or biliary tract disease. F. J. POHLE and J. K. STEWART (J. clin. Invest., 1940, 19, 365—372).—47% of 136 consecutive cases of liver or biliary tract disease showed a subnormal

plasma-prothrombin. Intrinsic liver disease was a frequent cause of prothrombin deficiency. A marked reduction of the plasma-prothrombin was present in each of 10 individuals who exhibited abnormal bleeding. Hæmorrhage may occur when the prothrombin concn. is 30% of normal or less. The effect of oral administration of vitamin-K and bile salts on prothrombin in 46 jaundiced patients with a reduction in this coagulation factor was not uniform. 28 patients showed a satisfactory increase in prothrombin while 18 patients showed no improvement. The failure appears due to the presence of extensive hepatic damage. In the absence of obstructive jaundice, external biliary fistula, or an abnormal intestinal absorptive surface, the plasma-prothrombin concn. serves as a measure of liver function.

C. J. C. B.

Hyperprothrombinæmia during pregnancy. O. THORDARSON (Nature, 1940, 145, 305).—A steady rise in prothrombin is found in pregnancy from the 3rd month on to term. A normal level is reached one month after delivery.

W. F. F.

Relations between elasticity, anomalies of flow, and ability to be spun into thread of sols, with special reference to fibrinogen. E. WÖRLISCH and L. JÜHLING (Pflüger's Archiv, 1939, 241, 96—107).—The ability of solutions to be spun into a thread is associated with certain anomalies of flow, and especially with a certain amount of elasticity when subjected to a shearing stress; a new method of determination is described. Distilled water and a 75% glycerol-water mixture both show little elasticity. A suspension of kaolin and a 1% benzopurpurin sol show very marked elastic properties, which, in the latter case, can be abolished by adding 30% of urea. Starch solutions show elasticity only in the slimy sediment which is formed after keeping for several weeks. The elasticity of hirudinised blood is markedly increased when part of the plasma is discarded after centrifuging; plasma, serum, and fibrinogen have a surface elasticity far in excess of that found below the surface; the former is abolished by adding 30% of urea.

J. A.

Iminazole [glyoxaline] buffer: its use in blood-clotting studies. E. T. MERTZ and C. A. OWEN (Proc. Soc. Exp. Biol. Med., 1940, 43, 204—205).—Mixtures of glyoxaline and HCl can have any p_H from 6.2 to 7.8 and do not react with Ca salts.

V. J. W.

Mechanism of inhibiting effect of electrolytes and heparin on blood coagulation. A. J. GLAZKO and D. M. GREENBERG (Amer. J. Physiol., 1940, 128, 399—407).—The inhibiting effect of various electrolytes and of heparin on coagulation was studied. Potency of the electrolytes increased with the valency, but not as a function of the ionic strength of the solution. Multivalent anions and heparin inhibit coagulation by acting directly on thrombin. The inhibiting action of multivalent cations is due to their effect on fibrinogen. Alterations of the electrical potentials of thrombin and fibrinogen are thought to interfere with the formation of a coagulation enzyme-substrate intermediate. M. W. G.

Heparin in subacute bacterial endocarditis. L. J. WITTS (Brit. Med. J., 1940, I, 484).—Report of an unsuccessful case. C. A. K.

Hæmorrhagic diathesis with prolonged coagulation time associated with a circulating anticoagulant. E. L. LOZNER, L. S. JOLLIFFE, and F. H. L. TAYLOR (Amer. J. med. Sci., 1940, 199, 318—327).—A patient with hæmorrhagic diathesis is reported in whom a prolonged blood coagulation time was associated with the proven existence of an anticoagulant in his blood plasma. C. J. C. B.

Blood platelet count of sucklings according to Arakawa's reaction of their mothers. M. SHINDO (Tohoku J. exp. Med., 1939, 37, 45—61).—In infants fed on (a) Arakawa-positive, (b) Arakawa-intermediate, or (c) Arakawa-negative human milk the blood platelets (estimated by Fonio's method) averaged (a) 301,000, (b) 384,000, and (c) 435,000 per cu. mm. In a series of Arakawa-negative cases in which vitamin-B₁ was added to the diet the increase in platelets was less pronounced. H. L.

Blood platelet counts in surgical diseases, especially in renal tuberculosis. Y. YABE (Tohoku J. exp. Med., 1939, 37, 179—188).—Data are given on platelet counts in acute infections, peptic ulcer, malignant tumours, and renal tuberculosis. H. L.

Determination of blood groups using serum dried on papers. Simple method for determining blood group in spots of blood. N. I. BLINOV (Sang, 1940, 14, 12—14, 15—19).—The methods are described. C. J. C. B.

Weak "A" reaction in blood group "AB." G. L. TAYLOR, R. R. RACE, A. M. PRIOR, and E. W. IKIN (Brit. Med. J., 1940, I, 297—298).—Some subjects of blood group AB react very feebly with anti-A serum and may be mistaken for group B.

C. A. K.

Agglutinable factor in human blood recognised by immune sera for rhesus blood. K. LANDSTEINER and A. S. WIENER (Proc. Soc. Exp. Biol. Med., 1940, 43, 223).—Serum of rabbits immunised with rhesus serum, after exhaustion with OM bloods, still agglutinates other human bloods independently of group or MN type and including bloods which lack the property P. V. J. W.

Effect of enteral absorption of fluids on recovery of blood pressure after severe hæmorrhage. E. J. VAN LIERE, D. W. NORTHUP, and P. E. VAUGHAN (Amer. J. digest. Dis. Nutr., 1940, 7, 71—72).—Dogs under barbital anaesthesia were bled by 3.2% of their body-wt. The enteral absorption of normal saline solution or water did not aid in the recovery of the blood pressure. Animals absorbing dog serum showed a somewhat higher blood pressure than the controls. C. J. C. B.

Blood volume of mouse. C. L. OAKLEY and G. H. WARRACK (J. Path. Bact., 1940, 50, 372—377).—The average blood vol. per kg. of the mouse is 63.2 c.c. ($\pm 12.9\%$). The figures for the sexes are: 46 males, mean 63.5 c.c. ($\pm 11.9\%$); 54 females, mean 62.9 c.c. ($\pm 13.3\%$). The best fit for the males is given by blood vol. = $0.09 \times \text{body-wt.}^{0.88}$. There

is a small negative correlation between the blood vol. per kg. and the wt. in male mice, but not in non-pregnant female mice. Pregnant mice have such a blood vol. as would be expected if the foetuses were part of the maternal tissues, *i.e.*, the mother provides a stroma for the foetuses. The increased blood vol. per kg. of the pregnant females less foetuses persists into the puerperium in some mice for at least 10 days. C. J. C. B.

Use of placental and mixed blood in blood transfusion. F. SPIRITO (Münch. med. Wschr., 1939, 86, 1584—1585).—Placental blood shows little coagulability; the clot forms 1% of the total blood. Normal blood does not coagulate if mixed with placental blood in a ratio of 10:1. Transfusions of 250 c.c. of mixed blood were made without untoward effects. A. S.

Transfusion of the patient's own blood in cases of ruptured Fallopian tube. W. SPIER (Münch. med. Wschr., 1939, 86, 1528—1532).—Re-transfusion of the patient's own blood (collected from the abdominal cavity) after citration in patients with ruptured Fallopian tubes was successfully done in 138 out of 381 extra-uterine pregnancies. The average amount of transfused blood was 1500 c.c., the max. 2000 c.c. 5 out of 138 transfused patients died. A. S.

Tanning from ultra-violet irradiation brought out by blood transfusion. E. O. JODAR (Amer. J. Dis. Child., 1939, 58, 1047—1049).—A child was exposed to ultra-violet light every week for 18 weeks. No tanning occurred. The patient received 180 c.c. of blood from its mother and pigmentation of the skin was evident next morning, involving those areas that had been previously exposed to the ultra-violet light. A. C. F.

Diluents for stored blood. M. MAIZELS and N. WHITTAKER (Lancet, 1940, 238, 590—593).—Blood cells show less hæmolysis on storage with an isotonic solution (*e.g.*, NaCl 0.43, Na citrate 1.05%) than with a hypertonic solution (*e.g.*, NaCl 0.85, Na citrate 1.05%). With prolonged storage Na enters the cells, which swell and finally burst. Hæmolysis is reduced by 50% at p_H 6.6. Addition of glucose or dextrans in final concns. of 1.0 and 3.0% respectively decreases hæmolysis to about 1/10 that seen in simple salt solutions after 6 weeks. C. A. K.

Dried plasma for transfusion. F. R. EDWARDS, J. KAY, and T. B. DAVIE (Brit. Med. J., 1940, I, 377—381).—A technique for drying plasma at 37° is described. The proteins are not denatured in the process, and do not change with storage up to 2 months. Indications for use are discussed. C. A. K.

Basic amino-acid content of human serum-proteins. Effect of ingestion of arginine on composition of serum-proteins. R. J. BLOCK (J. Biol. Chem., 1940, 133, 71—74).—The proteins prepared by heat-coagulation or by pptn. with 2 vols. of alcohol or 5 vols. of acetone have approx. the same basic amino-acid composition, and proteins pptd. from serum containing 0.5% of arginine hydrochloride yield little, if any, extra arginine on hydrolysis.

Contrary to the results of Dirr (A., 1939, III, 770), ingestion of 24 g. of arginine hydrochloride does not cause any appreciable increase in the arginine content of serum-proteins. J. N. A.

Determination of amines in blood. Colorimetric determination of histamine, tyramine, and tryptamine index of serum. A. LESURE (J. Pharm. Chim., 1940, [ix], 1, 55—69).—The apparent tyramine and histamine content (tyramine and histamine index) of serum is 0.2—0.6 and 0.0—0.2 mg.-%, respectively. In disease, the corresponding vals. are 1—2 and 0.4—0.8 mg.-%, respectively. The tryptamine index is normally approx. zero. J. L. D.

Influence of nitrogen retention on regeneration of plasma-proteins. R. L. HOLMAN and J. G. MEBANE (J. Exp. Med., 1940, 71, 299—304).—In dogs with hypoproteinæmia, damage to the kidneys by injection of U nitrate causes non-protein levels up to 10 times normal but no interference with plasma-protein formation. Elevation of the non-protein-N and proteinuria *per se* do not affect protein production. A. C. F.

Plasma-protein production and utilisation. Influence of amino-acids and sterile abscesses. S. C. MADDEN, C. A. FINCH, W. G. SWALBACH, and G. H. WHIPPLE (J. Exp. Med., 1940, 71, 283—297).—Plasma-protein production is uniform in dogs with hypoproteinæmia following plasmapheresis if kept on a basal low-protein diet. Plasma-protein formation is up to 33% of protein ingested as casein or liver and 40% when plasma-protein is fed. Zein is not effective unless supplemented with cystine, tryptophan, lysine, and glycine, when plasma-protein formation is doubled. If liver-protein is supplemented with cystine, leucine, and glutamic acid, which are of prime importance, and also tryptophan, the effect is equiv. to that following ingestion of plasma-protein. In a protein-fasting animal, plasma-protein formation is min. when the protein reserve is exhausted. There is a "dynamic equilibrium" between the various protein depôts even in severe hypoproteinæmia. A. C. F.

Serum-albumin regeneration following intravenous amino-acids in hypoproteinæmia produced by hæmorrhage. R. ELMAN (Proc. Soc. Exp. Biol. Med., 1940, 43, 14—16).—Intravenous injection of an enzyme digest of casein caused an increase in serum-albumin concn. with a decrease in serum-globulin concn. and red cell vol. V. J. W.

Electrophoretic analysis of plasma- and urinary proteins. J. A. LEUTSCHER, jun. (J. clin. Invest., 1940, 19, 313—320).—Plasma- and urinary proteins were analysed in the Tiselius electrophoresis apparatus. Analysis of serum-albumin shows 2 components at p_H 4.0. A reversal of the normal ratio of these components occurs in the nephrotic syndrome and advanced cirrhosis of the liver. C. J. C. B.

Clinical experience with Abderhalden's [interferometer] serum reaction. W. SCHÖN (Klin. Woch., 1939, 18, 1472—1475).—The reaction is clinically useless. M. K.

Takata reaction. T. MARKOLF (Klin. Woch., 1939, 18, 1389—1392).—Two different types of reaction are described. One is determined by an increase of the easily coagulable albumins in serum. The other is not caused by a change of albumins.

M. K.

Porphyrin in normal blood corpuscles. W. GROTEPASS (Nederl. Tijds. Geneeskunde, 1937, 81, 362—366; Chem. Zentr., 1937 i, 3359).—Published work indicates that the protoporphyrin in human blood corpuscles is derivable from aetioporphyrin-III.

A. J. E. W.

Hæmatoporphyrin and blood-sugar. A. G. DOUGLAS (Klin. Woch., 1939, 18, 1396).—Blood-sugar of rabbits which were kept in darkness was not influenced by large doses of hæmatoporphyrin (5 mg. per kg.). Animals exposed to light showed a decrease of blood-sugar, even after doses of 1 mg. per kg.

M. K.

[Blood-]alkali reserve during injection of acetic and other acids. A. FERRANTE (Arch. Sci. biol., Napoli, 1940, 26, 67—79).—HCl, lactic and pyruvic acid, when injected intravenously into dogs, produce a steady decrease of the alkali reserve, whilst the decrease produced by acetic acid is rapid at first but becomes slower later. Under the experimental conditions used, the min. lethal doses were 0.35, 1.08, 0.27, and 2.21 g. per kg., respectively.

S. O.

Serial blood-sugar determinations in normal newborn infants. J. B. MCKITTRICK (J. Pediat., 1940, 16, 151—159).—Vals. above 40 mg.-% blood-sugar are normal in the 1st week of life. During the 2nd week the range is from 60 to 120 mg.-% (average 85 mg.-%).

C. J. C. B.

Mechanism of iodoacetate and fluoride hyperglycæmia. J. M. YU (Chinese J. Physiol., 1940, 15, 1—8).—When 80 mg. per kg. of iodoacetate or 100 mg. per kg. of F was injected intraperitoneally into rabbits anaesthetised with amytal, hyperglycæmia resulted (sometimes preventable by insulin), liver-glycogen disappeared, and arterial-venous sugar difference increased. More glycolysis occurred in a leg muscle incubated for 24 hr. if it was removed after the injection.

N. H.

Technique of blood-sugar determination. K. DIRR and H. STINGEL-MUNZERT (Munch. med. Wschr., 1939, 86, 1694—1698).—Technical details of blood-sugar determinations in medical practice are described.

A. S.

Modified Folin-Malmros micro-blood-glucose determination. J. KAMLET (Amer. J. clin. Path., Tech. Sect., 1940, 4, 20—24).—The Folin-Malmros micro-method is adopted to the determination of glucose in 20 cu. mm. of blood.

C. J. C. B.

Serum-cholesterol in acute infections as recorded during and after pneumonia. A. STEINER and K. B. TURNER (J. clin. Invest., 1940, 19, 373—377).—The serum-cholesterol of 19 patients with pneumonia was followed at frequent intervals for 96—520 days after the onset of the disease. Hypocholesterolaemia occurred during the febrile stage of the illness and was largely due to a decrease in the ester fraction. Hypercholesterolaemia frequently as-

sociated with wide fluctuations occurred during convalescence from pneumonia for periods varying from 20 to 110 days, with an average of 52 days.

C. J. C. B.

Glycine tolerance test in sprue and pernicious anæmia. L. A. ERF and C. P. RHOADS (J. clin. Invest., 1940, 19, 409—421).—In 4 patients with untreated sprue and pernicious anæmia the results of glycine tolerance tests suggested that glycine was absorbed from the gastro-intestinal tract more slowly than normal. Evidence of this abnormality was not found in the same cases after the administration of liver extract. Malabsorption was not demonstrable in patients with intractable diarrhoea, severe refractory anæmia, or pernicious anæmia in complete or partial remission, but was present in 2 patients with cirrhosis of the liver.

C. J. C. B.

Constancy of blood-cholesterol in children. R. LUCENTINI (Biochim. Terap. sperim., 1940, 27, 33—44).—Blood-cholesterol in children, aged 2—12 years, shows variations when determined at 2—20 weeks' interval, indicating that a single determination gives an unreliable val. The level, however, tends to vary about a fairly const. val. which is characteristic for the individual.

F. O. H.

Inter-relation of lipins in blood plasma of White Leghorn cockerels. E. M. BOYD and E. L. CLARKE (Canad. J. Res., 1940, 18, D, 49—52).—Mean plasma-lipin vals. recorded are total 520, neutral fat 225, total fatty acids 361, total cholesterol 100, free cholesterol 34, phospholipin 155 mg. per 100 c.c. In general the amounts of the fractions varied in proportion to the total.

A. G. P.

Coccarboxylase content of human blood. F. WIDENBAUER (Klin. Woch., 1939, 18, 1392—1394).—The total vitamin-B₁ content (aneurin + coccarboxylase) of serum was determined by a modification of Ritsert's thiochrome test. Normal human serum contains 5 µg.-% of coccarboxylase, which represents 1/3 of the total -B₁ content.

M. K.

Zinc and copper content of blood in beriberi, protein deficiency, and diabetes mellitus. W. G. E. EGGLETON (Chinese J. Physiol., 1940, 15, 33—44).—Zn and Cu, determined by a modified dithizone method, averaged 6.79 and 1.72 mg. per kg. of blood in normal Chinese. Blood-Zn was low in beriberi and suspected protein deficiency, while the Cu might be raised.

N. H.

Copper metabolism and hypophysis. H. YOSIKAWA (Japan. J. Med. Sci., II, 1939, 4, 231—232).—Injection of anterior pituitary extract or its thyrotrophic fraction has no effect on Cu content of rabbit blood.

R. L. E.

Adrenal gland in regulation of blood-copper. H. YOSIKAWA and H. SIBUTA (Japan. J. Med. Sci., II, 1939, 4, 223—230).—Rabbit blood-Cu is unaffected by removal of adrenals, but falls when thyroid is also removed. It is restored to normal by thyroxine. Adrenaline increases the effect of thyroxine but has no effect alone.

R. L. E.

State of copper in blood and tissues. H. YOSIKAWA (Japan. J. Med. Sci., II, 1939, 4, 211—

217).—Ox serum-Cu is combined with protein. Keeping blood for 2 days or treatment with acid or alkaline protein precipitants makes Cu dialysable. Cu occurs in rabbit liver-fat. R. L. E.

Serum-iron in leukæmia. R. STODTMEISTER and P. BUECHMANN (Klin. Woch., 1939, 18, 1365—1366).—Serum-Fe is decreased in leukæmia, and is a reliable indication of the gravity of the case. Anæmia in chronic leukæmias is due to Fe deficiency. M. K.

Determination of sub-micro-quantities of calcium [in blood-serum].—See A., 1940, I, 232.

Distribution of water and electrolytes in blood of dolphins (*Tursiops truncatus*). L. EICHELBERGER, E. S. FLETCHER, jun., E. M. K. GELLING, and B. J. VOS, jun. (J. Biol. Chem., 1940, 133, 145—152).—Analytical data for the serum and whole blood of 4 living, unanæsthetised dolphins are reported. The high serum-Na val. (0.1533 g.-mol. per l.) is decisively different from that of land mammals. A. L.

Plasma-electrolytes as affected by insulin and by various partial pressures of atmospheric gases. M. R. ZIEGLER (Proc. Soc. Exp. Biol. Med., 1940, 43, 165—167; cf. A., 1939, III, 380).—There is no definite relationship between proportions of plasma-electrolytes and occurrence of insulin convulsions. V. J. W.

Blood studies in pemphigus. J. H. TALBOTT and F. S. COOMBS (Arch. Dermat. Syphilol., 1940, 41, 359—369).—Studies of the blood of 34 patients with acute pemphigus showed changes in concn. of constituents consistent with adrenal insufficiency. 5 patients with acute pemphigus were given large amounts of adrenal cortex extract and NaCl solution. A remission followed in each patient but 5 control patients all died. C. J. C. B.

p_H of systemic blood in normal and hypertensive dogs determined by means of a syringe type glass electrode. O. H. MÜLLER and W. F. NICKEL (Proc. Soc. Exp. Biol. Med., 1940, 43, 89—92).—Normal dogs gave p_H 7.32 and dogs with a blood pressure of 175 mm. Hg gave p_H 7.35. V. J. W.

Determination of iodine in blood. A. L. CHANEY (Ind. Eng. Chem. [Anal.], 1940, 12, 179—181).—The catalytic action of I on the reduction of $Ce(SO_4)_2$ by AsO_3''' (A., 1937, I, 630), has been applied to the micro-determination of I in biological material. The method described gives satisfactory results with not less than 0.05 $\mu g.$ of I. The rate at which $Ce(SO_4)_2$ is reduced is proportional to the amount of I' present, and the reduction of the $Ce(SO_4)_2$ after a fixed time at $30^\circ \pm 0.5^\circ$ is followed by photo-electric measurement of the intensity of the yellow colour. An improved distillation apparatus for the rapid recovery of small amounts of I in a small vol. of distillate is described. It is used after oxidation of the I in blood with H_2CrO_4 and H_2SO_4 . The reduction of the resulting HIO_3 by H_3PO_3 is improved by addition of H_2O_2 . L. S. T.

Blood-iodine of patients with acne vulgaris. E. F. TRAUB and R. EMMET (Arch. Dermat. Syphilol.,

1940, 41, 506—508).—In 13 control patients the average blood-I was 6 $\mu g.$ -% and in 45 patients with acne vulgaris 5.975 $\mu g.$ -%. C. J. C. B.

Lead content of human blood. J. N. M. CHALMERS (Lancet, 1940, 238, 447—450).—The Pb content of blood of 70 subjects with no known industrial exposure to Pb was 30—89 (mean = 57) $\mu g.$ -%. In 44 symptom-less Pb workers the vals. were 60—192 (mean = 104) $\mu g.$ -%; 34 of the latter showed stippling of the erythrocytes using alkaline methylene-blue. C. A. K.

Spreading effect of testis extract on areas of acute inflammation produced by physical agents. J. J. HEAD and R. M. THOMAS (Yale J. Biol. Med., 1939, 12, 69—78).—The sharply localised inflammatory lesion caused by the application of a steel rod heated to 95° or of solid CO_2 to the skin of rabbits or guinea-pigs is increased 2—5 times in area by the direct, intraperitoneal, or intravenous injection of bull testis extract. The extract probably overcomes the fixation, by the tissues in the site of injury, of a factor liberated by the injured tissues which is responsible for the inflammatory reaction. (4 photomicrographs.) F. S.

Effect of warm and cold nasopharyngeal irrigation on cervical lymph flow. J. D. MCCARRELL (Amer. J. Physiol., 1940, 128, 349—354).—Nasopharyngeal irrigation with isotonic saline in dogs at temp. above 5° and below 45° caused no variations in lymph flow or its protein content. At 45° lymph flow increased, continued only during heat application, and was the result of a rise in the rate of capillary filtration. At 50° and above, irreversible changes in capillary permeability occurred, and lymph flow was profuse, highly proteinised, and did not return to normal with reduction of temp. At 5° an augmented lymph flow occurred which, depending on the absence or presence of capillary damage, was either temporary or prolonged. M. W. G.

(vi) VASCULAR SYSTEM.

The stethoscope. F. D. JOHNSTON and E. M. KLINE (Arch. intern. Med., 1940, 65, 328—339).—Acoustical studies of various types of stethoscope are reported. C. A. K.

Distribution of cardiac nerves, with special reference to identification of sympathetic and parasympathetic post-ganglionics. J. F. NONDEZ (Amer. J. Anat., 1939, 65, 361—413).—The ansa subclavia of the dog conveys afferent fibres reaching the middle cervical ganglion in the branches of the middle cardiosympathetic (accelerator) nerve. The superior cardiosympathetic from the middle cervical ganglion ends on the walls of the great vessels. The middle nerve supplies the ventricles. The inferior nerve contains afferent fibres from the heart and may join the accelerator. The right cardiovagal joins the accelerator of its side and sends preganglionic fibres to the deep cardiac plexus and to the paranglia between the aorta and pulmonary artery. The left cardiovagal carries pressoreceptors to the arch of the aorta and pulmonary bifurcation. It receives

sympathetic post-ganglionics from the middle cervical ganglion. The vagus component of the heart shows a plexiform arrangement and there is no evidence that it is continuous with the sympathetic. Const. differences in the affinity of the sympathetic and parasympathetic nerve fibres for Ag are reported and discussed.

W. F. H.

Relation of electrical and mechanical events in ventricle of turtle. H. GOLDBERG and J. A. E. EYSTER (Amer. J. Physiol., 1940, 128, 390—398).—The potential field on the surface of the snapping turtle ventricle during the *QRS* period is characterised by the simultaneous appearance of electrical sources and sinks which show periods of growth and decline and changes in orientation. The onset of contraction at various regions of the ventricular surface is coincident with, or separated by a very brief interval from, the occurrence of max. electrical current flow across the region and the max. time rate of change of this current. This electrical state coincides with the main deflexion of the differential curve and the most rapid rate of potential change in the unipolar curve recorded from this region.

M. W. G.

Ventricular fibrillation [produced by drugs]. T. C. R. SHEN and R. MARRI (Arch. int. Pharmacodyn., 1940, 64, 58—78).—Injection of F.1262 with adrenaline prevents benzole-adrenaline fibrillation of the dog's ventricle. 5—60 min. later adrenaline alone causes hypertension and fatal fibrillation in benzole inhalation. Corynanthine (0.5—2 mg. per kg.) causes hypotension and is protective against the benzole-adrenaline action. Intrapericardial injection of 0.2 mg. of adrenaline per kg. does not cause fibrillation in benzole inhalation; intravenously 0.02 mg. per kg. does. In the former case the rise of pressure is slow; the cardiac disturbance is caused by a sharp blood pressure rise.

D. T. B.

Protecting action of procaine against ventricular fibrillation induced by adrenaline during cyclopropane anaesthesia. C. L. BURSTEIN and B. A. MARANGONI (Proc. Soc. Exp. Biol. Med., 1940, 43, 210—212).—0.01 mg. of adrenaline per kg. caused ventricular fibrillation in 3 out of 5 dogs. 2 of these 3 had recovered from a similar dose when they had previously received 5 mg. per kg. of procaine. All dogs survived when procaine was given first, and adrenaline fibrillation could frequently be cured by subsequent procaine administration.

V. J. W.

Excitatory activity of small doses of quinine dihydrochloride on isolated toad's heart. S. GAJATTO (Arch. Farm. sperim., 1940, 69, 101—110).—Concns. (as g.-mol. per l.) of quinine below 10^{-15} are without effect, concns. of 10^{-15} — 10^{-4} (max. at 10^{-5}) increase amplitude and frequency of beat; concns. above 10^{-4} have a depressant effect (10^{-3} and above being toxic).

F. O. H.

Experimental localised auricular necrosis. A. SANDERS (Amer. J. med. Sci., 1939, 198, 690—694).—Necrosis near the sinus node (dogs) caused a nodal rhythm, wandering pacemaker, auricular extrasystoles, and paroxysmal auricular tachycardia. Localised left auricular necrosis often produced elevation of the

auricular *S-T* segment in lead I with an upward bowing and an auricular *Q* wave. In 2 instances, intra-auricular block resulted. In a few instances of left auricular necrosis, similar auricular *S-T* changes occurred in the oesophageal lead, to the exclusion of lead I. Right auricular necrosis produced similar auricular *S-T* changes in the oesophageal lead and in leads II and III. Changes in the initial auricular complex (*P* wave proper) consisted of broadening, inversion, diminution, or increase in amplitude, and slurring, notching, the development of a *Q* or *S* wave, or *M* or *W* shapes. Some cases of localised auricular necrosis failed to alter the e.c.g., while others produced minor changes in the ventricular complexes.

C. J. C. B.

Cardiac inositol of sheep, pig, and ox. L. B. WINTER (Biochem. J., 1940, 34, 249—250).—In contrast to the dog's heart, combined inositol cannot be detected in heart muscle of sheep, pig, and ox. Considerable destruction of inositol occurs when it is boiled with 5% aq. KOH.

J. N. A.

Glutathione in heart failure. R. KLOTZ (Klin. Woch., 1939, 18, 1466—1468).—Glutathione, especially the oxidised form, is increased in cardiac insufficiency. Daily injection of a digitalis prep. restored the vals. to normal.

M. K.

Types of congestion in patients with right ventricular failure. E. SONS (Münch. med. Wschr., 1939, 86, 1501—1508).—Two types are distinguished: (i) congestion mainly in the region of the superior vena cava and nutritive circulation of lungs and pleura with subsequent pleural effusion; (ii) congestion in the region of the inferior vena cava with ascites and oedema.

A. S.

Asthmatoid heart failure, a form of left ventricular failure and its differentiation from bronchial asthma. M. PLOTZ (Ann. int. Med., 1939, 13, 151—160).—Patients suffering from left ventricular failure suffer occasionally from disturbances of breathing closely resembling allergic bronchial asthma with relief of the symptoms by adrenaline. Differential diagnosis is possible by determining the circulation time, which is normal in asthma but increased in heart failure.

A. S.

Treatment of Stokes-Adams syndrome by intravenous injection of hypertonic glucose solution. L. H. SIGLER (Ann. int. Med., 1939, 13, 101—106).—Intravenous injection of 50 c.c. of a 50% solution of glucose was beneficial in 4 patients suffering from repeated attacks of complete auriculo-ventricular dissociation. The no. of attacks greatly diminished.

A. S.

Coronary circulation after occlusion. H. B. BURCHELL (Arch. intern. Med., 1940, 65, 240—262).—The anatomy of the coronary arteries in the dog is reviewed. Experimental constriction of the main coronary vessels, if not immediately fatal, may cause no infarction or disability, circulation being re-established from the first branches of the coronary stems and pre-existing collateral channels. There is no evidence that pericardial adhesions provide a significant blood supply to the myocardium after coronary occlusion.

C. A. K.

Coronary insufficiency in extrarenal azotæmia. P. GÖMÖRI and Z. VON GRUBER (Klin. Woch., 1939, 18, 1417—1421).—Dehydration and azotæmia were produced in cats by ligation of pylorus; the e.c.g. showed characteristic signs of coronary insufficiency which is attributed to decreased blood pressure. M. K.

Cardiac and coronary insufficiency. E. EDENS (Klin. Woch., 1939, 18, 1381—1382).—A review. M. K.

Pulmono-coronary reflex during pulmonary embolism. P. ECKARDT (Pflüger's Archiv, 1939, 241, 224—240).—0.2—0.5 c.c. of suspensions of lycopodium powder or of BaSO₄ in FeCl₃ were injected repeatedly into the right jugular vein of large dogs under light morphine-pernocton or bulbo-capnine anaesthesia; blood clots were formed and embolism of small and middle-sized pulmonary vessels ensued. With each successive pulmonary embolism the pressure rises in the pulmonary artery and falls in the left auricle. There is a fall lasting for 20—30 sec. in the systemic blood pressure followed by a rise above the original val. and return to normal in 2—3 min. Occasionally following the first few embolisms, these changes may be preceded by a short initial rise in the blood pressure. The changes in the coronary circulation are more marked in the right than in the left coronary artery and consist of a decrease in the blood flow for 5 sec. followed by a very marked increase lasting 15—30 min.; the rise is due to a peripheral reflex initiated from the myocardial capillaries; it occurs after cutting the sympathetic, vagus, and nerves in the root of the lung and after atropine or ergotamine. J. A.

Embolism following hystero-salpingography with lipiodol. O. WALTHER (Acta Radiol., Stockh., 1939, 20, 457—468).—Lipiodol used in hystero-salpingography occasionally enters the uterine and pelvic veins and becomes roentgenologically visible for a short time in the inferior vena cava. It blocks the pulmonary capillaries, where it is decomposed into oil and I. Most of the I is excreted as KI through the kidneys in 6—8 days. The oil is taken up by the endothelium, adventitia cells, and alveolar epithelium. Only small quantities of lipiodol pass through the lungs on intravenous injection in rabbits. A. S.

Pericardial milk spots. A. A. NELSON (Arch. Path., 1940, 29, 256—262).—Pericardial milk spots occurred in 34.4% of 494 persons 1 year or more of age. In 439 persons 18 or more years of age the incidence was 37.6%. There is an association. Of 42 persons with chronic or recurrent valvular heart disease, 66.7% showed spots. Patients with severe coronary sclerosis and enlarged hearts showed increases of 50.0 and 47.9% respectively. C. J. C. B.

Electrocardiographic changes in pericarditis. P. H. NOTH and A. R. BARNES (Arch. intern. Med., 1940, 65, 291—320).—In acute pericarditis elevation of the RS-T segment and exaggerated T waves in the standard leads are most frequently seen. The changes are more transient than those seen after myocardial infarction. In the subacute and chronic

stages low-voltage QRS complexes and T waves often occur. Other changes are described. C. A. K.

Capillary rupture with intimal hæmorrhage in causation of cerebral vascular lesions. J. C. PATERSON (Arch. Path., 1940, 29, 345—354).—Intimal hæmorrhages in sclerotic cerebral arteries are similar in structure to those in sclerotic coronary arteries. They result not from backflow of blood through defects produced by rupture of atheromatous "abscesses" as was previously thought, but from rupture of capillaries derived from the main arterial lumens. Capillary rupture with intimal hæmorrhage is intimately concerned with the mechanism of cerebral arterial thrombosis and possibly, in certain cases, with the causation of cerebral arteriospasm and rupture. The factors responsible for the rupture of intimal capillaries in the cerebral arteries are high intracapillary pressure from hypertension, progressive atheromatous degeneration of the supporting tissues, and increased capillary fragility from a variety of causes. (5 photomicrographs.) C. J. C. B.

Primary amyloid disease of myocardium and blood vessels. C. H. BINFORD (Arch. Path., 1940, 29, 314—320).—The case of a 56-year old white man who died of myocardial failure and cardiac asthma is reported. Autopsy showed stenosing amyloidosis of the small coronary vessels and interstitial deposition of a hyaline substance in the myocardium, as well as generalised amyloidosis of the small arteries and veins. There was no associated chronic disease. (5 photomicrographs.) C. J. C. B.

Changes in elasticity of aorta with age. J. KRAFKA, jun. (Arch. Path., 1940, 29, 303—309).—Loss in elasticity of the aorta with age results from 2 factors: distensibility 80% and fibrosis 20%. Increase in distensibility from birth to maturity is not established. No direct correlation exists between elasticity, blood pressure, sclerosis, and thickness of the aortic wall. C. J. C. B.

Experimental production and pathogenesis of hypertension due to renal ischæmia. H. GOLDBLATT (Amer. J. clin. Path., 1940, 10, 40—72).—A review of the author's technique and findings on the subject with pertinent literature. C. J. C. B.

Rise of blood pressure during ischæmia of the gravid uterus. E. OGDEN, G. J. HILDEBRAND, and E. W. PAGE (Proc. Soc. Exp. Biol. Med., 1940, 43, 49—51).—In pregnant bitches the aorta was compressed below the renal arteries until the femoral blood pressure was diminished by half. This caused a gradual rise in carotid pressure of 10—58 mm. Hg. Non-pregnant controls showed no such reaction. V. J. W.

Production of renin by constricting renal artery of an isolated kidney perfused with blood. K. G. KOHLSTAEDT and I. H. PAGE (Proc. Soc. Exp. Biol. Med., 1940, 43, 136—140).—Isolated dog's kidney is perfused with defibrinated blood. If blood flow is reduced from 180 c.c. to 129 c.c. per min. by constriction of the renal artery the blood is found to cause vasoconstriction in the rabbit's ear. V. J. W.

Rate and rhythm in hypertensive heart disease. N. FLAXMAN (Arch. intern. Med., 1940, 65, 595—606).—243 of 800 cases of hypertensive heart disease showed arrhythmia, which was due in 198 cases to auricular fibrillation. C. A. K.

Brain in malignant hypertension. E. F. ROSENBERG (Arch. intern. Med., 1940, 65, 545—586; cf. A., 1939, III, 658).—A more extensive report on the same subject. C. A. K.

Cure of experimental renal hypertension. S. CERGUA and A. SAMAAAN (Clin. Sci., 1939, 4, 113—118).—Hypertension was produced in dogs by constricting the renal artery. Decapsulation of the ischaemic kidney and establishing a collateral circulation permanently reduced the blood pressure to normal. The pressure at once rose again after dividing the anastomosing vessels. B. I.

Hypertension produced in rabbit by prolonged renin infusion. J. R. HILL and G. W. PICKERING (Clin. Sci., 1939, 4, 207—216).—Continuous infusion of low concns. of renin in saline produces a rise in blood pressure, continuously sustained while infusion lasts, and slowly declining when discontinued. High concns. produce a rapid and larger rise maintained for a short time and gradually diminishing to normal levels while the infusion still continues. The presumptive causes for this are discussed. B. I.

Circulation time (magnesium sulphate method) in diagnosis of peripheral vascular disease. J. E. BERK (Amer. J. med. Sci., 1940, 199, 505—512).—The arm-to-tongue and arm-to-extremity circulation times were determined on 200 normal subjects and 21 patients with peripheral vascular disease by the intravenous injection of 5 c.c. of 10% MgSO₄ solution. Individuals with peripheral vascular disease had a longer circulation time and an increase in the no. of "blank" and "persistent" blank reactions. Wide variations in circulation times were obtained both in the normal and in the abnormal groups and even in the same individual. C. J. C. B.

Function of carotid sinus in foetus. L. DONATELLI (Arch. int. Pharmacodyn., 1940, 64, 93—108).—The carotid sinus in the foetal sheep functions in regulating blood pressure during the latter half of gestation and is independent of the maternal sinus. Vagal tone exists in the foetus. D. T. B.

Thrombo-angiitis obliterans in horse. J. R. M. INNES and J. W. WHITTICK (J. Path. Bact., 1940, 50, 377—381).—A case report. (6 photomicrographs.) C. J. C. B.

Comparison of procedures for increasing blood flow to limbs using an improved optical plethysmograph. G. W. WRIGHT and K. PHELPS (J. clin. Invest., 1940, 19, 273—283).—A boot plethysmograph is described; it is easy to apply and calibrate. The open end is sealed around the leg without constriction by the use of plaster of Paris and Unna's paste; it is comfortable for prolonged periods of study. The apparatus is connected to a Frank segment capsule. The phasic arterial blood flow of the leg for normal subjects at rest in a warm

room (28—30°) shows 3 variations during each cycle: (1) a rapid systolic forward flow, (2) a slower smaller and variable systolic backflow, (3) a slow forward flow during diastole. Of various procedures suggested for promoting a max. blood flow in the leg, direct application of heat and sciatic nerve block are the most efficacious. There was no increase in blood flow following effective spinal anaesthesia or sacral diathermy. Amyl nitrite increases the amplitude of oscillations but often causes decrease in vol. flow. C. J. C. B.

Direct arterial and venous pressure measurements in man as affected by anaesthesia, operation, and shock. P. P. VOLPITTO, R. A. WOODBURY, and W. F. HAMILTON (Amer. J. Physiol., 1940, 128, 238—245).—Both venous and arterial pulse contours showed striking changes of two types; cases of haemorrhage or secondary traumatic shock showed a rapid pulse of the "empty" type; cases of shock of neurogenic origin with equally low pressures showed a slow heart and entirely different pulse contours. M. W. G.

Conditions for excitation of vasoconstrictors. C. MALTESOS and M. SCHNEIDER (Pflüger's Archiv, 1939, 241, 108—119).—Threshold determinations were carried out by stimulating the sympathetic chain with sinusoidal current between 2 lumbar ganglia in dogs under morphine-pernocton or morphine-urethane anaesthesia and by measuring the alterations in the blood flow through the femoral vessels with Rein's thermostromuhr. The rami communicantes of the 2 ganglia were severed and the sympathetic chain was cut centrally. From the strength-duration curves thus obtained the time factor was determined and the nerve fibres were found to belong to 4 groups with time factors of 0.3—0.5, 1.0—1.1, 3.2—3.8, 7—8 m-sec. (electrodes 5 mm. apart). This was concluded from (1) the kinking of some curves which seemed to be composed of parts of 2 curves, (2) a shifting of the threshold-strength vals. which sometimes affected only one part of a kinked curve, (3) an increase of blood flow and a return to normal which was rapid when in the range of a low time factor and slow when in the range of a high time factor. J. A.

Experimental stimulation of vasodilator nerves. C. MALTESOS and M. SCHNEIDER (Pflüger's Archiv, 1939, 241, 120—128).—Threshold determinations were carried out by stimulating the lingual nerve (which contains no vasoconstrictor fibres) in dogs (for methods cf. preceding abstract). The vasodilator fibres belonged to 4 groups with time factors 0.2, 0.8, 2.3, 6 m-sec. The rheobase was low in fibres with a high chronaxie and vice versa. Rapid fatigue of these fibres occurred when currents with short duration were used, but was absent when the duration was longer as in a.c. of 10—55 cycles per sec. The increase in blood flow in the femoral vessels which is observed after stimulation of the sympathetic chain or of the cut sciatic nerve does not occur after intravenous administration of atropine, which inhibits the vasodilator fibres, but a decrease of the blood flow or a decrease followed by an increase is brought about; atropine raises the threshold of

the vasodilator and lowers that of the constrictor fibres. J. A.

Congenital arteriovenous fistula. J. C. LUKE (Canad. Med. Assoc. J., 1940, 42, 341—345).—3 cases are described. C. J. C. B.

Measurement of diastolic and systolic blood pressure by palpation of arterial vibrations (sounds) over brachial artery. H. N. SEGALL (Canad. Med. Assoc. J., 1940, 42, 311—316). C. J. C. B.

Circulatory modifications in dog in B_1 -avitaminosis. I. Pulse, blood pressure, and electrocardiogram. L. DE SOLDATI (Rev. Soc. argent. Biol., 1939, 15, 142—153).—A diet of autoclaved meat, 10% of sugar, and vitamins-A, -D, and -C was given to 13 dogs. Anorexia appeared on the 18th day and other symptoms of $-B_1$ lack followed. Controls on the same diet to which 70 μ g. of cryst. $-B_1$ was added daily had no symptoms. The pulse rate increased in 92% of the experiments, but no arrhythmia was seen. The systolic blood pressure decreased in all but 3 animals. The e.c.g. showed enlarged P, inverted or biphasic, a prolonged Q-T interval, and an alteration in the ST level. The auriculo-ventricular and intraventricular conduction time was not altered. The e.c.g. modifications were frequently observed before the occurrence of nervous symptoms. A total of 30—75 mg. of cryst. $-B_1$, injected in the course of several days, produced complete recovery. J. T. L.

Vasodilator substance in red blood cells. A. STUDER, A. FLEISCH, and M. CROISIER (Pflüger's Archiv, 1939, 241, 78—87).—A method for the isolation of a vasodilator substance from red cells is described in detail. 1 l. of fresh blood yields 180 mg. of dry Ba acetate ppt. which is further separated into a water-sol. and a more active acid-sol. fraction. Examination of the corresponding Na salt by various biological methods suggests that it consists mainly of adenosinetriphosphoric acid; this is confirmed by chemical analysis and by determination of the m.p. (205—206°) of its acridine salt (cf. A., 1938, III, 376). J. A.

Excitability of vasodilators after X-rays. H. BADE (Strahlenther., 1939, 66, 490—493).—Isolated organs should not be used for the demonstration of an increased excitability of the vasodilators after X-irradiation because of the "normal" dilatation occurring post mortem. E. M. J.

Local and general metabolism in peripheral disturbances of circulation. M. RATSCHOW (Klin. Woch., 1939, 18, 1301—1306).—A lecture. M. K.

Normal fragility of skin capillaries. G. SACK (Klin. Woch., 1939, 18, 1341—1343).—Capillary fragility depends on type of skin, no. of red corpuscles, and on skin circulation; it is reduced in rigid skin and in anæmia, but greatly increased in active and reactive hyperæmia. M. K.

Influence of respiration on finger-plethysmogram. G. PETERS (Pflüger's Archiv, 1939, 241, 201—219).—The decrease in digit vol. during deep inspiration is dependent on the vascular nerve supply,

as shown by its absence after avulsion of the brachial plexus or after blocking with novocaine. Movements of the shoulders play no part. The alteration of digit vol. is evident in persons with thoracic type of respiration and absent in persons with abdominal respiration but can be elicited in the latter by addition of CO_2 to the inspired air, which makes the respiration thoracic in type. Passive respiration (pulmotor, biomotor) elicits or increases the respiratory waves. Under pathological conditions the respiratory waves are inverted and the influence of a deep respiration on the digit vol. may be absent. Both vasomotor reflexes are initiated from receptors in the chest wall. J. A.

Lymph flow from heart-lung preparation during pulmonary œdema. V. LORBER (Proc. Soc. Exp. Biol. Med., 1940, 43, 170—172).—Development of œdema is not accompanied by any increase of lymph flow from the thoracic duct. V. J. W.

Edema of eyelids. G. E. BURCH (Arch. intern. Med., 1940, 65, 477—498).—The mean subcutaneous tissue pressure in the lower eyelids of 21 normal subjects was 23.4 mm. H_2O . Injection of 1 c.c. of physiological NaCl solution subcutaneously had no effect on the pressure, although in other parts of the body such injection raised the subcutaneous pressure. The distensibility of the skin of the lower lid is greater than that of other skin. These and other facts are related to the occurrence of œdema in the eyelids in nephritis etc. C. A. K.

(vii) RESPIRATION AND BLOOD GASES.

Respiratory regulation in *Eriocheir sinensis*, Milne-Edwards. P. F. VAN HEERDT (Chinese J. Physiol., 1940, 15, 25—32).—In water containing 0.75—1 c.c. of O_2 per l., the crab's respiration became more rapid. With high CO_2 , the rate first showed a decrease, prevented by amputating the first antennæ, then an increase if CO_2 was above 23 c.c. per l., and a final decrease if it rose to 35—70 c.c. per l. N. H.

Attempt to detect reflex changes in bronchial calibre synchronous with respiration. H. C. NICHOLSON and R. H. TRIMBY (Amer. J. Physiol., 1940, 128, 276—280).—Using a proved sensitive method in over 30 anæsthetised dogs, it was demonstrated that the rhythmic changes in bronchial calibre synchronous with respiration are not reflex but probably purely passive. M. W. G.

Part played by carotid body reflexes in respiratory response of dog to small changes in CO_2 tension in arterial blood. C. F. SCHMIDT, P. R. DUMKE, and R. D. DRIPPS (Amer. J. Physiol., 1939, 128, 1—9).—The claim that the carotid body receptors respond more rapidly and at a lower threshold than the respiratory centre to increase in the CO_2 tension of the blood was tested on dogs, and not confirmed by the methods employed. That impulses from the carotid bodies are an important factor in maintaining respiratory activity during quiet breathing without anoxæmia (cf. Euler and Liljestrand, Physiol. Abs., 1937, 21, No. 4278) was not confirmed. The carotid chemoreceptors are not more

sensitive than the respiratory centre to changes in arterial CO_2 tension; that reflexes from them only become important under unusual circumstances is reaffirmed for the conditions studied (lightly anaesthetised vagotomised dogs). M. W. G.

Stimulation of respiration by oxygen lack. T. BENZINGER, E. OPITZ, and W. SCHOEDEL (Pflüger's Archiv, 1939, 241, 71—77).—When the respiratory centre in dogs is depressed to a certain extent by morphine-pernocton, respiration is not initiated by rise in CO_2 but by lack of O_2 via the chemoreceptors of carotid sinus and aortic arch; when the depressant action on the respiratory centre is slighter, there is a continuous change-over from the CO_2 to the O_2 type of respiration, and vice versa. The addition of CO_2 to O_2 in overdosage of ether- or CHCl_3 -anaesthesia in man may be harmful under such conditions. J. A.

Intrinsic asthma. F. M. RACKEMANN (J. Allergy, 1940, 11, 147—162).—The term "intrinsic" applies to patients whose asthma bears no relationship to changes in season, environment, or diet. The group is not small. Some patients are free for several years between the early extrinsic and the later intrinsic asthma. Deaths from asthma occur in 8% of the intrinsic group, but in extrinsic asthma they are only accidental. C. J. C. B.

Bronchial aspiration in poisoning with asphyxiating gases. PIQUET and MARCHAND (Bronchoscopie, 1939, 3, 145—149).—Dogs were exposed to 9 times the fatal concn. of asphyxiating gases for 30 min. They recovered if the fluid accumulating in the respiratory tract was sucked off through a tracheal canula. Higher concn. or longer exposure always proved fatal. C. E.

B.L.B. mask for administering oxygen. W. I. CARD, J. F. SMITH, W. J. GRIFFITHS, B. A. MCSWINEY, and B. SAVAGE (Lancet, 1940, 238, 398—402).—The apparatus is described in detail. C. A. K.

Drug prophylaxis against lethal effects of severe anoxia. I. Convulsant agents. G. A. EMERSON and E. J. VAN LIERE (Arch. int. Pharmacodyn., 1940, 64, 239—249).—Mice were given injections of different convulsive agents 15 min. before exposure to anoxia in a decompression chamber. Full subconvulsive doses of apomorphine, camphor, tetrazole, KCN, and strychnine were most effective as prophylactics. Camphor and picrotoxin had doubtful effects. Caffeine, cocaine, coramine, and adrenaline had no preventive action and seemed harmful. No const. prophylactic effects were shown by cerebral stimulants as a class. Respiratory stimulation is an important factor in the mechanism of prevention. D. T. B.

Low oxygen pressure and lung tumours. J. A. CAMPBELL (Brit. Med. J., 1940, I, 336—339).—Anoxia increases the incidence of primary lung tumours in mice (of same stock as controls) older than 10 months. Mice may become acclimatised to 13% O_2 , so that they can breed and rear young which grow normally. They cannot become acclimatised to 10% O_2 . C. A. K.

Oxygen content of venous blood from arm vein and oxygen consumption of resting human muscle. H. E. HOLLING (Clin. Sci., 1939, 4, 103—111).—The O_2 consumption of resting muscle was calc. from the O_2 content of venous blood and the blood flow through the muscle, measured plethysmographically. Variations in O_2 consumption under different conditions are discussed, and comparisons with animal experiments made. B. I.

Oxygen intoxication. H. BECKER-FREYSENG and H. G. CLAMANN (Klin. Woch., 1939, 18, 1382—1385).—In experiments on man, inhalation of 90% O_2 for 5 hr. at atm. pressure caused no symptoms during the first 24 hr. Later nervous disturbances occurred and in one case inflammation of the lung developed. M. K.

Effect of high atmospheric pressure on intermediary carbohydrate metabolism and serum-protein. T. ISHIKAWA (Tohoku J. exp. Med., 1939, 37, 1—32).—Rabbits were subjected to pressures of 5, 7, or 10 atm. for periods of 30 min. or 2 hr. Immediately after decompression, blood-lactic acid was decreased, blood-sugar increased, and haemoglobin and serum-proteins decreased; there was an abs. fall but relative increase in colloid osmotic pressure (perhaps owing to relative increase in serum-albumin), but no significant change in serum-NaCl. H. L.

Reserve capillaries of lung. M. GAIDA (Anat. Anz., 1939, 89, 52—65).—Injections were made into living lungs in the fully collapsed and fully expanded states. Many more capillaries were found open when the lung was expanded, confirming the suggestion that only a certain proportion of the capillaries are open at any one time during life. R. W. H.

Rapid method of determining lung capacity. J. McMICHAEL (Clin. Sci., 1939, 4, 167—173).—Re-breathing into a spirometer containing a known vol. of H_2 produces complete mixing of the gases in the spirometer-lung system. Changes in electrical conductivity, as measured by a katharometer, are used to determine the final % of H_2 and hence the total lung vol. B. I.

Postural changes in lung volume. J. McMICHAEL and J. P. MCGIBBON (Clin. Sci., 1939, 4, 175—183).—The total lung vol., the functional residual air, and the residual air all decrease in recumbency, the average figures of decrease being 340, 780, and 150 c.c. respectively. B. I.

Action of electric current on respiratory and circulatory organs. I. Respiratory organs. A. W. GREENBERG (J. Ind. Hyg., 1940, 22, 104—110).—Dogs and cats under ether anaesthesia were stimulated with currents (100 v., 50 ma.) of 10 sec. duration. Radiological examination showed a diminution in the capacity of the chest, due to the predominant action of the expiratory muscles, with darkening of the lung fields suggesting collapse. Spirometry showed that respiration ceased after a max. expiration, while bronchographs showed narrowing of the trachea and bronchi. E. M. K.

Gas exchange during ascent to high altitudes. W. WILBRANDT, R. WILBRANDT, and B. STEINMANN

(Pflüger's Archiv, 1938, 240, 698—707).—The gas exchange during ascent from 2600 to 3450 m. was investigated. Corresponding experiments in the atm. chamber were performed up to a barometric pressure equal to an altitude of 5000—7200 m. O₂ consumption and CO₂ output were continuously measured by interferometric methods. There was an immediate rise of 21% in the O₂ consumption, CO₂ output, and R.Q. during ascent (the reverse holds true for descent). The rise is due to the increased energy output necessary for the increased respiration and circulation. J. A.

Respiratory resistance, oil-water solubility, and mental effects of argon, compared with helium and nitrogen. A. R. BEHNKE and O. D. YARBROUGH (Amer. J. Physiol., 1939, 126, 409—415).—Breathing resistance was tested in carefully trained divers of exceptional stability in a respiratory resistance machine which admitted to and withdrew from a Benedict spirometer 32 l. of gas per min. The gas mixtures were 86% A + 14% N₂, 76% He + 4% N₂ + 20% O₂, and air. At pressures of 1—4 atm. the resistance varied as the square roots of their sp. gr. Oil-water solubility ratio for A is 5.32:1 compared with 5.24:1 for N₂ and 1.7:1 for He. A is twice as sol. in water and in oil as is N₂. The narcotic effect of A is greater than that of N₂ at pressures of 4—10 atm. corresponding with depths of 100—300 ft. At 1 atm. no difference was detected between A, N₂, or He with respect to respiratory resistance or psychological effects. M. W. G.

Free and combined silica in silicotic lungs. G. E. YOUNGBURG and M. V. YOUNGBURG (Proc. Soc. Exp. Biol. Med., 1940, 43, 146—148).—Quantities of SiO₂ and silicates (sol. in H₂SiF₆) in 14 lungs are tabulated. Great variations were present. V. J. W.

Pulmonary oedema of central origin. A. JARISCH, H. RICHTER, and H. THOMA (Klin. Woch., 1939, 18, 1440—1443).—Pulmonary oedema, which occurred in rabbits a few min. after suboccipital injection of 0.01 mg. of veratrine, is attributed to stimulation of the sympathetic system and marked rise of blood pressure. M. K.

Effect of unilateral spontaneous pneumothorax on circulation in man. H. J. STEWART and R. L. BAILEY, jun. (J. clin. Invest., 1940, 19, 321—326).—The cardiac output is usually reduced in the presence of unilateral pneumothorax of small or moderate size; sometimes it is unchanged or even increased. Patients exhibiting more extensive pneumothorax showed a variable reduction in cardiac output. When the data for all 4 cases examined were pooled, a rough linear correlation appeared between both cardiac output per min. and per beat, and % collapse of the lung. The decrease in vital capacity bears a linear relation to the % collapse of the lung. C. J. C. B.

Composition of intrapleural air in artificial pneumothorax. A. T. MILLER, jun., and J. M. JONES (Amer. J. med. Sci., 1940, 199, 564—569).—The validity of the diagnosis of broncho-pleural fistulæ by means of intrapleural air analyses has been

confirmed. In the absence of fistulæ, a fair degree of correlation has been found between the CO₂ tension of intrapleural air and the purulency of the fluid, except in cases of intermittent formation and reabsorption of fluid. The O₂ analyses have been found useful in the study of small fistulæ periodically closed by fluid; the degree of correlation between O₂ tension of intrapleural air and purulency of fluid was low. In many cases single analyses of intrapleural air are misleading; serial analyses should be performed when possible. C. J. C. B.

So-called sulphhæmoglobin. F. JUNG (Arch. exp. Path. Pharm., 1939, 194, 16—30).—Green products from hæmoglobin can be obtained by the addition of H₂O₂ at alkaline reaction (p_H 9—11), by adding methæmoglobin-forming substances (*p*-aminophenol, phenylhydroxylamine, *p*-benzoquinone) plus cyanide. These products are probably verdohæmochromogens. H₂S causes the appearance of similar compounds, especially in the presence of methæmoglobin-forming substances. The common factor is the inhibition of catalase and oxidation enzymes by HCN and H₂S. It is suggested that "sulphhæmoglobin" is usually nothing but verdohæmochromogen. H. BL.

Pseudomethæmoglobin and its reaction with carbon monoxide after reduction. G. BARKAN and O. SCHALES (Science, 1939, 90, 616).—Discussion on paper by Amundsen (cf. A., 1940, III, 195). W. F. F.

(viii) MUSCLE.

Post-tetanic increase of muscular reactions following single stimuli. A. F. VON PIRQUET (Pflüger's Archiv, 1938, 240, 763—768).—It was shown that in dogs, cats, rabbits, guinea-pigs, and frogs (1) single indirect faradic stimuli which produce submaximal contraction of the muscle bring about a max. contraction when closely following a short indirect tetanus, (2) indirect subthreshold faradic stimuli produce a contraction only when following faradisation of the nerve, (3) in some experiments the contractions were large when the activating tetanus and the stimulating impulse were applied to the nerve by the same electrodes and were small when the electrodes were applied to different parts of the nerve. J. A.

Enzymic transformation of sugar in muscle. R. WILLSTÄTTER and M. ROHDEWALD (Enzymologia, 1940, 8, 1—63; cf. A., 1937, III, 142, 355).—Determination of carbohydrate balance and investigation of the enzymic differences between fresh and dried muscle, muscle pulp, and extract (using muscle of mammals, birds, and fishes; no differences between red and white muscle), of lactic acid and glycogen production and glucose consumption, of the effects of p_H change, of addition of glycogen or PO₄^{'''}, of hexokinase (attempts to find biological substitutes for hexokinase failed) with and without insulin, of re-synthesis of carbohydrate from lactic acid, of diffusion and permeability phenomena, of activators and inhibitors, of presence and absence of O₂, and of the action of muscle-amylase show that the activity and specificity of the enzyme systems involved in carbo-

hydrate metabolism in muscle are readily altered. The system responsible for lactic acid production is independent of that responsible for glucose transformation. *In vitro*, sliced muscle (not muscle extract) in presence of hexokinase converts glucose into glycogen as intermediate in degradation to lactic acid. In absence of hexokinase, fresh sliced muscle converts glucose in high concn. into an insol. polysaccharide not identical with glycogen. No inositol is produced. The polysaccharide is not pptd. from conc. alkaline solution by alcohol and is not degraded to lactic acid. W. McC.

Effect of malonate on tissue [muscle] respiration. C. A. BAUMANN and F. J. STARE (J. Biol. Chem., 1940, 133, 183—191).—The respiration of pigeon breast muscle, inhibited by malonate, is effectively restored by the addition of fumarate, malate, α -ketoglutarate, and, in high concn., succinate; citrate and glutamate are much less effective. An intact citric acid cycle, therefore, does not appear to be essential for muscle respiration. A. L.

Effect of glyceraldehyde on muscle and uterus. L. LIACI (Biochim. Terap. sperim., 1940, 27, 65—76).—The isotonic work performed by isolated frog gastrocnemii stimulated to fatigue by single faradic shocks was increased (both no. and amplitude of contractions) when 0.1—1.0 mg. per g. glyceraldehyde was injected into the lymph sac 20 min. before the experiment. The amplitude of the spontaneous contractions of both the isolated stomach of the frog and guinea-pig uterus, suspended in Ringer's (or Tyrode's) solution, was also increased by 0.1% of glyceraldehyde in the fluid. S. O.

Oxidation of pyruvate in pigeon breast muscle. H. A. KREBS and L. V. EGGLESTON (Biochem. J., 1940, 34, 442—459).—Fumarate catalyses the oxidation of pyruvate, but in presence of malonate the reaction is stopped at the succinate stage. The succinate cannot therefore arise by anaerobic reduction. In presence of excess of pyruvate, in place of succinate there is formed citrate (up to 15%) and α -ketoglutarate (up to 50%). Addition of fumarate (without pyruvate) to pigeon breast muscle also causes formation of succinate. These reactions form the major part of the normal respiration of this tissue, and oxidation of pyruvate appears to take place via citrate and α -ketoglutarate. P. G. M.

Work done in lifting and lowering of weights. S. TAKENAKA and Y. HATAKEYAMA (Japan. J. Med. Sci., III, 1939, 6, 135—146).—It is confirmed that, within limits, the energy used per unit external work done is a const. and, therefore, the energy expended (above the basal metabolism) increases linearly (a) with increasing wt. for the same no. of liftings per min., and (b) with the no. of liftings per min. of the same wt. With growth of a juvenile (Japanese) the linear range of the curves, especially for higher wts., extends and the efficiency increases. H. Ro.

Myasthenia gravis and thymus gland. H. G. MILLER (Arch. Path., 1940, 29, 212—219).—The literature is reviewed; 5 new cases with autopsies are described. In 2 cases an encapsulated tumour of the thymus was found associated with remnants of

normal thymus; in 2 a persistent thymus was observed, with marked peripheral epithelial hyperplasia in 1 case. In 1 case the thymus was not identified. (6 photomicrographs.) C. J. C. B.

Myasthenia gravis; relation to thyroid gland. K. TSUJI (Klin. Woch., 1939, 18, 1366—1369).—Hyperexcitability of the vagus nerve was found in the majority of 9 cases of myasthenia gravis. Blood-sugar and metabolism were decreased. Post mortems on 2 cases revealed a colloid goitre. Small doses of thyroid substance improved the condition in all patients; slightly larger amounts produced deterioration. Small amounts of adrenaline, ephedrine, and sympatol caused distinct improvement; larger amounts and ergotamine had the contrary effect. M. K.

Changes of choline-esterase at end plates of voluntary muscle following section of sciatic nerve. R. COUTEAUX and D. NACHMANSOHN (Proc. Soc. Exp. Biol. Med., 1940, 43, 177—181; cf. A., 1938, III, 989).—The choline-esterase content of the guinea-pig's gastrocnemius is not decreased during 2 weeks following section of the sciatic though the nerve endings disappear in this time. It is suggested that the esterase is contained mainly in the end plates. In the superior cervical ganglion the esterase falls by about 60% when the preganglionic nerves degenerate. V. J. W.

(ix) NERVOUS SYSTEM.

Fibre dissociation produced by cooling human nerves. R. G. BICKFORD (Clin. Sci., 1939, 4, 159—164).—Dissociation is produced by cooling the nerve by means of a pipe through which cooling lotion circulates. The fibres are paralysed on gradually lowering the temp. in the following order: light touch, cold, motor, vasomotor, 1st pain, touch, 2nd pain, and warmth. B. I.

Muscle sounds of single twitch. G. VAN RIJNBERK and H. D. BOUMAN (Proc. K. Akad. Wetensch. Amsterdam, 1940, 43, 350—355).—Motor nerves to gastrocnemius and rectus abdominis of dogs were stimulated by single condenser discharges and the muscle sounds recorded with amplifier and recording string oscillograph. It was found that a single twitch produces a muscle sound. If the muscle is *in situ* the character of the sound is determined mainly by the bone ("after-vibration"). In an isolated muscle the sound is more simple, with a single di-phasic vibration as its main feature. Records obtained from frog muscles are not essentially different from those obtained from dog muscles. J. D. B.

Function of sweat centre as expressed in electrogram of sweat glands. B. HASAMA (Pflüger's Archiv, 1939, 241, 88—95).—Sweating was elicited in cats by electro- or thermo-stimulation of a localised area of the base of the brain, situated between the prechiasmatal region in front, the mamillary bodies behind, and the medial aspect of the temporal lobes laterally. Action currents, taken by unipolar leads (small electrode on ball of toes, indifferent on electrically inactive part of neighbouring skin), show an

increase in potential which starts 0.5 sec. after the beginning of stimulation and ends 0.5 sec. after the end of stimulation. This stimulation is followed by sweating even when the animal is under the influence of chloral hydrate or urethane, but not when chloretone or luminal is used. J. A.

Quasiperiodic oscillations of skin potential and excitability after faradisation of the skin nerves. K. MOTOKAWA (Japan. J. Med. Sci., III, 1939, 6, 199—214).—Subsequent to an effective indirect faradisation the potential of frog's skin undergoes quasiperiodic oscillations of gradually falling amplitude and lengthening period (total duration more than 30 min.). These after-potentials are much more pronounced in fresh than in old preps. even if resting and action currents remain unaltered. They are also diminished in fatigue. During the supernormal phase following a tetanus both excitability of the nerve and the magnitude of the response are increased. During the quasiperiodic oscillations of the skin potential the excitability is increased when the potential is negative and vice versa. Direct tetanic stimulation does not produce these excitability changes, nor can they be detected with direct shocks, *i.e.*, they occur in the autonomic fibres.

H. Ro.

Summation in neuro-cutaneous system. K. MOTOKAWA (Japan. J. Med. Sci., III, 1939, 6, 185—198).—Stimulation of the autonomic nerves of the frog's skin by means of 2 slightly supermax. induction shocks of increasing interval results in summation of the skin action currents. Analysis of the summated curves shows that, after an abs. refractory period of 10 m-sec. (at room temp.), the response to the second stimulus rises, attains the normal height after 4 sec., and then becomes supernormal for 100 sec. In brief tetani the summation curve rises steeply during the first and gradually during the second period of 0.25 sec. If a subthreshold shock is followed by a slightly supraliminal shock of the same direction, the amplitude of the action currents shows a series of positive and negative phases of responsiveness which may last longer than 150 m-sec. If the test shock has the opposite direction the series begins with a negative phase.

H. Ro.

Quantitative relationship between resting and action currents of frog's skin. K. MOTOKAWA (Japan. J. Med. Sci., III, 1939, 6, 119—133).—When the outside of isolated frog's skin is exposed to different concns. of various salts, the inside being in contact with Ringer's fluid, there is a linear relationship between the widely varying resting and action currents if the solutions affect the skin only superficially and permit equilibrium to be established, *viz.*, $A = a(R - b)$, where A is the action current (in mv., outgoing positive), R the resting current (in mv., ingoing positive), b a const. independent of the media, and a a factor also independent of the media but variable with time in the course of the action current. The factor a , always positive, is supposed to describe the momentary magnitude of the "internal" excitation (change of permeability?). The const. b is interpreted as an "internal" (chemical?) potential. The media alter the resting currents

directly, and consequently the action currents. Hence the latter are comparable only if the former are const.

H. Ro.

Action currents of frog's skin as quantitative indicators in graded stimulation. K. MOTOKAWA (Japan. J. Med. Sci., III, 1939, 6, 101—117).—Various salt solutions in contact with the outside of frog's skin influence the electrical response to nerve stimulation (the inside always being covered with Ringer's fluid). A relative stability is reached only 2—3 hr. after mounting the prep. and depends on a suitable concn. of the media in contact with the outside of the skin. If the external surface is led off through isotonic saline or Ringer's fluid in 0.1—1 concn., a single induction shock usually evokes a "normal" monophasic action current, *i.e.*, a slow diminution of the (normally ingoing) resting current, similar in shape to the curve of a muscle twitch. The deflexion, including possible after-currents, is completed within 1 min. Repetitive stimulation leads to summation and fatigue. The direction of the action current is inverted (ingoing) when the resting current is small or changes to the opposite (outgoing) direction. Salt solutions diminishing the resting current and dil. solutions tend to invert the action current whilst salt solutions setting up large resting currents favour the normal direction. Bi- and tri-phasic currents (but not a double summit type) may be due to the interference of asynchronous action currents of opposite sign (which may also cause apparent changes in latency). Under standard conditions the prep. responds quantitatively to stimulation of its autonomic fibres. When the quantity of electricity of the induction shocks is increased steeply the responses rise linearly to a max. If the increase is gradual the responses rise in a series of definite steps.

H. Ro.

Distortion of weak current passed through human body. I. Passage of some m-sec. duration. T. WAKABAYASHI (Japan. J. Med. Sci., III, 1939, 6, 77—99).—Measurements were made with a Helmholtz pendulum, d.c. amplifier, and ballistic galvanometer. A current of 10^{-5} — 10^{-6} amp. and brief duration shows a rapid fall after make (initial spike) and an opposite depolarisation spike after break. Both spikes are similar, initially resembling charge and discharge respectively of a leaky condenser, but slowing down rapidly. Additional resistance and increase of electrode area delay the course. From the exponential parts of the curves the equiv. capacity per sq. cm. of skin is calc. to be about 0.02 μ F. Fresh isolated human skin gives analogous, though not identical results, the capacity and the final current being greater. The direction of the current flow through the isolated skin is without influence.

H. Ro.

Action currents and polar excitability of frog's skin in direct electrical stimulation. K. MOTOKAWA (Japan. J. Med. Sci., III, 1939, 6, 163—184).—When a tangential induction shock is applied to frog's skin immersed in saline, the response to direct stimulation may be recorded without considerable distortion with a slow galvanometer. These action currents are not influenced by atropine applied to the inside of

the skin while responses to indirect stimulation are abolished (outside atropine application is without effect). Tangential shocks do not stimulate the nerve fibres in the skin as they do not produce the supernormal phase obtained in stimulation of the nerve trunk. In contrast to the responses to indirect stimulation, the responses to direct stimulation continue to increase with the increase of shock strength until the skin is damaged by the current (increasing current spread stimulates an increasing no. of cells). The latency in direct stimulation is less than 40 m-sec. and that in indirect stimulation of the order of sec. Direct stimulation of the outside is more effective than that of the inside. When forming the different electrode, on the outside the cathode and on the inside the anode is more effective. The A/C ratio as measured by the height of the action currents evoked is const. for different shock strengths on either side. The side of the cells which faces the external surface is probably more excitable than the opposite side; thus more cells respond when the virtual cathode is established at the former. H. Ro.

Atypical facial neuralgia. M. A. GLASER (Arch. intern. Med., 1940, 65, 340—367).—An atypical form of facial neuralgia possibly associated with vascular afferent nerves is discussed. C. A. K.

Pathology of nervous system in vitamin deficiencies. H. M. ZIMMERMAN (Yale J. Biol. Med., 1939, 12, 23—28).—The peripheral nerve lesions produced experimentally in pigeons, rats, and dogs by vitamin- B_1 -deficient diets are non-inflammatory, consisting first of medullary sheath destruction and later of axon disintegration also. Peripheral nerve demyelination with posterior column degeneration is frequent. Occasionally the lateral spinal sensory and the pyramidal tracts are involved. The lesions are compared with those found in human beriberi, chronic alcoholism, diabetes, and other organic diseases. (9 photomicrographs.) F. S.

Origin, course, and terminations of the secondary pathways of the trigeminal nerve in primates. A. E. WALKER (J. comp. Neurol., 1939, 71, 59—89).—By Marchi method, fibres from the spinal trigeminal nucleus were shown to cross the midline and run at the lateral margin of the medial lemniscus, then with the spinothalamic tracts, to finish in the medial portion of nucleus ventralis posterior. One group of fibres from the main sensory nucleus of the 5th nerve crosses the midline and following the medial lemniscus ends in the dorsolateral part of the nucleus ventralis posteromedialis; a second, chiefly uncrossed, passes through the dorsolateral part of the reticular substance and ends in the pons, mesencephalon, and in the medial part of the nucleus ventralis posteromedialis. W. M. H.

Fibre components of laryngeal nerves of *Macaca mulatta*. R. J. BROCKLEHURST and F. H. EDGEWORTH (J. Anat., 1940, 74, 386—389).—About 97% of the myelinated fibres in the laryngeal nerve are motor, and 3% are muscle afferents from the scanty spindles in the laryngeal muscles. E. E. H.

Spinal accessory nerve in sheep. G. J. ROMANES (J. Anat., 1940, 74, 336—347).—The

motor nucleus is closely related to the nucleus ambiguus, and the motor fibres are well myelinated in a 78-day foetus; the sensory group which is associated with the solitary tract begins to myelinate at about 84 days (foetal). E. E. H.

Galvanic contracture during ascending galvanisation in frogs. F. K. KÖLLENSPERGER and F. SCHEMINZKY (Pflüger's Archiv, 1939, 241, 38—53).—The hind limbs of frogs galvanically stimulated with ascending currents of increasing intensity became extended in spasm when a c.d. of 0.5—0.7 δ (= μ a. per sq. mm.) was reached; the fore-limbs responded only with a c.d. of 1.5—2.0 δ ; they were flexed in males and extended caudally in females during the spasm. Stimulation of the peripheral nerves is not responsible for the spasm; the nerves in the fore-limbs leave the spinal cord at right angles and their reaction should be independent of current direction; yet ascending current causes spasm and descending current paralysis. For further localisation various parts of the nervous system were successively destroyed by short-wave heat-therapy (method described in detail); the spinal cord was found to be the site in which the galvanic spasm and galvano-anæsthesia was produced during the passage of the current. J. A.

Production of substances which increase excitability of spinal cord of frogs during passage of electric currents. F. SCHEMINZKY and F. K. KÖLLENSPERGER (Pflüger's Archiv, 1939, 241, 54—70; cf. preceding abstract).—Emulsions of spinal cords of frogs subjected to galvanisation (method described in detail) were prepared and injected into other frogs. The interval between the end of galvanisation of "donor frogs" and injection of emulsion into "receiver frogs" was 1—45 min. Increase of excitability and spontaneous movements in "receiver frogs" appeared within 5 min. from injection, and lasted for 45 min., when the emulsions were injected within 45 min. of galvanisation; later the substances responsible for the increase of excitability had disappeared from the emulsions. By using methods previously described (cf. Physiol. Abs., 1924, 9, No. 683) it was found that the same substances were formed in spinal cord during galvanic spasm and paralysis; larger amounts appear during galvanic paralysis. The cords of untreated frogs or of animals treated with corresponding doses of a.c. were free from these substances. J. A.

Spinal cord regeneration in rat. O. SUGAR and R. W. GERARD (J. Neurophysiol., 1940, 3, 1—19).—If the spinal cords of rats are severed completely, the animals become typically spinal in 4 weeks. After this time some animals showed further recovery of sensory and motor functions. Later histological investigation revealed bundles of new axons passing continuously between cord tracts on either side of the lesion. It is concluded that true anatomical and physiological regeneration can occur; this is aided by suitable implants in the cord gap. S. CR.

Functional spinal cord regeneration in adult rainbow-fish. J. H. KEIL (Proc. Soc. Exp. Biol. Med., 1940, 43, 175—177).—After complete trans-

section of the cord near the dorsal fin a large no. showed partial or complete restoration of normal movements, the first signs of restoration appearing 3—11 days after operation. V. J. W.

Intramural nervous system of small intestine. P. LI (J. Anat., 1940, 74, 348—359).—The circular muscle of the small intestine consists of a thick external layer supplied by tertiary branches of Auerbach's plexus and a cell-net of interstitial cells of Cajal: the thin inner layer is very rich in nerve fibres chiefly derived from local primitive type interstitial cells of Cajal. Definite relationships exist between the interstitial cells, the nerve fibres, Auerbach's ganglion cells, and the muscle cells; the interstitial cells are probably primitive ganglion cells. The inner layer of the circular muscle is probably a neuro-muscular mechanism responsible for maintaining the fundamental responses of conduction and rhythmic contraction that can be carried out in the absence of control from the extrinsic nerves and the intramural ganglion cell systems of Auerbach's and Meissner's plexuses. E. E. H.

Responses of vegetative end-organs during nervous and humoral stimulation. C. MALTESOS and M. SCHNEIDER (Pflüger's Archiv, 1939, 241, 154—168).—When various vegetative nerve fibres in dogs, cats, and rabbits are stimulated with threshold intensities of sinusoidal currents or of condenser discharges, a quick or a slow reaction can be observed in the terminal organ according to whether the fibres stimulated have a low or high chronaxie. Administration of adrenaline or acetylcholine can be followed by a quick or slow reaction closely resembling that obtained by stimulation with a.c. of 10—20 cycles per sec. When injection of adrenaline is followed by an increase in the blood flow through the muscles, electrical stimulation of the lumbar sympathetic chain also has the same effect; in others in which adrenaline produces a decrease in the blood flow, electrical stimulation does the same. It is thus the actual state of the terminal organ which decides the type of reaction. J. A.

Experimental stimulation of vegetative systems. C. MALTESOS and M. SCHNEIDER. (Pflüger's Archiv, 1939, 241, 139—153).—Stimulation of the lumbar sympathetic chain, the lingual nerve, and the cervical sympathetic in dogs, cats, and rabbits by means of condenser discharges in mammals shows that the strength-duration curves thus obtained agree with Hill's formula; furthermore the time factors are identical with those found in previous experiments with sinusoidal currents for threshold strength-frequency curves. As regards their chronaxie 4 groups of fibres can be distinguished which are almost identical for vaso-constrictors and -dilators and for pupil dilators. The chronaxie of vegetative nerve fibres is independent of the frequency of the stimulating current. J. A.

Stimulation of pupil-dilating fibres in the cervical sympathetic of rabbits with alternating currents. C. MALTESOS (Pflüger's Archiv, 1939, 241, 132—138).—The preganglionic cervical sym-

pathetic in rabbits was stimulated with sinusoidal currents of 10—1000 cycles per sec. after severing the central end, and the width of the pupil photo-electrically recorded for the determination of threshold intensity of current. The vals. obtained correspond with Hill's formula. 4 groups of pupil-dilating fibres are found with time factors of 0.3—0.5, 1.7—2.0, 3.5, 6—8 m-sec. When 3 times the threshold intensity is used for stimulation, fatigue is noticed but only for frequencies over 55 cycles per sec. This fatigue is due to exhaustion of the motor end plates and to changes in the site of stimulation of the nerve. J. A.

Action of quinine methochloride on [ganglionic and] neuromuscular transmission. A. M. HARVEY (Johns Hopkins Hosp. Bull., 1940, 66, 52—59).—Like curarine, quinine methochloride, formed by the addition of a methyl group to the quinuclidine nucleus of the quinine mol., causes in the decerebrate cat a depression of the response of the ganglion cell to nerve impulses and to acetylcholine without interfering with the normal liberation of acetylcholine from the preganglionic nerve endings. It blocks transmission at the neuromuscular junction and at the synapses in the superior cervical ganglion without interfering with the normal discharges from the respiratory centre in the medulla. T. F. D.

Origin of nerve fibres to glomus aorticum of cat. W. H. HOLLINSHEAD (J. comp. Neurol., 1939, 71, 417—425).—The aortic bodies in cats are supplied by myelinated fibres arising in the nodose ganglion of the vagus. W. M. H.

Nerve endings in urinary bladder. O. R. LANGWORTHY and E. L. MURPHY (J. comp. Neurol., 1939, 71, 487—509).—By vital staining with methylene-blue parasympathetic fibres were shown to supply motor endings to the detrusor muscle of the bladder and the muscle of the urethra excepting the part derived from Bell's muscles. Myelinated fibres connect with stretch receptors and endings in the submucosa and subserosa. Most of the sensory nerves at the base are associated with the sympathetic; those over the dome join the parasympathetic pathway. Sympathetic fibres innervate the blood vessels and the muscle of the ureters, its continuation in Bell's muscles, and the crista of the urethra. W. M. H.

Motor seizures accompanying small cerebellar lesions in cats. S. L. CLARK (J. comp. Neurol., 1939, 71, 41—57).—In unanæsthetised cats the cerebellum was stimulated directly by wiping with cotton wisps or by probing with a needle. Results differed from those of electrical stimulation in that often the phases of excitation and rebound were absent and only a long after-effect occurred. Sometimes the phase of excitation alone was absent. With more destructive mechanical stimuli the sequence of graded muscle adjustments of the after-effect was less clear. Cerebellar attacks occurred spontaneously in cases of localised cortical abscesses and resembled attacks produced by electrical stimulation of the area. W. M. H.

Paleocerebellar inhibition of vasomotor and respiratory carotid sinus reflexes. G. MORUZZI

(*J. Neurophysiol.*, 1940, **3**, 20—32).—Weak faradic stimulation of the vermician cortex of the anterior cerebellum causes inhibition of carotid sinus vasopressor and respiratory reflexes produced by occlusion of the common carotid arteries. The effects are due to a central inhibition of bulbopontine centres by the paleocerebellar cortex and point to the existence of a cerebellar control in the vegetative as well as the somatic sphere. S. CR.

Central pathways of sensation and taste and their thalamic terminations. M. A. GERBETZOFF (*Cellule*, 1939, **48**, 91—146).—The nervous systems of 20 adult rabbits, in which lesions of the nuclei of Goll and Burdach, the substantia gelatinosa, and the nucleus of the solitary tract had been inflicted, were studied by the Marchi technique. The spinothalamic pathway terminates in the ventral-external and parafascicular nuclei of the thalamus. The bulbo-thalamic pathway (lateral third of medial lemniscus) terminates chiefly in the ventral external nucleus but a few fibres pass to the intermediate ventral nucleus; the fibres from the gracile nucleus are lateral to those from the cuneate nucleus. The dorso-quinto-thalamic pathway terminates in the postero-internal ventral nucleus and in the parafascicular nucleus. The ventral quinto-thalamic tract runs in the medial third of the medial lemniscus and terminates in the postero-internal ventral nucleus with a few of the fibres passing to the medial portion of the ventral intermediate nucleus. The central gustatory pathway arises in the nucleus of the solitary tract, runs in the medial part of the medial lemniscus, and terminates partly in the arciform nucleus (from which fibres are relayed to the insular cortex) and partly in the subthalamic region (for olfactory correlation). The nucleus of Staderini cannot be more than a purely reflex gustatory centre as it has no thalamic connexions. The projection of spino-, bulbo-, and quinto-tectal fibres is also described. The author discusses the terminology of the thalamic nuclei and has introduced several new terms. J. D. B.

Ocular rotation in anaesthesia and under influence of supranuclear centres. E. A. SPIEGEL and D. A. COLLINS (*J. Neurophysiol.*, 1940, **3**, 59—65).—Those anaesthetics that act mainly on the brain-stem, such as the barbiturates, produce marked ocular rotation, whilst so-called cortex anaesthetics show the effect to a slight degree only. The first group still produces some degree of rotation in mid-brain animals so that the effect is not entirely due to supranuclear centres. S. CR.

Histological lesions of central nervous system produced by ischaemia. M. JONESCO-SISESTI, O. SAGER, and H. ASKENASY (*Bull. Acad. Sci. Roumaine*, 1939—40, **22**, 299—303).—Occlusion of the basilar and carotid arteries in the dog for 4—10 hr. produces widespread degenerative changes in the nerve cells in the brain. The changes are most frequent in the pyramidal cells of the anterior sigmoid gyrus, ventral thalamus, corpus striatum, red nucleus, Purkinje cells, and Deiters nucleus. Other parts of the brain were generally normal. Autonomic nuclei were more resistant. Pathological changes in the

mesencephalon produce decerebrate rigidity which is uninfluenced by changes in the olive. P. C. W.

Relative vascularity of subcortical ganglia of cat's brain: putamen, globus pallidus, substantia nigra, red nucleus, and geniculate bodies. H. B. HOUGH and H. G. WOLFF (*J. comp. Neurol.*, 1939, **71**, 427—436).—The vascularity of the putamen is greater than that of the globus and substantia nigra, but only 75% that of the parietal cortex, which is equalled by that of the red nucleus and geniculate bodies. Vascularity varies with total neural surface area. W. M. H.

Capillary beds of paraventricular and supra-optic nuclei of hypothalamus. K. H. FINLEY (*J. comp. Neurol.*, 1939, **71**, 1—21).—In the monkey these nuclei have a capillary bed denser than in any other nuclear or cortical area, excepting a nuclear mass in the floor of the lateral recess of the 4th ventricle. W. M. H.

Adie's syndrome. Non-luetic disease simulating tabes dorsalis. J. MCD. MCKINNEY and M. FROCHT (*Amer. J. med. Sci.*, 1940, **199**, 546—555).—7 cases of Adie's syndrome are presented and the various theories of the location and nature of the pathology of this condition are discussed. C. J. C. B.

Laurence-Moon-Biedl syndrome. R. G. NOVICK (*Amer. J. Psychiat.*, 1939, **96**, 717—722).—A case is described, in which psychosis was present. G. D. G.

Vertigo. M. ATKINSON (*Canad. Med. Assoc. J.*, 1940, **42**, 326—332).—A lecture. C. J. C. B.

Cytology of opossum cortex and cortical evolution. W. REISE and G. E. SMYTH (*Proc. K. Akad. Wetensch. Amsterdam*, 1940, **43**, 403—409).—In Nissl preps. of the cerebral cortex it was found that cytoarchitectural differentiation is in advance of cellular differentiation. The most highly evolved cells are found in the area præpiriformis and cornu ammonis; the least differentiated are those of the neopallium. Irrespective of the area the cells of lamina V are invariably the most highly differentiated. The criteria of structural differentiation are discussed. J. D. B.

Fibre-tracts from antero-lateral part of cerebral cortex of goat. Y. IGARASI (*Morph. Jahrb.*, 1939, **84**, 108—153).—The anterior and lateral part of the cerebral cortex of the goat was removed with a knife. The olfactory region was left intact. The degenerating tracts were studied by Marchi's methods 21 days after the operation. Commissural and association fibres are not described. Two large projection systems come from the removed area of the cortex; the pyramidal and extrapyramidal tracts. The following peculiarities of the pyramidal system were observed. The fibres of the cortico-bulbar tract to the motor nucleus of the trigeminal nerve do not cross. Pyramidal crossing extends from the level of the facial nerve to the caudal end of the medulla. The fibres form 3 separate cortico-spinal tracts. The well-developed extrapyramidal system comprises tracts to caput and cauda of the caudate nucleus, to putamen and pars pallida, the claustrum, the anterior, ventral

and reticulate nuclei of the thalamus, to the corpus subthalamicum, to the nucleus ruber, substantia nigra, corpus bigeminum superius, and nuclei pontis.

W. J.

Activity of isocortex and hippocampus: electrical studies with micro-electrodes. B. RENSHAW, A. FORBES, and B. R. MORISON (*J. Neurophysiol.*, 1940, 3, 74—105).—A satisfactory micro-electrode devised from a micro-pipette is described and its limitations are discussed. Predictions were verified that micro-electrodes placed in some positions in active tissue should lead off large potentials and that under certain conditions they should record in a localised way. Experiments were carried out on the isocortex in the cat under deep pentobarbital anaesthesia and isolated voltage changes of considerable size and duration were found. Further experiments on the hippocampus in the cat and rabbit showed three types of activity: slow waves of 20—70 m-sec. duration, rapid deflexions of about 1 m-sec. duration obtained near the strata containing the cell bodies of the pyramidal cells of the Ammon's horn, and responses arriving at the hippocampus after stimulation of the area entorhinalis. The results have been analysed in terms of the potential theory and the membrane hypothesis. It is concluded that the responses of stimulation are due largely to potential changes characterising the activity of the perikarya of the pyramidal cells of the Ammon's horn. S. CR.

Effect of various cortical lesions on development of placing and hopping reactions in rats. C. McC. BROOKS and M. E. PECK (*J. Neurophysiol.*, 1940, 3, 66—73).—Complete removal of that area of the cortex which in rats 1—5 days old corresponds with the sensorimotor area of the adult results in a permanent deficiency of the placing and hopping responses. Smaller lesions produce permanent deficiencies in sp. parts of these responses, and the remaining cortical and subcortical tissues are unable to take over the functions of the ablated part.

S. CR.

Modification of cortical frequency spectrum by changes in carbon dioxide, blood-sugar, and oxygen. F. A. GIBBS, D. WILLIAMS, and E. L. GIBBS (*J. Neurophysiol.*, 1940, 3, 49—58).—The responses of the electrical activity of the human cortex to alterations in normal blood constituents have been analysed with the Grass frequency analyser. CO₂ readily changes the cortical frequencies, but very high or low concns. of glucose and O₂ are necessary to cause fast or slow frequencies. S. CR.

Brain potential changes in man during cyclopropane anaesthesia. M. A. RUBIN and H. FREEMAN (*J. Neurophysiol.*, 1940, 3, 33—42).—A study is made in different regions of the head of the changes in brain potential frequencies in man during cyclopropane anaesthesia and recovery. Discrete and abrupt changes in frequency are seen during the approach to anaesthesia and different changes are found in recovery. S. CR.

Electro-encephalography in the psychoses. M. A. RUBIN (*Amer. J. Psychiat.*, 1940, 96, 861—875).—14 electrodes were placed on the scalp in 2 rows from back to front, 1 on each side of the midline.

Potentials from corresponding electrodes on both sides were recorded simultaneously, and α -wave activity was measured by the "% time α ." Observations were made with 14 schizophrenics, 2 manic-depressives, and 1 case of traumatic psychosis. In patients with no detectable cerebral pathology, the α activity changes from one electrode to another in the same way in both hemispheres, but when there is a difference between the 2 hemispheres in this respect, a diagnosis of cerebral atrophy is made for the area concerned. This was confirmed by pneumoencephalography in 8 out of 9 schizophrenics tested, and in both manic-depressives. G. D. G.

Effect of ablation of neocortex on mating, maternal behaviour, and production of pseudopregnancy in female rat and on copulatory activity in male. C. D. DAVIS (*Amer. J. Physiol.*, 1939, 127, 374—380).—Pseudopregnancy of normal duration can be elicited in rats following bilateral ablation of the neocortex but is more difficult to obtain than in normal animals. The rats have normal oestrous cycles; mate, but less readily and frequently; become pregnant; have normal young but show no maternal behaviour. Ablation of the neocortex does not necessarily abolish mating behaviour in the male rat. M. W. G.

Experiments in non-sensory cognition. W. W. CARINGTON and S. G. SOAL (*Nature*, 1940, 145, 389—390).—Experiments on the naming of unseen cards are described. W. F. F.

Cerebral action currents in various mammals. G. ITO and K. KITAMURA (*Tohoku J. exp. Med.*, 1939, 37, 106—112).—Spontaneous cortical action currents were investigated in dogs, cats, guinea-pigs, and rats. They were synchronous and isomorphic in each individual animal but differed from species to species in frequency and amplitude. Group formation and interruption were observed only in the guinea-pig and rat. The greatest amplitudes were found in all species over the area striata. H. L.

Technique for exclusion of localised subcortical areas by means of electrocoagulation. E. WEISSCHEDEL and R. JUNG (*Pflüger's Archiv*, 1939, 241, 169—183).—A modification of Hess' method ("Die Methodik der lokalisierten Reizung und Ausschaltung subcorticaler Hirnabschnitte," Leipzig, 1932) to reach subcortical areas is described in detail as well as the making of the aiming-device and electrodes. This method was used in cats to lead off alterations in potential, to exert localised stimulation, and for circumscribed focal electrocoagulation. Certain advantages are claimed for this method as compared with the Horsley-Clarke device. J. A.

Abolition of motor functions after localised exclusion by electrocoagulation. R. JUNG and E. WEISSCHEDEL (*Pflüger's Archiv*, 1939, 241, 184—200).—Localised small (1—5-mm.) subcortical lesions were produced in cats to study the functions of the extrapyramidal motor system. Thermoregulation remains normal. Functional analysis of motor functions was made, including film recordings. Destruction of the pyramidal and rubrospinal tracts produces marked and prolonged extension of the contra-

lateral hind-limb; the nuclei of the efferent fibres of the proprioceptive cervical and vestibular reflexes are the red nucleus and the neighbouring nuclei situated in the subst. reticularis of the midbrain.

J. A.

Neuronophagia in human cerebral cortex in senility and in pathologic conditions. W. ANDREW and E. S. CARDWELL, jun. (*Arch. Path.*, 1940, 29, 400—414).—This process is most active in the layer of polymorphic cells. There is an increase in the degree of satellitosis about the large pyramidal cells with advancing age. A loss of Nissl material and an increase in the basophilic properties of the nuclei are found in most of the older persons and are believed to be natural phenomena of ageing in man. (10 photomicrographs.)

C. J. C. B.

Biochemistry of epilepsy. H. GOLDSTEIN and R. A. McFARLAND (*Amer. J. Psychiat.*, 1940, 96, 771—850).—A review, with 197 references.

G. D. G.

Provocation of epileptic seizures. R. JANZEN and H. HOMEYER (*Münch. med. Wschr.*, 1939, 86, 1755—1757).—Seizures in epileptics can be provoked by ingestion of fluid (1 l.) and inhibition of diuresis by administration of posterior pituitary extracts.

A. S.

Cortical spread of epileptic discharge and conditioning effect of habitual seizures. W. PENFIELD and E. BOLDREY (*Amer. J. Psychiat.*, 1939, 96, 255—281).—The results of electrical stimulation of the cortex in 200 craniotomies, mostly on patients with the diagnosis of focal epilepsy, are analysed. The epileptic cortex varies from time to time in its sensitivity to electrical stimulation, and occasionally passes into a refractory state. Induced seizures beginning with motor or sensory manifestations have their stimulation points in or near the corresponding motor or sensory zones. Distant responses are not followed by fits. Induced seizures begin by discharge near the electrode, followed by spread along a definite preformed or acquired system of neuronal connexions, often slowly and episodically.

G. D. G.

Evaluation of electro-encephalograms of schizophrenic patients. P. A. DAVIS (*Amer. J. Psychiat.*, 1940, 96, 851—860).—Determination of the electro-encephalograms of 132 schizophrenics led to their division into 3 groups: (1) normal, (2) dysrhythmic, (3) "choppy." Those of group 2 are indistinguishable from those associated with convulsive disorders, e.g., epilepsy; these patients have catatonic episodes and often the syndrome of bed-wetting, night terrors, destructive behaviour, etc., common in epileptics. Those of group 3 suggest the presence of brain lesions, which are sometimes found. Shock therapy is contra-indicated with group 3 and possibly group 2.

G. D. G.

Release of autonomic humoral substances in hypoglycæmic cats and monkeys. M. B. BENDER and S. SIEGAL (*Amer. J. Physiol.*, 1940, 128, 324—331).—In the cat during insulin hypoglycæmia the sympathetically denervated pupil dilates, the nictitating membrane retracts, and the ear vessels constrict. In the monkey insulin hypoglycæmia produces dilatation of the sympathetically denervated pupil

only after cocaine administration. In the absence of hypoglycæmia cocaine produces little or no dilatation of the denervated pupil. Late in the course of insulin hypoglycæmia less conspicuous, apparently cholinergic effects occur. The completely denervated pupil of the hypoglycæmic cat shows an initial dilatation and later a constriction; the monkey shows only a constriction. Bilateral adrenalectomy abolishes the dilatation and makes the constriction more evident.

M. W. G.

Treatment of schizophrenia by hypoglycæmia. E. C. MENZIES (*Canad. Med. Assoc. J.*, 1940, 42, 320—325).—A lecture.

C. J. C. B.

Nitrogen inhalation therapy for schizophrenia. F. A. D. ALEXANDER and H. E. HIMWICH (*Amer. J. Psychiat.*, 1939, 96, 643—655).—The treatment consists in the production of acute anoxia thrice weekly by N₂ administration. When signs of mid-brain release have appeared (torsion and extensor spasms) O₂ is given to stop the bout, which should not exceed 6 min. Encouraging results were obtained in a group of 12 patients. N₂O will not satisfactorily replace N₂.

G. D. G.

Central nervous system changes produced by insulin. K. E. APPEL, B. J. ALPERS, D. W. HASTINGS, and J. HUGHES (*Amer. J. Psychiat.*, 1939, 96, 397—401).—The brains of 5 out of 7 cats which were caused to go daily into insulin convulsions showed scattered ischæmic cell changes involving particularly the cells in the frontal areas. There were no striking changes in the neuroglia or myelin architecture.

G. D. G.

Significance of Babinski sign during hypoglycæmic treatment of schizophrenia. M. HEIMAN (*Amer. J. Psychiat.*, 1939, 96, 387—391).—A positive Babinski was found in 74.2% of cases before, and in 92.3% after, the onset of unconsciousness. Its appearance is therefore of no aid in determining the depth of coma. Loss of corneal reflexes is a reliable sign of a second or deeper stage of coma.

G. D. G.

Mechanism of [cerebral] symptoms of insulin hypoglycæmia [in schizophrenia]. H. E. HIMWICH, J. P. FROSTIG, J. F. FAZEKAS, and Z. HADIDIAN (*Amer. J. Psychiat.*, 1939, 96, 371—385).—Clinical signs, O₂ utilisation and electrical activity of the brain, and blood-sugar were observed simultaneously in schizophrenic patients undergoing insulin treatment. Hypoglycæmia results in decrease of brain metabolism and this in turn in changes of cerebral function as shown by electrical activity and clinical signs. Alpha waves decrease, and disappear approx. at the time when cortical function is completely suppressed. The delta index increases over several hr., most rapidly at first. The changes are reversed during recovery from the hypoglycæmia.

G. D. G.

Irreversible or hyperglycæmic insulin coma. Its cause and its response to blood transfusion. J. WORTIS and R. H. LAMBERT (*Amer. J. Psychiat.*, 1939, 96, 335—345).—Irreversible or protracted coma is accompanied by fever, rapid pulse and respiration, and often vomiting, diarrhoea, and status epilepticus. The blood-sugar remains high following

intravenous glucose administration. This coma is probably due to prolongation of therapeutic coma beyond 1—1½ hr. 3 cases are described, in which there was improvement following transfusion with 500 c.c. of blood.

G. D. G.

Vascular and respiratory responses during metrazol convulsions. D. W. LOUGHEED and G. E. HALL (Amer. J. Psychiat., 1939, 96, 657—671).—Physiological and biochemical changes accompanying metrazol convulsions were studied in unanesthetised rabbits. No changes were found during the latent period. During the excitement stage the systemic blood pressure rises, the heart accelerates, and the respirations increase in rate and depth; the splanchnic vol. and pulmonary blood pressure rise, whilst the hyperpnoea causes increase in blood-O₂ and decrease in -CO₂. In the tonic phase there is complete apnoea, with great increase in blood-CO₂ and fall in -O₂, and a temporary return to normal of the pulmonary blood pressure. In the clonic phase respiration begins again, leading to hyperpnoea with increased blood-O₂ and acapnia. When convulsive movements cease there is an exhaustion stage in which splanchnic vol., heart rate, and pulmonary blood pressure return to normal, the systemic blood pressure is subnormal, and the hyperpnoea persists. Hyperglycaemia occurs soon after the injection and lasts 1—2 hr. The above changes are not due to muscle activity as they occur in curarised animals. There is synergism between adrenaline and metrazol.

G. D. G.

Results of pharmacological shock therapy and metrazol convulsive therapy in New York State. J. R. ROSS and B. MALZBERG (Amer. J. Psychiat., 1939, 96, 297—316).—Of 1757 schizophrenic patients treated with insulin 11.1% recovered, 26.5% were much improved, 26.0% were improved, and 35.2% were unimproved. The corresponding figures for 1140 patients treated with metrazol were 1.6, 9.9, 24.5, 63.5, and for a control group 3.5, 11.2, 7.4, 73.3. Metrazol is ineffective, produces severe complications, and should not be used indiscriminately. The recovery rate after insulin treatment decreases as the age of the patient and the duration of the disease increase. Better results are obtained with catatonia and dementia paranoides than with hebephrenia and schizoprenia simplex.

G. D. G.

Fractures of neck of femur in convulsion therapy. W. GISSANE, D. BLAIR, and B. K. RANK (Lancet, 1940, 238, 450—453).—Case records.

C. A. K.

Absorption of sodium ferrocyanide from subarachnoid space into venous system. R. O. SCHOLZ and E. M. RALSTON (Anat. Rec., 1939, 75, 365—371).—Isotonic Na₄Fe(CN)₆ passes from the subarachnoid space into the venous channels by way of the arachnoid villi and the subarachnoid veins. Villi show a greater concn. of Prussian-blue than veins. No crystals were observed in the perivascular spaces or in the walls of the arteries of the subarachnoid space. The animals used were young adult dogs and cats.

W. F. H.

Sources of enzymes of normal and pathological cerebrospinal fluid. I. KAPLAN, D. J. COHN,

A. LEVINSON, and B. STERN (J. Lab. clin. Med., 1940, 25, 495—505).—Centrifugation studies of c.s.f. of purulent meningitis indicate: (a) its tryptic activity is due to the desmotrypsin of the polymorphonuclear cells; (b) its phosphatase activity is due to desmophosphatase of the polymorphonuclear cells; (c) its lipase, tributyrinase, and esterase activities are 50% due to desmolipolytic enzymes of the polymorphonuclear cells; (d) its amylase activity is due, in a small degree, to the desmoamylases of the polymorphonuclear cells. The remainder of the enzymic activity of this c.s.f. is due to: (i) lyoenzymes of the polymorphonuclear cells and (ii) plasma enzymes which enter the c.s.f. because of increased meningeal permeability. It has not yet been possible to determine the relative importance of (i) and (ii). The antitryptic power of the c.s.f. of tuberculous meningitis and pyocephalus varies with p_{H} , having a max. near p_{H} 7.5—8.0 and decreasing on either side of that range. This similarity to the behaviour of serum-antitrypsin suggests that the c.s.f.-antitrypsin enters the c.s.f. from the plasma because of increased meningeal permeability. The lipase and tributyrinase of the c.s.f. of hydrocephalus and brain tumour in cases where there is no known involvement of the meninges or ventricles may in part be lyoenzymes of the gitter cells and myelophages which take part in the phagocytosis of fatty debris of nerve tissue degeneration. Lipolytic enzymes may also be liberated from brain tissue by destructive processes. The enzymes may reach the c.s.f. via the perivascular spaces.

C. J. C. B.

Effect of ergotamine [and other drugs on cerebrospinal fluid pressure]. A. CANNAVÀ and S. MUSUMECI (Arch. Farm. sperim., 1940, 69, 73—100).—Ergotamine or adrenaline increases the c.s.f. pressure in the 4th ventricle (dog) and constricts the superficial cranial arteries; the total effect of the two substances equals the sum of the two separate effects. Ephedrine decreases the c.s.f. pressure, which is increased to levels above normal by subsequent injection of ergotamine. Acetylcholine and amyl nitrite decrease c.s.f. pressure; in the latter case subsequent administration of ergotamine produces a return to normal levels. The changes in c.s.f. pressure are correlated with the vascular changes.

F. O. H.

Copper in cerebrospinal fluid. H. YOSIKAWA (Japan. J. Med. Sci., II, 1939, 4, 219—221).—Human c.s.f. contains 14—15 μ g. of Cu per 100 ml., all dialysable.

R. L. E.

Use of the photometer in making Lange [colloidal gold] test readings. E. R. JOHNSON, R. M. AUDE and C. H. SOBUM (J. Lab. clin. Med., 1940, 25, 645—648).—The photometer provides a very sensitive and accurate method for making Lange readings.

C. J. C. B.

Benzedrine (β -phenylisopropylamine) and brain metabolism. P. J. G. MANN and J. H. QUASTEL (Biochem. J., 1940, 34, 414—431).—The fall in brain respiration in glucose media caused by tyramine, β -indolyethylamine, and isoamylamine is counteracted by benzedrine, the effect of which is due to its reversible competition with the other amines

for amine-oxidase. 3:4-Methylenedioxyphenylisopropylamine has an activity similar to that of benzedrine, whilst ephedrine and 4-hydroxy-3-methoxyphenylisopropylamine are less active. Certain aldehydes (e.g., *p*-hydroxybenzaldehyde) and luminal, chlorotone, etc., which inhibit respiratory processes, are not counteracted by benzedrine. P. G. M.

(x) SENSE ORGANS.

Two cases of congenital facial hemi-hypertrophy with anomalous ocular manifestations. R. GÖZBERG (Ann. Oculist., Paris, 1939, 176, 624—630).—In both cases there was a true hyperplasia of bones and soft parts of the left side of the face. In one there was buphthalmos, a small cornea, hypermetropia and astigmatism, with amblyopia. In the other the cornea was large. The aetiology is completely unknown. D. WH.

Modern conceptions in embryology, especially regarding development of the eye. G. LEPLAT (Bull. Soc. belge Ophtal., 1940, 79, 6—19).—A lecture. H. L.

Experimental studies of ocular tuberculosis. IV. Relationship of ocular sensitivity, cutaneous sensitivity, and ocular activity in immune-allergic rabbit. A. C. WOODS, E. L. BURKY, and J. S. FRIEDENWALD. V. Organotropism, or selective sensitisation of second eye. A. C. WOODS and E. L. BURKY (Arch. Ophthal., N.Y., 1940, 23, 351—362, 363—369).—IV. Virulent human tubercle bacilli were inoculated into one eye in rabbits which had previously been made hypersensitive to tuberculin and relatively immune to reinfection by inoculation of the same strain into the groin. The dose required for the production of ocular lesions was nearly 50 times as strong as that necessary for normal animals. Growth of bacilli and spread of the lesions were more restricted in the immune-allergic animals and ocular sensitivity to purified protein derivative of the tubercle bacillus developed to a proportionally smaller degree. Cutaneous sensitivity was little influenced by the ocular process and showed no relationship to the course of ocular sensitivity. The latter paralleled the local inflammation during the early stages but remained fairly high for some time after apparent healing of the eye.

V. Ocular tuberculosis of one eye in immune-allergic rabbits (see above) did not produce selective sensitivity of the second eye. The sensitivity of the latter paralleled that of the skin. In another series where the second inoculation had been made into the groin, both ocular and cutaneous sensitivity developed to the same degree as in the first group. H. L.

Histological observations on vital staining of human conjunctiva. M. DE SOUSA (Klin. Monatsbl. Augenheilk., 1940, 104, 174—194).—Cells of the histiocytic type stain distinctively with certain acid stains, e.g., trypan-blue, pyrrole-blue, lithium-carmin, and Fe^{III} saccharate. Following on the use of trypan-blue as a treatment for leprosy, the effect of injecting it into normal conjunctivæ was tried. Numerous forms of histiocyte were found which did not alter in pathological conditions. Round cells preponderated

probably in response to the irritative effect of the dye. In inflammatory conditions the cells appeared to congregate around the vessels and Krause's glands in the deeper layers of the conjunctiva. (Illus.)

D. A. C.

Improved kinetic test for binocular stereopsis. F. V. VERHOEFF (Amer. J. Ophthal., 1940, 23, 320—321).—The simple apparatus described can be used with any ordinary stereoscope. H. L.

Nystagmus. XLVII. Pendular nystagmus of very high frequency in albino. J. OHM (v. Graefes Arch. Ophthal., 1939, 140, 527—530).—In an albino man, on lateral deviation of the eyes beyond a certain point, the nystagmus changed from the ordinary jerky type to a pendular type of a frequency of 9 to 15 per sec. which was about double the previous frequency. It is suggested that this is evidence in favour of the author's theory that jerky nystagmus is the result of the combination of pendular motions of frequencies n and $2n$. W. T. A.

Surgical experiment in changing refraction of eye. M. WIENER (Proc. Soc. Exp. Biol. Med., 1940, 43, 384—385).—Canine eyes were lengthened by 2.5—3 mm. and the refraction was changed from about normal to —8 or —9 diopters by removing elliptical segments of sclera, 9 mm. long and 1.5 mm. wide, from 4 opposite sides of the eye and bringing the edges together by sutures. Excision of scleral segments between the recti muscles produced shortening of the eye by 1 mm. and a refractive change of about 3 diopters. H. L.

Spectacled eye condition in rats. J. J. OLESON, C. A. ELVEHJEM, and E. B. HART (Proc. Soc. Exp. Biol. Med., 1940, 43, 161—164; cf. A., 1939, III, 293).—This deficiency condition, previously shown to be curable by liver extract, is now found to be curable by 2—3 drops of corn oil daily but not by any of the vitamin-B factors tested. V. J. W.

Water absorption of cornea. G. C. HERINGA and A. WEIDINGEN (Acta neerl. morph., 1940, 3, 196—202).—The influence of the mucoid content of cow cornea on its swelling capacity was investigated. The mucoid was removed by Levene's method; after treatment the cornea contained no inorg. S and gave no Molisch reaction. The X-ray diagram of the treated cornea was essentially identical with that of untreated material except that the amorphous halo disappears, indicating that the amorphous mucoid is not part of the micellar collagen structure. The swelling isotherms of treated and untreated corneæ were determined by exposure to water vapour. These were similar in shape but less water was taken up by treated corneæ at high v.p. or after immersion in water. It is assumed that the mucoid has a lyotropic effect producing a high intermicellar swelling. The swelling of isolated mucoid (probably denatured) is low.

E. BR.

Effect of vitamin-A deficiency on origin of recurrent seasonal kerato-conjunctivitis allergica (scrofulosa). J. FRONIMOPOULOS (Klin. Monatsbl. Augenheilk., 1940, 104, 1—37).—41 subjects suffering from different types of kerato-conjunctivitis allergica were investigated and a vitamin-

A deficiency, usually related to malnutrition, was found in a large no. This was demonstrated by determination of -A in the serum by Gaetgens' method, and by testing dark adaptation by the Birsch-Hirschfeld photometer. There were no epithelial keratinised cells in smears from the conjunctiva. The ocular inflammation showed a definite tendency to recur so long as -A deficiency persisted. Statistics showed an increased occurrence of the disease in the spring of the year, and particularly in the years following the war. Present knowledge of variations of -A in clinical conditions is summarised. D. A. C.

Vitamin-D complex in progressive myopia. A. A. KNAPP (Amer. J. Ophthalm., 1939, 22, 1329—1337).—23 out of 46 juvenile cases whose myopia was thought to be progressive remained stationary or showed reduction in myopia after several months' treatment with Ca and vitamin-D. Measurements made from plaster casts in cases of anterior curvature myopia showed corneal and scleral shrinkage following the treatment. H. L.

Slit lamp illumination by krypton-filled lamps (for examination with polarising filters). G. KLEEFELD (Bull. Soc. belge Ophtal., 1940, 79, 145—149).—The reduction in brightness produced by polarising filters has been compensated by substituting a Kr-filled lamp for the commonly used A-N₂-filled lamp. H. L.

Rôle of cervical sympathetic nerve in light reflex of pupil. E. A. SPIEGEL and N. P. SCALA (Arch. Ophthalm., N.Y., 1940, 23, 371—376).—The effect of cervical sympathectomy of slightly impairing pupillary dilatation in the dark was transiently abolished by instillation of benzedrine sulphate. When abolished by section of the oculomotor nerve the light reflex remained negative even when a medium width of pupil was restored by eserine. Electro-sympathicograms in curarised cats showed no difference whether taken on retinal illumination or in the dark. The influence of the cervical sympathetic nerve on dilatation is therefore thought to be confined to the enhancing effect of tonic innervation of the dilator muscle on relaxation of the sphincter muscle; the Argyll Robertson pupil is held to be due to a lesion of the reflex arc inducing contraction of the sphincter muscle and not to an impairment of the dilator innervation. H. L.

Mydriatic action of adrenoxine. P. HEIRMAN and M. GOFFART (Compt. rend. Soc. Biol., 1939, 132, 84—85).—Adrenoxine is a much more powerful mydriatic than adrenaline on the enucleated eye of the frog and the eye *in situ* in mammals. W. T. A.

Method of continuous recording of width of pupil. C. MALTESOS (Pflüger's Archiv, 1919, 241, 129—131).—The interior of the eye in rabbits is illuminated through the sclera from the upper conjunctival fornix. The amount of light which is emitted through the pupil and which varies with its size is photo-electrically recorded. A galvanometer of 1000 Ω . internal resistance and 10^{-7} amp. sensitivity was used. J. A.

Lens glycolysis. R. WEEKERS (Bull. Soc. belge Ophtal., 1940, 79, 44—48).—Brief review of lens metabolism. M. C. B.

Pigment of vertebrate lens. G. L. WALLS (Science, 1940, 91, 172).—The yellow coloration of vertebrate lenses is not due to melanin. W. F. F.

Influence of immunological factors on cataract production. J. FRANÇOIS (Bull. Soc. belge Ophtal., 1940, 79, 110—115).—When pregnant rabbits were subcutaneously injected with lens emulsion, congenital lens opacities were produced in 50% of the offspring. The opacities were discrete, varying in size and shape, and usually centrally placed. Stereoscopic photographs of the eyes are given. Lenses of adult rabbits were unaffected by repeated injections. It is concluded that precipitins produced by injected lens-proteins can reach the foetal but not the adult lens. M. C. B.

Effect of exercise on growth and cataract development of rats fed galactose. H. S. MITCHELL and G. M. COOK (Proc. Soc. Exp. Biol. Med., 1940, 43, 85—86).—In rats on a diet containing 25% of galactose, cataract appeared at 20.6 days in those in stationary cages and at 28 days in those in revolving cages. V. J. W.

Relation of dynamic to static refraction in presbyopic patients 40—50 years of age. H. F. SUDRANSKI (Arch. Ophthalm., N.Y., 1940, 23, 545—553).—In 100 cases, manifest refraction and refraction with eucatropine mostly failed to reveal the correct amount of cylindrical error or the correct location of cylindrical axis as shown by subsequent refraction with homatropine; the errors of eucatropine refraction were slightly smaller than those of manifest refraction. Incorrect results were obtained even in cases of advanced presbyopia. As shown by estimation of the punctum proximum, cyclopegia had been produced by eucatropine in 46 out of 72 eyes tested. H. L.

Congenital miosis. A. VAN LINT (Bull. Soc. belge Ophtal., 1940, 79, 24).—A case is reported of bilateral miosis which remained unaffected by atropine. No other ocular or nervous anomaly was found and the condition is attributed to an agenesis of the dilator muscle. H. L.

Effect of hyper- and hypo-glycæmia on the intraocular tension. V. ČAVKA (Ann. oculist., Paris, 1939, 176, 616—623).—The intraocular tension was examined in schizophrenic patients who were being treated by insulin shock. 65% of cases showed a rise in intraocular tension during coma. It is suggested that, following the retention of water in the body due to insulin, there was passive hyperæmia of the ciliary body. D. WH.

Influence of retrobulbar anæsthesia on intraocular pressure. G. MEES (Klin. Monatsbl. Augenheilk., 1940, 104, 223—230).—The problem of the fall of intraocular pressure after administration of cocaine and novocain was investigated by taking tonometric readings at 1-min. intervals after local anæsthesia produced by nosuprin (novocain and adrenaline) injected in the eyelids and behind the eye. In 133 eyes the changes in intraocular pressure occurred immediately and there was a return to normal usually

within 3 min. In the first min. 8 showed a rise, 29 were stationary, and 96 showed a fall. In 34 cases of glaucoma simplex the majority showed a fall in intra-ocular pressure frequently to a lower level than that previously obtained under treatment with miotics. In 10 eyes with hæmostatic glaucoma the fall in pressure was slight and not sustained. The mode of action is discussed, adrenaline being the most probable factor.

D. A. C.

Retinal circulation. M. P. BAILLIART (Bull. Acad. Méd., Paris, 1939, 122, 204—208).—A general account of the hydraulics of the retinal circulation, with special reference to the influence of alterations in arterial pressure on the ophthalmoscopic appearance of the retina.

W. T. A.

Cone and pigment epithelium oil droplets and regeneration of cone substance and visual purple. G. VON STUDNITZ (Pflüger's Archiv, 1940, 243, 181—205).—Three kinds of oil droplets were found in the cones of pigeons, the colours of two of which faded during dark adaptation. Ether-sol. oil droplets were also found in the pigment epithelium. It is suggested that the cone droplets contain the precursors of the "cone substance" which is supposed to mediate day vision and that the epithelium droplets contain the lipin fraction of bleached visual purple. This lipin fraction is used again to regenerate visual purple in the dark and this may be the reason why visual purple can only be regenerated in the isolated (frog) retina if this is left in contact with the pigment epithelium. Similar observations were made on frog and chick retina.

K. T.

Pigmentary effector system. IX. Receptor fields of teleostean visual response. L. HOGGEN and F. LANDGREBE (Proc. Roy. Soc., 1940, B, 128, 317—342).—A description of the structure and optical properties of the teleost eye, pointing out how these differ from those of the human eye. The area of the retina concerned with "black background" response is located below the optic disc while that concerned with "white background" response is around the optic disc. These two areas (called "B" and "W") showed no difference in their sensitivity to different parts of the visible spectrum. No microscopic difference in the visual elements of the two areas was found but there was some indication of differences in the movements of the epithelial pigment in response to light and darkness. The teleost retina may be divided into three areas from the point of view of the formation of retinal images: (1) a small area below the optic disc where images of extra-aquatic objects fall; (2) a large central region where images of sub-aq. objects are focussed; (3) a wide peripheral band where no distinct image can be formed. These findings seem to apply to all fish with the exception of the skate (elasmobranch) which probably cannot focus images of extra-aquatic objects at all.

K. T.

Influence of sodium bicarbonate on oxygen consumption of illuminated retina of the rabbit *in vitro*. N. OYAMA (Tohoku J. exp. Med., 1939, 37, 78—87).—Retinal O_2 consumption was estimated by Warburg's method in $NaHCO_3$ -Ringer solutions of p_H 6.88—7.88 (corresponding with a $NaHCO_3$ concn. of 1.2×10^{-3} to 3.4×10^{-2} mol.). O_2 consumption

was the higher the greater was the alkalinity of the medium. At a $NaHCO_3$ concn. of 3.4×10^{-2} mol. (p_H of solution 7.88) both retinal O_2 consumption and p_H of the medium remained nearly const. during 2 hr. When placed for 2 hr. in solutions of p_H 7.81—6.88, retinal O_2 consumption decreased and the solution became more acid; both these changes were the more intense the lower was the buffer capacity of the medium.

H. L.

Diminution of acetylcholine content of retina after prolonged functional disuse. H. CHANG, W. HSIEH, L. LEE, and T. LI (Proc. Soc. Exp. Biol. Med., 1940, 43, 140).—Disuse of one eye in the dog is produced by suture of the eyelids. After 160—170 days the retina of such an eye contains 58% less acetylcholine than the other.

V. J. W.

Tangent screen scotometry. Value in diagnosis, prognosis, and evaluation of therapy. W. F. DUGGAN (Arch. Ophthal., N.Y., 1940, 23, 316—339).—The method allows detection of small or early lesions in the visual sensory system. The sensitivity of the test depends on the use of test objects subtending small visual angles; for detection of early lesions 0.5—1-mm. test objects should be used at a min. distance of 1 m. Illustrative case reports are given.

H. L.

Lesions of fundus associated with brain hæmorrhage. L. L. TUREEN (Arch. Neurol. Psychiat., Chicago, 1939, 42, 664—678).—The theories of the production of papilloedema and retinal hæmorrhages are reviewed. 23 cases of massive hæmorrhage of the brain are described. Intraventricular hæmorrhage, not associated with subarachnoid or pontile hæmorrhage, most often produces papilloedema. Retinal hæmorrhage, not associated with retinal arteriosclerosis, occurs in the course of subarachnoid and pontile hæmorrhages.

D. WH.

Angiomatosis retinae (Hippel's disease). Report of case in which Roentgen therapy was used in an early stage. F. C. CORDES and M. J. HOGAN (Arch. Ophthal., N.Y., 1940, 23, 253—269).—A non-familial case is reported. Decrease in size of the tumour and the amount of exudate was observed 7 months after high-voltage X-ray therapy; the condition of the vessels was unaltered.

H. L.

Dark adaptation and vitamin-A deficiency. A. G. SHEFTEL (Amer. J. clin. Path., 1940, 10, 168—175).—A new technique for determination of vitamin-A deficiency is described having the following features. A means for control of the bleaching process of the visual purple is provided. The light threshold during dark adaptation is measured by the intensity of light passing through a solution of Prussian-blue, the concn. of which can be decreased or increased, thus dispensing with rheostats. The rapidity of regeneration of the visual purple is measured separately at the periphery and at the fovea. The light threshold is determined by the subject rather than the operator. The apparatus herein described can be quickly and inexpensively constructed in any laboratory.

C. J. C. B.

Origin of visual after-images. K. J. W. CRAIK (Nature, 1940, 145, 512).—During anoxia of the retina, produced by pressure at the outer canthus, the

eye was exposed to a bright object (60-w. bulb). When the pressure was released and the bright object removed an after-image was seen. This after-image could not have been central in origin because of the blindness of induced anoxia.

W. F. F.

Functional configuration of retina. A. TSCHERMAK-SEVSENEGG (v. Graefe's Arch. Ophthal., 1939, 140, 445—455).—A new projection of direction-circles is described. The retinal sections cut by planes passing through a point at the entrance to the pupil (3.0 mm. posterior to the pole of the cornea, 0.564 mm. anterior to the surface of the iris) are projected through the nodal point on to a fronto-parallel plane. The resulting hyperbolas are less curved than those in Helmholtz's well-known chess-board pattern. Subjective tests show that, at the appropriate distance, the projection is perceived as a right-angled pattern, while the lines in Helmholtz's pattern are clearly too strongly curved. Another system of retinal sections of geometrical interest is treated mathematically in detail. The sections are cut by planes passing through the "fronto-axial point." This point lies on the axis of the eye 24.18 mm. anterior to the nodal point and is at the apex of the cone which is tangential to the retina in the frontal plane passing through the nodal point (corresponding with the edge of the sensitive retina). Projection on to a fronto-parallel plane through the nodal point gives a characteristic axially symmetrical pattern of hyperbolas.

W. T. A.

Fusion [in vision]. F. WECKERT (v. Graefe's Arch. Ophthal., 1939, 140, 553—560).—A general discussion of the nature of the fusion of unocular impressions in binocular vision. It is emphasised that fusion is a function of the calcarine cortex having as anatomical basis the duplication of the inner granular layer which is associated with binocular vision. The essential cause of squint is a relative cortical blindness of one eye which disturbs the balance of the unocular visual sensations and leads to a failure of fusion. The eye with defective vision then has no goal for fixation and deviates undirected by cortical control. The treatment of squint should involve primarily the restoration of the functional relationship of the deviating eye with the visual cortex.

W. T. A.

Binocular vision. H. HARMS (v. Graefe's Arch. Ophthal., 1939, 140, 589—594).—The author maintains that squinting vision is essentially binocular vision in which there is an anomalous development of retinal inter-relationship. At the same time there is a functional inhibition of the deviating eye producing a relative or abs. central scotoma. This inhibition is probably at the level of the ganglion cells of the retina, as the pupillo-motor sensitivity of the central retina of the deviating eye is decreased.

W. T. A.

Binocular vision. F. WECKERT (v. Graefe's Arch. Ophthal., 1939, 140, 595—598).—A defence of the cortical origin of squint as a weakness of fusion and a denial that the amblyopia of the deviating eye is due to a central scotoma.

W. T. A.

Sudden blindness in children. DEDIMOS (Ann. Oculist., Paris, 1939, 176, 605—616).—Three cases are described of sudden bilateral blindness of which the first only showed angiospasm of the retinal arteries.

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The existence of an angiospasm, either retinal or retrobulbar, is inferred in all cases from their rapid cure by acetylcholine.

D. WH.

Optic pathway. L. L. MAYER (Arch. Ophthal., N.Y., 1940, 23, 382—394).—A review.

H. L.

Three families affected with optic neuritis. L. HAMBRESIN and C. SCHEPENS (Bull. Soc. belge Ophtal., 1940, 79, 115—143).—Pedigree and full case histories are given. In two families the diagnosis of Leber's disease was made. In one of these the pedigree comprises 19 members; seven (2 ♂, 5 ♀) were affected. The high proportion of females is discussed and an explanation offered. Diagnosis in the third family was uncertain. Aetiology and pathogenesis of hereditary optic atrophy are discussed, also the relation of toxic factors (tobacco and alcohol), concomitant disease (tuberculosis and syphilis), bone malformations, and endocrine disturbances.

M. C. B.

Microphthalmia and visual pathways. S. E. WHITNALL and R. M. NORMAN (Brit. J. Ophthal., 1940, 24, 229—244).—Post-mortem findings in a microphthalmic imbecile of 17 years of age are recorded. The eyes were completely degenerate and could never have transmitted light, thereby constituting a condition comparable with anophthalmia. There was markedly poor development of the optic nerves, chiasma tracts, and lateral geniculate bodies. By contrast, the superior quadregiminal bodies were normal in size and structure and the optic radiation was well formed with well-myelinated fibres. The visual cortices showed a normal lamina granulosa and stria of Gennari, although they were slightly deformed. The imbecile condition appeared to be due to a general imperfection of the cerebral cortex. The inheritance of this case has previously been described (Fraser, 1937) as a recessive sex-linked defect.

D. A. C.

Deficiency diseases of ocular nerves. Lesions of optic nerve and central nervous system. A. HAGEDOORN (v. Graefe's Arch. Ophthal., 1939, 143, 561—587).—Achyilia gastrica and frank pernicious anæmia frequently coexist with the alcohol-tobacco amblyopia. A lesion of the optic nerve in pernicious anæmia may develop *pari passu* with subacute combined degeneration of the cord. In retrobulbar neuritis and lesions of the central nervous system complicating diabetes, arteriosclerosis is probably not an immediate cause, but it may interfere with the absorption and utilisation of essential substances.

D. WH.

Sodium ricinoleate and methylene-blue insufflated for tympanosclerosis. A. CORONE (Bull. Soc. belge Otol., 1939, 80—83).—Some cases of tympanosclerosis were improved after insufflation of methylene-blue (0.4—5%) and Na ricinoleate (1—10%) through the eustachian tube into the middle ear.

C. E.

Action of sulphonamide on otogenic streptococcal brain abscess after operation. C. HUBERT and M. LEROUX (Rev. Laryng. Otol. Rhin., 1939, 60, 660—662).—A child of 9 years suffering from brain abscess after otitis media recovered following operation and treatment with sulphonamide.

C. E.

Next step in auditory research. H. G. KOBRAK, J. R. LINDSAY, and H. B. PERLMAN (Arch. Otolaryng., 1940, 31, 467—477).—Conduction of sound in the inner ear was studied in animals; cochlear function was tested by observing the reflex contraction of the tensor and stapedius muscles. The cochlea was stimulated both by sounds conveyed through tubes into the round window and by bone-conducted sounds after extirpation of the stapes. Blocking of both windows by plaster of Paris abolished cochlear response to both air- and bone-conducted sounds. The significance of the labyrinthine fluid as conductor of sound was shown by absence of cochlear function after cochlear puncture. The physical properties of the cranio-labyrinthine communications (aqueductus, lymph- and blood-vessels) were studied by inducing sinusoidal pressure changes in the cranial cavity and recording resultant movements of the labyrinthine fluid; low pressure changes caused rhythmic movements but high-frequency pressure changes were without effect. The bearing of these findings on cochlear function is discussed. H. L.

Changes in internal ear due to increased endocranial pressure. Histologic basis of congestive inner ear. J. FISCHER (Arch. Otolaryng., 1940, 31, 391—418).—The findings of serial sections of the petrous bones in 5 cases of tumour of the anterior or middle cerebral fossa are described in detail; they are regarded as signs of a congestion of the inner ear due to chronically raised endocranial pressure. Lesions of the neuro-epithelium and nerve ganglia were observed only in late stages. H. L.

Development of tonal sensation. H. D. BOUMAN (Arch. néerland. Physiol., 1939, 24, 142—152).—Evidence is presented that in addition to the inner ear, the central nervous system contributes to the perception of pitch. Various theories of hearing are discussed. P. W. N.

Upper frequency limit for binaural localisation of a pure tone by phase differences. J. W. HUGHES (Proc. Roy. Soc., 1940, B, 128, 293—305).—The least perceptible changes of phase (made by an electrical method) in binaural localisation were determined at frequencies from 600 to 2000 cycles per sec. For medium frequencies it was found that differences in phase of sounds of equal intensity can serve as basis for binaural localisation. All observers failed to detect changes of phase at frequencies higher than 1400 cycles per sec.; this indicates that the refractory period of the 8th nerve in man is about 16, *i.e.*, of the same order as in other, motor or sensory, nerves. H. L.

Speech hearing and speech interpretation tests. D. MACFARLAN (Arch. Otolaryng., 1940, 31, 517—528).—Phonographic speech tests are recommended for testing deafness. Word lists are given and tests described for judging agility of hearing and for determining whether hearing is improved by suppressing low or high tones. H. L.

Inherent accuracy of a series of repeated clinical audiograms. E. G. WITTING and W. HUGHSON (Laryngoscope, 1940, 50, 259—269).—Comparison of 15—20 audiograms per case (con-

duction deafness and normal subjects) showed a probable error of ± 3 to ± 5 decibels for the various frequencies. The error was smallest for 1024 cycles per sec. and rose gradually for both higher and lower frequencies. A slight rise in apparent acuity of hearing was found in later audiograms even when the interval between first and last examination was more than 2 years. H. L.

Vitamin-C treatment of inner ear deafness and tinnitus. Z. SZOLNOKY (Mschr. Ohrenheilk., 1939, 73, 707—722).—Best results were obtained in inner ear affections of arteriosclerotic origin. In otosclerosis the tinnitus only was improved whereas the deafness could not be influenced. Vitamin-C is also recommended in cases of deafness of neuritic origin. It is always necessary to check the excretion of -C in the urine. C. E.

Petrous pyramid of temporal bone. Pneumatisation and roentgenologic appearance. J. R. LINDSAY (Arch. Otolaryng., 1940, 31, 231—255).—Data are given on presence and origin of air cells in the various areas of the pyramid, based on investigation of 100 cases by serial sections. Radiological findings in cases of acute suppuration are described and the scope of this method is discussed. Asymmetric pneumatisation of normal pyramids is frequent but unilateral pneumatisation is rare. H. L.

Experimental hyperparathyroidism and otosclerosis. E. C. SLAUGHTER (Ann. Otol. &c., St. Louis, 1940, 49, 130—140).—Dihydrotachysterol (A.T.10) was injected in guinea-pigs, rabbits, and dogs for periods of 3 weeks to 4 months and the animals were fed on diets poor in Ca and free from vitamin-D. Serial sections of the temporal bones showed in most cases circumscribed formation of new bone in the labyrinthine capsule which differed from normal bone by staining more deeply and by marked enlargement of bone spaces and Haversian canals; osteoblasts and osteoclasts were numerous in certain areas; the bone spaces were filled with connective tissue and surrounded by numerous blood vessels. Stapedal ankylosis was not observed. H. L.

Ménière's symptom complex. K. M. SIMONTON (Ann. Otol. &c., St. Louis, 1940, 49, 80—98).—A review. H. L.

New labyrinthine reaction: waltzing test. C. HIRSCH (Ann. Otol. &c., St. Louis, 1940, 49, 232—238).—Caloric stimulation of the labyrinth provokes in a normal subject, standing with closed eyes and arms stretched forwards, deviation of the arms and shortly afterwards of the whole body towards the direction of the slow component of nystagmus; the movement is enhanced when the legs are alternately raised with the knees flexed. The reaction is held to be due to stimulation of the homolateral vestibulo-spinal tracts and the test is recommended for the topical diagnosis of lesions of the posterior longitudinal bundle in the floor of the 4th ventricle. H. L.

Conditioned vestibular reactions. H. LÖWENBACH and W. H. GANTT (J. Neurophysiol., 1940, 3, 43—48).—In dogs an auditory stimulus preceded the passage of a galvanic current between the external

auditory meatuses causing characteristic vestibular reflexes. Conditioned vestibular responses were readily set up and persisted for several months.

S. CR.

Vascularity of olfactory neuro-epithelium in mammals. H. LAMS (Bull. Acad. Roy. méd. Belg., 1940, 6, 110—135).—The olfactory neuro-epithelium and the organ of Jacobson have been studied histologically in various mammals including human foetuses. It is concluded mainly from the presence of an intraepithelial capillary network that these tissues represent a detached portion of the telen-cephalon secondarily included in the epiblast. Both the supporting tissue and Bowman's glands are held to be of neuroglial origin and the superficial cell layer of the former is thought to have secretory properties and to correspond with the ependymal cells. H. L.

Sucrose taste thresholds of rats and humans.

C. P. RICHTER and K. H. CAMPBELL (Amer. J. Physiol., 1940, 128, 291—297).—Rats recognised the difference between distilled water and sucrose solution in average concns. of 0.5% (0.0146 mol.). Young adults recognised the difference in average concns. of 0.17% (0.005 mol.) and first recognised a sweet taste in average concns. of 0.41% (0.012 mol.).

M. W. G.

Sectional roentgenography of larynx. W. E.

HOWES (Radiology, 1939, 33, 586—597).—Sectional X-ray photographs of the larynx are presented, including exposures taken during phonation.

W. F. F.

(xi) DUCTLESS GLANDS, EXCLUDING GONADS.

Multiple tumours of endocrine glands in a case of acromegaly. G. GERSTEL (Frankf. Z. Path., 1938, 52, 485—499).—In a case of an acromegalic man of 36 years of age there were found an eosinophil adenoma of the anterior pituitary and benign adenomatous tumours in thyroid, parathyroid, adrenals, pancreas, and pineal gland. The possible inter-relation of these tumours is discussed.

H. W. K.

Treatment of hormonal deficiencies. K. SOM-

MER (Med. Klin., 1939, 35, 1537—1538).—A review.

A. S.

Hypophysis and blood picture. P. RUITINGA,

J. H. GAARENSTROOM, and G. A. OVERBEEK (Arch. int. Pharmacodyn., 1940, 64, 109—114).—Reticulopenia after hypophysectomy in the rat disappears in 4—6 weeks when the fragility of the erythrocytes is normal. Excretion of urobilin is less than normal after hypophysectomy and becomes normal after injection of pituitary extracts.

D. T. B.

Pituitary function in adiposo-genital dystrophy.

H. SCHWARZ, A. B. NEWMAN, and H. BAUM (Endocrinol., 1940, 26, 605—608).—Injection of patients' sera into rats on a high-fat diet causes a greater increase in blood-ketone than does normal serum. No other differences were found. Administration of gonadotrophic hormone had no effect on the obesity.

V. J. W.

New type of pluriglandular insufficiency. K.

TSUJI (Acta Sch. med. Univ. Kyoto, 1939, 33, 200—

215).—4 cases are described and regarded as due to pituitary, thyroid, and parathyroid hypofunction. The main signs were: stunted growth, acromicria, hypogenitalism, hypotrichosis, pigmentation of exposed parts, slight degrees of scleroderma, cataract formation in early adult life, smallness of the sella turcica, creatinuria, increased N excretion, and in 2 cases glycosuria after injection of adrenaline.

H. L.

Indications for radiotherapy of pituitary, thyroid, and adrenal gland. A. SCHITTENHELM (Strahlenther., 1939, 66, 373—427).—A review.

E. M. J.

Reticulo-endothelial system and hormone refractoriness. A. S. GORDON, W. KLEINBERG, and H. A. CHARIPPER (J. Exp. Med., 1939, 70, 333—346).—In rats and guinea-pigs that are splenectomised or in which the reticulo-endothelial system is blocked by dyes or injured by infection, hormones produce a greater effect due to interference with anti-hormone production. In female rats under these conditions pregnancy urine extracts cause a greater increase in ovarian tissue than in normal animals. Similar differences are obtained in the testes and seminal vesicles of splenectomised and normal male rats. Regression of ovarian wt. on cessation of hormone treatment is prevented by blocking the reticulo-endothelial system with trypan-blue. Thyrotrophic hormones are more effective in animals in which the reticulo-endothelial system is interfered with.

A. C. F.

Hormonal regulation of hair growth. E.

KYLIN (Acta med. scand., 1940, 103, 144—151).—Hypophyseal implantation stimulated correct growth of normal hair in one case of emaciation due to delayed puberty. In 40 out of 49 cases of total alopecia in adults, normal hair growth was restored by implantation of calf's hypophysis.

C. A. A.

Anterior pituitary extract in psychiatry. A.

GUIRDHAM (Lancet, 1940, 238, 221—222).—Injections of anterior pituitary extract into a case of Lorain type of dyspituitarism produced increases in height and wt., development of the secondary sexual characteristics, and marked improvement of the mental state.

C. A. K.

Effects of anterior pituitary preparation on metabolism in phloridzin diabetes. O. H. GAEBLER and W. J. ZIMMERMAN (Amer. J. Physiol., 1939, 128, 111—120).—Bitches were given large injections of a growth prep. ("Antuitrin, growth") on the 4th day of phloridzin administration. The calorogenic effect of the prep. was superimposed on the high metabolism of phloridzin diabetes. In spite of this the wt. increased and the N output was smaller than in experiments with phloridzin alone. The effect of the prep. on N output was increased by thyroidectomy. In meat-fed phloridzinised animals glucose and N output were diminished proportionately; in thyroidectomised depancreatised animals receiving a const. amount of insulin the same doses of the prep. were severely diabetogenic.

M. W. G.

Histology of pituitary of normal and partly hypophysectomised *Triton vulgaris*. A. MEYER

(Arch. EntwMech. Org., 1939, 139, 309—362).—In 6-months old animals, the pars tuberalis is separating from the anterior lobe; this is unusual among Urodeles, but typical for Anurians. Pars tuberalis and intermedia are composed of small basophil cells only. After hypophysectomy metamorphosis of the larvæ is prevented or delayed. Most of the operated animals change to a white colour, but 25% became black. In this case part or the whole of the pars intermedia was found to be present and hypertrophied. The basophil cells of the pars intermedia give rise to the chromatophore hormones. The chromophobe cells of the anterior lobe develop after metamorphosis only and can therefore be excluded from being the source of the thyrotrophic hormones. As in animals with delayed metamorphosis the basophil cells of the pars tuberalis were always present, it may be assumed that the basophil cells play a part in metamorphosis. Animals with intact pituitary and damaged infundibulum and floor of diencephalon turn black soon after the operation, but metamorphose normally.

W. J.

Pituitary changes in male rats reared and maintained on "pure" dietaries with and without vitamin-E. A. A. KONEFF (Anat. Rec., 1939, 74, 383—399).—In the anterior lobe basophils and chromophobes increase in no. and size and acidophils enlarge with vitamin-E-low diet. The addition of α -tocopherol or wheat-germ oil to an -E-free diet influences the pituitary cytological changes only slightly but preserves seminiferous epithelium and fertility.

W. F. H.

Lipin, calcium, phosphorus, and iron content of rats with hypothalamic and hypophyseal damage. A. W. HETHERINGTON and A. WEIL (Endocrinol., 1940, 26, 723—727).—Bodies of 1 hypophysectomised rat and 4 rats obese through hypothalamic injury were analysed. In the fat rats Ca, P, and Fe were diminished. Ca, but not P, was diminished in the hypophysectomised.

V. J. W.

Effect of anterior pituitary-like sex hormone on blood picture in man. W. M. MOFFAT (Endocrinol., 1940, 26, 595—598).—Injections of 100—400 r.u. caused a leucocytosis 6—8 hr. later. All leucocytes increased, especially neutrophils. Daily injections of 200 r.u. failed to cause the leucocytosis after about 7 days.

V. J. W.

Cellular constitution of transplants of the anterior hypophysis in inbred strains of mice. J. M. WOLFE, M. M. KIRTZ, and L. LOEB (Amer. J. Cancer, 1940, 38, 239—242).—Multiple transplants of the anterior lobes of the pituitary of closely inbred strains of mice were found alive after 7 to 10 months. The persisting transplants were surrounded by a fibrous capsule from which strands of connective tissue grew into the graft. The surviving tissue was made up chiefly of chromophobes, but in most transplants a few eosinophils were seen. Basophils were not observed. In some grafts intermediate lobe tissue was identified. Cell counts on the anterior pituitaries of the hosts showed more basophils than in non-ovariectomised animals. They were generally degenerated. Castration cells were not observed.

There was no similarity between the cellular pattern in the transplants and in the pituitaries of the host.

F. L. W.

Separation in nearly pure form of luteinising (interstitial cell-stimulating) and follicle-stimulating (gametogenic) hormones of pituitary gland. R. O. GREEP, H. B. VAN DYKE, and B. F. CHOW (J. Biol. Chem., 1940, 133, 289—290).—Whole pig pituitaries are fractionated as previously described (J. Endocrinol., 1940, 1, 440). The salt-free solution thus obtained is half-saturated with $(\text{NH}_4)_2\text{SO}_4$ and the inactive ppt. is removed. Protein is then removed by increasing the concn. of $(\text{NH}_4)_2\text{SO}_4$ to 90%-saturation and the filtrate is dialysed. Addition of 1 vol. of M-acetate buffer at p_{H} 4.41 + 2 vols. of 41% Na_2SO_4 ppts. almost pure luteinising hormone. The follicle-stimulating hormone is pptd. by further addition of 40 g. of $(\text{NH}_4)_2\text{SO}_4$ per 100 c.c. to the filtrate. 0.01 mg. (as N) of follicular hormone thus prepared produces definite ovarian hypertrophy, whilst 0.36 mg. of luteinising hormone produces no such effect. Luteinising but not follicle-stimulating hormone produces enlargement of the anterior prostate (rat).

P. G. M.

Species specificity of gonadotrophic factors in vertebrates. C. W. CREASER and A. GORBMAN (Quart. Rev. Biol., 1939, 14, 311—331).—A review.

J. D. B.

Quantitative studies on hormones of human pituitaries. E. WITSCHI and G. M. RILEY (Endocrinol., 1940, 26, 565—576).—Dried acetone preps. were assayed for gonadotrophic hormones by their effect on vaginal epithelium in rats. These hormones were almost absent in children. During the reproductive period male pituitary is 4 times as active as female. The highest vals. were obtained in women over 50 and castrates. The content falls during early pregnancy, rising later. The gonadotrophic complex was almost entirely follicle-stimulating with traces of luteinising hormone. Other hormone vals. do not vary with age or sex.

V. J. W.

Potency evaluations of human chorionic gonadotrophic preparations. B. L. CINBERG and S. F. GOLDMAN (Proc. Soc. Exp. Biol. Med., 1940, 43, 208—210).—7 commercial preps. were assayed on rats by the vaginal smear method using doses of 1—12 r.u. 2 were quite ineffective and 1 was so variable that assay was impossible.

V. J. W.

Rate of appearance of antiluteinising activity in serum of rabbits injected with extract of ox pituitary gland. I. W. ROWLANDS (J. Endocrinol., Lond., 1939, 1, 172—176).—Serum was withdrawn weekly from rabbits injected daily with a gonadotrophic extract of ox pituitary gland, and assayed by its power to inhibit selectively the luteinising activity, in immature female rats, of an extract of gelding pituitary gland. The antiluteinising activity of the serum increased up to the 7th week after the start of immunisation, was const. for the 2 succeeding weeks, and subsequently diminished slightly.

P. C. W.

Separation of follicle-stimulating fraction from pituitary gonadotrophin. H. RINDERKNECHT and P. C. WILLIAMS (J. Endocrinol., Lond., 1939, 1, 117—

127).—An attempt was made to separate the luteinising and follicle-stimulating fractions from acetone-dried horse pituitary gland, using the procedures adopted by Evans *et al.* (Univ. Calif. Publ. Anat., 1936, 1, 255) and Fevold (A., 1938, III, 486) which depend on $(\text{NH}_4)_2\text{SO}_4$ fractionation of sheep pituitary gland. The attempt was unsuccessful but by modifying the Evans procedure a relatively pure follicle-stimulating fraction was obtained. Differences in pptn. properties between the gonadotrophin present in crude ox pituitary extracts and that in the horse gland, and the fact that the yield of follicle-stimulating fraction was improved if the horse pituitary gonadotrophin was freed from some of the inert material by pptg. the latter with salicylsulphonic acid or 50% alcohol prior to the fractionation, suggested that the impurities might interfere with the separation and that species differences in these impurities might account for the failure to repeat the results of the other workers.

P. C. W.

Precipitins in antigonadotrophic sera. M. VAN DEN ENDE (J. Endocrinol., Lond., 1939, 1, 157—171).—Antisera to an active gonadotrophic extract of pregnancy urine contain precipitins demonstrable with a variety of urinary extracts independent of their hormone content. The amount of precipitin present could be determined by optimal proportions and was independent of the antigonadotrophic activity. Pregnancy urine extracts contain multiple antigens. Absorption of precipitins by an extract of male urine removed all the precipitins for urinary gonadotrophin but, only partly removed the biological inhibitory activity. Absorption of the precipitins for human serum only slightly reduced the precipitins for urinary extracts but left the biological inhibitory activity intact.

P. C. W.

Antibody response in rabbits to extracts of human pregnancy urine and of normal female urine. K. M. HOWELL and S. SOSKIN (Endocrinol., 1940, 26, 577—580).—No differences were found in precipitins or complement-fixing antibodies.

V. J. W.

Progonadotrophic and antithyrotrophic activity of antisera to extracts of anterior pituitary gland. I. W. ROWLANDS (J. Endocrinol., Lond., 1939, 1, 177—183).—The serum of a dog injected daily for many weeks with an extract of ox pituitary gland augmented the gonadotrophic activity of both ox and pig pituitary extracts in immature female rats. It had no effect on the thyrotrophic activity of the immunising ox pituitary extract. The serum of a goat injected with an extract of pig pituitary gland augmented the gonadotrophic activity of the immunising extract in immature rats. This progonadotrophic activity reached a max. 6 weeks after the start of the injections at a time when the serum first exhibited an inhibitory effect on the thyrotrophic action of the immunising extract. 10 weeks after the start of the injections the progonadotrophic activity of the serum was diminished, the antithyrotrophic activity increased.

P. C. W.

Inactivation of prolactin by treatment with phenyl isocyanate. A. C. BOTTOMLEY and S. J. FOLLEY (Nature, 1940, 145, 304).—Phenylureido-

prolactin, prepared by treating purified prolactin from ox pituitary with phenylcarbimide, shows a large reduction in pigeon crop-gland stimulating activity compared with prolactin. This confirms the conclusions of Li *et al.* (A., 1940, III, 404) that the crop-stimulating activity of prolactin depends on the presence of free amino-groups in the mol. L. S. T.

Comparison of methods of assay of lactogenic hormone. A. J. BERGMAN, J. MEITES, and C. W. TURNER (Endocrinol., 1940, 26, 716—722).—Vals. obtained by 3 modifications of the pigeon crop gland method and by the rabbit method were found to be comparable and indicate that the factor concerned is the same.

V. J. W.

Hormonal inhibition of lactation. R. P. REECE, J. W. BARTLETT, I. L. HATHAWAY, and H. P. DAVIS (Proc. Soc. Exp. Biol. Med., 1940, 43, 183—186).—Daily injection of 200 r.u. of pregnancy urine extract in rats increased the effectiveness of oestrogens in inhibiting lactation. Increased mitoses were observed in the mammary glands.

V. J. W.

Metabolism of thyrotrophic and gonadotrophic hormones. S. M. SEIDLIN (Endocrinol., 1940, 26, 696—702).—Urine of thyroidectomised guinea-pigs injected with thyrotrophic hormone caused thyroid hyperplasia in guinea-pigs, and urine of castrated male or female guinea-pigs injected with gonadotrophic hormone caused gonadal stimulation. Urine of normal guinea-pigs so injected, or of untreated castrates, caused no such reactions. The hormones were partly removed from solutions by thyroid and ovarian tissues respectively.

V. J. W.

Endocrine dwarfism. R. L. SCHAEFER and F. L. STRICKROOT (Endocrinol., 1940, 26, 599—604).—14 out of 18 cases received benefit from average doses of 5 c.c. of "antuitrin-G" twice weekly.

V. J. W.

Effect of adrenotrophic hormone in 4-day-old rats. H. D. MOON (Proc. Soc. Exp. Biol. Med., 1940, 43, 42—44).—At 4 days of age rats are 20 times as sensitive as at 21 days to this hormone.

V. J. W.

Effect of adrenotrophic hormone on thymus of rat. R. H. CREDE and H. D. MOON (Proc. Soc. Exp. Biol. Med., 1940, 43, 44—46).—This hormone causes in 21-day-old rats atrophy of the thymus which is not prevented by castration or hypophysectomy but is prevented by adrenalectomy.

V. J. W.

Response of thyroidectomised rats to adrenotrophic hormone. H. D. MOON and W. HANSEN (Proc. Soc. Exp. Biol. Med., 1940, 43, 46—48).—Adrenal response to this hormone is not modified by thyroidectomy or thyroid administration.

V. J. W.

Preparation and assay of anterior pituitary fractions rich in ketogenic and respiratory quotient-reducing substances. J. D. GREAVES, I. K. FREIBERG, and H. E. JOHNS (J. Biol. Chem., 1940, 133, 243—259).—The assay of the R.Q.-reducing substance of the anterior pituitary is based on the effect of intraperitoneal injection of extracts in fasted rats which are fed glucose 2 hr. after the injection of extract; 1 unit is the amount that will reduce the R.Q. to 0.80. Extraction of the frozen

glands at p_H 11 gives the best results. The active principle is destroyed by heating at 100° for 15 min. at p_H 10, and it cannot be dialysed. It is pptd. by 20–45% saturation with $(NH_4)_2SO_4$, and is more stable at p_H 9.5–11.0 than in acid solution. The most active preps. contain 1 unit in 0.17 mg. of protein; they are rich in growth factor, have a parallel ketogenic action, but contain only small amounts of prolactin. P. G. M.

Importance of connexion between pituitary and brain for release of melanophore hormone. W. RODEWALD (Arch. exp. Path. Pharm., 1939, 194, 74–75).—Hæmato- and proto-porphyrin cause release of melanophore hormone from the frog's pituitary (cf. A., 1939, III, 379). After cutting the pituitary-brain connexion an injection of porphyrins no longer causes a darkening of the frog's skin. On the contrary, the skin becomes almost white. H. BL.

Degradation of oxytocin and vasopressin *in vitro*. M. CHRISTLIEB (Arch. exp. Path. Pharm., 1939, 194, 44–51).—Suspensions of guinea-pig organs (liver, kidney, small intestine, muscle) destroy the oxytocic and vasopressor activity of posterior pituitary extracts (hypophysin Baeyer). Boiling reduces the destructive activity of the suspensions to about $\frac{1}{2}$. The activity on the sheep's uterus and the cat's blood pressure is lost at about the same rate. H. BL.

Antidiuretic pituitary hormone after mercuric chloride poisoning. L. FRÜHFART (Arch. exp. Path. Pharm., 1940, 194, 174–178).—The content of rats' posterior pituitary lobe in antidiuretic hormone is not diminished 24 hr. after subcutaneous injection of 6 and 8 mg. of $HgCl_2$ per kg. or 96 hr. after 8 mg. per kg.; 96 hr. after 8 mg. per kg. the content is increased. H. BL.

Degeneration of infundibular nerve fibres without precipitating diabetes insipidus. A. D. KELLER (Proc. Soc. Exp. Biol. Med., 1940, 43, 61–63).—Partial hypophysectomy in the rat does not cause diabetes insipidus provided that either a remnant of the pars tuberalis, or the posterior lobe, is left *in situ*. V. J. W.

Relationship of function of pineal gland to heredity and racial characteristics. J. VON KUP (Frankf. Z. Path., 1938, 52, 427–432). H. W. K.

Nerve of pineal gland. W. E. LE G. CLARK (Nature, 1940, 145, 349–350).—In the monkey and man a nerve bundle running upward from the tip of the pineal gland is reported as a regular feature. No ganglion at the tip of the gland was found. W. F. F.

Does thymus extract affect the action of pituitrin on uterus? H. HANDOVSKY (Arch. int. Pharmacodyn., 1940, 64, 184–189).—Addition of thymus extract had no influence on the action of pituitrin on the cat's uterus. D. T. B.

Skin changes in experimental hyperthyroidism. I. ABELIN (Biochem. J., 1940, 34, 229–233).—Oral treatment of rats with 0.1 g. of thyroid gland daily for 5 days increases the total cholesterol in the skin by approx. 80%, whilst the ratio total cholesterol:total lipin increases by nearly 100%. After 15 days' treat-

ment the effect is more pronounced and the vals. become nearly 3 times normal. Subcutaneous injection of 0.75 mg. of thyroxine daily for 24 days causes 100% increase in total cholesterol whilst the above ratio rises to 8 times the normal val. Cl' and water of skin are scarcely affected by addition of small amounts of hormone, but after 15 days' administration of 0.1 g. of gland daily, Cl' increases by approx. 20% and water by 7%. The water-binding capacity of the skin *in vitro* is also increased and swelling is most pronounced at p_H 3.67 and 12.97. The changes in lung- and blood-cholesterol are slight and irregular. The results are discussed in relation to the increased liberation of energy and loss of heat during hyperthyroidism. J. N. A.

Recent advances in physiology and pathology of thyroid gland. H. W. BANSI (Med. Klin., 1939, 35, 1405–1407).—A review. (B.) A. S.

Effects of feeding thyroid substance. B. A. SCHNEIDER (Quart. Rev. Biol., 1939, 14, 289–310, 431–450).—A review. J. D. B.

Thyroid deficiency in twins. H. HOSEN (J. Pediat., 1940, 16, 210–214). C. J. C. B.

Determination of iodine in thyroid. C. E. NICKLAUS and N. TIPPETT (J. Amer. Pharm. Assoc., 1940, 29, 124–126).—The sample (0.5 g.) is digested with CrO_3 , and I, liberated by reduction with H_3PO_3 , is oxidised to IO_3' by $KMnO_4$; excess of $KMnO_4$ is removed by HNO_2 and excess of HNO_2 by urea. The IO_3' is caused to react with I' and liberated I is titrated with 0.01N- $Na_2S_2O_3$ (cf. Matthews *et al.*, A., 1939, III, 222). F. O. H.

Thyroxine content of body. I. ABELIN and E. WEHREN (Arch. int. Pharmacodyn., 1940, 64, 156–170).—Like other amino-acids, thyroxine in the body is easily decomposed. The liver and the skin show by chemical analysis some accumulation in induced hyperthyroidism. Biological tests on basal metabolism in animals fed with tissues from hyperthyroidism indicate that the organism resists storing of the hormone. Greater concn. is found after oral administration of thyroid powder than after subcutaneous injection of thyroxine. D. T. B.

Effect of thyroid on nitrogen retention. J. A. JOHNSTON and J. W. MARONEY (Amer. J. Dis. Child., 1939, 58, 965–982).—Small doses of thyroid extract given during the growth period are essentially anabolic, whereas larger doses are catabolic. Treated cretins and mild cases of hyperthyroidism show a positive N balance. The crit. point at which anabolism swings to catabolism cannot be determined by O_2 consumption standardisation methods. A. C. F.

Autonomic control of thyroid secretion. H. B. FRIEDGOOD and W. B. CANNON (Endocrinol., 1940, 26, 142–152).—In 2 cats, anastomosis of the right phrenic with the cervical sympathetic caused unilateral exophthalmos and increased basal metabolic rate (cf. Cannon *et al.*, Amer. J. Physiol., 1915, 36, 363). Removal of the right lobe of the thyroid reduced basal metabolic rate and cutting the anastomosis brought it back to normal. Cutting the cervical sympathetics and the adrenal nerves reduces

basal metabolic rate but does not modify the effect of thyrotrophic hormone, but its effect is increased by injections of pilocarpine or adrenaline. V. J. W.

Sporadic congenital goitre causing death of infant. L. SOLIS-COHEN and M. STEINBACH (*Amer. J. Dis. Child.*, 1939, **58**, 1067—1071).—An enlarged thyroid weighing 41 g. instead of the normal 1—2 g. was found in an infant born to a mother suffering from hypothyroidism. The infant, who also had unrelated congenital syphilis, died within 48 hr. of birth from pressure asphyxia. A. C. F.

Alterations of thyroid gland due to extreme temperature variation. T. SHOOG (*Anat. Anz.*, 1939, **88**, 289—320).—Mice kept at a lower temp. show enlargement of the gland, particularly of the cells of the glandular epithelium, while high temp. decrease the gland size. Animals born and raised in the cold show also an increased no. of cells. R. W. H.

Biological effects of thyroidectomy in Graves' disease and thyrotoxicosis. K. MARUTA (*Tohoku J. exp. Med.*, 1939, **37**, 88—105).—Pre- and post-operative data are given on sedimentation rate, white blood cells, pulse rate, blood pressure, circulation rate, basal metabolic rate, and cholesterol. H. L.

Parathormone [A.T.10] shock-treatment in post-operative tetany. J. H. MULLIN and F. ELLIOTT (*Canad. Med. Assoc. J.*, 1940, **42**, 345—348).—Report of a case treated successfully with A.T.10. C. J. C. B.

Post-operative parathyroid tetany treated with dihydrotachysterol (A.T.10). L. J. ADAMS (*Canad. Med. Assoc. J.*, 1940, **42**, 373—375).—A.T.10 gave dramatic results, and proved entirely satisfactory in raising the blood-Ca and controlling the signs and symptoms of tetany. C. J. C. B.

Parathyroid hypertrophy and hypocalcæmia in vegetarian rats. C. Y. CHANG and T. T. CHEN (*Chinese J. Physiol.*, 1940, **15**, 19—24).—The vegetable diet previously described (*Physiol. Abstr.*, 1928, **13**, No. 2112) provided 300 mg. of Ca and 400 mg. of P per week; the mixed diet, consisting of wheat, millet, soya bean, tankage, cod-liver oil, yeast bran, and fresh cabbage, provided 1100 mg. of Ca and 790 mg. of P. The parathyroids of the omnivorous rats weighed 0.2—0.6 mg., of the vegetarians 1.5—11 mg., the males having the heavier ones; the blood-Ca of the omnivorous rats was 9.9—11.2 mg.-%, of the vegetarians 5.8—9.8 mg., higher in the females. N. H.

Connexion between carbohydrate and potassium metabolism in normal and adrenalectomised animals. F. VERZAR and J. C. SOMOGYI (*Nature*, 1939, **144**, 1014—1015).—After adrenalectomy rats show changes in behaviour of injected sugars, and K metabolism disturbance. These two phenomena are related through phosphorylation. W. F. F.

Cozymase in adrenalectomised rats. J. RUNNSTRÖM, E. SPERBER, and E. BARANY (*Nature*, 1940, **145**, 106—107).—No significant difference was found in the mean cozymase content of the tissues in normals and adrenalectomised rats. W. F. F.

Use of deoxycorticosterone in asthenic conditions. H. EITNER (*Med. Klin.*, 1939, **35**, 1544—1546).—Good results with administration of deoxycorticosterone were obtained in patients suffering from loss of wt. and general cachexia; treatment with insulin-glucose had no result. A. S.

Effect of deoxycorticosterone in hyperthyroidism. H. J. VON PLEHWE (*Med. Klin.*, 1939, **35**, 1603—1604).—Administration of deoxycorticosterone acetate in patients suffering from Graves' disease had no effect on the basal metabolic rate. A. S.

Pseudohermaphroditismus femininus and its relationship to adrenals. C. VELTEN and R. NOETHE (*Frankf. Z. Path.*, 1939, **53**, 153—177).—A case is described of a 10-days-old infant with pseudohermaphroditismus femininus externus and premature development of the adrenal cortex. The literature is reviewed. H. W. K.

Survival of adrenalectomised rats. L. WATERMAN (*Arch. int. Pharmacodyn.*, 1940, **64**, 46—51).—Completely adrenalectomised rats of 50—65 g. survive longer when Na citrate or NaCl is given with low-K diet. Old rats last longer than young ones. Corticosterone derivatives prolonged life. D. T. B.

Andromimetic function of the immature male rat adrenal. M. W. BURRILL and R. R. GREENE (*Endocrinol.*, 1940, **26**, 645—650; cf. A., 1939, III, 983).—Complete atrophy does not occur in the prostates of castrated rats up to 31 days of age if the adrenals are present, but does so in adrenalectomised rats. V. J. W.

Fluid and electrolyte shifts in the normal and adrenalectomised rat after intraperitoneal injection of isotonic sugar solutions. J. W. REMINGTON (*Endocrinol.*, 1940, **26**, 631—640).—Injection of 10 c.c. of isotonic glucose solution per 100 g. caused 80% mortality in adrenalectomised rats, and none in normal rats. In the former ascitic fluid was less in amount and more conc. Blood concn. was also greater, though serum-electrolytes were less. V. J. W.

X-Zone of adrenal gland of mouse. I. GERSH and A. GROLLMAN (*Anat. Rec.*, 1939, **75**, 131—153).—Administration of desiccated hog thyroid powder to the immature or castrate mouse produces marked hypertrophy of the X-zone. The cells increase in size and numerous lipid droplets appear in their cytoplasm. Small doses of cortical hormone produce almost complete degeneration of the X-zone. Large doses of the hormone may inhibit entirely the appearance of the zone in very young animals. It is concluded that this zone performs the same functions as the other two cortical zones, that it acts as a reserve tissue which responds to increased demands on the glands for their hormone, and that it is readily depressed when great need for cortical hormone does not exist, or is satisfied in some other way. W. F. H.

Inactivation of adrenaline by phenolases. H. BLASCHKO and H. SCHLOSSMANN (*J. Physiol.*, 1940, **98**, 130—140).—The O₂ uptake in the oxidation of adrenaline by polyphenol oxidase and by cytochrome + cytochrome oxidase is measured manometrically.

There is an initial fast reaction in which 2 atoms of O per mol. of adrenaline are consumed and in which a red colour appears. There follows a second reaction, which is independent of an enzyme, during which the O₂ uptake is slow and the colour changes to brown. The initial reaction is the formation of adrenochrome from adrenaline and represents the inactivation of adrenaline. The inactivation of adrenaline by peroxidase cannot be measured manometrically; here, too, inactivation occurs with the formation of a red substance, probably adrenochrome. The formation of adrenochrome by phenolases and its subsequent oxidation is not associated with the formation of adrenoxine. J. A. C.

Calorigenic action of adrenaline. Proportionality with dose. F. R. GRIFFITH, jun., F. E. EMERY, and J. E. LOCKWOOD (Amer. J. Physiol., 1940, 128, 281—290).—The min. effective rate of intravenous injection of adrenaline on O₂ consumption of chloralose-anæsthetised cats is 0.5 µg. per 12 g. per min. At rates of injection below 7 µg. per kg. per min. O₂ consumption continues to increase to a max. 5—10 min. after injection is over; the max. calorigenic effect (+16%) occurs at this time after injection at the rate of 4 µg. per kg. per min. The calorigenic effect parallels closely in threshold, max., and decline at higher rates of injection the simultaneous changes in blood-sugar level, but is quite unlike the increases in blood-lactic acid. M. W. G.

Improvement of respiration by adrenaline. B. S. POLAK (Arch. int. Pharmacodyn., 1940, 64, 52—57).—Improvement of the respiration in rabbits and cats by 0.1 mg. of adrenaline persists after cutting out the vaso-sensory zones. The effect is central. D. T. B.

Adrenaline hyperglycæmia. M. LEE and D. RICHTER (Biochem. J., 1940, 34, 551—562).—The amylase content of liver is too low to account for the rapid glycogenolysis which occurs during adrenaline hyperglycæmia. Liver-phosphatase has an activity comparable with that of muscle. Phosphorylysis in the liver depends on the blood-sugar level and is inhibited as the latter rises, but only in the presence of O₂. Adrenaline increases the rate of this lysis by accelerating the removal of glucose 1-phosphate or other intermediate in the conversion of glycogen into glucose 6-phosphate. The rate of lysis is also increased in liver brei by reducing agents or HCN, the latter effect being unconnected with cytochrome inhibition. P. G. M.

Blood-adrenaline levels during insulin shock treatment. E. B. TIETZ, H. DORNHEGGEN, and D. GOLDMAN (Endocrinol., 1940, 26, 641—644).—Blood-adrenaline increases during insulin coma and falls below normal on recovery. V. J. W.

Influence of pilocarpine on adrenaline output in dogs and cats. T. HIRANO (Tohoku J. exp. Med., 1939, 37, 119—138).—After intravenous injection of 1—2 mg. of pilocarpine, adrenaline secretion in anæsthetised cats (estimated from cava pocket blood samples by the paradoxical pupil test or by the rabbit intestine test) remained unchanged or decreased owing to diminished blood flow through the adrenal

glands; an increase in secretion was observed after 4—5 mg. of pilocarpine. In dogs a slight increase was observed after 1—2 mg. of pilocarpine intravenously and a reduction in output after 1 mg. given subcutaneously. H. L.

Number of peptide linkages in insulin. K. LINDERSTRÖM-LANG and C. F. JACOBSEN (Enzymologia, 1940, 8, 64—74; cf. A., 1939, III, 195).—Determinations of the no. of acid and basic groups in cryst. insulin (N content 15.2%) before and after hydrolysis with HCl show that the no. of peptide linkages (*i.e.*, C—N linkages hydrolysed to α-amino- or α-imino- and carboxyl groups) per N atom is 0.753 ± 0.005 . The val. calc. on the assumptions that insulin has the composition given by Du Vigneaud (undetermined N being regarded as in the form of monoaminomonocarboxylic acids), and that there are as many peptide linkages as α-amino- or α-imino-groups, is 0.749. The val. for lactoglobulin is 0.790. If accepted mol. wt. vals. are used, the no. of peptide linkages per mol. is 292 ± 10 for insulin and 328 ± 10 for lactoglobulin. The results do not contradict Bergmann's theory of protein structure but show that the existence of Svedberg's wt. classes cannot be explained by the cyclol theory. W. McC.

Effect of alkylresorcinols and related compounds on absorption of insulin from isolated intestinal loops of anæsthetised dogs. R. R. SEALOCK, J. MURLIN, and R. L. DRIVER (Amer. J. Physiol., 1939, 128, 92—96).—The effects of the alkylresorcinols (ethyl to octyl), on the absorption of insulin from isolated loops of the small intestine of anæsthetised dogs were compared. Hexylresorcinol causes the greatest absorption as indicated by blood-glucose. The lower and higher homologues of hexylresorcinol exhibit decreasing effects. The hydrophilic-hydrophobic nature of hexylresorcinol is not the only factor involved in promoting insulin absorption. M. W. G.

Adenomata and carcinomata of islets of Langerhans. M. ISAJI (Frankf. Z. Path., 1939, 53, 178—207).—Two cases are described of islet cell adenomata with attacks of spontaneous hypoglycæmia. The literature on adenomata and carcinomata of the islets is reviewed. H. W. K.

Effect of repeated insulin hypoglycæmia on lipin composition of rabbit tissues. L. O. RANDALL (J. Biol. Chem., 1940, 133, 129—136).—In the brain and spinal cord of rabbits in which convulsions had been induced by insulin hypoglycæmia, statistically significant decreases in the phospholipins and probably also in neutral fats were observed. The phospholipins were unchanged in liver, kidney, spleen, and muscle, whilst neutral fat had increased in liver and kidney. In the hypertrophied adrenals of the animals, the abs. amounts of phospholipin and neutral fat had increased. No significant changes in the cholesterol vals. of any of the tissues occurred. A. L.

Effects of large doses of protamine-zinc-insulin in non-diabetic individuals. D. GOLDMAN (Endocrinol., 1940, 26, 612—618).—Administration of up to 300 units daily caused only slight

hypoglycæmic symptoms although blood-sugar was lowered and irregular. V. J. W.

Symptoms of hyperinsulinism in relation to blood sugar and keto-bodies of the blood. R. FREUDENBERG and J. FINE (J. ment. Sci., 1940, 86, 84—94).—Blood-sugar, HSO_3^- -binding substances, and ketones (acetone + acetoacetic acid) were determined in the blood of schizophrenic patients undergoing insulin hypoglycæmia. There is no clear connexion between the symptoms of hypoglycæmia and the blood-sugar level. The latter must be below 30 mg.-% for a certain time before coma appears. HSO_3^- -binding substances and ketones were depressed during hypoglycæmia, but rose when muscular movements or twitchings occurred. G. D. G.

Islands of Langerhans in infants born of diabetic mothers. E. B. HELWIG (Arch. intern. Med., 1940, 65, 221—239).—Infants of diabetic mothers show a variable degree of hypertrophy and hyperplasia of the islands of Langerhans. The stroma, and to a smaller degree the islands, were frequently infiltrated with eosinophilic granulocytes. C. A. K.

Diabetic coma [treatment with insulin]. A. F. FOWLER, E. H. BENSLEY, and I. M. RABINOWITCH (Canad. Med. Assoc. J., 1940, 42, 336—341).—A series of blood-sugar-time curves are recorded to demonstrate the different responses to treatment of diabetic coma with one simultaneous injection of 100 units of unmodified insulin intravenously and 100 units of unmodified insulin and 200 units of protamine-Zn-insulin subcutaneously. C. J. C. B.

(xii) REPRODUCTION.

Histogenesis of tissues sensitive to œstrogens. S. ZUCKERMAN (Biol. Rev., 1940, 15, 231—271).—A review. J. D. B.

(xiii) DIGESTIVE SYSTEM.

Derivation and excretion of calcium in chorda saliva. L. KESZTYÛS and J. MARTIN (Pflüger's Archiv, 1939, 241, 241—247).—During stimulation of the chorda tympani with induction current for 10—15 min. the concn. of Na, K, and Cl in the saliva falls by 30—60% but remains const. (9.5—11 mg.-%) for Ca. These experiments were carried out on dogs with salivary fistula. Samples of blood from the external carotid artery and external jugular vein were tested for Ca content. When the blood-Ca was increased by intravenous injection of CaCl_2 solution or decreased by bleeding and infusion of physiological saline the Ca content of the saliva showed corresponding alterations. Similar experiments with Na showed no such changes. The Ca in the saliva is believed to be a product of simple filtration. J. A.

Abnormal mechanism for excitation of gastric secretion in dog. A. C. IVY and W. H. BACHRACH (Amer. J. digest. Dis. Nutr., 1940, 7, 76—78).—In 3 Pavlov-pouch-Mann-Williamson dogs, which manifested a high continuous secretion and one of which manifested a hypersecretion in response to a meal, the gastric secretory mechanism reacted to atropine

as though a portion of the secretory stimulus were histamine. C. J. C. B.

Gastric analyses and gastric symptoms in diabetes insipidus. H. BLOTNER (Amer. J. digest. Dis. Nutr., 1940, 7, 73—75).—A greater vol. of gastric juice, a higher degree of acidity, and increased pepsin and rennin occurred in diabetes insipidus than are ordinarily found in normal people. Administration of pituitrin decreased these findings. C. J. C. B.

Relation of blood- CO_2 and dehydration to gastric acidity. F. W. TAYLOR and A. C. MICHAEL (Amer. J. digest. Dis. Nutr., 1940, 7, 67—69).—No correlation between the plasma- CO_2 and the gastric acidity could be demonstrated in dogs. The plasma- CO_2 was lowered to 26 vols.-% by feeding NH_4Cl . This caused no decrease in the free acidity of Pavlov pouches. Concurrent with the administration of NH_4Cl there was a great increase in the pouch secretion attributed to salt ingestion. Dehydration was effective in reducing the amount of pouch secretion but caused only a slight change in the free acid. C. J. C. B.

Wilhelmj test meal. J. L. LATTIMORE, A. GOLD, and H. C. EBENDORF (Amer. J. clin. Path., Tech. Sect., 1940, 4, 24—26).—A modification using a Difco prep. of the meal. C. J. C. B.

Physical therapy in diseases of stomach. A. ENGELHARD and H. FRIEDRICH (Münch. med. Wschr., 1939, 86, 1476—1478).—The results, obtained with physical therapy, in 404 patients suffering from gastric or duodenal ulcers or gastritis, are discussed. A. S.

Symptomatology of chronic atrophic gastritis. R. SCHINDLER and H. M. MURPHY (Amer. J. digest. Dis. Nutr., 1940, 7, 7—13). C. J. C. B.

Desiccated hog's stomach extract (ventriculin) in treatment of atrophic gastritis. L. SCHIFF and S. GOODMAN (Amer. J. digest. Dis. Nutr., 1940, 7, 14—17).—Case histories are presented of 5 patients with a gastroscopic diagnosis of chronic atrophic gastritis not associated with other gastric disease, pernicious anæmia or other anæmia, protein deficiency, or obvious vitamin deficiency. The patients were given hog's stomach extract (ventriculin) in doses of 30—60 g. per day in addition to a bland or regular diet. All 5 patients showed marked symptomatic improvement together with disappearance of the atrophic changes. When the ventriculin was withdrawn in 3 of the patients, 2 showed a return of the atrophic changes, and 1 an associated return of symptoms. In a 4th patient atrophic changes reappeared when ventriculin was taken in a total dosage of 500 g. during a period of 4 months. C. J. C. B.

Clinical results from continuous intra-gastric drip, using colloidal aluminium hydroxide in treatment of peptic ulcer. J. T. EADS (Amer. J. digest. Dis. Nutr., 1940, 7, 32—35).—Prompt symptomatic relief and both clinical and Roentgen evidence of rapid healing of the ulcer were found in all but 2 of a group of 40 ulcer patients; most of these patients had derived little or no benefit from previous medical treatment. C. J. C. B.

Effect of barbiturates on digestive secretion. R. J. COFFEY, T. KOPANYI, and C. R. LINEGAR (Amer. J. digest. Dis. Nutr., 1940, 7, 21—23).—Barbiturates in large hypnotic and anaesthetic doses produce a reduction of the gastric and pancreatic secretions, with a prompt return to normal flow after hypnotic doses and a delayed return after anaesthetic doses. Barbiturates are excreted in the pancreatic juices in very small amounts, and the max. post-cibal excretion in the gastric juice is approx. 5%.

C. J. C. B.

Azotæmia after gastro-intestinal hæmorrhages. M. DEMOLE and J. NEESER (Gastroenterologia, 1939, 64, 208—226).—The high blood-urea found in many cases of gastro-intestinal hæmorrhage is attributed to the absorption of the blood from the intestine.

E. M. J.

Effect of carmine on gastro-intestinal motility of children. I. G. MACY, L. REYNOLDS, and A. J. SOUDERS (Amer. J. Physiol., 1939, 126, 75—81).—Roentgenographic study of the effect of 0.2—0.3 g. of carmine on the gastro-intestinal motility of healthy children, 7—11 years old, showed that carmine had little effect on the total time of retention of a test meal in the tract. The average emptying time of the stomach was 257 min. with the test meal alone; with the test meal preceded by carmine it was 177 min.

M. W. G.

Effect of activated ergosterol and of parathyroid hormone on gastric secretion in the dog. B. P. BABKIN, O. KOMAROV, and S. A. KOMAROV (Endocrinol., 1940, 26, 703—715).—In dogs with a Pavlov pouch, administration of irradiated ergosterol raising blood-Ca to 15 mg.-% reduces the nervous phase of gastric secretion by nearly 50%. Acidity and total pepsin are also reduced. Histamine response is not affected. Similar results followed administration of parathormone or intravenous injection of 30 c.c. of 5% Ca lactate.

V. J. W.

Does alcohol stimulate gastric secretion by liberating histamine? C. A. DRAGSTEDT, J. S. GRAY, A. H. LAWTON, and M. R. DE ARELLANO (Proc. Soc. Exp. Biol. Med., 1940, 43, 26—28).—Perfusion of the isolated lungs of the guinea-pig with dil. alcohol causes the liberation into the perfusion fluid of a substance which acts like histamine on guinea-pig's intestine, and is destroyed by histaminase or by boiling in alkali.

V. J. W.

Effects of atropine and fat on gastric secretion stimulated by alcohol. J. S. GRAY and W. H. BACHRACH (Proc. Soc. Exp. Biol. Med., 1940, 43, 36—38).—Secretion into a Pavlov pouch in dogs is not affected by atropine or fat.

V. J. W.

Effect of urine from gastrectomised and duodenectomised dogs on gastric secretion. M. H. F. FRIEDMAN, H. C. SALTZSTEIN, and A. A. FARBMAN (Proc. Soc. Exp. Biol. Med., 1940, 43, 181—183; cf. A., 1940, III, 35).—The gastric inhibitory substance is present in the urine after removal of either stomach or duodenum.

V. J. W.

Use of hydrated magnesium trisilicate for peptic ulcer. M. KRAEMER and B. AAARON (Amer. J. digest. Dis. Nutr., 1940, 7, 57—60).—Mg trisilicate

was used in 150 patients with peptic ulcer. 92% were markedly benefited and 84% kept symptom-free for the duration of the study. Mg trisilicate has no effect on colonic motility in most cases. It produced no discernible toxic effects. It does not affect the acid-base balance of the serum.

C. J. C. B.

Production of peptic ulcers by vasomotor alterations (pitressin episodes). M. BERG (Amer. J. digest. Dis. Nutr., 1940, 7, 78—81).—Single injections of pitressin produce vasomotor episodes (vascular spasm and relaxation) with scattered superficial erosions or localised areas of œdema in the stomach and duodenum. These occur in both normal and vagotomised dogs. With frequent injections of pitressin ulcers of the stomach are obtained but in the vagotomised group the ulcerations are obtained in a greater % of cases (67%).

C. J. C. B.

Study of liver function in experimental peptic ulcer. A. REYMONT (Amer. J. digest. Dis. Nutr., 1940, 7, 65—66).—The quant. bilirubin test and the blood-lipase and bromsulphalein retention determinations for liver function were applied to 31 dogs on which the Mann-Williamson operation was performed for the production of post-operative jejunal ulcer. The operation does not cause disturbance of liver function. When the body is much embarrassed by a loss of blood or threatened perforation in consequence of the development of an ulcer, liver function is deranged in some but not all cases. The liver was not disturbed prior to the development of the ulcer. The same tests were applied to 11 dogs which received daily 100 mg. of cinchophen for 90 days along with 60 g. of gastric mucin. None of the dogs developed ulcer, but evidence of liver damage may be produced by cinchophen without causing an ulcer.

C. J. C. B.

Peptic ulcer and achlorhydria. W. L. PALMER and P. B. NUTTER (Arch. intern. Med., 1940, 65, 499—509).—Small acute and subacute gastric ulcers may occur with achlorhydria (proved by repeated histamine tests). Large chronic gastric ulcers occur only in the presence of acid gastric juice.

C. A. K.

Perforated peptic ulcer. D. JENNINGS (Lancet, 1940, 238, 395—398, 444—447).—A review of the frequency of perforated peptic ulcer in many countries during the last 150 years suggests that environmental are more important than constitutional factors.

C. A. K.

Peptic ulcer treated by posterior pituitary preparations. M. H. METZ, R. W. LACKEY, P. E. WIGBY, A. B. SMALL, and C. O. PATTERSON (Amer. J. digest. Dis. Nutr., 1940, 7, 27—32).—Satisfactory clinical results are reported in 67 of 76 cases of peptic ulcer treated with posterior pituitary preps. Intranasal insufflation of posterior pituitary powder was the most satisfactory mode of administration. Neither a strict dietary regime nor other medication was employed and the patients remained ambulatory.

C. J. C. B.

Stomatitis in childhood. C. G. PARSONS (Arch. Dis. Childh., 1940, 15, 43—54).—A review of 115 cases.

C. J. C. B.

Roentgenographic study of normal pylorus and duodenal cap. J. M. PAINTER, T. W. TODD,

and W. KUENZEL (*J. Lab. clin. Med.*, 1940, **25**, 581—602).—Serial roentgenograms at intervals of 10 sec. provide a ready method of analysing gastroduodenal behaviour patterns. The typical neutral pattern of the stomach is expressed in a peristalsis of both stomach and duodenum wherein the waves follow each other at 20-sec. intervals. The pylorus opens and closes every 20 sec., and evacuation of gastric secretion recurs with every systole. The upper level of the fluid column in the stomach is a good guide to activity. It falls if elimination exceeds secretion. If secretion exceeds elimination, the gastric shadow area is increased through widening or elongation. Water causes profuse gastric secretion; after the initial disturbance all neutral rhythms are quickly re-established and both gastric and duodenal peristaltic waves are deepened. Soda and peppermint greatly increase the vigour of gastroduodenal peristalsis and maintain an open pylorus; duodenal diastole is lengthened and duodenal peristalsis slowed; cap systole and gastric peristalsis retain their neutral rhythms. Milk and buttermilk slow down all rhythms and greatly weaken peristalsis in both stomach and duodenum. Amyl nitrite, in therapeutic doses, has a complete immediate inhibitory effect on gastric peristalsis and fall of fluid level. It does not reduce gastric tone. It has some, but progressively less inhibitory, effect on pyloric rhythm, cap rhythm, evacuation rhythm, and duodenal peristalsis. C. J. C. B.

Gastro-ileac reflex. D. M. DOUGLAS and F. C. MANN (*Amer. J. digest. Dis. Nutr.*, 1940, **7**, 53—57).—The activity of exteriorised loops of jejunum, ileum, and colon in continuity in trained dogs was studied in relation to feeding. A prompt motor response following feeding was noted in both the jejunal and ileac loops. The response occurred more rapidly in jejunal than in the ileac loops. Moreover, in an animal in which 2 exteriorised loops of small intestine at different levels were prepared, the motor response constantly appeared in the loop at the higher level before appearing in the lower loop. Feeding by a duodenal fistula gave as const. results as feeding by the mouth. Section of the intestine orad to the loop and reanastomosis in such a way as to prevent at least immediate union of the muscular coats and the intrinsic enteric plexuses did not prevent the occurrence of the motor response. A const. motor response was noted, after feeding, in the distal part of the colon but not in its proximal part. C. J. C. B.

Renal calcification accompanying pyloric and high intestinal obstruction. H. MARTZ (*Arch. intern. Med.*, 1940, **65**, 375—389).—Case reports and discussion. C. A. K.

Pathways of enzymes into blood in acute damage of pancreas. H. L. POPPER and H. NECHELES (*Proc. Soc. Exp. Biol. Med.*, 1940, **43**, 220—222).—If the pancreas is injured by injection of bile into its duct, concns. of amylase and lipase in the blood are increased when the thoracic duct is cannulated but not when the portal vein is ligatured, the main pathway being therefore by the blood stream. V. J. W.

Indole absorption in small intestine of healthy rat. H. NICOLAI (*Klin. Woch.*, 1939, **18**, 1338—

1341).—Indole (solution containing 2.3 mg. per c.c.) is very rapidly absorbed from a piece of jejunum 15 cm. long. Some accumulates in the intestinal wall and small amounts are excreted into the remaining jejunum. M. K.

Wave mechanics of smooth muscle action.
XV. Experimental multiple reflexions between intestinal ligatures transform travelling into stationary micro-pressure waves in smooth muscle. E. J. CAREY (*Arch. Path.*, 1940, **29**, 321—344).—Experimental microscopical evidence is presented of changes in the differential spatial distribution, deformation, and physical, mechanical, and staining qualities of the cytoplasm and nuclei during smooth muscle contraction. Stationary intestinal waves, experimentally transformed from travelling waves, are similar to those of inanimate matter in association with phase differences of stationary transverse or longitudinal pressure waves, such as sound or supersonic waves. The conclusion is that the cytoplasmic living matter of smooth muscle is not only composed of colloidal particles but that these in action are distributed in a manner that structurally expresses underlying associated micro-pressure waves. The living matter of the cytoplasm of smooth muscle, therefore, has 2 aspects, namely colloidal particle and the associated micro-pressure wave. (22 photomicrographs.) C. J. C. B.

Intestinal movements in ileocæcal region. A. E. BARCLAY (*Radiology*, 1939, **33**, 170—176).—The movements of the terminal ileum were studied by direct X-ray cinematography. Two main types of contraction were seen, propulsive and churning, the former rapid and the latter slow. No contractions of the ileo-cæcal valve were seen. W. F. F.

(xiv) LIVER AND BILE.

Clinical use of tests of liver function. T. BRUGSCH, NONNENBRUCH, L. HEILMEYER, E. RISSEL, E. LAUDA, J. H. PRATT, A. HURST, A. M. SNELL, GRUNKE, N. FIESSINGER, and K. FRANKE (*Med. Klin.*, 1939, **35**, 1451—1454, 1477—1480, 1505—1506).—A discussion. A. S.

Action of oxalate on liver glycogenolysis. N. BROCK, H. DRUCKREY, and H. HERKEN (*Arch. exp. Path. Pharm.*, 1940, **194**, 165—173).—The aerobic glycogenolysis of rat liver slices is abolished by oxalate even if an equiv. amount of Ca⁺⁺ is simultaneously added. Pptd. Ca oxalate is without effect. Oxalic acid therefore has an effect on liver metabolism which is not due to the removal of ionised Ca. H. BL.

Action of tyrosine and glycine on blood-sugar content in Eck fistula dogs. T. KA (*Tohoku J. exp. Med.*, 1939, **37**, 113—118).—Intravenous injection of 0.1 g. of tyrosine per kg. body-wt. produced a slight rise in blood-sugar which was followed by a slight hypoglycaemia; it had no effect in the normal dog. 0.1 g. of glycine per kg. produced a slight rise followed by a more prolonged hypoglycaemia; only the latter was observed in normal dogs. After 0.5 g. of glycine the rise was higher and the fall less pronounced; normal dogs responded similarly. H. L.

Comparative value of serial hippuric acid excretion, total cholesterol, cholesterol ester, and phospholipin tests in liver diseases. II. Clinical comparison of tests. F. W. WHITE, E. DEUTSCH, and S. MADDOCK (*Amer. J. digest. Dis. Nutr.*, 1940, 7, 3—7).—The most useful tests in cases of acute liver disease with jaundice were the icteric index, hippuric acid excretion, urobilinogen in the urine, cholesteryl ester %, and galactose tolerance. In the cases of chronic liver disease with jaundice, the icteric index, hippuric acid excretion, and urobilinogen in the urine are most helpful. The phospholipins and total cholesterol have val. in obstructive jaundice. In case of liver disease without jaundice the most useful tests are the hippuric acid and bromsulphalein tests. C. J. C. B.

Fibrosis of liver in heart failure. T. D. DAY and T. G. ARMSTRONG (*J. Path. Bact.*, 1940, 50, 221—226).—11 cases were described in which a persistent rise in venous pressure was associated with fibrosis of the liver. (8 photomicrographs.) C. J. C. B.

Toxic hepatitis. J. D. KIRSHBAUM and H. POPPER (*Arch. intern. Med.*, 1940, 65, 465—476).—15 cases of fatal acute hepatitis are reported. The fulminating form is intermediate between catarrhal jaundice and acute yellow atrophy of the liver. Dissociation of the liver cells is due to serous hepatitis. C. A. K.

Effect of yeast on incidence of cirrhosis produced by lead arsenate. W. C. VONGLAHN and F. B. FLINN (*Amer. J. Path.*, 1939, 15, 771—781).—The incidence of hepatic cirrhosis in rabbits produced by the ingestion of Pb arsenate is reduced when powdered brewer's yeast is added to the diet. There is no relation between the amount of hepatic glycogen and the quantity of As in the liver, and there is no connexion between the glycogen content of the liver and the incidence of cirrhosis. C. J. C. B.

Blood-cholesterol in hepatic diseases. N. ROMANO, S. REY, and F. MOLINARI (*Rev. Asoc. med. argent.*, 1940, 54, 96—100).—In 11 cases of parenchymatous jaundice the total blood-cholesterol was decreased with a marked decrease of the cholesteryl esters; vals. increased towards normal in 6 cases which showed clinical improvement. Out of 19 cases of obstructive jaundice, cholesteryl esters were normal in 14 and decreased in 5. S. O.

Colloidal gold reaction of blood serum in liver disease. S. J. GRAY (*Arch. intern. Med.*, 1940, 65, 524—544; cf. A., 1940, III, 40).—A more extensive report on the subject. C. A. K.

Dilatation of bile ducts and its relation to distress after cholecystectomy. K. W. BENSON (*Amer. J. digest. Dis. Nutr.*, 1940, 7, 1—2).—The circumference of the extrahepatic bile ducts was not altered by peptic ulcer, gastric carcinoma, or general peritonitis. There was dilatation of the extrahepatic ducts in the presence of disease of the gall-bladder wall, in proportion to the severity of disease. Distress after cholecystectomy is closely related to dilatation of the bile ducts after cholecystectomy, both being due to loss of the absorptive function of the gall

bladder and rise in pressure within the duct system. In one case of severe distress after cholecystectomy the circular fibres of the choledochal sphincter showed marked hypertrophy. C. J. C. B.

Reaction following employment of pitressin in cholecystography. B. R. KIRKLIN and E. E. SEEDORF (*Amer. J. Roentgenol.*, 1939, 42, 811—819).—The use of pitressin in cholecystography enables a clearer shadow to be obtained in certain cases where there are accumulations of intestinal gas. The contra-indications are few. W. F. F.

Multiple cholesterol stones in gall bladder. A. VOGL (*Klin. Woch.*, 1939, 18, 1447).—3 case reports. M. K.

(xv) KIDNEY AND URINE.

Current conceptions of physiology of kidney. J. M. HAYMAN, jun. (*Amer. J. clin. Path.*, 1940, 10, 12—20).—A review. C. J. C. B.

Renal function. M. H. BARKER (*Amer. J. Clin. Path.*, 1940, 10, 21—29).—A lecture. C. J. C. B.

One-hour renal condition test. W. G. EXTON and A. R. ROSE (*Amer. J. clin. Path.*, 1940, 10, 73—96).—Urine collected over 1 hr. under special conditions of fluid intake is examined for vol., sp. gr., albumin and globulin content, and a count of the formed elements present made. The findings in illustrative cases are detailed and interpreted. C. J. C. B.

Effect of gum acacia infusion and blood transfusion on glomerular filtration and tubular reabsorption in normal and in cantharidin-poisoned rabbits. M. KOIWA (*Tohoku J. exp. Med.*, 1939, 37, 139—162).—Glomerular and tubular function were estimated by a modified creatinine test. Isotonic gum acacia solution increased diuresis owing to increased glomerular filtration; a hypertonic solution produced marked diuresis owing to increased glomerular filtration and inhibition of tubular reabsorption. The increase in diuresis was smaller in the poisoned animals. Blood transfusion was followed in normal rabbits by slight diuresis owing to increased filtration, and in poisoned animals by decreased flow owing to decreased filtration. H. L.

Effect of hypnotics, naphthylamine, and picrotoxin on glomerular filtration and tubular reabsorption. M. KOIWA (*Tohoku J. exp. Med.*, 1939, 37, 163—178).—Small doses of chloral hydrate produced in rabbits an increase in both glomerular filtration and tubular reabsorption. Veronal, luminal, and chloral hydrate in higher doses had an inhibitory effect on glomerular filtration. Picrotoxin and β -naphthylamine produced a decrease in glomerular filtration and a relative increase in tubular reabsorption. H. L.

Determination of glomerular filtration by endogenous creatinine clearance. K. STEINITZ and H. RURKAND (*J. clin. Invest.*, 1940, 19, 285—296).—The glomerular filtration can be determined much more easily by the endogenous creatinine clearance than with any other method (cf. Popper, A., 1937, III, 412). C. J. C. B.

Conditions of glucose excretion [by kidney] in man. K. STEINITZ (J. clin. Invest., 1940, 19, 299—305).—The tubular reabsorption of glucose was examined by simultaneous determination of the endogenous creatinine clearance or the inulin clearance, the glucose excretion, and the blood-sugar level in normals and patients with diabetic conditions. The results are tabulated. C. J. C. B.

Rapid micro-method for determining diodrast and inorganic iodide-iodine in blood and urine. H. L. WHITE and D. ROLF (Proc. Soc. Exp. Biol. Med., 1940, 43, 1—7).—The sample is digested with $KMnO_4$ and HCl to oxidise org. matter and I' to IO_3' . Excess of $KMnO_4$ is reduced by $NaNO_2$ and excess of NO_2' destroyed by urea. IO_3' is titrated against $Na_2S_2O_3$ in presence of excess of KI. V. J. W.

Interpretation of diodrast clearances in the dog. H. L. WHITE and P. HEINBECKER (Proc. Soc. Exp. Biol. Med., 1940, 43, 8—10).—Diodrast clearance does not give a measure of renal blood flow since it is easily exchanged between blood cells and plasma and is not completely removed from the blood by the kidney. V. J. W.

Interpretation of diodrast clearances in man. H. L. WHITE, T. FINDLEY, jun., and J. C. EDWARDS (Proc. Soc. Exp. Biol. Med., 1940, 43, 11—14).—Clearance figures differ in some details from those published by Smith *et al.* (A., 1938, III, 916). V. J. W.

Diodrast clearance and renal blood flow in normal pregnant and non-pregnant women. L. C. CHESLEY and E. R. CHESLEY (Amer. J. Physiol., 1939, 127, 731—737).—With the procedure described diodrast clearances were made on normal pregnant and non-pregnant women. The normal renal blood flow averaged 856 ml. per 1.73 sq. m. per min. (range 694—1233 ml.). Pregnancy had no effect on the renal blood flow. Urea extraction ratio averaged 8.7% as calc. from the plasma clearance of urea divided by renal blood flow. M. W. G.

Effect of specific kidney antisera on normal kidney. A. M. BUCHHOLZ (Proc. Soc. Exp. Biol. Med., 1940, 43, 20—22).—Sp. antiserum from the rabbit, free from antibodies for blood-proteins, causes degenerative changes in dog's kidney. V. J. W.

Clinical aspects of renal disease. L. LEITER (Amer. J. clin. Path., 1940, 10, 30—39).—A lecture. C. J. C. B.

Urea reabsorption in renal disease. A. ARKIN and H. POPPER (Arch. intern. Med., 1940, 65, 627—637).—Urea and endogenous creatinine clearances were compared in 87 normal and diseased subjects. Urea reabsorption is markedly diminished when the kidneys are severely damaged, and the urea clearance may then exceed the creatinine clearance; this suggests urea secretion. Uræmia due to reabsorption in renal disease does not occur. C. A. K.

Bright's disease. W. S. McCANN (Arch. intern. Med., 1940, 65, 638—658).—A review of recent literature. C. A. K.

Hypotonic uræmia in amyloid glomerular nephrosis with adrenal damage. K. LIEDHOLM

(Acta med. scand., 1940, 103, 137—143).—Three cases are described. At autopsy, amyloid destruction of the renal glomeruli and the adrenal cortex was confirmed. C. A. A.

Cyst of kidney due to hydrocalycosis. K. H. WATKINS (Brit. J. Urol., 1939, 11, 207—215).—Dilatation of one or more calyces commonly occurs, usually with, but occasionally without, obstruction. This may lead to cyst formation, as in one case described. Cysts which freely communicate with the renal pelvis may be regarded as due to hydrocalycosis. B. I.

Allergic reactions after injections of opaque substances in urography. K. A. HULTBORN (Acta Radiol., Stockh., 1939, 20, 263—271).—7 cases of allergic reactions following intravenous injection of I-containing substances for urography are reported. 3 patients showed urticaria and œdema; 4 patients suffered from severe allergic shock, one of them developing uræmia. 4 patients had previously suffered from allergic reactions (bronchial asthma, urticaria). A. S.

Pyelographic reactions. T. MOORE (Brit. J. Urol., 1939, 11, 233—244).—Severe renal pain, partial or complete suppression of urine, vomiting, or bloody diarrhœa, accompanied by raised blood-urea, sometimes follow ascending pyelography, occasionally even with fatal results. Previous renal deficiency predisposes to these reactions, which appear to be caused reflexly via the splanchnic plexus. The reflex is probably initiated by the irritation of the fluid used. B. I.

Renal excretion (dog) of inulin and creatinine. J. A. SHANNON and F. R. WINTON (J. Physiol., 1940, 98, 97—108).—As in normal dogs, the creatinine and inulin clearances are the same in anæsthetised dogs over a range of urine/plasma (U/P) ratios from 22 to 196. In the isolated kidney they are the same only at low U/P ratios up to 40; the creatinine clearance falls to 85% of the inulin clearance in the higher range of inulin U/P ratios of 65—159. So far as the identity of the creatinine and inulin clearances is concerned, the evidence for using them as a measure of the glomerular filtration rate is as good in the anæsthetised dog as in the normal animal. In the pump-lung-kidney prep. their use for this purpose is certainly invalid at high U/P ratios, and possibly at low U/P ratios. The creatinine clearance is lower than the inulin clearance only when the U/P ratio is high. The influence of arterial pressure on the clearance is not very different in the two preps. A given change in clearance produces 3 or 4 times the change in inulin U/P ratio in the isolated kidney that it does in the denervated kidney *in situ* unless urea or sulphate is acting on the former. J. A. C.

Identification of therapeutic and toxic substances in urine. R. FABRE and A. CISMARU (J. Pharm. Chim., 1940, [ix], 1, 137—140).—The extraction and determination of barbiturates and As in urine are described. J. L. D.

Empirical formula for characterisation of relations between various urine compounds. H. HUNGERLAND (Klin. Woch., 1939, 18, 1348).

M. K.

Preparation of urobilin. C. A. SAGASTUME and V. OLIVA (Rev. Fac. Cienc. Quim. La Plata, 1939, 14, 15—16).—Urobilin isolated from faeces is purified by absorption from very dil. HCl with kaolin, which is then washed with ether, ligroin, and CHCl_3 successively and the product extracted with 0.8% HCl in acetone, the residue from which is extracted with CHCl_3 . F. R. G.

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

Growth and development in the pig, with special reference to carcass quality character. I. C. P. McMEEKAN (J. Agric. Sci., 1940, 30, 276—343).—Inbred male pigs were killed at monthly intervals and their development was studied by dissection. Growth of the whole body is the result of differential growth rates of bone, muscle, and fat in all parts of the body. Changes in composition of muscle and fat with age are recorded. Muscle growth is due to an increase in size of the fibres, not in their no. R. L. E.

Method of preventing adhesions. Y. CHAO, S. HUMPHREYS, and W. PENFIELD (Brit. Med. J., 1940, I, 517—519).—Amniotic membrane is washed and then placed in 70% alcohol. It may be dried and stored and finally boiled or autoclaved for sterilisation. It has been successfully used to prevent meningo-cerebral adhesions after brain injuries and should find other applications. "Amnioplastin" is completely absorbed within 30 days. C. A. K.

Titanium content of animals. V. T. TSCHUIKO and A. O. VOINAR (Ukrain. Biochem. J., 1939, 14, 191—201).— Fe^{II} , Fe^{III} , Mn^{II} , Mn^{VII} , Cr^{III} , Cr^{VI} , Ni^{II} , Co^{II} , Zn , Bi^{III} , Sn^{II} , Sn^{IV} , Ag , Pb^{II} , Pb^{IV} , Cd , As^{III} , As^{V} , W^{VI} , V^{V} and UO_2 do not interfere with the colour reaction given by Lehner and Crawford's thymol reagent with Ti in conc. H_2SO_4 . HNO_2 and H_2O_2 interfere with the test, and should be removed by repeated evaporation of the solution in H_2SO_4 . The Ti content of various tissues (dog) was: blood traces, heart 1.5, skeletal muscle 2.5, medulla oblongata 3, cerebrum 3.7, cerebellum 8, skin 8, kidney 12, liver 2—30, hair 280, lungs 1.6 μg . (rising to 2 mg. in anthracosis) per 100 g. fresh tissue. R. T.

Rate of rejuvenation of the skeleton. G. C. HEVESY, H. B. LEVI, and O. H. REBBE (Biochem. J., 1940, 34, 532—537).—In 50 days 29% of the femur and tibia epiphysis and 7% of the diaphysis are found to be renewed by administration of radioactive P in rabbits. Bone- and marrow-phosphatides are completely renewed, but no appreciable P exchange takes place between the enamel and the dentine of the incisor tooth. P. G. M.

Composition of bone in extreme osteoporosis associated with hepatoma. A. E. HANSEN, L. S. PALMER, and J. W. NELSON (Proc. Soc. Exp. Biol. Med., 1940, 43, 206—207).—A case report. V. J. W.

Painful joint conditions and their relation to osteoarthritis. J. H. KELLGREN (Clin. Sci., 1939, 4, 193—205).—By infiltration with local anaesthetic 3 types of joint pains of obscure aetiology were

differentiated, i.e., ligamentous and muscular strains, synovitis, and disordered joint mechanisms. B. I.

Enzyme systems in articular cartilage. C. LUTWAK-MANN (Biochem. J., 1940, 34, 517—527).—Adenosinetriphosphoric, adenylic, and inosic acids etc. are dephosphorylated and/or deaminated by cartilage with formation of hypoxanthine. No mechanism exists capable of oxidising succinate, lactate, or aldehydes. The formation of lactic acid from hexose diphosphate requires the presence of cozymase the activity of which, however, is destroyed by prolonged action of cartilage. Lactic acid is also formed via methylglyoxal under the influence of glyoxalase, without addition of SH-glutathione. Co-carboxylase is not stable to cartilage extracts. P. G. M.

Natural occurrence of zinc in teeth. III. Variations in tuberculosis. D. B. CRUICKSHANK (Brit. Dental J., 1940, 68, 257—271; cf. A., 1937, III, 455).—Analyses by a modification of the Sylvester-Hughes method (B., 1937, 82) show that the Zn contents of human dentine and enamel are 7.3 and 17.1% respectively higher in tuberculosis than in health. The increase is greatest in molars and least in incisors. Possibly there is some relation between degree of increase in Zn content and period of calcification. The Zn contents of healthy dried dentine and enamel are 178 ± 21 and 152 ± 27 mg. per kg., respectively. W. McC.

Photophysiology of the skin. G. MIESCHER (Strahlenther., 1939, 66, 615—626).—A review. E. M. J.

Bioclimatology of the skin. H. PFLEIDERER (Strahlenther., 1939, 66, 627—634).—A review. E. M. J.

Thiol content of skin and its catalytic action under the influence of light. P. WELS (Strahlenther., 1939, 66, 677—683).—A review. E. M. J.

Goat's milk. A. K. BESLEY (Amer. J. Publ. Health, 1940, 30, 182—185).—The composition of the milk of Saanen does not differ from that of Toggenburg goats. Compared with Holstein cow's milk, goat's milk has similar contents of vitamin-A and -D, total solids, protein, fat, Fe, Cu, and total minerals, higher contents of -B₁, Ca, P, albumin, non-protein-N and saturated fatty acids, and a lower content of unsaturated fatty acids. The -C content is low. The surface tension is the same as that of cow's milk, but the max. buffering power is much higher and the curd tension and fat globule vol. are much lower. Feeding experiments with kids, rats, and babies show that the nutritive val. of goat's milk differs little from that of cow's milk. The nutritional anaemia produced in kids and rats by a diet of goat's or cow's milk only is cured or prevented by addition of Fe and Cu. The bacterial content of goat's milk is often very low. W. McC.

Composition and properties of goat's as compared with cow's milk. J. A. GAMBLE, N. R. ELLIS, and A. K. BESLEY (U.S. Dept. Agric. Tech. Bull., 1939, No. 671, 72 pp.).—A detailed account of work already noted (see preceding abstract). A. G. P.

Influence of electrolyte on the fauna of fresh water. E. MERKER (Naturwiss., 1940, 28, 30).—The action of natural fresh waters containing small quantities of salts in protecting *Gammarus pulex* from the deleterious effects of ultra-violet light and of heat is not accounted for by the p_H or by the Ca content, although Ca salts exert a small protective action. W. O. K.

Relation between asymmetry of the organism and optical activity of its components. I. Amino-acids of conchiolin of shells with right and left direction of whorls. A. KIZEL, E. EFTMOTSCHKINA, and J. RALL (Compt. rend. Acad. Sci. U.R.S.S., 1939, 25, 481—483).—The optical activity of certain essential amino-acid constituents of conchiolin gives no indication of its relation to the asymmetry of the shell. P. G. M.

Denaturation of sericin. I. Denaturation by boiling water. Z. HIROSE (J. Agric. Chem. Soc. Japan, 1940, 16, 209—212).—Sericin in the outside layer of the cocoon is more sol. in water than that of the middle and inside layers, and when treated with basic Cr sulphate adsorbs more Cr_2O_3 than that of the inside layer. After denaturation of the sericin with boiling water the various layers of the cocoon adsorb more basic oxalatochromiate, and less basic Cr sulphate, than before denaturation. J. N. A.

(xvii) TUMOURS.

Mode of action of methylcholanthrene on normal tissue cultures. W. R. EARLE and C. VORGLIN (U.S. Publ. Health Repts., 1940, 55, 303—322; cf. A., 1939, III, 491).—3 series of tissue cultures of fibroblasts from abdominal musculature from C_3H mice were treated with a suspension of 0.001% methylcholanthrene. After 115 to 146 days the methylcholanthrene was omitted and the cultures carried on for 100 to 265 days in fresh medium with frequent changes. In appearance the treated cultures resembled cultures of carcinoma tissue and were different from the controls; the differences persisted after the omission of the carcinogen, when only extremely minute amounts of the latter could have been present. The initial effect was a retardation of growth. The treated cells formed compact cultures, while the controls were diffuse, even if grown in the same culture flask. Necrosis was present, and a large no. of mitotic figures. The control cultures had long slender terminal processes which were absent in the treated cells; the latter tended to adhere to each other laterally or in long ribbon-like growths. There was no evidence that a few cells overgrew the cultures, but rather that all the cells were modified. It is suggested that the main changes are connected with change in the cell membrane. E. B.

Tumours produced in hamsters by benzpyrene. L. HALBERSTAEDTER (Amer. J. Cancer, 1940, 38, 351—358; cf. A., 1940, III, 44).—Hamsters were injected with benzpyrene in lard every 3 or 4 weeks. 29 of 31 surviving more than 3 months developed sarcomas. One hamster tumour strain gave metastases in the lymph nodes in 72% of animals inoculated. X-Irradiation or splenectomy

before inoculation of the graft caused no increase in metastasis. F. L. W.

Induction of lymphomatosis in mice following painting with 9:10-dimethyl-1:2-benzanthracene. L. W. LAW and M. LEWISOHN (Proc. Soc. Exp. Biol. Med., 1940, 43, 143—146).—Mice of the dilute brown strain were painted twice a week with a 0.3% solution in benzene and developed lymphomata after about 70 days. V. J. W.

Induction of tumours by injected methylcholanthrene in mice of strain especially sensitive to carcinogenic agents applied to skin. G. M. BONSER (Amer. J. Cancer, 1940, 38, 319—327).—Mice of the inbred strains *IF* with high susceptibility to skin cancer, strong *A*, *CBA*, White Label, and also outbred market mice were injected subcutaneously with 2 mg. of methylcholanthrene in lard. Sarcomas developed latest in the *IF* strain. The greatest difference was between *IF* mice and strong *A*. The difference in response between the sexes was not significant. Spindle-cell sarcomas, squamous carcinomas, and mammary adenocarcinomas were obtained. F. L. W.

Effect of liver feeding on production of malignant tumours by injections of carcinogenic substances. K. MORI and W. NAKAHARA (Gann, 1940, 34, 48—57).—The addition of 10% of dried liver to a rice diet protected the livers of rats injected with dimethylaminoazobenzene from developing cirrhosis. Similar addition of liver to the diet of rats injected with methylcholanthrene or benzpyrene did not influence the incidence of tumours. E. B.

[Carcinogenic] hydrocarbons.—See A., 1940, II, 212.

Oxidation-reduction potentials of quinones derived from carcinogenic hydrocarbons. J. IBALL (Amer. J. Cancer, 1940, 38, 372—376).—The oxidation-reduction potentials of 18 quinones were measured. All the compounds were substitution derivatives of 1:2-benzanthracene. The position of the substituent had a marked effect on the oxidation-reduction potential but there was no correlation between potential and carcinogenic potency. F. L. W.

Experimental production of sarcomas in mice by injection of glucose, fructose, and galactose. Histogenesis of fibroplastic sarcomas. N. TAKIZAWA (Gann., 1940, 34, 1—5).—Repeated injection of 25% glucose solution for 250 days induced sarcomas in 5 out of 18 mice; fructose induced 2 tumours in 16 mice, and galactose 4 tumours in 13 mice. Injection of saline gave no tumours. (15 photomicrographs.) E. B.

Tumour production and internal secretions. II. Hepatoma production and prolan. S. ITO (Gann, 1940, 34, 31—32).—Castration of female rats increased the incidence of hepatoma formation by feeding *o*-aminoazotoluene from 28% to 85%. Injection of prolan decreased the incidence of tumours of both normal and castrated rats to 14%. E. B.

Experimental teratoma testis in fowl. L. I. FALIN (Amer. J. Cancer, 1940, 38, 199—211).—The

morphology of experimental testicular tumours is described. The mechanism of the production of teratoma testis by salts of Zn is discussed. The suggestion is made that the Zn salts, which produce a disintegration of albuminous substances, may be considered as activators of inducing substances which are found in the pluripotential cells of the testis and are liberated in the process of disintegration. Under the influence of these inducing substances the gonocytes may display a previously latent potency for growth and differentiation. F. L. W.

Physico-chemical aetiology of carcinoma [and action of sunlight]. A. H. ROFFO (Strahlenther., 1939, 66, 328—350).—Carcinomata and sarcomata of bald parts (either natural or artificial) and of the eye were produced in white rats by exposure to sunlight (90%) or ultra-violet light with λ below 4000 Å. (100%) for 7—12 months. No tumours were seen with sunlight in which the λ below 4100 Å. had been filtered off. Increased tissue-cholesterol is found in skin after prolonged exposure; the cholesterol then becomes photoactive, ionisation of the surrounding tissue occurs, and a fluorescing substance is formed. E. M. J.

Ultra-violet ray carcinoma and sarcoma. F. HOLTZ (Strahlenther., 1939, 66, 712—715). E. M. J.

Cancer-producing chemical compounds. J. W. COOK (Nature, 1940, 145, 335—338).—A review. W. F. F.

Results of a "functional test" in a strain of mice (C57 Black) with low breast tumour incidence. C. C. LITTLE and J. PEARSONS (Amer. J. Cancer, 1940, 38, 224—233).—Forced breeding of females of the C57 black strain of mice gave no mammary tumours among a random sample of 98 females. At and after 215—244 days of age the females usually show: a decrease in the number of young per litter; an increase in the time interval between successive litters; increase in % of young stillborn; increase in stillbirth of whole litters as compared with scattered individuals. F. L. W.

Initiation and growth of tumours. I. Effects of underfeeding. A. TANNENBAUM (Amer. J. Cancer, 1940, 38, 335—350).—The effects of underfeeding on the initiation and growth of induced skin and subcutaneous tumours and of spontaneous breast and lung tumours in mice are described. In underfed animals fewer tumours form and at a later time. The rate of growth of tumours developing in underfed animals is the same as in full-fed animals. The rate of growth of tumours in full-fed animals diminishes on subsequent underfeeding. F. L. W.

Three functional tests in high-tumour and low-tumour strain of mice. E. FEKETE (Amer. J. Cancer, 1940, 38, 234—238).—The production of breast tumours in C57 and dilute brown mice were compared under 3 different conditions. In group I the conditions were frequent pregnancy followed by lactation for one day; in group II frequent pregnancy followed by lactation until weaning; in group III infrequent pregnancy followed by increased length of lactation. In the C57 black females only one tumour appeared in a mouse in group I. In the dilute brown

mice the respective % of mammary tumours were 87, 72, and 56. The difference between groups I and II is not significant but that between groups I and III is. F. L. W.

Local influence of zinc on development of thymomas in Marsh-Buffalo mice. F. BISCHOFF and M. L. LONG (Amer. J. Cancer, 1940, 38, 404—405).—The incidence of tumours of the thymus in female virgin mice of the Marsh-Buffalo strain is not influenced by the injection of ZnCl₂ into the thymus gland. F. L. W.

Differences in hæmoglobin values in blood of breeder female mice; comparison between cancer-susceptible and cancer-resistant strains. L. C. STRONG and L. D. FRANCIS (Amer. J. Cancer, 1940, 38, 399—403).—Hæmoglobin determinations on the blood of breeder mice of the A strain (high cancer) and the CBA strain (low cancer) were made at 40-day intervals from 120 to 640 days of age. A more continuous and precipitous fall occurred in the level of hæmoglobin in the A strain than in the CBA strain. At all but one of the ages the difference between the strains was significant. F. L. W.

Effect of sex hormones on growth of transplanted mammary adenofibroma in rats. F. E. MOHS (Amer. J. Cancer, 1940, 38, 212—216).—Oestrogenic hormone is the important factor in the successful transplantation of mammary adenofibroma in rats. The tumours grow better in females than in males. Castration reduces the takes in females. Oestrogenic hormone injections increase the takes in castrates of both sexes. Castration has no effect on the takes in males. Testosterone injections in castrates of both sexes do not inhibit the fibroma. The stimulatory effect of oestrogen is probably exerted through the mammogenic hormone of the anterior pituitary. F. L. W.

Familial mammary tumours in rabbit. IV. Evolution of autonomy in course of tumour development as indicated by transplantation experiments. H. S. N. GREENE (J. Exp. Med., 1940, 71, 305—324).—In experimental intra-optic transplantation of papillary and acinar mammary tumours in rabbits, the morphological relationships between the cells of the tumour and host determine whether growth will occur. If only local invasion has occurred, transplants fail, but they grow if the cells are able to invade foreign tissue or metastasise, which is regarded as a sign of the attainment of autonomy. The papillary tumours show twice as many "takes" in males as in females, possibly due to endocrine factors. The acinar tumours are not affected by sex, grow rapidly, and show early regression. A. C. F.

Malignant hepatoma in white-tailed deer (Odocoileus osceola). J. H. WINER and C. R. SCHROEDER (Amer. J. Cancer, 1940, 38, 268—270).—A case of malignant hepatoma with adrenal metastasis. F. L. W.

Carcinoma of oesophagus in antelope. L. MOSCHKOWITZ and H. SPRINZ (Amer. J. Cancer, 1940, 38, 271—274).—A case of a stenosing and ulcerated,

cornifying, squamous-cell carcinoma of the oesophagus in a Nyala antelope. F. L. W.

Metastasis to lymph nodes from mouse sarcoma 37. W. H. WOGLOM (Amer. J. Cancer, 1940, 38, 328—334).—The lymph nodes from a strain of American mice bearing sarcoma 37 produce tumours on inoculation into other mice. F. L. W.

Early stages of growth in white rats of Ehrlich-Putnoky rat carcinoma. J. PUTNOKY (Amer. J. Cancer, 1940, 38, 191—198).—Ehrlich mouse carcinoma and Ehrlich-Putnoky rat carcinoma were implanted by the same technique into Hungarian white rats. The animals were killed at intervals and the implants examined histologically. A high degree of resistance to the Ehrlich mouse carcinoma was shown, but in some cases the implants reached a certain size. With the Ehrlich-Putnoky rat carcinoma there was little resistance and the tumour grew continuously and infiltratively. It is concluded that the Ehrlich-Putnoky rat tumour is a sub-strain of the Ehrlich mouse tumour which, while living in rats continuously, has adapted itself highly to the rat organism. F. L. W.

Vascularisation of Brown-Pearce rabbit epithelioma transplant as seen in transparent ear chamber. A. G. IDE, N. H. BAKER, and S. L. WARREN (Amer. J. Roentgenol., 1939, 42, 891—899).—Blood vessel growth was first observed in 3—8 days following transplantation of the tumour fragment. Tumour growth was visible, grossly, within 24 hr. following blood vessel growth. If no blood vessel growth occurred, subsequent biopsy showed failure of the transplant. The mechanism of vessel growth was normal but the rate greatly increased. W. F. F.

Occurrence of virus III in rabbits in lesions of infectious fibroma and of transplantable sarcoma. C. H. ANDREWES (J. Path. Bact., 1940, 50, 227—234).—In the course of propagation of infectious fibroma and sarcoma RSI through rabbits intranuclear inclusions were discovered in the lesions, caused by virus III. Virus III in the fibroma lesions causes their premature regression but does not affect the growth of the sarcoma. The sarcoma could be freed from virus III by passage through one virus III-immune rabbit. (2 photomicrographs.) C. J. C. B.

Distinctive substance associated with Brown-Pearce rabbit carcinoma. I. Presence and specificity of substance as determined by serum reactions. II. Properties of the substance. J. G. KIDD (J. Exp. Med., 1940, 71, 335—350, 351—371).—I. A sp. complement-fixing substance, which reacts with the sera of tumour-bearing rabbits, is regularly present in saline extracts of the Brown-Pearce rabbit carcinoma. Extracts of normal tissues, other growths, or tissues from rabbits with various virus infections do not contain the substance. Complement fixation does not occur when sera of rabbits which are normal or immune to various diseases are mixed with the sp. Brown-Pearce tumour antigen.

II. The Brown-Pearce tumour antigen differs from most other tissue antigens in that it is not effective after alcoholic extraction of the tissue containing it.

P P (A., III.)

It is inactivated by heat, acid, or alkali. It passes readily through a membrane with a pore diameter of 383 m μ . but is completely retained by those of pore diameter 348 m μ . or less. It is completely thrown down by centrifugation at 20,000 r.p.m. for 1 hr. When injected into normal or tarred rabbits, it gives rise to no lesions. A. C. F.

Interaction of cells and tumour growth. R. J. LUDFORD (Brit. Med. J., 1940, I, 201—205).—Tissue culture studies showed that leucocytes produce substances which stimulate growth of fibroblasts and sarcoma cells, and increase their capacity to digest clotted plasma. Monocytes and macrophages may thus facilitate malignant invasion of normal tissues. C. A. K.

Studies on neoplasms with aid of radioactive phosphorus. I. Total phosphorus metabolism of normal and leukæmic mice. J. M. LAWRENCE, L. W. TUTTLE, K. G. SCOTT, and C. L. CONNOR (J. clin. Invest., 1940, 19, 267—271).—The average uptake of radio-P per g. of whole body and bone was only slightly greater in the leukæmic animals, and the uptake in muscle was slightly less. On the other hand, the uptake and exchange in leukæmic spleen and lymph gland are strikingly greater than normal. C. J. C. B.

Glutamic acid of proteins [relation to malignancy]. (A) A. C. CHIBNALL, M. W. REES, E. F. WILLIAMS, and E. BOYLAND. (B) A. KONIKOVA. (C) B. W. TOWN (Nature, 1940, 145, 311—312, 312, 312—313).—(A) Racemisation of amino-acids is not a characteristic of malignancy.

(B) The presence of *d*-glutamic acid is not a regular phenomenon attending malignancy.

(C) The racemic acid is a definite hydrolysis product of normal protein. W. F. F.

Glutamic acid of normal and malignant tissue-proteins. A. C. CHIBNALL, M. W. REES, E. F. WILLIAMS, and E. BOYLAND (Biochem. J., 1940, 34, 285—300).—Quant. isolation of glutamic acid by a modification of Foreman's method from 7 different malignant tissue-protein preps. showed that in all cases the yield was about 10% and that the degree of racemisation was small, the yield of the *d*(-)-antipode being only about 0.2%. Similar results were obtained from two normal tissue-protein preps. Gliadin gave 2.2% of the *d*(-)-antipode. The Cu₂O (Abderhalden and Fuchs) method used by Kögl and Erxleben to isolate glutamic acid as its hydrochloride from tissue hydrolysate has been shown to give the racemised product preferentially, even when a large excess of the *l*(+)-antipode is present. Small amounts of partly racemised aspartic acid, as well as of glutamic acid, were isolated from both normal and malignant tissue protein material and it is concluded that racemisation of amino-acids is not a characteristic of the proteins of malignancy. E. B.

Metabolism of normal and neoplastic skin epithelium. I. BERENBLUM, E. CHAIN, and N. G. HEATLEY (Amer. J. Cancer, 1940, 38, 367—371).—O₂ uptake, aerobic and anaerobic glycolysis, and R.Q. of normal skin epithelium and Shope papilloma were measured with the microrespirometer (cf. A., 1939, III, 295). The vals. for normal epithelium and for

Shope papilloma are almost identical and similar to those for squamous carcinomas. Aërobic glycolysis and a low R.Q. are both normal processes and are not characteristic of tumour growth or any other lesion. F. L. W.

Metabolism of tumours. (A) F. DICKENS. (B) E. BOYLAND (*Nature*, 1940, 145, 512—513).—(A) A reply to Boyland (*A.*, 1940, III, 425). (B) A reply to the above. W. F. F.

Effects of tissue extracts on respiration and glycolysis of some normal and tumour tissues. M. P. SCHROEDER and E. S. COOK (*Stud. Inst. Divi Thomae*, 1939, 2, 247—258).—Extracts, crude or purified, from yeast or from animal tissues cause (a) increased O₂ uptake of normal rat liver, (b) over 50% inhibition of anaërobic glycolysis, and (c) complete suppression of aërobic glycolysis. Comparable effects were obtained on tumour tissues. D. BU.

Inactivation of melanophore hormone by cancer serum. J. H. LAST and E. M. K. GEILING (*Amer. J. Cancer*, 1940, 38, 380—382).—There is no appreciable inactivation of melanophore hormone following its addition to cancer serum. F. L. W.

Tumour inhibition by anti-tumour nuclei serum. C. A. STONEBURG and F. L. HAVEN (*Amer. J. Cancer*, 1940, 38, 377—379).—Tumours in rats injected with serum from rabbits immunised against the nuclei of the same tumour are inhibited. F. L. W.

Induced immunity to malignant tumours. B. FISCHER-WASELS (*Acta Univ. int. contra cancerum*, 1939, 4, 693—699).—Subcutaneous or intracutaneous injection of a virulent prep. of tumour in saline-kaolin produced immunity in rabbits to the Brown-Pearce tumour. E. B.

Active and passive immunisation against virus of malignant panleucopenia of cats. J. F. ENDERS and W. D. HAMMON (*Proc. Soc. Exp. Biol. Med.*, 1940, 43, 194—200).—Formalinised suspensions of spleen and liver tissue from infected cats induce resistance to the virus in susceptible cats. Serum of convalescent cats, or of these immunised and inoculated cats, also confers resistance to infection. V. J. W.

Precipitin antisera for malignant tissue. L. S. MANN and W. H. WELKER (*Proc. Soc. Exp. Biol. Med.*, 1940, 43, 18—19).—Carcinoma extracts prepared by the adsorption method of Spinka and Weichselbaum (*A.*, 1938, III, 768) were injected into rabbits, giving an antiserum which reacted with serum from carcinomatous patients and not with normal serum. V. J. W.

Transfusions and polycythæmia in normal and tumour-bearing rats. F. M. ALLEN (*J. Lab. clin. Med.*, 1940, 25, 471—475).—Polycythæmia *per se* does not display any antagonism to tumour growth. The special congestion and subsequent necrosis of tumours in connexion with large transfusions seem to be due to general circulatory failure. C. J. C. B.

Problems of tissue specificity and chemotherapy of cancer. L. C. STRONG (*Amer. J. Cancer*, 1940, 38, 243—252).—The spontaneous

tumours of 6 distinct genetic strains of mice grow at approx. the same rate. The same effect on the rate of growth of the spontaneous tumours in all six strains was produced by addition of heptaldehyde and methylsalicylate to the diet. Retardation, regression, and liquefaction of the tumours occurred. F. L. W.

Influence of heptaldehyde on Marsh-Buffalo adenocarcinoma. M. L. LONG and F. BISCHOFF (*Amer. J. Cancer*, 1940, 38, 406—407).—The growth of spontaneous tumours was not retarded nor was there any liquefaction of the tumours when Marsh-Buffalo mice were fed a calf meal diet containing 1% of heptaldehyde. Caloric intake was normal and somatic growth was unaffected. F. L. W.

The aldehydes in the chemotherapy of tumours. K. WALLERSTEINER (*London Hosp. Gaz.*, 1940, 43, Clin. Suppl. No. 4, i—x).—Glucose penta-acetate (0.02 M.), furfuraldehyde (0.01 M.), α - and β -naphthaldehydes, 1-naphthaldehyde-4- and -5-sulphonic acids, 1-naphthol-2-aldehyde, 2-naphthol-1-aldehyde-6-sulphonic acid, 1-naphthol-4-aldehyde-3-sulphonic acid (all 0.001 M.), and two azo-dyes containing naphtholaldehyde groups inhibited the growth of chick fibroblasts in tissue culture. The results are discussed in relation to the inhibition of tumours in mice with heptaldehyde and citral. E. B.

Effects of colchicine and radiation on growth of normal tissues and tumours. A. M. BRUES, B. B. MARBLE, and E. B. JACKSON (*Amer. J. Cancer*, 1940, 38, 159—168).—Treatment of tumour-bearing rats and mice with max. sublethal daily doses of colchicine shows no retardation of tumour growth or of prevention of recurrence or metastases after tumour excision. Large doses (lethal in a few days) retard tumour growth. The smaller doses used were sufficient to produce arrest of many mitoses at metaphase. Regression of tumours following large doses are correlated with metabolic changes in tissue and vascular damage. Animals receiving less than these amounts fail to show the fall in tissue-ascorbic acid which occurs with the larger doses. The administration of colchicine does not enhance or accelerate the effects of radiation in causing tumour regression. F. L. W.

Tissue metabolism. XII. Action of colchicine on transplanted, induced, and spontaneous mouse tumours. E. BOYLAND and M. E. BOYLAND (*Biochem. J.*, 1940, 34, 280—284).—Injection of sublethal doses of colchicine into mice bearing grafted or induced sarcomata causes hæmorrhage, reduction of ascorbic acid content, and inhibition of respiration and glycolysis of the tumour tissue. Spontaneous mammary carcinomata are much less sensitive to the action of colchicine. The changes are not influenced by administration of ascorbic acid or vitamin-K. E. B.

Cytological study of effect of colchicine on plant tumours. H. DERMEN and N. A. BROWN (*Amer. J. Cancer*, 1940, 38, 169—190).—Tumours artificially produced in *Tagetes patula* and *T. erecta* by inoculation with *Bacterium tumefaciens* were killed by an effective dose of colchicine. The effect was associated with excessive polyploidy (multi-

polyploidy) in the affected meristematic cells of the tumour tissue, which are prevented from dividing and increasing numerically. Growth in treated and control tumours was parallel for more than 7 days. Then there was no growth in the treated tumours for 3 days; they then darkened and shrivelled and became dead and dried. The multipolyploidy resulted in large nuclei and enlarged cells. The size increase in nuclei and cells had definite limits beyond which death of the cell resulted. F. L. W.

Attempt to modify growth, development, and tumour incidence in mice with thymus gland extracts. G. VAN S. SMITH and E. E. JONES (Proc. Soc. Exp. Biol. Med., 1940, 43, 157—160).—Calf thymus extracts injected into mice had no effect during the 1st generation and caused great decrease in fertility in the 2nd generation. The 3rd generation consisted of a few sterile females which failed to reach tumour age. *p*-Thiocresol had no effect on growth or tumour incidence. V. J. W.

Destruction of bacteria in experimental tumours by chemotherapeutics. M. VANYO and M. ENGEL (Arch. int. Pharmacodyn., 1940, 64, 153—155).—In the inoculation of mice for tumour growth and subsequent tissue culture sepsis is prevented by injection of anilinesulphondimethylamide. D. T. B.

Local asphyxia and X-ray irradiation of transplantable rat tumours. F. M. ALLEN (Amer. J. Roentgenol., 1939, 42, 745—755).—X-Ray tolerance of normal tissues of the leg of the rat is higher than of human tissues and is reduced by local asphyxia produced by ligation. Combination of local asphyxia and irradiation is more effective than either treatment alone. W. F. F.

Irradiation of a tumour-producing filterable virus with X-rays. P. GÜNTHER, E. HAAGEN, and F. GEBERT (Naturwiss., 1939, 27, 858—859).—Irradiation with 45 kr. but not less destroyed the Sanarelli rabbit myxoma virus in the presence of rabbit testes tissue. Tissue cultures of the myxoma were killed with a dose of 55 kr. E. B.

Human beings with cancer, maintained at reduced temperatures of 75—90° F. L. W. SMITH and T. FAY (Amer. J. clin. Path., 1940, 10, 1—11).—33 patients were studied. They can be maintained for 5—8 days at body temp. around 80° F.; relief of pain regularly follows for a few days to 5 months. Basal metabolism is reduced by 20—25%. C. J. C. B.

Case report of cancer of right leg resulting from burns of skin. I. FUKUKI and T. SHINKAWA (Gann, 1940, 34, 33—37).—The cancer was successfully removed by cautery. (6 figs.) E. B.

Important cytologic-histologic findings in carcinoma of uterus. S. KAWANAGO (Gann, 1940, 34, 39—46).—Consideration of 15 cases. (13 figs.)

Urinary cholesterol in cancer. II. H. SOBOTKA, E. BLOCH, and A. B. ROSENBLUM (Amer. J. Cancer, 1940, 38, 253—256; cf. A., 1939, III, 490).—Cholesterol determinations on 163 specimens of urine from 92 cancer patients showed high vals. in 19 cases. 112 specimens from 91 non-cancer patients

were analysed as controls. Cholesteroluria is not a characteristic symptom of malignancy, but it occurs in most cases of severe renal disease. The high urinary cholesterol found in the presence of a tumour is due to (a) the occurrence of cachexia in which mobilisation of peripheral fat is temporarily accompanied by hypercholesterolemia, and (b) the breakdown of tumour-affected tissues and organs and of the tumour itself, releasing cholesterol from cells. F. L. W.

Carcinoma of uterus and ovarian activity. F. GAL (Strahlenther., 1939, 66, 570—582).—The no. of recurrences was less in cases in which the ovaries had either been excised or been adequately irradiated (with the production of fibrosis and atrophy) in addition to the treatment of the primary uterine neoplasm. Recurrences were also less numerous in the cases aged over 45 years. E. M. J.

Incidence of cancer in Cook County, Illinois, 1937. H. F. DORN (U.S. Publ. Health Repts., 1940, 55, 628—650).—Among men the stomach was the most common site, while among women 56% of all cases were of breast or uterus. The incidence of skin cancer among males was 3 times as high in Atlanta, Ga., as in Cook County while cancer of the digestive tract was 3 times as common in Cook County. E. B.

Urinary diagnosis of cancer by using albino salamander. H. NAKAMURA, J. TANAKA, and Y. YOHDA (Gann, 1940, 34, 6—11).—Injection of 0.2—0.3 c.c. of urine of patients into albino salamander larvæ caused the melanophores to expand and blacken the skin. The reaction was positive for cancer patients and for cases of gangrene of the liver, abscess of the liver, and pregnancy. E. B.

Interferometric serum test for cancer. M. W. METTENLEITER (Nature, 1940, 145, 305).—In 325 cases of cancer interferometer readings on the serum gave positive diagnostic results in 96% of cases. W. F. F.

(xviii) NUTRITION AND VITAMINS.

Mystery of alimentation. E. P. CATHCART (Lancet, 1940, 238, 533—537, 586—590).—A review. C. A. K.

Diet of some Australian schoolboys. H. S. H. WARDLAW and C. J. WHITE [with R. FISHER and N. L. WAKE] (Austral. J. Exp. Biol., 1940, 18, 9—20). The daily intake of energy of a group of normal Sydney schoolboys ranged from 1691 cal. at age 11 to 2707 at age 18. The corresponding range of protein intake was from 55.8 to 105.4 g. The mean composition of the food was protein 16.7, fat 17.5, carbohydrate 62.7, ash 3.1%. D. M. N.

Relation of gain in weight to gain in energy content of growing chicks. G. S. FRAPS and E. C. CARLYLE (J. Agric. Res., 1939, 59, 777—781).—The energy content per g. of live-wt. in chicks varied with the composition of the ration. The relative amount of food required per g. gain in live-wt. differed from the relative amount required per cal. of gain. Food required per unit gain in body-wt. is not a satisfactory standard of comparison of nutrient vals. of rations. A. G. P.

Nourishment assimilated by fully developed Lepidoptera. P. PORTIER and R. DE RORTHAYS (Compt. rend., 1940, 210, 324—325).—Various Rhopalocera, after starvation for some days, consumed syrup, honey, or fruit juice at one meal equal in amount to 16—50% of their body-wt. J. L. D.

p_H values of ingesta of bovine rumen. C. F. MONROE and A. E. PERKINS (J. Dairy Sci., 1939, 22, 983—991).—Average vals. when the animal received various rations were: maize silage-lucerne hay 6.96, lucerne hay 6.8, maize silage 6.68, pasture 6.69. The ingesta were most alkaline immediately before feeding. J. G. D.

Soya-bean flour with dried milk, as substitute for breast milk. H. M. M. MACKAY (Arch. Dis. Childh., 1940, 15, 1—25).—48 infants received until 6 months old a mixture (yolac) of equal parts of full-cream roller-process dried milk and a soya-bean flour, prepared by a modified Berczeller process, together with a supplement of cod-liver oil; 102 controls received dried milk with added Fe (hemolac) and a supplement of cod-liver oil or vitamin-D emulsion. Both received orange juice. After 6 months old the babies were given a mixed diet, the first group continuing to have yolac (1—1½ lb. weekly), the second the same amount of hemolac, providing them with about 1 pint of milk daily. The average weekly gain in wt. of the controls was 4.3 oz. and of the yolac cases 3.98 oz. The total morbidity rate of the yolac group was about the same as that of the controls, and therefore better than would be expected with babies fed on milk without added Fe. On the other hand the tendency to loose stools was greater in the yolac group. Calcification of the bones was as good in the yolac group as in the control group. C. J. C. B.

Adequacy of a milk diet for rats. L. R. RICHARDSON and A. G. HOGAN (J. Nutrition, 1940, 19, 13—19).—Four generations of female rats receiving milk supplemented with Fe, Cu, and I produced and weaned as many young per litter but only about half as many litters as did normal controls on Steenbock's stock diet. A. G. P.

Influence of nitrogen content of diet on calorie balances of pre-school children. J. E. HAWKS, J. M. VOORHEES, M. M. BRAY, and M. DYE (J. Nutrition, 1940, 19, 77—89).—Increase in dietary protein from 3 to 4 g. per kg. body-wt. did not change the const. level of calorie utilisation but increased the N content of excreta and the proportion of the dietary cal. which were eliminated. The abs. and % of dietary calories available for body requirements were lowered but the gain in wt. increased. A. G. P.

Protein requirement in adolescence and in middle age. I. HARRIS, J. T. IRELAND, and G. V. JAMES (Lancet, 1940, 238, 220—221).—N balances were studied in 2 young men and 1 case of hypertension. It is suggested that restriction of protein intake in adolescence would be harmful, in middle age probably beneficial. C. A. K.

Protein content of organs and tissues at different levels of protein consumption. T. ADDIS, D. D. LEE, W. LEW, and L. J. POO (J. Nu-

trition, 1940, 19, 199—205).—In rats receiving iso-caloric diets of varying protein content the level of dietary protein producing max. protein content of organs varies considerably for different organs. Each level of protein intake is associated with a characteristic distribution of protein among the organs. A. G. P.

Extraction of proteins from vegetable food-stuffs with alkali. C. Y. CHANG (Chinese J. Physiol., 1940, 15, 45—52).—20—50% of the N of potatoes, cabbage, carrots, and spinach is dialysable. Proteins are extracted with 0.05N-NaOH and starch is removed by digestion with diastase and dialysis. Some of the protein-N becomes dialysable. N. H.

Isolation of total proteins from vegetable foods. C. Y. CHANG and H. WU (Chinese J. Physiol., 1940, 15, 53—66).—The starch in 0.5 g. of the food is converted into sol. carbohydrate by addition of 10 c.c. of 10N-CaCl₂ acidified with HCl and 5 min. heating. It may then be dialysed through Cellophane for 12 hr., losing some protein-N, or the protein may be pptd. with 8 c.c. of 0.5N-CuCl₂, neutralised with 0.5N-NaOH, and washed with 0.1N-HCl in alcohol. Analyses of 23 vegetables are given. N. H.

Chronic selenium poisoning of rats as influenced by dietary protein. R. A. GORTNER, jun. (J. Nutrition, 1940, 19, 105—112).—Casein and, to a smaller extent, lactalbumin, counteract the toxicity of Na₂SeO₃ to rats. Gelatin and edectan were without effect. A ration containing 30 p.p.m. of Se and 30% of casein produced fairly good growth. A. G. P.

Rôle of urea in ruminant metabolism. F. SAUER (Bied. Zentr., 1938, B, 10, 187—213).—Ingestion of urea, even in relatively large amounts, had no ill-effects on sheep. All urea fed was resorbed; part was retained in the tissues and blood-urea and -alkali reserve were increased. A. G. P.

Choline in the diet of chickens. O. D. ABBOTT and C. U. DE MASTERS (J. Nutrition, 1940, 19, 47—55).—Addition of choline to the basal diet of chickens increased egg production, decreased mortality, inhibited abortion of egg yolks, and decreased the % of fatty acids in livers. The fatty acid concn. in livers of males was much less than that of pullets on the same diet irrespective of the amount of choline given. A. G. P.

Essential nature of choline for lactation and growth of albino rats. B. SURE [with A. BEACH] (J. Nutrition, 1940, 19, 71—76).—Choline is shown to be an essential constituent of the vitamin-B complex for growth and lactation of rats. A. G. P.

Digestion and resorption of carbohydrates in the large intestine of ruminants. A. TRAUTMANN and T. ASHER (Z. Tierernähr. Futtermittelk., 1939, 3, 45—52).—When introduced into the caecum of goats by canula cellulose and starch pass through the large intestine without appreciable change; glucose, even in small quantities, is not completely resorbed and sucrose, maltose, and lactose are detectable in faeces 1 hr. after administration. When fed similarly into the abomasum cellulose undergoes little or no digestion. A. G. P.

Indigestible carbohydrates of feeding stuffs. V. G. HELLER and R. WALL (*J. Nutrition*, 1940, **19**, 141—149).—The lignin, hemicellulose, and cellulose contents of various cereals and grasses are recorded. The indigestible residue thus determined is much greater than the "crude fibre." The apparent utilisation of cellulose exceeds that of lignin, and varies with the source. A. G. P.

Growth of rats on high-fat and low-fat diets deficient in the essential unsaturated fatty acids. R. G. SINCLAIR (*J. Nutrition*, 1940, **19**, 131—140).—Rats receiving a casein-salts-dried yeast-elaïdin diet supplemented with vitamin-A and -D ceased to grow when reaching approx. 100 g. wt. and later declined in wt. probably through deficiency of essential dietary unsaturated acids. Normal growth was resumed on feeding a supplement of maize oil, by replacing elaïdin by sucrose, or, to a smaller extent, by changing to a high-carbohydrate, low-fat diet. A. G. P.

Availability to white rats of phosphorus in *Lespedeza sericea* and lucerne hays. D. E. WILLIAMS, F. L. MACLEOD, and E. MORRELL (*J. Nutrition*, 1940, **19**, 251—262).—In diets containing the min. adequate proportion of P, but optimum levels of all other nutrients, P supplied as low-P *lespedeza* or lucerne hay was less available to rats than that of corresponding high-P materials. The min. P requirement for rats was 0.16% with a Ca/P ratio of 3:1 in an *ad lib.* ration. A. G. P.

Iron and copper versus liver in treatment of hæmorrhagic anæmia in dogs on milk diets. D. V. FROST, V. R. POTTER, C. A. ELVEHEJEM, and E. B. HART (*J. Nutrition*, 1940, **19**, 207—211).—Cu as well as Fe is essential for hæmoglobin production in dogs. Whole milk supplemented by Fe and Cu is adequate to meet requirements for blood regeneration after severe bleeding. Formation of hæmoglobin on a whole-milk diet was no more rapid with liver therapy than with Cu and Fe supplements. A. G. P.

Effect of ferric chloride on utilisation of calcium and phosphorus in the animal body. P. REHM and J. C. WINTERS (*J. Nutrition*, 1940, **19**, 213—222).—Addition of FeCl₃ (in amounts sufficient to combine with half the P) to rat diets resulted in considerable diminution in live wt. increases, and in the total ash, Ca, and P contents of the carcasses within 30 days. When the diet was supplemented with cod-liver oil the decrease in body-Ca and -P due to Fe treatment was less marked. A. G. P.

Prevention of hyperplasia in the fore-stomach epithelium of rats fed white flour. G. R. SHARPLESS (*J. Nutrition*, 1940, **19**, 31—37).—The hyperplasia caused by a white flour diet is prevented by addition of lactoflavin, nicotinic acid, cystine, and rice polish concentrate to the diet. The cause of the irritation and the action of the protective factors are discussed. A. G. P.

Simplified rations for chicks. A. G. HOGAN and L. R. RICHARDSON (*J. Nutrition*, 1940, **19**, 1—11).—Cases of failure of the Hogan-Boucher (1933) diet are attributed to use of unsatisfactory liver extracts. All vitamins other than -A, -B₁, -B₂, and -D

required by chicks are present in alcohol and water extracts of liver. Partial separation of the active constituents of liver is obtained by extracting first with alcohol and then with water. Both fractions are necessary for satisfactory growth. When the extracts are fed in small amounts, but not when in generous proportions, the residue or hydrolysed residue of the liver provided a further essential nutrient. An active constituent of tiki-tiki is present in alcohol extracts of liver. A. G. P.

Growth-promoting substances in yeast. A. KOCH (*Naturwiss.*, 1940, **28**, 24—27).—The larvæ of *Tribolium* require for growth at least 6 factors present in yeast, aneurin, riboflavin, ergosterol (or cholesterol), and three others of unknown constitution. In such larvæ growth does not take place in the absence of symbiotic micro-organisms which contribute the accessory factors necessary for their nutrition. W. O. K.

Nutrition and sexual development in cockerels. A. ALIBRANDI (*R. C. Atti Accad. Ital.*, 1939, [vii], **1**, 67—69).—Cockerels fed on dried milk enriched with wheat-embryo extract containing vitamin-A, -D, and -E, and with -B₂, show retarded sexual development (as compared with controls fed on wheat), not appreciably affected by substitution of wheat autoclaved at 134° for part of the milk. Addition of mineral salts to the diet somewhat improved development, which became normal when untreated wheat replaced part of the milk. E. W. W.

Vitamin-A requirements in man. W. VON DRIGALSKI and H. KUNZ (*Klin. Woch.*, 1939, **18**, 1318—1319).—Daily vitamin-A needs are greatly increased during pregnancy, but become nearly normal during lactation. M. K.

Minimum vitamin-A and carotene requirements of mammalian species. H. R. GUILBERT, C. E. HOWELL, and G. H. HART (*J. Nutrition*, 1940, **19**, 91—103).—The vitamin-A-requirement of horses is determined and compared with that of cattle, sheep, and pigs (A., 1937, III, 493). The need for separate standards of -A and carotene requirements is emphasised. A. G. P.

State of vitamin-A in the liver of the rat after feeding various forms of the vitamin. E. LE B. GRAY, K. C. D. HICKMAN, and E. F. BROWN (*J. Nutrition*, 1940, **19**, 39—46).—Vitamin-A fed to rats as cod-liver oil, as esters, alcohol, or β -carotene was recovered from livers in the ester form to the extent of 56, 44, 39, and 9.7%, respectively. The type of ester produced was similar in each case. A small amount of the vitamin alcohol was always present. A. G. P.

Vitamin-A absorption in catarrhal jaundice. B. B. BREESE and A. B. McCOORD (*J. Pediat.*, 1940, **16**, 139—145).—In catarrhal jaundice in the active stage, vitamin-A is poorly absorbed when given by mouth. With improvement in the disease, the rise in blood-A concn. after ingestion is equal to, or higher than, that of the normal person. C. J. C. B.

Disturbance of the central nervous system in avitaminosis-A in pigs. H. MØLLGAARD (*Bied.*

Zentr., 1938, **B**, 10, 214—237).—Deficiency of vitamin-*A* causes serious lesions in the central nervous system in pigs (clinical observations recorded) but does not affect growth. The min. protective dose of -*A* for the nervous system is 1500 and for perfect condition in other respects 2500 i.u. daily.

A. G. P.

Vitamin-*A* content of livers of Chinese infants, children, and adults. T. T. WOO and F. T. CHU (Chinese J. Physiol., 1940, 15, 83—100).—Vitamin-*A* content of livers of 77 stillborn infants, 95 children under 12, 50 adults, and 10 adult Europeans were determined by the $SbCl_3$ method. The median val. for normal adult Chinese was 54 i.u. per g., which is lower than for Europeans; for stillborn infants 6 i.u. per g., or 11 if premature. The vals. increased up to 4 months. Infants from mothers with osteomalacia, children with diarrhoea or dysentery, and adults with cirrhosis of the liver had the lowest reserves. Children stored less than 10% of administered -*A*.

N. H.

Vitamin-*A*-free basal diets. III. A. L. BACHARACH (Biochem. J., 1940, 34, 542—550).—Vitamin-*A* tests which involve wt. increases in the experimental animals should be carried out either on litter mates or animals of identical initial wt., when an unprepared stock is used. An improved basal diet is described, which gives a higher incidence of xerophthalmia but responds more readily to curative doses; this improvement is probably due to the increase (to 10%) in the constituents which contain -*B*₁ and the -*B*₂ complex.

P. G. M.

Histological demonstration of vitamin-*A* in rats by means of fluorescence microscopy. H. POPPER (Proc. Soc. Exp. Biol. Med., 1940, 43, 133—136).—In sections of rat's liver, fixed in 10% formalin and frozen, vitamin-*A* can be recognised by its fading green fluorescence under ultra-violet illumination.

V. J. W.

Constitution and physiological significance of carotene and allied pigments. R. A. MORTON (Chem. and Ind., 1940, 301—307).—A lecture.

J. H. B.

Requirements of the components of the vitamin-*B* complex for lactation and growth of nursing young of albino rats. B. SURE [with A. BEACH] (J. Nutrition, 1940, 19, 57—69).—The rearing of young of vitamin-*B*-depleted rats is ensured by use of a stock diet supplemented with thiamin 120, riboflavin 120, -*B*₆ 50 μ g., choline chloride 15 mg., a solution of "W" factor equiv. to 1 g. of liver extract, and nicotinic acid 6 mg. daily.

A. G. P.

Vitamin-*B* complex and its constituents in functional digestive disturbances. F. F. CHESLEY, J. DUNBAR, and L. A. CRANDALL, jun. (Amer. J. digest. Dis. Nutr., 1940, 7, 24—27).—A high % of patients with functional digestive disturbances are improved by the administration of a vitamin-*B* complex concentrate in large doses (1000 i.u. per day). The effectiveness of the whole complex is not due to -*B*₁ or riboflavin. Part of the effectiveness is due to the action of the nicotinic acid.

C. J. C. B.

Vitamins in Manchurian millet. T. AKO (Bull. Inst. Phys. Chem. Res. Japan, 1939, 18, 1162—1164).

—Vitamin-*B*₁ (0.96), -*B*₂ (0.07), -*E* (0.24), and nicotinic acid (32 mg.-%) are found in millet oil.

J. L. D.

Urinary excretion of thiamin in clinical cases and diagnosis of thiamin deficiency. W. D. ROBINSON, D. MELNICK, and H. FIELD, jun. (J. clin. Invest., 1940, 19, 399—408).—The level of the urinary excretion of thiamin permits an objective determination of the state of thiamin nutrition in the human subject. There is good correlation between the urinary thiamin vals. and the adequacy of the preceding diet with respect to this vitamin.

C. J. C. B.

Cure of vitamin-*B*₁ deficiency in pigeons by administration of thiazole and pyrimidine components of aneurin. E. ABDERHALDEN and R. ABDERHALDEN (Pflüger's Archiv, 1938, 240, 746—752).—The symptoms of vitamin-*B*₁ deficiency in pigeons were cured by the administration of thiazole and pyrimidine; these substances were more active after oral than intramuscular administration. To determine where conjugation of the 2 substances takes place, dried and powdered organs (intestinal mucosa, muscle, liver, kidneys) were suspended in saline or buffer solutions and incubated with thiazole and pyrimidine for 16—20 hr. but no aneurin could be recovered.

J. A.

Acetylcholine and vitamin-*B*₁. V. ERSPAMER (Arch. int. Pharmacodyn., 1940, 64, 1—8).—Vitamin-*B*₁ given intravenously is fatal to the rat in dose of 200 mg. per kg. Much larger doses given subcutaneously are resisted; thus injected 15 min. before lethal doses of acetylcholine it proves a strong antidote.

D. T. B.

Blood-sugar in *B*₁-avitaminotic chicken. I. I. NITZESCU and V. IOANID (Compt. rend. Soc. Biol., 1940, 133, 490—491).—In early stages of avitaminosis, blood-sugar is sub-normal and then increases to a max. (twice the normal val.) at the convulsive crisis. Injection of cryst. aneurin causes a return to normal.

H. G. R.

Vitamin-*B*₁ (aneurin) and blood-sugar. I. I. NITZESCU and V. IOANID (Compt. rend. Soc. Biol., 1940, 133, 492—495).—Intravenous injection of aneurin decreases the blood-sugar in normal fasting chicken and reduces the hyperglycemia caused by avitaminosis-*B*₁.

H. G. R.

Synthesis of vitamin-*B*₁ in plant tissue cultures. P. NOBÉCOURT (Compt. rend. Soc. Biol., 1940, 133, 530—532).—Carrot tissues grown on synthetic media synthesise vitamin-*B*₁ as well as the plant grown under natural conditions.

H. G. R.

Biological assay of thiamin with chicks. T. H. JUKES and H. HEITMAN, jun. (J. Nutrition, 1940, 19, 21—30).—The basal diet used in the test consists chiefly of polished rice, fish meal, and autoclaved yeast. A response curve is constructed showing the relation between the amount of thiamin added to the diet and the "polyneuritic mortality index," i.e., length of test period (28 days) minus no. of days survival. The antipolyneuritic potency of a test diet is determined from such a curve. The thiamin requirement of chicks is 130—150 μ g. per

100 g. of diet. Polished rice contains 0.4 μ g. of thiamin per g. and also an essential growth factor which is not present in autoclaved yeast. A. G. P.

Vitamin- B_1 content of Chinese plant beriberi remedies. E. F. YANG and B. E. READ (Chinese J. Physiol., 1940, 15, 9—18).—Dried and fresh vegetables were studied by the method of Yang and Platt (cf. A., 1940, III, 233). Seeds contained a good deal of vitamin- B_1 , plantain the most with 1500 μ g. per 100 g., the content increasing with ripening. Stems, barks, and seaweed had a low content. The best of the roots and rhizomes was the lesser galangal, of herbs the carpenter weed, and of leaves the mulberry. N. H.

Vitamin- B_2 complex. V. Effect of carbohydrate on vitamin- B_2 deficiencies. Flavin synthesis in rats. VI. Rat acrodynia and fatty acids. U. TANGE (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1939, 36, 471—481, 482—490; cf. Birch, A., 1938, III, 820).—Screened rats were fed vitamin- B_2 -deficient diets in which the principal source of carbohydrate was starch, sucrose, glucose, lactose, or dextrin (cf. A., 1939, III, 703). When the faeces of rats on the lactose and dextrin diets were extracted with ether and fed as supplements to rats on the other diets, the growth rate and general condition improved. When lactose was the basal carbohydrate, cataract appeared early; its appearance was delayed if the protein (fish, ovalbumin) content of the diet was increased from 18 to 35%. Faeces of rats on lactose and dextrin were bulky and contained a flavin which, when converted into lumiflavin, had an absorption spectrum similar to that of lactoflavin (cf. Kuhn *et al.*, A., 1933, 847; 1934, 1041).

VI. Rats fed a B_6 -deficient diet show poor growth and develop acrodynia-like dermatitis which is improved by yeast extract and cured if liver extract is also given. On a fat-free diet when B_6 or yeast extract is fed, the animals lose wt. and develop stomatitis, dandruff, and alopecia which are cured by soya-bean oil or linoleic acid, but not by crisco. 3% of soya-bean oil, but not crisco, in the diet delays the onset of symptoms. J. L. D.

Vitamin- B_2 (lactoflavin) and thyroid gland. H. WAHL (Klin. Woch., 1939, 18, 1363—1365).—Lactoflavin further increases basal metabolism of guinea-pigs with experimental hyperthyroidism produced by thyrotrophic hormone. The histological structure of normal or activated thyroid glands remains unchanged. Subcutaneous and oral administration of lactoflavin have equal effect. M. K.

Occurrence of vitamin- B_2 (lactoflavin). IV. Combination of lactoflavin with proteins. J. SCHORMÜLLER (Z. Unters. Lebensm., 1939, 78, 124—138; cf. A., 1939, III, 703).—Muscle-fibre proteins, prepared by extracting horse and goose muscle with aq. urea, reversibly adsorb lactoflavin. Adsorption by heat-coagulated ovalbumin is at a max. at the isoelectric point (p_H 4.6). When proteins are pptd. by HWO_4 , $ZnSO_4$, or trichloroacetic acid in presence of lactoflavin, varying amounts of lactoflavin appear in the ppt. E. C. B. S.

Importance of riboflavin in reproduction in poultry. A. E. SCHUMACHER and G. F. HEUSER (Poultry Sci., 1939, 18, 369—374).—Adverse effects of riboflavin deficiency on the hatchability of eggs appear within a week of commencement of the deficient diet. Improved hatchability following feeding of riboflavin varied considerably with the individual hen and with the amount given. Injection of riboflavin into hens or eggs had no effect on hatchability. A. G. P.

Bacterial assay of riboflavin in urine and tissues of normal and depleted dogs and rats. H. F. FRASER, N. H. TOPPING, and H. ISBELL (U.S. Publ. Health Repts., 1940, 55, 280—289).—Employing a microbiological method for the assay of riboflavin (using *Lactobacillus casei*) a definite reduction of riboflavin was noted in the urine of depleted dogs and rats as compared with control animals on stock diets, or basal diets adequately supplemented with riboflavin. This urinary depletion is observed before the animals manifest significant symptoms of riboflavin deficiency. The riboflavin content of several tissues of depleted dogs and rats was reduced as compared with control animals on stock diets, or basal diets appropriately supplemented with riboflavin. C. G. W.

Determination of riboflavin. I. New biological method. M. M. EL SADR, T. F. MACRAE, and C. E. WORK. **II. Riboflavin in milk, by fluorimetric and biological methods.** K. M. HENRY, J. HOUSTON, and S. K. KON. **III. Statistical analysis of data.** J. O. IRWIN (Biochem. J., 1940, 34, 601—612).—I. Yeast or liver charcoal filtrates contain all the constituents of the vitamin- B_2 complex except riboflavin. Such filtrates may therefore be used as riboflavin-free supplements to the diet in the biological determination of riboflavin in foods.

II. Good agreement is obtained between vals. for riboflavin in dried milk given by the above technique and the fluorimetric method, when the equiv. of up to 10 μ g. is fed daily.

III. A statistical analysis of results from different laboratories. P. G. M.

Riboflavin content of yeasts. Determination photometrically and biologically. A. E. SCHUMACHER and G. F. HEUSER (Ind. Eng. Chem. [Anal.], 1940, 12, 203—204).—Yeast is extracted with 5% HCl, neutralised, and the riboflavin and pigments are reduced with $Na_2S_2O_4$. The light absorbed by this solution is measured with a photo-electric photometer and riboflavin is then regenerated by shaking with air and the absorption again measured. The photometric determinations are in good agreement with those made by biological assay on hens, chicks, and rats, and wide variations are found in the riboflavin content of different yeast samples. J. D. R.

Flavin-adenine dinucleotide in tissues of rats on diet deficient in flavin. S. OCHOA and R. J. ROSSITER (Nature, 1939, 144, 787).—In rats fed on a diet deficient in flavin there is a decrease in the flavin-adenine dinucleotide of Warburg and Christian in the heart and liver (cf. A., 1940, III, 165).

W. F. F.

Vitamin- B_2 (flavin) contents of foods. II. Certain aquatic products. M. SUMI and T. AKŌ (Bull. Inst. Phys. Chem. Res. Japan, 1940, **19**, 240—242).—Vitamin- B_2 has been found in fish, shell-fish, prawns, and octopus, particularly in the viscera and eggs. L. J. J.

Pellagra. H. S. STANNUS (Lancet, 1940, **238**, 352—354).—A review. C. A. K.

Infantile pellagra. H. C. TROWELL (Trans. Roy. Soc. trop. Med. Hyg., 1940, **33**, 389—404).—A review. C. J. C. B.

Nicotinic acid in body-fluids in pellagra and in health. W. W. KÜHNAU (Klin. Woch., 1939, **18**, 1333—1334).—Nicotinic acid excretion in urine was extremely low in a pellagra patient as well as in a healthy subject, who were both given daily 0.1 g. of nicotinamide. The c.s.f. of 2 pellagra patients with neurological symptoms contained 100—200 μ g.-% of nicotinic acid. M. K.

Effect of nicotinamide on porphyrin metabolism and light reaction. W. W. KÜHNAU (Strahlenther., 1939, **66**, 24—39).—Nicotinamide had no influence on the porphyrin metabolism of 8 patients and 250 mice. There was only a slight protective effect towards light in mice previously injected with hæmatoporphyrin. E. M. J.

Epileptiform fits in rats maintained for long periods on a vitamin- B_6 -free diet. H. CHICK, M. M. EL SADR, and A. N. WORDEN (Biochem. J., 1940, **34**, 595—600).—Fits closely resembling those previously observed in pigs occur in rats fed for 4—5 months on a purified diet containing vitamins other than B_6 . These fits are prevented by administration of 10—15 μ g. of B_6 daily, or by inclusion of cooked purified rice starch as the source of carbohydrate in the diet. P. G. M.

Effect of synthetic vitamin- B_6 on hæmopoietic system of man. R. W. VILTER, H. S. SCHIRO, and T. D. SPIES (Nature, 1940, **145**, 388).—Intravenous administration of 50—100 mg. daily for 10 days to 3 pellagrins with macrocytic anæmia and 2 pernicious anæmia patients was accompanied by increased sense of well-being and strength. Slight (5%) reticulocytosis was found. W. F. F.

Negative effect of synthetic vitamin- B_6 hydrochloride in nutritional deficiency in man. R. KARK, E. L. LOZNER, and A. P. MEIKLEJOHN (Proc. Soc. Exp. Biol. Med., 1940, **43**, 97—99).—No benefit resulted from administration of 3-hydroxy-2-methyl-4 : 5-di(hydroxymethyl)pyrimidine in total doses of up to 350 mg. orally with 1120 mg. intravenously. V. J. W.

Identity of natural and synthetic vitamin- B_6 . E. J. REEDMAN, W. L. SAMPSON, and K. UNNA (Proc. Soc. Exp. Biol. Med., 1940, **43**, 112—115).—The natural and synthetic products were equally effective as curative and prophylactic agents in the rat. V. J. W.

Toxicity of vitamin- B_6 . K. UNNA and W. ANTOPOLO (Proc. Soc. Exp. Biol. Med., 1940, **43**, 116—118).—The lethal dose of the synthetic compound for 50% of rats was 3.1 g. per kg. subcutaneously and 4 g. per kg. orally. V. J. W.

Urinary excretion of vitamin- B_6 in the rat. J. V. SOUDI, H. F. KOONES, and J. C. KERESZTESY (Proc. Soc. Exp. Biol. Med., 1940, **43**, 118—122).—A colorimetric method of determination is described. Excretion is rapid even in deficiency conditions. V. J. W.

Antidermatitic effect of vitamin- B_6 analogues. K. UNNA (Proc. Soc. Exp. Biol. Med., 1940, **43**, 122—124).—Efficiency is not affected by acetylation but is diminished by methylation or ethylation of one hydroxymethyl group but less than by methylation of the phenolic OH group. It is destroyed by replacement of a hydroxymethyl group by methyl or amino-groups. V. J. W.

Has lactoflavinphosphoric acid a vitamin- B_6 -like action? E. ANHAGEN and G. WENDT (Pflüger's Archiv., 1939, **241**, 220—223).—Rats of 35—45 g. were kept on a vitamin- B_6 -deficient diet and developed acrodynia after 5—15 weeks with arrest of growth or loss of wt. Addition of 240 μ g. of synthetic lactoflavinphosphoric acid did not prevent death within 4—14—43 days. J. A.

"Pigeon dermatitis"; a vitamin- B deficiency state with anæmia. W. DAMESHEK and P. G. MYERSON (Amer. J. med. Sci., 1940, **199**, 518—539).—Pigeons on a diet of polished rice with added vitamin- B_1 parenterally developed a deficiency state (pigeon dermatitis) characterised by loss of wt., changes in the feathers and epidermis, and progressive anæmia associated with a hyperplastic, immature marrow. This deficiency state did not respond to riboflavin, nicotinic acid, B_6 , or filtrate factor (Lepkovsky). Striking clinical and hæmatological responses occurred with yeast concentrate, dil. (parenteral) liver extract, and (parenteral) B_2 complex. Conc. liver extracts gave either a partial or a delayed response. Elvehjem's purified chick anti-dermatitis principle resulted in a reticulocyte response which was, however, not followed by an erythrocyte increase. C. J. C. B.

Comparison of utilisation by guinea-pigs of equivalent amounts of ascorbic acid in lemon juice and in crystalline form. E. N. TODHUNTER, R. C. ROBBINS, G. IVEY, and W. BREWER (J. Nutrition, 1940, **19**, 113—120).—Guinea-pigs receiving ascorbic acid as lemon juice showed similar increases in wt. and the same levels of ascorbic acid in plasma and adrenals as did those receiving an equiv. supply of the cryst. acid in aq. solution. The former animals showed fewer hæmorrhages. Lemon juice contains a factor preventing the hæmorrhages characteristic of scurvy. A. G. P.

Comparison of utilisation by college women of equivalent amounts of ascorbic acid in red raspberries and in crystalline form. E. N. TODHUNTER and A. S. FATZER (J. Nutrition, 1940, **19**, 121—130).—Urinary excretion and blood plasma level of ascorbic acid were similar whether the vitamin was supplied in raspberries or in cryst. form. The "utilisation index" was the same for both sources of vitamin- C . Individual variations in urinary and plasma- C were considerable. A. G. P.

Amount of ascorbic acid required to maintain tissue saturation in normal adults. E. N. TOD-

breast milk to 4 infants from whom similar data were secured at the same time, showing intimate relationship in the state of vitamin-*D* nutrition between the mother and the infant during the nursing period.

C. J. C. B.

Vitamin-*D* action, early signs of depletion and effect of minimal doses in osteomalacia. H. U. CHU, S. H. LIU, T. F. YÜ, H. C. HSU, T. Y. CHENG, and H. C. CHAO (J. clin. Invest., 1940, 19, 349—363).—Ca and P metabolism was studied in 3 patients with osteomalacia on vitamin-*D*-deficient diets. At the beginning all cases showed positive Ca and P balances, due presumably to prior *-D* store. Subsequently the following changes were observed. Urinary Ca decreased and then disappeared; the faecal Ca progressively increased; the Ca balance was reduced or became negative when the Ca intake was low. P metabolism followed a similar course; both urinary and faecal P were increased. Serum-Ca and -inorg. P usually diminished only slightly in the course of these observations. Addition of very small doses of *-D* (as Vigantol) or the addition of eggs to the basal diet was helpful.

C. J. C. B.

Determination of vitamin-*D* in food substances containing phosphorus. K. H. COWARD and E. W. KASSNER (Biochem. J., 1940, 34, 538—541).—Administration of vitamin-*D* + phosphate to rats fed on a rachitogenic diet has more than an additive effect of the two components separately on calcification. It is therefore necessary, when determining the *-D* content of P-containing food substances, to saponify, extract with ether, and assay the extract.

P. G. M.

Results of feeding wheat-germ oil prepared by ether extraction. D. L. RIDER (Amer. J. Cancer, 1940, 38, 275—276).—3 c.c. of wheat-germ oil prepared by ether extraction of raw wheat germ were fed daily to 51 rats for periods of 81—351 days; no tumours developed and the animals were healthier than controls. 8 rats fed on raw wheat germ showed no pathological changes after 120 days.

F. L. W.

Comparative activity of vitamin-*H* curative of egg-white injury administered orally and parenterally to rats. P. GYÖRGY and C. S. ROSE (Proc. Soc. Exp. Biol. Med., 1940, 43, 73—74).—Parenteral administration is 3—5 times as effective as oral.

V. J. W.

Possible identity of vitamin-*H* with biotin and co-enzyme R. P. GYÖRGY, D. B. MELVILLE, D. BURK, and V. DU VIGNEAUD (Science, 1940, 91, 243—245).—Electrodialysis increases the potency of vitamin-*H* preps. from liver concentrates to 215 units per mg. A highly-pure *-H* sample was very potent in co-enzyme *R* activity. Correlation of *-H*, biotin, and co-enzyme *R* assays of various liver concentrate electrodialysates supports the view that these three substances are identical.

L. S. T.

Preparation of antihæmorrhagic compounds. L. F. FIESER (J. Biol. Chem., 1940, 133, 391—396).—Details of improved methods are given for the rapid prep. from 2-methylnaphthalene of 2-methyl-1:4-naphthaquinone (38—42%) and, from it, of the corresponding quinol (94%), and phthiocol (about 76%). Vitamin-*K*₁ (24—29%) and Na-2-methyl-1:4-naphtha-

quinoldisulphate (42—49% as dihydrate) are also prepared from the above quinol.

P. G. M.

Compounds having antihæmorrhagic activity.—See A., 1940, II, 226.

Greying of fur and other disturbances in several species due to a vitamin deficiency. A. F. MORGAN and H. D. SIMMS (J. Nutrition, 1940, 19, 233—250).—Young black or hooded rats receiving a diet adequate except for vitamin-*B* and supplemented with thiamin chloride, riboflavin, and a wheat-germ prep. of *-B*₆ grew fairly well but showed greying of fur and certain skin disorders in 6—10 weeks. Filtrates from fuller's earth-treated extracts of rice, bran, yeast, liver, crude cane molasses, and lucerne prevented the symptoms and partly restored normal growth. Injection of adrenal and thyroid extracts cured the greying but did not restore growth. Feeding the filtrate-deficient diet on the day of mating or littering caused failure in lactation. Guinea-pigs, dogs, and silver foxes showed greying effects, growth disturbance, and other disorders in response to a similarly deficient diet.

A. G. P.

(xix) METABOLISM, GENERAL AND SPECIAL.

Cyanide inhibition and mechanisms of cellular respiration. B. COMMONER (Biol. Rev., 1940, 15, 168—201).—A review.

J. D. B.

Respiratory activity of liver tissue in normal and vitamin-*A*-deficient rats. M. V. RUDDY (Stud. Inst. Divi Thomae, 1939, 2, 165—172).—Normal liver slices (18 rats) consumed 6.4—10.5 (mean 8.2) ml. of O₂ per mg. (dry wt.) per hr. In *-A* deficiency (8 rats) the uptake was 6.1—9.2 (mean 7.7). It was raised by excess of *-A* (mean 8.5). The ratio liver wt. : body wt. was slightly greater in *-A* deficient rats.

D. Bv.

Source of error in the measurement of tissue metabolism by Warburg's "direct" method. N. BROCK, H. DRUCKREY, and R. RICHTER (Biochem. Z., 1939, 303, 286—287).—Since CO₂ is not instantaneously absorbed by KOH, errors may arise especially where CO₂ production is large and continues for long periods. If the amount of tissue or other material used is such that not more than approx. 100 c.c. of CO₂ are produced in 10 min. the errors are avoided.

W. McC.

Analysis of metabolism with gas interferometer. W. WILBRANDT (Pflüger's Archiv, 1938, 240, 708—712).—A modification of a method previously used (cf. Physiol. Abs., 1935, 20, No. 2948) is described: a pressure pump conveys a continuously measured vol. of dried CO₂-free air to a person with a Knipping respiration mask. The expired air is collected for a short time, mixed, and sucked into separate interferometer chambers partly through a CaCl₂ filter (= dried expired air + CO₂ content) and partly through a CaCl₂ + ascarite filter (= dried expired air minus CO₂); a third interferometer chamber is filled with dried CO₂-free inspired air. The error for CO₂ up to great heights remains below 1%, for O₂ about 1% for each 3000 ft. Differences of temp. of the gases

must be equalised while the interferometer chambers are filled. J. A.

Rectal temperature and metabolism of the wild cottontail rabbit. R. C. LEE (*J. Nutrition*, 1940, 19, 173—177).—The rectal temp. of adult rabbits was 39.6—39.9° (atm. temp. 28°). Vals. were unchanged by fasting for 24 hr. or by variation in atm. temp. in the range 16—28°, but fell 0.7° with decrease in atm. temp. to 10—12°. Exercise for 4 min. increased rectal temp. by 0.3—2.1°. The basal metabolism of wild was 6% above that of domestic rabbits of the same wt. A. G. P.

Basal metabolism and serum-cholesterol of obese children. H. BRÜCH (*Amer. J. Dis. Child.*, 1939, 58, 1001—1022).—In 72 obese children the average basal metabolic rate was higher than normal. In 89 the average serum-cholesterol was about 200 mg.-%. No relationship between these facts could be established. A. C. F.

Basal metabolism of obese children. N. B. TALBOT and J. WORCESTER (*J. Pediat.*, 1940, 16, 146—150).—The basal metabolic rate is moderately elevated in adipose children. C. J. C. B.

The spleen and protein catabolism. A. GRADINESCO and C. DEGAN (*Bull. Soc. Chim. biol.*, 1939, 21, 1410—1416).—In young dogs on a diet of bread and milk, splenectomy causes slightly increased protein catabolism and loss of N. In some cases the operation increases diuresis, the increase in N excretion then being due, in whole or in part, to removal of accumulated waste products. The changes in diuresis and urinary N excretion which immediately follow splenectomy suggest that the operation causes hyperfunction of organs which act like the spleen. W. McC.

Influence of urea ingestion on nitrogen balance and energy metabolism of rats. M. KRISS and L. F. MARCY (*J. Nutrition*, 1940, 19, 151—160).—Of the total urea fed to rats 95% was recovered unchanged in urine and 0.7% in faeces. Heat production and the R.Q. of the animals were unaffected by feeding urea. Rats do not utilise urea to an appreciable extent and the excretion of urea does not exert a sp. dynamic effect. A. G. P.

Independence of endogenous and exogenous nitrogen metabolism. E. W. BURROUGHS, H. S. BURROUGHS and H. H. MITCHELL (*J. Nutrition*, 1940, 19, 271—283).—Endogenous metabolism in adult rats was not suppressed by supplementing the diet with essential amino-acids, singly or in admixture or with complete egg protein. A. G. P.

Biological degradation and synthesis of amino-acids. W. FRANKE (*Angew. Chem.*, 1939, 52, 695—698).—A review. R. S. C.

Metabolism of tyrosine, aspartic acid, and asparagine with special reference to respiratory exchange and heat production. M. KRISS and L. F. MARCY (*J. Nutrition*, 1940, 19, 297—309).—Tyrosine, aspartic acid, and asparagine, when added to the maintenance ration for rats, were absorbed to the extent of 95—97%, the amounts retained being 0, 25.1, and 13.7%, respectively, of the quantities

ingested. The metabolisable energy vals. were 59.2, 71.8, and 60.6% of the gross energy; the O₂ required and CO₂ and no. of calcs. produced per g. of urinary N formed were in the approx. order tyrosine : aspartic acid : asparagine = 4 : 2 : 1. A. G. P.

Conversion of S-benzylglutathione into benzylmercapturic acid in the rat. J. A. STEKOL (*Proc. Soc. Exp. Biol. Med.*, 1940, 43, 108—110).—When S-benzylglutathione is fed to rats N-acetyl-S-benzyl-L-cysteine can be isolated from the urine. V. J. W.

Cystine-cysteine in normal animal. M. MONDEN (*Japan. J. Med. Sci.*, III, 1939, 6, 147—161).—It is confirmed that almost all the tissues of the rabbit contain cystine and cysteine, their concn. being highest in the adrenal (110 mg.-%) and lowest in muscle (5 mg.-%). The content is still higher in the adrenal of the ox (195 mg.-% in the cortex and 114 mg.-% in the medulla). H. Ro.

Canine cystinuria. V. Family history of two cystinuric Irish terriers and cystine determinations in dog urine. E. BRAND, G. F. CAHILL, and B. KASSELL (*J. Biol. Chem.*, 1940, 133, 431—436; cf. A., 1936, 881).—The S distribution in the urine of normal and cystinuric dogs has been determined. Cystine is pptd. by CuCl at *p*_H 4.5 to separate it from substances which interfere with the various colour reactions and the ppt. is decomposed by KCNS; the average cystine vals. obtained by the photometric and Sullivan methods on the filtrate are 90 and 84% of those determined directly by the photometric method. P. G. M.

Purine catabolism of anodonts. G. DUCHATEAU, M. FLORKIN, and G. FRAPPEZ (*Compt. rend. Soc. Biol.*, 1940, 133, 433—435).—The hepatopancreas of anodonts degrades aminopurines, but not their nucleosides, to urea. H. G. R.

Enzymes of purine catabolism in insects. G. DUCHATEAU, M. FLORKIN, and G. FRAPPEZ (*Compt. rend. Soc. Biol.*, 1940, 133, 436—437).—The presence of enzymes (adenase, guanase, xanthine oxidase) transforming aminopurines, but not their nucleosides, into uric acid is demonstrated. H. G. R.

Effects of a beef liver fraction on fat synthesis in rats. E. W. MCHENRY and G. GAVIN (*Science*, 1940, 91, 171).—Ox liver contains a substance which markedly affects fat synthesis when fed to rats. The total cholesterol in the liver is also increased. W. F. F.

Conversion of palmitic acid into stearic and palmitoleic acids in rats. DE W. STETTEN, jun., and R. SCHOENHEIMER (*J. Biol. Chem.*, 1940, 133, 329—345).—44% of the D of ethyl deuteropalmitate fed to rats is recovered from the body-fat. Not only does desaturation to palmitoleic acid etc. and degradation to shorter-chain acids (? myristic etc.) occur, but stearic acid is also formed. P. G. M.

Biological relations of higher aliphatic alcohols to fatty acids. DE W. STETTEN, jun., and R. SCHOENHEIMER (*J. Biol. Chem.*, 1940, 133, 347—357).—Cetyl and octadecyl acetates containing D, when fed to rats, are readily converted into saturated fatty acids of the same chain length, whilst stearic and

palmitic acids are also formed. Cetyl alcohol is also probably formed after ingestion of ethyl deuteropalmitate. P. G. M.

Diseases of metabolism and nutrition. R. M. WILDER, H. C. BROWNE, and H. R. BUTT (Arch. intern. Med., 1940, 65, 390—460).—A review of recent literature. C. A. K.

Lipoid histiocytosis. A. H. BAGGENSTOSS, E. F. ROSENBERG, and A. E. OSTERBERG (Arch. Path., 1940, 29, 420—431).—Report of a case with post-mortem and chemical studies of the spleen. (8 photomicrographs.) C. J. C. B.

Von Gierke's disease. F. R. B. ATKINSON (Brit. J. Child. Dis., 1939, 36, 261—294).—A complete review of the literature. C. J. C. B.

Chronic Gaucher's disease. H. H. PERLMAN (J. Pediat., 1940, 16, 191—205).—In the case of Gaucher's disease reported normal blood-lipin and blood-Ca and -P vals. were obtained, while the cholesteryl ester and phosphatase vals. were decreased. The ingestion of milk containing 20% of cream was followed by a normal fat tolerance curve. The galactose tolerance test and bromsulphalein test and phenolsulphonephthalein test gave normal responses. C. J. C. B.

Food rationing and diabetes mellitus. W. FALTA and E. PILGERSTORFER (Med. Klin., 1939, 35, 1445—1448).—The increased carbohydrate and diminished fat and protein intake, enforced by food rationing, has to be compensated by increased administration of insulin in diabetics. A. S.

Management of diabetes as controlled by tests of acetone in expired air. A. P. BRIGGS (J. Lab. clin. Med., 1940, 25, 603—609).—From the viewpoint of rationale the control of diabetes may be based on estimations of the ketosis as well as the sugar in blood and urine. A simple clinical test for determining acetone in the breath is described for the rapid estimation of ketosis. The changes in blood chemistry associated with control of patients based on this clinical test are detailed. C. J. C. B.

Insulin hypoglycæmia and glycogenic hepatomegaly in diabetes mellitus. N. B. FRIEDMAN (Arch. Path., 1940, 29, 415—419).—2 cases in which glycogenic hepatomegaly was associated with insulin hypoglycæmia in patients with diabetes are reported and similar cases in the literature are reviewed. (3 photomicrographs.) C. J. C. B.

Hepatosplenomegaly resembling Niemann-Pick's disease: recovery following liver therapy. J. V. BRAITHWAITE and J. H. DEREK (Arch. Dis. Childh., 1940, 15, 61—64).—A case report. C. J. C. B.

Interpretation of glucose tolerance test; necessity of a standard preparatory diet. J. W. CONN (Amer. J. med. Sci., 1940, 199, 555—564).—A short period of carbohydrate restriction in the normal person causes a marked delay in the rate of utilisation of carbohydrate as indicated by the glucose tolerance test. Undernourished individuals respond to the same procedure with a greater loss of carbohydrate tolerance. Unless the influence of previous carbo-

hydrate restriction is removed by an adequate preparatory diet, the glucose tolerance test is not reliable as an indicator of the individual's ability to utilise carbohydrate. C. J. C. B.

Glycogen and calcification. G. E. GLOCK (J. Physiol., 1940, 98, 1—11).—The glycogen content of developing bones (rat) determined chemically increases up to 10—13 days after birth and then rapidly declines, whereas the calcification increases progressively. The glycogen content of the bones of rats receiving 0.05% of NaF in their diet is less at all ages than the corresponding control rats and the max. concn. ($\frac{1}{3}$ of that of the control animals) is reached later; calcification is retarded in the early stages of development, but eventually reaches the same level as the controls. Glycogen is present only in very early stages of tooth development and disappears as soon as or soon after calcification begins. In both tooth and bone development glycogen may first initiate the differentiation and later serve as a primary source of the phosphoric esters required for calcification. J. A. C.

Glycolysis in retinal extracts. M. KERLY and M. C. BOURNE (Biochem. J., 1940, 34, 563—576).—The mechanism of carbohydrate metabolism in retinal extracts is the same as that in other organ extracts. The same activators and co-enzymes are present, and inhibition of glycolysis by NaF is reversed by pyruvate. The initial phosphorylation may occur by direct phosphorylation (polysaccharides only) or by phosphorylation coupled with oxidoreduction, or with dephosphorylation of phosphopyruvate, since in the presence of NaF and pyruvate lactic acid formation from glucose is only about half that occurring in unpoisoned extracts. It is uncertain which form of nucleotide is active in retinal extracts, and cozymase cannot replace either adenosine triphosphate or adenylic acid as co-enzyme. P. G. M.

Phosphorylation of glucose in kidney extract. S. P. COLOWICK, M. S. WELCH, and C. F. CORI (J. Biol. Chem., 1940, 133, 359—373).—Phosphorylation of inorg. P in kidney extracts occurs only aëroically, with formation of fructose diphosphate and phosphoglyceric acid in the presence of NaF. Phosphorylation of glucose is therefore not dependent on dehydrogenation of glyceraldehyde phosphate, but on oxidation of dicarboxylic acids, e.g., succinic to fumaric acid. A similar mechanism is probably also present in liver. At least two co-enzymes, adenylic acid and cozymase, and Mg⁺⁺ are required. P. G. M.

Vitamin-B₁, insulin, and phosphate metabolism. H. VON EULER and B. HÖGGER (Naturwiss., 1940, 28, 29).—The pyruvic acid content of the blood (measured by the dinitrophenylhydrazine method) is reduced by 30—40% in a healthy adult by administration of aneurin (20 mg. by mouth) or insulin (10 i.u.) or by cocarboxylase (5 mg.) by injection. After insulin or cocarboxylase administration, the P content of the urine falls. The relationship between carbohydrate and P metabolism and insulin and aneurin is emphasised. W. O. K.

Sulphur metabolism and effect of sulphur administration in chronic arthritis. R. H.

FREYBERG, W. D. BLOCK, and M. F. FROMER (J. clin. Invest., 1940, **19**, 423—435).—No evidence of S deficiency or abnormality of S metabolism was found in patients with arthritis. The data of this study reveal no biochemical or metabolic indication of need for, or benefit from, S medication in the treatment of arthritis. C. J. C. B.

Iron metabolism. I. Rôle of calcium in iron assimilation. S. W. KLETZIEN [with K. W. BUCHWALD and L. HUDSON] (J. Nutrition, 1940, **19**, 187—197).—Addition of 1—3% of CaCO₃ to a basal Fe-containing diet fed to rats previously rendered anæmic by a milk diet resulted in a diminution in Fe contents of tissues. CaCl₂, Ca₃(PO₄)₂, and Ca lactate, but not CaSO₄, produced similar effects. The influence of Ca on the metabolism of other minor elements is discussed. A. G. P.

Detoxication. VI. Etheral sulphate formation in the rabbit after sulphanilamide administration. J. SHELSWELL and R. T. WILLIAMS (Biochem. J., 1940, **34**, 528—531).—Oral administration of sulphanilamide in rabbits results in increased excretion of etheral sulphates which varies according to the dose, 6—12% of which is converted into a phenol, which is then conjugated with H₂SO₄. P. G. M.

Detoxication of sodium benzoate in neuropsychiatric disorders. I. FINKELMAN, J. HORA, I. C. SHERMAN, and M. K. HORWITT (Amer. J. Psychiat., 1940, **96**, 951—960).—Hippuric acid excretion after benzoate ingestion (Quick's liver function test) was determined in various neuropsychiatric diseases. Normal average vals. were found with chronic encephalitis, multiple sclerosis, progressive muscular dystrophy (1 case), and non-institutionalised epileptics, and low average vals. with institutionalised deteriorated epileptics and 3 patients with paraplegic state. 47% of 17 catatonics showed a defect in hippuric acid synthesis (benzoic acid excretion less than 2.9 g.), but only 11% of 9 hebephrenics (cf. A., 1938, III, 892; 1939, III, 35). The defect in catatonia may be due to the immobility and muscular rigidity. G. D. G.

Faulty detoxication in mental disorder. D. R. DAVIES and T. P. E. HUGHES (Lancet, 1940, **238**, 403—405).—Hippuric acid excretion after oral administration of Na benzoate was diminished in catatonia and other mental disorders. C. A. K.

Mechanism of formation of indoxyl *in vivo* from *o*-nitrobenzene derivatives. F. BÖHM (Z. physiol. Chem., 1939, **261**, 35—42).—Indoxyl is excreted when ethyl *o*-nitro-benzoylacetate or -phenylpropionate (but not *o*-amino-cinnamic or -propionic acid) is fed to rabbits. *o*-Nitrobenzoic and anthranilic acid are isolated. Formation of indoxyl involves formation of *o*-nitroacetophenone or its derivatives, which are either oxidised to *o*-nitrobenzoic acid or reduced to the hydroxylamino-acid, the latter condensing to give indoxyl. R. S. C.

Urinary excretion of intravenously administered mandelic acid by cats. R. C. GARRY and I. A. SMITH (Biochem. J., 1940, **34**, 490—499).—When *dl*-mandelate is administered intravenously to

decerebrate cats, early samples of their urine contain excess of the *l*-form of the acid, but subsequent samples contain progressively less of this form until the *d*-form ultimately predominates. In long experiments, 80—90% of the acid given is recovered, the total material showing slight *l*-rotation. The partial, non-bacterial resolution thus achieved is possibly due to differential adsorption of the *d*- and *l*-forms in the kidney or at some other site or to differences in rates of biological esterification of the acid and hydrolysis of the esters. When *d*- and *l*-mandelic acid are administered, slight changes in rotation are produced. W. McC.

(xx) PHARMACOLOGY AND TOXICOLOGY.

Significance of oxidation of sulphanilamide during therapy. C. L. FOX, jun. (Amer. J. med. Sci., 1940, **199**, 487—494).—Sulphanilamide is believed to be oxidised during therapy since complete, initial deprivation of O₂ interferes with bacteriostasis; increased O₂ availability increases it. Reducing agents and large inocula which rapidly reduce the potential abolish bacteriostasis despite excess of sulphanilamide; the use of a preformed oxidant derived from sulphanilamide, 4-hydroxylaminosulphanilamide, eliminates the usual initial growth period before bacteriostasis appears and gives a more prolonged effect than sulphanilamide. The occurrence of methæmoglobinæmia during therapy and the occurrence of an oxidation product of sulphanilamide in the urine of treated patients confirm the view that an oxidant is produced in the blood or tissues of the patient. C. J. C. B.

Effect of temperature on bacteriostatic action of sulphanilamide on members of enterococcus group. E. NETER (Proc. Soc. Exp. Biol. Med., 1940, **43**, 52—55).—Sulphanilamide is very much more effective against these organisms at 43° than at 37°. V. J. W.

***In vitro* conversion of prontosil-soluble into sulphanilamide by various types of microorganisms.** W. W. SPINK, F. W. HURD, and J. JERMSTA (Proc. Soc. Exp. Biol. Med., 1940, **43**, 172—175).—Time taken by different organisms to decolorise prontosil-soluble solutions varied widely. V. J. W.

Determination of prontosil-soluble in blood and plasma. S. STELZER (Arch. exp. Path. Pharm., 1940, **194**, 133—155).—A chromatographic method is based on the fact that prontosil is retained by talcum in acid medium and passes through franconite in alkali. The subsequent determination is done by means of the step photometer. Prontosil is also absorbed by proteins, e.g., fibrin. H. BL.

Behaviour of sulphanilamide and uleron in organism. M. H. SIMSEN (Arch. int. Pharmacodyn., 1940, **64**, 250—256).—Sulphanilamide and uleron given to rats were eliminated partly free and partly combined. Part is burnt. Sulphanilamide is eliminated 3—4 times as fast as uleron. D. T. B.

Fate of albucid in the body. A. K. HAU (Arch. exp. Path. Pharm., 1939, **194**, 52—61).—Albucid (*p*-aminobenzenesulphonylacetamide) can be determined in biological fluids by treatment with HNO₂

and coupling of the diazo-derivative with thymol. The drug is rapidly absorbed and quickly excreted. Some retention takes place in the liver. The excretion is about equally in faeces and urine. H. BL.

Action of sulphanilamide *in vitro* on aerobic sporogenic bacilli. L. ROSENTHAL (Proc. Soc. Exp. Biol. Med., 1940, 43, 78—80).—1 : 1000 sulphanilamide added to agar prevents spore formation and causes degeneration in bacilli of the *subtilis-mesentericus-mycoides* group. V. J. W.

Toxic and therapeutic response of blood and bone marrow to sulphanilamide. J. T. PAUL and L. R. LIMARZI (Proc. Soc. Exp. Biol. Med., 1940, 43, 29—32).—Therapeutic doses often cause a macrocytic anaemia with normoblastic bone-marrow reaction. In the rarer acute haemolytic anaemia this reaction is more marked and young forms predominate. V. J. W.

Chemotherapy of haemolytic streptococcal septicæmia. C. HUBERT, R. PERTUS, and R. DEVERNOIX (Rev. Laryng., Otol., Rhin., 1939, 60, 662—667).—3 children with haemolytic streptococcal septicæmia were cured by operation (one child paracentesis only) and sulphonamide treatment. One child received 54 g. in 19 days, another child 90 g. in 5 weeks. C. E.

Does haemolytic streptococcus infection or sulphanilamide affect the alpha hæmolysin of serum? E. M. BIXBY (J. Lab. clin. Med., 1940, 25, 476—484).—3 group O patients are described who had had β -haemolytic streptococcus infections treated with sulphanilamide and whose sera showed rapid group-sp. (anti-A) hæmolysis with little or no agglutination. C. J. C. B.

Bedside test for sulphapyridine. H. D. RATISH and J. G. M. BULLOWA (J. Lab. clin. Med., 1940, 25, 654—657).—A simplified method for determining sulphapyridine, by ether extraction of the drug from the blood, is described. C. J. C. B.

Antibody formation in cases of lobar pneumonia treated with sulphapyridine. Y. KNEELAND, jun., and B. MULLIKEN (J. clin. Invest., 1940, 19, 307—312).—In only 4 of 19 cases of pneumonia treated by sulphapyridine, there was an excess of antibodies demonstrated, and in these cases antibodies were not noted until after the patient's temp. had been normal about a week. C. J. C. B.

Effect of sulphapyridine alone and with serum on pneumococcal pneumonia and on pneumococcus-infected marrow cultures. J. G. M. BULLOWA, E. E. OSGOOD, S. C. BUKANTZ, and I. E. BROWNLEE (Amer. J. med. Sci., 1940, 199, 364—379).—In marrow cultures, the presence of sulphapyridine in concn. of 5 mg.-% or more may lead to ultimate sterility with inocula of 500 or less per c.c. of types I, III, or VII pneumococci; controls grow to over 100 million colonies per c.c. Sulphapyridine alone is more effective against pneumococci than equimolar concns. of sulphanilamide. The presence of type-sp. antiserum usually increases the effectiveness of sulphapyridine. With the same concns. of sulphapyridine, increasing quantities of antibody are increasingly effective. Different strains

of pneumococci vary in their susceptibility to sulphanilamide and sulphapyridine. Freshly isolated virulent strains are less susceptible than strains after they have been grown for some time in ordinary media. The presence of sulphapyridine does not result in rapid death of all organisms present. Sulphapyridine, in the concns. employed, does not damage directly the marrow cells nor modify phagocytosis. Organisms exposed to the action of sulphapyridine undergo no loss of capsule or type specificity. They may, however, become distorted, develop long chains, and stain irregularly. Acetyl-sulphapyridine is ineffective. Serum from untreated pneumonia patients is not bactericidal. The serum from treated patients has bactericidal activity roughly proportional to serum-sulphapyridine content. Sulphapyridine alone gave a lower death rate than either serum alone or serum plus sulphapyridine in a series of 324 adult patients rotated for treatment. The lowest mortality rate was observed in cases treated early (1—4 days) with serum and sulphapyridine. The results in children were inconclusive. (5 photomicrographs.) C. J. C. B.

Dosage of sulphonamides in children. M. HYNES (Lancet, 1940, 238, 261—262).—A method of determining sulphonamides, using diazotisation and coupling with diphenylamine, is described, and from figures obtained in 81 children tables are given which relate blood concn. of sulphapyridine to dose, age, and wt. The desired level is 4—10 mg.-%. C. A. K.

Discussion of treatment of pneumonia in infants and children. C. H. SMITH; H. L. BARNETT; G. E. CULLEN; L. J. SCHERMERHORN (J. Pediat., 1940, 16, 254—271). C. J. C. B.

Sulphapyridine in pneumonia of infancy and childhood. C. C. FISCHER and H. A. AGERTY (Arch. Pediat., 1940, 57, 67—75).—13 cases of lobar pneumonia and 28 cases of bronchopneumonia in infants and children were treated with sulphapyridine with 1 death. There was no marked influence on the blood picture. C. J. C. B.

Treatment of pneumonia with sulphapyridine. A. V. ST. GEORGE, A. F. KRAETZER, W. MAGEE, W. S. GIBBS, jun., and L. STIX (Amer. J. clin. Path., 1940, 10, 97—119).—50 cases of various types of pneumococcus pneumonia were treated with sulphapyridine with a mortality of 8%. C. J. C. B.

102 cases of lobar pneumonia treated with M. & B. 693. G. ALSTED, E. LUNDSTEEN, and E. MOGENSEN (Acta med. scand., 1940, 103, 83—89).—The mortality was only 6% and the fall of temp. and clinical improvement occurred simultaneously after treatment started. Transitory cyanosis sometimes, and nausea and vomiting usually, occurred. No macroscopic hæmaturia was observed. C. A. A.

Blood changes during treatment of pneumonia with sulphapyridine. F. WUHRMANN and E. UNDRITZ (Schweiz. med. Wschr., 1940, 70, 69—72).—Sulphapyridine prevents the spreading of infiltrations in cases of lobar pneumonia. The leucocytosis and the "shift to the left" of the

neutrophils disappear; blood sedimentation rate is decreased; neutrophilia and lymphopenia disappear. A. S.

Sulphapyridine in pneumonia. C. S. D. DON, R. W. LUXTON, H. R. DONALD, W. A. RAMSAY, D. W. MACARTNEY, G. S. SMITH, and C. H. ADDERLEY (Lancet, 1940, 238, 311—314).—A series of 234 cases of lobar pneumonia is reported. Among 78 untreated controls there were 21 deaths; in 119 cases treated with sulphapyridine there were 8 deaths (6.7%); in 37 cases of type I or II who were given sulphapyridine + sp. serum there were 3 deaths. In 870 cases seen in 1935—1937 the mortality rate was 30%. The effects of age, type of pneumococcus, and bacteraemia are discussed. C. A. K.

Use of sulphapyridine in pneumonia and meningitis. E. HÜTTENHAIN (Med. Klin., 1939, 35, 1634—1636).—Sulphapyridine had no effect in children suffering from empyema in the course of pneumonia and in two cases of pneumonia with pulmonary abscess with pleural effusion (one case with *Staphylococcus aureus* in pleural exudate). 1 out of 19 cases of meningococcal meningitis recovered under sulphapyridine treatment; 2 children with pneumococcal and 1 with influenzal meningitis died. 3 out of 200 children treated with sulphapyridine developed rashes. A. S.

Intramuscular injection of sulphapyridine and treatment of lobar pneumonia. P. T. KUO and C. H. HO (Chinese Med. J., 1939, 56, 523—531).—Sulphapyridine is powdered and stirred into 5 times its wt. of 0.2N-NaOH; the mixture is again heated in boiling water for 15 min. before use. It is injected high in the outer quadrant of the gluteal region. One dose of 3—4 g. is usually sufficient to maintain an optimum level of sulphapyridine in the blood for 4—5 days without toxic effects. W. J. G.

Sulphamide therapy in gonorrhoea. G. IACAPRARO (Rev. Med., Buenos Aires, 1940, 2, 70—75).—150 acute cases successfully treated with sulphapyridine are reported; 80% cures were obtained within 4—24 days. S. O.

Sulphapyridine in Pfeiffer's bacillus meningitis. J. SAKULA (Lancet, 1940, 238, 596—598).—A case of meningitis due to Pfeiffer's bacillus was successfully treated with sulphapyridine. C. A. K.

Erysipeloid of Rosenbach successfully treated with sulphanilamide. A. G. SCHOCH and B. SHELMIERE (Arch. Dermat. Syphilol., 1940, 41, 570—571).—Sulphanilamide alone in doses of 3 g. a day produced prompt resolution in 3 of 4 cases of erysipeloid of Rosenbach. C. J. C. B.

Sulphonamides in lupus erythematosus. H. W. BARBER (Lancet, 1940, 238, 583—586).—Sulphonamides are more effective in lupus erythematosus in cases of streptococcal than those of tuberculous origin. C. A. K.

Disseminated lupus erythematosus treated by sulphanilamide. A. L. WEINER (Arch. Dermat. Syphilol., 1940, 41, 534—544).—2 of 4 severe cases recovered. C. J. C. B.

Sulphonamides in trachoma. A. F. MACCALLAN (Brit. Med. J., 1940, I, 482—483).—Good results obtained by giving sulphonamides in trachoma are probably due to action on secondary infections. C. A. K.

Sulphapyridine in human anthrax. W. BONNAR (Brit. Med. J., 1940, I, 389).—2 cases of anthrax were successfully treated with sulphapyridine. C. A. K.

Therapeutic activity of sulphanilamide and allied compounds in experimental brucellosis in mice. J. A. KOLMER (J. Pharm. Exp. Ther., 1940, 68, 406—412).—Treatment with sulphanilamide, neoprontosil, sulphapyridine, Na sulphapyridine, and Na formaldehydesulphoxylate derivative of sulphanilamide (aldanil) was highly efficacious in infection with *Br. abortus*, moderately with *Br. melitensis*, slightly with *Br. suis*. In *Br. abortus* infections aldanil gave best results, in *Br. melitensis* sulphapyridine, in *Br. suis* sulphanilamide. E. M. S.

Chemotherapy of anaerobic infections. D. STEPHENSON and H. E. ROSS (Brit. Med. J., 1940, I, 471—475).—Sulphanilamide and sulphapyridine protected mice against a small no. of lethal doses of *Cl. welchii*, type A, injected intraperitoneally but were less effective against intramuscular inoculation. Antitoxic serum was most effective against a strain of high toxicity. Sulphapyridine was better than sulphanilamide against *Cl. septicum* and its action was enhanced by serum. Neither drug was active against *Cl. oedematiens*. C. A. K.

Combined action of sulphapyridine and serum in experimental staphylococcus infection in mice. L. N. FARRELL (Canad. Publ. Health J., 1940, 31, 27).—Sulphapyridine and staphylococcus antitoxin have a synergic effect in protecting mice against 5 average lethal doses of highly toxigenic staphylococci, a dose which killed untreated mice in 4—5 hr. C. G. W.

Chemotherapeutic investigations of heterocyclic derivative of sulphanilamide. K. TSUDA and K. SUZUKI (J. Pharm. Soc. Japan, 1939, 59, 224—228).—Sulphanil-2-pyridylamide, -2,4-methylthiazylamide, and 2,6-methylpyridylamide have curative action on mice infected with pneumococcus type I and III, whereas the -6-amino-2-pyridylamide and -2-quinolyamide appear to have little activity. H. W.

Effect of sulphathiazole on *Staph. aureus*. Epidural abscess with septicæmia and pyæmia. T. S. P. FITCH (Arch. Pediat., 1940, 57, 119—124).—The case recovered. C. J. C. B.

Bacteriostatic action of three thiazole derivatives of sulphanilamide on bacteria in broth cultures. C. A. LAWRENCE (Proc. Soc. Exp. Biol. Med., 1940, 43, 92—97).—2-Sulphanilamido-thiazole, -4-methylthiazole, and -4-phenylthiazole were found superior to sulphanilamide and sulphapyridine in effect on pneumococcus I, II, and III, *Str. hæmolyticus* A, gonococcus, and *Staph. aureus*. V. J. W.

Agranulocytosis from sulphapyridine. B. PRINGLE, G. C. DOCKERAY, and R. H. MITCHELL

(Brit. Med. J., 1940, I, 212—213).—Non-fatal agranulocytosis occurred in a woman aged 54 who was given 46.5 g. of sulphapyridine in 18 days for pneumonia. C. A. K.

Severe disease of spinal cord after treatment of gonorrhoea with uleron. E. SANTO (Frankf. Z. Path., 1939, 53, 105—119).—A case is described of paraplegia due to widespread degeneration of the white matter of the spinal cord, probably caused by overdosage of uleron. H. W. K.

Neuro-histological investigations in pigeons after diseptal. E. BECK (Klin. Woch., 1939, 18, 1416—1417).—No changes were found. M. K.

Scarlet fever therapy. Comparison of convalescent serum and sulphanilamide. M. FOX and M. HARDGROVE (Amer. J. med. Sci., 1940, 199, 495—498).—Neoprontosil seems to have less effect on initial toxicity and pyrexia of scarlet fever than does convalescent scarlet fever serum, although both have been found useful in the treatment of this disease. C. J. C. B.

4 : 5-Dimethylacetylsalicylic acid.—See A., 1940, II, 220.

Chemotherapy of filarial infection. R. N. CHOPRA and S. S. RAO (Indian J. Med. Res., 1939, 27, 549—562).—The effects of a no. of drugs in filarial infection are discussed. H. B. C.

Serum-phosphatase in pulmonary tuberculosis. M. N. RUDRA and S. K. ROY (Current Sci., 1940, 9, 25—26).—The serum-phosphatase of pulmonary tuberculosis patients (usually above normal) was reduced in 71% of cases after receiving *Embilica officinalis* daily for 10 days. E. M. W.

Use of convalescent mumps serum. G. W. KUTSCHER, jun. (J. Pediat., 1940, 16, 166—169).—With a reported incidence of 30—50% in exposed and susceptible children following exposure to mumps, an infection incidence of the disease in between 15 and 25 boys might have been expected in the group of 51 boys studied. The much lower infection incidence of only 2% was attributed to the use of 8 to 10 c.c. of convalescent mumps serum on the 4th day following exposure. C. J. C. B.

Chemotherapy of acquired syphilis. H. ORR (Canad. Med. Assoc. J., 1940, 42, 316—320).—A lecture. C. J. C. B.

Distribution of quinine in blood. F. J. KAISER (Arch. int. Pharmacodyn., 1940, 64, 215—238).—Various salts and amounts of quinine were administered to dogs, and the blood content was determined by measurement of fluorescence. 8 min. after oral administration of quinine hydrochloride quinine appears in the blood, and concn. increases with dose. Hydroquinone hydrochloride acts similarly. The absorption of equinine is slower. The concn. is higher when sulphate is given intramuscularly than by oral administration and the max. content is more rapidly reached. Addition of urethane or anti-pyrine makes no difference, but with such mixture the max. concn. is greater at p_{H} 7.2 than at 6.8. 15% of quinine and 20% of hydroquinone are eliminated in the urine. D. T. B.

Treatment of ringworm of the scalp with gentian-violet. W. F. SPILLER, W. B. SHARP, and M. B. JOHN (Arch. Dermat. Syphilol., 1940, 41, 370—377).—A local application is presented for the treatment of *Tinea capitis*, consisting of 2% gentian-violet and 10% salicylic acid, dissolved in 95% alcohol. C. J. C. B.

Hypertonic sodium sulphate for infected wounds. J. C. LYTH (Lancet, 1940, 238, 216—219).—The successful use of hypertonic Na_2SO_4 solution in infected wounds is described. C. A. K.

Pharmacodynamic study of phenyltyramine. A. LESPAGNOL and G. BIZARD (Compt. rend. Soc. Biol., 1939, 132, 103—106).—Intravenous injection of phenyltyramine hydrochloride decreases arterial pressure (dog). Decreased tonus and increased amplitude of contraction in the isolated intestine of rabbit are observed. H. G. R.

Two new physiological properties of ibogaine also shared by cocaine. RAYMOND-HAMET (Compt. rend. Soc. Biol., 1940, 133, 426—429).—Ibogaine reinforces the hypertensive action of adrenaline and abolishes the sino-carotid reflexes. H. G. R.

Bio-assay of small quantities of papaverine. J. LÉVY (Compt. rend. Soc. Biol., 1940, 133, 374—376).—The antagonism between papaverine and acetylcholine on rat duodenum is adapted for assay of 60—100 μg . of papaverine. H. G. R.

Influence of mescaline and dimethoxyphenylethylamine on arterial pressure. A. GEESINK and W. A. DEN HARTOG JAGER (Arch. néerland. Physiol., 1939, 1, 79—82).—Mescaline (β -3 : 4 : 5-trimethoxyphenylethylamine) has no effect on blood pressure. 100 mg. of dimethoxyphenylethylamine produced a rise of pressure of 20% in a cat. P. U. N.

Pressor drugs in surgery. H. DODD (Lancet, 1940, 238, 358—360).—A review. C. A. K.

Nature of pilomotor response to acetylcholine ; pharmacodynamics of skin. J. M. COON and S. ROTHMAN (J. Pharm. Exp. Ther., 1940, 68, 301—311 ; cf. A., 1940, III, 110).—Sweating and vasoconstriction accompany the pilomotor response, previously reported. Intradermal injection of nicotine-like drugs probably elicits axon reflexes involving the whole autonomic nerve supply of the skin. E. M. S.

Action of narcotics on acetylcholine sensitivity of rectus muscle of frog. N. EMMELIN (Skand. Arch. Physiol., 1939, 83, 69—76).—Methyl, ethyl, *n*-propyl, *n*-butyl, and *n*-amyl alcohols potentiate the action of acetylcholine on the frog's abdominal rectus muscle; the threshold concns. for these substances are : 1 : 200, 1 : 1000, 1 : 5000, 1 : 7000, and 1 : 10,000. *tert*-Butyl alcohol acts only weakly; *isobutyl* alcohol has a strong action; ethylene glycol and glycerol are inactive. Methyl, ethyl, and propyl carbamate increasingly potentiate the action of acetylcholine. Evipan and CHCl_3 diminish sensitivity; chloralose, bromural, and pernocton have no effect; paraldehyde, chloral hydrate, veronal, luminal, and acetcarbromal increase it. The potentiating action of these drugs persists after inhibition of choline-esterase by eserine. A. S.

Effect of furfuryltrimethylammonium iodide on various autonomic functions in man. A. MYERSON, M. RINKEL, J. LOMAN, and W. DAMESHEK (J. Pharm. Exp. Ther., 1940, 68, 476—481).—The compound is a potent parasympathetic stimulant, producing marked effects when given orally. It is antagonised by atropine, but there is no synergism with prostigmine, due to the lack of any ester group.

E. M. S.

Relation between frog titre and guinea-pig titre in evaluation of digitalis. W. STRAUB, Z. KANDA, and F. ZINNITZ (Arch. exp. Path. Pharm., 1939, 194, 1—15).—Various digitalis drugs are given to guinea-pigs in intravenous infusion until a crit. fall of blood pressure is reached. The lethal doses of these preps. for the frog are also determined and coeffs. are given which make it possible to convert the guinea-pig titre into frog titre. It is found that the guinea-pig is much more resistant to *k*-strophanthin than the frog.

H. BL.

Cumulation of digitalis and glycogen content of heart. F. HAHN (Arch. exp. Path. Pharm., 1939, 194, 62—73).—24 hr. after one intramuscular injection of more than half the lethal dose of digitoxin into pigeons the glycogen content of the heart is increased. An increase is also obtained when the drug is given in several doses which are singly ineffective.

H. BL.

Determination of digitalis glucosides and genins with the step photometer. A. HAGEMEIER (Arch. exp. Path. Pharm., 1940, 194, 195—204).—The degree of purity of solutions of digitalis substances is determined by the colour reaction with alkaline picric acid. Even pure preps. of cryst. digitoxin give slightly varying results. The highest colour activity is given by the biologically practically inactive diginin. Pure preps. of gitalin show no change after heating and treatment with alcohol.

H. BL.

Detoxication of digitoxin in white rat. K. N. VON KAULLA (Arch. exp. Path. Pharm., 1940, 194, 178—189).—In subcutaneous injection digitoxin has a lower lethal dose if the area of resorption is increased. Injected intravenously (dissolved in a mixture of methylpiperidone, alcohol, and water) the lethal dose depends on the rate of injection. This proves the occurrence of detoxication in the white rat.

H. BL.

Solubility in water and adsorption of genins and glucosides of the digitoxin and *k*-strophanthin groups. K. KORFMACHER (Arch. exp. Path. Pharm., 1940, 194, 217—228).—Experiments on adsorption of these substances on SiO₂, kaolin, animal C, and Al₂O₃ show that there is no relationship between adsorption and toxicity.

H. BL.

Binding of digitalis glucosides and digitaloids to serum-proteins. W. HAARMANN, A. HAGEMEIER, and L. LENDLE (Arch. exp. Path. Pharm., 1940, 194, 205—216).—Glucosides are bound to the serum-albumins only; there is no binding to pseudo-globulin, euglobulin, or hæmoglobin.

H. BL.

Conditions of binding of digitalis glucosides to serum-proteins. W. HAARMANN, K. KORFMACHER, and L. LENDLE (Arch. exp. Path. Pharm., 1940, 194, 229—247).—Dialysis experiments on

Q Q (A., III.)

serum-albumin solutions show that there is no effect of p_H or of Ca on the binding of digitoxin and digitoxigenin. Inactivation of the serum (horse or rabbit serum; 30 min. at 60°) abolished binding; reactivation re-established it. The binding does not represent a true adsorption; it is relatively less at low concn. The binding of strophanthin is reversible, that of digitoxigenin partly, and that of digitoxin wholly, irreversible.

H. BL.

Binding of digitalis substances to muscle-proteins. O. DYBING and H. G. HOLZHAUSEN (Arch. exp. Path. Pharm., 1940, 194, 248—259).—All fractions of proteins from heart and skeletal muscle bind digitalis glucosides. Myogen from heart muscle takes up twice as much glucosides as the same fraction from skeletal muscle, and about 4 times as much as globulin X and myosin from heart. The binding to the heart muscle-proteins is more reversible than that to the fractions from skeletal muscle.

H. BL.

Effect of digitalis glucosides on viscosity of muscle-proteins. H. G. HOLZHAUSEN (Arch. exp. Path. Pharm., 1940, 194, 260—264).—*k*-Strophanthin has no effect on the viscosity of the proteins from heart and skeletal muscle.

H. BL.

Mechanism of digitalis action in heart failure. H. GOLD and M. CATTELL (Arch. intern. Med., 1940, 65, 263—278).—From experiments on the papillary muscle of the right ventricle of the cat it is concluded that digitalis acts by increasing the tension developed during systole, without influencing the diastolic length of the heart muscle, *i.e.*, the tone. In the cat it does not constrict the hepatic veins.

C. A. K.

Limitations of use of digitalis for ambulatory patients with auricular fibrillation. W. WEINSTEIN, J. PLAUT, and L. N. KATZ (Amer. J. med. Sci., 1940, 199, 498—505).—Digitalis was found to lessen the ventricular acceleration which occurs following a standardised exercise test in ambulatory patients with auricular fibrillation. It also decreased the pulse deficit at the same time. It was not effective in patients who already had a slow ventricular rate. Protracted rest, as well as large doses, may be required to produce slowing.

C. J. C. B.

Clinical use of *Digitalis lanata*. H. OETTEL (Med. Klin., 1939, 35, 1628—1632).—*D. lanata* preps. on oral administration are superior to *D. purpurea* in rate of absorption. Intravenous administration of *lanata* glucosides gives rapid results, like strophanthin, in severe cardiac emergencies; the effective dose is approx. twice that of strophanthin.

A. S.

Rôle of the blood vessels and heart in regulation of blood pressure. I. Histamine. II. Veritol. T. GOTSEV (Arch. exp. Path. Pharm., 1939, 194, 31—43, 109—120).—I. Vol. changes of spleen and duodenum were measured after intravenous injection of 5—20 µg. of histamine in dogs under luminal Na anaesthesia; vasoconstriction occurred. In the intestine, response is vasodilatation after a preceding dose of adrenaline, veritol, or acetylcholine. In animals in which only the pulmonary and the intestinal circulation is retained, histamine still

causes a blood pressure fall. This must be due to an action of histamine on the heart.

II. Veritol (0.1 mg. per kg. in dogs) leads to contraction of the spleen and dilatation of the intestine.

H. BL.

Action of ouabain on splanchnic circulation in dog. J. E. NADLER, A. T. BERGER, and J. BALLINGER (J. Lab. clin. Med., 1940, 25, 557—566).—In 42 dogs, (0.029—0.039 mg. per kg. of ouabain (comparable with a therapeutic dose in man) had no effect on spleen vol. but toxic doses caused a decrease. Intestinal vol. increased slightly with small doses, and strikingly with toxic doses, of ouabain. Small doses caused splanchnic engorgement but not enough to account for the decrease in cardiac output.

C. J. C. B.

Isolation of toxic substance from extract of *Ascaris megalocephala*. (A) Properties. M. MACHEBEUF and R. MANDOU. (B) Biological properties. R. MANDOU (Compt. rend. Soc. Biol., 1939, 132, 124—126, 126—128).—(A) The non-dialysable toxic substance in the trichloroacetic acid extract is sol. in alcohol at 50°, is heat-labile, and loses its activity in a week at 0° in neutral solution. It is possibly a polypeptide.

(B) Sub-lethal doses of the toxin in guinea-pigs produce some resistance to subsequent dosage. No anticoagulant effect is observed *in vitro*.

H. G. R.

Toxicity of liver fluke. R. MANDOU (Compt. rend. Soc. Biol., 1939, 132, 128).—Trichloroacetic acid extracts of *Fasciola hepatica* are non-toxic to guinea-pigs.

H. G. R.

Peptone shock in foetal dogs and its significance in metabolism of histamine. C. A. DRAGSTEDT, M. R. DE ARELLANO, and A. H. LAWTON (Proc. Soc. Exp. Biol. Med., 1940, 43, 28—29).—Peptone shock occurs in the dog foetus as well as in the adult and is associated with the formation of histamine.

V. J. W.

[Diuresis in] heart failure. G. HERRMANN (Ann. int. Med., 1939, 13, 122—142).—The greatest diuretic action in patients suffering from heart failure and oedema was obtained by combination of org. mercurial with theophylline (5%); "Mercuripurin" was intravenously injected in doses of 2 c.c. of a 13.5% solution.

A. S.

Pharmacology of 2:4-diketo-3:3-diethyl-tetrahydropyridine and 2:4-diketo-3:3-diethylpiperidine. T. KOPANYI, R. P. HERWICK, C. R. LINEGAR, and R. H. K. FOSTER (Arch. int. Pharmacodyn., 1940, 64, 123—152).—The two newly synthesised hypnotics, pyridione and piperidione, produce motor paralysis, loss of righting reflexes, and deep sleep. They are absorbed from the gastrointestinal tract, subcutaneous tissue, and peritoneal cavity. Respiration and blood pressure are diminished and the temp. is lowered. Pyridione is antagonistic to central stimulants like picrotoxin and cardiazol.

D. T. B.

Extracellular and intracellular hydrogen-ion concentration in relation to anaesthetic effects of barbituric acid derivatives. G. H. A. CLOWES, A. K. KELTCH, and M. E. KRAHL (J. Pharm. Exp.

Ther., 1940, 68, 312—329; cf. A., 1938, III, 424).—Theoretical considerations are presented to interpret the gradation in anaesthetic effect exerted by substituted barbituric acids on fertilised eggs and larvae of *Arbacia punctulata* at varying levels of extra- and intra-cellular p_H . The extracellular concn. of undissociated mols. required to produce a 50% reduction in the rate of cell division of eggs is independent of extracellular p_H , for each of 30 compounds tested. Using representative compounds, the concns. required are not affected by an increase or decrease of intracellular p_H .

E. M. S.

Toxic actions of sodium diphenylhydantoinate (dilantin) when injected intraperitoneally and intravenously in experimental animals. C. M. GRUBER, V. G. HAURY, and M. E. DRAKE (J. Pharm. Exp. Ther., 1940, 68, 433—436).—Convulsive and lethal doses are determined, and the effects following administration of dilantin in mice, rats, rabbits, and dogs are described.

E. M. S.

Hemiplegia associated with sodium diphenylhydantoinate in epilepsy. D. BLAIR (Lancet, 1940, 238, 269—270).—A case record.

C. A. K.

Epanutin in epilepsy. A. J. M. BUTTER (Brit. Med. J., 1940, I, 483—484).—Epanutin was effective in 27 of 43 epileptics; it is much less hypnotic than phenobarbitone; the margin between therapeutic and toxic dose is very small.

C. A. K.

Epanutin in epilepsy. R. COOPE and R. G. R. BURROWS (Lancet, 1940, 238, 490—492).—Epanutin was more successful than other anticonvulsants in many of 60 epileptics. Toxic signs, mainly mild, occurred in 12 cases. Status epilepticus developed in 2 cases during administration of the drug.

C. A. K.

Excretion of a combined form of morphine in tolerant and non-tolerant dogs. E. G. GROSS and V. THOMPSON (J. Pharm. Exp. Ther., 1940, 68, 413—418).—In non-tolerant dogs 80—92% of administered morphine, free and combined, was recovered from the urine and faeces by use of hydrolysis methods. In tolerant dogs the recovery was 35—65%, the difference being due to a fall in the amount of combined morphine excreted.

E. M. S.

Respiratory alkalosis during anaesthesia. I. Effects on circulatory, respiratory, and muscular activity. M. H. SEEVERS, R. T. STORMONT, and H. R. HATHAWAY. II. Influence on survival. M. H. SEEVERS and R. T. STORMONT (J. Pharm. Exp. Ther., 1940, 68, 365—382, 383—388).—I. Dogs anaesthetised with cyclopropane, morphine-ether, morphine-chloretone, barbital, pentobarbital, or pentothal were hyperventilated for 1—15 hr. Reduction in arterial CO_2 content averaged 66%. Immediate arterial hypotension was followed by gradual recovery during hyperventilation, and an immediate increase in arterial pressure when hyperventilation ceased. The fall in pressure was proportional to the depth of anaesthesia rather than to the loss of CO_2 . No fall occurred in dogs hyperventilated under local anaesthesia. The duration of apnoea was inversely proportional to the duration of hyperventilation. It was not possible to induce fatal respiratory

paralysis by hyperventilation during ordinary anaesthesia. The tetany characteristic of alkalosis was not observed during anaesthesia, but occurred in decerebrate and unanaesthetised dogs.

II. 20 dogs, under barbital anaesthesia, were subjected to excessive hyperventilation from 1—15 hr. 17 survived. The death of 2 was due to mechanical injury to the lung. The cardiovascular system is not permanently injured during hyperventilation.

E. M. S.

Effect of quantity on intensity and duration of local anaesthesia, determined by a new test. A. J. LESER (J. Pharm. Exp. Ther., 1940, 68, 389—394).—Depth and duration of corneal anaesthesia were recorded in the rabbit after subconjunctival injection of procaine. Depth of anaesthesia was influenced by concn. more than by quantity of drug used. No marked increase in duration was produced by increased concn.

E. M. S.

Rôle of changes in extracellular and intracellular hydrogen-ion concentration in action of local anaesthetic bases. M. E. KRAHL, A. K. KELTCH, and G. H. A. CLOWES (J. Pharm. Exp. Ther., 1940, 68, 330—350).—The extracellular mol. concn. of each of 16 basic local anaesthetics required to produce a 50% reduction in the rate of cell division of fertilised *Arbacia* eggs is independent of extracellular p_H , if intracellular p_H is kept const. Similar results are obtained on the movement of larvæ. With representative compounds, increase in cytoplasmic concn. of anaesthetic cations increases anaesthetic effectiveness and vice versa. The local anaesthetic cation, not the undissociated mol., is active inside the cell.

E. M. S.

Comparative study of twenty-five alkylthiobenzoates with respect to surface anaesthesia, toxicity, and systemic effects. H. R. HULPIEU, J. H. KITCHEL, and J. H. WEATHERBY (J. Pharm. Exp. Ther., 1940, 68, 395—405).—The alkylthiobenzoates, prepared by Donleavy and English (A., 1940, II, 86), all caused some anaesthesia of rabbit's cornea. Intravenous injection, in the dog, produced excitement, rigidity, and respiratory and cardiovascular depression. Toxicity, in mice, increased with increase in mol. wt., but anaesthetic and irritant effects showed no such correlation. Only one compound, β -piperidinoethyl *o*-propylthiobenzoate, is of possible clinical val.

E. M. S.

Combined action of local anaesthetics. F. CAVALLI and G. B. DELLEPIANE (Arch. int. Pharmacodyn., 1940, 64, 9—32).—Procaine (type II) and tutaocaine (type III) cause vasoconstriction which is greater when the former prevails in the mixture. Here apparently the anaesthetic effect is potentiated with vasoconstriction, whilst vasodilatation generally favours rapid absorption. The relationship of rate of absorption and rate of elimination or destruction is discussed.

D. T. B.

Intravenous anaesthesia in gynæcology. W. KIRCHNER (Med. Klin., 1939, 35, 1426—1429).—Experiences with evipan, eunarcen, and pernocton in intra- and extra-abdominal gynæcological operations are reviewed.

A. S.

Ethyl *n*-propyl ether as anaesthetic. W. E. BROWN (Canad. Med. Assoc. J., 1940, 42, 370—371).—Because of ease of administration, apparent excellence of the anaesthesia, the unusual safety factor, and lack of unpleasant after-effects this anaesthetic is superior to the generally used volatile anaesthetics.

C. J. C. B.

Convulsions with vinesthene anaesthesia. C. J. M. DAWKINS (Brit. Med. J., 1940, I, 163—164).—Case reports.

C. A. K.

Spinal anaesthesia in dog. J. C. WAGNER, R. F. SIEVERS, A. L. BENNETT, and A. R. MCINTYRE (J. Pharm. Exp. Ther., 1940, 68, 437—453).— β -Diethylaminoethyl *p*-ethoxybenzoate, β -(*N*-ethyl-*N*- β -hydroxyethylamino)ethyl *p*-*n*-butoxybenzoate, and γ -hydroxy- γ -phenyl- β -(diethylamino)propyl benzoate showed promise of suitability as spinal anaesthetics. Preliminary data were obtained on the length and wt. of the spinal cord and the vol. of c.s.f. in the dog; the rate at which various types of solutions may be injected into the spinal theca without danger; the fatal and dangerous doses of hypo-, hyper-, and iso-tonic saline solutions. Histological changes produced in the cord by anaesthetics were examined. A new method for investigating the mechanism of death in spinal anaesthesia showed that paralysis of the thorax results in asphyxia and cardio-vascular embarrassment, frequently causing cardiac death before the medullary centres are paralysed.

E. M. S.

Comparison between some effects of isomyn (benzedrine) and of methylisomyn. F. L. GOLLA, J. M. BLACKBURN, and S. GRAHAM (J. ment. Sci., 1940, 86, 48—59).—Methylisomyn like isomyn produces in human beings euphoria, heightened mental and motor activity, increased talkativeness, and diminished sleep, and the 2 drugs have similar effects on blood pressure and pulse rate. Both increased the speed of writing, walking, and decision during physiological tests, and also the speed of a figures test of memory and attention. Isomyn increased the speed of addition, drawing, and writing the alphabet, whilst methylisomyn did not. Neither drug improved the score at darts. The curves for excretion in the urine were similar for the two drugs.

G. D. G.

Detoxication and excretion of β -phenylisopropylamine (benzedrine). K. H. BEYER and J. T. SKINNER (J. Pharm. Exp. Ther., 1940, 68, 419—432; cf. A., 1939, III, 861).—A colorimetric method is described for the detection and determination of benzedrine. In man, after oral doses of benzedrine up to 30 mg., 43% is excreted in the urine within 48 hr. Excretion, in dogs, is increased when the liver function is impaired by CCl_4 , indicating that the liver is normally concerned in detoxication of benzedrine.

E. M. S.

Action of *l*- and *d*-veritol in man. E. METZ (Klin. Woch., 1939, 18, 1408—1410).—*d*-Veritol has a greater action on blood pressure than the *l*-compound; in equal doses the latter is less toxic. Neither compound has tachyphylactic properties.

M. K.

Action of veritol on heart and blood pressure. G. SCHOENEWALD, A. SCHWEITZER, and G. C. STEEL (Lancet, 1940, 238, 544—546).—The effects of intra-

venous injection of veritol on blood pressure and e.c.g. were studied in cats under various anaesthetics. With ether, chloralose, or pentothal, veritol raised the blood pressure often above physiological levels; a second injection often lowered the blood pressure (tachyphylactic action). With CHCl_3 and cyclopropane, veritol had no pressor action but marked abnormalities in ventricular rhythm were seen in the e.c.g. Both actions of veritol occurred after atropine.

C. A. K.

Effect of metrazol on recent learning. E. ZISKIND, R. LOKEN, and J. A. GINGERELLI (Proc. Soc. Exp. Biol. Med., 1940, 43, 64—65).—Metrazol injections caused a marked falling off in the reproduction from memory of recently learnt material.

V. J. W.

Treatment of poisoning with hypnotic drugs. A. HEINRICH (Klin. Woch., 1939, 18, 1410—1416).—Large doses of cardiazol (3—10 c.c.) were successfully employed in 42 cases. Epileptiform convulsions occurred after too rapid injection or overdosage.

M. K.

Picrotoxin in barbiturate collapse. S. W. GILLMAN (Lancet, 1940, 238, 598).—Case reports.

C. A. K.

Action of theophylline-diethanolamine. A. IAGNOV (Arch. int. Pharmacodyn., 1940, 64, 203—214).—Deriphylline (theophylline and diethanolamine) is a mild respiratory stimulant and hypotensive agent. It is not very effective in Cheyne-Stokes breathing due to morphine or evipan. It acts on the centre and on the carotid sinus. Theophylline-ethylenediamine is a stronger respiratory stimulant, though more hypotensive.

D. T. B.

Relation between drug action and calcium-potassium ratio in striated muscle. A. M. HARVEY (J. Pharm. Exp. Ther., 1940, 68, 494—500).—Reduction of Ca^{++} content of the fluid surrounding frog's muscle sensitises the muscle to stimulation by K^+ and, to a smaller degree, by acetylcholine. The effects of guanidine or veratrine resemble those of Ca^{++} deprivation, and both are antagonised by Ca^{++} .

E. M. S.

Agar cup-plate method. II. Effect of blood on mercury antiseptics. S. B. ROSE and R. E. MILLER (Amer. J. med. Sci., 1940, 199, 338—342).—Using a standardised agar cup-plate technique, 4 Hg antiseptics (HgCl_2 , mercurochrome, metaphen, and merthiolate) were studied in horse blood-agar mixtures. The blood content of the test media varied from 1 to 50%. The test organism was *Staph. aureus* (WP3 strain). All 4 compounds showed a diminishing antiseptic effectiveness as the blood concn. was increased, and indicate that Hg compounds have no val. in intravenous therapy.

C. J. C. B.

Treatment of pruritus ani by tattooing with mercury sulphide. R. TURELL, A. M. BUDA, and A. W. M. MARINO (Arch. Dermat. Syphilol., 1940, 41, 521—526).—Encouraging results were obtained in 22 cases.

C. J. C. B.

Arsenic poisoning and its chemical detection. F. KÜNKELE (Chem.-Ztg., 1940, 64, 29—32, 37—38).—Accidental As poisoning is chiefly due to AsH_3 or anti-pest preps. As is absorbed by the lungs and gastro-

intestinal tract. The As content of hair and urine is determined by an adaptation of the Gutzeit method.

E. M. W.

Effect of antisyphilitic treatment on histopathology of local tuberculous lesions in syphilitic rabbits. J. D. ARONSON and D. R. MERANZE (Proc. Soc. Exp. Biol. Med., 1940, 43, 83—84).—Tuberculous lesions are not affected by arsphenamine treatment of syphilitic rabbits.

V. J. W.

Action of arsenicals in lichen ruber planus. K. KRANTZ (Med. Klin., 1939, 35, 1625—1627).—The administration of As in patients suffering from lichen ruber planus is of doubtful val.

A. S.

Liver degeneration following neoarsphenamine and mapharsen treatment. I. SNAPPER, K. Y. CH'IN, and S. H. LIU (Chinese Med. J., 1939, 56, 501—518).—The pathology of catarrhal jaundice and arsphenamine liver damage is discussed. It is probable that in arsphenamine jaundice, as in catarrhal jaundice, there is diffuse toxic liver degeneration, and that the sequence of events leading to acute yellow atrophy is the same in both conditions. Mapharsen is icterogenic and should not be used when arsphenamine hepatitis is present.

W. J. G.

Fixed eruption with extracutaneous manifestation due to mapharsen. H. V. MENDELSON (Arch. Dermat. Syphilol., 1940, 41, 509—514).—The eruption, which was of the erythematous type, appeared 5—10 min. after an injection and disappeared within 3 days, leaving no pigmentation. The extracutaneous effect consisted of severe, sharp pain in the upper jaw that appeared 10—20 sec. after an injection and lasted 5—10 min. Both effects recurred in identical manner after each of 6 injections of mapharsen in doses of 10—20 mg. No other ill effects occurred. Patch and intradermal tests with mapharsen and neoarsphenamine gave negative results in both the normal and the previously affected skin.

C. J. C. B.

Relationship between physiological properties and physical characters of trivalent arsenicals.

G. ANTOINE and M. T. REGNIER (J. Pharm. Chim., 1940, [ix], 1, 201—213).—Curves relating the p.d. to the current in electrolytic cells containing aq. solutions of org. As compounds are unrelated to the toxicity of the compounds, their curative action on mice infected with *Trypanosoma equiperdum*, the extent to which they can be tolerated subcutaneously, or their optical densities. When aq. 1% novarsenobenzene oxidises in air, the increase in toxicity follows the increase in colour and the decrease in the slope of the above curve.

J. L. D.

Antimony treatment of kala-azar. L. ROGERS (Nature, 1939, 144, 1003—1004).—A review.

W. F. F.

Changes of electrocardiogram during anti-mony treatment. F. MAINZER and M. KRAUSE (Trans. Roy. Soc. trop. Med. Hyg., 1940, 33, 405—418).—In 12 bilharzia patients the e.c.g. was observed during a course of tartar emetic treatment. In 7 cases there were changes of the S-T interval as well as of the T deflexion. The extent of the changes was parallel to the degree of chronic bradycardia due to the Sb. One of 5 cases injected

became infected. The appearances at post mortem are described. C. J. C. B.

Action of sulphur-containing compounds in arsenical and mercurial poisoning. K. B. MUIR, E. STENHOUSE, and S. W. BECKER (Arch. Dermat. Syphilol., 1940, 41, 308—330).—The val. and action of $\text{Na}_2\text{S}_2\text{O}_3$, Na formaldehydesulphoxylate, and other S compounds in poisoning by various metallic salts, especially As and Hg, is reviewed. In 123 rabbits poisoned with inorg. and org. arsenicals and Hg, $\text{Na}_2\text{S}_2\text{O}_3$ or Na *p*-thiolphenylsulphonate had no protective action. Na formaldehydesulphoxylate protected rabbits poisoned with HgCl_2 when given before but not after the latter. It had no protective action against poisoning by inorg. and org. arsenicals. Na formaldehydesulphoxylate acts by reducing HgCl_2 to metallic Hg, which is considerably less toxic. C. J. C. B.

Dermatitis due to [nickel in] safety pins. J. G. DOWNING (Arch. Dermat. Syphilol., 1940, 41, 568—571).—A case report. C. J. C. B.

Action of gold salts on laryngeal tuberculosis. T. DESPONS (Rev. Laryng. Otol. Rhin., 1939, 60, 483—500).—Good results were obtained in subacute and chronic laryngeal tuberculosis. C. E.

Detoxication mechanism. I. Ability of apple or its constituents to counteract toxic effects of lead and arsenic. I. A. MANVILLE, F. J. REITHEL, P. M. YAMADA, T. W. SPENCER, and J. R. RICHARDSON (J. Ind. Hyg., 1940, 22, 36—47).—With rats, guinea-pigs, and rabbits on diets low in uronic acid and, with the exception of the rats' diet, in Ca and P, the toxicity of ingested Pb arsenate was significantly reduced by adding apple to the diet. E. M. K.

Endemic fluorosis in Argentine. N. CAPIZZANO, J. VALOTTA, and F. R. MEGY (Rev. Med. Buenos Aires, 1940, 2, 19—32).—Out of 178 persons examined in various areas there were 21 cases of typical chronic F poisoning with marked osteosclerosis. The paper, which includes a review on F poisoning, is illustrated with 22 pelvis radiographs. S. O.

Physiological activity of cigarette smoke solutions as related to nicotine content. H. B. HAAG (J. Lab. clin. Med., 1940, 25, 610—618).—By intravenous administration, cigarette smoke solutions had the same pressor effect on the anaesthetised dog and the same toxicity for rabbits as a solution of similar nicotine content. By intraperitoneal administration into white mice, smoke solutions are more toxic than solutions of equal nicotine concn. This is due to the more rapid absorption of the nicotine from the smoke solutions on account of vasodilatation caused by irritants. C. J. C. B.

Sensitivity to nicotine of *Lebistes reticulatus*. E. SCHUSTER-WOLDAN (Arch. exp. Path. Pharm., 1940, 194, 156—164).—The fish were kept in tap water containing various concns. of nicotine. Sensitivity showed individual variations and was not related to body-wt. (Cf. A., 1939, III, 91.) H. BL.

Toxicology of amygdalic acid. K. MEIER (Arch. int. Pharmacodyn., 1940, 64, 79—92).—

Amygdalic acid and its salts cause fatty degeneration of liver cells, especially the Kupffer cells, and function becomes defective. Jaundice occurs and may be attributed to hæmolysis, or pressure on the bile capillaries. D. T. B.

Thiocyanate formation in cyanide poisoning as affected by methylene-blue and sodium nitrite. R. G. SMITH, B. MUKERJI, and J. H. SEABURY (J. Pharm. Exp. Ther., 1940, 68, 351—364).—Administration of sublethal doses of NaCN resulted in a greater and more rapid increase in CNS' concn. in rabbit's than in dog's serum. NaNO_2 caused initial depression of the increase in serum-CNS', more marked in dogs than in rabbits. Methylene-blue produced stimulation of CNS' formation in the rabbit, slight depression in the dog. Urinary excretion of CNS' was rapid in the rabbit and slow in the dog. E. M. S.

Toxicity of pyruvic acid solutions. V. ZAMBOTTI and A. FERRANTE (Arch. Sci. biol., Napoli, 1940, 26, 51—66).—The toxicity of aq. pyruvic acid (intravenous injection in dogs) decreases on keeping. Polarographic analysis indicates that this decrease in toxicity is due to gradual conversion of the keto- into the enol form (cf. A., 1940, III, 58). S. O.

Plasma-bromide levels in bromoderma. L. W. KIMBERLY (J. invest. Dermat., 1939, 2, 331—342).—13 patients with mental symptoms of acute bromism had plasma-Br' levels of 57—562 mg.-% (average 281 mg.). After treatment with NaCl, bromides were once more given to 4 of these patients and their bromoderma was reproduced. A control group of patients were given large amounts of Br' in an endeavour to induce bromoderma, but this was uniformly unsuccessful. There is thus no direct correlation between plasma-Br' level and occurrence of bromoderma. C. J. C. B.

Iodine rashes in exophthalmic goitre. E. HAMAGUCHI (Klin. Woch., 1939, 18, 1344—1348).—A generalised measles-like I rash was observed in 3 cases of exophthalmic goitre after administration of Lugol's solution. This was accompanied by high temp., low pulse rate, and leucopenia with relative lymphocytosis and increase of eosinophils. M. K.

Selenium and duck sickness. A. C. TWOMEY, S. J. TWOMEY, and L. R. WILLIAMS (Science, 1939, 90, 572—573).—The livers of ducks dying from duck sickness contained Se and were decreased in size and wt. Ducks given 18 p.p.m. Se in drinking water developed a condition resembling duck sickness, and showed similar hepatic changes. W. F. F.

Death from quinine poisoning. C. K. VARTAN and G. DISCOMBE (Brit. Med. J., 1940, I, 525—526).—A woman aged 34 died after taking 6 g. of quinine sulphate as abortifacient. C. A. K.

Hæmolysin of cobra venom. I. Isolation of hæmolysin from cobra (*Naja naja*) venom. S. S. DE (Indian J. Med. Res., 1939, 27, 531—536).—Methods are outlined for the isolation of the hæmolysin from venom. H. B. C.

Absorption, distribution, and elimination of alcohol. V. Influence of glycocoll [glycine] on

absorption of alcohol. H. W. HAGGARD and L. A. GREENBERG (J. Pharm. Exp. Ther., 1940, 68, 482—493; cf. A., 1939, III, 933).—When alcohol is given with glycine the concn. of alcohol in the blood of rats rises more slowly, but falls sooner, than when alcohol is given alone. Alcohol is not altered, combined, or destroyed by glycine, but it causes a prolonged retention of alcohol in the stomach and retards absorption. E. M. S.

Effect of drugs on vitamin-C excretion. L. T. SAMUELS, N. D. RITZ, and E. B. POYET (J. Pharm. Exp. Ther., 1940, 68, 465—475).—Acetylsalicylic acid and Na salicylate caused an increased excretion of ascorbic acid in rats and guinea-pigs. Subnormal excretion followed cessation of drug administration, in rats, indicating depletion of body supplies of ascorbic acid. Cinchophen had a slower and slighter effect than the salicylates. Caffeine, salyrgan, and NaHCO₃ had no significant effect. E. M. S.

Nails and nail changes. I. Investigation of nail lacquers and their components. H. SILVER and B. CHIEGO (J. invest. Dermat., 1939, 2, 361—374).—Over 5000 patch tests performed on human subjects with nail lacquers, and their ingredients such as solvents, dyes, transparent nail lacquers, plasticisers, and perfume, failed to show sensitivity to the finished nail enamels. C. J. C. B.

Immediate reactions, to anhydrides, of wheal-and-erythema type. J. L. JACOBS, T. S. GOLDEN, and J. J. KELLEY (Proc. Soc. Exp. Biol. Med., 1940, 43, 74—77).—Guinea-pigs can be sensitised by intracutaneous injections of citraconic, *n*-hexoic, and 3-nitrophthalic anhydrides so as to give wheal and erythema reactions on scratch test. V. J. W.

Treatment of ragweed dermatitis. J. A. CLARKE and J. F. RICCHIUTI, jun. (Arch. Dermat. Syphilol., 1940, 41, 551—556).—Report of 7 cases of successful treatment with abs. alcohol extract of ragweed leaves. C. J. C. B.

Allergy in rheumatic infections. G. EDSTRÖM (Acta med. scand., 1940, 103, 90—110).—Anti-streptolysins and antifibrolsins were found in the serum of most rheumatic subjects. The clinical picture was determined more by the allergic than the hyperergic reaction (*i.e.*, impaired circulation, cold hands and feet, low basal metabolic rate, and depressed *T* wave in the e.c.g. etc.). (B.) C. A. A.

Histaminase in treatment of urticaria and atopic dermatitis. C. W. LAYMON and H. CUMMING (J. invest. Dermat., 1939, 2, 301—312).—1—5 histaminase detoxicating units were given intramuscularly or by mouth at intervals of 2—4 days to 17 cases of urticaria and 3 times daily to 8 cases of atopic dermatitis. 59% of the former group but none of the latter group were cured. C. J. C. B.

Antigenic studies by Dale test. II. Antigenicity of house dust. S. F. HAMPTON and A. STULL (J. Allergy, 1940, 11, 109—129).—28 of 31 guinea-pigs, after a single injection of house dust extract, were found sensitive by the Dale test. Positive Dale tests were obtained with feather extract in 10 of 20 experiments, with dog dander in 4 of 20, and

with cat dander in 4 of 20. Cottonseed, cotton linters, kapok, raw silk, orris, glue, pyrethrum, wool, tobacco, ragweed, jute, horse dander, and the moulds, *Alternaria*, *Aspergillus*, *Mucor*, *Monilia albicans*, *Dematium*, *Penicillium*, and *Hormodendrum*, failed to produce positive Dale tests in 147 tests on dust-sensitised guinea-pigs. Uterine muscles, sensitised by dust extract, gave positive Dale reactions to dust extracts in 13 of 18 instances. Human dander extract gave a positive Dale test in 8 of 12 uteri sensitised by dust extract, but completely neutralised to dust extract in only 1 instance. Alum-pptd. human dander extract sensitised 2 of 4 guinea-pigs injected, and 1 of these 2 was sensitive to dust extract. C. J. C. B.

Significance of cottonseed sensitiveness. H. S. BERTON, J. R. SPIES, and H. STEVENS (J. Allergy, 1940, 11, 138—146).—The sp. and potent water-sol. allergens of the cottonseed embryo do not occur in refined cottonseed oil, which patients who are sensitive only to water-sol. cottonseed extractives may safely take. C. J. C. B.

Allergic syndromes in absence of allergens. H. L. ALEXANDER (J. Allergy, 1940, 11, 163—169).—A lecture. C. J. C. B.

Immunologically altered skin reactivity in non-atopic persons. L. W. HILL (J. Allergy, 1940, 11, 170—177).—A crit. review. C. J. C. B.

Oral pollen therapy. S. C. SCHWARTZ (J. Lab. clin. Med., 1940, 25, 566—575).—In 154 cases the results have been comparable with those to be expected with the hypodermic method. C. J. C. B.

Reaction of mouse skin to various reduced and partially oxidised sulphur compounds. S. P. REIMANN and G. TOENNIES (Arch. Path., 1940, 29, 175—180).—Mouse skins were rubbed with thiocresol, cysteinesulphinic acid, cystine, cystine disulphoxide, *dl*-methionine, methionine sulphoxide, and dibenzanthracene. Of these, only thiocresol increased the rates of cell proliferation and the cells subsequently differentiated and organised to higher degrees than in normal skin. C. J. C. B.

Bites of rabid animals treated by experimental cautery with ultra-violet rays and eosin. J. H. JORDAN, H. PEDERSEN, and S. SHU (Trans. Roy. Soc. trop. Med. Hyg., 1939, 33, 233—240).—Experiments performed on 40 rabbits indicate that ultra-violet light is effective in the cauterisation of rabies bites. C. J. C. B.

Vollmer tuberculin patch test: evaluation of its relative sensitivity. J. G. HUGHES (J. Pediat., 1940, 16, 171—178).—The patch test is shown to be more sensitive than the intradermal test with first-strength solution of purified protein derivative and less sensitive than the intradermal test with second-strength solution of purified protein derivative. C. J. C. B.

Influence of organic solvents on activity of drugs. L. ZANCAN (Arch. int. Pharmacodyn., 1940, 64, 171—183).—The effects of drugs like luminal in org. solvents, methylacetamide, etc. were compared with those of the same agents in water when injected

into rodents. Local effects were compared in the groins of the same animal, or the general effects in different animals. Much depends on the solubility of the agents. The rate of absorption may be quite different. D. T. B.

Action of drugs on cells. J. C. KRANTZ (Arch. int. Pharmacodyn., 1940, 64, 115—121).—The principle of le Chatelier is invoked for explanation of the action of drugs on living cells. The drug retards or accelerates degradation or synthesis in rapidly shifting equilibria. *E.g.*, narcotics demobilise cytochrome in nerve cells by inactivating reductase. A new equilibrium is set up with smaller CO₂ output. D. T. B.

(xxi) PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Physical fitness of pre-adolescent boys. D. BURNS and J. SECKER (J. Physiol., 1940, 98, 2p).—Three groups of 6 boys aged 12—14 were selected as the fittest of their type by physical training experts from the following three socio-economic levels: (a) a Grammar School; (b) a Suburban Secondary School; (c) a Boy Scout Group from an artisan district. Physical fitness decreased in the order mentioned, group (a) being the fittest. J. A. C.

Biochemical changes caused by training. ASATIANI and KUNTSCHULLA (Ukrain. Biochem. J., 1939, 14, 171—190).—Training of athletes causes increase in blood-glutathione, affecting chiefly the reduced form, and in blood-catalase activity. The rise in blood-lactic acid and -glutathione, and in the reducing power of the urine, following fatigue is smaller in trained than in untrained subjects. Blood-sugar is not significantly affected. R. T.

Temperatures lethal to louse. P. A. BUXTON (Brit. Med. J., 1940, I, 341).—Lice are killed by exposure to a temp. of 46° for 45—60 min. or to 51·5° for 5 min. Eggs are killed by 50° for 30 min. or 53·5° for 5 min. C. A. K.

Cabinet cubicle for infants, combining isolation with control of temperature and humidity. C. C. CHAPPLE (J. Pediat., 1940, 16, 215—219). C. J. C. B.

Occupational dermatitis due to mint. W. M. SAMS (Arch. Dermat. Syphilol., 1940, 41, 503—505).—An occupational dermatitis due to mint in 2 bartenders is reported. Patch tests indicate *Mentha citrata* to be a potential source of contact dermatitis. C. J. C. B.

X-Ray study of lungs of workmen in asbestos industry, covering period of ten years. A. W. GEORGE and R. D. LEONARD (Radiology, 1939, 33, 196—202).—All asbestos mining and manufacturing cannot be classed together from the point of view of dust hazard. Asbestosis is not a progressive disease after removal from the dust hazard. No close relation was found over the 10 years of study between tuberculosis and asbestosis. W. F. F.

Safety on Delaware Aqueduct. [Control of silicosis and toxic gases.] F. S. MILLER (Industr. Hyg. Bull., 1940, 19 5—6).—Methods adopted for

the control of silicosis and toxic gases during blasting through 85 miles of rock tunnel are described.

C. G. W.
Protection of radiation worker. G. W. C. KAYE (Nature, 1940, 145, 370—373).—A review.

W. F. F.

(xxii) RADIATIONS.

Changes in respiration [of skin slices] following irradiation [of skin *in situ*] with X-rays. J. C. FARDON, W. A. SULLIVAN, G. C. BROTZGE, M. K. LOEFFLER, and M. B. ANDRUS (Stud. Inst. Divi Thomae, 1939, 2, 203—213).—Skin respiration at site of X-ray burn is depressed for about 13 days after irradiation. This is followed by increased respiration for about 35 days during period of active regeneration of tissue with extensive invasion of the area by lymphoid cells. D. BU.

Stimulation of rat skin respiration by ultra-violet irradiation *in vivo*. M. M. LANE and C. H. JANSEN (Stud. Inst. Divi Thomae, 1939, 2, 283—286).—Irradiation of the shaved abdominal wall of female rats increased the respiration of the skin (slices) over that of unexposed skin for about 4 hr. The rapidity of onset of the increased O₂ uptake suggests a direct action from liberated hormones rather than from the erythema and leucocytosis produced secondarily. D. BU.

[Skin] pigment darkening caused by long-wave ultra-violet light. G. MIESCHER and H. MINDER (Strahlenther., 1939, 66, 6—23).—Instantaneous darkening of pigmented (living) skin after irradiation with long-wave ultra-violet light, darkening of excised pieces of skin after irradiation with the quartz lamp (Lignec's phenomenon), and darkening of such pieces of skin after heating to 56° (Cheirowsky's phenomenon) are fundamentally equal processes. They are caused by the oxidation of the pigment already present, an incompletely reversible process showing the usual pigment to be a mixture of an O-saturated and an O-poor form. E. M. J.

Radiosensitivity of rats' skin in relation to central and peripheral nervous system. H. BADE (Strahlenther., 1939, 66, 50—65).—Section of the anterior and posterior nerve roots or of the spinal cord prolonged the latent period, spread the reaction, and postponed healing of radiodermatitis in white rats. This effect is attributed to changes in the local blood supply. E. M. J.

Differences of skin reaction with hard and soft X-radiation. A. FRANK (Strahlenther., 1939, 66, 66—72).—Two small skin fields on either thigh of 14 patients were given 1600—1800 r. at 160—170 kv. and 0·5 mm. Cu + 1 mm. Al or 60—110 kv. and 1 mm. Al filter, respectively, the focus-skin distance being 20 cm. In all cases the reaction was more severe on the side receiving the harder rays. E. M. J.

Basic principles and problems of short-wave therapy. B. RAJEWSKY (Strahlenther., 1939, 66, 269—295).—A review.

Biological problems of high-frequency therapy. SCHLIEPHAKE (Strahlenther., 1939, 66, 296—302). E. M. J.

Radium dosimetry. H. SMEREKER (Strahlenther., 1939, 66, 320—327).—The dose const. r. per mg.-hr. in 1 cm. is dependent on the form of the applicator used. Measurements on different surface Ra applicators which were known to give certain results showed that more recurrences were seen when the field was smaller than 5 sq. cm. and when the intensity at 10 mm. depth was only 0.6 r. per min. as against 0.8 r. per min. The use of multiple fields on a phantom of a chin for the treatment of a sublingual carcinoma resulted in a tumour dose of 78% of the surface dose. A spherical chamber made of elektron metal and with a vol. of 33 cu. mm. was used for the dosimetry. E. M. J.

Ultra-violet dosimeter readings. D. LANGEN (Strahlenther., 1939, 66, 530—534).—The ultra-violet dosimeter readings represent relative vals. only; individual workers should be assayed by comparison with the colour-sensitivity of an average worker. E. M. J.

Depth dose distribution of X-rays in rotation therapy. M. NAKAIDZUMI and T. MIYAKAWA (Strahlenther., 1939, 66, 583—592).—A rotating cylindrical beeswax phantom was irradiated and the depth dose measured directly at several points. At a depth of 10 cm., i.e., at the axis of rotation, the dose was 200 to over 300% of the surface dose with a focus-surface distance of 40 cm., a focus-diaphragm distance of 30 cm., and a diaphragm of 4 to 2 cm. in this order. The quality of X-rays had no influence on the depth dose within the limits examined (120—160 kv. and a $\frac{1}{2}$ val. layer of 0.58—0.89 mm. of Cu). For clinical purposes it is necessary to introduce a Pb pellet into the irradiated body cavity or hollow organ and observe the shadow on a fluorescing screen, the cubicle being darkened. E. M. J.

Depth dose and rotation therapy. R. DU M. DE ROCHEMONT (Strahlenther., 1939, 66, 593—608).—Calculations based on the phantom experiments of Nakaidzumi and Miyakawa (*ibid.*, 1937, 60, 648; 1938, 63, 176) show that in rotation radiation the scatter increases the surface dose and thereby diminishes the relative depth doses. This mechanism is operative mainly in small fields which are rarely used in actual therapy. This scatter also compensates the increased penetration of hard rays. E. M. J.

Biological and physical basis of red and infra-red therapy. U. HENSCHKE (Strahlenther., 1939, 66, 646—662).—A review. E. M. J.

Electron bombardment of biological materials. II. Rate of death of fungus spores bombarded in vacuum with cathode-ray beams from 4—15 kv. R. M. WHELDEN, C. E. BUCHWALD, F. S. COOPER, and C. P. HASKINS (J. Gen. Physiol., 1940, 23, 391—400).—The rate of inactivation is described of spores of *Aspergillus niger* bombarded in a vac. with homogeneous beams of cathode rays of velocities and densities in the range of those of showers of secondary electrons produced in biological materials irradiated with moderately soft X-rays, thus serving as a quant. indicator of the mechanics of X-ray action. The effect on germination and growth is discussed. D. M. N.

Mitogenetic radiation. H. BARTH and O. GLASSER (Radiology, 1939, 33, 25—33).

W. F. F.

(xxiii) PHYSICAL AND COLLOIDAL CHEMISTRY.

Osmotic pressure and mol. wt. of serum-albumin and -globulin of selachians and cyclostomes. J. ROCHE, Y. DERRIEN, and M. FONTAINE (Compt. rend., 1940, 210, 374—376; cf. A., 1939, III, 816).—The serum-proteins of dog-fish (*Galeus canis*, L.; *Scylliorhinus stellaris*, L.) and the marine lamprey (*Petromyzon marinus*, L.) are fractionally pptd. with $(\text{NH}_4)_2\text{SO}_4$, the fractions being dialysed at 0° against N/15- PO_4^{4-} buffer at pH 6.38 and osmotic pressures measured (Adair). Dog-fish sera contained albumin of mol. wt. $65.5\text{--}70.4 \times 10^3$, whilst that of *P. marinus* was 56.8×10^3 , probably due to globulin as an impurity. The serum-globulins had mol. wts. of 154.8, 213 (dog-fish), and 34×10^3 (lamprey) (cf. Svedberg *et al.*, A., 1938, III, 782). J. L. D.

Determination of low-frequency impedance of animal tissue. J. W. DUYFF (Arch. néerland. Physiol., 1940, 24, 133—141).—In determinations of the low-frequency impedance of living tissue, the amplitude of the measuring current passing through the tissue should be independent of the ohmic resistance of the tissue. This is achieved by a balanced resistance method of operating a Kohlrausch bridge. J. W. S.

Stabilisation of spider crab nerve membrane by alkaline earths, as shown by resting potential measurements. R. GUTTMAN (J. Gen. Physiol., 1940, 23, 343—364).—Isotonic solutions of salts of Ba, Sr, Ca, and Mg have no effect on the resting potential of non-medullated spider crab nerve. Ba, Sr, and Ca can prevent the depressing action of K on the resting potential. The decreasing order of effectiveness is Ba, Sr, Ca. Ba, Sr, Ca, and Mg oppose the depressing action of veratrine sulphate; the decreasing order of effectiveness is Ba, Sr, Ca, Mg. The action of saponin, amylurethane, chloral hydrate, and Na salicylate, which all depress the resting potential, is abolished by Ba. Hypertonic sea-water does not affect the potential. The alkaline earths reversibly depress excitability. The org. agents which depress the resting potential also depress excitability, in most cases reversibly, but the concns. necessary to depress excitability are much smaller than those necessary to depress the resting potential. The bearing of these findings on resting potential phenomena is discussed. D. M. N.

Behaviour of water in certain heterogeneous systems. W. J. V. OSTERHOUT and J. W. MURRAY (J. Gen. Physiol., 1940, 23, 365—390).—Models were designed to imitate living cells, the protoplasmic surface being represented by guaiacol. The behaviour of the two-phase system of water and guaiacol under the influence of trichloroacetic acid, acetone, etc. is described and discussed with reference to the possible occurrence of similar phenomena in the living cell. D. M. N.

Bioelectric potentials in *Halicystis*. VIII. Effects of light. L. R. BLINKS (J. Gen. Physiol., 1940, 23, 495—520; cf. A., 1939, III, 210).—The

effect of light on the normal p.d. across the protoplasm of impaled *Halocystis* cells was slight; if the p.d. had been decreased by low O_2 content or increased CO_2 content of the water, light restores the p.d. (probably through the photosynthetic production of O_2 and utilisation of CO_2). The presence of NH_4 salts in the water markedly sensitises the cells to light. The ultimate cause of the light effects is an alteration of the surface properties of the cell. D. M. N.

Chemical aspects of potassium effect. W. J. V. OSTERHOUT (J. Gen. Physiol., 1940, 23, 429—432).—The ability of *Nitella* to distinguish electrically between Na^+ and K^+ appears to depend on org. substances present in the cell. The specificity of these substances in determining mobility and partition coeff. of K^+ and Na^+ is discussed (cf. A., 1938, III, 963). D. M. N.

Electrophoresis of pepsin. R. M. HERRIOTT, V. DESREUX, and J. H. NORTHROP (J. Gen. Physiol., 1940, 23, 439—447).—Pepsin preps. containing several protein components were studied by electrophoresis. All samples showed a homogeneous boundary moving to the anode at p_H 4.4. The activity of this material, although it may be higher than that of the original solution on the basis of total N, is the same on the basis of protein-N. The apparent isoelectric point at p_H 2.7, previously obtained by the collodion particle method, is due to the presence of decomp. products. Pure cryst. pepsin, free from decomp. products, is always negatively charged. D. M. N.

Electrophoresis of haemocyanins.—See A., 1940, I, 255.

Permeability of insect cuticle. H. HURST (Nature, 1940, 145, 462—463).—The toxicity of poisons used as insecticides depends primarily on the physico-chemical relations of the toxic principle and the carrier. Feebly dissociating compounds of high dielectric const. (ϵ) penetrate the cuticle of insects more readily in presence of relatively apolar substances of low ϵ . Thus, the toxicity of constituents of heavy naphtha, e.g., indene, to *Cimex lectularius*, L., is much increased by the addition of non-toxic mixtures of paraffins and cycloparaffins. The main region of induced penetration is at the cuticle-haemolymph interface. With strongly dissociating compounds, such as neutral salts and mineral acids, induced penetration is negligible. The inner chitinous layer of the insect cuticle is relatively permeable to polar and apolar compounds. The outer lipin layer is relatively impermeable to polar compounds. L. S. T.

Reactions of iodine and iodoacetamide with native ovalbumin. M. L. ANSON (J. Gen. Physiol., 1940, 23, 321—331).—Native ovalbumin treated with I and then denatured no longer gives a nitroprusside test or reduces dil., neutral $Fe(CN)_6'''$ reagent (cf. A., 1940, III, 160). More I is needed to abolish the $Fe(CN)_6'''$ reduction if albumin and I react at p_H 6.8 than if they react at p_H 3.2. At p_H 6.8, I reacts with tyrosine as well as cysteine. Cysteine and tryptophan are the only amino-acids with reducing groups which are known to react with dil. I at p_H 3.2. The reducing power of cysteine is abolished by I, whilst the

reducing power of tryptophan is unchanged. Pepsin and chymotrypsinogen, which contain tryptophan but not cysteine, do not react with I at p_H 3.2. Native ovalbumin treated with iodoacetamide at p_H 9.0 and then denatured by duponol PC reduces only 60% as much $Fe(CN)_6'''$ as untreated albumin. The thiol group is the only protein reducing group known to react with iodoacetamide. Hence native ovalbumin appears to contain free and accessible but relatively unreactive thiol groups which react with I and iodoacetamide but not with $Fe(CN)_6'''$, porphyrindin, or nitroprusside. Tobacco mosaic virus was modified by I at p_H 2.8 without being inactivated; this virus and rabbit papilloma virus were not inactivated by iodoacetamide at p_H 8.0. D. M. N.

Coagulation and denaturation of ovalbumin by shaking. C. F. WANG and H. WU (Chinese J. Physiol., 1940, 15, 67—82).—Albumin was shaken for 1 hr. in unbuffered solutions at different p_H , coagulated protein filtered off, denatured protein pptd. by neutralisation, and the 3 fractions were determined by a micro-Kjeldahl method. Coagulation was max. at p_H 4.8, min. at 2, and then increased sharply; below 1 it occurred without shaking. Between p_H 4 and 1, there was some albumin which was denatured but not coagulated; on the alkaline side of the isoelectric point there was none; this fraction was decreased by Na_2SO_4 , which increased coagulation. Saponin prevented coagulation but not denaturation, which began rapidly and stopped when about 10% was denatured. At p_H vals. at which denaturation and coagulation occurred, denaturation was at first rapid, but when half was coagulated, no denatured protein was left. N. H.

Reversibility of denaturation of serum-albumin. J. ROCHE and M. S. CHOUAÏECH (Compt. rend. Soc. Biol., 1940, 133, 474—478).—Natural horse serum-albumin and the reversed protein after acid-acetone denaturation (Anson and Mirsky, A., 1931, 1080) have the same mol. wt. but differing solubilities in increasing concns. of $(NH_4)_2SO_4$ at p_H 6.16. H. G. R.

Hydrolysis of proteins. II. Alkaline hydrolysis of fish proteins. A. J. J. VAN DE VELDE (Natuurwetensch. Tijds., 1940, 22, 7—20).—The muscles of cod, haddock, whiting, and coal-fish give approx. the same yields of protein-B on hydrolysis with alkali and acidification to the isoelectric point. The best results are obtained with $n./18.2-NaOH$ at room temp.; HNO_3 and mono- and di-chloroacetic acids are better precipitants than HCl and acetic acid. The amounts of albuminoses and peptones produced are inversely proportional to the amounts of protein-B. S. C.

Molecular structure and surface properties of hair and wool keratin.—See A., 1940, I, 253.

Molecular structure of fibres of the collagen group.—See B., 1940, 383.

(xxiv) ENZYMES.

Crystalline lactic dehydrogenase from heart muscle. F. B. STRAUB (Biochem. J., 1940, 34, 483—486; cf. A., 1939, III, 719).—The enzyme is

adsorbed from aq. extract of minced bullock's heart on $\text{Ca}_3(\text{PO}_4)_2$, eluted with PO_4''' buffer at p_{H} 7.2, and pptd. successively with aq. $(\text{NH}_4)_2\text{SO}_4$ and acetone. In cold aq. $(\text{NH}_4)_2\text{SO}_4$ it is stable for not less than 6 weeks but is inactivated and denatured if freed from salts. Lactic dehydrogenase is not identical with malic dehydrogenase. W. McC.

Inhibition by hydrogen peroxide of the aerobic oxidation of succinate. L. MASSART, L. VANDENDRIESSCHE, and R. DUFAIT (*Enzymologia*, 1940, 8, 204—210).—The aerobic oxidation of succinate by extract of pigeon breast muscle (containing NH_2OH to inactivate the catalase) is inhibited by H_2O_2 ; H_2O_2 also inactivates the succinic dehydrogenase in the absence of substrate, probably by attacking the SH groups of the colloidal carrier of the enzyme. Cytochrome-oxidase is also inactivated by H_2O_2 . Since H_2O_2 is not produced from succinate by the extract in presence of pyruvate, malonate, and NH_2OH , the biological oxidation of succinate is succinic acid (1 mol.) + $\text{O} \rightarrow$ fumaric acid (1 mol.) + H_2O . W. McC.

Inhibition of succinoxidase by cozymase. V. R. POTTER (*Arkiv. Kemi, Min., Geol.*, 1939, 13, B, No. 7, 5 pp.).—Concns. of cozymase inhibiting the succinoxidase system are higher than physiological concns. E. M. W.

Ascorbic acid oxidase. G. B. RAMASARMA, N. C. DATTA, and N. S. DOCTOR (*Enzymologia*, 1940, 8, 108—112).—The activity of the oxidase is approx. proportional to its Cu content and hence, although plant juices contain also non-catalytic Cu, Cu is probably an active constituent of the oxidase. Cu-protein mixtures (globulin from Bengal gram) also oxidise ascorbic acid but their activity per unit wt. of Cu is much less than that of the oxidase, which apparently contains a sp. protein. W. McC.

Tyrosinase in feather germs. D. R. CHARLES and M. E. RAWLES (*Proc. Soc. Exp. Biol. Med.*, 1940, 43, 55—58).—Extracts of black chicken feather germs contained tyrosinase in 80% of tests. Red feather germs contained it in 60%. V. J. W.

Tyrosinase from *Dolichos lablab*. S. L. VENKATISWARAN and M. SREENIVASAYA (*Current Sci.*, 1940, 9, 21—22).—Tyrosinase extracts oxidise pyrocatechol easily and phenol less easily. With progressive purification, the difference becomes more marked. E. M. W.

Fermentation process in tea manufacture. V. Rôle of cytochrome oxidase. VI. Effect of dilution on rate and extent of oxidations in fermenting tea-leaf suspensions. E. A. H. ROBERTS (*Biochem. J.*, 1940, 34, 500—506, 507—516; cf. A., 1939, III, 720, 951; 1940, III, 161).—V. The R.Q. and rate of fermentation are not in accord with the ascorbic acid oxidase theory of the process and it is shown that oxidation of the acid does not precede that of tannins during the fermentation. The oxidation is brought about by the primary oxidation product of tea tannin thus: o -quinone + ascorbic acid \rightarrow pyrocatechol + dehydroascorbic acid, so that, when the product is removed by condensation, oxidation of the acid ceases. Very probably the

oxidase involved is cytochrome oxidase and a revised scheme for the fermentation is accordingly proposed. The occurrence of the cytochrome oxidase system renders desirable re-investigation of the respiratory enzymes of plants and a revision of Onslow's classification (A., 1921, i, 485).

VI. The increased rate of O_2 uptake and the decreased rate of carbohydrate oxidation, which result from diluting aq. suspensions of fermenting tea leaf, and other phenomena of tea fermentation are best explained on the supposition that the treatment to which the leaf is subjected results in dispersion of the co-enzymes. In dil. suspensions, the rôle of peroxidase is negligible. W. McC.

Polyphenolases. E. YAKUSHIJI (*Proc. Imp. Acad. Tokyo*, 1940, 16, 39—41).—Laccase isolated from *Rhus succedanea* and *R. vernicifera* oxidises o - and p -polyphenols and other substances but not resorcinol or p -cresol whilst laccase from *Lactarius piperatus* oxidises all these compounds. Tyrosinase from *L. vellereus* contains an activator which stimulates the oxidation of p -cresol. E. M. W.

Action of methylglyoxalase. H. PETROVICIKI (*Biochem. Z.*, 1939, 303, 186—199; cf. Lohmann, A., 1932, 1287).—The enzyme is extracted from the fresh liver of the calf with water, inactive protein is removed by adding acetate buffer, and the enzyme is separated by fractional pptn. with $(\text{NH}_4)_2\text{SO}_4$. Purification is achieved by dissolution in water, pptn. with acetone, and fractional dissolution in water. Thus, over all, 100-fold concn. is attained. The rate at which the enzyme transforms methylglyoxal into lactic acid does not depend on the methylglyoxal concn. (reaction of null order) when the ratio of co-enzyme (reduced glutathione) to apo-enzyme is from 1:1 to 32:1 but when the ratio is greater than 32:1 the rate increases with increase in substrate concn. although remaining proportional to time. The rate increases, at first rapidly, later more slowly, as the glutathione concn. increases until a max. glutathione concn. is reached. The rate is then approx. inversely proportional to the vol. of solution. When the glutathione concn. is below the max. the rate is less dependent on this vol. The temp. coeff. of the reaction is 2.75. The linear course of the reaction is explained by supposing that saturation of the active centres of the enzyme with substrate occurs and that the substrate increases the no. and activity of these centres. The glutathione is attached to active centres other than those occupied by the substrate. W. McC.

Carboxylase. J. L. MELNICK and K. G. STERN (*Enzymologia*, 1940, 8, 129—151; cf. A., 1940, III, 161).—Carboxylase is best extracted from yeast with 0.1M- Na_2HPO_4 . Aq. $(\text{NH}_4)_2\text{SO}_4$ ($\frac{1}{2}$ saturated) is slightly, and water, aq. NaCl, and 50% glycerol much less, effective. The activity and stability of the enzyme are at a max. at p_{H} 6.1; its isoelectric point is p_{H} approx. 5.1. Stability is favoured by low temp. and is greater in glycerol and PO_4''' than in aq. extracts. Cu in very low concn. inactivates carboxylase, the ease of inactivation increasing with increase in the purity of the enzyme. Carboxylase is adsorbed by Al_2O_3 and is partly purified by pptn. with $(\text{NH}_4)_2\text{SO}_4$ or acetone. Partial purification is

also achieved by electrophoresis and the use of the ultracentrifuge and it is shown that the mol. wt. of the enzyme is approx. 141,000. Evidence is given that carboxylase belongs to the group of enzymes in which 1 mol. of protein catalyses the reaction of many co-enzyme and substrate mols. by rapidly exchanging its prosthetic group during catalysis. Phosphopyruvic acid is probably not an intermediate in the decarboxylation of pyruvic acid by carboxylase.

W. McC.

Cause of the "activation" of the carboxylase system by free aneurin. H. G. K. WESTENBRINK and D. A. VAN DORP (Nature, 1940, 145, 465—466).—Experiments described support the view that the apparent activation of the carboxylase system by free aneurin (A., 1938, III, 614) is due to the inhibition, by aneurin, of the phosphatase action.

L. S. T.

Determination of cocarboxylase and aneurin by a micro-modification of Ochoa and Peters' method. H. G. K. WESTENBRINK (Enzymologia, 1940, 8, 97—107; cf. A., 1938, III, 926; Linderström-Lang and Glick, *ibid.*, 439).—Application of the Cartesian-diver technique permits determination of 0.00005 µg. of cocarboxylase and 0.0005 µg. of aneurin. Yeasts freed from cocarboxylase and aneurin by washing with alkaline PO_4^{3-} solutions exhibit large differences in sensitivity to cocarboxylase in the absence of aneurin and to aneurin in presence of cocarboxylase. When aneurin is absent, the sensitivity to cocarboxylase of brewer's yeast is much greater than that of baker's yeast. All yeasts, if suitably washed, and supplemented with Mg^{++} and cocarboxylase, are sensitive to aneurin. The method of washing greatly affects the sensitivity, which is diminished if the temp. of washing is 30°. The amount of cocarboxylase required in presence of aneurin is very much less than that required in its absence. Yeast probably contains an essential substance (? protein) which combines with aneurin, this substance and not the free aneurin being the active agent. The stimulating effect of acetylaneurin is approx. half that of free aneurin.

W. McC.

Determination of cocarboxylase in blood and tissues by thiochrome method. K. RITSERT (Klin. Woch., 1939, 18, 1370—1372).—Cocarboxylase is determined by absorption, after being decomposed to free aneurin by diastase.

M. K.

Distribution and significance of carbonic anhydrase. H. VAN GOOR (Enzymologia, 1940, 8, 113—128).—The anhydrase occurs in varying proportions in the erythrocytes of warm-blooded animals, in the pancreas of many warm- and cold-blooded animals, in lower animal organs which have functions similar to that of the pancreas, and in the gills of molluscs. The significance of the enzyme for the removal of CO_2 is discussed. As a rule, the presence in living tissue of the enzyme is undesirable since it catalyses the reaction $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$ as well as the reverse reaction.

W. McC.

Plasma- and erythrocyte-lipase during fasting and subsequent feeding, avitaminosis-C, and hyperthyroidism. G. SCOZ and G. ZORZOLI (Enzymologia, 1940, 8, 177—192; cf. A., 1937, III, 440).—

Erythrocyte-lipase (guinea-pig), in addition to its insensitivity to quinine and atoxyl, differs from plasma-lipase in its greater sensitivity to $[\text{H}^+]$, its greater independence of concn. of substrate, and in its lower activity. Plasma-lipase activity is directly proportional to the time of incubation at 37° and, for short periods of incubation and low concns. of substrate, to the concn. of substrate. In conditions of growth, e.g., during feeding after fasting, after thyroxine treatment, and during recovery from avitaminosis-C, blood- and plasma-lipase activities are below normal; fasting also diminishes lipase activity. Thyroxine treatment increases erythrocyte-lipase activity, whilst small doses diminish, and large doses increase, plasma-lipase activity. The mechanism of these changes is discussed. F. O. H.

Hydrolysis of fats and fatty acid esters. VI. T. ONO (J. Agric. Chem. Soc. Japan, 1940, 16, 147—158; cf. A., 1940, I, 260).—Triglycerides are less readily hydrolysed by *Ricinus* than by pancreatic lipase. Increasing the no. of C in the alcohol component of fatty acid esters decreases the rate of hydrolysis by both enzymes. The no. of C in the acid component of the esters has no relationship to the hydrolysis of the esters as is the case with hydrolysis of triglycerides. Esters of unsaturated fatty acids are more rapidly hydrolysed than those of saturated acids with the same no. of C. Methyl and ethyl formate, acetate, valerate, benzoate, salicylate, and phthalate are scarcely affected by the two enzymes. The differences in the hydrolysis of *n*- and *iso*-butyl esters of fatty acids are not due to structural differences but to the density of the esters, whilst the difference between *n*- and *iso*-propyl esters is probably due to the structure of the alcohols.

J. N. A.

Action of ions on choline-esterase. D. NACHMANSOHN (Nature, 1940, 145, 513—514; cf. A., 1940, III, 162).—Choline-esterase is active only in presence of bivalent cations. After dialysis activity is practically lost, but a few µg. of bivalent ions restore it. The order of increasing activation is Ba^{++} , Ca^{++} , Mg^{++} , and Mn^{++} . Na^+ and K^+ also reactivate the enzyme, but less strongly.

L. S. T.

Activators of bacterial rennin. D. TALCE-NIEDRA (Enzymologia, 1940, 8, 163—166; cf. A., 1940, III, 347).—Potato extract activates the rennin but not the peptone-splitting protease of bacteria. Other activators of varying strength occur in extracts of peas, carrots, pumpkin, melilot, yeast, and caraway. Sometimes these extracts inhibit the action of the rennin. *l*-Ascorbic acid, KCl, BaCl_2 , FeCl_3 , and KCN in low concns. also activate bacterial rennin, which is an independent enzyme.

W. McC.

Synthesis of glycoamine and creatine from amino-acids, urea, and cyanamide. H. H. BEARD and J. K. ESPENAN (Enzymologia, 1940, 8, 241—251).—The rate of *in vitro* synthesis of glycoamine from glycine and urea or cyanamide, and of creatine from sarcosine and urea or cyanamide, in presence or absence of small amounts of NH_3 (which acts as a catalyst) depends on temp., concn., and time. Muscle tissue, but not liver or kidney, contains an enzyme which accelerates the synthesis of glyco-

amine and creatine from urea and glycine and sarcosine, respectively, when the tissue and each of the substances in aq. solution are incubated at 37° for 3—7 days. It is concluded that muscle tissue is the site of synthesis of glycoamine and creatine from amino-acids. The formation of creatine from creatinine does not require an enzyme since it occurs in aq. solution at approx. the same rate as in the body. The enzyme in muscle tissue is not essential for the above syntheses if the substances are autoclaved at 15 lb. pressure for 15 min., or larger concn. or longer time of reaction is used. Caffeine increases the rate of reaction between glycine and urea in the case of muscle but not kidney tissue. Glycoamine and creatine are also formed when solutions of cyanamide with glycine and sarcosine respectively are evaporated at 80°. The animal body can hydrolyse and methylate glycoamidine to creatine. J. N. A.

Kidney-peptidase. S. UTZINO and M. NAKAYAMA (Enzymologia, 1940, 8, 280—288).—The heat-stability and behaviour to adsorbents of the enzymes in pig kidney are determined. After 30 min. at 60°, a maceration of kidney still exhibits peptidase and hippuricase activity, but after 15 min. at 80° both enzymes are almost completely destroyed. Peptonase is destroyed after 10 min. at 70°, and after 15 min. at 70° tripeptidase activity is lost, but hippuricase and dipeptidase are still present, whilst hydrolysis of benzyldiglycine is no longer observed. Heating at 75° for 15 min. almost inactivates hippuricase and after 30 min. at 75° dipeptidase is the only enzyme present. After adsorption on kieselguhr, C, or kaolin the residual solution (p_H 4) still contains peptonase, dipeptidase, and hippuricase, whilst acylase is absent, as hydrolysis of benzyldiglycine no longer occurs. The eluate (p_H 8.0) from adsorption on $Fe(OH)_3$ contains acylase but not hippuricase, whilst the eluate (p_H 9.0) obtained by aq. NH_3 from C adsorption contains peptonase, but neither acylase nor di- or tri-peptidase. Hydrolysis of benzyldiglycine by pig kidney is max. at p_H 7.2 and 4.4. J. N. A.

Hydrolysis of acyl radicals of polypeptides composed of glycine. I. II. T. KAZAMA (Acta Sch. med. Univ. Kyoto, 1939, 33, 169—175, 176—180).—I. The activity of a polypeptidase is proved to be related to the no. of peptide linkages in a compound. Acylglycine and acyltriglycine were more completely hydrolysed by renal, acylglycine by pancreatic, and acyltriglycine by intestinal peptidases.

II. Carboxypolypeptidases of liver and spleen hydrolyse benzoylpolypeptides but do not split chloroacetyl- and 2-naphthalenesulpho-derivatives. Papain-HCN has a marked enzymic effect on gelatin and peptone but none on polypeptide radicals. H. L.

Sulphopeptidase. I. Isolation of renal peptidases by adsorption. II. Specificity of sulphopeptidase. T. KAZAMA (Acta Sch. med. Univ. Kyoto, 1939, 33, 154—159, 160—168).—I. Histozyeme could be separated from sulphopeptidase and a benzyldiglycine-splitting enzyme by adsorbing a glycerinated kidney extract (p_H 5.1) on a suspension of Al_2O_3 C γ . Separation of the latter two enzymes was accomplished by repeated adsorption and

elution of the adsorbed fraction with a glycerinated NH_3 solution.

II. The isolation of pancreatic peptidases acting specifically on benzoylglycyl-L-leucine, 2-naphthalenesulphoglycyl-L-leucine, and chloroacetyl-L-phenylalanine respectively is deduced from the different enzymic effects of solutions obtained by fractional pptn. of a glycerinated extract of dried pancreas (pig) on these polypeptide radicals. H. L.

Bacterial proteases. XIII. Absence from anaërodipeptidases of the carbonyl group necessary for the activity. E. MASCHMANN (Biochem. Z., 1939, 303, 145—151; cf. A., 1940, III, 163).—The activity of anaërodipeptidases, activated by cysteine + Fe or cysteine + Mn, is not diminished by reagents for the CO group (N_2H_4 , phenylhydrazine, NH_2OH , semicarbazide) and in some cases is increased by these reagents. The activity of the corresponding dehydrodipeptidases, and in some cases also that of the apodipeptidases (less effective) produced by the action of cysteine, is diminished by the reagents. The magnitude of the effect depends on the origin of the enzyme and the reagent used, phenylhydrazine being the most active. Semicarbazide has no effect. The active anaërodipeptidases contain no aldehyde or keto-groups and the free NH_2 of their substrates does not serve merely as a place of attachment for the enzymes. W. McC.

Diffusing factors. IV. Mode of action. M. G. EVANS and J. MADINAVEITIA. V. Separation from proteolytic enzymes in culture filtrates of *Clostridium welchii*. J. MADINAVEITIA. VI. Action of testicular extracts on viscosity of vitreous humour preparations. J. MADINAVEITIA and T. H. H. QUBELL (Biochem. J., 1940, 34, 613—620, 621—624, 625—631).—IV. A mathematical discussion.

V. The proteolytic enzymes of *Cl. welchii* may be separated from the diffusing factor by pptn. from dialysed culture filtrates with M-acetate buffer at p_H 4, by fractional adsorption on Al_2O_3 C γ , or by elution of the diffusing factor from combined adsorbates at a lower p_H (1% pyridine).

VI. Testicular mucinase may be determined by the viscosimetric method described with an error not exceeding 5%. The optimum p_H is approx. 4.7, and it is uncertain whether the enzyme is identical with the diffusing factor. P. G. M.

Physico-chemical properties of proteolytic enzyme from latex of milkweed, *Asclepias speciosa*, Torr. Comparison with other proteases. I. Chemical properties, activation-inhibition, p_H -activity, and temperature-activity curves. II. Kinetics of protein digestion by asclepain. III. Kinetics of heat-inactivation of papain, bromelin, and asclepain. T. WINNICK, A. R. DAVIS, and D. M. GREENBERG (J. Gen. Physiol., 1940, 23, 275—288, 289—300, 301—308).—I. *Asclepain*, a proteolytic enzyme from the latex of milkweed, clots milk and digests most proteins; it does not clot blood. The activation and inhibition phenomena of the enzyme resemble those of papain, and can be explained by assuming that free thiol groups in the enzyme are necessary for activity. No definite

p_H optima were found for digestion of undenatured proteins; for proteins in urea solution, there were well-defined max. near 7.0. The optimum temp. increased with decreasing time of digestion.

II. At higher concns. of enzyme, the clotting time of milk was inversely proportional to enzyme concn. Digestion of caseinogen and hæmoglobin in urea solution and of caseinogen in water followed the second-order reaction rate. The enzyme-substrate intermediate in urea solution appears to consist of 1 mol. of asclepain and 1 mol. of caseinogen or hæmoglobin. Inhibition by the reaction products was deduced from the fact that the digestion velocity of hæmoglobin in urea solution varied with asclepain concn. in agreement with the Schütz-Borissov rule.

III. Papain is far more resistant to heat than is bromelin or asclepain. The destruction of papain at 75–83° and of bromelin at 55–70° followed the course of a first-order reaction. The rate of inactivation of asclepain at 55–70° followed the second-order equation. The crit. thermal increments of inactivation of papain and bromelin, calc. with the van 't Hoff-Arrhenius equation, were of the same high order that has been found for protein denaturation; that for asclepain was lower. D. M. N.

Action of yeast proteinase on gelatin and caseinogen acropeptide. A. FODOR and M. FINKELSTEIN (Enzymologia, 1940, 8, 219–224; cf. A., 1925, i, 1215; 1931, 874; 1938, III, 953).—Aq. yeast extract, freed from phosphoproteins by adjusting the p_H to approx. 5 with N-HCl, yields proteinase free from di- and poly-peptidase on treatment with acetone, which ppts. the inactive enzyme. Activation, achieved by adding the filtrate after removal of the acetone, probably results from a change in the enzyme-carrier. The proteinase attacks gelatin and acropeptides at p_H 5 (citrate buffer) and 5.3 (PO_4''' buffer). When the acropeptide D_A from caseinogen is used, 4 CO-NH groups, possibly identical with those attacked by pepsin and pancreatic proteinase, are hydrolysed. W. McC.

Anthelmintic inactivity of fresh pineapple juice *in vivo*. E. KUITUNEN-EKBAUM (Science, 1940, 91, 240–241; cf. A., 1940, III, 250, 333).—In a puppy infected with *Toxocara canis*, a kitten infected with *T. cati*, and a child infected with *Enterobius vermicularis*, administration of fresh pineapple juice had no anthelmintic effect. The digestive effect observed with *T. canis* and *T. cati in vitro* at 38° in absence of added gastric juice is due probably to the presence in pineapple of bromelin, which is destroyed by the action of gastric juice. L. S. T.

Emulsin. XXXIX. Fission of methylglucosides of synthetic sugars by sweet almond emulsin. XLI. Fission of lactobionic acid by sweet almond emulsin. B. HELFERICH, W. W. PIGMAN, and H. S. ISBELL (Z. physiol. Chem., 1939, 261, 55–60, 189–192).—XXXIX. α - and β -Methylglucosides of *d*-gulose, *d*- α -glucoheptose, and *d*-lyxose, and α -methyl-*d*- α -galaheptoside are unaffected (or only very slowly hydrolysed) by sweet almond emulsin, indicating great specificity for the enzyme.

XLI. $W \times 10^3$ for hydrolysis of lactose, Ca lactobionate, and lactobiono- δ -lactone by sweet almond

emulsin are 11.1, 0.42, and 0.68, respectively, in accordance with the effect anticipated from negative groups. Hydrolysis of the lactone group is faster than that of the glucoside group. R. S. C.

Specificity of mould maltase. S. HESTRIN (Enzymologia, 1940, 8, 193–203; cf. A., 1939, III, 519).—Crudetaka-maltase hydrolyses maltose, maltosazone, maltobionic acid, sucrose, raffinose, lactose, and salicin to varying extents but hydrolyses α -methylglucoside only very slightly. The activity of the enzyme is greatly diminished by heating to 100° but is subsequently restored and hence heat-treatment purifies the enzyme by freeing it from other carbohydrateases. Of the above substrates, only maltose and maltobionic acid are attacked by the purified enzyme. Taka-maltase is resistant to acid and is separated from taka-invertase by acid treatment. Taka-maltase does not synthesise α -methylglucoside from glucose and methyl alcohol under conditions in which the synthesis is accomplished by yeast maltase. Yeast maltase does not hydrolyse maltobionic acid and is not identical with taka-maltase. The chief maltase of moulds is a glucomaltase presumably sp. for the maltose mol. as a whole and hence incapable of hydrolysing α -glucosides and C_{60} -substituted derivatives of glucose other than maltose. The results support the theory of Leibowitz and Mechlinski (A., 1926, 865). W. McC.

Mannans. V. Question of the existence of a manniase in barley malt. F. KLAGES and F. KIRCHER (Annalen, 1940, 543, 183–190; cf. A., 1936, 1095; 1938, II, 309).—Contrary to Pringsheim *et al.* (A., 1925, i, 214; B., 1926, 104) a separation of the enzymes of barley malt into di- and poly-saccharase could not be accomplished. Use of salep- or ivory nut-mannan as substrate gives essentially the same results. H. B.

Production and degradation of glycogen in retina extracts. H. SÜLLMANN and R. BRÜCKNER (Enzymologia, 1940, 8, 167–176; cf. A., 1940, III, 203; Cori and Cori, *ibid.*, 165).—In extract of ox retina, degradation of glycogen is for the most part preceded by phosphorylation. Phosphorylation of glucose and glycogen in the extract is inhibited by addition of glucose-1-phosphoric acid. Since there is no additive production of lactic acid when pairs of the substrates glucose, glycogen, and glucose-1-phosphoric acid are present together, it is probable that the glycolytic degradation of these carbohydrates follows the same route. The extract produces glycogen from glucose-1-phosphoric acid, the transformation being stimulated by addition of adenylic acid. Probably hexose diphosphate is an intermediate in the degradation of glucose-1-phosphoric acid. W. McC.

Inhibition of phosphorylation degradation of starch and glycogen in muscle extract. O. DAHL (Arkiv Kemi, Min., Geol., 1939, 13, A, No. 13, 17 pp.).—Phloridzin and phloretin, but not arbutin, salicin, or amygdalin, inhibit this degradation, the effect operating before formation of the Cori ester and not on the phospho-gluco-mutase system. Glucose has a similar effect if present in larger concn. Pyrocatechol also inhibits degradation, probably by

destroying the enzyme. Similar effects are observed if adenosinetriphosphoric acid replaces adenylic acid.

R. S. C.

Glycolysis in cell-free brain extracts. A. GEIGER (Biochem. J., 1940, 34, 465—482; cf. A., 1939, III, 750).—Glycolytically active (optimum p_{H} 7.0—7.5) extracts are obtained by ensuring the presence of Mg^{++} (optimum concn. 0.013M.) and maintaining dilution high enough to inactivate the inhibitor which occurs in brain. The extracts are 4—7 times as active as slices or pulp. They are irreversibly inactivated by dialysis against water but no loss of activity occurs if water is replaced by 0.6% aq. NaCl. Fructose, glucose, mannose, and glycogen serve as substrates but although the glycolysis results in production of phosphoric esters (chiefly compounds less readily hydrolysed than hexose diphosphate), these esters and other carbohydrates yield little or no lactic acid when treated with the extract. No glycolysis or phosphorylation occurs in the absence of inorg. PO_4''' . The co-enzymes involved in the glycolysis are, in addition to those involved in muscle glycolysis, phosphocreatine, probably another as yet unknown co-enzyme, and possibly also glutathione. When adenosine triphosphate is present addition of F' to the extract causes inhibition of lactic acid production and accumulation of phosphoglyceric acid. Added glucose is converted into hexose diphosphate by the extracts in presence of iodoacetate and much adenosine triphosphate. The extracts exhibit max. activity only if low concn. of K is present. Ca^{++} , Na^+ , and O_2 inhibit the glycolysis.

W. McC.

Phosphatase activity and growth of dermal bone. Scales of Selachii and Teleostei. J. ROCHE, J. COLLET, and M. MOURGUE (Enzymologia, 1940, 8, 257—260).—The dermal bones of the ray (*Raia clavata*, Rondelet) exhibit increasing phosphatase activity with increase of growth, but when they have reached a certain degree of development the enzyme content diminishes as in the case of higher vertebrates. The scales of the Mediterranean sardine (*Clupea pilchardus*, Walb.) contain practically no phosphatase during the winter, but as soon as the annual spring growth (formation of "summer rings") begins, there is a rapid formation of phosphatase and the scales are the seat of intense enzyme activity. This gradually decreases during the summer, to become almost zero in the autumn. Phosphatase appears very important in rapid osteogenesis whilst in slow ossification it is of less importance since the direct humoral contribution of PO_4''' suffices for calcification.

J. N. A.

Determination of serum-phosphatase activity with disodium phenyl phosphate. D. M. GREENBERG and H. G. WEITZMAN (J. Lab. clin. Med., 1940, 25, 634—641).—A modification of the serum-phosphatase method of King and Armstrong, in which Na_2 phenyl phosphate is used as the substrate, is presented. The phosphatase vals. obtained by the new method agree in general with those previously obtained by other methods.

C. J. C. B.

Nicotinamide-nucleoside. F. SCHLENK (Naturwiss., 1940, 28, 46—47).—The prep. of the nucleoside,

which is a colourless solid, from cozymase is described. The process involves the following stages: hydrolysis of cozymase with sweet almond phosphatase, dialysis, pptn. of PO_4''' with $\text{Ba}(\text{OH})_2$, pptn. of adenosine with Ag_2SO_4 , pptn. of the nucleoside as phosphotungstate, and removal of other substances by picric acid. After regeneration, the crude nucleoside is pptd. with alcohol-ether, 500 mg. of cozymase yielding approx. 150 mg. of crude nucleoside. Purification is effected by adsorption on Al_2O_3 followed by fractional pptn. with alcohol-ether. The nucleoside has no co-enzyme action, and the ratio of nicotinamide and pentose produced on hydrolysis is 1:1.

J. N. A.

(xxv) MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY.

Phosphorylation of glucose in the initial and stationary phases of alcoholic fermentation by live yeast. Z. DISCHE (Compt. rend. Soc. Biol., 1940, 133, 380—384).—In the initial stage a P-donor for glucose is formed, probably a phosphorylated derivative of cozymase or cophosphorylase. The stationary phase is associated with phosphorylation of glucose and not a resynthesis of the labile pyrophosphate fraction accompanied by oxidation-reduction.

H. G. R.

Production of glycerol during fermentation. E. NEGELEIN and H. BRÖMEL (Biochem. Z., 1939, 303, 231—233).—The enzyme protein involved in the glycerol production which occurs during alcoholic fermentation is the protein of acetaldehyde reductase and not the protein of the carbohydrate-oxidising enzyme. Of the trioses tested (glyceraldehyde, dihydroxyacetone, and their phosphates) the most rapidly reduced to glycerol is dihydroxyacetone, but its reduction proceeds 20,000 times more slowly than does the reaction of acetaldehyde with dihydropyridine. Hence, in normal fermentation, the yield of glycerol or glyceryl phosphate is very low. If acetaldehyde production is prevented (e.g., with F') or if the acetaldehyde produced is trapped (e.g., with SO_3'') the rate of glycerol production, which is probably governed by the concn. of triose or triose phosphate, is much greater than in normal fermentation.

W. McC.

Formation and disappearance of volatile acids during anaërobic alcoholic fermentation. E. PEYNAUD (Ann. Ferm., 1939—1940, 5, 321—337, 385—401).—Added volatile fatty acids are reduced to the corresponding alcohols in fermenting yeast cultures. Such acids are formed in the early stages of fermentation, and diminish in amount thereafter to extents dependent on the nature of the yeast involved. Yeasts which cause the greatest diminution in amount of naturally formed acid are those which remove added acids most readily, and they have also the greatest reducing power as measured with redox indicators. Cysteine increases the reduction of the medium and favours removal of acid; Cu has the opposite effect in each case. Added acetic acid inhibits further formation of the acid at p_{H} 3.32, but at p_{H} 7.5 acetic acid production is a linear function of the sugar fermented; acid production is a min. at

p_H 3.5—4.5. A scheme is presented for acid changes in fermenting grape juice; the concn. of acetic acid is dependent on the balance between dismutation of acetaldehyde and reduction of the acetic acid produced, this balance varying with factors which are partly dependent on the yeast race and partly on the properties of the medium. I. A. P.

Biochemistry of *Torula utilis*. IV. Total sulphur, glutathione, and cystine contents of yeasts. H. FINK and F. JUST (Biochem. Z., 1939, 303, 234—241).—The average total S contents of *Torula*, brewer's, and pressed yeast are 0.22, 0.20, and 0.17% respectively. The vals. vary little except when the culture medium is sulphite waste liquor, which gives yeast of high $SO_4^{''}$ content. The average glutathione contents of the yeasts, determined by a modification of the method of Fujita and Numata (A., 1939, III, 538), are respectively 0.43—0.46, 0.86—0.89, and 0.65 g. per 100 g. of dry matter, the ratio reduced glutathione: oxidised glutathione ranging from 68:32 to 34:66. *Torula* synthesises glutathione from sugar and inorg. salts. The yeasts contain no free cystine but cystine is liberated during plasmolysis. W. McC.

Cytoplasmic effect of inbreeding in homozygous yeast. Ö. WINGE and O. LAUSTSEN (Compt. rend. Trav. Lab. Carlsberg, Sér. physiol., 1940, 23, 17—39).—Degeneration, evidenced by reduction in % germination of subsequently formed spores, takes place in *Saccharomyces cerevisiae*, var. *ellipsoideus* (Danish baking yeast), when spores from the same ascus form zygotes, when two haploid cells from a given spore fuse, or when direct fusion of nuclei takes place in a germinating spore; in the last case, the spores produced approach sterility. Further, dry matter production is reduced in yeasts from single spores. This degeneration is not seen in *S. validus* or *Zygos. priorianus*. The probable influence of chondriosomes on degeneration is discussed. I. A. P.

Influence of nitrogenous nutrition on respiratory and fermentative powers of baker's yeast. P. BERAUD (Ann. Ferm., 1939—1940, 5, 402—409; cf. A., 1939, III, 1010).—Aërobic fermentation by yeast on solid media is feeble or nil. Anaërobic fermentation is increased when N is provided in the form of $(NH_4)_2SO_4$, NH_4 succinate, or asparagine, but is reduced to low vals. by tyrosine, histidine, and tryptophan. Respiration varies with the N source, and is enhanced by tryptophan (alone or in mixtures), peptone, or malt-rootlet extract. Young cells show high respiratory and fermentative powers; fermentation decreases with age until that in presence of O_2 almost disappears. Clear parallelism between growth and any of the factors including O_2 absorption and CO_2 production cannot be established, although some amino-acids (particularly tryptophan) appear to have a sp. influence on growth and heavy crops appear to be related in general to high respiratory power of cultures. I. A. P.

Malt culms as source of respiratory factors for yeast and skin. E. S. COOK and C. W. KREKE (Stud. Inst. Divi Thomae, 1939, 2, 173—178).

D. BU.

Charcoal as adsorbent for respiratory factors. E. S. COOK and E. M. WALTER (Stud. Inst. Divi Thomae, 1939, 2, 189—202).—Norit C adsorbs, from aq. or alcoholic crude extracts of yeast, the factors which stimulate respiration of yeast and skin. The former is better adsorbed than the latter especially from aq. solution at 60° and at p_H above 7. D. BU.

Respiratory activity of steam-distillate from yeast. E. S. COOK and C. W. KREKE (Stud. Inst. Divi Thomae, 1939, 2, 215—225).—The distillate contains a water-insol. complex, mostly saturated fatty acids, which stimulates respiration of yeast suspensions and growth of epithelium in tissue cultures but inhibits O_2 uptake of rat skin slices. Na *n*-decoate and undecoate have similar properties. D. BU.

Solubility behaviour of respiratory factors from yeast. E. S. COOK and E. M. WALTER (Stud. Inst. Divi Thomae, 1939, 2, 239—245).—Abs. methyl alcohol is a fairly good solvent. The factors are insol. in abs. ether and acetone and almost insol. in abs. ethyl alcohol. D. BU.

[Yeast-]growth factors of birch sap. J. DAGYS (Compt. rend. Trav. Lab. Carlsberg, Sér. physiol., 1940, 23, 1—15).—Spring sap of birch has a strong growth-promoting influence on yeast, but only in presence of biotin. The action is largely due to the buffering properties of the sap, but there may be also some purely nutritive influence; aneurin does not influence the action of normal sap. Autoclaved sap in presence of both aneurin and biotin shows 4—5 times the growth-promoting action of normal sap, due apparently to production during the heating of β -alanine from fructose, malic acid, and NH_3 . Autoclaving also produces, without intervention of NH_3 , a further factor which is active towards *Aspergillus niger* but not towards yeast. I. A. P.

Isolation of a crystalline derivative of pantothenic acid. D. W. WOOLLEY (Science, 1940, 91, 245—246).—Concentrates of the lactone of the OH-acid fragment of pantothenic acid were converted into the Na salt and acetylated. The acetyl acid was converted into the acid chloride ($SOCl_2$), and poured into conc. aq. NH_3 . The alcohol-sol. fraction of the product crystallised from acetone and alcohol. Re-combination of the OH-acid from the crystals with β -alanine gives a product highly active in promoting growth of *Lactobacillus casei* and in rats. L. S. T.

(A) Effects of nitrogen compounds and trace elements on growth of *Aspergillus niger*.

(B) Relation of carbon nutrition to trace elements and accessory requirements of *A. niger*. R. A. STEINBERG (J. Agric. Res., 1939, 59, 731—748, 749—763).—(A) Fe, Zn, Cu, Mn, Mo, and Ga are essential to the growth of *A. niger*. Mo is concerned in the reduction of NO_3' , NO_2' , or nitrohydroxylaminic acid ($OH \cdot NO \cdot N \cdot OH$) supplied in the nutrient medium. Among inorg. N sources NO_3' , NH_4' , and $OH \cdot NO \cdot N \cdot OH$ were the most effective, NH_2OH was much less satisfactory, and NO_2 , N_2H_4 , and azides were not utilised. NH_3 is probably the form of N immediately assimilated and the efficiency of other N sources is paralleled by the ease of conversion into NH_3 in acid substrates.

(B) Irrespective of the C source, Fe, Zn, Cu, Mn, Mo, and Ga are necessary for growth. Sc increases growth on glycerol media. Sucrose, *d*-glucose, *d*-fructose, *d*-mannose, and *l*-sorbose were equally good C sources; glycerol, *d*-mannitol, *d*-lactose, and *d*-galactose were ineffective. Sources of C which, individually, were unassimilable were utilised when supplied in suitable admixture, probably through supplementation of essential mol. configurations. Growth in glycerol or mannitol became normal on addition of Na Fe chlorophyllin or of certain sp. amino-acids. Addition of yeast extract to the medium improved the growth of *A. niger* by supplying intermediate metabolic products which the organism normally synthesises from sucrose and N compounds.

A. G. P.

Mechanism of citric acid formation. R. CIUSA (Annali Chim. Appl., 1940, 30, 86—88; cf. A., 1939, III, 522).—Further evidence in favour of the hypothesis of the formation of fermentation citric acid (1 mol.) from malic (1 mol.) and glycollic acid (1 mol.) is discussed.

F. O. H.

Constitution of carviolin, a colouring matter of *Penicillium carmino-violaceum*, Biourge.—See A., 1940, II, 227.

Effect of substances produced by fungi in respiration of tissue of potato tubers. I, II. J. J. A. HELLINGA (Proc. K. Akad. Wetensch. Amsterdam, 1940, 43, 249—266, 267—276).—I. Extracts of *Gibberella saubinetii* (and of other *Fusaria*), the medium on which it has been grown, or potato tissue infected with it, increase the O₂ and CO₂ consumption of discs of potato, the R.Q. remaining approx. unchanged. The active agent is thermostable, non-volatile, insol. in ether or CHCl₃, and is adsorbed by activated C or asbestos filter plates. It has no effect on respiration in presence of HCN.

II. The respiration of potato tissue is increased by crude peptone and yeast extracts. Vitamins and amino-acids tested have little or no effect, except ascorbic acid, which produces a different type of increase. Sugar increases respiration independently of extracts of *Fusaria*.

E. M. W.

Method of substituting pine sapwood for malt agar in culturing test fungi. E. E. HUBERT (Science, 1940, 91, 247—248).

L. S. T.

Specificity of action of the pyrimidine component of aneurin, the growth factor for microorganisms. W. H. SCHOFFER and S. BLUMER (Enzymologia, 1940, 8, 261—266).—The effect of a no. of substituted pyrimidines, as substitutes for aneurin, on the growth of *Pilaira anomala*, *Absidia ramosa*, *Parasitella simplex*, *Phytophthora fagopyri*, *Rhodotorula rubra* and *mucilaginoso*, *Dematium nigrum*, *Polyporus adustus*, and *Schizophyllum commune* is determined. 4-Amino-2-methyl-5-aminomethylpyrimidine can replace aneurin for growth of *Parasitella*, *Rhodotorula*, and *Polyporus*. In the cases of *Pilaira*, *Phytophthora*, and *Schizophyllum* growth is only 30—60% of that observed when aneurin is used. 4-Amino-2-methyl-5-thioformamidomethylpyrimidine can replace the 5-aminomethyl derivative in all cases, except for *Schizophyllum* where growth is not so good, and for

Phytophthora and *Dematium* where it is inactive. 4-Amino-2-ethyl-5-aminoethylpyrimidine is just as active as the methyl compound except for *Polyporus* and *Schizophyllum*. 4-Amino-2:5-dimethylpyrimidine can replace 4-amino-2-methyl-5-aminomethylpyrimidine for growth of *Rhodotorula*, *Dematium*, and *Pilaira* whilst it is quite inactive for the other organisms. Only the red yeasts react slightly towards other pyrimidines. *R. rubra* reacts feebly to 4-hydroxy-2:5-dimethyl-, 4-thiol-2-methyl-, and 6-amino-5-carbethoxy-2-methyl-pyrimidine, and *R. mucilaginoso* reacts to the first of these. The NH₂ in position 4 is very important; it cannot be replaced by NH₂ in the 6 position, and for all the organisms 6-amino-4-hydroxy-2-methylpyrimidine is inactive. Thiochrome has a small activity, which is due to hydrolysis and utilisation of the pyrimidine component.

J. N. A.

Autolysis of a thermophilic *Actinomyces*. H. KATZNELSON (Soil Sci., 1940, 49, 83—93).—The organism, isolated from composted horse manure kept at 50°, undergoes autolysis on starch-agar media; after 24—48 hr. at 50° no transmissible lytic agent was detected. Berkefeld filtrates of lysed cultures have no effect on growth of the organism or on that of other soil *Actinomycetes*. During growth on neutral starch-agar the organism lowers the p_H of the medium to 5.7. Addition of CaCO₃ prevents this change and also inhibits autolysis, which begins when the p_H falls below 6.0.

A. G. P.

Positive and negative chemotaxis; experiments with myxomycete. D. R. COMAN (Arch. Path., 1940, 29, 220—228).—Chemotaxis was investigated in *Physarum polycephalum*. Chemotaxis was positive to glucose but indifferent to sucrose. Both H⁺ and OH⁻ in adequate concns. induced negative chemotaxis.

C. J. C. B.

Production of synthetic mycorrhiza in the cultivated cranberry. M. C. RAYNER and I. LEVISOHN (Nature, 1940, 145, 461).—Fresh, sterilised roots of *Vaccinium oxycoccus* develop pure culture colonies of greyish-white mycelium, becoming brown with age, in various media. After 2—3 weeks' growth at room temp., this fungus resembles *Phoma radialis oxycocci* in all respects. Root material washed in water only, without surface sterilisation (A., 1938, III, 449), gives colonies of unidentified fungi, usually yellow or orange in colour.

L. S. T.

Effects of culture filtrates and old medium on growth of the ciliate *Colpidium campylum*. R. P. HALL and J. B. LOEFER (Proc. Soc. Exp. Biol. Med., 1940, 43, 128—133).—5—10% of culture filtrate or 3-month-old culture medium accelerates growth in cultures of this organism.

V. J. W.

***Plasmodium ovale*.** IV. Efficacy and nature of the immunity acquired as result of infections induced by sporozoite inoculations compared with those by trophozoite injections. J. A. SINTON (Trans. Roy. Soc. trop. Med. Hyg., 1940, 33, 439—446).—Infections induced by sporozoite inoculation give rise to a more effective anti-parasitic immunity than do those caused by trophozoite injection. The immunity developed after infections,

induced either by sporozoites or by trophozoites, probably acts mainly, if not entirely, against trophozoites and not against sporozoites as such.

C. J. C. B.

Comparison of dark-field examination and nigrosine stain in demonstrating *Treponema pallidum*. N. NAGLE and J. GRAUL (J. Lab. clin. Med., 1940, 25, 660—661).—The results in 100 cases indicate a close correlation between both methods in early syphilis diagnosis.

C. J. C. B.

Effect of carbon dioxide on glucose metabolism of trypanosomes. D. S. SEARLE and L. REINER (Proc. Soc. Exp. Biol. Med., 1940, 43, 80—82).—In glucose cultures of *T. lewisi* under anaërobic conditions CO₂ and pyruvic acid are used up. In aërobic conditions CO₂ is produced.

V. J. W.

Influence of amino-acids and proteins on nitrogen fixation by *Azotobacter chroococcum*. J. E. GREAVES, L. JONES, and A. ANDERSON (Soil Sci., 1940, 49, 9—19).—Tyrosine, *dl*-isoleucine, hydroxyproline, *l*-histidine, cystine, *dl*-methionine, casein, and albumin increased and phenylalanine and gelatin retarded the fixation of N by *A. chroococcum* in artificial media.

A. G. P.

Mechanism of the microbiological oxidation of ammonia. II. G. G. RAO and W. V. S. RAO (J. Indian Chem. Soc., 1939, 16, 681—690; cf. A., 1939, III, 428).—The inhibitory action of capillary-active substances like urethanes, nitriles, alcohols, and ketones on the microbiological oxidation of NH₃ is marked only at sufficiently high concn., the concn. being lower in a compound of high mol. wt. At concn. of 0.0002—0.001M. valero- and benzo-nitrile accelerate the reaction. KCN and HCN completely inhibit the growth and respiration of the bacteria at extremely low concn. The conclusion is reached that the oxidation is a surface catalytic reaction taking place at certain active centres on the surface of the bacteria.

F. R. S.

Biotin as growth-stimulant for root-nodule bacteria. P. M. WEST and P. W. WILSON (Enzymologia, 1940, 8, 152—162; cf. A., 1933, 1080; 1939, III, 792, 873).—The heat-stable factor in yeast extract which promotes the growth of *Rhizobium trifolii* is affected in the same way by acid, alkali, H₂O₂, adsorption, and extraction with solvents as is the factor promoting the growth of *Saccharomyces cerevisiae*. For the growth of *R. trifolii*, the factor is replaced by biotin or co-enzyme R but not by thiamin, cocarboxylase, riboflavin, nicotinic acid, nicotinamide, adenine, cozymase, uracil, β -alanine, inositol, 3-indolylacetic acid, pantothenic acid, ascorbic acid, ergosterol, "sporogenes vitamin," or amino-acids. For the growth of yeast, biotin requires to be supplemented with β -alanine or pantothenic acid. Co-enzyme R and the growth factor of yeast extract are probably identical with biotin.

W. McC.

(A) Production of growth-substance on peptone broth by crown-gall bacteria and related non-gall-forming organisms. (B) Nature of growth-substance originating in crown-gall tissue. S. B. LOCKE, A. J. RIKER, and B. M. DUGGAR (J. Agric. Res., 1939, 59, 519—525, 535—539).—

R R (A., III.)

(A) *Bac. radiobacter* and the organisms of virulent and of attenuated crown gall differed widely in ability to produce overgrowths in plants but showed similar capacities for producing growth-substance in peptone broth. No evidence was obtained that the formation of indolylacetic acid is a factor in the pathogenicity of crown-gall bacteria.

(B) Ether extracts of gall tissue from tomatoes contained β -indolylacetic acid or a similar substance which may have originated from the plant or from the gall bacteria. Auxin-A and -B were not detectable in these extracts.

A. G. P.

Anaërobic decomposition of cysteine and cystine by *Propionibacterium pentosaceum*. P. DESNUELLE, E. WOOKEY, and C. FROMAGEOT (Enzymologia, 1940, 8, 225—240).—The rate of liberation of H₂S from *l*-cysteine by the organism under anaërobic conditions at p_H 6.4 and 29° is const. if a large excess of cysteine is present. In presence of glucose the rate is considerably increased. Large amounts of toluene (over 1%) cause inhibition. In presence of glucose the rate of evolution of H₂S is practically independent of cysteine concn. Small amounts of lactic acid or glycerol also increase the rate whilst formic, acetic, succinic, and pyruvic acids are inactive, but in high concn. lactic acid also inhibits. High concn. of pyruvic acid in presence of glucose causes marked inhibition. Small amounts of alanine, valine, serine, and glycine in presence of glucose cause some inhibition, the effect decreasing in the order given. Alanine also inhibits in absence of glucose. Liberation of H₂S ceases when approx. 55% of the cysteine has been decomposed and *dl*- and *d*- behave similarly to *l*-cysteine. Liberation of NH₃ during the reaction depends on the presence of other metabolites. In presence of glucose practically no NH₃ is evolved whilst in presence of glycerol or lactic acid large amounts of NH₃ are liberated. For decomp. of *l*-cystine and liberation of H₂S another metabolite must be present; the most active are glycerol, glucose, and lactic acid. *d*-Cystine is not attacked by the organism whilst *dl*-cystine is 60—70% decomposed. In presence of glucose all the S of mesocystine is evolved as H₂S but the rate of reaction is much less than for *l*-cystine. Liberation of NH₃ from *l*-cystine in presence of glucose is preceded by an induction period. Methionine in presence of glucose yields no H₂S and only a small amount is obtained from glutathione in presence of glucose. This may arise from cysteine formed by enzymic hydrolysis. The mechanism of the reactions is discussed.

J. N. A.

Pigment-protein compound in photosynthetic bacteria. I. Extraction and properties of photosynthin. II. Absorption curves of photosynthin from several species of bacteria. C. S. FRENCH (J. Gen. Physiol., 1940, 33, 469—481, 483—494).—I. Photosynthetic bacteria in water suspension break open when treated with supersonic vibration, liberating the cell contents, including a water-sol. protein to which are attached the otherwise water-insol. pigments, bacteriochlorophyll and carotenoids. Both types of pigment seem to be combined with the same protein. The protein-pigment compound is

insol. at p_H 3.0—4.5 and in neutral solution is pptd. by half-saturation with $(NH_4)_2SO_4$. It is sol. in distilled water and adsorbed on fuller's earth. Extracts of bacteria prepared by the supersonic method cannot carry on photosynthesis, but will act as a photocatalyst for the oxidation of ascorbic acid with visible or infra-red radiation. The rate of the photochemical process is proportional to the light intensity.

II. Absorption curves at 450—900 $m\mu$. were obtained for the water-sol. cell juice of four species of photosynthetic bacteria, *Spirillum rubrum*, *Rhodovibrio sp.*, *Phaemonas sp.*, and *Streptococcus varians*. These curves all show max. due to bacteriochlorophyll. The bacteria that appear red rather than brown have a band at 550 $m\mu$. due to a carotenoid pigment. The absorption curve of bacteriopheophytin has max. at 530 and 750 $m\mu$. The extraction of cell juice by the method of supersonic vibration does not change the position of the absorbing bands or the light-absorbing capacity of the pigments.

D. M. N.

Lactic acid-mannitol fermentation. V. BOLCATO and P. TONO (Enzymologia, 1940, 8, 273—277).—The amounts of the products formed from pyruvic acid or its Ca salt by a lactic acid-mannitol organism depend on the concn. of the starting material and on the p_H of the medium, except at approx. p_H 4.5 where decomp. is independent of the concn. of pyruvic acid.

J. N. A.

[Biochemical] preparation of aliphatic ketones. M. GIORDANI and R. NEGRO (Atti X Congr. Internaz. Chim., 1938, III, 189).—A yield of about 85% of theoretical of higher aliphatic ketones is obtained from carbohydrates by anaërobic conversion by *B. butylicus* into higher fatty acids which are ketonised in the vapour phase by alkaline-earth catalysts.

E. W. W.

Carbohydrate metabolism of *Oidium lactis* and *B. subtilis* in complex carbohydrate-rich culture medium. T. F. FRIEDEMANN (Proc. Soc. Exp. Biol. Med., 1940, 43, 148—151).—The medium contained 0.9% of glucose, of which 70% became converted into lactic acid and 20% of the C_3 intermediate products was metabolised into 2 mols. of formic acid and 1 mol. each of acetic acid and alcohol.

V. J. W.

Inhibition of sulphate-reducing bacteria by dyes. T. H. ROGERS (J.S.C.I., 1940, 59, 34—39).—These bacteria may be inhibited by the use of dyes derived from 3:6-diaminoacridine which are non-corrosive and are effective in very small quantities. The concn. of dye necessary for inhibition is a function of the nos. of bacteria present. Under practical conditions the concn. necessary for inhibition may rarely exceed 1 in 250,000 of the dyes.

Removal of glucose from substrates by activated sludge. C. C. RUCHHOFT, J. F. KACHMAR, and W. A. MOORE (U.S. Publ. Health Repts., 1940, 55, 393—423).—The rates of removal of glucose from substrates by normal activated sludge and by pure cultures of certain bacterial species found in activated sludge or domestic sewage were determined. The effect of various factors such as temp., p_H , dissolved O_2 , supplemental feeding, and acclimatisation on these removal rates was examined.

C. G. W.

Formation of trimethylene glycol from glycerol by *Aërobacter*. M. N. MICKELSON and C. H. WERKMAN (Enzymologia, 1940, 8, 252—256).—Four strains of *Aërobacter*, two of which show the characteristic properties of *A. aërogenes*, and two unidentified species, ferment glycerol in a medium containing only inorg. salts with production of approx. 45% of trimethylene glycol. Small amounts of acetylmethylcarbinol and considerable amounts of β -butylene glycol, but no succinic acid, are also formed. The data are compared with those of Braak for dissimilation of glycerol by organisms of similar type. The results do not agree with the assumption that only the intermediate *coli-aërogenes* bacteria form trimethylene glycol from glycerol.

J. N. A.

Relationship between *R* and *S* variants of *B. anthracis* and virulence. S. STAMATESCU and N. STURDZA (Compt. rend. Soc. Biol., 1940, 133, 510—512).—The *R* form is more virulent and is probably the pathogenic strain.

H. G. R.

Stability of bacteria in relation to p_H . J. G. BAUMGARTNER and G. G. KNOCK (J.S.C.I., 1940, 59, 53—56).—The resistance to heat and alcohol and stability in suspension of 5 bacterial species (*Esch. coli*, *Esch. cloacæ*, *Proteus vulgaris*, *Staph. aureus*, and a *Lactobacillus* strain) were investigated over the p_H range 3.0—8.0. The results indicated that for a given bacterial species there is an optimum p_H val. at which resistance of the organism to heat and alcohol, and stability in suspension, are at a max. The vals. obtained were: *E. coli* 6.4; *E. cloacæ* 6.0—6.4; *P. vulgaris* 6.0; *S. aureus* 6.8—7.2; *Lactobacillus sp.* 5.2—5.6. The results are interpreted as being related to the hydration of the bacterial protein.

Laboratory diagnosis of undulant fever. L. FOSHAY (Amer. J. clin. Path., 1940, 10, 176—187).—A review.

C. J. C. B.

Bacterial spores as antigens. J. W. HOWIE and J. CRUICKSHANK (J. Path. Bact., 1940, 50, 235—242).—With 5 different organisms—*Cl. sporogenes*, *B. cereus*, *B. mesentericus*, and 2 aërobic spore-bearing organisms from soil—it was possible to produce spore antisera which would agglutinate spore suspensions of the corresponding organism.

C. J. C. B.

Blood changes and post-mortem findings following intravenous inoculation of sheep with culture filtrates of *Cl. welchii*, types *A*, *C*, and *D*. W. S. GORDON, J. STEWART, H. H. HOLMAN, and A. W. TAYLOR (J. Path. Bact., 1940, 50, 251—269).—Whereas the toxin of *Cl. welchii* type *C* produces no sp. blood changes, that of type *A* produces a marked hæmolytic anæmia, while that of type *D* produces an anhydremia.

C. J. C. B.

Types of *Cl. welchii* present in soil and in the intestinal contents of animals and man. A. W. TAYLOR and W. S. GORDON (J. Path. Bact., 1940, 50, 271—277).—Of 196 strains of *Cl. welchii* isolated from 43 samples of farm soil, 7 were of type *D* and the remainder of type *A*. Of 1147 strains isolated from the intestinal contents of man and of several species of animals, 1134 were of type *A*, 3 of type *B*, and 10 of type *D*. The type *B* strains were isolated from a

wild rabbit; of the *D* strains one was isolated from a sheep, 2 from a bovine, and 7 from a domesticated rabbit. Of 174 filtrates prepared from intestinal contents, the toxin of *Cl. welchii* was detected in only one, a sample from a rabbit which died after an acute illness. This was of type *D* and the animal probably died of enterotoxaemia. C. J. C. B.

Triple sugar-ferrous sulphate medium for identification of enteric organisms. S. E. SULKIN and J. C. WILLETT (J. Lab. clin. Med., 1940, 25, 649—653).—A modification of the Krumweide triple sugar medium for use in the differentiation of the colon-typhoid-dysentery group of organisms is described. C. J. C. B.

Dried diphtheria antitoxin. B. A. PETERS (Brit. Med. J., 1940, I, 213).—Dried diphtheria antitoxin was successfully used in 20 severe cases of diphtheria. It was given intravenously and reactions were slight. C. A. K.

Differentiation of types of diphtheria toxin. K. W. CLAUBERG (Klin. Woch., 1939, 18, 1490—1493).—Investigations of 46 different types of diphtheria bacillus in rabbits did not give uniform results. M. K.

Simplification of special staining method of bacteria. E. RYU (Kitasato Arch. exp. Med., 1940, 17, 53—58).—Simpler methods of staining *C. diphtheriae* and tubercle bacilli are detailed. C. J. C. B.

Erysipelothrix rhusiopathiae. P. S. WATTS (J. Path. Bact., 1940, 50, 355—369).—Of 43 strains studied serologically 38 appeared to be of one antigenic type and 5 of another. There was no correlation between animal host and serological group or between group and virulence. Each group possesses a heat-stable sp. antigen. In addition, each probably contains 2 heat-labile antigens which are present in different proportions in the 2 groups and are responsible for cross-agglutination; they are also the important antigens with regard to resistance to infection. Sera of low potency containing antibodies to these antigens will protect mice against many lethal doses of an organism of the same group but not against a strain from the other group. An intradermal test was used to test active immunisation of pigs with a formalised vaccine. In the doses used this vaccine failed completely to protect the pigs against a min. infecting dose. C. J. C. B.

Hereditary transmission of rat leprosy. I. Y. WATANABE and N. NONAKA (Kitasato Arch. exp. Med., 1940, 17, 8—16).—A filtrate of rat leproma emulsion shows no typical acid-fast bacillus, but when this filtrate is subcutaneously inoculated into rats acid-fast organisms appear in the axillary glands and leprous granular infiltration at the site of inoculation after 3—5 months. C. J. C. B.

Pantothenic acid and nicotinic acid as essential growth substances for Morgan's bacillus. M. J. PELCZAR, jun., and J. R. PORTER (Proc. Soc. Exp. Biol. Med., 1940, 43, 151—154).—Growth took place when the culture medium contained 0.4 µg.-% of 20% Ba pantothenate as well as nicotinic acid, but not in the absence of either. V. J. W.

R R* (A., III.)

Immunity to experimental pneumococcal infection with artificial antigen containing saccharide of synthetic origin. W. F. GOEBEL (Science, 1940, 91, 20—21).—Passive immunity to types III and VIII pneumococcal infection can be conferred on mice by the sera of rabbits immunised with an artificial antigen containing an aldobionic acid. Passive immunity to type II infection can be conferred when an artificial antigen containing saccharides of synthetic origin is used (cf. A., 1939, III, 429). W. F. F.

Isolation of antibody from agglutinate of type I pneumococcus by treatment with acid. K. LEE and H. WU (Proc. Soc. Exp. Biol. Med., 1940, 43, 65—69).—If HCl is added to the agglutinate to p_H 2 all the antibody is liberated and 87% of it can be recovered after removing the cells and neutralising. V. J. W.

Pneumococcus typing by culture. S. A. SCUDER and S. B. WEINBERGER (Amer. J. clin. Path., Tech. Sect., 1940, 4, 27—28).—A simple culture method on Loeffler serum is recommended for obtaining young cultures of pneumococci, instead of by animal passage, for performing the Neufeld test. C. J. C. B.

Comparative behaviour of the two toxins of Shiga's bacillus towards the corresponding antibodies. A. BOIVIN and A. DELAUNAY (Compt. rend. Soc. Biol., 1940, 133, 376—380).—The neurotoxin is differentiated from the sugar-lipin endotoxins and is related to the typical exotoxins. H. G. R.

New Salmonella type (*S. onarimon*). S. KISIDA (Kitasato Arch. exp. Med., 1940, 17, 1—7). C. J. C. B.

Determination of effect of antiseptics on phagocytosis. H. WELCH and A. C. HUNTER (Amer. J. Publ. Health, 1940, 30, 129—137).—Using guinea-pig or human blood, the toxicity and germicidal power of antiseptics are simply determined by measuring the concn. required to inhibit the phagocytosis of artificially opsonised staphylococci. The toxicity indices of 10 germicides agree well with those found by Salle *et al.* (A., 1938, III, 326, 423). I is only 79% as toxic to human cells as to staphylococci, whereas phenol, merthiolate, and mercurochrome are 4, 5.7, and 29.31 times respectively as toxic to the cells as to staphylococci. W. McC.

Streptococci isolated from war wounds. (A) Biochemical characters. (B) Biological variations of different strains caused by sulphamide derivatives. J. LEVADITI and J. GIUNTINI (Compt. rend. Soc. Biol., 1940, 133, 408—410, 410—413).—(A) Eleven out of twelve strains isolated were of the *S. pyogenes* type and one of the *S. faecalis* type. Only those obtained soon after the injury were gelatinolytic.

(B) Successive strains of streptococci isolated during wound treatment with sulphonamide derivatives differ only in the loss of virulence to mice and the temporary loss of gelatinolytic power. H. G. R.

Peptone-dextrose broth in studies of antibacterial activity. H. J. WHITE (Proc. Soc. Exp.

Biol. Med., 1940, 43, 214—216).—A broth which will support streptococcal growth at 39° is described.

V. J. W.

Peroxide production by type 3 strains of group A β -haemolytic streptococci. F. P. HADLEY and P. HADLEY (Proc. Soc. Exp. Biol. Med., 1940, 43, 102—104).—7 out of 8 strains gave black colonies on blood-agar containing benzidine after several days' growth.

V. J. W.

Comparative study of blood and cerebrospinal fluid by the Kahn, Kline, and Laughlen tests. L. E. TASCHNER (J. Lab. clin. Med., 1940, 25, 642—645).—The Laughlen test is less sp. than the Kahn and Kline tests and to secure accurate results nearly the same time is needed. Inexperienced workers should not use the Laughlen test for the diagnosis of syphilis.

C. J. C. B.

Reactions of Wassermann, Kahn, and Auguste. C. A. SAGASTUME, M. L. GAUDINO, and V. RIVERA (Rev. Fac. Cienc. Quím. La Plata, 1939, 14, 153—157).—Results with these reactions are recorded for 145 normal, syphilitic, and treated-syphilitic sera. It is concluded that it is preferable to compare the results of all three reactions, the technique of Auguste being especially valuable when the results with the Wassermann and Kahn reactions are discordant, although owing to its complexity it is less practicable. 23 discordant results were obtained.

F. R. G.

Kahn test. I. Tube for preparation of antigen suspension. M. B. KURTZ and E. M. HILL (Amer. J. Publ. Health, 1940, 30, 180—181).—Loss of material is avoided and the attainment of a uniform speed of mixing is facilitated by using a Λ -tube with an opening at the apex. Before mixing, the antigen is introduced into one leg of the tube and saline solution into the other.

W. McC.

Modified Kahn test. T. E. OSMOND (Brit. Med. J., 1940, I, 252—253).—A simplified technique is described.

C. A. K.

Meinicke clarification reaction: factors influencing non-specific zone phenomena. W. M. F. ROBERTSON and D. B. COLQUHOUN (J. ment. Sci., 1940, 86, 66—75).—With certain specimens of antigen, zonal pptn. may occur with non-syphilitic sera. Dilution of the latter then results in increased pptn. This non-sp. action is shown when highly purified lecithin is used in the prep. of the antigen, but not when kephalin is added as well. Pure anhyd. solvents should be used in extracting the lipin for the antigen.

G. D. G.

Value of a "repeat" injection of tetanus toxoid (secondary stimulus) in active immunisation against tetanus. H. GOLD (J. Lab. clin. Med., 1940, 25, 506—511; cf. A., 1939, III, 93.)

C. J. C. B.

Anaphylaxis after tetanus toxoid. (A) H. E. WHITTINGHAM. (B) H. J. PARISH and C. L. OAKLEY (Brit. Med. J., 1940, I, 292—293, 293—294).—(A) 2 cases of anaphylactic shock occurred after the 2nd dose of tetanus toxoid (incidence of 0.003%).

(B) 1 case of anaphylactic shock after tetanus toxoid (2nd dose) is described. It may be due to the Witte peptone present in the medium.

C. A. K.

Chemotherapy of tuberculosis. R. ROBINSON (J.C.S., 1940, 505—509).—A review. The synthesis of compounds analogous to phthioic acid and their *in vitro* action against tubercle bacilli are discussed.

J. H. B.

Specificity of typhoid and paratyphoid vaccines. M. H. BROWN and A. J. BISHOP (Canad. Publ. Health J., 1939, 30, 585—589).—Protection conferred by the vaccines of typhoid, paratyphoid B, and paratyphoid A is sp.

C. G. W.

Antigenic properties of typhoid lysates prepared with aqueous solutions of essential oils. F. DE POTTER (Compt. rend. Soc. Biol., 1940, 133, 454—456).—The lysate obtained is an excellent antigen and is more active than the solution of essential oils containing the stroma in suspension.

H. G. R.

Chemical properties of typhoid antigens. E. SORU and C. COMBIESCO (Compt. rend. Soc. Biol., 1940, 133, 498—500).—Mild acid hydrolysis of antigen-O yields three fractions: a water-sol. fraction containing polysaccharide and org. P, an ether-sol. fraction of palmitic or stearic acids, and a water- and ether-insol. fraction containing the whole of the N which, on more severe hydrolysis, yields ether-sol. and reducing substances.

H. G. R.

Chemical properties of the complete antigen from cholera vibrio. A. DAMBOVICEANU and C. BARBER (Compt. rend. Soc. Biol., 1940, 133, 501—503).—The acid-sol. antigen is a sugar-lipin complex containing amino-N and P.

H. G. R.

Application of phage typing to strains of *B. typhosus*. K. F. BRANDON (Canad. Publ. Health J., 1940, 31, 10—12).—Phage preps., used in high dilutions determined by standardisation tests, can be used to identify strains similar to the strains used for the growth of the phage.

C. G. W.

Toxicity of sodium and potassium ions to bacteriophages. A. GRATIA (Compt. rend. Soc. Biol., 1940, 133, 443—444).—Na⁺ and K⁺, within certain zones of concn. depending on the nature and valency of the anion, have a rapid, toxic effect on bacteriophage.

H. G. R.

Antagonistic action of alkaline-earth ions on the toxicity of ions of sodium and potassium towards bacteriophage. A. GRATIA (Compt. rend. Soc. Biol., 1940, 133, 445—447).—The toxicity of Na⁺ and K⁺ (cf. preceding abstract) is abolished by traces of alkaline-earth ions.

H. G. R.

Isolation and supermicroscopic representation of bacteriophage. E. PFANKUCH and G. A. KAUSCHE (Naturwiss., 1940, 28, 46).—A *coli* bouillon phage lysate, purified by adsorption of the high-mol. protein on Al₂O₃ followed by elution with 0.1—0.03M-PO₄''' buffer at p_H 7, still produces lysis when 1 c.c. contains only 3 × 10⁻¹⁵ g. of protein. The smallest concn. of protein which causes lysis is 1—3 × 10⁻¹⁶ g. per c.c. The calc. mol. wt. of the phage protein is 10⁸, equiv. to a diameter of 60 m μ . for a spherical mol. whilst the determined diameter of the bodies in phage is 40—80 m μ .

J. N. A.

Visibility of bacteriophage lysis in super-microscope. H. RUSKA (Naturwiss., 1940, 28, 45—46).—When a lysate is added to *coli* bouillon the phage is quickly adsorbed on the bacterial membrane and soon afterwards the latter is ruptured with liberation of the plasma constituents. Finally complete lysis occurs, except for the resistant nucleus. During lysis of the cell, cubical structures are observed. The phage consists of small round bodies which when carefully irradiated appear homogeneous and moderately thick. With high intensity of irradiation the phage appears to be destroyed by the electrons, as also are the cubical structures; the latter may be the origin of the phage protein. It is not known with certainty whether phage formation is exclusively endogenous or exogenous. J. N. A.

Viruses. ANON. (Lancet, 1940, 238, 610—612).—A review. C. A. K.

Comparison of concentration of the virus of Japanese encephalitis in the blood, cerebrospinal fluid, and brain tissues of encephalitis patients, and monkeys and mice infected with the virus. R. KOBAYASHI (Kitasato Arch. exp. Med., 1940, 17, 45—52).—The concn. of virus varies widely from animal to animal. C. J. C. B.

Recurrent traumatic herpes. G. M. FINDLAY and F. O. MACCALLUM (Lancet, 1940, 238, 259—261).—A case of recurrent traumatic herpes on hand and lips in a child is described. Inoculation of the fluid from the vesicles into rabbits and mice produced encephalitis. The child's serum contained immune bodies. The mechanism of recurrence is discussed and the literature reviewed. C. A. K.

Recent influenza epidemics: experimental study. F. L. HORSFALL, jun., R. G. HAHN, and E. R. RICKARD (J. clin. Invest., 1940, 19, 379—392).—Epidemic influenza virus was isolated from cases of influenza in 4 epidemics during 1939. The virus was not isolated from various cases of acute respiratory disease which occurred prior to the epidemics. The neutralising antibody titre increased rapidly after the 5th day of disease and reached max. levels between the 10th and 14th days. Contacts developed a significant increase in neutralising antibody titre without manifesting any symptoms. No increase in neutralising antibody titre occurred during convalescence from 4 different non-influenzal respiratory infections. C. J. C. B.

Virus in influenza. C. H. S. HARRIS, W. SMITH, and C. H. ANDREWES (Lancet, 1940, 238, 205—211).—Outbreaks of upper respiratory tract infection were studied in January—April 1939. Clinically the cases resembled those seen in 1937 (from whom influenza virus was isolated) but virus was found in only 33%. Inoculation of a group of boys with formalised influenza virus vaccine had no protective effect over a 4-month period. C. A. K.

Serial passage of human influenza virus in the European hamster (*Cricetus cricetus*). R. M. TAYLOR and M. DREGUSS (Proc. Soc. Exp. Biol. Med., 1940, 43, 100—101).—Hamsters were successfully inoculated intranasally with virus suspensions from

the mouse and ferret and developed antibodies with very slight constitutional reaction. V. J. W.

Fluctuations in titre of neutralising antibody for influenza virus in human beings. R. HARE (Canad. Publ. Health J., 1940, 31, 32).—The changes which occur in the immunity of adults for influenza virus over a period of 2½ years were studied by the serum-virus neutralisation test. The titre of the serum is no indication of susceptibility or immunity to infection. C. G. W.

Titration of mallein *in vitro* and *in vivo*. A. URBAIN, J. P. THIÉRY, A. NEVOT, and R. COURTADE (Compt. rend. Soc. Biol., 1940, 133, 344—345).—The antigenic val. of mallein may be obtained by titration with a serum rich in anti-mallein sensitisers. Horses with glanders only react to mallein with a high antigenic val. and samples which cannot fix alexin in presence of anti-mallein serum are inactive. H. G. R.

Virus of infectious myxomatosis. A. K. BALLS, E. F. JANSEN, and B. AXLEROD (Enzymologia, 1940, 8, 267—272).—Rabbit myxoma tumours are ground up with 8.9% aq. NaCl and stored at -1° for several days. After centrifuging at 0° the sediment is extracted twice in the same way and the three extracts are combined and filtered. The p_H of the solution is 6.3—6.7 and no loss of activity occurs after 6 months at -1° ; with excess of 8.9% aq. NaCl, or by dialysis, inactivation occurs. If tumour extract is diluted with 8.9% aq. NaCl against which an extract has been dialysed no appreciable loss of activity occurs. This dialysable stabilising factor or a similar substance is present in normal tissue and skin and commercial meat extracts, but not to the same extent as in myxoma tissue. The virus can be conc. in the ultra-centrifuge when the solution is stabilised; the sediment so obtained may consist mainly of the agent producing the disease. It contains a lipin which is not present in normal tissue and this may be part either of the cause or of the effect of the disease. Extraction with $CHCl_3$ of a wet centrifuged sediment or of a crude aq. extract yields a sterol which contains no P, but if the dried sediment is extracted, then the $CHCl_3$ extract contains N, P, and the sterol. The latter can be extracted from an acid (not alkaline) suspension of the virus. The lipin from the dried virus may consist of a N base containing P, and a sterol which is not cholesterol. J. N. A.

Alumina gel as an adjuvant to anticattle-plague vaccine. H. JACOTOT (Compt. rend., 1940, 210, 376—378).—Calves were vaccinated with a formaldehyde-treated suspension of cattle-plague virus containing $Al(OH)_3$ gel which increased the immunising power of recently-prepared vaccine 25 times and preserved the immunising substance. J. L. D.

Chemical prevention and treatment of poliomyelitis. E. W. SCHULTZ (Amer. J. Publ. Health, 1940, 30, 175—179).—The poliomyelitis virus is very resistant to chemical attack but is inactivated *in vitro* by $HgCl_2$, $KMnO_4$, $CuSO_4$, hexylresorcinol, mercurochrome, and other substances in approx. 0.1% solution. Mercurochrome has a prophylactic effect *in vivo*. Monkeys are rendered resistant to intranasal

inoculation with the virus by applying chemicals (e.g., $ZnSO_4$, picric acid, mercurochrome) having destructive action to the olfactory mucosa; susceptibility is restored when regeneration of the epithelium occurs.

W. McC.

Urea-treated virus as vaccine against rabies.

A. HOYT and D. WARNER (Proc. Soc. Exp. Biol. Med., 1940, 43, 154—156).—Infected rabbit brain, in a concn. of urea sufficient to liquefy the brain material, was able to cause in mice a high degree of immunity to rabies.

V. J. W.

Effect of slow and rapid desiccation on the viruses of rabies and of Aujeszky's disease. P. REMLINGER and J. BAILLY (Compt. rend. Soc. Biol., 1940, 133, 395—397).—The virus of Aujeszky's disease is much less sensitive to slow desiccation but behaves like the rabies virus on rapid drying.

H. G. R.

Rickettsia diseases of Malaya. R. LEWTHWAITE and S. R. SAVOOR (Lancet, 1940, 238, 255—259, 305—311).—From clinical, pathological, epidemiological, and experimental studies it is concluded that tsutsugamushi and rural typhus are identical diseases due to the same virus.

C. A. K.

Infective agent of rickettsia type in a tick (*Hemaphysalis bispinosa*, Neumann) from Cochin China deer. J. MESNARD and C. TOUMANOFF (Compt. rend., 1940, 210, 378—380).—Macerated *H. bispinosa*, from a sambar, when suspended in 0.9% NaCl and inoculated into female guinea-pigs, caused pyrexia, splenomegaly, and congestion of the vaginal epithelium with a gelatinous hæmorrhagic exudate. The macerated brain of the infected animal inoculated into other guinea-pigs transmitted the disease with an incubation period of 4—8 days, pyrexia lasting 2—14 days (sometimes absent), and sometimes scrotal oedema. The spleen and vaginal smears contained rickettsia.

J. L. D.

Development of vaccinia and variola viruses in embryonated eggs at 28°. J. B. NELSON (Proc. Soc. Exp. Biol. Med., 1940, 43, 110—112).—When these viruses are inoculated on the chorio-allantoic membrane of fertile eggs kept at 28° they multiply as well as at 37° but their effect on the membrane and embryo is much less.

V. J. W.

Living vaccinia virus in corneal cells of rabbit.

K. B. EISENBERG-MERLING (J. Path. Bact., 1940, 50, 279—286).—A simple technique is described for demonstrating living vaccinia virus in the corneal cells of the rabbit. The distribution and behaviour of the virus, the formation of inclusion bodies, and their various appearances in different kinds of cells are described. (12 photomicrographs.)

C. J. C. B.

Elimination of smallpox in Montreal by vaccination. A. GROULX (Canad. Publ. Health J., 1940, 31, 6—9).—The val. of vaccination in the control of smallpox is illustrated by experience in Montreal. No case has been reported during the last 10 years.

C. G. W.

Effects of salicylate on plant viruses. R. J. BEST (Nature, 1940, 145, 627—628).—Neutral aq. K salicylate inactivates the viruses of tobacco mosaic

and of tomato spotted wilt at concns. over 0.46M. and 0.1M., respectively. Solutions of tobacco virus and K salicylate deposit an insol., denatured, inactive virus protein. The rate of the irreversible inactivation is logarithmic. Denaturation runs parallel with loss of stream double refraction and of infectivity.

L. S. T.

Relation between activity of virus protein and hydrogen-ion concentration of medium. G. A. KAUSCHE (Naturwiss., 1940, 28, 61—62).—A concn. of tobacco mosaic virus protein of 1 in 10^3 shows max. activity at p_H 3.5 and 7.5 whilst in concn. of 1 in 10^4 and 1 in 10^5 the activity decreases considerably; max. activity is now exhibited at p_H 6.5 and not at 3.5. After 20 min. at p_H 2.6 or 9.5 activity decreases, but can be restored on the acid side by increase of p_H , if not less than 2; on the alkaline side the virus is irreversibly damaged.

J. N. A.

Specific activity of plant virus protein. G. A. KAUSCHE and L. HOLZAPFEL (Naturwiss., 1940, 28, 62—63).—When purified virus solutions are centrifuged, a solution of the solid so obtained has a lower p_H than that of the supernatant liquid; similarly a virus solution which has been frozen and then thawed has a lower p_H than has a control. In this case interferometric determination shows a change in the state of aggregation of the virus protein. Solutions of virus protein which have been frozen and thawed have infecting activities which are proportional to the ratio H^+ concn. : virus concn.

J. N. A.

Reversible inhibition of tobacco mosaic virus in living cells with 0.002M-sodium cyanide. M. W. WOODS (Science, 1940, 91, 295—296).—Protoplasmic streaming in leaf cells of tobacco is O_2 -sensitive, and the rate of streaming can be reversibly and characteristically inhibited by 0.0002M-NaCN. Washing with water restores streaming completely. The multiplication of tobacco mosaic protein is retarded by 0.0002M-NaCN, and is resumed 25 hr. after treatment with NaCN ceases. The appearance of lesions in detached leaves of *Nicotiana tabacum* \times *N. glutinosa* is delayed 45 hr. by 0.0002M-NaCN. Either the virus mechanism depends on the activity of hæmin-containing respiratory catalysts of the cell or the virus protein contains hæmin or a similar structural unit that can be blocked reversibly with CN'.

L. S. T.

Turnip mosaic: extended host range and identity. E. E. CHAMBERLAIN (New Zealand J. Sci. Tech., 1939, 21, 212—223A).—Symptoms of mosaic infection in 18 newly recorded host plants are described. *In vitro* the virus survives between 2 and 3 days; its dilution tolerance is less than 1 : 100 but more than 1 : 1000. Inactivation occurs after 10 min. at 55—60°.

A. G. P.

Oils as protectors of bacteria against heat. A. DUBOIS and M. BALLION (Compt. rend. Soc. Biol., 1940, 133, 448—449).—Vegetable and mineral oils have a protective action against sterilisation of bacteria by heat.

H. G. R.

Differentiation between Gram-positive and Gram-negative organisms without staining. E.

RYU (Kitasato Arch. exp. Med., 1940, 17, 58—63).—A review of the phenol, HNO_3 , and KOH methods of this author. C. J. C. B.

Preparation and diagnostic value of antiserum for placental protein. H. R. COHEN and V. C. FREDA (Proc. Soc. Exp. Biol. Med., 1940, 43, 22—23).—Placental antiserum reacts with autolysed extracts of placenta, kidney, liver, and uterus, and with pregnancy serum, but not with normal serum. V. J. W.

Anticomplementary power of sera. C. A. SAGASTUME and I. MARANO (Rev. Fac. Cienc. Quím. La Plata, 1939, 14, 115—117).—Of 91 samples of sera treated for 30 min. at 55° with 1% of C, 6 developed anticomplementary power. F. R. G.

Immunological differences in Bence-Jones proteins. L. HEKTOEN and W. H. WELKER (Biochem. J., 1940, 34, 487—489).—Precipitin tests with cryst. and non-cryst. Bence-Jones proteins from various patients show that two immunologically distinct groups of the proteins exist. In some cases, proteins of both types are excreted simultaneously by the same individual. The antigenic properties of the proteins are not determined solely by the proportions of various amino-acids which they contain. W. McC.

Iodinated serum-albumin precipitin reaction. Non-precipitable fraction of antibody system. A. BONOT (Bull. Soc. Chim. biol., 1939, 21, 1417—1437; cf. A., 1939, III, 1014).—The ratio of antigen (iodinated serum-albumin fractions) to antibody in precipitin reactions is examined by means of I and N determinations in ppt. produced by different dilutions of antibody. An important fraction of the antibody system remains in solution under conditions in which pptn. of the antibody is most complete. An expression for the change in ratio between antigen and antibody in the ppt. with dilution of antibody was obtained. G. P. G.

Gordon's biological reaction. D. BARBIERI (Klin. Woch., 1939, 18, 1394—1395).—Characteristic degenerative changes in spinal cord of rabbits, especially in the antero-lateral columns, were constantly observed after introduction of material from Hodgkin's lymphatic disease or leukaemia into the brain. The hypothetical relationship between eosinophils or increased spermine content and the Gordon reaction was not confirmed. M. K.

(xxvi) PLANT PHYSIOLOGY.

Ecology of mangroves. I. Determination of osmotic pressure of *Avicennia alba*, Blume. B. S. NAVALKAR (J. Univ. Bombay, 1940, [ii], 8, 58—74).—The osmotic pressure of leaf sap of *A. alba* varies directly with the tide, rainfall, and temp. and inversely with R.H. A. G. P.

Ecology of the larger fungi. III. Constancy and frequency of grassland species with special reference to soil types. W. H. WILKINS and S. H. M. PATRICK (Ann. Appl. Biol., 1939, 26, 25—46).—On grassland the abundance of sporophores was unrelated to the org. matter content of soils.

Clay soil carried relatively few species, probably as a result of water-logging and lack of aeration. In general fungi are more common on acid soil types. A. G. P.

Transport of inorganic ions in polar plant tissues. F. W. WENT (Plant Physiol., 1939, 14, 365—369; cf. A., 1937, III, 444).—Simultaneous polar transport of auxin and non-polar transport of Na^+ and Br^- through coleoptiles and hypocotyls is demonstrated. A. G. P.

Electrical response of *Phaseolus multiflorus* to electrical currents. W. S. REHM (Plant Physiol., 1939, 14, 359—363).—Relationships between applied electric currents and the orientation of potentials within the plant system are examined. A. G. P.

Early growth of beech seedlings under natural and experimental conditions. J. L. HARLEY (J. Ecol., 1939, 27, 384—400).—Shading of beech seedlings results in poor root growth, low root/shoot ratio, low dry matter content in root and shoot, poor absorption of N, and incomplete mobilisation of N before the fall of cotyledons. Mycorrhizal infection is not an important factor in growth of beech during the first 2 years. A. G. P.

Vernalisation of fragments of embryo tissue. O. N. PURVIS (Nature, 1940, 145, 462).—Results obtained with mutilated embryos of Petkus winter rye, vernalised at 1° for 6 weeks, are described and illustrated. Vernalisation accelerates flowering, but response is less than that obtained with complete embryos. L. S. T.

Use of Warburg respirometers in plant physiological investigations. J. W. BROWN (Plant Physiol., 1939, 14, 309—320).—Adaptation of the respirometer to studies of the respiration of acorns is described. A. G. P.

Automatic plant irrigator and recorder. C. N. JOHNSTON and O. A. ATKINS (Plant Physiol., 1939, 14, 391—393).—Simple apparatus for use in pot-culture experiments is described. A. G. P.

Relation between fruit size and food supply in the tomato. F. G. GUSTAFSON and H. B. HOUGHTALING (Plant Physiol., 1939, 14, 321—331).—Increase in leaf area per fruit (as effected by pruning) results in production of larger fruit. The limit of increase differs according to variety. A. G. P.

Potassium deficiency in ammonium- and nitrate-fed tomato plants. M. E. WALL and V. A. TIEDJENS (Science, 1940, 91, 221—222).—Substitution of NH_4^+ for NO_3^- -N in K-deficient tomato plants produces different deficiency symptoms. Deterioration and collapse of leaf tissue are rapid, and carbohydrates decrease rapidly as NH_4^+ increases in the foliage. The injury is attributed to lack of K in preventing NH_4^+ from being converted into NH_2 - and protein-N. L. S. T.

Radioactive isotope study of the absorption of phosphorus and sodium by corn seedlings. A. K. BREWER and A. BRAMLEY (Science, 1940, 91, 269—270).—Using radioactive P (K_3PO_4) and Na (NaCl) as indicators, the curves reproduced show that (i) uptake of P and Na increases with the amount

supplied to the plants, (ii) absorption of P is low in the dark and increases rapidly on exposure to light, and (iii) low temp. and an atm. of CO₂ decrease uptake. The distribution of P in the plant changes considerably with time, but the final distribution is uniform between and along the leaves, except at the tip, where it remains low. The effect of the extent of the root system on uptake has also been investigated. Elimination of Na from the leaf occurs rapidly, but that of P decreases only slightly with time. L. S. T.

Effect of iron and manganese on nitrogen assimilation of *Chlorella*. K. NOACK and A. PIRSON (Ber. deut. bot. Ges., 1939, 57, 442—452).—*Chlorella* utilises NO₃' and NH₃ to similar extents if culture solutions are strongly buffered with PO₄''. Assimilation of NO₃' is unaffected by presence of Fe in media, irrespective of the supply of sugar. The presence of Mn is essential in both myxo- and heterotrophic cultures. A. G. P.

Rôle of boron [in soil and plants]. F. HERZINGER (Bodenk. Pflanzenernähr., 1940, 16, 141—168).—Effects of various dosages of H₃BO₃ on the growth of crop and other plants and on soil micro-organisms are examined. In potato tissue tyrosinase activity and melanin production are suppressed and methylene-blue reduction is favoured by H₃BO₃ (1 in 10³—10⁵); catalase activity is unaffected. H₃BO₃ favours the growth of green filamentous algæ but is injurious to Cyanophyceæ. Ill effects of H₃BO₃ on algæ are more marked in sandy than in calcareous, marl, or moorland soils. In certain ranges of concn. H₃BO₃ favours development of *Azotobacter* and *Clostridium*. A. G. P.

Boron and certain Gramineæ. W. SCHROPP and B. ARENZ (Bodenk. Pflanzenernähr., 1940, 16, 169—184).—B is essential for growth of barley, Sudan grass, and other Gramineæ, in water cultures. Deficiency of B restricts the development of reproductive organs rather than vegetative growth and increases N intake. B has no direct effect on C assimilation or protein metabolism but acts indirectly by modifying the swelling of plasma colloids and thence the water economy of the plant. Monocotyledons have a smaller B requirement than have dicotyledons. Glass culture vessels provide a certain amount of B for plants. A. G. P.

Effect of boron on carrots, sunflower, and buckwheat. W. SCHROPP and B. ARENZ (Bodenk. Pflanzenernähr., 1940, 16, 185—191).—B is essential for growth of carrots, sunflower, and buckwheat. Deficiency of B causes increased N intake, but the ratio protein/total N in the plants is lowered and the translocation of photosynthetic assimilate is restricted. Effects of the deficiency take the form of NH₃ poisoning resulting from protein decomp. which in turn is a consequence of carbohydrate deficiency. A. G. P.

Effect of boron on growth of field beans receiving varied proportions of nitrogen and potassium. B. ARENZ and W. SCHROPP (Bodenk. Pflanzenernähr., 1940, 16, 191—205).—In sand cultures an increase in N supply increased the yield of roots and tops of the beans, diminished nodule formation, increased the p_H of sap, and lowered the total and protein-N content of the plants; the gross

yield of crude and true protein was, however, increased provided adequate amounts of K were available. With progressive increase in K (but no B) supply, there was associated a decrease in yield of root and top, the effect being accentuated by simultaneous use of N fertilisers. The latter nullify the effect of K in increasing nodulation. When B is also given increase in K supply without N leads to diminished yields, whereas max. yields result from application of K + N. Small amounts of B markedly increase yields and nodulation, and improve translocation but do not alter the ratio of protein- to sol. N. Individual plants vary considerably in resistance to B deficiency. A. G. P.

Influence of boron on flower-bud development in cotton. K. T. HOLLEY and T. G. DULIN (J. Agric. Res., 1939, 59, 541—545).—Flower bud development in sand-cultured cotton requires a level of B supply exceeding that necessary for vegetative growth. There is no evidence that initiation of flower buds is related to B supply. A. G. P.

Essentiality of certain elements in minute quantity for plants with special reference to copper. D. I. ARNON and P. R. STOUT (Plant Physiol., 1939, 14, 371—375).—Methods of establishing the necessity of trace elements for plant growth are discussed and illustrated by experiments on Cu in relation to growth of tomatoes (cf. A., 1940, III, 173). A. G. P.

Organic acid metabolism of buckwheat. G. W. PUCHER, A. J. WAKEMAN, and H. B. VICKERY (Plant Physiol., 1939, 14, 333—340).—The org. acids in leaves and stems of buckwheat consist largely of oxalic with smaller proportions of malic and minor amounts of citric acid. The increase in org. acid content during periods of max. daily illumination is accompanied by diminution of [H⁺] in stem saps. Later in the day malic acid is utilised by the plant with increase in other (unidentified) acids and in [H⁺] of saps; this change coincides with diminished intake of inorg. ions. During the night "other acids" are converted into one or more of the identified acids without appreciable change in sap-p_H. A. G. P.

Physiological ontogeny in tobacco plant. III. Drifts in organic acid content of the leaves in relation to phosphorus supply and topping. E. D. WARD and A. H. K. PETRIE (Austral. J. Exp. Biol., 1940, 18, 21—34; cf. A., 1939, III, 948).—The abs. total org. acidity of tobacco plant leaves increased up to the time of attainment of max. area of the leaves. After this there was a further increase in oxalic acid. The % org. acidity on a dry-wt. basis remained const. or fell until maturity. Increasing P supply depressed the % org. acidity. Topping caused a decrease in total org. acidity and oxalic acid content of the lower and middle leaves; this was attributable to accumulation of reserve materials. In the upper leaves, topping caused accumulation of oxalic acid. The % org. acidity was smaller the higher the position on the stem; this was associated with known structural differences in successively-formed leaves. D. M. N.

Seasonal sugar variations in lucerne. J. C. IRELAND (Plant Physiol., 1939, 14, 381—384).—The

concn. of sugar in lucerne is inversely related to soil temp. Hardier plants show the greater concns. of sugar. A. G. P.

Change in alkaloid composition due to the influence of stock on scion in *Nicotiana*. A. SCHMUK, D. KOSTOV, and A. BOROZDINA (Compt. rend. Acad. Sci., U.R.S.S., 1939, 25, 477—480).—In grafted *N. glauca* there is a preponderance of anabasine over nicotine formation. This replacement of nicotine is due to drastic modification of the biological synthesis of alkaloids, arising out of the effect of the stock on the scion. P. G. M.

Condition of chlorophyll in leaves. O. L. INMAN and M. L. CROWELL (Plant Physiol., 1939, 14, 388—390).—Trypsin liberates Mg from the chlorophyll mol. (forming phaeophytin), thus facilitating its displacement by CO₂. The reaction is not solely due to change of p_H. A. G. P.

Photosynthesis in mutational barrenness of Montmorency cherry. J. W. CRIST (J. Agric. Res., 1939, 59, 547—553).—In normal trees part of the products of photosynthesis are diverted from use in vegetative growth to the formation and development of sexual organs. In barren mutants photosynthetic activity is, in general, normal and the total amount of photosynthetic products formed is sufficient to cover the requirements for flowering and fruiting. None is diverted for this purpose and all is utilised vegetatively. There is a slight temporary restriction of photosynthesis in mutants at the period when the first detectable initiation of fruit buds should normally appear. A. G. P.

Rhythmic precipitation of pigments in cell membranes. E. KUSTER (Ber. deut. bot. Ges., 1939, 57, 380—388).—Rhythmic formation and pptn. of necrosis pigment is demonstrated. A. G. P.

Light-bleaching of dried leaves. G. FUNK (Ber. deut. bot. Ges., 1939, 57, 404—413: cf. A., 1939, III, 801).—Colour changes in response to light action vary with the stage of development of the leaves, 5 successive stages being distinguished. Colours developed in leaves containing precursors of chlorophyll differ from those resulting from chlorophyll alone. A. G. P.

Rôle of the chemical constitution and physical properties in the action of cyclic hydrocarbon derivatives on karyokinesis, cytodieresis, and morphogenesis of plants. P. GAVAUDAN and N. GAVAUDAN (Compt. rend. Soc. Biol., 1940, 133, 348—352).—The effects of various halogen derivatives of benzene and naphthalene have been studied. Those with a lower m.p. exhibit greater toxicity. H. G. R.

Ploidy in soya bean, pea, wheat, and rice, induced by colchicine treatment. P. S. TANG and W. S. LOO (Science, 1940, 91, 222).—Changes produced in seedlings by treatment with 0.05% colchicine are described; the plants that develop are tetraploid. L. S. T.

Effects of different forms of colchicine on roots of *Vicia faba*, L. P. N. BHADURI (J. Roy. Microscop. Soc., 1939, 59, 245—276).—Colchicine, colchi-

cine salicylate, and crude corm and seed powder of *Colchicum autumnale*, L., all produce a collapse of the spindle system and other secondary changes in roots of seedlings of *V. faba*. The min. threshold concn. of alkaloid varies according to the physiological state of the cell. Colchicine appears to catalyse chemical reactions which increase the fluidity of the cytoplasm and nuclear material, thus inhibiting spindle formation. E. M. W.

Intercellular wound hormones produced by toxic effect of heteroauxin. J. R. LOOFBOUROW and C. M. DWYER (Stud. Inst. Divi Thomae, 1939, 2, 155—163).— β -Indolylacetic acid is toxic for yeast and produces effects similar to those of irradiation trauma. D. BU.

***Helianthus* test.** W. A. BECK and M. W. DONNELLY (Stud. Inst. Divi Thomae, 1939, 2, 179—188).—If the cotyledons and the uppermost 5 mm. of the hypocotyl are removed from young seedlings the next zone (1.5 mm.) is an excellent growth-indicator. D. BU.

Toxic effects of quinquevalent arsenic compounds on [plant] cells. G. MANGENOT (Compt. rend., 1940, 210, 412—415).—0.001N-Na arsenate rapidly and completely inhibits the growth in length and thickness of rootlets of *Pisum sativum* and *Allium cepa* in Knop's fluid diluted with an equal vol. of water, and retards the growth of the shoot. Na monomethylarsinate and cacodylate gradually inhibit growth in length but give rise to a generalised or sub-terminal thickening of the rootlets. Cell division is by stathmokinesis (cf. A., 1938, III, 966) and leads to a 4n chromosome no. in cells containing giant, lobed, and segmented nuclei. Stathmokinesis in apical meristematic cells is inhibited before that in pericyclic cells. J. L. D.

Relations of plants to minute doses of inhibitive substances. E. S. REYNOLDS (Plant Physiol., 1939, 14, 385—387).—The acclimatisation of plant cuttings to dosages of auxin in respect of stimulative or retarding effects on root production is demonstrated. A. G. P.

Synthesis of growth-inhibitory polycyclic compounds.—See A., 1940, II, 220.

Intracellular inclusions of some plant virus diseases. F. C. BAWDEN and F. M. L. SHEFFIELD (Ann. Appl. Biol., 1939, 26, 102—115).—Some but not all viruses examined induce in plants the formation of intracellular inclusions, some produce only amorphous bodies, and others both amorphous and cryst. inclusions. Insol. complexes of viruses with protamines, histones, and proteins produced *in situ* closely resemble the natural intracellular inclusions. A. G. P.

Bacteriosis. XXIV. Bacterium associated with leafy galls, fasciations, and "cauliflower" disease of various plants (iii). Further isolations, inoculation and cultural studies. M. S. LACEY (Ann. Appl. Biol., 1939, 26, 262—278).—The causal organism, *Bact. fascians*, causes galls and fasciation in numerous plant species. Physiological reactions (described) do not permit cultural distinction between virulent and avirulent forms. A. G. P.

(xxvii) PLANT CONSTITUENTS.

Determination of ammonia- and amide-nitrogen in connexion with the chlorate method for nitrogen in plant tissues. E. M. EMMERT (Plant Physiol., 1939, 14, 341—349).—In the NaClO_3 - H_2SO_4 method for determining oxidisable org. N as NO_3' (B., 1935, 919; A., 1938, III, 361) NH_4 salts present are not oxidised (if sufficient org. matter is present) and may be determined directly in an aliquot of the digest by Nessler's reagent. Treatment of asparagine by this method affords a quant. separation of amino-N (oxidised) and amide-N (remaining as NH_3). By prolonging the ClO_3' oxidation under reflux with further addition of NaClO_3 complete oxidation of NH_3 to NO_3' may be effected. The total N of pyridine is determined by this method. A. G. P.

Amino-acids in maize kernels. F. A. CSONKA (J. Agric. Res., 1939, 59, 765—768).—The N distribution of the proteins of whole maize is determined. None of the essential dietary amino-acids is absent. The distribution is similar in white and yellow varieties. Compared with casein whole maize protein is deficient in lysine and tryptophan. A. G. P.

Oil bodies of liverworts. K. MÜLLER (Ber. deut. bot. Ges., 1939, 57, 326—370).—The occurrence and nature of the oil bodies in various species are examined. A. G. P.

Calythron.—See A., 1940, II, 203.

Isolation of phytin from soil. W. J. DYER, C. L. WRENSHALL, and G. R. SMITH (Science, 1940, 91, 319—320).—Phytin is stable to alkaline hypobromite. Treatment of an alkaline soil extract with OBr' , followed by FeCl_3 pptn. in acid solution, yields a product containing about 25% of the org. P of the original soil. Comparison with Fe^{III} phytate prepared from wheat bran phytin shows that the soil prep. is Fe^{III} phytate. Phytin combines with more Fe than is indicated by titration to the CNS end-point. It appears to be fixed promptly in acid soils, presumably by Fe. L. S. T.

Removal of melanin from amino-acid solutions. K. KIHARA (J. Agric. Chem. Soc. Japan, 1940, 16, 206—208).—Phenol is an excellent solvent for melanin. A method for determining the "taste ratio" of protein hydrolysates is described. The amino-acid solution containing melanin is treated with aq. $\text{Ba}(\text{OH})_2$ and the filtrate shaken with phenol. The aq. layer is extracted with ether and conc. Amino-N (calc. as A per 100 c.c.) is determined in 5 c.c. of this conc. solution. 20 c.c. of conc. solution are treated with 2 g. of $\text{Ba}(\text{OH})_2$ and 80 c.c. of 94% alcohol. The washed and dry ppt. is dissolved in warm aq. acetic acid and amino-N is determined. If B is the amount of glutamic acid-N in 100 c.c. of conc. solution, and C the amount of amino-N in 100 c.c. of the original solution containing melanin, then B/A is the "taste-ratio" and the glutamic acid-N of the original solution is given by BC/A . J. N. A.

Constituents of *Catalpa ovata*, G. Don. M. HIRAMOTO and K. WATANABE (J. Pharm. Soc. Japan, 1939, 59, 261—264).—Extraction of the bark of the roots of *C. ovata* with boiling water and then methyl

alcohol affords isoferulic acid, m.p. 228° (decomp.) (also from caffeic acid and methyl iodide-KOH-methyl alcohol at 135°), sitosterol, m.p. 137°, and (?) an anthraquinone derivative. Extraction of the leaves of the plant with aq. NaHCO_3 gives *p*-coumaric acid, whilst the bark of the trunk, with methyl alcohol, gives *p*-coumaric and ferulic acid, m.p. 171°.

A. T. P.

Constituents of *Lentinus tuber-regium*, Fr. S. NAKANISHI, M. YAMAMOTO, and T. NAKAMURA (J. Pharm. Soc. Japan, 1939, 59, 276—277).—*L. tuber-regium* ("Nanyo Bukuryo") is an imitation of the natural drug "Bukuryo" (cf. A., 1940, II, 229), but differs in appearance and chemical properties. An ether extract affords a sterol, $\text{C}_{27}\text{H}_{46}\text{O}_3$, m.p. 112°, and a wax, m.p. 80°.

A. T. P.

Constituents of *Geranium Onoli*, Franch. et Sav. F. FUZIKAWA and M. INA (J. Pharm. Soc. Japan, 1940, 60, 30).—The presence of quercetin, gallic acid, methyl gallate, and tannic acid is established. H. W.

Pharmacognosy of leaves of *Hamamelis* spp. II. Y. YOSIDA (J. Pharm. Soc. Japan, 1939, 59, 246—247).—7 species contain 2.12—8.89% of tannic acid. R. S. C.

Constituent of leaves of *Leucothoe Keiskei*, Miq. H. SIMADA (J. Pharm. Soc. Japan, 1939, 59, 242—244).—The leaves contain ursolic acid and uvaol.

R. S. C.

Loco weeds. Isolation of α - and β -earleine from *Astrogalus earlei*.—See A., 1940, II, 185.

Irritant substance of *Mimosa pudica*, L. G. HESSE (Biochem. Z., 1939, 303, 152—163; cf. Soltys *et al.*, A., 1936, 534).—The crude substance, which is probably identical with that of *Neptunia plena*, is isolated by boiling fresh shoots with water, concentrating the extract, removing impurities with Pb acetate, evaporating under reduced pressure, pptg. the active material with Hg acetate, suspending the ppt. in dil. alcohol, removing Hg with H_2S , evaporating to dryness, dissolving in water, adsorbing on Al_2O_3 , and eluting with 2N-acetic acid. In the last stage the yield is 90% and the degree of concn. 20-fold. A method (error 20%) of determining the substance is described. The spontaneous inactivation of the substance in solution results from autoxidation which, in the unpurified solution, is retarded by oxidisable impurities. Partial reactivation is brought about by reducing agents (H_2S , $\text{Na}_2\text{S}_2\text{O}_4$). The plant and the press-juice contain also a heat-sensitive oxidase which, in presence of O_2 , rapidly inactivates the substance. The substance resembles, but is not identical with, ascorbic acid. W. McC.

Sterol from seeds of *Coix lacryma-jobi*, L.—See A., 1940, II, 218.

Constituents of *Veronica* spp. F. FUZIKAWA, Y. KUDO, and H. SENGOKU (J. Pharm. Soc. Japan, 1939, 59, 241—242).—8 species contain 0.14—1.74% of *d*-mannitol. R. S. C.

Constituent of fruit of *Pyracantha angustifolia*, Schneid (Rosaceae). H. SIMADA and T. KANO (J. Pharm. Soc. Japan, 1939, 59, 255—256).—The

fruit contains about 9% of sorbitol and about 1.2% of a sugar. R. S. C.

Composition of plants in Taiwan. T. HIRATA, K. HONDA, Y. NAKAMURA, and K. YAMAFUJI (Bull. Agric. Chem. Soc. Japan, 1940, 16, 33—37).—Analyses of the nodular, exterior, and medullary portions of the stalks of various strains of sugar cane, and of the woody and fibrous tissue and green shoots of *Crotalaria juncea*, *C. usaromoensis*, and *Sesbania cannabica* (types of Leguminosæ) and the cotton shrub, stalk of castor oil plant, rice straw, *Agave americana*, *Pandanus odoratissimus*, and *Casuarina stricta* are recorded. The exterior portion of the sugar cane stalk contains more cellulose and less ash than do the other parts, whilst the nodular portions contain the largest amount of lignin. In the Leguminosæ fibrous tissue contains less pentosan and lignin but more N and ash than woody tissue. The changes in the amounts of the constituents in woody and fibrous tissue 60, 90, and 120 days after sowing are determined. J. N. A.

Soluble reserve carbohydrates in Liliifloræ. N. GRALÉN and T. SVEDBERG (Biochem. J., 1940, 34, 234—248).—The water-sol., high-mol. substances present in the bulb juices of approx. 75 species of Liliaceæ, Amaryllidaceæ, and Iridaceæ are investigated in the ultracentrifuge. The different species contain proteins and polysaccharides of different properties and in varying proportions and give very different sedimentation diagrams. In general, the species of the same genus have a similar content of high-mol. material. The *Lilium* species all contain large amounts of sol. polymeric carbohydrate and they all have similar sedimentation diagrams. Outside the genera, differences are great even within the same family, and species of *Fritillaria* and *Tulipa*, which belong to the same subfamily as *Lilium*, contain more protein than carbohydrate. In the various species there are two classes of carbohydrates which are distinguished by their sedimentation behaviour. One class (*Hyacinthus*) gives a broad diffuse boundary which indicates a marked polydispersity, whilst the second class (*Lilium*), although it has a const. of the same magnitude, has a very sharp boundary. The purified polysaccharides from *L. speciosum* and *Narcissus Leedsii* have sedimentation consts. of 1.6 and 1.9, and mol. wts. of 20,000 and 50,000, respectively. The polydispersity of the sol. polysaccharides and the monodispersity of the globular proteins are compared and discussed. J. N. A.

The [plant] cell wall. I. Methods for demonstrating lignin distribution in wood. H. E. DADSWELL and D. J. ELLIS (J. Council. Sci. Ind. Res. Australia, 1940, 13, 44—54).—Lignin patterns in the secondary wall of cells of wood sections are demonstrated in many but not in all woods by gently warming in 72% H₂SO₄ on a micro-slide. In some cases pretreatment with I in aq. KI improved the test. The patterns indicate a degree of lignification of the wall comparable with that shown by staining with safranin and light-green. A. G. P.

Scilliroside.—See A., 1940, II, 206.

Adenium somalense.—See A., 1940, II, 206.

Conditions of carotenoids in plastids. W. MENKE (Naturwiss., 1940, 28, 31).—Spectroscopic observations indicate that the carotenoids in the plastids of plants are combined with protein. The change in absorption bands on denaturing the protein by heat is best shown by the fucoxanthin of brown algæ. W. O. K.

Natural anthocyanin pigments. III. Flower pigments of *Verbena hybrida*. R. SCOTT-MONCRIEFF and V. C. STURGEES (Biochem. J., 1940, 34, 268—271; cf. A., 1930, 967).—The isolation of delphinidin-3:5-diglycoside and -3-monoglycoside from purple and maroon flowers of *V. hybrida* is described. The carbohydrates present are probably glucose. J. N. A.

Chlorophyll as the prosthetic group of a protein in the green leaf. E. L. SMITH (Science, 1940, 91, 199—200; cf. A., 1938, III, 971).—The purified chloroplast material from spinach and aspidistra contains approx. 16 parts of chlorophyll to 100 of protein. The constancy of this ratio supports the conclusion that chlorophyll acts as the prosthetic group of a protein (cf. *loc. cit.*). Na dodecyl sulphate clarifies the green pigment completely, and converts the chlorophyll quantitatively into phæophytin by removing Mg. Conversion occurs even at p_H 8—9, and the rate is proportional to [H⁺]; at const. p_H , the rate is proportional to the concn. of the Na salt until a max. is reached. The formation of phæophytin does not occur in 4% digitonin, or in 10% bile salts at p_H 4.5. In presence of this Na salt the chlorophyll or phæophytin (depending on p_H) remains attached to the protein, indicating that in the smaller units Mg plays no part in uniting chlorophyll to protein. L. S. T.

State of chlorophyll in the plant, and in extracts and pure preparations. K. P. MEYER (Helv. Phys. Acta, 1939, 12, 349—393).—Chlorophyll extracts obtained from plants by the mild treatment with alcohol and light petroleum described give an absorption spectrum in which the extinction- λ curve differs from that found with ordinary preps., notably in the absence of the band at 5300 Å. The differences disappear when the solution is aged. Colloidal preps. obtained from alcohol extracts give extinction curves closely similar to those given by chlorophyll *in situ* in plant leaves, and different from those of molecularly dispersed preps. L. J. J.

Determination of chlorophyll and carotene in plant tissue. H. G. PETERING, W. WOLMAN, and R. P. HIBBARD (Ind. Eng. Chem. [Anal.], 1940, 12, 148—151).—Chlorophyll in acetone extracts of plant tissue can be determined without removal of other pigments by means of the photo-electric colorimeter with suitable filters. Carotene in light petroleum can be determined after removal of all other pigments, although small amounts of chlorophyll can be corrected. Chlorophyll can be removed from acetone or alcohol extracts by activated Ba(OH)₂ or finely divided Ba(OH)₂·8H₂O. F. R. G.

Alkaloids from *Sanguinaria canadensis* and their influence on growth of *Phymatotrichum omnivorum*. G. A. GREATHOUSE (Plant Physiol.

1939, 14, 377—380).—Sanguinarine, chelerythrine, and protopine are isolated from roots and rhizomes of *S. canadensis* and shown to be toxic (notably sanguinarine) to *P. omnivorum* even in small concns. Resistance of *S. canadensis* to *Phymatotrichum* root-rot is probably dependent on the presence of these alkaloids.

A. G. P.

Alkaloids of *Petrosimonia monandra* (Pall.), Bge. (Chenopodiaceæ family). N. K. JURASCHEVSKI and S. I. STEPANOV (J. Gen. Chem. Russ., 1939, 9, 1687—1689).—The plant contains 1.5% (dry wt.) of alkaloids, chiefly piperidine (1.33%). The m.p. of piperidine hydrochloride is 245—246° (lit. 237°), and of the picrolonate 251—252° (lit. 248°).

R. T.

Alkaloids of the Papaveraceæ family. VI. Alkaloids of *Glaucium fimbriigerum*. R. A. KONOVALOVA, S. JUNUSOV, and A. P. OREKHOV (J. Gen. Chem. Russ., 1939, 9, 1939—1946).—The air-dry plant contains 0.77% of alkaloids. Chelerythrine and sanguinarine are identified in the roots, and protopine, corydine, and allocryptopine in the remainder of the plant.

R. T.

Pharmacology of *Ochrosia elliptica*, Labill. Should it be classed as a quinine plant? RAYMOND-HAMET (Compt. rend. Soc. Biol., 1940, 133, 262—264).—The pharmacological reactions of an extract resemble those of gelsemine rather than quinine.

H. G. R.

Menispermaceæ alkaloids.—See A., 1940, II, 238.

Alkaloids of *Corydalis ochotensis*, Turcz, and *C. pallida*, Pers.—See A., 1940, II, 238.

(xxviii) APPARATUS AND ANALYTICAL METHODS.

Nebuliser for inhalation experiments. R. J. MAIN (Ind. Eng. Chem. [Anal.], 1940, 12, 117).—The modification of the Parke Davis nebuliser described produces a stable, smoke-like mist without spattering.

L. S. T.

"Vacuum" flasks for preserving sugar-cane pollen. M. VIJAYASARADHY (Current Sci., 1939, 8, 554—555).—Simple apparatus for preserving sugar-cane pollen in a viable state for several days under controlled temp. and R.H., is described.

W. O. K.

Determination of relative humidity while measuring respiration in a gas train system. W. W. JONES (Science, 1940, 91, 202).—Apparatus and method are described. In the sterilisation of papayas at 110° F. the fruits are severely injured when R.H. is approx. 100%; at 80% R.H. there is no injury.

L. S. T.

Determination of paraldehyde in biological fluids. H. LEVINE and M. BODANSKY (J. Biol. Chem., 1940, 133, 193—198).—The method described is based on oxidation of paraldehyde by $K_2Cr_2O_7-H_2SO_4$, and iodometric titration of the excess of $K_2Cr_2O_7$.

P. G. M.

Micro-diffusion method for determination of acetone. S. C. WERCH (J. Lab. clin. Med., 1940, 25, 414—420).—The method is based on the use of the Conway diffusion apparatus.

C. J. C. B.

Iodometric determination of pyruvic acid. G. A. SCHRADER (J. Lab. clin. Med., 1940, 25, 520—526).—The essential improvements are (a) the addition of an excess of 0.01N-I prior to liberation of pyruvate-bound HSO_3' with HCO_3' ; (b) a decrease in the amount of HSO_3' with a consequent decrease in amount of 0.1N-I and in total vol. of solution; (c) the use of 0.01N- $Na_2S_2O_3$ which permitted a more accurate adjustment of the end-point prior to and following the liberation of pyruvate-bound HSO_3' . With the apparatus used and concn. of reagents employed, 0.10—5.0 mg. of pyruvic acid can be determined accurately.

C. J. C. B.

Detection, identification, and determination of methyl formate in tissues. A. O. GETTLER (Amer. J. clin. Path., 1940, 10, 188—190).—An acute fatal poisoning by absorption of methyl formate is described and analytical procedures are given.

C. J. C. B.

Micro-determination of homocystine in pure solution with the dropping mercury cathode. A. STERN and E. F. BEACH (Proc. Soc. Exp. Biol. Med., 1940, 43, 104—108; cf. A., 1940, III, 176).—The method previously described is applied to homocystine.

V. J. W.

Colorimetric micro-determination of arginine and of mono-substituted derivatives of guanidine. Application to protein hydrolysates.—See A., 1940, II, 241.

Rapid determination of magnesium in body fluids; results on clinical material. B. CASSEN (J. Lab. clin. Med., 1940, 25, 411—413).—A spectrographic method is described. The plasma vals. were 3—4 mg.-%; for whole blood 6—7 mg.-%. C.s.f. contained an average of 3 mg.-%.

C. J. C. B.

Earthworm as sensitive detector of acetylcholine. N. GAVRILESCO and N. IONESCO (Bull. Acad. Sci. Roumaine, 1940, 22, 249—250).—Earthworms cut longitudinally can be used to detect acetylcholine at a concn. of 10^{-7} and can replace leeches for this purpose. The presence of eserine is necessary.

F. L. U.

(xxix) NEW BOOKS.

Système nerveux cérébro-spinal. [Cérébro-spinal nervous system.] F. BREMER and F. KLEYNTJENS (Actualités scientifiques et industrielles, no. 767. Hermann et Cie., Paris, 1939, 94 pp.).—This monograph deals first with general problems of the central nervous system and subsequently discusses the special physiology of the spinal cord, medulla, pons, thalamus, hypothalamus, cerebellum, and cerebral cortex. Central excitation and inhibition are reviewed mainly from the point of view of the "electro-physiologist." There is an extensive bibliography of recent work.

A. S.

Life at high altitudes, and mountain sickness. M. M. SIROTININ (Acad. Sci. Ukr. S.S.R., Inst. Clin. Physiol., 1939, pp. 5—226).—The monograph gives an historical survey of human life at high altitudes. The therapeutic value of the mountain climate is discussed. (33 figs.)

R. T.