BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

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

APRIL, 1941.

I.—GENERAL ANATOMY AND MORPHOLOGY.

Innervation of the panniculus carnosus in *Dasypus novemcinctus*. S. S. Miles (*Anat. Rec.*, 1940, **78**, 273—280). W. F. H.

Anatomy of ulnar bursa. C. R. Salsbury (*Canad. Med. Assoc. J.*, 1940, **43**, 430—432).—The exact details of the relation between the ulnar bursa and the digital sheath of the little finger are reported. C. J. C. B.

Specialised sphincter in arteries of human lung. H. von Hayek (*Anat. Anz.*, 1940, **89**, 216—219).—The arteries of the lung possess a specialised closing mechanism similar to those found in the cavernous tissue of penis, in the umbilical arteries, the ductus arteriosus, and in the kidney, ovary, and thyroid. J. D. B.

Periarterial lymphatic spaces in human lung. H. von Hayek (*Anat. Anz.*, 1940, **89**, 219—233).—Arteries in newly-born and adult lung are frequently found to lie within a lymph space which separates them from the neighbouring lung tissue. J. D. B.

Lobe of the azygos vein in Japanese. B. Adachi (*Anat. Anz.*, 1940, **89**, 214—216).—This lobe is much rarer in Japanese than in Europeans. J. D. B.

Inferior phrenic artery: origin and suprarenal branches. J. W. Pick and B. J. Anson (*Anat. Rec.*, 1940, **78**, 413—427).—This artery is derived more frequently from the coeliac artery than from the aorta directly. The incidence of paired and unpaired origin from these sources is given. The renal artery is sometimes the source, most commonly on the right side, more rarely the left branch of the hepatic artery. The inferior phrenic arteries are the most const. source of suprarenal arteries. These originate from its main stem or posterior branch, never from its anterior branch. W. F. H.

Experimental study of mechanics and rôle of muscles and ligaments in support of arch of human foot. R. L. Jones (*Amer. J. Anat.*, 1941, **68**, 1—39).—The greater part of the tension stress of the longitudinal arch is sustained by the plantar ligaments. Short plantar muscles also aid in the support of this arch and are better adapted for the purpose than the long flexors. Stress on the longitudinal arch is directly proportional to pressure (or wt.) borne by the ball of the foot. The distribution of wt. on the metatarsal heads follows a definite ratio related to the bony architecture of the foot and is affected by changes in the position of the foot and the actions of muscles. The main function of the inverters and everters is to preserve constancy in the ratio of wt. distribution among the metatarsals. Failure of the arch is correlated with the duration of the stress. A fallen arch cannot be raised by muscular exercise and arch supports have little effect. W. F. H.

Rudimentary teeth primordia and other peculiarities of buccal cavity of *Manis javonica*. D. Storeck (*Anat. Anz.*, 1940, **89**, 305—315). J. D. B.

Rare anomaly of clavicle. P. Prulachs (*Anat. Anz.*, 1940, **89**, 238—239).—Abnormal articulation with the acromion in a patient with no history of trauma. J. D. B.

Time and order of appearance of ossification centres and their development in skull of rabbit. J. A. Bruce (*Amer. J. Anat.*, 1941, **68**, 41—67).—The mandible is the first bone to ossify (16th day); the last is the petrous (28th day). The basioccipital originates from an unpaired centre. The order of the appearance of the bones is correlated with their origin and the investing bones usually appear before the replacing bones. Comparison of the appearance of ossification centres with those in man, the rat, and the mouse indicates that in animals with shorter gestation periods ossification occurs relatively later. W. F. H.

Response of cartilage and bone of new-born guinea-pig to stimulation by various hormones. M. Silberberg and R. Silberberg (*Anat. Rec.*, 1940, **78**, 549—558).—In the new-born cartilage reacts to hormonal stimulation (anterior hypophyseal extract, œstrogen, thyroxine) with more proliferative and less retrogressive changes than in older animals. W. F. H.

Effect of elementary phosphorus on epiphysis of rat. E. A. Gall, J. S. Barr, and J. R. Langley (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 539—543).—Feeding with P causes a failure in the absorption of the calcified cartilage trabeculæ. Bone is deposited on these, causing a sclerosis, but there is no increased osteoblastic activity. V. J. W.

Influence of fusion of spine on growth of vertebræ. S. L. Haas (*Arch. Surg., Chicago*, 1940, **41**, 607—624).—Fusion of the spinous processes in dogs caused anterior bulging of the vertebral bodies, lordosis, compression of the intervertebral discs, and premature ossification of the epiphysial plates. F. S.

Differential diagnosis of rare skeletal diseases. M. Lüdin (*Helv. med. Acta*, 1938, **5**, 524).—A lecture. M. K.

Albers-Schönberg disease (marble bones). A. Albrecht and O. Geiser (*Jahrb. Kinderheilk.*, 1939, **153**, 84—103).—Two cases of the malignant infantile form are reported. M. K.

Albers-Schönberg disease (marble bones). S. van Crefeld and N. J. Heybroek (*Acta paediatr. Stockh.*, 1939, **27**, 462—494).—Clinical, roentgenological, and chemical findings in 2 cases of marble bones are reported. M. K.

Ætiology of multiple deformities. D. Engel (*Amer. J. Dis. Child.*, 1940, **60**, 562—579).—All signs of dysotosis are considered to be caused by the damaging effect of blebs of the c.s.f. which has escaped from the medullary tube into the subcutaneous tissue through the foramen anterius in early embryonic life. C. J. C. B.

Effects of maceration and drying on presacral vertebræ. R. R. Lanier (*Amer. J. phys. Anthrop.*, 1940, **27**, 469—477).—A method of maceration is described, and it was found that while the vertebræ shrink uniformly in the process no distortion occurs. W. F. H.

Multiple anomaly of human heart and pulmonary veins. W. J. Atkinson, J. L. Dean, E. H. Kennerdell, and C. J. Lambertsen (*Anat. Rec.*, 1940, **78**, 383—388). W. F. H.

Congenital defects in diaphragm. A. A. Liebow and H. C. Miller (*Amer. J. Path.*, 1940, **16**, 707—738).—Persistence in patency of the pleuroperitoneal foramen beyond the 7th—8th week of intrauterine life is probably responsible for congenital diaphragmatic hernia. The one associated anatomical change found in all 4 specimens dissected was in the atypical rotation and attachment of the mesenteries. This suggests that the intestines were already misplaced at the middle of the 4th month, the usual time of rotation and fixation. It is concluded that the high position of the left kidney observed 3 times in the present series cannot invariably be the cause of the defect in the diaphragm. The abdominal viscera are attached in the thorax only where the kidney in a high position serves as the attachment of the mesenteries. C. J. C. B.

Congenital diaphragmatic hernia. J. H. Willard (*Amer. J. digest. Dis.*, 1940, **7**, 447—450).—Report of a successfully operated case. N. F. M.

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Atresia of œsophagus combined with tracheo-œsophageal fistula in 9-mm. human embryo, and its embryological explanation. P. Gruenwald (*Anat. Rec.*, 1940, **78**, 293—302). W. F. H.

Evolution of amnio-ectoblastic vesicles in parthenogenic poly-embryomata in human testes. A. Peyron (*Compt. rend. Soc. Biol.*, 1940, **133**, 203—205). P. C. W.

Development of peripheral lymphatics in human fœtus. R. Marti (*Compt. rend. Soc. Biol.*, 1940, **133**, 188—190).—In early fœtal life the growth of the lymphatics in man appears to be directed along the path of the arterial vessels. P. C. W.

Regulation phenomena in anomalous closure of neural tube in chick embryo. A. Baumann and J. Wirth (*Compt. rend. Soc. Biol.*, 1940, **133**, 265—267). P. C. W.

Early localisation of thyroid anlage in *Hyla regilla*. M. Stokes (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 681—682).—Vital staining with Nile-blue sulphate shows that the cells to form the thyroid lie in the median plane, within the early blastoporal groove, towards its ventral lip. V. J. W.

Kuo vaseline technique for studying behaviour development in chick embryos. R. F. Becker (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 689—691).—Application of vaseline to shell membrane causes anoxæmia and asphyxia, and the behaviour described by Kuo cannot be regarded as normal. V. J. W.

Transplantation of non-differentiated nerve tissue in chick embryo. A. Weber (*Compt. rend. Soc. Biol.*, 1940, **133**, 221—223).—The transplants were made at the end of the 2nd day of incubation. Transplants from the sensory fibres of the neural crest behaved exactly as in *in vitro* culture irrespective of the site of implantation. Fibres from the motor region were attracted to the sympathetic nerve elements of the host embryo around which they formed pericellular terminations. P. C. W.

Development of melanophores from embryonic mouse tissues grown in cœlom of chick embryos. M. E. Rawles (*Proc. Nat. Acad. Sci.*, 1940, **26**, 673—680).—The cœlom of the chick embryo is an excellent site for the growth and differentiation of implanted, embryonic mouse tissue. The formation of pigmented hairs and the migration of melanophores from such implants of skin ectoderm–mesoderm from mouse embryos are described. Both in the chick and mouse, the melanophores probably arise from the neural crest and migrate into the skin and developing hair follicles. F. O. H.

Hormones of development. G. Lenart (*Jahrb. Kinderheilk.*, 1940, **155**, 140—159).—Morphogenesis and direction of development are determined by hormonoid substances (gen-hormones and tissue-hormones). Gen-hormones are responsible for the normal course of growth, enchondral and perichondral ossification, normal erythropoesis, etc. Tissue-hormones organise the differentiation of tissues and organs during the course of embryonic development. They cause sexual differentiation when the gonads are not fully developed morphologically and also play a big part in the process of growth. The placental hormones form a transition from tissue to glandular hormones. Glandular hormones of the maternal organism are considered as ecto-hormones from the point of view of the fœtus. M. K.

Genetic constitution of mice of strain XXIX reproducing without segregation. N. Kobozieff and N. A. Pomriaskinsky-Kobozieff (*Compt. rend. Soc. Biol.*, 1939, **132**, 406—409). P. C. W.

Genetical and mechanical properties of sex chromosomes. VII. *Apodemus sylvaticus* and *A. hebridensis*. P. C. Koller (*J. Genet.*, 1941, **41**, 375—389).—A study of the chromosome complements was made in the male of both species. In addition to sp. morphological characteristics such as coat-colour, size, etc., a difference in the sex-determining mechanism was observed. Both species have a diploid chromosome no. of 48 in the spermatogonia. The sex chromosomes are unequal in size; the *X* is the largest, *Y* the smallest, and *Y* is smaller in *A. hebridensis* than in *A. sylvaticus*. The behaviour of the *X* and *Y* chromosomes during meiosis is described in both species. W. F. H.

Effect of sex on spontaneous mutation rate in *Drosophila melanogaster*. C. Auerbach (*J. Genet.*, 1941, **41**, 255—265).—Spontaneous mutation rate in various stocks reared under controlled identical conditions was found to be markedly higher in the male, the differences being statistically significant. Explanations for these results are suggested but without further evidence no decision is possible. The fluctuations observed indicate that strict control of all conditions is necessary. W. F. H.

III.—PHYSICAL ANTHROPOLOGY.

Critique of methods of classifying mankind. W. C. Boyd (*Amer. J. phys. Anthrop.*, 1940, **27**, 333—364).—Various characteristics employed in classification are considered, *e.g.*, blood groups, taste reactions to phenylthiocarbamide, stature, metrical characteristics of the body, pigmentation of skin, hair, and eyes, and physical characteristics of the hair. Of these, blood groups are considered the most valuable criteria of classification. W. F. H.

Oncoming reversal of human growth tide. C. A. Mills (*Science*, 1940, **92**, 401—402).—Adult stature may be receding at lower latitudes of U.S.A., while more rapid growth through childhood and adolescence brings young people to adult stature at ever earlier ages. Cessation or reversal in the human growth tide may be due to continuous unseasonable warmth, which has prevailed since 1929. E. R. S.

Anthropometric data on college women of the Middle-States. E. G. Donelson, M. A. Ohlson, B. Kunerth, M. Patton, and G. M. Kinsman (*Amer. J. phys. Anthrop.*, 1940, **27**, 319—332).—Measurements of height, wt., lateral chest breadth, chest depth (antero-posterior), girth of arms and left leg, and pressure of the right and left hands are recorded from 1013 women of 5 states. Height, wt., girth of right arm, and leg circumference show a small consistent increase between the ages of 17 and 19 years. Height and wt. measurements slightly exceed those previously recorded from the respective states. Chest measurements are slightly below those recorded by Hrdlička for Old Americans. Pressure measurements varied but all exceeded those given by Hrdlička for adult Old Americans. W. F. H.

Lower jaw. Further studies. A. Hrdlička (*Amer. J. phys. Anthrop.*, 1940, **27**, 383—467).—Additional data are given on bigonial breadth, symphyseal height, length of body, length–breadth index, height of ramus, ramus height–body length index, and breadth–height index of ramus. The measurements are based on approx. 4500 adult non-pathological lower jaws representing 24 racial or tribal groups. The largest and stoutest found in American Arctic and Alaskan peoples has no bearing on their stature or physical type. The only southern group approaching them was Old Florida Indians but in them the stoutness is comparable with the massiveness of the whole skeleton, in turn dependent on the nature of the food and perhaps water. Canton coolies and Indians of Old Peru and New Guinea Melanesians have "weak" jaws comparable with their submedium physical stature. Melanesian and Australian jaws are medium to submedium in development. American negro jaws resemble those of American whites in general development. W. F. H.

Palpation and location of nasion in living. M. F. Ashley-Montagu (*Amer. J. phys. Anthrop.*, 1940, **27**, 313—317).—A criticism of the work of Chattopadhyay (A., 1939, III, 1023) who maintained that in a large proportion of cases it is possible to determine the position of the nasion in the living by palpation with the thumb-nail. Various objections to the use of this method are cited by the author, who has never been able to locate the fronto-naso suture by this means. W. F. H.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Origin and relations of pulmonary macrophages. L. P. Clements (*Anat. Rec.*, 1940, **78**, 429—447).—Pulmonary dust cells in the white mouse are functional macrophages and are derived from the septum cells. The latter arise from undifferentiated connective tissue cells of the lungs. There is a direct relationship between the amount of connective

tissue in different regions of the lung and the no. of macrophages. Monocyte-like macrophages similar to those in connective tissue remote from the respiratory tract sometimes occur free in the alveolar spaces, where they function as dust cells. They are not the precursors of true dust cells. Little evidence was adduced of a sp. protective cell against acids in the lung. W. F. H.

Calcification of developing bones in embryonic and newborn rats. W. Bloom and M. A. Bloom (*Anat. Rec.*, 1940, **78**, 497—523).—Periosteal membrane bone is laid down and there is extensive calcification in the cartilage before penetration by blood vessels. Erosion and invasion at the epiphyseal line in rapidly growing long bones almost outstrips calcification of the cartilage. In the embryo rat calcification of the cartilage matrix occurs as the adjacent cells become hypertrophic and of osseous tissue as it is laid down. The relative val. of various histological methods is discussed. W. F. H.

Calcification in normal growing bone. F. C. McLean and W. Bloom (*Anat. Rec.*, 1940, **78**, 333—359). W. F. H.

Cytogenesis in pars distalis of horse pituitary. B. M. Harrison and E. H. Shryock (*Anat. Rec.*, 1940, **78**, 449—471).—21 specimens ranging from a 25-mm. fœtus to the adult stage were examined. The invasion by mesenchyme of the epithelial tissue in the anterior wall of Rathke's pouch is described. Acidophil cells were observed at 64-mm. and basophils at the 138-mm. stages. Acidophilic and basophilic cytoplasmic granules were never present in the same cell. Chromophile cells are typically located adjacent to capillaries. The evidence indicates that basophils and acidophils develop independently from chromophobe cells. W. F. H.

Melanophores with special reference to their rôle in feather coloration. H. L. Hamilton (*Anat. Rec.*, 1940, **78**, 525—547).—Two basic types of feather-pigmenting melanophores are described. Migration of melanophores appears to be restricted to the period prior to pigment differentiation. Melanin granules first appear as colourless refractile particles; increase in their size is accompanied by colour changes. As the amount of pigment increases within melanophores granules appear in the tips of the cell processes and are eliminated. Melanophores are present in the embryos of both dominant and recessive white breeds. The relationship between viability differences of melanophores and whiteness in feathers is discussed. W. F. H.

Effect of colchicine on epithelial cells in axolotl. V. Bureau and V. Vilter (*Compt. rend. Soc. Biol.*, 1939, **132**, 553—558).—The buccal epithelium was examined at varying intervals after immersion of axolotls in a colchicine solution (1/20,000) and intraperitoneal injection of 0·5 mg. per 10 g. body-wt. The no. of mitoses was counted and analysed into % of the various stages. The proportion of prophases diminishes, as does that of anaphase, while the proportion of premetaphase increases to a max. of 90%. The total no. of mitoses diminishes before gradually increasing. Colchicine has no stimulating action on karyokinesis; the apparent increase in no. of mitoses is due to the accumulation of blocked mitoses in premetaphase. P. C. W.

Action of arsenic, colchicine, trypaflavin, and other substances on tissue cultures. O. Bucher (*Schweiz. med. Wschr.*, 1940, **70**, 910—911).—As_2O_3 stimulates the growth of cultures of rabbit's fibroblasts in concn. of 1 : 10—40 million; 1 : 1—3 million produces abnormal mitoses and inhibits growth, and chromosoma are split off the nucleus during cell division. Colchicine arrests mitosis in the metaphase in concn. of 1 : 20—30 million; the chromosoma become pyknotic and may disintegrate; cells may contain the double no. of chromosoma. Trypaflavin (1 : 600,000—1 million) prevents new mitoses and produces abnormal division of the chromosoma. Nicotine (1 : 20,000) has no action on the cell nuclei but it vacuolises the protoplasm. Coramine does not affect cell division in concn. up to 1 : 8; slight changes were observed in the protoplasm. A. S.

Transformation of skeletal muscle elements grown *in vitro* into histiocytes. M. Chèvremont (*Compt. rend. Soc. Biol.*, 1939, **132**, 487—490).—Cultures of skeletal muscle grown *in vitro* develop complex formations chiefly consisting of thin bands of tissue. These bands fragment or are transformed into cells of sp. character. These latter cells may be transformed into macrophages. P. C. W.

Simple method of obtaining pure cultures of embryonic heart muscle. E. F. Stilwell (*Science*, 1940, **92**, 267—268).—18 days' incubation of embryonic chick heart muscle resulted in a pure culture. Heart cells were contracting but no mitotic figures were seen in a stained prep., nor connective tissue cells. E. R. S.

Attraction fields *in vitro*. J. C. Fardon, G. Brotzge, M. K. Loeffler, and J. Breit (*Nature*, 1940, **146**, 619—620).—Two fragments of embryo chick heart in tissue culture gave rise to a field-like appearance between them, similar to Fe filings in a magnetic field. Older tissues gave a much weaker field. E. R. S.

Hydrostatic pressure effects on protoplasmic streaming in plasmodium. D. C. Pease (*J. Cell. Comp. Physiol.*, 1940, **16**, 361—375).—Portions of a myxomycete were subjected to pressures up 6000 lb. per sq. in. and the resultant changes described with photographs. The results support the view of Seifriz that streaming is produced by local contractions of the plasmagel and that these contractions are initiated by a "trigger" mechanism located in an interfacial layer. V. J. W.

Simple stain for tissue cultures. J. S. Craig (*Science*, 1940, **92**, 226).—1% aq. toluidine-blue was used; details of technique are given. The stain was used for brain tissue cultures. E. R. S.

Method for staining microglia. J. Negrin, jun. (*Arch. Path.*, 1940, **30**, 768—771).—This method gives good results and offers the following advantages. No special fixation is required (either solution of formaldehyde or of formaldehyde–NH_4Br may be used). Sections of old material may be impregnated. It is const., offering clear and good images, especially of pathological forms. It permits economy in the use of sections inasmuch as even those not showing perfect impregnation may be restained; it is only necessary to repeat the steps of this technique beginning with the stage of cyanuration. In no way does it impair the previous impregnation. It requires only 1 hr. (2 photomicrographs.) C. J. C. B.

Rapid method of staining fat in frozen sections with osmic acid. A. A. Krajian (*Arch. Path.*, 1940, **30**, 766—767).—10 min. only are required to cut, stain, and mount the section. C. J. C. B.

Fixation of post-mortem material. A. C. Lendrum (*J. Path. Bact.*, 1941, **52**, 132—137).—A study of different fixatives as applied to human heart muscle and then to post-mortem material has led to the adoption of the following routine: 4—6 hr. primary fixation in 90 parts of saturated aq. $HgCl_2$ with 10 parts of commercial formalin, followed by 4—30 days' secondary fixation in saturated aq. $HgCl_2$. C. J. C. B.

Preparation of tissues for paraffin embedding. A. C. Lendrum (*J. Path. Bact.*, 1941, **52**, 138—142).—Oservation of different methods of dehydration of human tissues led to the replacement of the usual ethanol–$CHCl_3$ series by a butanol series. It is useful to follow this by infiltration with pyroxylin, on Peterfi's principle, with the important modification that a plasticising substance is combined with the pyroxylin; this is then followed by paraffin impregnation. C. J. C. B.

Alizarin-red S and toluidine-blue for differentiating adult or embryonic bone and cartilage. T. W. Williams (*Stain Tech*, 1941, **16**, 23—25).—The specimen is washed in tap water, and fixed in 10% formalin for at least a week. The cartilage is then stained for one week in a solution of 0·25 g. of toluidine-blue in 100 c.c. of 70% alcohol, and then destained for 72 hr. in 4 changes of 95% alcohol. The specimen is then macerated in 2% KOH for about 5—7 days, until the limb bones are visible. The bone is then stained. The specimen is transferred to fresh 2% KOH, and a saturated alcoholic solution of alizarin-red S added by drops until a deep wine-red; after 24 hr. the bones are well stained. The specimen can be dehydrated in cellosolve, and cleared by gradual transference to methyl salicylate, in which it can be permanently stored. Alternatively the specimen can be taken after staining through water–glycerin mixtures up to pure glycerin for storage. E. E. H.

Amyl acetate as clearing agent for embryonic material. H. F. Drury (*Stain Tech.*, 1941, **16**, 21—22).—Amyl acetate can be used as a general clearing agent; it is sol. in 95% alcohol and in hot paraffin wax, thus avoiding the need for using abs. alcohol with its hardening action. About 1 hr.

in 95% alcohol is followed by 24 hr. or longer in amyl acetate, followed by a rinse in toluene, and 15 min. each in 3 changes of paraffin wax before imbedding. Amyl acetate does not produce optical clearing, but there is no max. period for treatment. Precautions should be taken as when using $CHCl_3$. E. E. H.

Romanowsky staining with buffered solutions. III. Extension of the method to Romanowsky stains in general. R. D. Lillie (*Stain Tech.*, 1941, **16**, 1—6).—The method is designed to adjust the reaction of the staining mixture so as to avoid differentiation after staining. The staining mixture contains stock stain solution 2 c.c., acetone 3 c.c., methyl alcohol 3 c.c., buffer solution to give required p_H val. 2 c.c., distilled water 30 c.c. The buffer solutions are citric acid and Na phosphate (table given). The correct p_H level for staining is determined on a no. of sections from the same block at various p_H levels in the expected range, which is 4·2 for neutral formalin or Orth, 4·6 for acid formalin, 5 for Zenker formalin, and 6·5 for alcohol or Carnoy. Clarite and liquid petrolatum are superior mountants to Canada balsam. E. E. H.

V.—BLOOD AND LYMPH.

Comparative experimental studies of 200- and 1000-kilovolt Roentgen rays: biological effects on bone marrow of albino rat. J. R. Lingley, E. A. Gall, and J. A. Hilcken (*Amer. J. Path.*, 1940, **16**, 845—854).—The application of graded doses of irradiation to the bone marrow of the albino rat produced a prompt diminution in cellular content proportionate in amount to the dose. This is initially due almost wholly to a decline in normoblasts and is followed by a short period of apparent regeneration which subsequently gives place to a progressive decline in cellularity. Qualitatively there is ultimately a depression of normoblasts, primitive cells, and myelocytes with a persistent preponderance of mature granulocytes. There was no essential difference in the effects on the marrow of equal amounts of roentgens of both types of rays. (5 photomicrographs.) C. J. C. B.

Effect of *X*-irradiation on human bone marrow. P. Florentin and C. Binder (*Compt. rend. Soc. Biol.*, 1940, **133**, 130—133).—Patients with *X*-irradiation of the thoracic region had regular sternal punctures performed. The aplasia of the marrow tissue was followed quantitatively. The aplasia and leucopenia found in animals are also present in man. The younger of the hæmopoietic elements are first affected. The sternal puncture technique does not give a true picture of the marrow structure owing to unavoidable contamination with leucocytes from the circulating blood. P. C. W.

Blood studies in malaria. Genesis of blood cells in relation to treatment with quinine. G. Vyronis (*Amer. J. med. Sci.*, 1940, **200**, 809—819).—In malaria treated with quinine in 4 sisters, a reticulocytosis followed defervescence and the disappearance of asexual forms of parasites and was synchronous with the appearance of gametes. The no. of reticulocytes was increased by the 8th day of treatment, reached a peak by the 11th day, remained at a plateau until the 19th day, and then began to fall. The no. of erythrocytes began to fall by the 8th day of treatment (when the reticulocytes were rising); they continued to decrease to low levels until the 19th day of treatment (when the reticulocytes began to fall). The no. of leucocytes remained stationary at normal levels until the 12th day of treatment, and then began to decrease until the 19th day of treatment when they began to return to normal, accompanied by an eosinophilia. The changes in the leucocyte counts were due to changes in the neutrophils. C. J. C. B.

Effect of bilirubin on erythropoiesis. R. R. Bomford (*Brit. Med. J.*, 1940, II, 549—551).—Repeated intravenous injections of pure bilirubin in 2 dogs kept anæmic by bleeding increased the rate of production of hæmoglobin and caused a prolonged reticulocyte response. Bilirubin may increase absorption or utilisation of Fe. C. A. K.

Problem of gastrectomy and anæmias. C. M. Jones (*Amer. J. digest. Dis.*, 1940, **7**, 502—505).—A review. N. F. M.

Ulcers of legs in sickle cell anæmia. C. L. Cummer and C. G. Larocco (*Arch. Dermat. Syphilol.*, 1940, **42**, 1015—1039).—A review. C. J. C. B.

Pernicious anæmia and hypothyroidism. A. Vannotti (*Schweiz. med. Wschr.*, 1940, **70**, 1106—1108).—Two patients suffered from myxœdema and pernicious anæmia. The anæmia improved on treatment with thyroid extracts. A. S.

Experimental production of leucocytes with Kurloff bodies in guinea-pig. P. Florentin and C. Binder (*Compt. rend. Soc. Biol.*, 1940, **133**, 127—130).—Leucocytes with contained Kurloff bodies are produced in the lymphoid tissues of the guinea-pig by the injection of œstrone, testosterone, progesterone, and vitamin-*D*. Adrenaline, pituitrin, insulin, thyroxine, serum, and egg-albumin were inactive. The leucocytes are apparently formed from lymphocytes. P. C. W.

Leucocyte count in rubella. M. Hynes (*Lancet*, 1940, **239**, 679—680).—Details of characteristic changes in the leucocyte count of 61 cases of rubella are given. C. A. K.

Development of eosinophilia following liver therapy. R. N. Allin and O. O. Meyer (*J. Lab. clin. Med.*, 1940, **26**, 457—463).—Eosinophilia may follow the administration of whole liver and parenteral liver extract in normal individuals or in patients with pernicious anæmia following parenteral administration of liver extract. The eosinophilia may persist after cessation of therapy. C. J. C. B.

Leucocyte changes in acute peritoneal irritation. R. E. Kaufman and F. von Saal (*J. Lab. clin. Med.*, 1940, **26**, 468—476).—A marked shift to the left in the differential blood count frequently occurs in all types of acute peritoneal irritation, even without infection. The absence of such shift does not exclude acute peritoneal irritation. In the presence of a low total white cell count, a definite shift is of especial importance in diagnosis and prognosis. C. J. C. B.

Standardised technique for sedimentation rate. J. W. Cutler (*J. Lab. clin. Med.*, 1940, **26**, 542—552).—Cutler sedimentation tubes of 1 c.c. capacity are used, graduated into 50-mm. divisions, with 0 at the 1-c.c. level. 0·1 c.c. of 3·8% Na citrate solution and 0·9 c.c. of blood obtained by puncture of a suitable vein are mixed in a 2-c.c. syringe and poured into the sedimentation tube, which is placed in a special rack. The position of the sedimenting column of erythrocytes is determined every 5 min. for ½ hr. and is recorded on special charts. The max. settling in any 5 min. during the ½ hr. is the sedimentation rate and becomes the unit of comparison; a max. settling in 5 min. of 1 mm. or less is normal. C. J. C. B.

Hæmorrhagic thrombocythæmia. J. Reid (*Lancet*, 1940, **239**, 584—587).—A case of "hæmorrhagic thrombocythæmia" is reported. The condition is characterised by multiple hæmorrhages (not petechial) and thrombosis of the larger veins of the leg, spleen, and mesentery. The blood platelet count was much increased, often to more than 1·5 million cells per cu.mm., and there was a leucocytosis (12,000—43,000 per cu.mm.). The bone marrow contains excessive nos. of megakaryocytes and platelets. C. A. K.

Acute idiopathic porphyry. L. Rau (*Lancet*, 1940, **239**, 647—648).—A case of acute idiopathic porphyry complicated by acute polyneuritis is described. C. A. K.

Sulphhæmoglobinæmia following prolonged administration of phenacetin. R. V. Coxon and J. P. Crawford (*Brit. Med. J.*, 1940, II, 556).—Case report. C. A. K.

Effect of *X*-rays on vapour pressure of blood and its components. T. P. Ting and R. E. Zirkle (*J. Cell. Comp. Physiol.*, 1940, **16**, 277—283).—Irradiation decreased v.p. of blood as measured by the thermo-couple method. The decrease all occurred in the red cells and was equiv. to 0·02—0·03% NaCl. V. J. W.

Effects of *X*-rays on permeability of erythrocytes to water and certain non-electrolytes. T. P. Ting and R. E. Zirkle (*J. Cell. Comp. Physiol.*, 1940, **16**, 269—276).—Exposure to 33,000 r. of *X*-rays increased the permeability of ox red cells to water by 20%, to thiourea by 6%, and to ethylene glycol by 3·5%. Irradiated cells in hypotonic NaCl solution reached the same % hæmolysis as controls when the former were placed in a solution 0·003 mol. more conc. in NaCl. V. J. W.

Nature of change in resistance of red cells to hæmolysis. P. M. Porter (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 744—745).—Increase of resistance on standing is not modified by

variations in temp. from 18° to 39°, nor by suspending the cells in saline in which other cells have previously been suspended for 3 hr. at 39°. V. J. W.

Hæmorrhagic diathesis of newborn. W. W. Waddell and G. McL. Lawson (*J. Amer. Med. Assoc.*, 1940, **115**, 1416—1421).—A review and a statistical study. C. A. K.

Vitamin-*K* in hæmorrhagic diseases of infants and children. N. Kugelmass (*Amer. J. clin. Path.*, 1940, **10**, 673—687).—A review. C. J. C. B.

Partition studies on clot-aiding and related blood-phospholipins. B. N. Erickson and J. H. Ferguson (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 579—583).—Both normal and hæmophilic plasma contain only traces of free kephalin, which is normally bound to plasma-proteins and is only found free in lipæmia. There is no deficiency of bound kephalin in hæmophilia. V. J. W.

Activity of common anticoagulants. A. D. Morenzi, E. Lida, and Z. G. de Cairo (*Compt. rend. Soc. Biol.*, 1940, **133**, 327—328).—The activity of common anticoagulants is compared, using human and dog blood as test objects. P. C. W.

Sulphapyridine and heparin in subacute bacterial endocarditis. C. M. Fletcher (*Lancet*, 1940, **239**, 512—514).—A patient with subacute bacterial endocarditis died of cerebral hæmorrhage after treatment with sulphapyridine + heparin. Differences in activity in 3 brands of heparin were noted. C. A. K.

Human serum transfusions. S. O. Levinson, F. E. Rubovits, and H. Necheles (*J. Amer. Med. Assoc.*, 1940, **115**, 1163—1169).—Human serum was successfully used in transfusions for cases of hæmorrhage, shock, burns, hypoproteinæmia, and other conditions. No reactions were seen in 47 cases. C. A. K.

Desivac process for drying [of blood plasma] from frozen state. E. W. Flosdorf, F. J. Stokes, and S. Mudd (*J. Amer. Med. Assoc.*, 1940, **115**, 1095—1097).—An apparatus for vac. desiccation from the frozen state at 4·5 mm. Hg pressure is described. It is suitable for large-scale drying of human blood plasma. C. A. K.

Concentration and drying of plasma. F. X. Aylward, B. R. S. Mainwaring, and J. F. Wilkinson (*Brit. Med. J.*, 1940, II, 583—586).—Two methods for the concn. and drying of plasma are described: (1) using spray distillation in vac., (2) using evaporation through Cellophane tubes under sterile conditions followed by low-temp. drying of the concentrate. Serum may be similarly treated. C A. K.

Transfusion of red cells in anæmia. D. H. G. MacQuaide and P. L. Mollison (*Brit. Med. J.*, 1940, II, 555—556).—Conc. red cell suspension in NaCl and glucose solution was successfully used in 61 cases of transfusion for anæmia. Rigors occurred in 6·5% of cases as compared with 22·5% of 45 cases given whole stored blood. C. A. K.

Determination of blood volume in plasma transfusion. S. R. M. Bushby, A. Kekwick, and L. E. H. Whitby (*Lancet*, 1940, **239**, 540—541).—After transfusion of a known vol. of plasma the blood vol. can be simply calc. from the hæmatocrit, hæmoglobin, or red cell vals. C. A. K.

Blood preservatives. J. Dubash, O. Clegg, and J. Vaughan (*Brit. Med. J.*, 1940, II, 482—484).—Glucose in a final concn. of 0·1—1·0% preserves red cells in stored blood through its effects on red cell fragility. Red counts on stored blood must be made with plasma as diluent. C. A. K.

Blood substitutes in acute hæmorrhage. G. A. H. Buttle, A. Kekwick, and A. Schweitzer (*Lancet*, 1940, **239**, 507—510).—Cats were bled 50% of the calc. blood vol. at a rate which reduced the blood pressure to below 60 mm. Hg and produced marked respiratory disturbances; death occurred in all untreated animals. Various blood substitutes were injected at the end of bleeding at a rate of 2 c.c. per kg. per min. and compared with whole blood. Plasma was nearly as efficient as blood in restoring and maintaining blood pressure. The order of efficiency of other substitutes was serum, hæmoglobin–Ringer solution, gum-saline, red cells suspended in saline, and isotonic saline or isotonic glucose. Filtration is the best method of preventing plasma infection. C. A. K.

Blood-urea in experimental hæmorrhage. D. A. K. Black (*Lancet*, 1940, **239**, 618—619).—After severe hæmorrhage in dogs the blood-urea increased by about 15 mg. per 100 c.c.; this was not affected by large doses of cortin, deoxycorticosterone acetate, or adrenaline. Changes in plasma-Cl′ were slight. C. A. K.

Fluids in surgical shock. R. A. King (*Brit. Med. J.*, 1940, II, 485—487).—Methods of replacing fluids in the shocked experimental animal are compared. C. A. K.

Complement titre of blood of newborn. P. Wasserman and E. Alberts (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 563—564).—Blood from the umbilical cord has always a lower complement content than has maternal blood. V. J. W.

Acid–base balance in plasma and blood cells of normal non-pregnant, pregnant, and puerperal women. F. W. Oberst and E. D. Plass (*J. Lab. clin. Med.*, 1940, **26**, 513—520).—The acid–base equilibrium of the plasma and cells was studied in 10 normal, non-pregnant, 20 pregnant, and 10 puerperal women. The reduction of the total acid constituents of the plasma, which occurs during pregnancy, is balanced by a corresponding reduction in the total base; both factors return to normal early in the puerperium. Plasma-p_H is unchanged during pregnancy and early puerperium. Plasma-CO_2 tension falls slightly in late pregnancy but returns to normal shortly after delivery. The total acid constituents in the cells are slightly diminished in late pregnancy but return to normal within 9 days after delivery. K concn. in the cells is increased in late pregnancy and shows a further rise during the early puerperium. The alkali reserve of the cells is increased during pregnancy but falls to normal a few days after labour. C. J. C. B.

Magnesium content of blood serum and urine. M. Bernstein and S. Simkins (*J. Lab. clin. Med.*, 1940, **26**, 521—526).—312 determinations in 197 medical cases with no disturbance of mineral metabolism showed an average serum-Mg val. of 2·19 mg.-% (1·23—3·54). In 4 cases of chronic nephritis with varying degrees of renal insufficiency, the serum-Mg level was raised. The average 24-hr. urinary output of Mg in 57 persons was 105·5 mg. (17·3 to 285·0). C. J. C. B.

Influence of cobalt on iron transportation and storage. K. Kato and V. Iob (*Amer. J. clin. Path.*, 1940, **10**, 751—766).—In experimental Co polycythæmia in rabbits and dogs the Co caused a rise of 25—58% in the hæmoglobin- and non-hæmoglobin-Fe. In those animals which received Co + Fe both the spleen and the bone marrow showed little deposition of Fe suggesting that Co enables Fe to be more completely utilised for hæmopoiesis. C. J. C. B.

Blood volume in cobalt polycythæmia. J. E. Davis (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 671—673).—Co feeding in dogs causes an increased blood vol. due to an increased cell vol., as has already been shown in rats. V. J. W.

Plasma-potassium hæmolysis. L. Binet and R. Fabre (*Compt. rend. Soc. Biol.*, 1940, **133**, 230—231).—The K content of splenic vein plasma is higher than that of plasma from the right auricle or from the arteries. Plasma-K is raised during hæmolytic anæmia and increases during the storing of citrated blood. P. C. W.

Experimental storage of iron and changes of blood count. J. Cremer (*Z. ges. exp. Med.*, 1940, **107**, 467—477).—Colloidal Fe solutions were intravenously injected into rabbits for periods up to 39 days. The first injection produces temporary leucopenia, followed by an increase in the leucocyte count; the monocyte count increased (up to 20% of the total white cell count). The reticulocyte count is initially increased, followed by diminution and gradually developing secondary anæmia. There was hypertrophy of the Kupffer cells, and of the reticulum cells in the spleen and bone marrow; reticulo-endothelial elements, especially in the spleen, proliferated and showed marked Fe storage (Prussian-blue reaction). A. S.

Guanidine and other blood constituents in experimental anoxæmia. J. E. Andes, E. J. van Liers, E. J. Andes, and P. Vaughn (*J. Lab. clin. Med.*, 1940, **26**, 530—534).—Anoxæmia was produced in dogs in a low-pressure tank. Increases in the vals. of blood-urea, hæmoglobin, and vol. of red blood cells were observed but the blood-guanidine was unchanged. C. J. C. B.

Colorimetric standards for determination of blood constituents. E. J. King (*Brit. Med. J.*, 1940, II, 445—447).—Permanent artificial colour standards for determination of urea, non-protein-N, and protein are described. A mixture

of $FeCl_3$ and $CoCl_3$ in solution gives a colour indistinguishable from nesslerised NH_3 solutions in daylight and in artificial light. C. A. K.

Changes in purine metabolism after blocking reticulo-endothelial system in dogs. K. Dirr and A. Amann (*Z. ges. exp. Med.*, 1940, **107**, 347—354).—Ingestion of thymonucleic acid following intravenous injection of Indian ink increased the urinary uric acid and diminished the allantoin excretion in 1 out of 12 dogs. A. S.

Determination of pyruvic acid in blood. B. Högberg and F. Schlenk (*Arkiv Kemi, Min., Geol.*, 1940, **14**, **B**, No. 4, 8 pp.).—The method of Lu (A., 1939, III, 540, 702) yields trustworthy results if extraction is carried out immediately, the aq. layer is sharply separated from the ethyl acetate, and the last traces of ethyl acetate are removed from the Na_2CO_3-containing solution before NaOH is added. The most suitable containers are Thunberg tubes which are employed in conjunction with an evacuating device and suction tube by which the liquid is transferred from one tube to another. The criticisms of Larsson and Liljedahl (A., 1940, III, 630) do not apply to the slightly modified Lu method. W. McC.

VI.—VASCULAR SYSTEM.

Effect of adrenaline–acetylcholine complex on heart culture of chick embryo. E. Paes and J. M. Pires Soares (*Compt. rend. Soc. Biol.*, 1940, **133**, 125—126).—If acetylcholine and adrenaline are added to the heart culture from a chick embryo that has ceased to beat there is a resumption of rhythmicity similar to that preceding the cessation. This persists for some time. Adrenaline by itself causes localised tremors. Acetylcholine has no effect. The reappearance of rhythmicity is attributed to activation of a precursor of the "active substance" of the nodal tissue of the heart. P. C. W.

Genesis of electrical currents established by injury to heart. H. Sugarman, L. N. Katz, A. Saunders, and K. Fochim (*Amer. J. Physiol.*, 1940, **130**, 130—143).—The electrical changes produced by an area of injury on the dog's ventricles were studied in (1) a very small injured area produced by pressure and (2) a small area of injury produced by intramyocardial injection of 95% alcohol. Changes in the contour of the *QRS* complex occurred, ascribed to alterations in the pattern of impulse spread. The *T–Q* elevation and *S–T* depression which occurred are attributed to the production by injury of a region which is partly depolarised at rest and irresponsive during activation. A coronary type of upright *T* wave appeared some time after the injury was produced and was confined to the margin of the injury and a narrow region surrounding it. This *T* wave disappeared with time. M. W. G.

Auriculo-ventricular conductivity. R. S. Megibow and L. N. Katz (*J. Pharm. Exp. Ther.*, 1940, **70**, 388—399; cf. A., 1940, III, 190).—Innervated and denervated heart-preps. were used to differentiate between direct and indirect influences on auriculo-vintricular conduction. Asphyxia enhanced and later, as it advanced, depressed conduction by direct action on the heart. Both anoxæmia and hypercapnia shared in this effect. Slight deviations in blood-p_H enhanced, and extreme deviations depressed, conduction. Conduction was directly enhanced by paredrine and by $BaCl_2$, directly depressed by quinidine, but indirect effects were caused by a reflex accompanying changes in blood pressure. Atropine directly depressed conduction, but indirectly enhanced it by its vagal action. E. M. S.

Effect of veratrine on action current of heart. E. S. Echagüe (*Compt. rend. Soc. Biol.*, 1940, **133**, 319—320).—Effects of veratrine on the e.c.g. were studied in dogs and rabbits. The main findings were a decrease in frequency of the heart, auriculo-ventricular block with increase in *PR* and *QRS* intervals, increase in amplitude of *R* and *S* waves, and ventricular fibrillation. The latter is the cause of death in dogs, that in rabbits being due to heart block. If the vagi are cut the *R* and *S* waves decrease in amplitude. P. C. W.

Fat utilisation by mammalian heart. E. W. H. Cruickshank and H. W. Kosterlitz (*J. Physiol.*, 1941, **99**, 208—223).—The relation of blood-sugar to cardiac glycogen (male rat) is logarithmic. This relationship is disturbed by adding adrenaline to the blood perfusing the heart–lung prep. The low cardiac glycogen produced with a comparatively high blood-sugar indicates a sp. activity of adrenaline in causing breakdown of cardiac glycogen. The utilisation of glucose and lactic acid by heart and lungs depends on their relative concns. A perfectly viable aglycæmic heart prep. is available for investigation of the non-carbohydrate metabolism of the heart. The cholesterol and phospholipin fatty acid content of the heart is not altered by losses of blood-sugar and cardiac glycogen amounting to 80 and 45%, respectively. The utilistion of blood- and heart-fatty acids depends on the amount of carbohydrates in blood and heart muscle. J. A. C.

Tobacco and coronary disease. J. P. English, F. A. Willins, and J. Berkson (*J. Amer. Med. Assoc.*, 1940, **115**, 1327—1329).—Review and discussion. C. A. K.

Registration and interpretation of normal phasic inflow into left coronary artery by improved differential manometric method. D. E. Gregg and H. D. Green (*Amer. J. Physiol.*, 1940, **130**, 114—125).—A method is described for continuous optical registration of the instantaneous rate of inflow into a coronary artery (dogs, hearts *in situ*) involving shunting the blood from the aorta to the coronary artery through a short external circuit containing an orifice connected with a differential manometer. Left coronary inflow curves so obtained show that beginning approx. at the onset of isometric contraction there is a rapid retardation of flow but that with the rise of aortic pressure during ejection the inflow rapidly accelerates, reaching a peak during the middle of the rise of aortic pressure and then declining to a const. rate during the latter part of systole. Following the incisura there is again a rapid acceleration, the inflow reaching a peak early in diastole and then declining with the progressive fall of aortic pressure in diastole. Despite certain complications, it is probable that the rate of inflow at the end of diastole just preceding isometric contraction can be used as an index of intramural flow during diastole, and the rate of inflow during the brief interval at or just preceding the onset of protodiastole can be used as an index of the systolic rate of intramural flow. M. W. G.

Effects of viscosity, ischæmia, cardiac output, and aortic pressure on coronary blood flow measured under constant perfusion pressure. D. E. Gregg and H. D. Green (*Amer. J. Physiol.*, 1940, **130**, 108—113).—With the raised blood pressure and cardiac output following augmented venous return, the coronary blood supply increases because although the aortic pressure rises, the peripheral coronary pressure fails to rise as much. The reduction in viscosity of the perfusate by substitution of Locke's solution for blood causes an unexpectedly large increase of flow, amounting at times to 300—400% of the rate observed with blood. A period of coronary ischæmia increases the flow during the initial period of restored circulation. Peripheral coronary pressure curves accurately represent the time relations of the change of flow to the aortic pressure variations but do not indicate the magnitude of the change in resistance to flow under various circulatory conditions; hence the flow itself is underestimated. M. W. G.

Ligation of patent ductus arteriosus. R. E. Gross (*J. Amer. Med. Assoc.*, 1940, **115**, 1257—1262).—A patent ductus arteriosus was successfully ligated in 8 of 10 cases attempted. The diastolic pressure rose to normal in all cases. Discussion. C. A. K.

Mechanical effects of patent ductus arteriosus on heart. E. C. Eppinger and C. S. Burwell (*J. Amer. Med. Assoc.*, 1940, **115**, 1262—1266).—*X*-Ray observations of enlargement of the left ventricle, the left auricle, and pulmonary artery in 9 of the cases reported by Gross (see preceding abstract) are described. C. A. K.

Ligation of patent ductus arteriosus in a case of bacterial endocarditis. A. S. W. Touroff and H. Vesell (*J. Amer. Med. Assoc.*, 1940, **115**, 1270—1272).—A woman aged 29 had a patent ductus arteriosus and subacute *Streptococcus viridans* endarteritis. The ductus was successfully ligated, and all signs of infection disappeared, blood culture being negative for 20 weeks after the operation. C. A. K.

Use of intravenous hypertonic glucose in cardiac failure. W. Hadorn (*Schweiz. med. Wschr.*, 1940, **70**, 1078—1081).—Strophanthin was intravenously injected in doses of 0·25—1·0 mg. into rabbits; electrocardiographic disturbances (changes of *P* and increase in *P–Q* interval, disturbances of

intraventricular conduction, of S–T, and of T) were not prevented by simultaneous injection of 3—18 c.c. of 20—40% glucose solutions. Administration of glucose does not increase the lethal dose of strophanthin. The clinical use of intravenous injections of hypertonic glucose solutions in patients suffering from heart failure or coronary insufficiency is unjustified. A. S.

Experimental atherosclerosis and high-protein diets. D. R. Meeker and H. D. Kesten (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 543—545).—In cholesterol-fed rabbits, raising the diet-protein from 15% to 39% by addition of soya-bean flour lowers the incidence of atherosclerosis. Similar protein increase as casein increases incidence of atherosclerosis from cholesterol and causes occasional cases without cholesterol feeding. V. J. W.

Heart size and experimental atheromatosis in rabbit. L. N. Katz, A. Sanders, R. S. Megibow, and S. Carlen (*Amer. J. med. Sci.*, 1940, **200**, 731—739).—22 rabbits were fed on a high-cholesterol diet with the addition of vitamin-B complex. 16 of these rabbits subsequently developed moderate to severe atherosclerosis including involvement of the coronary arteries. Of these 16 rabbits, 12 showed heart wts. of more than 5 g. with an average cardiac wt. of 6·3 g.; 18 untreated rabbits showed an average heart wt. of 3·8 g., with only 2 hearts weighing more than 5 g. (10 photomicrographs.) C. J. C. B.

Etiology of calcified nodular aortic stenosis. E. M. Hall and T. Ichioka (*Amer. J. Path.*, 1940, **16**, 761—785).—In 12 of 31 unselected cases of nodular calcified aortic stenosis there was a healed lesion of the mitral valve in addition to the aortic stenosis. In 19 cases, or 61%, there was a solitary lesion of the aortic valve. There was a positive history of a previous attack of rheumatic infection in 15 cases (48%). Histological studies revealed substantial evidence of rheumatic involvement in every case. (17 photomicrographs.) C. J. C. B.

Changes in arteries in walls of tuberculous pulmonary cavities. R. Charr and J. W. Savacool (*Arch. Path.*, 1940, **30**, 1159—1171).—The most frequently involved artery in 30 cases of pulmonary tuberculosis was the first main branch of the pulmonary artery, which lies at the level of the 2nd rib anteriorly at the parasternal line. Destruction of capillaries and sclerosis of arterioles about the cavities are frequent. These changes were most extensive around fibroid cavities of long standing. C. J. C. B.

Wilm's tumour causing hypertension. K. M. Koons and M. K. Ruch (*J. Amer. Med. Assoc.*, 1940, **115**, 1097—1098).—A girl aged 7 years showed marked hypertension which was relieved by removal of a Wilm's tumour and adjacent kidney. C. A. K.

Hypertension and chronic atrophic pyelonephritis. N. W. Barker and W. Walters (*J. Amer. Med. Assoc.*, 1940, **115**, 912—916).—Hypertension was seen in 5 cases of unilateral chronic atrophic pyelonephritis. Nephrectomy reduced the blood pressure in all cases. The atrophic kidneys showed marked thickening of the walls of the arteries in the scarred regions. C. A. K.

Relation of kidney to cardiovascular disease. M. C. Winternitz, E. Mylon, L. L. Waters, and R. Katzenstein (*Yale J. Biol. Med.*, 1940, **12**, 623—679).—Dogs survive bilateral nephrectomy as long as 10 days; the average is 7, and few die before 5 days. After ligature of the main renal artery of both kidneys, death occurs within 4 days and the non-protein-N rises rapidly and is as high at 3 days as at 6 days after bilateral nephrectomy. Œdema, hæmorrhage, and necrosis of muscle, including heart muscle, smooth muscle of arteries and hollow viscera, are found. The results of the injection of extracts of necrotic and normal dog kidneys into bilaterally nephrectomised dogs are similar and consist of a slow rise in blood pressure to a max. in several min. followed by a more gradual fall, an abrupt rise in non-protein-N, and the development of lesions similar to those after bilateral ligation. The active substance in the extract was found in the redissolved ppt. after $\frac{2}{3}$-saturation with $(NH_4)_2SO_4$. Activity was destroyed after exposure to 70° for 45 min. and by peptic or tryptic digestion. Similar effects in bilaterally nephrectomised dogs could not be produced by injections of adrenaline, pitressin, tyramine, or saline extracts of muscle or liver. The changes in the electrolytes in the serum of dogs after bilateral nephrectomy and bilateral arterial ligature were: large drop in alkali reserve and Cl, total Ca rise to 13 mg.-% and more, followed by drop to 6 mg.-%, rise of K to 9·5 m-equiv. or more, and rise of inorg. PO_4 to 3—6 times normal val. (16 photomicrographs.) F. S.

Hypertension in girl of 12, associated with unilateral chronic atrophic pyelonephritis, treated by nephrectomy. F. S. Patch, L. J. Rhea, and J. T. Codnere (*Canad. Med. Assoc. J.*, 1940, **43**, 419—424).—The result was excellent in a follow up of 6 months. C. J. C. B.

New evidence of hormonal nature of vagotonine. C. Franck and R. Grandpierre (*Compt. rend. Soc. Biol.*, 1940, **133**, 135—137).—The decrease in excitability of the cardiac vagal reflex in the chloralosed dog is abolished by the transplantation of pancreas into the jugular–carotid circulation. The effect is independent of the blood-sugar level. P. C. W.

Distinction between arterial, venous, and flow components in photo-electric plethysmography in man. A. B. Hertzman and J. B. Dillon (*Amer. J. Physiol.*, 1940, **130**, 177—185).—The possibility of distinguishing "active" from "passive" components and of separating arterial from venous reactions in photo-electric plethysmograms of the human skin was studied. A technique is described for recording the vol. pulse separately from the plethysmogram, with a photo-electric plethysmograph and capacity coupled amplifier. The arterial component in the plethysmogram is distinguished by the amplitude of the vol. pulse. The flow component is indicated by the product, amplitude of the vol. pulse × heart rate. The val. of this product appears to parallel flow. The analysis of the vol. changes recorded in the plethysmogram involves evaluating the arterial and flow components by these criteria and so, by a process of exclusion, differentiating when possible the contribution of the venous component. M. W. G.

Effects of physical fatigue on peripheral circulation in athletes. M. A. Hinrichs (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 685—686).—In most human subjects, fatigue was followed by a decrease in polymorphonuclear cells and an increase in large and small lymphocytes. V. J. W.

Vasoconstrictor nerves, oxygen consumption, and perfused muscles (dog). J. R. Pappenheimer (*J. Physiol.*, 1941, **99**, 182—200).—When the blood flow through the perfused hind-limb or gastrocnemius is reduced by stimulation of the vasoconstrictor nerves the O_2 consumption calc. as the product of blood flow and arterio-venous O_2 difference is greatly reduced. The arterio-venous temp. difference is increased when the blood flow is reduced by lowering the perfusion pressure or by the action of adrenaline. When a similar change in blood flow is caused by nerve stimulation the arterio-venous temp. difference is decreased. The action of the vasoconstrictor nerves is to divert blood from parts of the muscle through regions in which the O_2 consumption and surface available for heat loss are small. J. A. C.

Vasodilator action of potassium. G. S. Dawes (*J. Physiol.*, 1941, **99**, 224—238).—Small doses of KCl cause vasodilatation, larger doses vasoconstriction, in the hindlimb of adrenalectomised cats under chloralose, or in the perfused hindlimbs of dogs and cats. This dilatation is not affected by atropine, nor antagonised by Ca. KCl causes an increased outflow from perfused skin vessels of the dog's hindlimb, but has no effect on lung vessels, and very little on intestinal vessels. The rise of blood pressure caused by intra-arterial injection of KCl in the adrenalectomised spinal cat is reduced by ergotoxine. The vasoconstriction caused by adrenaline in the dog's perfused hindlimb is reduced by an infusion of KCl. The potentiation and depression of working muscle by KCl are not necessarily dependent on the vascular changes caused by KCl. The greater the frequency of the stimuli and the more fatigued the muscle becomes, the closer is the relation between the muscular and vascular changes. J. A. C.

Sympathetic nervous system and capillary permeability. D. Engel (*J. Physiol.*, 1941, **99**, 161—181).—The penetration of dye (mostly fuchsins) from the blood through the synovial membrane is tested by perfusing two knee joints, one of which is deprived of its sympathetic nerve supply by unilateral lumbosacral sympathectomy; changes in local blood flow are measured thermoelectrically. Sympathetic activity increases whilst sympathectomy decreases capillary permeability. J. A. C.

Hereditary œdema of legs (Milroy's disease) associated with other congenital anomalies. W. A. Rosenberg (*Arch. Dermat. Syphilol.*, 1940, **42**, 1113—1121).—A case report. C. J. C. B.

Treatment of arteriosclerosis obliterans. I. S. Wright (*J. Amer. Med. Assoc.*, 1940, **115**, 893—895).—A review. C. A. K.

Buerger's disease. K. Scheyer (*Schweiz. med. Wschr.*, 1940, **70**, 1102—1106).—Pathology, symptoms, and medical and surgical treatment of Buerger's disease are discussed. Clinical improvement results in 50—60% of the patients following diagnostic arteriography, *e.g.*, with thorotrast. A. S.

Arteriosclerosis obliterans: clinical and pathological study. E. A. Hines, jun., and N. W. Barker (*Amer. J. med. Sci.*, 1940, **200**, 717—730).—A review of 280 cases. C. J. C. B.

VII.—RESPIRATION AND BLOOD GASES.

Recording respiration. J. H. Gaddum (*J. Physiol.*, 1941, **99**, 257—264).—The method gives a record on which the mean height above the base-line depends on the total ventilation per min.; it can be applied either to conscious animals or man or to anæsthetised animals. J. A. C.

Respirator as oxygen apparatus. H. L. Marriott (*Brit. Med. J.*, 1940, II, 519—520).—A simple method of converting the civilian respirator into an O_2 face-piece apparatus is described. C. A. K.

Effect of exposure to high oxygen tension on lungs and heart of rat. D. J. Rehbock, M. R. Oldt, and H. M. Dixon (*Arch. Path.*, 1940, **30**, 1172—1177).—50 young adult rats were exposed to 80—85% O_2 at normal barometric pressure for 4—28 days. The characteristic acute pulmonary changes previously described as "fibrinous pneumonia" were found in animals dead on the 4th day of exposure. These changes were present but less severe in animals dead on the 7th day of exposure and were absent in animals dead on or after the 14th day of exposure. No significant sclerotic changes were found in the pulmonary arteries and arterioles. Definite right ventricular hypertrophy was demonstrated in animals on which autopsies were made 7—41 days after the beginning of exposure and a less significant hypertrophy in animals examined 7—15 months after exposure to high O_2 tension. It is not clear whether the right ventricular hypertrophy was caused by the exposure to O_2 or by inflammatory pulmonary disease. C. J. C. B.

Interaction of central and peripheral chemical control of breathing. R. Gesell, G. Lapides, and M. Levin (*Amer. J. Physiol.*, 1940, **130**, 155—170).—Repeated withdrawal of known chemo-reflex support to the respiratory centre (bilateral reversible cold blocking of sinus nerves after double vagotomy and permanent sinus collapse in chloralosed dogs) during various respiratory states yielded the following conclusions. CO_2 and O_2 pressures prevailing during eupnœa are sources of reflexogenic respiratory support. Chemoreceptors exert an important tonic stimulating action on breathing and are particularly responsive to O_2 lack occurring at the end of apnœa. Hyperpnœa of high-grade hypercapnia is purely centrogenic. Hyperpnœa of high-grade O_2 deficiency is purely reflexogenic. Increasing CO_2 exerts an increasing central blocking action of the signals which it sets up in the chemoreceptors. Conversely, diminishing pressures are thought to diminish the central blocking action of CO_2 and thereby potentiate the signals arising in the chemoreceptors. Prolonged apnœas resulting from maintained withdrawal of chemoreceptive support during hypoöxic hyperpnœa frequently gave way to renewed breathing, attributed to reaccumulation within the centre of acid derived from its own acid metabolism and to increasing acidæmia. M. W. G.

Specific oxygen affinity of hæmoglobin in adult rats. F. H. McCutcheon (*J. Cell. Comp. Physiol.*, 1940, **16**, 404—407).—No change was caused by splenectomy in the sp. O_2 capacity of hæmoglobin in rats, nor was this val. modified by differences of age between 5 and 32 months. V. J. W.

Accidental acute carbon monoxide poisoning. J. McMichael and H. D. Ruskin (*Lancet*, 1940, **239**, 677—679).—Case report. C. A. K.

VIII.—MUSCLE.

Effect of α-tocopherol on lesions of skeletal muscles in rats on vitamin-*A*-deficient diet. C. Krakower and J. H. Axtmayer (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 583—586).—The muscular lesions in such rats are really due to a lack of vitamin-*E* and can be prevented by administration of -*E* or of α-tocopherol. V. J. W.

Effect of "curarising" substances on motor end organ. P. Rojas, J. Szepsenwol, and L. S. Resta (*Compt. rend. Soc. Biol.*, 1940, **133**, 332—333).—The effects of cobra venom, *Erythrina crista-galli* extract, and veratrine on the histology of the motor end organ in the lizard *Teius teius* were compared. Only the cobra venom produced changes like those found with curare, although to a smaller degree. P. C. W.

Features of neuromuscular transmission. A. Rosenblueth and W. B. Cannon (*Amer. J. Physiol.*, 1940, **130**, 205—218).—The responses of striated muscles to stimulation of their motor nerves were studied in cats. With high frequency of stimulation the tension shows successively: initial rise (stage 1); a fall (2); a rise and fall (3*b*); a rise (3*c*). These "early" stages are followed by "late" stages: fatigue (4), delayed rise (5). With increasing frequency of stimulation (3*b*) occurs with a lower rate than is necessary for (2). Repetition of a high frequency results in the earlier development of (2) and (3*b*). After prostigmine the early stages occur with relatively slow frequencies. Acetylcholine and K have only a slight effect on (2). They accentuate depression during (3*b*). Tetanic stimulation augments muscular responses to acetylcholine and KCl. The changes of tension are due to presence or absence of transmission at some of the neuromuscular junctions. The increased response of muscle to nerve impulses, acetylcholine, or KCl after a period of tetanisation may be due to mobilisation of KCl during the tetanus. M. W. G.

Conditions affecting late stages of neuromuscular transmission. W. B. Cannon and A. Rosenblueth (*Amer. J. Physiol.*, 1940, **130**, 219—229).—The muscular response of gastrocnemius–plantaris–soleus in fatigue (stage 4) and recovery while tetanic stimulation is continued (stage 5) was studied in cats. Prostigmine (usually 0·5 mg. per kg.) augments the muscular response during stage 4; a depressant effect is more marked as stage 5 progresses. Prostigmine advances the onset of stage 5 and accelerates its development. Curare has an early depressant influence in stage 4, but recovery is sooner and faster than in fresh muscle, *i.e.*, the fatigued synapse is more resistant to curare than the fresh one. Post-tetanic decurarisation does not occur in stage 4 as it does in the fresh state of the synapse. Wedensky inhibition (induced by max. stimuli applied 2 per sec.) occurs to a more marked degree and at a faster rate in fresh than in fatigued muscle. The muscle in stage 5 is less resistant to curare, and Wedensky inhibition is more prominent, than in stage 4. The post-tetanic increment of responses to single nerve volleys (evident in fresh prep.) disappears in stage 4, if the test is made immediately after the fatiguing tetanus. A short period of rest allows the phenomenon to reappear. The increment is absent also in stage 5, and a longer rest is required for its return than in stage 4. M. W. G.

Quinine for "night cramps." H. K. Moss and L. G. Herrmann (*J. Amer. Med. Assoc.*, 1940, **115**, 1358—1359).—Quinine was successfully used in 15 cases of "night cramps" in the limbs. C. A. K.

Gelatin and glycine in muscular fatigue. G. L. Maison (*J. Amer. Med. Assoc.*, 1940, **115**, 1439—1441).—Ergograph studies in 2 trained subjects showed that neither glycine (15 g. daily) nor gelatin (60 g. daily) increased the work capacity of the extensor digitorum communis muscles working with or without their blood supply. C. A. K.

IX.—NERVOUS SYSTEM.

Adrenaline and nerve action potentials. E. Bülbring and D. Whitteridge (*J. Physiol.*, 1941, **99**, 201—207).—Intra-arterial injection of 5—25 μg. of adrenaline increases the height of the action potential (cat's sciatic nerve *in situ*) produced by submaximal stimuli; this effect is due to a lowering of threshold; it lags behind and outlasts the vascular action of adrenaline. The effect of adrenaline is much

larger when the nerve shows fatigue. The same doses of adrenaline reduce or abolish the δ spike in the action potential produced by max. stimuli; this effect is due to reduction of blood flow caused by adrenaline. J. A. C.

Potentials in isolated medullated axon. C. Pfaffmann (*J. Cell. Comp. Physiol.*, 1940, **16**, 407—410).—Action potential is max. at the nodes of Ranvier, and beyond the node potentials have the same form and latent period as at the node itself, decreasing as an exponential function of the distance from the node, so that the internodal response is a combination of the responses spreading from the nodes above and below. V. J. W.

Latent period of transmission across experimental synapse. A. Arvanitaki (*Compt. rend. Soc. Biol.*, 1940, **133**, 208—211).—Two axons are placed in contact at one point. The second is subjected to an oscillating subliminal stimulus while the first receives a single supraliminal stimulus. The latent period of transmission across the junction depends on the potential in the second axon, being max. when the latter is most positive and vice versa. P. C. W.

Variable latent period of transmission across experimental synapse. A. Arvanitaki (*Compt. rend. Soc. Biol.*, 1940, **133**, 211—215).—If stimuli of decreasing intensity are applied to the first axon of two contiguous axons (see preceding abstract) subliminal stimuli give rise to increases in the amplitude of the oscillations in potential of the second axon which lead to stimulation after a variable no. of oscillations dependent on the smallness of the initial stimulus. Similar long latent periods are produced if the stimulus to the first axon is applied during the refractory period following stimulation of the second. P. C. W.

Histologic variations with age in apparently normal peripheral nerve trunks. L. Cottrell (*Arch. Neurol. Psychiat.*, 1940, **43**, 1138).—Changes in the peripheral nerve trunks with increasing age were studied in apparently normal nerves taken from 30 subjects. Slight increase in the connective tissue elements is seen in the 2nd decade. There is progressive increase in the endo-perineurium, and later replacement of areas of the nerve bundles by connective tissue. Endothelial proliferation in the blood vessels seen in the 4th decade is followed by medial fibrosis, hyalinisation, and finally complete vascular occlusion. Parenchymal changes with degeneration of the neurokeratin network precede loss of nerve fibres usually detected in the 6th decade. These changes are most marked in the lower extremities, and may be the cause of many of the sensory and motor complaints of old age. W. M. H.

Effect of temperature on properties of decalcified nerve. G. Coppée (*Compt. rend. Soc. Biol.*, 1940, **133**, 278—280).—Frog nerve immersed in Ca-free Ringer's solution becomes decalcified and exhibits spontaneous impulses. These disappear at temp. below 6°. The extinction coeff. of nerve (λ/k of Hill) diminishes with fall in temp. The crit. val. of extinction on which the autorhythmicity depends is also dependent on temp. P. C. W.

Thermal coefficients of two time characteristics of decalcified nerve. G. Coppée (*Compt. rend. Soc. Biol.*, 1940, **133**, 280—282).—The temp. coeff. of the periodicity of the autorhythmicity displayed by decalcified frog nerve and of the "optimal periods" of such a nerve stimulated by alternating sinusoidal currents are compared and the reasons for their difference (except at 28°) discussed. P. C. W.

Single responses of motor units in consequence of volitional effort. A. S. Gilson and W. B. Mills (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 650—652).—By inserting needles in the brachialis anticus muscle it was possible to obtain amplified records of single electric responses corresponding with single quick volitional contractions of the muscle. V. J. W.

Activity in simplest spinal reflex pathways. B. Renshaw (*J. Neurophysiol.*, 1940, **3**, 373—387).—Determinations of the synaptic delay at neurones in the spinal cord, in conjunction with measurements of central reflex times, demonstrate that the simplest spinal pathways involve reflex arcs of two neurones. The facilitation and inhibition of activity in these direct pathways have also been examined. S. Cr.

Diplomyelia (duplication of the spinal cord). E. Y. Herren and J. E. Edwards (*Arch. Path.*, 1940, **30**, 1203—1214).—A review of 43 cases in the literature. C. J. C. B.

Treatment of amyotrophic lateral sclerosis with vitamin-*E* (tocopherols). I. S. Wechsler (*Amer. J. med. Sci.*, 1940, **200**, 765—778).—Twenty cases of amyotrophic lateral sclerosis treated with vitamin-*E* were studied. Synthetic -*E* (α-tocopherol) and natural -*E* acted specifically in some cases and brought about varying degrees of improvement, in inverse ratio to the age and duration of the disease process. Some cases failed to respond despite intensive treatment. C. J. C. B.

Innervation of annulus fibrosus and posterior longitudinal ligament. P. G. Roofe (*Arch. Neurol. Psychiat.*, 1940, **44**, 100—103).—To account for localised pain in herniation of the nucleus pulposus the ligaments between the 4th and 5th lumbar vertebræ were searched for nerve fibres. In the annulus fibrosus the endings of unmyelinated fibres were naked and in the posterior longitudinal ligament glomerular-like terminations were found as well. Their exact origin and course were not determined. W. M. H.

Tumours of cervical portion of spinal cord. W. McK. Craig and C. H. Shelden (*Arch. Neurol. Psychiat.*, 1940, **44**, 1—16).—In a series of 91 cases of tumours in the cervical region of the spinal cord pain in the neck was an early sign. It was usually of the so-called root type. Muscular weakness starting in the arms and dissociated anæsthesia were typical. Manometric and c.s.f. studies almost constantly showed abnormalities. Sphincteric disturbances, often present, were of no localising val. Hemilaminectomy on the side of the tumour was recommended. W. M. H.

Relation of nervous system to skin potentials in intact frog. F. R. Steggerda and E. Ponder (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 617—621).—Skin potential is decreased about 25% by destruction of central nervous system; it is increased 2—3-fold for about 15 min. after injection of strychnine, and is unaffected by removal of the heart. V. J. W.

Function of mesencephalic root of fifth cranial nerve. K. B. Corbin and F. Harrison (*J. Neurophysiol.*, 1940, **3**, 423—435).—Action potentials have been obtained from the mesencephalic root of the fifth cranial nerve in cats. Opening of the jaws and stretch of the masticator muscles cause potentials in the homolateral root; the responses are confined to the caudal part of the root when there is blunt pressure on the homolateral teeth or hard palate. The impulses concerned are probably chiefly inhibitory, preventing damage to the structures concerned in biting and controlling chewing. No responses were elicited by stretching the extrinsic ocular muscles and an autonomic function for the fibres is highly improbable. S. Cr.

Bilateral acoustic neurofibromas; hereditary deafness and Recklinghausen's disease. W. J. Gardner and O. Turner (*Arch. Neurol. Psychiat.*, 1940, **44**, 76—99).—The record of a family in which Recklinghausen's disease, in the form of bilateral acoustic tumours, had been transmitted as a dominant Mendelian trait is continued to the 6th generation. Earlier reports of the 38 affected members of the family are summarised, and gross and histological findings in 4 additional members are given. More diffuse involvement is suggested only in two who had other tumours. Some published reports of familial central neurofibromatosis are summarised. W. M. H.

Convulsions associated with tumours of cerebellum: clinical and pathophysiologic features. J. E. Webster and L. M. Weinberger (*Arch. Neurol. Psychiat.*, 1940, **43**, 1163).—A study of 158 cases of verified cerebellar tumour showed 34 instances of convulsions of varying type. The theory that these fits represent decerebration is examined. Decerebrate and tonic fits are notably absent in tumours of the midline and pons, which give conditions nearly approaching anatomical discontinuity of the brain stem. So-called decerebrate and tonic fits have their most common cause in cortical anoxia or destruction, *e.g.*, anæsthetic asphyxia, meningitis, metrazol, hydrocephalus. It is suggested that the so-called "cerebellar fit" is likewise evidence of transitory decortication. It cannot be due to stimulation of the brain stem, for the motor patterns so produced are different, as are those of stimulation of the interior of the cerebellum. Physiological decerebellation by vascular changes is unlikely. "Cerebellar fits" and syncopal attacks are likely to occur in conditions of raised intracranial tension when cortical ischæmia is provoked by further pressure alterations and aggravated by pressure on medullary centres. W. M. H.

Hypothalamus and nervousness. W. C. Alvarez (*J. Amer. Med. Assoc.*, 1940, **115**, 1010—1013).—A review. C. A. K.

Location of inhibitory respiratory centre in cerebral cortex of dog. P. Bailey and W. Haynes (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 686—687).—This centre is area 4c of Klempin. It is situated in the gyrus compositus anterior just lateral to the posterior extremity of the gyrus proreus. V. J. W.

Movements elicited from precentral gyrus of adult chimpanzees by stimulation with sine wave currents. M. Hines (*J. Neurophysiol.*, 1940, **3**, 442—466).—Movements were elicited by the stimulation of the precentral gyri of three chimpanzees and were interpreted as activation (i) of discrete motor nuclei of the cranial and spinal nerves and of parts of these nuclei; (ii) of groups of motor nuclei within the spinal cord which innervate extensor or flexor sheets of skeletal muscles; and (iii) of brain stem integration systems. Certain of the co-innervations suggest cortical selection of nuclear groups, such that use patterns were elicited. An optimum frequency of 90 c.p.s. sine wave current gave movements characteristic of the unanæsthetised animal. Movements of the digits were most frequently elicited; vocalisation, a light whistle, and salivation were also produced in one animal. S. Cr.

Central course of "recurrent" sensory discharges. D. H. Barron (*J. Neurophysiol.*, 1940, **3**, 403—406).—The hypothesis is not supported that the "recurrent sensory-like" discharges are conducted through the spinal cord and out again towards the periphery in a single continuous fibre. At least two fibres may be involved. S. Cr.

Influence of sensory systems on spontaneous activity of cerebral cortex. F. H. Lewy and G. D. Gammon (*J. Neurophysiol.*, 1940, **3**, 388—395).—The activity of cortical brain cells in cats under deep nembutal anæsthesia disappears on trans-section of the brain stem at the colliculi, on destruction of the thalamus, or on cutting the thalamo-cortical radiations. Removal of the cerebellum, the opposite hemisphere, the occipital and the frontal pole does not abolish the discharge in the remaining cortex. The latter is thus dependent on the integrity of the sensory pathways. This is further confirmed by stimulation of the sensory systems. S. Cr.

Cortical representation of taste in man and monkey. I. Functional and anatomical relations of taste, olfaction, and somatic sensibility. II. Localisation of cortical taste area in man and method of measuring impairment of taste in man. W. S. Börnstein (*Yale J. Biol. Med.*, 1940, **12**, 719—736; **13**, 133—156).—I. A review (75 references) from which it is concluded that any alternative to the parietal operculum localisation of the cortical taste area in man has little basis in clinical, experimental, and anatomical data.

II. Evidence from 12 patients with gustatory disturbances caused by bullet wounds involving the parietal lobe showed that the cortical taste area is in area 43, *i.e.*, in the base of the postcentral gyrus. An elaborate technique for testing gustatory acuity is described. F. S.

p_H of cerebral cortex in relation to that of arterial blood. C. Marshall and L. F. Nims (*Yale J. Biol. Med.*, 1940, **13**, 117—121).—In dogs and cats the acidity of the fluid on the surface of the cerebral cortex follows that of the arterial blood when the respiration is altered for short periods of time. Swings in p_H are much less on the cortex than in the arterial blood after intravenous injections of acid and alkali. Lowered blood flow through the cortex produced an acid shift in p_H. F. S.

Alzheimer's disease. W. H. English (*Psychiat. Quart.*, 1940, **14**, 583—594).—Review of the literature, and report of one case. G. D. G.

Neurohistopathologic changes with metrazol and insulin shock therapy: experimental study on cat. N. W. Winkelman and M. T. Moore (*Arch. Neurol. Psychiat.*, 1940, **43**, 1108).—A histological study of the central nervous system was made in 5 cats after 9—25 injections of metrazol, in 3 cats dying from one convulsive dose of metrazol, and in 3 cats allowed to die in secondary hypoglycæmic coma after a no. of spaced insulin shocks. After metrazol convulsions little change was discernible. In the insulin-treated animals cortical ganglion cells showed shadows, shrinkage and liquefaction necrosis, with increase in glia, tortuosities and clubbing of the axis cylinders; in the spinal cord there was swelling or destruction of the axis cylinders, and the posterior root ganglia cells showed homogenisation of the Nissl substance and vacuolation. Metrazol is accordingly considered the safer drug with respect to central nervous effects. W. M. H.

Prevention of metrazol fractures by β-erythroidine hydrochloride. S. R. Rosen, D. E. Cameron, and J. B. Ziegler (*Psychiat. Quart.*, 1940, **14**, 477—480).—The severity of pentamethylenetetrazole convulsions may be reduced by previous administration to the patient of β-erythroidine hydrochloride, which is given intravenously at the rate of 400 mg. per min. until dysarthria occurs. No fractures have been observed in 37 patients. Any undesirable effects of the β-erythroidine hydrochloride observed after the fit may be removed by 1—2 c.c. of 1 : 2000 prostigmine. G. D. G.

Treatment of schizophrenia by nitrogen inhalation. B. Lipetz (*Psychiat. Quart.*, 1940, **14**, 496—503; cf. A., 1940, III, 486).—Of 16 schizophrenics treated with N_2 inhalation accompanied by psychotherapy, 5 underwent remission, 7 showed varying degrees of improvement, 4 were unimproved. N_2 treatment has the advantages of being simple, controllable, and free from severe neuromuscular reactions, whilst the cerebral anoxia can be pushed farther than with pentamethylenetetrazole. G. D. G.

Choline-esterase in brain and spinal cord of sheep embryos. D. Nachmansohn (*J. Neurophysiol.*, 1940, **3**, 396—402).—At an early age of gestation of sheep fœtuses choline-esterase is present at a high concn. in the spinal cord, striated muscles, and extrinsic eye muscles. It is low in brain centres, where it rises rapidly in the last weeks before birth. S. Cr.

Thyroid and brain respiration. R. J. Rossiter (*J. Endocrinol., Lond.*, 1940, **2**, 165—172).—In the presence of glucose, Na pyruvate or succinate, brain brei from thyroid- and vitamin-B_1-treated rats has a higher O_2 uptake than brei from controls receiving -B_1 only. If no -B_1 is given the increase is smaller with glucose and disappears with pyruvate. With dispersion preps. from similarly treated animals there is no increased O_2 uptake. *In vitro* addition of thyroglobulin increased O_2 uptake of brei or dispersion preps. with either glucose or pyruvate. This effect differs in its time relations from that considered above. Addition of thyroxine *in vitro* under the same conditions does not cause increased O_2 uptake. P. C. W.

Encephalitis periaxialis diffusa of Schilder. D. L. Reeves and L. R. Anderson (*Arch. Pediat.*, 1940, **57**, 620—630).—Report of a case with anatomical findings. C. J. C. B.

Influence of sodium chloride crystallisation by cerebrospinal fluid. S. Burack and P. B. Szanto (*J. Lab. clin. Med.*, 1940, **26**, 483—489).—C.s.f. of general paresis influences the crystal habit of NaCl in a typical manner. (2 photomicrographs.) C. J. C. B.

Comparison of chloride concentrations in whole blood and cerebrospinal fluid. R. S. Hubbard and G. M. Beck (*J. Lab. clin. Med.*, 1940, **26**, 535—541).—The agreement of c.s.f.-Cl′ with whole blood-Cl′ is not as close as with plasma-Cl, but is close enough to whole blood-Cl concn. to serve as a useful check on the significance of c.s.f. analyses. C. J. C. B.

Cerebral air embolism and vital staining: contribution to experimental study of the blood–brain barrier. S. M. Bouton, jun. (*Arch. Neurol. Psychiat.*, 1940, **43**, 1151).—Immediately following cerebral air embolism trypan-blue was injected intravenously in dogs. 48 hr. later they were killed by intravenous $MgSO_4$. Areas of the cortical ground substance which showed gross vital staining had lost normal staining qualities. Boundaries between normal and altered tissue were sharp and independent of cytoarchitectural peculiarities. Vital staining of the lesions occurred regardless of the condition of the blood vessels. These results suggest that staining with trypan-blue depends on the changed constitution of the ground substance. Failure of the intact nervous tissue to stain is due not to vascular retention but to lack of affinity of the ground substance. W. M. H.

Source of cerebrospinal fluid. Distribution of bromide and iodide throughout central nervous system. G. B. Wallace and B. B. Brodie (*J. Pharm. Exp. Ther.*, 1940, **70**, 418—427; cf. A., 1940, III, 335).—Br′ and I′, injected intravenously in dogs, were distributed evenly in the extracellular fluid

throughout the central nervous system. After cisternal injection, greater amounts were distributed in adjacent parts and smaller amounts in distant parts. Intravenous Br′ entered the c.s.f. of a region of the cord isolated by ligation from the cisterna. Intravenous I′ reached a given concn. in the extracellular brain fluid earlier than in the cisternal fluid. The anions pass from the general circulation into the extracellular spaces of the brain and cord and from these to the c.s.f. E. M. S.

Dural headache and innervation of dura mater. W. Penfield and F. McNaughton (*Arch. Neurol. Psychiat.*, 1940, **44**, 43—75).—Anatomical studies and results of stimulation of the human cranial dura show that while most of the dural convexity is insensitive, there are sensitive points on the meningeal arteries and in the middle and posterior fossæ, where nerves pass on their way to the vascular channels. In macacus the ganglion cells for these dural nerves are on the ophthalmic side of the ganglion, and it is suggested that the branches from the 2nd and 3rd divisions may have their central roots on the ophthalmic side in man. The ache resulting from stimulation of the dural sinuses is referred to a distance. Stimulation of the meningeal arteries gives local pain. Relief of headache by section of the trigeminal nerve has been frequently reported. It is necessary to cut the ophthalmic fibres. No evidence was obtained for mediation of pain by sympathetic fibres in the middle meningeal plexus. W. M. H.

X.—SENSE ORGANS.

Ocular tuberculosis. VI. Effect of sensitivity and immunity on experimental lesions of ocular tuberculosis. A. C. Woods and E. L. Burky (*Arch. Ophthal., N.Y.*, 1941, **25**, 62—74).—Rabbits were immunised by injections of tubercle bacilli. When such animals were inoculated in the anterior chamber of the eye with tubercle bacilli the eyes showed a relative immunity to the development of tuberculous lesions in comparison with the eyes of non-immunised controls. Immunised animals with high and low skin sensitivity to tuberculin showed a correspondingly high or low ocular sensitivity to the tuberculin, but the final tuberculous lesions of the eyes did not materially differ. A group of immune-allergic rabbits was completely desensitised by injections of tuberculin; these animals had a higher degree of ocular immunity to tuberculosis than animals partly or not desensitised. After an attack of ocular tuberculosis the eyes of immune-allergic rabbits developed an increased resistance to re-inoculation. This was not due to increased general immunity. W. T. A.

Experimental exophthalmos and associated myopathy induced by the thyrotrophic extract. R. B. Aird (*Arch. Ophthal., N.Y.*, 1940, **24**, 1167—1174).—A thyrotrophic extract of anterior pituitary body was injected daily into guinea-pigs for 5—7 months. An initial thyrotoxicosis was followed by a refractory period in which exophthalmos developed. This persisted despite discontinuance of the injections. The extra-ocular muscles were enlarged and showed degenerative changes. W. T. A.

Convergence. M. Dobson (*Brit. J. Ophthal.*, 1941, **25**, 66—71).—Remarks on the diagnosis and treatment of heterophoria. W. T. A.

Keeping the eyes on the ball. J. Maude (*Med. J. Austral.*, 1940, **27**, II, 358).—Skill in ball games is correlated with convergence efficiency as measured by the orthoptoscope. W. T. A.

Optical convergence and stereopsis in relation to perspective. J. Maude (*Med. J. Austral.*, 1940, **27**, II, 281—283).—The aptitude of art students for perspective drawing was found to be correlated with the power of voluntary convergence and with the degree of convergence as measured by the orthoptoscope. W. T. A.

Optical convergence and stereopsis in relation to perspective. K. O'Day (*Med. J. Austral.*, 1940, **27**, II, 360).—It is a mistake to suppose that the area centralis retinæ is particularly well developed in man; it is better developed in many birds and reptiles. W. T. A.

Necrosis of cornea due to vitamin-*A* deficiency. Report of case. H. K. Goldberg and K. Schlivek (*Arch. Ophthal., N.Y.*, 1941, **25**, 122—127).—Oral administration of vitamin-*A* was ineffective; intramuscular injection caused rapid improvement. W. T. A.

Rôle of anoxia in production of episcleritis and scleritis. Treatment with vasodilators. W. F. Duggan (*Arch. Ophthal., N.Y.*, 1941, **25**, 113—121).—Five patients with acute non-pyogenic scleral inflammations were relieved by intravenous injection of $NaNO_2$. The essential lesion in these conditions may be tissue anoxia from local vascular spasm. W. T. A.

Mechanism of aqueous secretion in mammalia. T. Henderson (*Brit. J. Ophthal.*, 1941, **25**, 30—35).—Formation of aq. humour by dialysis or filtration is impossible as the stroma of the ciliary body is in free communication with the aqueous at the angle of the anterior chamber; hence there is no difference in hydrostatic pressure across the ciliary epithelium. The condition of iris bombé shows that the ciliary epithelium is not permeable to passive diffusion. Therefore the aqueous must pass across the ciliary epithelium by active secretion. W. T. A.

Comparative study of effects of mecholyl, doryl, eserine pilocarpine, atropine, and adrenaline on blood-aqueous barrier K. C. Swan and W. M. Hart (*Amer. J. Ophthal.*, 1940, **23**, 1311—1319).—Mecholyl, eserine, and doryl instilled into the eyes of rabbits increased the permeability of the blood-aqueous barrier as shown by increase in total solids of aqueous, passage of inulin from blood to aqueous, and accelerated passage of dyes from blood to aqueous. Adrenaline had no effect in the first hr. but later increased permeability. Pilocarpine slightly increased permeability. Atropine caused a slight decrease in the total solids of the aqueous. These changes were not dependent on variation in the size of the pupil. W. T. A.

Regeneration of aqueous. J. G. Bellows and H. Chinn (*Arch. Ophthal., N.Y.*, 1940, **24**, 1144—1166).—A cannula was inserted into the anterior chamber of the eyes of anæsthetised dogs and the rate of production of aqueous was measured. Clotting was prevented by intravenous injection of chlorazol-fast-pink. The flow rapidly diminished in the first 2 hr. and was then const. for 3—5 hr. The sp. gr. of the aqueous increased sharply after paracentesis, reaching a max. in 5—25 min. Measures which raised the intra-ocular pressure increased the flow and vice versa. The effects of the retrobulbar injection of drugs are described. W. T. A.

Pupillodilator reactions to sciatic and diencephalic stimulation. Comparative study in cat and monkey. E. A. Weinstein and M. B. Bender (*J. Neurophysiol.*, 1941, **4**, 44—50).—In the cat stimulation of the sciatic nerve or hypothalamus caused dilatation of the pupil which was not affected by cutting the cervical sympathetic trunk but was abolished by cutting the third nerve. In the monkey the dilatation produced by the same means was abolished or greatly reduced by cutting the cervical sympathetic but was not abolished by cutting the third nerve. W. T. A.

Pharmacological behaviour of intraocular muscles. II. Sensitisation phenomena in dilator and sphincter iridis. E. Sachs and P. Heath (*Amer. J. Ophthal.*, 1940, **23**, 1376—1387).—The responses to drugs of isolated strips of rabbit's iris at different load levels were studied. With dilator strips the synergism of cocaine and adrenaline was due to "threshold sensitisation," that is, cocaine lowered the threshold to adrenaline although it diminished the max. effect of adrenaline at high loads. With sphincter muscle the synergism of eserine and acetylcholine was due to "augmentative sensitisation," that is, eserine increased the max. effect of acetylcholine by making available new sources of contractional energy. W. T. A.

Vascular basis of uveal disease. W. F. Duggan (*Arch. Ophthal., N.Y.*, 1940, **24**, 1123—1138).—A no. of patients with iritis and cyclitis of various types were greatly improved by vasodilator therapy with intravenous $NaNO_2$. The basis of these conditions may be tissue anoxia resulting from constriction of the arterioles produced by a histamine-like substance. W. T. A.

Glass membranes in the eye. II. A. Loewenstein (*Amer. J. Ophthal.*, 1940, **23**, 1340—1351).—In patients of about 30 years of age the lamina vitrea chorioideæ shows signs of ageing in the shape of verrucæ. In all patients over 50 years of age such changes can be detected with suitable ophthalmoscopic methods. On histological examination of the eyes of people

over 50 a vascularised tissue is found between the lamina vitrea chorioideæ and its pigment epithelium. In some cases this connective tissue may penetrate the pigment epithelium and grow under and in the retina, giving rise to "tumour-like" appearances (macular "tumours"). A. GL.

Formation of visual yellow and of so-called visual white through bleaching of visual purple. I. Effects of changes in extraction process on spectral absorption of visual purple and visual yellow. Y. Hosoya and S. Zempei (*Tôhoku J. Exp. Med.*, 1935, **27**, 172—190).—Visual yellow is produced by bleaching of visual purple. Absorption of light by the latter occurs chiefly in long λλ and by the former in short λλ, the absorption curves of the two pigments crossing in a crit. range of 410—460 mμ. The absorption curve of carefully purified and bleached visual purple was identical with that of visual yellow. CH. ABS. (*p.*)

Experimental pigmentary degeneration of retina by sodium iodate. A. Sorsby (*Brit. J. Ophthal.*, 1941, **25**, 58—62).—Intravenous injection of $NaIO_3$ in rabbits caused a degeneration of the retina similar to that caused by the prep. "Septojod." The essential lesion was in the neuro-epithelium. W. T. A.

Nature of experimental degeneration of retina. A. Sorsby (*Brit. J. Ophthal.*, 1941, **25**, 62—65).—The retinal degeneration produced in rabbits by administration of $NaIO_3$ or $NaBrO_3$ may be due to oxidation of vitamin-*C* in the retina. W. T. A.

Problem of diabetic retinitis. H. Elwyn (*Arch. Ophthal., N.Y.*, 1941, **25**, 139—148).—The pathology and ætiology of diabetic retinitis are reviewed. The condition can be explained as a result of local circulatory disturbances in the retina due to vasodilatation resulting in slowing of blood flow. W. T. A.

Case of gyrate atrophy of choroid and retina with hypogenitalism. E. C. Dax (*Brit. J. Ophthal.*, 1941, **25**, 18—23). W. T. A.

Repeatability of ophthalmo-eikonometer measurements. K. N. Ogle, H. A. Imus, L. F. Madigan, R. E. Bannon, and E. C. Wilson (*Arch. Ophthal., N.Y.*, 1940, **24**, 1179—1189).—The instrument with polarised eikonic targets is reliable for measuring differences in size of the ocular images at distant vision. Tests in the horizontal meridian at near vision are less reliable. W. T. A.

Effect of alcohol on vision. Z. W. Colson (*J. Amer. Med. Assoc.*, 1940, **115**, 1525—1527).—24 subjects consumed 2 oz. of whisky at ½-hr. intervals to the limit of tolerance. There was no appreciable change in visual acuity, visual fields, colour vision, or dark adaptation. All subjects showed an increasing esophoria, progressing to convergent strabismus with diplopia in two cases. W. T. A.

Flicker response contour for *Phrynosoma*. W. J. Crozier and E. Wolf (*J. Gen. Physiol.*, 1941, **24**, 317—324).—This lizard, having a purely cone retina, gives a curve of crit. flicker frequency against log intensity of illumination without any sign of duplicity of mechanisms. The curve is fitted well by a normal probability integral, though differing somewhat from the curves given by other animals with cone retinæ. K. J. W. C.

Visual field defects associated with cerebellar tumours. L. M. Weinberger and J. E. Webster (*Arch. Ophthal., N.Y.*, 1941, **25**, 128—138).—In a series of 158 patients with verified cerebellar tumours, 8 had visual field defects. In 4 cases these were homonymous, ranging from hemianopia to sector defects, in one case bitemporal, and in 3 cases irregular. One patient also had primary optic atrophy. In each case there was marked ventricular distension; the evidence suggested that the pressure of the third ventricle on the optic chiasma produced the field defects. W. T. A.

Blindness follows hæmatemesis. C. H. Bamford and H. Barber (*Lancet*, 1940, **239**, 715).—Concentric contraction of the visual fields was followed by persistent total blindness in one case. W. T. A.

Mescaline hallucinations in artists. W. S. Maclay and E. Guttmann (*Arch. Neurol. Psychiat., Chicago*, 1941, **45**, 130—137).—Artists were asked to sketch the visual hallucinations induced by mescaline. The nature of the hallucinations showed that both physiological factors, such as scotomata and images of the retinal vessels, and psychological factors took part in their production. W. T. A.

Colour vision and chromaticity scales. W. Peddie (*Nature*, 1940, **146**, 717—718).—Two-dimensional representation of colour standards has the disadvantage of a scale which is not uniform in all stages of colour variation. A different representation, based on a hemispherical construction and using the sensation space instead of the stimulus space, is described. The 240° spread of the spectrum curve of sensation, compared with 90° for the stimulus plane, may be advantageous in the construction of a uniform chromaticity scale. E. R. S.

Colour vision and chromaticity scales. W. D. Wright (*Nature*, 1940, **146**, 718; cf. preceding abstract).—It is desirable that the distribution of colours should possess the geometrical relations characteristic of the trichromatic colour triangle, so that the stimulus approach seems to be essential. A colour solid would have to be derived from new observations, as in the Munsell system, since laws relating stimulus and sensation are open to question. E. R. S.

Psychology of colour. I. H. Godlove and E. R. Laughlin (*Paper Trade J.*, 1940, **111**, *TAPPI Sect.*, 216—223).—The significance of colour in daily life is discussed, with special reference to colour harmony, brightness, legibility, fatigue, and chromotherapy. H. A. H.

Optic atrophy associated with pernicious anæmia. J. W. A. Turner (*Brain*, 1940, **63**, 225—236).—Three cases are described and the clinical features reviewed. W. T. A.

Termination of optic fibres in lateral geniculate body. P. Glees (*Nature*, 1940, **146**, 747).—Evidence has been obtained that crossed and uncrossed fibres of the tract each terminate in three alternating layers of cells in the lateral geniculate body of the monkey. A. GL.

Association fibre system of visual cortex and central representation of retina. W. E. Le G. Clark (*J. Anat.*, 1941, **75**, 225—235).—Small areas of the visual cortex in rhesus monkeys were devascularised. The animals were killed after 14 to 15 days and the brains treated by the Marchi technique. While efferent cortical fibres (mainly those passing into the corpus callosum and those destined for the brain stem) degenerated there was no evidence of association fibres extending from the visual cortex to adjacent areas of the parietal lobe or to the motor cortex. There are merely short association fibres running from the site of the lesion to the immediately adjacent part of the visual cortex. A. GL.

Study of sub-cortical connexions of optic tract system of ferret, with special reference to gonadal activation by retinal stimulation. J. M. Jefferson (*J. Anat.*, 1940, **75**, 106—134).—Serial sections of the brains of ferrets and rats were studied after division of the optic nerves or tracts. The ferret does not possess a "dorsal hypothalamic root" or either of the accessory optic tracts. There is no evidence that the ventral nucleus of the lateral geniculate body receives any optic connexions. There is evidence that projection of the retina exists in the dorsal nucleus as in other species. In the rat, retinal fibres end in the stratum zonale of the superior colliculus; presumably there is a similar arrangement in the ferret. Optic fibres probably end in the pretectal region of the ferret, though this was not demonstrated. There appears to be no special pathway mediating gonadal activation in response to retinal stimulation; it may be an indirect result of the changes in total bodily activity produced by such stimulation. W. T. A.

Locus of distortion in the ear. E. G. Wever, C. W. Bray, and M. Lawrence (*J. Acoust. Soc. Amer.*, 1940, **11**, 427—433).—Harmonic analysis of the cochlear effect in guinea-pigs has been carried out (*a*) for normal air-borne stimuli, and (*b*) for mechanical vibrations conveyed directly to the inner ear, after removal of the outer ossicles. The results are interpreted as showing that the locus of distortion is not in the middle ear. A. F. R-S.

Function of round window. C. S. Hallpike and P. Scott (*J. Physiol.*, 1940, **99**, 76—82).—No change of cochlear sensitivity to tones of low frequency results from experimental occlusion of the round window membrane in the cat or from its occlusion in a human subject by a pathological formation of new bone. These findings contra-indicate an acoustic function of this membrane as postulated by the resonance hypothesis. J. A. C.

Acquired and inherited deafness in animals. M. H. Lurie (*J. Acoust. Soc. Amer.*, 1940, **11**, 420—426).—Degeneration

of the external hair cells of the organ of Corti results in a hearing loss of approx. 30 db. In cases of nerve deafness, the internal cells may still be functional. A hearing aid built for cases of conductive deafness does not necessarily improve the hearing of a "nerve" deafness case. A. F. R-S.

Genesis of absolute pitch. A. Bachem (*J. Acoust. Soc. Amer.*, 1940, **11**, 434—439).—Abs. pitch cannot be acquired unless a predisposition exists. This predisposition occurs in talented musicians more often than in average musicians, and is often inherited. The congenitally blind more often possess abs. pitch than others. Where it exists, abs. pitch may be improved by experience, or decline in its absence. A. F. R-S.

Objective tinnitus aurium. Report of a case. J. C. Donnelly (*Arch. Otolaryng.*, 1940, **32**, 1054—1066).—A case of the vascular type thought to be due to an arteriovenous angioma is reported and the various causes of objective tinnitus aurium are discussed. Tinnitus disappeared subjectively and to auscultation on light pressure on the internal jugular vein, was altered by certain rotatory movements of the head, and increased by exercise, change from sitting to reclined posture, and by inhaling NH_3 fumes or amyl nitrite. It is suggested that in cases of chronic tinnitus aurium auscultation might reveal more instances of the condition. H. L.

Auditory significance of the term hearing loss. J. C. Steinberg and M. B. Gardner (*J. Acoust. Soc. Amer.*, 1940, **11**, 270—277).—The audiogram does not indicate hearing impairment for sounds above threshold in cases of deafness partly or wholly of the "nerve" type. The audiogram is, however, found to give a more adequate indication of the ability to hear speech, as measured by syllable articulation tests. Differences between the audiograms for a reported normal group of listeners taken by the U.S. Health Survey and the conventional min. audible pressure curve taken in the Bell Telephone Laboratories are discussed. A. F. R-S.

Statistical measurements on conversational speech. H. K. Dunn and S. D. White (*J. Acoust. Soc. Amer.*, 1940, **11**, 278—288).—Measurements have been made by peak and r.m.s. pressures in $\frac{1}{8}$-sec. intervals, and in bands of frequencies up to 12,000 cycles per sec., of 6 male and 5 female speaking voices. For a single male voice a comparison has been made of the r.m.s. pressures in $\frac{1}{8}$- and $\frac{1}{4}$-sec. intervals. The differences between these results and those previously published are discussed. A. F. R-S.

Selective amplification in hearing aids. N. A. Watson and V. O. Knudsen (*J. Acoust. Soc. Amer.*, 1940, **11**, 406—419).—As tested by syllable articulation tests, the benefits of selective amplification in hearing aids are so small for cases of conductive deafness that uniform amplification should be prescribed on grounds of simplicity and low cost. For cases of nerve deafness, the benefits of selective amplification are greater, and justify its use. Tentative criteria to determine (*a*) whether or not to prescribe selective amplification, and (*b*) the optimum characteristic, are given. A. F. R-S.

Activity of semicircular canals of elasmobranch labyrinth. O. Löwenstein and A. Sand (*J. Physiol.*, 1940, **99**, 89—101).—In *Raia clavata* there is a spontaneous discharge (oscillographic method) of sensory impulses from each ampulla when the labyrinth (isolated prep.) is at rest. During angular displacement in the appropriate direction the discharge of impulses is increased or inhibited. The horizontal canals respond to rotation about the vertical primary axis, but are unaffected by rotations about the two horizontal primary axes. The anterior and posterior vertical canals respond to rotation about all three primary axes. There is an after-discharge following inhibitory rotation and a silent period following excitatory rotation. Ligature or cutting of the canal or perforation of the saccule abolishes the dynamic responses to rotation but leaves the spontaneous discharge unaffected. J. A. C.

Sensations of heat and moisture. G. P. Crowden and W. Y. Lee (*Chinese J. Physiol.*, 1940, **15**, 475—484).—The relation of subjective sensations of heat and moisture to atm. temp. and humidity when air movement is slight and when radiation from the solid surrounds is determined by the temp. of the air was investigated for temp. of 71—104° F. dry bulb and 58—95° F. wet bulb. Equilibrium sensations of heat closely followed the dry-bulb temp. whilst sensations of moisture were directly related to the R.H. Numerical scales were devised for grading sensations; the summated figures of heat and moisture sensations were closely related to the vals. given for the "total heat of the air" in standard tables used in air-conditioning practice. H. L.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Implantation of hormonal substances in anterior chamber of eye of rats. E. Cutuly (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 659—660).—Absorption took place from such implants of testosterone propionate, stilbœstrol, pregnant mare serum powder, and progesterone. V. J. W.

[Determination of] iodine in thyroid. R. S. Burnett and R. F. Warkow (*Ind. Eng. Chem.* [*Anal.*], 1940, **12**, 734—735).—The uncertain end-point and the blank are eliminated and accurate results obtained by the U.S.P. XI assay for I in thyroid when the p_H is adjusted to about 2·5—2·7 and the temp. to about 33° before titration. J. D. R.

Effect of undernutrition on thyroid tissue respiration of guinea-pig. D. J. Stephens and I. J. Belasco (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 706—708).—In undernourished females (cf. A., 1940, III, 404) O_2 consumption of thyroid slices was diminished by 22%. V. J. W.

Graves' disease and hyperthyroidism. W. Hadorn (*Helv. med. Acta*, 1938, **5**, 600—627).—A lecture. M. K.

Acute fatal hyperparathyroidism. F. B. Smith and R. T. Cooke (*Lancet*, 1940, **239**, 650—651).—A woman aged 44 with chronic hyperparathyroidism and osteitis fibrosa died in the 2nd of 2 crises of acute hyperparathyroidism with acute necrosis and calcinosis in kidneys and pancreas. C. A. K.

Diagnosis and treatment of hyperthyroidism. J. H. Means (*Canad. Med. Assoc. J.*, 1940, **43**, 509—513).—A lecture. C. J. C. B.

Hippuric acid test in hyperthyroidism. S. F. Haines (*Proc. Staff Mayo Clin.*, 1939, **14**, 495—496).—6 g. of Na benzoate was given orally or 1·77 g. intravenously to 17 cases of adenomatous goitre with hyperthyroidism and 61 cases of exophthalmic goitre. The urine was collected for 1 hr. after the administration and the hippuric acid in urine determined in either case. Reduced hippuric acid excretion was found in a significant no. Some correlation existed between hippuric acid output and the results of the bromsulphalein liver function test, the hippuric acid output being reduced when the phthalein test revealed retention of the dye. The test was not of great val. in management of hyperthyroidism. H. H. K.

Pathological changes produced by prolonged experimental hyperthyroidism. A. W. Elmer, B. Giedosz, and M. Scheps (*Compt. rend. Soc. Biol.*, 1940, **133**, 309—312).—4 dogs and 6 guinea-pigs died during prolonged treatment with thyrotrophin. They showed hyperplasia of the thyroid, follicular degeneration in the ovary, and reduction of the acidophil cells of the anterior pituitary. The liver and kidneys showed gross degenerative changes, parenchymatous degeneration in the kidneys and fatty degeneration in the liver. P. C. W.

Calcium and phosphorus metabolism in thyrotoxicosis. G. E. Beaumont, E. C. Dodds, and J. D. Robertson (*J. Endocrinol., Lond.*, 1940, **2**, 237—254).—Ca and P balance was studied in 9 normal men and women on a low intake of the two elements (Ca 100—150 mg., P 350—450 mg., daily). Negative balances were found in all cases. 33 cases of thyrotoxicosis were similarly studied on the same low intakes. The average loss of Ca and P from the body was greater than in the normals. There was no correlation between the severity of the condition as judged by clinical symptoms and basal metabolic rate determinations and the degree of Ca and P loss. The severest case had a normal mineral metabolism. Following I medication there was a fall in the mineral loss and a further fall after subtotal thyroidectomy. These findings were only true on the average: thus though I lowered basal metabolic rate in all cases, 45% showed no decreased Ca and P excretion. In 6 cases there was no fall in Ca excretion even after thyroidectomy. It is concluded that the decalcification occurring in thyrotoxicosis is not due to the direct action of thyroxine secretion on bone. P. C. W.

Relation of thyroid to mammary gland growth in rat. S. L. Leonard and R. P. Reece (*Endocrinol.*, 1941, **28**, 65—69).—

Thyroidectomy in young female rats, spayed or normal, causes mammary growth (ducts and buds) as compared with controls. This effect is accentuated by daily injections of 5 r.u. of œstradiol benzoate, and is abolished by thyroxine injections. V. J. W.

Effect of thyroidectomy and of experimental hyperthyroidism on histamine content of rat tissues. F. R. Gotzl and C. A. Dragstedt (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 688—689).—Thyroidectomy causes a marked decrease, and daily injections of 10 mg. of thyroid a marked increase, in skin-histamine. V. J. W.

Thyroid weight during pregnancy and adrenal weight in late pregnancy. W. F. Hewitt, jun., and E. J. Van Liere (*Endocrinol.*, 1941, **28**, 62—64).—During pregnancy in the guinea-pig no change takes place in the thyroid-wt. : body-wt. ratio, but the ratio adrenal-wt. : body-wt. increases by 48% in pregnancy and by 58% post partum. V. J. W.

Present status of thymus gland in pediatric practice. E. A. Morgan (*Canad. Med. Assoc. J.*, 1941, **44**, 41—44).—A lecture. C. J. C. B.

Physiology and pathology of thymus. H. Adler (*Dtsch. Z. Chir.*, 1938, **250**, 614—649; cf. A., 1939, III, 748).—A typical myasthenic reaction in the dog was produced by transplantation of dog's or calf's thymus, or by subcutaneous or intravenous injection of calf's thymus extract; repeated transplantation led to a myasthenic state which was improved by administration of eserine. Simultaneous injection of eserine prevented myasthenia when thymus extract was injected. Myasthenia produced by quinine was not influenced by eserine. A case of severe myasthenia gravis needed after thymectomy only $\frac{1}{5}$ of the dose of eserine previously necessary. A positive myasthenic reaction was found in many cases of Graves' disease; complications after thyroidectomy could be eliminated by simultaneous thymectomy in three cases. The rôle of the thymus gland in infections is discussed. E. M. J.

Administration of rat thymus to pregnant rats and lack of effect in successive generation. M. W. Burrill and A. C. Ivy (*Endocrinol.*, 1941, **28**, 94—100).—Subcutaneous injections of ground thymus during pregnancy for 4 generations produced no acceleration of development in offspring. V. J. W.

Effect of pseudopregnancy on survival of adrenalectomised cats. W. D. Collings (*Endocrinol.*, 1941, **28**, 75—82).—10 pregnant or pseudopregnant cats survived adrenalectomy for 14—35 days, average 23·2 days, the usual survival time for the normal cat being 8—11 days (cf. A., 1939, III, 1050). V. J. W.

Respiration of isolated liver and kidney tissues from adrenalectomised rats. S. R. Tipton (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 596—598).—O_2 uptake of liver and kidney slices is diminished by about 30% in adrenalectomised as compared with normal animals. This difference is increased by presence of 0·04M-Na pyruvate or succinate, but not by glucose. V. J. W.

Adrenalectomy and blood-histamine of rabbits. A. Wilson (*J. Physiol.*, 1941, **99**, 241—245).—Adrenalectomy produces a rise in the blood-histamine; adrenal cortical extract given subcutaneously reduces the blood-histamine level of adrenalectomised rabbits within 1 hr.; this effect is maintained for 3—24 hr. J. A. C.

Bee venom, cobra venom, lysolecithin, and adrenal medulla. W. Feldberg (*J. Physiol.*, 1940, **99**, 104—118).—In cats bee venom and cobra venom cause a long-lasting output of adrenaline from the adrenals if injected into the central stump of the cœlic artery after evisceration; the effect is attributed to lysolecithin. The latter causes an output of adrenaline from the isolated cat's adrenal perfused with Locke solution. Lysolecithin causes a release of adrenaline in *in vitro* experiments from a suspension of ground-up cellular material of the cat's adrenal. In rabbits lysolecithin has no or a slight and inconst. secretory action on the adrenal medulla. Its intravenous injection causes a fall of arterial blood pressure and a rise of pressure in the pulmonary artery. Its injection into the abdominal aorta causes peripheral vaso-constriction sometimes preceded by vaso-dilatation. J. A. C.

Action of adrenaline on respiration and its destruction by retractor penis *in vitro*. R. H. De Meio and F. P. Ludueña (*Rev. Soc. argent. Biol.*, 1940, **16**, 452—459).—Adrenaline was incubated with slices of retractor penis in a Warburg apparatus and the O_2 consumption measured. An increase was observed when concns. of 1 : 1500 to 1 : 1,000,000 were added; it was not due to autoxidation of the adrenaline and was 70—90% inhibited by CN′, as was the respiration of the muscle. Adrenaline was inactivated 10—50% in 2 to 4 hr. in concns. of 1 : 4500—1 : 10^8. This inactivation was not due to autoxidation, and was not inhibited by CN′. J. T. L.

Relation of the groups of adrenaline molecule to its cardio-accelerator action. W. B. Youmans, H. F. Haney, and K. W. Aumann (*Amer. J. Physiol.*, 1940, **130**, 190—196).—The potency of adrenaline, arterenol, neosynephrin, epinine, and synephrin as accelerators of the denervated heart was determined in normal and adrenal demedullated unanæsthetised dogs. Each of the compounds accelerates the denervated heart when given in concn. having any effect on the heart rate; the degree of acceleration increases as the threshold dose is doubled or quadrupled. Removal of the methyl group of the adrenaline molecule does not affect the cardio-accelerator potency, but removal of any one of the three hydroxyl groups results in a component $\frac{1}{26}$—$\frac{1}{2500}$ as potent as adrenaline. The most important of the 4 groups with regard to cardio-accelerator potency is the *m*-hydroxyl group. Removal of the *p*-hydroxyl group reduces cardio-accelerator potency more than pressor potency. Neosynephrin, given at a rate that does not alter the rate of the denervated heart, produces a rise in blood pressure. Development of refractoriness to the effects of a continuous injection of adrenaline and related compounds does not follow the same course in the sino-auricular node as in intestinal smooth muscle. M. W. G.

Involution of fœtal cortex of adrenal glands. M. C. Benner (*Amer. J. Path.*, 1940, **16**, 787—797).—Adrenal glands were studied in 217 fœtuses, infants, and children. There were marked individual variations in the rate of involution of the fœtal cortex. There is steady growth of the true cortex and medulla of the adrenal glands throughout infancy and childhood. The fœtal cortex begins to degenerate at, or just previous to, birth. The degeneration proceeds rapidly for 2—3 weeks with a loss of cells and increasing prominence of the stroma which takes on the appearance of a zone of connective tissue. C. J. C. B.

Influence of amorphous fraction from adrenal cortex on efficiency of muscle [and kidney]. D. J. Ingle and E. C. Kendall (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 602—606).—The amorphous fraction is the most effective adrenal product is promoting renal efficiency in the adrenalectomised dog and maintenance of wt. in the adrenalectomised rat. 17-hydroxy-11-dehydrocorticosterone is ineffective in these respects, but greatly increases the work capacity of the rat during its period of survival. V. J. W.

Causes of diabetes mellitus. G. Graham (*Brit. Med. J.*, 1940, II, 479—482).—A review. C. A. K.

Rôle of liver in diabetes mellitus. G. Graham (*Brit. Med. J.*, 1940, II, 513—516).—A review. C. A. K.

Successful responses in diabetes mellitus of menopause produced by antagonistic action of sex hormones on pituitary activity. E. Cantilo (*Endocrinol.*, 1941, **28**, 20—24).—40 diabetic women received benefit from administration of 5—15 mg. of pure œstrogen with 1—5 mg. of progesterone 2—4 times per week. V. J. W.

Diabetes therapy with protamin-zinc-insulin. A. Schüpbach (*Helv. med. Acta*, 1938, **5**, 570—574).—A discussion of its effect in 5 cases. M. K.

Comparative efficacy of various methods for administering insulin. E. M. Watson (*Canad. Med. Assoc. J.*, 1940, **43**, 444—447).—Observations on 40 diabetics show that in order to gain the individual physiological effects of regular insulin and protamine-Zn-insulin, these must be administered separately. When mixed, the regular insulin is converted into protamine-insulin, and only the delayed action on the blood-sugar, characteristic of the latter, is obtained. C. J. C. B.

Pitressin tannate in oil for diabetes insipidus. J. A. Greene and L. E. January (*J. Amer. Med. Assoc.*, 1940, **115**, 1183—1185).—Pitressin tannate in peanut oil produced an anti-

diuretic action lasting 3—7 days in cats with experimental diabetes insipidus and 30—82 hr. in human cases. C. A. K.

Innervation of hypophysis of rabbit and rat. C. McC. Brooks and I. Gersh (*Endocrinol.*, 1941, **28**, 1—5).—Nerve supply originates in the hypothalamus. Most fibres end in the posterior lobe but some go on to the pars intermedia and anterior lobe, which also receives in rabbits some fibres from the carotid plexus. In the rat, fibres were seen to terminate in networks around the gland cells. V. J. W.

Familial dyspituitarism. D. W. Boswell (*Brit. Med. J.*, 1940, II, 490).—3 brothers in one family showed adiposity, genital hypoplasia, and abnormal sella turcica. C. A. K.

Cutis verticis gyrata and acromegaly. E. P. Zeisler and L. M. Wieder (*Arch. Dermat. Syphilol.*, 1940, **42**, 1092—1104).—Investigation of the literature together with the 2 additional cases presented indicate that cutis verticis gyrata may be added to the other clinical signs pointing to pituitary disease. C. J. C. B.

Effects of pituitary and thyroid glands on carbohydrate metabolism. S. Morrison and M. Feldman (*Amer. J. digest. Dis.*, 1940, **7**, 453—456).—Normal, hypophysectomised, and thyroidectomised dogs were treated with thyroid and anterior pituitary extracts, which had the effect of diminishing glucose tolerance. N. F. M.

Effects of extracts of human anterior pituitary glands on *Xenopus lævis*. H. A. Shapiro (*J. Endocrinol., Lond.*, 1940, **2**, 156—161).—A protein or protein-like substance is present in alkali and aq. extracts of human anterior pituitary glands which causes ovulation in normal and hypophysectomised *Xenopus*. The extract is œstrogenic in intact females and induces the release of spermatozoa in the male and stimulation of secondary sexual characters. P. C. W.

Correlation of physiological and cytological changes in neurohypophysis of rats with experimental diabetes insipidus. I. Gersh and C. McC. Brooks (*Endocrinol.*, 1941, **28**, 6—19).—Water exchange was determined in rats after various hypothalamic lesions or hypophysectomy. Cellular changes were correlated with changes in the water exchange. Polyuria after hypophysectomy was temporary, but after hypothalamic lesions was often permanent. V. J. W.

Effect of pituitary on motility of gastro-intestinal tract. S. Morrison and M. Feldman (*Amer. J. digest. Dis.*, 1940, **7**, 451—452).—In dogs hypophysectomy had no effect on gastro-intestinal motility or gastric secretion. Motility was also unaffected by the subcutaneous administration of anterior pituitary extracts both in normal and in hypophysectomised dogs. N. F. M.

Effect of hypophysectomy on compensatory renal hypertrophy in dogs. M. C. Winternitz and L. L. Waters (*Yale J. Biol. Med.*, 1940, **12**, 705—709).—Nine dogs were subjected to unilateral nephrectomy after recovery from transbuccal hypophysectomy. A wide variation in the degree of compensatory hypertrophy of the remaining kidney resulted. Where there was little or no hypertrophy the pituitary remnant consisted of minute fragments of the pars tuberalis or distalis; where considerable compensatory hypertrophy took place, large remnants of the pars distalis of the anterior lobe were found. F. S.

Dose/response relation for certain principles of the pituitary gland, and of serum and urine of pregnancy. C. W. Emmens (*J. Endocrinol., Lond.*, 1940, **2**, 194—225).—The response of the ovary of the immature rat to gonadotrophins, of the thyroid gland of the guinea-pig to thyrotrophin, and of the pigeon crop-gland to prolactin follow logistic curves rather than logarithmic ones. The logistic is such that $y = L/(1 + e^{(\alpha - x)/\beta})$, where y is the response, x the dose, L the limiting val. of y, and α and β are consts. The curve is so fitted that the y-axis cuts the curve at a point corresponding with the wt. of the glands of unstimulated controls. The potencies of extracts may be compared by means of α, the "standard interval," since the no. of mg. of each extract equiv. to one unit of α is inversely proportional to its potency. Methods of fitting the curve are discussed and by one method it is possible to calculate the errors involved in the estimation of relative potencies. The logistic curve is superior to a logarithmic one as a description of the dose/response relations (checked by tests of goodness of fit) but its usefulness in practice depends on the range over which it is desired to assay preps. If only the small central part of the dose/response curve is to be employed the usual methods are sufficiently accurate but if the whole curve is to be used the logistic function gives more accurate readings. P. C. W.

Thyrotrophic action of hypophysis of *Bufo arenarum* on birds and mammals. V. G. Foglia (*Rev. Soc. argent. Biol.*, 1940, **16**, 381—389).—The anterior lobe of the hypophysis of toads was injected subcutaneously into day-old chicks which were killed 24 hr. later; thyroid wt. increased when 5 or more lobes were given. Normal 150-g. guinea-pigs also showed an increase in thyroid wt. after subcutaneous injection of 50 anterior lobes given in two daily doses during 5 days. 21-day-old female rats showed an increase in thyroid wt. after injection of 9—200 anterior lobes given 3 times per day during 3 days; the increase was proportional to the dose. Posterior lobe did not increase thyroid wt. in guinea-pigs but slightly increased it in female rats. Hypophysectomised female rats treated with anterior lobe had an increase in body- and thyroid wt. proportional to the dose given, which brought them close to normal vals. when 70 lobes were injected in 14 days; a higher dose produced less effect. The influence on the thyroid was more marked than on the body-wt. Posterior lobe produced a slight increase in body- and thyroid wt. Toad muscle and liver did not produce variations in body- and thyroid wt. An extract of kidney and adrenal increased thyroid wt., but was less active than anterior lobe. J. T. L.

Antithyrotrophic action of serum of rabbits treated with muscle extract. P. Oudet (*Compt. rend. Soc. Biol.*, 1939, **132**, 547—549).—Rabbits injected for 5—6 months with an extract of ox muscle provide serum which inhibits the thyrotrophic action of crude ox anterior pituitary extracts. The effect on a purified thyrotrophic extract of sheep pituitary is inconst. P. C. W.

Effect of thyrotrophic hormone on pancreas. P. Florentin and R. Wolff (*Compt. rend. Soc. Biol.*, 1940, **133**, 138—140).—Thyrotrophic hormone injected into guinea-pigs (75—300 units in 3—6 days) produced histological evidence of hypertrophy and hyperplasia of the islet tissue of the pancreas. The effect resembled that produced by thyroid injection. P. C. W.

Pancreotropic factor of anterior pituitary. H. P. Marks and F. G. Young (*Lancet*, 1940, **239**, 719—712).—Pancreotropic activity of various anterior pituitary preps. was estimated from the insulin content of the pancreas in rats treated with extract daily for 2 weeks. The activity of sheep extract was ½ that of ox extract while horse extract was inactive. The pancreotropic factor is not identical with prolactin or other factors. Collip's primary neutral alcoholic extract was inactive by mouth and on injection. C. A. K.

Assay of prolactin by the pigeon crop-gland response. S. J. Folley, F. J. Dyer, and K. H. Coward (*J. Endocrinol., Lond.*, 1940, **2**, 179—193).—The results of numerous prolactin assays are analysed statistically. There is a positive correlation between body-wt. and crop-gland wt. for a given dose of hormone. The relation between abs. crop-wt., or crop-wt. as % of body-wt., and log dose is linear with doses of 3—18 i.u. of prolactin. The necessary conditions are described for the performance of accurate assays. Light has no influence on the crop-gland response but temp. above 15° decrease it. An approx. and subjective assay may be made on the basis of the amount of "crop-milk" adhering to the glands of treated pigeons. P. C. W.

Retardation of mammary involution in mice by lactogenic hormone. C. W. Hooker and W. L. Williams (*Endocrinol.*, 1941, **28**, 42—47).—In mice, isolated from young on 4th day post partum, mammary involution was delayed in 10 out of 12 by injection of 20—60 i.u. daily of prolactin. V. J. W.

Continued treatment of lactating cows with anterior pituitary extracts. S. J. Folley and F. G. Young (*J. Endocrinol., Lond.*, 1940, **2**, 226—236).—Cows in declining lactation were injected over 22 days with a crude anterior pituitary extract. There was an increase of 16% in daily milk production over that expected in the absence of treatment. Similar injections of a prolactin prep., 7 times as active as the crude extract in stimulating the pigeon crop-gland, only increased the milk yield 5%. In both cases there was a decline in the stimulation to milk production towards the end of the injection period but no anti-prolactin activity could be demonstrated in the serum of the cows. Glycotropic preps. having no detectable pro-

lactin activity had no effect on milk production. In no instance was there any effect on the fat or non-fatty solids content of the milk. The results are discussed in the light of current ideas of the lactogenic factor of the pituitary. P. C. W.

Factors influencing sensitivity of rabbits to gonadotrophic effect of pregnancy urine. I. Thyroid, œstrone, and progesterone. J. M. Barman (*Rev. Soc. argent. Biol.*, 1940, **16**, 460—466).—Thyroidectomy increased, and hyperthyroidism produced by thyroxine treatment decreased, the response of the ovary of the mature female rabbit to pregnancy urine. Œstradiol benzoate and propionate and progesterone when given for several days previous to the injection of urine diminished sensitivity. J. T. L.

Synergism of œstrogens with pituitary gonadotrophins in hypophysectomised rats. M. E. Simpson, H. M. Evans, H. L. Fraenkel-Conrat, and C. H. Li (*Endocrinol.*, 1941, **28**, 37—41).—Stilbœstrol (10 mg. subcutaneously) was synergic with follicle-stimulating hormone (8 r.u.) in hypophysectomised male rats, but with interstitial cell-stimulating hormone (10 r.u.) its action was only additive. V. J. W.

Influence of thyroid on resorption of gonadotrophic hormones. F. Bischoff, G. J. Clarke, and C. H. Epps (*Endocrinol.*, 1941, **28**, 48—52).—Thyroidectomy augments the response to gonadotrophic hormone given in single daily doses, but has less effect when doses are divided, or when it is given as an insol. Cu compound. Thyroidectomy has slight effect on the response to prolan, and its effects on gonadotrophin are neutralised by thyroxine. V. J. W.

Rate of disappearance of pituitary gonadotrophin from blood of rabbits. J. M. Robson and A. I. S. MacPherson (*J. Pharm. Exp. Ther.*, 1940, **70**, 433—439; cf. A., 1939, III, 905).—6 hr. after intravenous injection, in rabbits, of gonadotrophin from horse pituitaries, 40% was detected in the serum. Only small amounts remained after 24 hr. 10—20% was recovered from the urine. Gonadotrophin was assayed by the ovarian wt. method in rats. E. M. S.

Purification of follicle-stimulating [anterior pituitary] hormone. H. L. Fraenkel-Conrat, M. E. Simpson, and H. M. Evans (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 627—630).—The method previously published (*Anal. fac. Med., Montevideo*, 1940, 25) is modified by fractionation of very dil. solutions with $(NH_4)_2SO_4$ and separation of the fraction pptd. between 0·6 and 0·7 saturation. The prep. so obtained contains 300—400 units per mg., 1 unit being the min. dose causing resumption of follicular growth in a hypophysectomised rat. V. J. W.

Synergism of follicle-stimulating and luteinising hormones in producing œstrogen secretion. H. L. Fevold (*Endocrinol.*, 1941, **28**, 33—36).—In rats, follicle-stimulating hormone from sheep pituitary causes very slight œstrogen output determined by uterine growth, unless luteinising hormone is also administered. Ovarian growth therefore gives a better criterion for hormone assay. V. J. W.

Posterior pituitary solution in labour. (A) J. A. Sharkey. (B) G. F. Pendleton. (C) J. B. De Lee (*J. Amer. Med. Assoc.*, 1940, **115**, 1315—1317, 1318—1320, 1320—1326).—Reviews and discussion on the dangers of posterior pituitary solution in labour. C. A. K.

Pituitary antidiuretic hormone in vertebrate series. H. Heller (*J. Physiol.*, 1941, **99**, 246—256).—The pituitary glands of different species of the same class of vertebrates contain roughly the same amount of antidiuretic activity per 100 g. body-wt. Mammalian pituitary bodies contain at least 8 times as much of the antidiuretic principle (calc. per 100 g. body-wt.) as the glands of any non-mammalian species (birds, amphibians, teleost and elasmobranch fishes). A relation between the phylogenetic development of Henle's loop and the amounts of antidiuretic hormone produced by the posterior pituitary is suggested. J. A. C.

Activation of pitressin by acetic acid. E. Ogden and L. A. Sapirstein (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 573—575).—Boiling for 15 min. with 1% acetic acid increases by about 50% the activity of pituitary extracts as determined by their antidiuretic effect in rats and pressor effects in dogs. This is not due to boiling, concn., acidity, or presence of acetate in the extract. V. J. W.

Influence of sex hormones and deoxycorticosterone on melanophore differentiation in birds. H. L. Hamilton (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 571—573).—Skin from New Hampshire Red or Rhode Island Red 6-day chick embryos, grown *in vitro*, develops red malanophores when sex hormones (œstradiol, œstrone, or testosterone) are added to the medium (20—300 μg. per c.c.), but not otherwise. Addition to the medium of 50—333 μg. of deoxycorticosterone acetate prevents the development of black melanophores. V. J. W.

XII.—REPRODUCTION.

Flavin-dinucleotide in eggs of the sea-urchin, *Arbacia punctulata*. M. E. Krahl, A. K. Keltch, and G. H. A. Clowes (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 719—721).—By an adaptation of Warburg and Christian's *d*-amino-acid oxidase method (A., 1938, III, 1047) the eggs can be shown to contain a flavin-dinucleotide like that in the other tissues. V. J. W.

Effects of colchicine on viscosity of *Arbacia* egg. K. M. Wilbur (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 696—700).—In unfertilised eggs viscosity, as determined by centrifuging, is not altered by 0·1% colchicine. In fertilised eggs the increased viscosity which normally follows fertilisation is inhibited by 0·05% colchicine, and fusion of pronuclei and nuclear breakdown are delayed. V. J. W.

Frog skin potential and sex. L. I. Katzin (*J. Cell. Comp. Physiol.*, 1940, **16**, 410—412).—In *Rana catesbiana* there is no difference in skin potential between the sexes at any time of year. V. J. W.

Duration of pregnancy in the hare. R. Lienhart (*Compt. rend. Soc. Biol.*, 1940, **133**, 133—135).—The relative maturity of new-born hares suggests that the gestation period is longer than that of the rabbit (30 days). A female hare killed 2 days after delivery of 2 normal off-spring had 3 embryos in the left horn of the uterus at about the same stage of development as new-born rabbits. The gestation period in the hare may be 60 days; the female may have fertile mating with the male half way through the gestation period. P. C. W.

Time and rate of appearance of gonadotrophin in serum of pregnant mares. F. T. Day and I. W. Rowlands (*J. Endocrinol., Lond.*, 1940, **2**, 255—261).—Gonadotrophin appeared in the serum of pregnant ponies on the 30th—47th day after ovulation and reached a max. concn. on the 60th—75th day. Max. concns. recorded were 43,000—352,0000 i.u. per l. Gonadotrophin had almost disappeared by the 110th day. Withdrawal of 2000 ml. of blood (10% of the total blood vol.) weekly for 4 weeks did not affect the course of the pregnancy or the rate of appearance of gonadotrophin. P. C. W.

Reply to recent criticisms of theory of relationship between vitamin-*E* and œstrogens. E. V. Shute (*J. Endocrinol., Lond.*, 1940, **2**, 173—178). P. C. W.

Regression of œstrogen-induced mammary tumours in female rats following removal of stimulus. R. L. Noble and J. B. Collip (*Canad. Med. Assoc. J.*, 1941, **44**, 1—5).—Treatment with progesterone of 4 rats bearing tumours induced by œstrone pellets was followed by cessation of tumour growth. Removal of the œstrone pellets in 4 animals caused complete regression of all the tumours previously present. Enlargement of the pituitary gland usually followed œstrogen treatment and a large hæmorrhagic adenoma of the anterior lobe was encountered in 2 rats during the 1st year of treatment. After longer periods, however, nearly all animals were found to have large pituitary adenomas. C. J. C. B.

Comparative activity of naturally occurring œstrogens on infantile rat uterus and vagina. R. I. Dorfman (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 594—596).—Descending order of activity is α-œstradiol, œstrone, equilin, equilenin, and œstriol. V. J. W.

Menstruation-like bleeding with constant œstrogen dosage in ovariectomised woman. S. R. M. Reynolds, S. Kaminester, and S. Schloss (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 749—750).—In a patient who received 2 mg. of œstradiol dipropionate fortnightly, and 0·5 mg. of œstradiol daily, for 5 months, uterine bleeding occurred 3 times at intervals of 18, 28, and 68 days. V. J. W.

Œstrogen in ovaries of prepubertal calf. P. Zephiroff, C. Drosdovsky, and N. Dobrovskaïa-Zavadskaïa (*Compt. rend.*

Soc. Biol., 1940, **133**, 236—238).—Œstrogenic material was extracted from the ovaries of prepubertal calves. 1 rat unit of œstrogen was contained in the extract from 3 g. of fresh tissue, which is about the quantity found in heifers' ovaries. P. C. W.

Effect of simultaneous administration of follicular and corpus luteum hormone on sexual apparatus of female castrated rats. E. Steinkamm (*Arch. Gynäk.*, 1939, **169**, 53—58).—Folliculin was injected simultaneously with corpus luteum hormone in proportion of 1 : 50 and 1 : 100 in oily solution twice weekly over a period of 100—212 days. The total dose of follicular hormone was 1·5 mg. in both groups, of progesterone 75—150 mg. No histological changes of the sexual organs were found in either group. Decrease in the size of uterus was observed, in direct proportion to the duration of treatment. No metaplastic changes were found in the uterus. Animals treated with the hormone mixture in the proportion of 1 : 5—1 : 10 showed in some cases metaplastic changes. M. K.

Quantitative and qualitative test for steroid hormones based on ovipositor reaction of the female bitterling (*Rhodeus amarus*, **Bloch**). J. J. Duyvené de Wit (*J. Endocrinol., Lond.*, 1940, **2**, 141—156).—Detailed descriptions are given of the apparatus and optimal conditions for the performance of steroid hormone assays using the elongation they cause of the ovipositor of the female bitterling. An assay of progesterone is given as an example. The time relations and max. of the response differ with different hormones. P. C. W.

Biological properties of pregneninolone in women. U. J. Salmon and S. H. Geist (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 522—525).—In contrast with its effects on rats, this substance in 60-mg. daily doses caused in women only slight and doubtful œstrogenic effects (vaginal smear), and no androgenic effects. V. J. W.

Isolation of ætio*allo*cholan-3-(β)-ol-17-one (*iso*androsterone) from normal and pathological human urines. W. H. Pearlman (*J. Biol. Chem.*, 1940, **136**, 807—808).—*iso*Androsterone has been isolated from the urine of normal women and of men and women with cancer. Normal male urine yielded a cryst. product, probably a mixture of *iso*- and dehydro*iso*-androsterone. E. M. W.

Polarographic determination of ketonic steroids. J. K. Wolfe, E. B. Hershberg, and L. F. Fieser (*J. Biol. Chem.*, 1940, **136**, 653—687).—The 17-keto-steroids of neutral urinary extracts are determined by condensation with Girard's reagent T and polarographic analysis of a buffered aq. solution of the product. The wave span of the curve is within limits proportional to the hormone concn. Saturated 3-keto-steroids are indifferent, ketonic œstrogens are determinable, and 20-keto-steroids give curves having two waves. *cyclo*-Hexanone and *cis*-2-keto-10-methyldecahydronaphthalene are almost indifferent, whilst *cyclo*pentanone and *cis*-8-methylhydrindan-2-one give characteristic curves. Δ^4-3-Keto-steroids can be determined free in *iso*propyl alcohol–aq. tetraethylammonium hydroxide, or better as Girard derivatives as above, when they are distinguished from 17- and Δ^1-3-keto-steroids by differences in the half-wave potential, and can be determined in presence of saturated ketonic androgens. Cholestanone with Girard's reagent T in acetic acid yields the *betaine hydrazone chloride* ($+H_2O$), m.p. 233—234° (corr.; decomp.). *Dehydro*iso*androsterone*-p-*nitrophenylhydrazone acetate* has m.p. 291—292° (corr.; decomp.). A. Li.

Concentration and detoxification of human urine for biological pregnancy diagnosis. L. D. Scott (*Brit. J. exp. Path.*, 1940, **21**, 320—324).—The gonadotrophic hormone is adsorbed from the urine with kaolin at p_H 4·0, using bromophenol-blue as indicator. The kaolin is centrifuged down and the hormone is extracted from the kaolin with 0·1N-NaOH. The alkaline suspension is centrifuged and the supernatant fluid is adjusted to a faintly acid reaction to litmus, when it is ready for injection into the test animal. 1000 urines have been tested by this method and in no case was an incorrect result obtained with the combined Friedman and Hogben tests. F. S.

Pregnanediol excretion after ovariectomy in early pregnancy. G. E. Seegar and E. Delfs (*J. Amer. Med. Assoc.*, 1940, **115**, 1267—1268).—After bilateral ovariectomy in a woman aged 26 on the 63rd day of pregnancy, the urinary pregnanediol excretion never rose above 20 mg. daily during the later stages, in contrast with normal pregnancy vals. of 60—70 mg. Chorionic gonadotrophin vals. in blood and urine were normal, and there were no clinical abnormalities during pregnancy or parturition. C. A. K.

Emesis gravidarum. P. Wetterdal (*Acta obstet. Gynec. Scand.*, 1939, **19**, 201—221).—In 311 cases serum-cholesterol level was lower in cases with emesis than in those without emesis at the same stage of pregnancy. Treatment with "gravomite" (bile compounds and cholesterol) was successful in 65% of 902 cases of emesis. In the successful cases average cholesterol val. was 201·1±0·13 mg.-%, while in the cases with ineffective treatment the average was 235±0·19 mg.-%. M. K.

Psychoses associated with pregnancy and puerperium. W. H. Cruickshank (*Canad. Med. Assoc. J.*, 1940, **43**, 571—576).—A lecture. C. J. C. B.

Human infertility. S. R. Meaker and S. N. Vose (*J. Amer. Med. Assoc.*, 1940, **115**, 1426—1428).—A lecture. C. A. K.

Dysmenorrhœa and sterility. E. Wittkower and A. T. M. Wilson (*Brit. Med. J.*, 1940, II, 586—590).—Personality studies showed that psychological maladjustments in childhood were common in patients with sterility or dysmenorrhœa. C. A. K.

Sterility in the male. H. A. R. Kreutzmann (*J. Amer. Med. Assoc.*, 1940, **115**, 1424—1426).—A review. C. A. K.

Testicular biopsy. C. W. Charny (*J. Amer. Med. Assoc.*, 1940, **115**, 1429—1433).—The technique of testicular biopsy is described and its val. shown by case reports. C. A. K.

Fate of testosterone in man. R. I. Dorfman (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 739—740).—30 mg. of testosterone propionate was given intramuscularly to a man with deficient testicular secretion. His urine was conc. and extracted as previously described (A., 1940, III, 131) and a substance identified as ætiocholan-3(α)-ol-17-one was obtained as well as the usual androsterone. In another man, a complete castrate, oral administration of testosterone caused excretion of androsterone in the urine. V. J. W.

Effect on body growth of small doses of testosterone propionate administered at different seasons. H. S. Rubinstein and M. L. Solomon (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 745—748).—0·05 mg. daily subcutaneously to rats from the 26th to the 80th day of age failed to cause increased growth when treatment was begun in April, but caused increase when begun in January, July, or October. V. J. W.

XIII.—DIGESTIVE SYSTEM.

Measurement of effect of sex hormones on submaxillary gland of mouse. A. Lacassagne (*Compt. rend. Soc. Biol.*, 1940, **133**, 227—229).—The average diameter of the secretory tubules is 37 μ. in the normal female and 48 μ. in the normal male. The diameter is reduced by castration or œstrogen treatment in both sexes and increased by androgen treatment. P. C. W.

Sexual dimorphism in submaxillary gland of mouse. A. Lacassagne (*Compt. rend. Soc. Biol.*, 1940, **133**, 180—181).—The submaxillary gland in the male is predominantly tubular, that of the female acinar. Injection of œstrone in the male or of testosterone in the female reverses the histological appearance of the glands. The glands of prepubertal mice are mixed in type. P. C. W.

Objective œsophageal changes due to psychic factors. W. B. Faulkner, jun. (*Amer. J. med. Sci.*, 1940, **200**, 796—803).—The œsophagoscope showed that œsophageal spasm could be increased by grief, anger, anxiety, apprehension, fear, and "spiritual imprisonment"; the spasm relaxes and the lumen widens immediately with such emotions as happiness, elation, enthusiasm, contentment, and security. C. J. C. B.

Gastroscopic observations in resected stomachs. R. Schindler (*Amer. J. digest. Dis.*, 1940, **7**, 505—507).—A description (with plates) of the normal and abnormal gastroscopic appearances of resected stomachs. Gastritis, jejunitis, marginal ulcers, and jejunal ulcers were frequently seen and the progress of these conditions was watched over long periods. N. F. M.

Present status of gastrectomy. I. Abell (*Amer. J. digest. Dis.*, 1940, **7**, 495—498).—A lecture. N. F. M.

Gastrectomy, partial, sub-total, and total; the radiographic phase. W. H. Stewart, (*Amer. J. digest. Dis.*, 1940, **7**, 498—500).—A review of the radiological findings in carcinoma of the stomach. N. F. M.

Diminution or prevention of peritonitis from leakage after intestinal resection or perforation. H. Koster (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 660—662).—Intestinal loops can be maintained on the abdominal wall in NaCl moistened gauze for 25 days, or till the incision or perforation has healed, and then returned to the abdomen. 19 cases have been so treated with no ill effects. V. J. W.

Present status of lipocaic. Council on Pharmacy and Chemistry (*J. Amer. Med. Assoc.*, 1940, **115**, 1454—1455).—A review. C. A. K.

Relation of transportation force to motility in colon of dog. R. D. Templeton and H. F. Adler (*Amer. J. Physiol.*, 1940, **130**, 69—73).—Data for correlating colonic motility with transportation force were obtained from 5 cæcostomised dogs; a special technique is described. The transportation force in the colon is intimately related to the active period; the time during which transportation force is exerted on an immovable object in the colon is greatest during the first half of an active period, and least during the last quarter. The intensity of an active period is not necessarily indicative of the quantity of transportation force. M. W. G.

Absorption of pentoses from small intestine of urethanised rat. J. N. Davidson and R. C. Garry (*J. Physiol.*, 1941, **99**, 239—240).—*d*(+)-Xylose is absorbed more rapidly than *l*(−)-xylose, *d*(−)-arabinose, *l*(+)-arabinose, and *d*(−)-ribose, which are all absorbed at about the same rate. J. A. C.

Alimentary azotæmia due to whole blood absorption from gastro-intestinal tract. C. F. Chunn and H. N. Harkins (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 569—571).—In 3—7 hr. after administration by mouth to dogs of 200 c.c. of citrated blood, the blood-urea-N rises from a normal of about 15 to about 30 mg.-%. V. J. W.

Fate of ingested glucose solutions of various concentrations at different levels of small intestine. H. Shay, J. Gershon-Cohen, S. S. Fels, and F. L. Munro (*Amer. J. digest. Dis.*, 1940, **7**, 456—462).—5·4%, 13·5%, and 25% glucose solutions were administered to human subjects by means of a special four-lumen gastro-intestinal tube. High glucose concns. delayed gastric emptying and provoked a flow of diluting fluid, principally from the duodenum. The duodenum absorbed dil. solutions but diluted conc. solutions. Isotonic or hypotonic conditions were usually maintained in the lower small intestine by means of this mechanism. High glucose concns. had an irritant effect on the duodenal mucosa. N. F. M.

Factors influencing digestion in jejunum. L. C. McGee and E. S. Emery (*Amer. J. digest. Dis.*, 1940, **7**, 462—467).—Amylase and protease content of jejunal contents of patients (*e.g.*, peptic ulcer, achlorhydria) were studied after removal with a special three-lumen tube. No significant variations between the different groups were encountered. The instillation of 0·1N-HCl, 5% solution of amino-acids, or isotonic $NaHCO_3$ produced a temporary fall in enzyme activity followed by a rapid return to normal. N. F. M.

Diets in dyspepsia. J. Daly (*Canad. Med. Assoc. J.*, 1940, **23**, 513—520).—A lecture. C. J. C. B.

Changes in small intestine associated with deficiency disease. T. M. Mackie and M. A. Mills (*Amer. J. digest. Dis.*, 1940, **7**, 480—483).—Detailed *X*-ray studies of the small intestine were made in 28 patients suffering from ulcerative colitis (19) and a variety of other conditions. A significant correlation was found between abnormal mucosal pattern and clinical and chemical indications of vitamin deficiency, particularly vitamin-*B*. N. F. M.

Roentgenologic diagnosis of diseases of small intestine. B. R. Kirklin and H. M. Weber (*Amer. J. digest. Dis.*, 1940, **7**, 475—480).—A lecture, with illustrative plates. N. F. M.

Enterogenous cyst of duodenum. J. B. Gillespie and J. C. T. Rogers (*Arch. Pediat.*, 1940, **57**, 652—658).—A case report. C. J. C. B.

Experimental jejunal ulcer. M. J. Schiffrin (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 592—594).—Cannulæ are tied in each end of isolated loops of jejunum and brought out through the abdominal wall. Perfusion with pepsin–HCl causes ulcers with perforation near the ends of the cannulæ; addition of $Al(OH)_3$ or $AlPO_4$ prevents these lesions. V. J. W.

Blood in cases of hæmatemesis and melæna with reference to factors influencing hæmorrhage. H. K. Moss, L. Schiff, R. J. Stevens, and M. L. Rich (*Amer. J. digest. Dis.*, 1940, **7**, 490—494).—A study of 44 patients with hæmetemesis, who were compared with 4 control groups of subjects either normal or suffering from other unrelated diseases, failed to establish any connexion between the hæmorrhage and plasma-vitamin-*C* level, bleeding time (Ivy or Duke), serum-Ca, prothrombin, bleeding time, clotting time, or blood-fibrinogen. N. F. M.

XIV.—LIVER AND BILE.

Metabolism studies on surviving turtle's liver. C. D. Snyder and F. H. Tyler (*J. Cell. Comp. Physiol.*, 1940, **16**, 377—388).—By the technique previously described (A., 1941, III, 106) perfused liver gave up 0·2—0·4 mg. of lactic acid and 2·6—3·6 mg. of glucose per min. per 100 g. of tissue. These vals. were increased by adrenaline or sarcolactic acid and decreased by acetylcholine which caused constriction of the hepatic vein. V. J. W.

Galactose-tolerance test in liver necrosis. E. J. King, C. V. Harrison, and G. E. Delory (*Lancet*, 1940, **239**, 541—543).—The rate of disappearance from the blood of intravenously injected galactose was a reliable estimate of the amount of liver damage produced in rabbits by CCl_4. C. A. K.

Intravenous galactose-tolerance test [in liver disease]. E. J. King and R. S. Aitken (*Lancet*, 1940, **239**, 543—545).—50 c.c. of a 50% solution of galactose are injected intravenously and blood-galactose is determined at intervals. Cases of jaundice with liver-cell damage can be distinguished from obstructive cases without cell damage. C. A. K.

Chronic jaundice. R. M. Tecon (*Helv. med. Acta*, 1938, **5**, 671—674).—Familial non-hæmolytic jaundice in groups of 2 families is discussed. M. K.

Measurement of the chloroform-soluble fraction of bilirubin in persons with jaundice and its significance. M. Heilbrun and R. S. Jubbard (*J. Lab. clin. Med.*, 1940, **26**, 576—581).—The $CHCl_3$-sol. pigment is compared with a 1 in 6000 $K_2Cr_2O_7$ solution as standard. C. J. C. B.

Methionine and cystine, specific protein factors preventing chloroform liver injury in protein-depleted dogs. L. M. Miller, J. F. Ross, and G. H. Whipple (*Amer. J. med. Sci.*, 1940, **200**, 739—756).—Methionine, and to a smaller extent cystine, given by mouth or by vein 24—5 hr. before anæsthesia almost completely protect the protein-depleted dog against $CHCl_3$ poisoning; other non-S-containing amino-acids alone or in various combinations have no protective action. A single large meal of beef or intravenous injection of plasma-protein 24—48 hr. before anæsthesia likewise protects, the S-containing amino-acids being responsible. The protein-depleted dog succumbs to 15—20 min. light $CHCl_3$ anæsthesia and shows extensive liver necrosis. The dog protected by methionine tolerates 40 min. $CHCl_3$ anæsthesia with little clinical disturbance and no evidence of liver injury. It is suggested that tissue thiol groups combine with $CHCl_3$; the combination may inactivate enzyme systems and cause cell death unless there is an adequate reserve of cystine or methionine. C. J. C. B.

Value of liver extract in cases intolerant to arsenicals, heavy metals, and radiation. G. M. MacKee and G. D. Astrachan (*J. invest. Dermat.*, 1940, **3**, 409—442).—In a small series of tests there were more improved cases among those intolerant to arsenicals than among cases intolerant to heavy metals; the best results were obtained in cases which received the largest no. of liver extract injections. Marked improvement in the blood counts and decrease in the icterus index were found in many cases. C. J. C. B.

Post-operative perfusion of biliary ductal system. D. Macdonald (*Canad. Med. Assoc. J.*, 1940, **43**, 411—418).—A simple procedure is outlined, by which the duct system is "flushed" by means of the ordinary continuous intravenous

apparatus connected with the gall-bladder stump and controlled heat applied directly to the internal biliary tract. C. J. C. B.

Pathological changes in gall-bladder wall due to action of bile. N. A. Womack and E. M. Bricker (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 710—712).—If the bile duct is tied in dogs, retained bile causes œdema, round cell infiltration, and fibrosis of the gall bladder. If in addition normal bile is replaced by conc. bile, necrosis of the gall bladder often occurs. The most toxic bile constituent is Na deoxycholate. V. J. W.

XV.—KIDNEY AND URINE.

Renal function. I. Coefficient of permeability of glomerular and tubular membranes. II. Simplified expression of urea excretion. III. Ambard's and Van Slyke's formulæ. IV. Experimental control of theoretical formula. C. Jung (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 67—71, 96—98, 98—100, 141—143).—I. By using Manegold's results on the permeability of membranes, the coeffs. of permeability of the glomerular and convoluted tubular membranes are calc.

II. A simplification of the original expression which is less exact but does not involve hypothetical terms such as the permeability of the membranes and diffusion pressures.

III. The formulæ are criticised.

IV. Assuming that creatinine is not absorbed in the convoluted tubules and that the blood-urea is 30 mg.-%, and by determining the concn. of creatinine in the urine, the amounts of urea and water filtered through the glomerular membrane are calc. The clearance of creatinine is unaffected by a marked diuresis, unlike the coeffs. of Ambard and Van Slyke. J. L. D.

Mechanism of renal tubular excretion of creatinine in dogfish. J. A. Shannon (*J. Cell. Comp. Physiol.*, 1940, **16**, 285—291).—Excretion of creatinine reaches a max. at 84 mg.-% of glomerular filtrate. Excretion rates accord with the supposition that creatinine forms a reversible combination with a cellular constituent present in a fixed amount. V. J. W.

Short phenolsulphonephthalein test of renal function [in man]. M. Plotz and M. Rothenberger (*J. Lab. clin. Med.*, 1940, **26**, 587—590).—6 mg. of phenolsulphonephthalein is injected intravenously. A patient who excretes 25% or more phenolsulphonephthalein within 15 min. or more than 35% within 30 min. has normal kidney function. Failure to secrete these amounts has less diagnostic val. C. J. C. B.

Indications for decapsulation of kidney. J. E. Nichol (*Canad. Med. Assoc. J.*, 1940, **43**, 577—580).—A lecture. C. J. C. B.

Relation of kidney to cardiovascular disease. M. C. Winternitz and R. Katzenstein (*Yale J. Biol. Med.*, 1940, **13**, 15—38).—A description of pathological lesions following complete and incomplete ligature of both ureters in the dog. (10 photomicrographs.) F. S.

Acute necrotising glomerulonephritis. J. S. Dunn and G. L. Montgomery (*J. Path. Bact.*, 1941, **52**, 1—16).—The ultimate determining factor in bilateral renal cortical necrosis is extreme glomerular capillary dilatation with loss of plasma leading to inspissation of the blood and complete circulatory blockage in the kidney at this level. The capillary dilatation may be initiated by the direct action of bacterial toxins on these vessels as in acute necrotising glomerulonephritis by partial ischæmia, as in the cortical necrosis of the renal toxæmias of pregnancy, or occasionally by acute venous obstruction. (10 photomicrographs.) C. J. C. B.

Experimental phosphate nephritis in rat. D. McFarlane (*J. Path. Bact.*, 1941, **52**, 17—24).—The early lesions produced in the rat kidney by intraperitoneal injection or oral administration of NaH_2PO_4 are similar and are restricted to a sp. segment of the broad limb of Henle in the outer medullary zone. It is suggested that it is this segment which is the site of acidification of the urine in the rat. (8 photomicrographs.) C. J. C. B.

Accidental bilateral ligation of ureters. F. Pilcher, jun., and A. E. Aikenhead (*Canad. Med. Assoc. J.*, 1940, **43**, 436—439).—A case report. C. J. C. B.

Congenital anomalies of urinary tract in children and infants and their relation to chronic pyuria. I. H. Erb and P. Summerfeldt (*Canad. Med. Assoc. J.*, 1941, **44**, 14—20).—In 1148 consecutive autopsies, 51 showed some form of congenital anomaly of the urinary tract. Seven other cases had dilatation of some part of the urinary tract with stasis but without congenital lesions. Inflammatory changes, as recognised by clinical pyuria or by the finding of pus in the urine at autopsy, were present in 25 cases. C. J. C. B.

Antidiuretic action of blood from dogs in thyroxine polyuria. L. Brull (*Compt. rend. Soc. Biol.*, 1940, **133**, 286—288).—Kidneys from normal dogs were transplanted into the carotid-jugular circulation of normal dogs and then into the same circulation in dogs rendered polyuric by thyroxine administration. The urinary flow was diminished by the change but increased if the change was in the opposite order. P. C. W.

Measurement of diodrast and inulin clearances in man after subcutaneous administration. T. Findley and H. L. White (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 623—625).—25% inulin solution is injected into the subcutaneous tissue of the axilla, followed after 45 min. by 0·2 c.c. per kg. of diodrast, diluted 2—3 times, in the same area. Blood and urine samples show satisfactory clearances of both substances. V. J. W.

Determination of urinary histidine. Histidine content of normal and pregnancy urines. W. D. Langley (*J. Biol. Chem.*, 1941, **137**, 255—265).—Histidine in 25 c.c. of urine is determined by adding 5 c.c. of 10% H_2SO_4 and powdered $KMnO_4$ until the purple colour persists for approx. 15 sec., stirring for approx. 1 min. with not more than 0·5 g. of acid-washed C, and filtering. Approx. 1·5 c.c. of a solution of Br (1 c.c.) in CCl_4 (100 c.c.) are drawn, in the dark, through 6 c.c. of filtrate at such a rate that the brown colour persists. After 20 min., excess of Br is removed by adding 1 c.c. of 0·5% phenol, 1 c.c. of saturated aq. Na acetate is added, and the mixture is heated for 1 min. at 100° in the dark. The colour of the cooled mixture, that of 6 c.c. of filtrate treated in the same way but containing 0·4 mg. of added histidine (to take account of the urea effect), and that of a standard containing 1 mg. of histidine are compared with those of standard indicator solutions or with that of a light filter. Pregnancy urines usually require to be diluted. As little as 0·04 mg. of histidine per c.c. is accurately determined and accuracy is fair with lower concns. The creatinine : histidine ratio of non-pregnancy urines is 2·5—17·7 (average 8·9) whilst that of pregnancy urines is 0·9—6·4 (average 2·71). Approx. 16% of urines, however, yield abnormal vals. and the ratio, although a valuable aid in the diagnosis of pregnancy, does not form the basis of a reliable test. W. McC.

Determination of hippuric acid in urine. I. Kraus and S. Dulkin (*J. Lab. clin. Med.*, 1941, **26**, 729—732).—The amount of inorg. acid required for a quant. recovery of hippuric acid varies with the composition of the urine and an excess of acid is desirable. Most workers use too little acid. C. J. C. B.

Determination of calcium in urine. A. E. Sobel and B. A. Sobel (*J. Lab. clin. Med.*, 1940, **26**, 585—586).—The direct acidimetric titration method for Ca is applicable to urine without ashing. C. J. C. B.

Determination of mercury in urine. D. M. Hubbard (*Ind. Eng. Chem.* [*Anal.*], 1940, **12**, 768—771).—A photometric "mixed colour" method for the determination of Hg in urine using the red colour given by Hg with di-β-naphthylthiocarbazone is described. Org. matter in 50 ml. of urine is oxidised by $KMnO_4$–H_2SO_4, and the Hg and Cu are extracted by means of a $CHCl_3$ solution of the reagent. Cu is removed by shaking the extract with dil. H_2SO_4 and aq. $Na_2S_2O_3$, and a second extraction of Hg with the reagent is made before the photometric determination. The method is sensitive, and the accuracy $\pm 0{\cdot}2$ μg. for 5 μg. of Hg. Amounts of Hg above 50 μg. can be determined with an error of less than ±2%. An improvement on Suprunovitsch's method (A., 1939, II, 58) of prep. of the reagent is described. L. S. T.

XVI.—OTHER ORGANS, TISSUES, AND BODY FLUIDS.

Growth and development in the pig : carcase quality characters. IV. Use of sample joints and carcase measurements as indices of composition of the bacon pig. V. Bearing of main principles emerging on problems of animal production and

human development. C. P. McMeekan (*J. Agric. Sci.*, 1941, **31**, 1—17, 17—49).—IV. In bacon type pigs of 200 lb. live wt. the total wt. of bone, muscle, and fat in the carcase can be estimated from the wts. of these tissues in loin or leg and more accurately from those of the combined joints. Among linear carcase measurements the length of hind leg and combined length of forearm and trotter afford the best indices of the total wt. of bone in the carcase. An even better index is the combined wt. of the cannon bones. The wt. of muscle in the carcase may be calc. from "eye" muscle measurements on the cross-section at the junction of thorax and loin or from the wt. of the psoas muscle. Fat measurements at the loin afford a measure of the total fat in the carcase.
A. G. P.

Isotopic constitution of potassium in rat tissues. A. Lasnitzki and A. K. Brewer (*Biochem. J.*, 1941, **35**, 144—151).—The ratio $^{39}_{19}K : ^{41}_{19}K$ in the ash from bone marrow and plasma is significantly lower than that of ordinary mineral K in KCl. K present in the ash from liver, kidney, salivary gland, skeletal muscle, spleen, lymph glands, and testis shows, on the whole, the same isotopic ratio as does mineral K, although in a few exceptional cases there is a very slight decrease in the amount of the heavy isotope. A kinetic mechanism which accounts for the difference in the isotopic ratios of tissue- and plasma-K is suggested. J. N. A.

Chemistry in dental science. D. A. Wallace and H. L. Hansen (*J. Chem. Educ.*, 1940, **17**, 425—426).—Typical researches are summarised. L. S. T.

Ætiology of dental caries. B. Gottlieb (*Brit. Dent. J.*, 1939, **67**, 377—384).—A discussion. H. H. K.

Birefringence of deciduous tooth enamel formed before and after birth. M. A. Rushton (*Brit. Dent. J.*, 1939, **67**, 1—10).—Ground sections of human deciduous teeth were examined to determine the relative birefringence of various parts of the enamel. Birefringence of the antenatal enamel was not more negative with respect to the prism direction than that formed in the following months by the same ameloblasts. It was sometimes about the same but more commonly less negative. The calcification of antenatal enamel is thus not higher than that of the postnatal tissue. The enamel in the neonatal line showed high negative birefringence of the prisms and little or no birefringence of the interprismatic substance. It is concluded that during the neonatal arrest of growth calcification of prisms proceeds to a high degree but calcification of interprismatic substance is low.
H. H. K.

Gingivitis. R. G. Torrens (*Brit. Dent. J.*, 1939, **67**, 70—80).—The chemical causation and cure are discussed.
H. H. K.

Brittleness of nails (fragilitas unguium). H. Silver and B. Chiego (*J. invest. Dermatol.*, 1940, **3**, 357—374).—In various diseases symptoms of brittleness are common. The highest incidence is found among housewives not using lacquers, suggesting that kitchen soap and water are important contributors. Lack of Fe and avitaminosis are further causes.
C. J. C. B.

Oxidation–reduction potentials of inflammatory lesions of skin. C. C. Torrance (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 741—744).—Potentials of skin fluids in the neighbourhood of lesions caused by heat or diphtheria toxin were determined by oxidation–reduction dyes. Reaction to heat caused a more positive potential, and to toxin a more negative one.
V. J. W.

Permeability of insect cuticle. V. B. Wigglesworth (*Nature*, 1941, **147**, 116).—Observations that support Hurst's views (A., 1940, III, 531) are recorded for an insect immersed in oil to which various reagents are added. They indicate also the importance of the partition coeff. of a substance between oil and water in determining the rate at which it will leave the oily base of a contact insecticide and enter the tissues of an insect. L. S. T.

Action of sulphites on cystine disulphide linkings in wool. II. Influence of temperature, time, and concentration on the reaction. F. F. Elsworth and H. Phillips (*Biochem. J.*, 1941, **35**, 135—143; cf. A., 1938, III, 589).—The disulphide-S of wool reacts with $NaHSO_3$ at p_H 5 forming thiol and cysteinesulphonate groups which are not easily removed by rinsing with water. The rate of reaction increases during the first 24 hr. and then gradually decreases. Increase of temp. to 60° also favours the reaction, but at higher temp. the wool is weakened and probably other changes occur besides the $NaHSO_3$ reaction. The extent of reaction also increases with increase in concn. of $NaHSO_3$, up to 13%. Not more than one third of the total disulphide-S of the wool reacts in this manner. The residual disulphide-S in wool which has been boiled with alkaline solutions (p_H above 8) reacts with $NaHSO_3$ in the same proportion as that of untreated wool. The cortical cells obtained by digestion of wool with papain in presence of $NaHSO_3$ contain more org. S than does the fibre as a whole. The keratin of the cells reacts with $NaHSO_3$ to give thiol and *S*-cysteinesulphonate groups. A probable explanation of the reaction is given. J. N. A.

Acids of phosphatides of cow's milk fat. T. P. Hilditch and L. Maddison (*Biochem. J.*, 1941, **35**, 24—30; cf. Kurtz *et al.*, A., 1934, 1247; Rewald, B., 1937, 488).—Analysis by the ester fractionation method of the mixed acids from the phosphatides of Swiss and English cow's milk fat (one sample of each) showed that these phosphatides contained myristic 3·2, 5·5, palmitic 21·0, 13·4, stearic 7·3, 9·0, impure arachidic 12·3, 20·9, impure $C_{26}H_{52}O_2$ 5·2, 10·0, hexadecenoic 4·3, 4·9, oleic 32·5, 23·5, octadecadienoic 6·4, 0·0, and unsaturated C_{20-22} acids 7·8, 12·8%, respectively. The typical acids of the glycerides of milk fat (*e.g.*, butyric) were absent.
W. McC.

Physiology and toxicology of blowflies. V. Hydrogen-ion concentration in the alimentary canal. VI. Adsorption and distribution of iron. D. F. Waterhouse. **VII. Quantitative examination of the iron content of** *Lucilia cuprina*. F. G. Lennox (*Counc. Sci. Ind. Res. Austral.*, 1940, *Pamph.* 102, 67 pp.; cf. B., 1941, III, 110).—V. The p_H of food in the crop of larvæ is the same as that of the medium and that of the anterior, mid, and posterior mid gut and hind gut is 7·4—7·6, 3·2—3·9, 7·6—7·8, and 7·8—8·0, respectively. The vals. for the adult insect are similar to those of the larva except the anterior mid gut and hind gut which are 4·8—5·3 and 4·3—5·3, respectively. No difference is observed in the sexes of adult flies.

VI. Fe is absorbed and accumulated by larvæ from low-Fe media by a band of cells at the posterior end of the acid region of the mid gut, but, with a higher concn., the epithelium of the alkaline anterior and posterior regions also absorb small amounts. During development of the prepupæ and pupal stages, Fe is transferred to the nephrocytes, fat body, and wing and leg rudiments and later appears temporarily in the oocyte during the early stages of egg-development. Fe is absorbed in the adult by the entire mid gut, particularly between the mid and posterior portions.

VII. Total Fe remains const. at 3—4 mg. per 100 g. of live tissue during development from egg to pupæ. Approx. one third of total Fe in the larvæ is sol. in 0·05N-HCl and one tenth in distilled water, the latter val. being higher in the eggs. H. G. R.

Structure of kephalin.—See A., 1941, II, 58.

XVII.—TUMOURS.

Comparative carcinogenicity of three carcinogenic hydrocarbons. M. B. Shimkin and H. B. Andervont (*J. Nat. Cancer Inst.*, 1940, **1**, 57—62).—Male mice of the C_3H strain were given standard subcutaneous injections of methylcholanthrene, benzpyrene, and dibenzanthracene dissolved in tricaprylin. The potency of the hydrocarbons was in the order given. Single injections of dibenzanthracene induced as many tumours as repeated injections of that hydrocarbon.
E. B.

Intestinal carcinoma and other lesions in mice following oral administration of 1 : 2 : 5 : 6-dibenzanthracene and 20-methylcholanthrene. E. Lorenz and H. L. Stewart (*J. Nat. Cancer Inst.*, 1940, **1**, 17—39).—The drinking-water of mice (strain *A* and strain *B* backcross) was replaced with emulsions of olive oil containing 1 : 2 : 5 : 6-dibenzanthracene and 20-methylcholanthrene. Animals became ill when the emulsion contained 0·4 mg. of dibenzanthracene per c.c., but survived up to 13 months with 0·2 mg. per c.c. Spectrographic analysis showed that unchanged dibenzanthracene occurred in the gastro-intestinal tract down to the level of the large intestine but not below. Extracts of blood, ascitic fluid, fat, and liver did not contain hydrocarbon. Two out of six pairs of lungs examined contained dibenzanthracene. Many animals became emaciated and prema-

turely old. Anasarca developed particularly in animals ingesting dibenzanthracene. The incidence of tumours of the lung was considerably increased. Mice which received dibenzanthracene (but not methylcholanthrene) showed liver bile duct proliferation, atrophy of the spleen and other lymphoid tissue, and depletion of bone marrow. A reversible inflammatory lesion occurred in the small intestine and 10 mice developed carcinoma of the intestine and 3 of these were transplanted. (12 photographs.) E. B.

Relative importance of local and constitutional effects of methylcholanthrene in production of skin tumours in the mouse. G. B. Mider and J. J. Morton (*J. Nat. Cancer Inst.*, 1940, **1**, 41—44).—Single painting of *C*57 black mice with 0·5% methylcholanthrene in benzene produced papillomata which disappeared spontaneously. Similar treatment of *C*57 brown mice induced papillomata and a few carcinomata. E. B.

Response of central nervous system to application of carcinogenic hydrocarbons. Methylcholanthrene. J. H. Peers (*Amer. J. Path.*, 1940, **16**, 799—816).—Cholesterol pellets containing 10% of methylcholanthrene were implanted into the brains of 99 stock albino mice. A total of 32 tumours was observed in 28 of the 87 surviving animals. 17 of the tumours were classified as sarcomas of mesodermal origin and 15 were gliomas. Three animals presented more than 1 type of tumour. The tissue surrounding the pellets was strikingly free of necrosis and non-sp. inflammation. (11 photomicrographs.) C. J. C. B.

Effect of dibenzanthracene on transplantable mammary adenofibroma of the white rat. J. H. Davis, K. M. Murphy, and L. A. Emge (*Amer. J. Path.*, 1941, **17**, 93—100).—The subcutaneous injection of 1 : 2 : 5 : 6-dibenzanthracene in a strain of rats refractory to spontaneous cancer produced sarcomas in over 80% of animals surviving the injection period 100 days or more. These sarcomas were readily transplantable, failed to metastasise, and were more anaplastic than sarcomas derived from the adenofibromas. The presence of a previously implanted benign tumour had no effect on the incidence or character of these induced sarcomas. Dibenzanthracene failed to induce malignant changes in a transplantable mammary adenofibroma known to undergo spontaneous malignant degeneration, and exerted an inhibitory effect on the growth of adenofibromas in the female rats. (9 photomicrographs.) C. J. C. B

Sensitivity of skin and connective tissue toward carcinogens in various strains of mice. C. Dittmar (*Z. Krebsforsch.*, 1940, **50**, 20—26).—3 strains of mice were subjected to external or subcutaneous applications of benzpyrene for 3 months. A strain which showed a high spontaneous incidence of mammary carcinoma was more resistant, cutaneous papillomata and carcinomata as well as sarcomata appearing later than in the other 2 strains. Hæmoglobin given with the food favoured malignant change in the benzpyrene papillomata; yeast delayed tumour formation; the same effect was seen when vitamin-*A* or carotene was injected at the same place as the benzpyrene. Implantation of a benzpyrene sarcoma greatly inhibited the formation of cutaneous tumours but had no effect on that of sarcomata produced as above. E. M. J.

Light and cutaneous cancer. O. Teutschlaender (*Z. Krebsforsch.*, 1940, **50**, 81—92).—8 of 14 white mice surviving 13 weeks in a dark room with exclusion of all light save that of a red lamp developed carcinomata after painting with tar, showing the facultative rôle played by ultra-violet light in the production of tar cancer. E. M. J.

Carcinogenesis. XII. Effect of the basic fraction of creosote oil on production of tumours in mice by chemical carcinogens. R. D. Sall and M. J. Shear (*J. Nat. Cancer Inst.*, 1940, **1**, 45—55).—Addition of 1% of the basic fraction of creosote to benzene solutions of 3 : 4-benzpyrene in benzene increased the rate of production of tumours on the skin of mice. Addition of the basic fraction to lard solutions of carcinogens which were injected subcutaneously in mice did not regularly increase the carcinogenic action. E. B.

Cocarcinogenic action of croton resin. I. Berenblum (*Cancer Res.*, 1941, **1**, 44—48).—Croton oil causes a marked augmentation of carcinogenesis when applied to the skin of mice in conjunction with a solution of benzpyrene in acetone. With croton resin the cocarcinogenic action is more marked. Turpentine or xylene applied in concns. producing comparable degrees of irritation to that of croton oil showed no cocarcinogenic action. The cocarcinogenic action of croton resin is not dependent on any possible carcinogenic action which it may possess. F. L. W.

Influence of heptaldehyde on carcinogenic action of methylcholanthrene. C. Carruthers (*Arch. Path.*, 1940, **30**, 1184—1191).—Heptaldehyde markedly inhibited the carcinogenic action of methylcholanthrene when the skin of mice was painted with it on alternate days with methylcholanthrene. Heptaldehyde had no effect on tumours once they had started to grow in the control group. (2 photomicrographs.) C. J. C. B.

Stimulation of tumour induction by an inhibitor of cell glycolysis. H. G. Crabtree (*Cancer Res.*, 1941, **1**, 34—38).—The effect of monochloroacetone, an inhibitor of cell glycolysis, on the rate of tumour induction by 3 : 4-benzpyrene is a function of the concn. used and the time of its application in relation to that of the carcinogen. When these times overlap, low concns. produce large inhibitory effects whilst higher concns. annul the inhibition. When the chloroacetone is applied after discontinuing preliminary treatment with the carcinogen a strong stimulatory effect is produced which is independent of the concn. used. (Cf. A., 1941, III, 113.) F. L. W.

Retardation of the rate of tumour induction by hydrolysing chloro-compounds. H. G. Crabtree (*Cancer Res.*, 1941, **1**, 39—43; cf. preceding abstract).—Acetyl, valeryl, myristyl, palmityl, and stearyl chlorides and benzenesulphonyl chloride inhibit the rate of tumour induction in mice by 3 : 4-benzpyrene. The degree of inhibition varies with the mol. size and rate of hydrolysis but does not run parallel with any single physical or chemical characteristic. Benzenesulphonyl chloride was most effectual. The action of acid chlorides on the glycolysis of cells was contrasted with that of the sp. inhibitors of this process and it was concluded that the acid chlorides impair the activities of cells non-specifically due to liberation of HCl. F. L. W.

Electrometric studies of tumours induced in mice by the external application of benzpyrene. H. S. Burr, G. M. Smith, and L. C. Strong (*Yale J. Biol. Med.*, 1940, **12**, 711—717).—In mice painted in the right axilla with benzene and also in mice painted with benzpyrene dissolved in benzene there was an increase in the voltage gradients across the chest, concomitant with the inflammatory reaction. The right axilla became increasingly negative and, with benzpyrene, remained negative through the papillomatous change but became slightly positive during the malignant phase. F. S.

Malignant melanoma in rabbit after painting with benzpyrene. O. Schürch (*Deut. Z. Chir.*, 1939, **252**, 277—284).—After 3½ years a malignant melanoma appeared in the ear. E. M. J.

Experimental liver cancer in rats and its inhibition by rice-bran extract, yeast, and yeast extract. K. Sugiura and C. P. Rhoads (*Cancer Res.*, 1941, **1**, 3—16).—Albino rats of the Sherman and Wistar strains are more susceptible than those of the Evans strain to the development of liver cancer when fed on a diet of unpolished rice containing butter-yellow (*p*-dimethylaminoazobenzene). Concurrent ingestion of carrot has no effect on the production of liver cancer. The induction of liver cancer by butter-yellow is inhibited by feeding ether-sol. extracts of rice-bran or of yeast. 15% of brewer's yeast in the diet completely prevented the formation of liver tumours but purified casein did not. F. L. W.

Differences between malignant blood cells from induced and spontaneous leukæmias of mice. J. Furth and W. A. Barnes (*Cancer Res.*, 1941, **1**, 17—22).—Methylcholanthrene and benzpyrene induced leukæmia in mice of a leukæmic stock, in mice of a non-leukæmic stock, and in hybrids of these stocks. The genetic structure of neoplastic blood cells from the induced leukæmias was tested in transmission experiments using pure bred and hybrid mice. Spontaneous leukæmias arising in hybrids behave the same in transmission experiments as spontaneous leukæmias arising in leukæmic stock. Induced leukæmias differ among themselves. Only one of six transmissible leukæmias induced in hybrids resembled those arising spontaneously. Two were non-sp. and could be grafted in both parental leukæmic and non-leukæmic stock, while two grafted readily in hybrids but not in either parental

stock. The difference may be explained by assuming that the cells of the induced leukæmias are mutants. F. L. W.

Spontaneous and induced tumours of guinea-pig. S. Warren and O. Gates (*Cancer Res.*, 1941, **1**, 65—68).—One spontaneous tumour and four tumours induced by injection of 5 mg. of 3 : 4-benzpyrene into guinea-pigs are described. Guinea-pigs are resistant to the development of spontaneous tumours, to transplantation of spontaneous or induced tumours, and to the production of induced tumours other than those of the gall bladder. Carcinogenic hydrocarbons are much less potent in guinea-pigs than in mice. The literature on guinea-pig tumours is reviewed. F. L. W.

Lung tumours and heredity. I. Susceptibility of four inbred strains of mice and their hybrids to pulmonary tumours induced by subcutaneous injection. W. E. Heston (*J. Nat. Cancer Inst.*, 1940, **1**, 105—111).—Mice of the *A*, *L* (leaden), *N*, and *W* strains and crosses of these strains were injected with 1 mg. of dibenzanthracene. Lung tumours occurred in 100%, 0, 7%, and 31% respectively of the *A*, *C*, *N*, and *W* strains. The incidence of tumours in the crosses indicates that a no. of factors rather than a single Mendelian factor control the inheritance of susceptibility to lung tumours. E. B.

Tissue response [tumour production] to sulphanilamide in mice. A. T. Haerem (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 536—539).—Out of 20 mice which received 2 injections of 15 mg. of sulphanilamide suspended in lard 2 developed sarcomata at the sites of injection. V. J. W.

Carcinogenic potency of stilbœstrol and œstrone in strain C_3H mice. M. B. Shimkin and H. G. Grady (*J. Nat. Cancer Inst.*, 1940, **1**, 119—127).—Virgin female mice of the C_3H strain developed mammary tumours at an average age of 46 weeks. Injection of 1·2 mg. of stilbœstrol reduced the average time to 35 weeks; injection of 1·2 mg. of œstrone reduced the time to 30 weeks. Of 10 male mice injected with 5 mg. of stilbœstrol 8 developed breast tumours. 1 of 5 male mice injected with 1·2 mg. of stilbœstrol and 2 of 10 injected with 1·2 mg. of œstrone developed mammary cancer. E. B.

Effect of œstrogens and carcinogenic chemicals in stimulating secretion of the mammogenic duct growth factor of the anterior pituitary. A. A. Lewis and C. W. Turner (*Cancer Res.*, 1941, **1**, 55—59).—Of various œstrogens promoting mammary gland proliferation, the most active, as judged by the mammogenic mouse unit technique, was stilbœstrol, which was 400 times as effectual as œstrone. Œstradiol benzoate was 240 times as active as œstrone whilst aq. œstriol, anol (*p*-hydroxypropenylbenzene), and triphenylethylene had about 1/30 of the activity of œstrone. 1 : 2 : 5 : 6-Dibenzanthracene was only 1/75 as effectual as œstrone. F. L. W.

Œstrogenic and carcinogenic action. H. Druckrey (*Z. Krebsforsch.*, 1940, **50**, 27—29).—No œstrus was produced in castrated female rats after injection of 5 or 100 mg. of benzpyrene in olive oil. No tumour formation was seen in 90 mice after painting a shaved portion of skin with solutions of digitoxigenin (1% or 3%) or digitoxin (5%) for 13½ months. E. M. J.

Pathology and pathogenesis of mammary tumours occurring spontaneously in Albany strain of rats. A. W. Wright, G. H. Klinck, jun., and J. M. Wolfe (*Amer. J. Path.*, 1940, **16**, 817—834).—Of 149 mammary tumours which occurred spontaneously in the breasts of 141 female rats of the *A-S* strain, 122 were fibroepithelial tumours (adenofibromas or fibroadenomas), 10 fibromas, 11 adenomas, 5 cystadenomas, and 1 carcinoma. Atypical focal lesions in the breasts of 11 female rats without tumours and of a considerable no. of rats with typical new growths are considered to represent the earliest stages in the pathogenesis of the mammary neoplasms. Bio-assays of tumour tissue for the presence of an extrogenic factor were negative. (23 photomicrographs.) C. J. C. B.

Mammary carcinoma in male mouse of non-susceptible strain suckled by female of very susceptible strain. A. Lacassagne and S. Danysz (*Compt. rend. Soc. Biol.*, 1939, **132**, 395—397).—New-born mice of strain 39 were suckled by mothers of the cancer-susceptible strain *R*III and injected with 50 μg. of œstrone benzoate weekly. After 6 months 1 male had a mammary carcinoma. P. C. W.

Proline and tumour incidence in mice. F. S. Hammett (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 601—602).—Daily injections of 0·2 c.c. of 0·008M. solution of *l*-proline increased incidence of mammary tumours in mice. V. J. W.

Transplantable lymphosarcoma of chicken. F. Pentimalli (*Cancer Res.*, 1941, **1**, 69—70).—A lymphosarcoma in a Leghorn chicken is described. The tumour was transplantable and non-filterable. F. L. W.

Adenomatous stomach lesion of the rat associated with heavy *Cysticercus fasciolaris* infestation. H. Blumberg and R. E. Gardner (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 673—677).—These lesions have been produced in 3 different strains of rats when they were fed with sufficient *Tænia* eggs to cause displacement by cysts of most of the liver tissue. V. J. W.

Factors influencing inactivation of rabbit papilloma virus by *X*-rays. W. F. Friedewald and R. S. Anderson (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 713—715).—Serum and other substances present in extracts protect virus against *X*-ray destruction. Purified suspensions were almost inactivated by 100,000 r., and completely by 500,000 r. V. J. W.

Nature of chicken leukæmia virus. F. Pentimalli (*Z. Krebsforsch.*, 1940, **50**, 96—98).—An active protein was obtained by reversible pptn. with 0·3—0·4-saturated $(NH_4)_2SO_4$. E. M. J.

Mice ascites carcinoma transplantations. III. H. Auler and B. Hohenadel (*Z. Krebsforsch.*, 1940, **50**, 30—40).—Transplantability was reduced to half after heating at 44° for 30 min. and lost completely after heating for 60 min.; it was regained after 24 hr. in the cold. Centrifuging at 15,000 r.p.m. for 1 hr. or over produced a fluid poor but not devoid of cells. Positive transplants with heparinised heart blood were obtained as early as 24 hr. after intraperitoneal, but only 7 days after subcutaneous, injection of ascites. Positive transplants after subcutaneous injection were seen after 24 hr. with liver, after 48 hr. with lung, brain, and spleen. No transplants could be obtained with serum. E. M. J.

Experimentally induced benignancy of neoplasm. V. Influence of hormones on the host's resistance to implanted neoplasm. W. T. Salter, I. T. Nathanson, and H. Wilson (*Cancer Res.*, 1941, **1**, 60—64).—Sarcoma 180 implanted in black *C*57 strain mice is inhibited by œstrone. Tumours implanted in Bagg albinos, strain *A*, are not inhibited. Anterior pituitary growth hormone, thyroxine, and testosterone do not inhibit the growth of implanted tumours. F. L. W.

Complement-fixing antibody in sera of rabbits bearing Brown-Pearce carcinoma. F. S. Cheever (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 517—522).—Antibody was found to be present in 14% of cases as against the 80% described by Kidd (A., 1938, III, 591). V. J. W.

Immunity induced against the Brown-Pearce carcinoma. F. S. Cheever and C. A. Janeway (*Cancer Res.*, 1941, **1**, 23—27).—Over 90% of intradermal Brown-Pearce carcinomas regressed spontaneously. Rabbits with intracutaneous tumours, or in which these tumours had regressed, were refractory to subsequent implantations of the tumour. F. L. W.

Glutamic acid from normal and cancerous tissue. J. M. Johnson (*J. Nat. Cancer Inst.*, 1940, **1**, 113).—Glutamic acid was isolated from (1) tumours and (2) livers of rats bearing J.R.S. and from (3) livers of normal rats and (4) livers of rabbits. The preps. contained (1) 2·6%, (2) 3·9%, (3) 2·4%, and (4) 4·5% of the *d*-form. The acid was isolated as the hydrochloride and the residue in the mother-liquors was pptd. as the Ba salt in 80% alcohol. When *l*-glutamic acid was boiled for 7 hr. with 3 vols. of conc. HCl 1·9% was converted into the *d*-form; after 35·5 hr. 4·6% was isolated as the *d*-isomeride. E. B.

Enzymological problems of cancer research. I. Protein metabolism. H. Dieckmann (*Z. Krebsforsch.*, 1940, **50**, 41—80).—A review. E. M. J.

Pre-excisional fixation of tissues in treatment of cancer in rats. F. E. Mohs and M. F. Guyer (*Cancer Res.*, 1941, **1**, 49—51).—$ZnCl_2$ incorporated in bases containing a combination of permeant and agglutinant materials is a satisfactory fixative for *in situ* fixation of tumours in rats. The fixative is applied to the tumour surface and left for 24 hr. $ZnCl_2$ causes slight shrinkage of cytoplasm and nucleus but the tissue loses none of its diagnostic val. and the progress of the removal of a neoplasm can be controlled microscopically to

assure complete extirpation with a min. of normal tissue destruction. F. L. W.

Quantitative study of growth of tumours under influence of hepatic and adreno-cortical extracts in mouse. N. Dobrovolskaïa-Zavadskaïa and P. Zéphiroff (*Compt. rend. Soc. Biol.*, 1940, **133**, 216—218).—6 female mice with mammary tumours were treated with an alcoholic liver extract, 5 were treated with an alcoholic adreno-cortical extract, and 5 with a combination of the two extracts. The effects on development of the tumours were inconst. P. C. W.

Actions of colchicine and of ethylcarbylamine on tissue cultures. R. Tennant and A. A. Liebow (*Yale J. Biol. Med.*, 1940, **13**, 39—49).—Colchicine (1 : 64,000,000) reduced growth of colonies of a mouse-breast carcinoma *in vitro*. The rate of mitosis was reduced. In mouse heart fibroblasts colchicine caused chromosomes to split longitudinally during prophase or metaphase and to disperse throughout the cytoplasm. The effect of ethylcarbylamine on mitosis is similar but occurs over a narrower and higher range of concns. (24 photomicrographs.) F. S.

Effect of colchicine and *X*-ray on a transplantable mammary carcinoma in mice. J. W. Hirschfeld, R. Tennant, and A. W. Oughterson (*Yale J. Biol. Med.*, 1940, **13**, 51—59).—Doses of 0·0009—0·0012 mg. per g. body-wt. produced a progressive increase in the no. of contracted metaphases starting 1 hr. after injection and reaching a max. at 9½ hr. Large doses (0·002 mg. per g.) produced extensive necrosis of the tumour but in all cases the mice eventually died. In doses of 0·001 mg. per g. plus 2500 r. of *X*-ray there was an insignificantly greater no. of cures than with *X*-ray alone. (8 photomicrographs.) F. S.

Effect of prolonged *X*-irradiation on Congo-red index of rabbits. C. Hoch-Ligeti (*Cancer Res.*, 1941, **1**, 28—33; cf. A., 1940, III, 854).—In the course of 1 year *X*-irradiation of rabbits induced changes in the rate of disappearance of Congo-red from the circulation. These changes are similar to those produced by injection of carcinogenic hydrocarbons but the fluctuations were not so large as those produced by the hydrocarbons. All rabbits treated with carcinogens showed a negative removal factor in the blood. The positive removal factor disappeared from the blood of 5 of the 6 *X*-irradiated rabbits but only one animal showed the negative removal factor, while one rabbit showed no change in the removal factor. F. L. W.

Post-mortems on 50 cancer patients subjected to local or generalised refrigeration compared with 37 nonrefrigerated patients. M. E. Sand and L. W. Smith (*J. Lab. clin. Med.*, 1940, **26**, 443—456).—Crit. analysis of the heart, lung, liver, spleen, and kidney findings revealed significant differences in the 2 groups. Acute pancreatic changes, either gross or microscopic, occurred in 10% of the persons given refrigeration. At least 240 hr. of generalised refrigeration is needed to induce significant regression of metastases; such regressions only occur irregularly. C. J. C. B.

General effect of operations on tumours and their carriers. E. Rehn (*Z. Krebsforsch.*, 1940, **50**, 15—19). E. M. J.

Approaches to cancer research. C. Voegtlin (*J. Nat. Cancer Inst.*, 1940, **1**, 11—15).—A lecture. E. B.

Urinary excretion of œstrogens and androgens by women with carcinoma of the breast. M. Ross and R. I. Dorfman (*Cancer Res.*, 1941, **1**, 52—54).—Urines of 4 women with breast cancer were assayed biologically for androgens and œstrogens. The quantities excreted did not vary appreciably from those reported for normal females. F. L. W.

Cancer in the mentally ill. S. Peller and C. S. Stephenson (*U.S. Publ. Health Repts.*, 1941, **56**, 132—149).—Analysis of 227 cancer cases which occurred among mental patients during a 10-year period. The distribution of primary tumours was the same as in the normal population except that the incidence of lip and skin cancer was less than expected. During 1938—1940 the no. of cancer deaths in the hospital exceeded the no. of tuberculosis deaths for the first time. E. B.

Stromal tumours of choroid plexus. A. F. Liber and J. R. Lisa (*Amer. J. clin. Path.*, 1940, **10**, 710—735).—A review. C. J. C. B.

Cytology of multiple myeloma. A. H. Du Bois (*Helv. med. Acta*, 1938, **5**, 558—561). M. K.

Mesodermal mixed tumours of body of the uterus. A. A. Liebow and R. Tennant (*Amer. J. Path.*, 1941, **17**, 1—30).—A complete review with 3 new cases. (20 photomicrographs.) C. J. C. B.

Primary malignant tumours of spleen with report of a case of lymphosarcoma. C. W. Bonney (*J. Lab. clin. Med.*, 1941, **26**, 630—636).—(5 photomicrographs.) C. J. C. B.

Properties of cancer cells. E. V. Cowdry (*Arch. Path.*, 1940, **30**, 1245—1274).—A general review. C. J. C. B.

Primary splenic neoplasms. S. A. Goldberg (*Amer. J. clin. Path.*, 1940, **10**, 700—709).—Three primary neoplams of the spleen are reported, viz., 2 lymphangiomata and 1 hemangioma cavernosum. (6 photomicrographs.) C. J. C. B.

XVIII.—NUTRITION AND VITAMINS.

Nutritional diseases in U.S.A. W. H. Sebrell (*J. Amer. Med. Assoc.*, 1940, **115**, 851—854).—A review. C. A. K.

Nutrition and [dental] disease. J. C. Spence (*Brit. Dent. J.*, 1939, **67**, 329—335).—A discussion and review on the effect of diet in the cause and cure of dental disease. H. H. K.

Diet in relation to dental caries. E. V. McCollum (*Nature*, 1941, **147**, 104—108).—An address. L. S. T.

Effect of a submaintenance diet on composition of the pig. R. W. Pomeroy (*J. Agric. Sci.*, 1941, **31**, 50—73).—In pigs receiving a submaintenance diet early-maturing organs (eyes, brains, etc.) continued to grow whereas heart, liver, and lungs exhibited varying degrees of atrophy. Under these conditions carcase tissues were affected in the reverse order to that of their development, *i.e.*, fat, muscle, bone, to diminishing extents. Bone continued to grow in the earlier stages of submaintenance. Joints also were affected in inverse ratio to their order of development. In fat depots the order of diminished production was kidney (earliest), subcutaneous fat, intermuscular, caul, and mesenteric fat. In the subcutaneous fat the later-maturing inner layer was affected before the early-maturing outer layer. A. G. P.

Effect of dietary fibre on alimentary secretion. Fæcal phosphatase excretion and calcium and nitrogen balances. J. Duckworth and W. J. Godden (*Biochem. J.*, 1941, **35**, 16—23).—When the fibre content of the diet of rats is increased by up to 30%, N retention is decreased and fæcal phosphatase excretion is greatly increased, but Ca retention is not appreciably affected. Increased intake of fibre probably increases intestinal secretion but the re-absorption of secreted Ca seems to be very efficient. W. McC.

Choline, creatine, and "labile methyl" supply. W. H. Griffith and D. J. Mulford (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 657—658).—Creatine, 0·2—1% of diet, decreases incidence of but does not prevent the renal and hepatic lesions occurring in young rats on a low-choline diet (cf. A., 1940, III, 149, 327). V. J. W.

Carbohydrate component of rice factor. E. L. R. Stokstad, H. J. Almquist, E. Mecchi, P. D. V. Manning, and R. E. Rogers (*J. Biol. Chem.*, 1941, **137**, 373—375; cf. A., 1940, III, 752).—Gum arabic, Na alginate, glycuronic and gluconic acids, galactonolactone, arabinose, and xylose, but not gum tragacanth and pectin, can serve as the carbohydrate component of the "rice factor" for chicks. J. N. A.

Reactions of grasshoppers to castor bean plants. L. A. Spain (*Iowa State Coll. J. Sci.*, 1940, **14**, 353—357).—Grasshoppers offered cereal plants or castor bean plants invariably consumed the former. Immature forms with access only to castor bean plants starved or fed so poorly as to die before reaching maturity; adults became sluggish and inactive, starving to death, though not as rapidly as when all food was withheld. J. L. D.

Control of coast disease on Thistle Island. R. C. Scott (*J. Dept. Agric. S. Australia*, 1938, **42**, 272—277).—Doses of 45 mg. each of $CoSO_4$ and $CuSO_4$ given in a 1-oz. drench to sheep every 2 months gave complete control. A. W. M.

Coast disease [of sheep] in Western Australia. H. W. Bennetts (*J. Dept. Agric. W. Australia*, 1940, **17**, 41—48).—A Cu- and Co-deficiency disease identical with that investigated in South Australia (A., 1938, III, 594) is reported. Control is

effected by addition of $CuSO_4$ and $CoCl_2$ to licks, drenches, and drinking H_2O. A. W. M.

Partial vitamin deficiencies. L. J. Harris (*Lancet*, 1940, **239**, 539—540).—A review. C. A. K.

Influence of nutritional intake on concentration of vitamin-*A* in body tissues. H. Kao and H. C. Sherman (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 589—591).—A 4-fold increase in vitamin-*A* intake in rats causes a slight increase in the -*A* content of the muscles. V. J. W.

Sjögren's syndrome and its significance [in relation to vitamin-*A* deficiency]. W. Stahel (*Helv. med. Acta*, 1938, **5**, 579—583).—A case is reported in which two phases of development were distinguished: the first beginning with polyarthritis at the age of 30 and continuing over a prolonged period, the second appearing 20 years later and characterised by changes in carbohydrate metabolism, kerato-conjunctivitis sicca, xerostomia, rhino-laryngo-tracheitis sicca, xerosis of skin, and achylia. These symptoms are attributed to vitamin-*A* deficiency, and confirmed by the beneficial results of the treatment with -*A* (16·000 units daily). M. K.

Effect of vitamin-*A* and -*C* on experimental hyperthyroidism. I. J. Belasco and J. R. Murlin (*J. Nutrition*, 1940, **20**, 577—588).—Ascorbic acid and vitamin-*A* somewhat reduced the hypermetabolism associated with hyperthyroidism in rats. Except in one instance neither vitamin affected normal basal heat production; both increased the respiration rates of liver and cortical tissue of kidney. Ascorbic acid increased and -*A* decreased thyroid tissue respiration. Neither -*A* nor -*C* influenced the increased liver and kidney tissue metabolism associated with hyperthyroidism or the depressed thyroid respiration following thyroxine administration. A. G. P.

Determination of carotene. R. O. Davies *et al.* (*Rep. Grass Driers' Assoc.*, 1941, 20 pp. + 1 table).—The results of investigations by 29 collaborators on the colorimetric determination of carotene are described. Chromatographic and spectrometric methods, using various types of tintometer, colorimeter, photo-absorptiometer, and spectrophotometer, were employed. The Lovibond calibration curve for β-carotene in light petroleum is identical with that for $K_2Cr_2O_7$ in distilled water; 0·025% aq. $K_2Cr_2O_7$ is equiv. to 0·158 mg. of β-carotene in 100 ml. of light petroleum. Tentative methods for determining carotene in dried grass and other leafy materials are described and comparative data tabulated. F. O. H.

Clinical studies of experimental human vitamin-*B* complex deficiency. K. O. Elsom, F. H. Lewy, and G. W. Heublein (*Amer. J. med. Sci.*, 1940, **200**, 757—764).—Vitamin-*B* deficiency was studied in a healthy individual who consumed an adequate diet except for the -*B* complex. Increase in pulse rate appeared during deficiency but no changes were observed in the resting blood pressure, orthodiagram, or e.c.g. Gastro-intestinal symptoms developed with *X*-ray evidence of delayed motility in the small intestine. Except for anorexia, which was promptly though temporarily relieved by thiamin, gastro-intestinal symptoms were not relieved and there was no improvement in the *X*-ray evidence of delayed motility until after yeast was added to the diet. Neurological symptoms and physical signs were mild, accompanied by decrease in electrical irritability, and disappeared following administration of thiamin. Mental symptoms were prominent, responding somewhat to thiamin, but not relieved entirely until yeast was added to the diet. A mild macrocytic anæmia developed during deficiency, which was uninfluenced by thiamin or riboflavin but was relieved by a full diet of brewer's yeast for 4 weeks. Œdema of the upper and lower extremities appeared early and was uninfluenced by the administration of thiamin or riboflavin. Gradual loss of body-wt. occurred in spite of the presence of œdema. Œdema disappeared and body-wt. returned to normal only after administration of yeast. C. J. C. B.

Reproduction in rats on synthetic *B*-complex supplement. T. H. Jukes (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 625—627).—When parents and offspring were maintained on a diet devoid of natural vitamin-*B*, but supplemented by synthetic products, a small no. survived and reached normal maturity. V. J. W.

Influence of exercise on the growing rat in presence and absence of vitamin-B_1. N. B. Guerrant and R. A. Dutcher (*J. Nutrition*, 1940, **20**, 589—598).—The vitamin-B_1 requirement of rats is increased by exercise. The voluntary activity of animals receiving a -B_1-deficient diet was greater during the first 4 weeks of test and subsequently smaller than that of animals receiving 6 μg. of -B_1 daily. Administration of -B_1 to deficient animals resulted in increased activity. A. G. P.

Thiamin requirement of young swine. C. van Etten, N. R. Ellis, and L. L. Madsen (*J. Nutrition*, 1940, **20**, 607—625).—Animals receiving a diet treated with Na_2SO_3–SO_2 to destroy thiamin developed sp. symptoms of thiamin deficiency. The supplemental requirement of thiamin chloride hydrochloride for alleviating deficiency symptoms and promoting normal growth was 106—120 μg. per 100 g. of carbohydrate and protein consumed. Confirmatory data were obtained with rats. A. G. P.

Vitamin-B_1 in nutritional œdema of sucklings. A. Kollmann (*Arch. Kinderheilk.*, 1939, **117**, 64—68).—Vitamin-B_1 had a dehydrating effect. M. K.

Effect of adrenalectomy on the phosphorylation of vitamin-B_1 and -B_2. J. W. Ferrebee (*J. Biol. Chem.*, 1940, **136**, 719—728).—Phosphorylation of vitamin-B_1 and of riboflavin is normal in adrenalectomised rats (cf. Verzár, A., 1937, III, 436). R. L. E.

Rice problems: white silver-fleece rice and the "parboiling" of rice. A. G. van Veen (*Geneesk. Tijds. Ned.-Indië*, 1940, **80**, 1696—1704).—Increased consumption of polished rice in the East Indies is a serious factor in protein and vitamin-B_1 deficiencies especially in areas other than Java, where "red" rice is eaten. The importance of white silver-fleece varieties and of "parboiled" rice, which retains its -B_1 content and good keeping qualities, in overcoming this trend, is stressed. S. C.

Pulse, arterial pressure, and electrocardiogram in avitaminosis-B_1. L. de Soldati (*Compt. rend. Soc. Biol.*, 1940, **133**, 323—324).—Dogs with vitamin-B_1 deficiency show tachycardia, hypotension, increased *P* wave, inverted or biphasic *T* wave, increase in *Q–T* interval, and levelling of the *S–T* segment. The changes disappear when -B_1 is administered. P. C. W.

Nutritive value of white flour with vitamin-B_1. H. Chick (*Lancet*, 1940, **239**, 511—512).—Feeding experiments on rats showed that growth was more rapid on wholemeal flour than on straight-run white flour even when the defects of the latter in protein, minerals, and vitamin-B_1 have been corr. The inferiority is attributed to lack of -B_2 vitamins in white flour. C. A. K.

Choline-esterase and B_1-avitaminosis. E. A. Zeller and H. Birkhäuser (*Helv. Chim. Acta*, 1940, **23**, 1457—1460).—In B_1-avitaminosis of rats the choline-esterase content of the liver is very greatly diminished whereas no change occurs in the brain. Acute hunger has only a slight influence on the content of both organs. H. W.

Vitamin-B_1 content of blood in health and disease. S. J. E. Pannekoek-Westenburg and A. G. van Veen (*Geneesk. Tijds. Ned.-Indië*, 1940, **80**, 1774—1784).—The aneurin contents of 390 blood samples from healthy Javanese and from patients suffering from nutritional œdema, beri-beri, polyneuritis, and tabes dorsalis were practically normal in all groups. Blood-vitamin-B_1 is no criterion of -B_1 deficiency. Cell vol. must also be taken into account. S. C.

Urinary pyruvate in thiamin deficiency. H. A. Harper and H. J. Deuel, jun. (*J. Biol. Chem.*, 1941, **137**, 233—238).—During depletion of thiamin reserves in rats, urinary excretion of pyruvate increases, being greater in males than in females. This is reduced by optimal thiamin administration but not by supplements adequate only for min. growth. H. G. R.

Determination of thiamin and certain of its metabolic products in urine. A. S. Schultz, L. Atkin, and C. N. Frey (*J. Biol. Chem.*, 1940, **136**, 713—717).—The fermentation method (cf. A., 1939, III, 287) determines vitamin-B_1 and some of its degradation products. Alkaline $K_3Fe(CN)_6$ oxidises only the -B_1, which may be determined by the decrease in the fermentation test. R. L. E.

Biochemical reaction of aneurin. E. Haag and C. Dalphin (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 76—77).—When a culture medium (details given) is inoculated with a yeast

deprived of vitamin-B_1 and kept at 25° for 23 hr., pyruvic acid is formed. Aneurin hydrochloride (0·01 μg.) inhibits the reaction. J. L. D.

Mechanism of *Phycomyces* test for aneurin. E. Haag (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 136—139; cf. Schopfer and Jung, A., 1937, III, 325).—A glucose medium containing aneurin hydrochloride (5×10^{-9}M.) inoculated with spores of *P. blakesleeanus* and left at room temp. in the dark produces pyruvic acid but not in the absence of aneurin or when its concn. is 5×15^{-7}M. Similar results are obtained if cocarboxylase or the pyrimidine + thiazole moieties of aneurin are substituted for aneurin, indicating that aneurin may be a precursor of cocarboxylase. J. L. D.

Riboflavin content of blood and urine. F. M. Strong, R. E. Feeney, B. Moore, and H. T. Parsons (*J. Biol. Chem.*, 1941, **137**, 363—372).—The bacterial assay method of Snell and Strong (A., 1939, III, 766) can be used for determining riboflavin in blood and urine. The blood of man, rat, or calf contains approx. 0·5 μg. of riboflavin per g.; that of dog or pig contains about twice as much. On an unrestricted diet, the daily urinary excretion of riboflavin by normal human adults is 500—800 μg. This val. rapidly decreases to 50—150 μg. on a dietary intake of 1—2 mg. of riboflavin per day, but when 2—5 mg. per day extra is given, most of it is quickly excreted. J. N. A.

Vitamins in the rumen contents of sheep and cows fed vitamin-low diets. I. Riboflavin and vitamin-*K*. II. Vitamin-B_6 (pyridoxine). L. W. McElroy and H. Goss (*J. Nutrition*, 1940, **20**, 527—540, 541—550).—I. The rumen contents of sheep receiving less than 0·3 μg. of riboflavin per g. of ration contained 33 μg. of riboflavin per g. On the same deficient diet the rumen of cows contained 25 μg. of riboflavin per g.; the skimmed milk contained 20 μg. of riboflavin per g. of dry matter. The daily secretion (milk) of riboflavin was 16—18 mg. and the intake 1·8 mg. daily. Riboflavin is probably produced in the cow's digestive tract. Vitamin-*K* is not a dietary essential for cows. The rumen contents are a good source of -*K* even when the diet is practically free from the vitamin.

II. The dried contents of sheep rumen and reticulum contained 10 and that of a fistulated cow 8 μg. of -B_6 per g., the ration in both cases containing 1—1·5 μg. per g. The -B_6 content of milk from the cow was normal. A. G. P.

Vitamin deficiencies in chronic diarrhœa. W. B. Bean and T. D. Spies (*J. Amer. Med. Assoc.*, 1940, **115**, 1078—1081).—100 cases of chronic diarrhœa with signs of pellagra, beriberi, and riboflavin deficiency are reported (about 10% of patients with deficiency diseases). Parenteral injections of nicotinamide (500—1000 mg. daily), thiamin hydrochloride (10—50 daily), and riboflavin (2—10 mg. daily) were effective in relieving sp. deficiencies in most cases. C. A. K.

Occidental beriberi. S. Weiss (*J. Amer. Med. Assoc.*, 1940, **115**, 832—839).—A review of the cardiac changes and their relation to thiamin deficiency. C. A. K.

Fatal pellagra in English schoolgirl. R. E. H. Simpson (*Lancet*, 1940, **239**, 589—590).—Case report. C. A. K.

Metabolism of nicotinic acid in the sheep. P. B. Pearson, A. H. Winegar, and H. Schmidt (*J. Nutrition*, 1940, **20**, 551—563).—Lambs receiving a ration deficient in nicotinic acid excreted normal amounts of urinary nicotinic acid over a period of several months. Alkaline hydrolysis of urine of these animals resulted in an increase in nicotinic acid content. Following ingestion of a single large dose of nicotinic acid 42—92% was recovered in the urine; liver-nicotinic acid was increased to extents which were related to the amounts excreted. Following a massive dose of the acid, blood-nicotinic acid was markedly increased, the rates of increase and of subsequent decline being related to the rate of urinary excretion of the acid. A. G. P.

Nicotinic acid derivatives in human urine and their determination. W. A. Perlzweig, E. D. Levy, and H. P. Sarett (*J. Biol. Chem.*, 1940, **136**, 729—745).—Methods are described for determining nicotinic acid, its derivatives, and trigonelline in urine. Excretion of nicotinic acid increases after its ingestion, and that of trigonelline after taking coffee. R. L. E.

Nicotinic acid determinations in blood of patients with nutritional œdemata in Mid-Java. A. G. van Veen and R. S. Dhanoedibroto (*Geneesk. Tijds. Ned.-Indië*, 1940, **80**, 1622—1637).—The low nicotinic acid level in the blood of many nutritional œdema cases is probably due to a deficient diet consisting principally of maize. It is associated not with pellagra-like symptoms but with low cell vol. (hæmatocrit val.). S. C.

Human vitamin-B_6 deficiency. T. D. Spies, R. K. Ladisch, and W. B. Bean (*J. Amer. Med. Assoc.*, 1940, **115**, 839—840).—The urinary excretion of pyridoxine (vitamin-B_6) was studied in patients with signs of -B_6 deficiency (extreme nervousness, insomnia, irritability, abdominal pain, weakness, and difficulty in walking) and in controls after intravenous injection of 50 mg. of pyridoxine. In the 1st hr. the controls excreted about 8%, whereas the patients excreted 0·0 to 0·5%, of the injected dose. C. A. K.

Development and cure of "ring-tailed" condition in rats on vitamin-B_6-deficient diets. L. W. McElroy and H. Goss (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 717—719).—Local constrictions of the tail appear in about 10% of rats kept on a -B_6-deficient diet. Addition of 3 μg. daily of synthetic -B_6 to the diet exacerbated the symptoms for 3—7 days, and caused them to appear in another 15% of rats. V. J. W.

Anti-grey hair vitamin deficiency in the silver fox. A. F. Morgan and H. M. Simms (*J. Nutrition*, 1940, **20**, 627—635).—Of three foxes receiving a purified diet supplemented with fish-liver oil, wheat germ, riboflavin, and nicotinic acid but not with the filtrate factor, one died after 26 days and the two survivors lost much fur, new growth being light grey. The organs of deficient foxes were normal except that large red-mottled thymuses were present. Foxes receiving the same diet supplemented with the filtrate factor retained their fur of normal colour and had no surviving thymuses. A. G. P.

Multiple deficiencies in the modified Goldberger diet as demonstrated with chicks. H. A. Waisman and C. A. Elvehjem (*J. Nutrition*, 1940, **20**, 519—526).—When used as a supplement to the modified Goldberger diet riboflavin produced a definite growth response in chicks. The effect of nicotinic acid (20 mg. per 100 g. of ration) was variable and thiamin had no action. Vitamin-B_6 did not affect growth but in conjunction with liver caused an appreciable increase in growth. The Goldberger diet is deficient in pantothenic acid and factor *U*. Factors other than the -*B* complex must be added to the diet to produce optimum growth. The unsupplemented Goldberger diet has no appreciable effect on the blood picture except a lowering of the hæmoglobin content. Various animal tissues improved growth when added to the diet. A. G. P.

Dermatitis in chicks distinct from pantothenic acid deficiency. D. M. Hegsted, J. J. Oleson, R. C. Mills, C. A. Elvehjem, and E. B. Hart (*J. Nutrition*, 1940, **20**, 599—606).—Chicks receiving a purified ration containing adequate pantothenic acid developed a typical dermatitis; this was cured in 3 weeks by injection of vitamin-*H*. A. G. P.

Pantothenic acid requirement of the rat. K. Unna (*J. Nutrition*, 1940, **20**, 565—576).—On a diet free from pantothenic acid rats did not grow after 3—4 weeks, the deficiency syndrome being characterised by coarse scanty fur, inflammation of the nose, and blood-caked whiskers. Autopsy revealed hæmorrhages under the skin and in the adrenal cortex. Marked growth response followed a single feeding of 800 or daily administration of 50 μg. of pantothenic acid but prolonged treatment was necessary to eliminate deficiency symptoms. The maintenance dose of the acid for optimal growth was 80 μg. daily. The growth-promoting action of pure pantothenic acid was less than that of a liver extract containing a similar amount of the acid. A. G. P.

Pantothenic and hydroxypantothenic acids in animal nutrition. E. Zschiesche and H. K. Mitchell (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 565—567).—Rats maintained on a diet containing vitamin-B_1 and -B_6, riboflavin, choline, and nicotinic acid show increased growth when given Na pantothenate or hydroxypantothenic acid. The former is the more effective. V. J. W.

Chronic otitis media and vitamin-*C* metabolism in childhood. K. Bernfeld, M. Feilschenfeld, and W. Hirsch (*Jahrb. Kinderheilk.*, 1939, **153**, 222—232).—A marked vitamin-*C* deficiency (1—5 mg.-%) was found in urine in over 50% of

cases of chronic otitis media. The tests were made by the saturation method. A series of children with acute otitis showed normal -*C* metabolism. M. K.

Influence of purines, creatinine, and creatine on the oxidation of vitamin-*C*. K. V. Giri and P. V. Krishnamurthy (*Nature*, 1941, **147**, 59; cf. A., 1940, III, 752).—Oxidation of vitamin-*C* by $Cu^{\cdot\cdot}$ is inhibited completely by xanthine, uric acid, and theophylline in a final concn. of 0·00014—0·00017M. Caffeine and theobromine have no effect. Only those purines in which :NH is free inhibit the oxidation. Methyl in position 7 prevents the inhibiting action. Creatinine, but not creatine, exerts powerful protection against oxidation of the vitamin. L. S. T.

Effect of salicylates and carvone on the ascorbic acid content of animal tissues. N. D. Ritz, L. T. Samuels, and G. Addiss (*J. Pharm. Exp. Ther.*, 1940, **70**, 362—369; cf. A., 1940, III, 528).—Na salicylate increased the urinary output of ascorbic acid in rats, but decreased the amount in the liver and brain. The decrease in brain concn. occurred even after nephrectomy, when the concn. in the plasma was increased. Carvone increased both the urinary output and the liver content of ascorbic acid. Salicylate increases output by increasing loss from the tissues; carvone by increasing production. E. M. S.

Deficiency of vitamin-*C* and vitamin-*P* in man. H. Scarborough (*Lancet*, 1940, **239**, 644—647).—From studies of 6 patients with vitamin deficiencies it is shown that ascorbic acid deficiency is associated with hæmorrhages involving large areas of subcutaneous tissues and muscle, and also the gums. There is not necessarily a decreased capillary resistance. In vitamin-*P* deficiency there are lassitude, easily induced fatigue, pains in shoulders and legs, and petechial hæmorrhages with decreased capillary resistance. In both cases the bleeding is produced by pressure. C. A. K.

Chemical methods for determination of clinical vitamin-*C* deficiency. G. J. Kastlin, C. G. King, C. H. Schlesinger, and J. W. Mitchell (*Amer. J. clin. Path.*, 1940, **10**, 882—893).—A clinical method for determining vitamin-*C* is described based on determining the fasting plasma level and urinary excretion, followed by intravenous injection of 500 mg. of ascorbic acid and subsequent determination of the plasma val. at 5 min., and blood plasma val. and urinary excretion after 1, 2, 3, and 4 hr. C. J. C. B.

Effect of rickets and ergosterol on brain- and liver-calcium of young rats. G. C. Linder (*Biochem. J.*, 1940, **34**, 1574—1579).—The normal concns. of Ca in rat brain and liver tissues are 4·7 and 3·3 mg. per 100 g., respectively. Rickets produced by high-Ca–low-P diet reduces the Ca level only of the former. Large and toxic doses of *X*-irradiated ergosterol give rise to increased brain- and liver-Ca, the latter as a result of decreased food intake. P. G. M.

Vitamin-D_3 requirement of pullet chicks: relative values of genuine and a sample of controlled cod-liver oil in feeding poultry up to the age of six weeks. M. D. Wright (*J. Agric. Sci.*, 1941, **31**, 161—170).—For the first 5 weeks of growth a ration containing 0·66% of genuine cod-liver oil promoted calcification in chicks as satisfactorily as did one containing 1% of controlled oil, although growth rates were similar with both diets. From 6—16 weeks 0·66% of controlled oil was inadequate. In 5-week chicks the vitamin-D_3 requirement for normal calcification is approx. 100 B.S.I. units per 100 g. of total diet. A. G. P.

Use of osteotropic dyes in modified line test for vitamin-*D*. G. J. Martin (*J. Lab. clin. Med.*, 1941, **26**, 714—719).—Alizarin is used. C. J. C. B.

Minimal daily requirement of rabbits for α-tocopherol. S. H. Eppstein and S. Morgulis (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 715—716).—Muscle dystrophy can be cured or prevented by 0·2—0·4 mg. of vitamin-*E* per kg. daily. V. J. W.

Biological activity of oxidation products of α-tocopherol. R. R. Ridgway, J. C. Drummond, and M. D. Wright (*Biochem. J.*, 1940, **34**, 1569—1573).—Spectroscopically identical products are formed by oxidation of α-tocopherol with $AgNO_3$ or $FeCl_3$, and show no activity in 5-mg. doses. The *o*-quinone produced by the action of HNO_3 shows an absorption band at 405 mμ. but has less activity than α-tocopherol. P. G. M.

Œstrogenic inactivity of *dl*-α-tocopherol acetate. A. L. Bacharach and M. R. A. Chance (*J. Endocrinol., Lond.*, 1940, **2**, 162—164).—Synthetic *dl*-α-tocopherol acetate (10 mg.) was administered subcutaneously or orally to immature female mice. No vaginal cornification was observed in any animal receiving the vitamin. P. C. W.

Liver and vitamin-*K*. J. L. Bollman, H. R. Butt, and A. M. Snell (*J. Amer. Med. Assoc.*, 1940, **115**, 1087—1091).—Liver damage was produced in rats by inhalation of CCl_4 vapour. The lowered blood-prothrombin levels which were produced were not affected by vitamin-*K* given by mouth or parenterally. There were no signs of choline deficiency in the diet or in the injured liver and the blood-heparin was not increased. 2 clinical cases of hepatic cirrhosis showed similar responses. C. A. K.

Clinical value of vitamin-*K*. G. Cheney (*J. Amer. Med. Assoc.*, 1940, **115**, 1082—1087).—A review with case records and discussion. C. A. K.

Clinical use of vitamin-*K*. J. F. Weir, H. R. Butt, and A. M. Snell (*Amer. J. digest. Dis.*, 1940, **7**, 485—489).—A review of recent advances in therapy with vitamin-*K* and its homologues, giving the authors' results with 85 cases. In the presence of severe liver damage response to -*K* may be lacking. N. F. M.

Polyhydroxyanthraquinones affecting coagulation time in vitamin-*K* deficiency. G. J. Martin and C. F. Lischer (*J. Biol. Chem.*, 1941, **137**, 169—171).—Tests on vitamin-*K*-deficient chicks show that 2-methyl-1 : 4-naphthaquinone has an activity of 1,000,000 units per g., purpurin 10,000 units, and rufigallol, anthragallol, and duroquinone 100 units each. E. M. W.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Eating habit and fasting metabolism of rats. M. Kleiber and A. H. Smith (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 630—632).—Metabolic rate is the same whether rats receive their food once daily or in 5 portions. V. J. W.

Effects of iodine therapy on blood-iodine and basal metabolic rate in pregnancy. N. M. Phatak, F. B. Zener, and N. A. David (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 667—668).—In pregnancy, basal metabolic rate and blood-I both increase, but administration of 0·3 g. daily of "lipoiodine-Ciba" maintained the basal metabolic rate near the normal level. V. J. W.

A casein hydrolysate for the study of the relationship between choline and homocysteine. A. D. Welch (*J. Biol. Chem.*, 1941, **137**, 173—181).—Using a casein hydrolysate deficient in methionine (prep. described) as the basis of a diet fed to rats, it is confirmed that choline or betaine must be present for homocysteine to promote growth. *S*-Methylcysteine and other compounds are ineffective. E. M. W.

Oxidation of native protein by glutathione–copper catalysis. R. N. Feinstein and F. J. Stare (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 529—531).—Egg white and gelatin in presence of 0·001M-$CuSO_4$ and 0·005M-glutathione consume equal O_2. If $CuSO_4$ is replaced by $FeCl_3$,O_2 uptake is diminished by half; if it is replaced by 0·1M-$CuSO_4$, gelatin consumes less O_2 and egg white more. V. J. W.

Increased excretion of urinary ammonia in the dog following intravenous injection of both natural and unnatural forms of certain amino-acids. S. Bliss (*J. Biol. Chem.*, 1941, **137**, 217—225).—An increased urinary excretion of NH_3 follows intravenous injection of either optical enantiomorph of alanine or leucine, the val. being greater for the *d*-forms. H. G. R.

Production of taurocholic acid in the dog. V. Methionine sulphoxide. R. W. Virtue and M. E. Doster-Virtue (*J. Biol. Chem.*, 1941, **137**, 227—231).—An increased output of taurocholic acid is observed in bile-fistula dogs, depleted of taurine by fasting and by daily feeding of cholic acid, on administration of methionine sulphoxide with cholic acid. A large proportion of the S from the sulphoxide appears in the org. fraction of the urine, the more highly oxidised S being more difficult to oxidise to SO_4'' (cf. A., 1939, III, 406). H. G. R.

Intermediary metabolism in diabetes mellitus. I. Synthesis of carbohydrate from fat in liver and from acetoacetate in kidney. II. Non-formation of acetic acid and ratio of

ketone body increase to fatty acid decrease in livers of diabetic animals. W. C. Stadie, J. A. Zapp, jun., and F. D. W. Lukens (*J. Biol. Chem.*, 1941, **137**, 63—74, 75—87).—I. Kidney slices *in vitro* do not convert acetoacetic acid into carbohydrate. Cat liver slices form carbohydrate from added *d*-lactate *in vitro* but, when corrections are made for carbohydrate produced from glycerol, glycogenic amino-acids, etc., it appears that fatty acids are not converted into carbohydrate by the diabetic liver.

II. No volatile fatty acids are produced by liver slices from depancreatised cats, although approx. 4 mols. of ketonic compound are produced by partial oxidation of 1 mol. of fatty acid. The significance of the ratio of ketone formation to fatty acid decrease is discussed, as it affects the hypothesis of multiple alternate oxidation in preference to that of β-oxidation. P. G. M.

Hepatic glycogen formation by the isomerides of alanine. E. M. MacKay, A. N. Wick, and C. P. Barnum (*J. Biol. Chem.*, 1941, **137**, 183—187).—When fed to mice in equimol. doses, *dl*-alanine produces as much hepatic glycogen as *l*(+)-alanine, whereas *d*(−)-alanine is much inferior. The improved utilisation of the latter when fed as racemic mixture is probably due to slower absorption and conversion. H. G. R.

Total carbohydrate and glycogen content of developing bee. R. M. Melampy and R. D. Olsan (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 754—758).—Total carbohydrate and glycogen both increase during the larval stage but almost disappear by the end of the pupal stage. The tissues also contain a reducing sugar, and a reserve carbohydrate convertible into reducing sugar by acid hydrolysis. V. J. W.

Glucose phosphorylation and oxidation in cell-free tissue extracts. S. P. Colowick, H. M. Kalckar, and C. F. Cori (*J. Biol. Chem.*, 1941, **137**, 343—356).—Heart muscle and kidney extracts oxidise glucose to CO_2 and water. For each mol. of glucose which is completely oxidised, six extra mols. of glucose disappear, five of which are converted into fructose diphosphate when heart muscle extracts are used. Thus at least ten of the H transfers involved in the complete oxidation of glucose are linked with phosphorylation. With kidney extracts where aërobic glycolysis occurs, most of the hexose diphosphate formed from glucose is converted into lactic acid. Oxidation of glucose by these extracts is preceded by phosphorylation and follows the course triose phosphate → phosphoglycerate → pyruvate → CO_2 and water. The oxidation of glucose and pyruvate requires catalysis by the succinic–fumaric acid system. Liver extracts also phosphorylate and oxidise glucose. In presence of NaF and glucose, hexose diphosphate accumulates when glutamic acid is used as the oxidisable substrate. Brain extracts also cause phosphorylation of glucose to fructose diphosphate linked with oxidation of pyruvate or succinate. Oxidation of succinate leads to phosphorylation of mannose and adenosine in kidney extracts; the former is converted into fructose diphosphate and the latter into a mixture of adenylic acid and adenosine polyphosphate. The anaërobic transfer of the labile PO_4''' groups of adenosine triphosphate to glucose in presence of iodoacetate occurs in heart extracts. The bearing of the results on the utilisation of oxidative energy in the cell is discussed. J. N. A.

Influence of glycerol on glycæmia in normal and diabetic individuals. M. Wishnofsky, A. P. Kane, W. C. Spitz, S. Michalover, and C. S. Byron (*J. Lab. clin. Med.*, 1940, **26**, 526—530).—The ingestion of glycerol increases blood-sugar concn. in most normal and diabetic individuals. Diabetics utilise glycerol better than glucose. C. J. C. B.

Changes in blood-keto-acids during artificial fever. M. Somogyi and M. B. Kirstein (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 640—644).—Increase in blood-ketones, usually found in artificial fever, can be prevented by continuous intravenous infusion of glucose. V. J. W.

Changes in ketonæmia and ketonuria during hypoglycæmia. M. Somogyi (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 644—647).—Hypoglycæmia, induced or spontaneous, is often accompanied by ketosis, which is coincident with increased hepatic glycogenolysis. V. J. W.

Effect of alkalosis on the relationship between serum-calcium and -protein *in vivo*. H. Yannet (*J. Biol. Chem.*, 1941, **137**, 409—415).—Alkalosis in cats causes hypocalcæmia and hyperphosphatæmia. This is attributed to reduction in [$Ca^{\cdot\cdot}$] by formation of Ca proteinate. R. L. E.

Water and electrolyte balance in surgery. F. B. Gurd and H. R. Robertson (*Canad. Med. Assoc. J.*, 1940, **43**, 405—411).—A lecture. C. J. C. B.

Retention of orally administered radio-phosphorus by mice. L. A. Erf, L. W. Tuttle, and K. G. Scott (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 652—657).—Orally administered glucose increased and $FeSO_4$ decreased the absorption of ^{32}P from the gut. V. J. W.

Increase of heavy potassium in plasma. A. Lasnitzki and A. K. Brewer (*Nature*, 1940, **146**, 807—808; cf. A., 1938, III, 1022).—The $^{41}_{19}K$ content in the plasma-K of normal rats is higher by approx. 2·5% than in K in ordinary KCl. This increase is of the same order as that found in K from bone-marrow. Assimilation of K by the cell appears to be connected with an isotope effect. L. S. T.

Excretion of copper in the rabbit. A. Eden (*J. Agric. Sci.*, 1941, **31**, 145—160).—On a bran–oats diet the rabbit is in Cu equilibrium, 90—96% of the ingested Cu being excreted in fæces. An increase in Cu content of the diet results in an almost quant. increase in fæcal output over a period of 4—5 weeks, urinary Cu increasing by only 0·2%. $CuSO_4$ given by stomach tube is almost entirely excreted in fæces, a small increase in urinary Cu (1% of that ingested) being followed by a return to normal within 48 hr. Of 3 mg. of Cu injected intravenously 17% appeared in urine within 48 hr. and 82% in fæces during 4 weeks. The apparently delayed excretion of ingested Cu is due to "normal physiological fæcal refection," 50—90% of fæces being swallowed as soon as excreted. When this refection is prevented 96% of ingested Cu is excreted in 5 days. Cu is rendered insol., probably as CuS, by bacterial decomp. products in the intestinal tract. Injection of Cu into the blood stream is fatal. A. G. P.

Metabolism of polycyclic compounds. IV. Production of dihydroxy-1 : 2 : 5 : 6-dibenzanthracene from 1 : 2 : 5 : 6-dibenzanthracene. E. Boyland, A. A. Levi, E. H. Mawson, and E. Roe (*Biochem. J.*, 1941, **35**, 184—191).—Rabbits fed for some months on a diet containing 0·16% of 1 : 2 : 5 : 6-dibenzanthracene generally die with cirrhosis of the liver. There is an increase in the ethereal sulphate fraction of the urine, which is fluorescent. Similar results are obtained with 3 : 4 : 5 : 6-dibenzcarbazole. Two procedures are given for the isolation of *dihydroxy*-1 : 2 : 5 : 6-*dibenzanthracene*, m.p. 340—350° (decomp.) (*diacetyl* derivative, m.p. 291°; *dimethyl ether*, m.p. 244—245°). Oxidation of the dimethyl ether with CrO_3 yields the corresponding *anthraquinone*, m.p. 264°. The free *dihydroxy*-derivative, m.p. 350°, obtained from the *diacetoxyanthraquinone*, m.p. 294—296°, on oxidation with acid $KMnO_4$ yields no tetracarboxylic acid, thus showing the absence of OH groups from the side rings. P. G. M.

Conversion of dibenzyl disulphide into hippuric acid in rat. J. A. Stekol (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 693—695).—Administration of 300 mg. of dibenzyl disulphide caused urinary excretion of 250 mg. of hippuric acid. V. J. W.

XX.—PHARMACOLOGY AND TOXICOLOGY.

Chemotherapeutic compounds of the streptocide series. I, II.—See A., 1941, II, 61, 62.

Sulphonamides.—See A., 1941, II, 22.

(A) Simplified Takata reaction. (B) Diazo-reaction after administration of sulphapyridine. F. Leuthardt (*Schweiz. med. Wschr.*, 1940, **70**, 1085—1086).—(A) Takata-positive sera show pptn. after addition of 10 drops of Hayem solution if kept at room temp. for 1 hr.

(B) Addition of Ehrlich's aldehyde reagent or of dissolved sulphanilic acid to urine of patients treated with sulphapyridine or sulphathiazole produces yellow-red or red colour reactions. The diazo- and urobilinogen tests are "positive" up to one week after discontinuing treatment. A. S.

Sulphur-containing compounds and sulphapyridine. E. J. R. Smith (*Brit. Med. J.*, 1940, II, 488—489).—Pentothal Na and sulphapyridine were given simultaneously to 30 patients with no harmful effects. C. A. K.

Sulphanilamide and sulphapyridine in treatment of acute laryngo-tracheo-bronchitis. R. R. MacGregor (*Canad. Med. Assoc. J.*, 1941, **44**, 1, 48—52).—There was one death in 12 children so treated. C. J. C. B.

Sulphanilamide in surgical infections. J. S. Lockwood (*J. Amer. Med. Assoc.*, 1940, **115**, 1190—1195).—A lecture. C. A. K.

Sulphanilamide in erysipelas. J. A. Foley and E. R. Yasuna (*J. Amer. Med. Assoc.*, 1940, **115**, 1330—1333).—80 cases of erysipelas treated with sulphanilamide showed a mortality rate of 2·5%; 80 controls showed a rate of 10%. The drug-treated cases also showed shorter duration of fever and fewer complications. C. A. K.

Sulphanilamide and bacterial endocarditis. A. Christie (*J. Amer. Med. Assoc.*, 1940, **115**, 1357—1358).—A case of subacute bacterial endocarditis with positive blood culture (*Strep. viridans*) was successfully treated with sulphanilamide. She was alive 1 year later, with negative blood culture. C. A. K.

Effect of sulphanilamide on wound healing. M. Taffel and S. C. Harvey (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 647—650).—Healing of stomach wounds, as measured by tensile strength, was identical in normal rats and in rats receiving 1% of sulphanilamide in their diet. V. J. W.

Sulphonamides in pædiatrics. B. W. Carey (*J. Amer. Med. Assoc.*, 1940, **115**, 924—929).—A review. C. A. K.

Chemotherapy of cerebrospinal fever in childhood. M. I. Williams (*Lancet*, 1940, **239**, 642—643).—In 102 cases of cerebrospinal fever in patients under 16 years old who were treated with sulphonamides (chiefly sulphanilamide) the case fatality was 12·7%. In 54 under 3 years the rate was 15% and in 21 under 1 year it was 19%. C. A. K.

Sulphonamides in cerebrospinal fever. R. W. Cushing (*Brit. Med. J.*, 1940, II, 439—442).—There was a mortality rate of 3% in 135 cases of cerebrospinal fever treated with sulphonamides. C. A. K.

Effect of sulphanilamide on diphtheria infection in guinea-pig and on diphtheria bacilli in culture. A. Rouslacroix, E. Schafer, and H. Mosser (*Compt. rend. Soc. Biol.*, 1940, **133**, 146—147).—Oral or oral + subcutaneous administration of sulphanilamide (1·5 g. over 7 days) to guinea-pigs protects them from the fatal effects of experimental diphtheria infection. The drug had no apparent effect on the virulence of the bacilli *in vitro*. P. C. W.

Sulphonamides in gonorrhœa. D. J. Mackinnon (*Brit. Med. J.*, 1940, II, 448—449).—Sulphonamides are much more successful in gonorrhœa when the gonococci are extracellular than when they are intracellular. C. A. K.

Sulphapyridine in pneumococcal meningitis. F. H. Coleman (*Lancet*, 1940, **239**, 615—618).—2 successful cases are reported and the literature is reviewed. C. A. K.

Treatment of pneumococcal meningitis. P. S. Rhoads, A. L. Hoyne, B. Levin, R. G. Horswell, W. H. Reals, and W. W. Fox (*J. Amer. Med. Assoc.*, 1940, **115**, 917—922).—7 recoveries occurred in 22 cases of pneumococcal meningitis treated with sulphanilamide or sulphapyridine + sp. anti-pneumococcal rabbit serum. The prognosis is worst in cases associated with pneumococcal endocarditis and/or extensive pneumonia. C. A. K.

Serum and sulphanilamide in meningococcal meningitis. K. K. Gregory, E. J. West, and R. E. Stevens (*J. Amer. Med. Assoc.*, 1940, **115**, 1091—1095).—In 43 cases of meningococcal meningitis treated with antimeningococcal serum the mortality rate was 42%, in 33 cases given meningococcal antitoxin 42%, and in 29 cases given sulphanilamide alone 17%. C. A. K.

Sulphapyridine in experimental brucellosis. E. S. King and M. Lucas (*J. Lab. clin. Med.*, 1941, **26**, 616—621).—In guinea-pigs infected with *Br. suis*, *Br. melitensis*, and *Br. abortus* sulphapyridine had only slight effect in controlling the infection. The effect was most marked with the first 2 organisms and when the drug was given at frequent intervals. C. J. C. B.

Chemotherapy of abdominal actinomycosis. G. C. Dorling and N. L. Eckhoff (*Lancet*, 1940, **239**, 707—709).—4 out of 5 cases of abdominal actinomycosis were successfully treated with sulphanilamide or sulphapyridine. C. A. K.

Sulphapyridine in experimental *B. pyocyaneus* infection of cornea. H. H. Joy (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 709—710).—In the rabbit's cornea, severity of ulceration and final result were markedly improved by sulphapyridine administration, especially if begun before or soon after infection. V. J. W.

[Treatment of] acute disseminated lupus erythematosus [with sulphonamides]. U. J. Wile and H. H. Holman (*Arch. Dermat. Syphilol*, 1940, **42**, 1059—1072).—Sulphapyridine and promin failed therapeutically where sulphanilamide had previously failed. These drugs were not used in the few cases in which sulphanilamide alone was beneficial. C. J. C. B.

Chemotherapy of lymphogranuloma venereum. G. M. Findlay (*Lancet*, 1940, **239**, 682—683).—Mice were infected intracerebrally with the virus of lymphogranuloma venereum and then treated with sulphonamides. Sulphamethylthiazole was the most effective followed by sulphapyridine, sulphathiazole, sulphanilamide, lutazol, and disodium 4 : 4′-bis-*o*-carboxybenzamidodiphenyl sulphone. None of these compounds was effective in mice against the viruses of yellow fever (neurotropic strain), Rift Valley fever, influenza *A* (W. S. strain), and lymphocytic choriomeningitis. C. A. K.

Action of sulphanilamide on virus of lymphogranuloma venereum. G. M. Findlay (*Brit. J. exp. Path.*, 1940, **21**, 356—360).—*p*-Aminobenzoic acid inhibited the therapeutic action of sulphanilamide on this virus infection in mice in the same manner as in streptococcal infection (Selbie, A., 1940, III, 597). It may therefore be an essential metabolite for this and the only other virus (trachoma) known to be susceptible to sulphonamide drugs. F. S.

Sulphathiazole in blood and urine. F. W. Sunderman and D. S. Pepper (*Amer. J. med. Sci.*, 1940, **200**, 790—795).—Recovery of sulphathiazole in whole blood averaged 86% of the theoretical; the loss occurred during protein pptn. With serum instead of whole blood, loss of sulphathiazole is only 3%. Since both sulphathiazole and its acetyl derivative are twice as sol. in urine of p_H 7·6 as of p_H 5·6, the passage of a large vol. of alkaline urine is desirable. C. J. C. B.

Absorption, excretion, diffusion, and acetylation of sulphathiazole in man. J. F. Sadusk, F. G. Blake, and A. Seymour (*Yale J. Biol. Med.*, 1940, **12**, 681—696).—The drug is readily absorbed and excreted. There is considerable individual variation in the capacity to absorb it but not enough to interfere with the use of standard dosage in the great majority of patients. It diffuses readily into pleural and ascitic fluids. Acetylation is not excessive and rarely exceeds 30% in the blood and urine but pptn. of crystals may occur in the urine. F. S.

Clinical use of sulphathiazole. W. W. Spink and A. E. Hansen (*J. Amer. Med. Assoc.*, 1940, **115**, 840—847).—128 cases of various infections were treated with sulphathiazole by mouth or Na sulphathiazole intravenously. There was 1 death in 33 cases of pneumococcal pneumonia; 2 out of 3 cases of pneumococcal meningitis died; 15 cases of staphylococcal septicæmia recovered; cases of urinary infection due to staphylococci, *Strep. fæcalis*, and *B. proteus* responded well. Sulphathiazole is absorbed more readily than sulphapyridine but less readily than sulphanilamide; it is excreted more rapidly than either and about 20% becomes conjugated. The effective blood concn. is about 5 mg.-%. Toxic signs in 100 cases included a maculopapular skin eruption, a lesion like erythema nodosum, nausea and vomiting (6 cases, 1 severe) which were much less than with sulphapyridine. Oliguria and N retention occurred in 1 case after 27 g. of the drug by mouth in 5½ days. Gross hæmaturia was seen in another case after intravenous Na sulphathiazole. No effects on the leucocyte count were noted. C. A. K.

Sulphathiazole in treatment of pneumococcus pneumonia. I. F. Volini, R. O. Levitt, and H. B. O'Neill (*Amer. J. med. Sci.*, 1940, **200**, 778—784).—169 patients with typed pneumococcus pneumonia were treated with peroral sulphathiazole with 9 deaths (5·3% mortality). When sulphapyridine combined with serum was used mortality was 4·2%, though the mortality in the bacteræmic group was higher with sulphapyridine treatment. Sulphapyridine was more effective in types I and III infections, sulphathiazole in types II and VII. Nausea and vomiting and other common toxic manifestations of sulphapyridine therapy are less frequent

with sulphathiazole. Drug fever, and especially the papulonodular eruption with conjunctivitis, are severe toxic manifestations of sulphthiazole medication. The blood concn. level varies considerably in the same individual on the ordinary maintenance dose of 1 g. every 4 hr. C. J. C. B.

Sulphathiazole treatment in respiratory infections. D. S. Pepper and G. C. Ham (*Amer. J. med. Sci.*, 1940, **200**, 784—790).—In 37 cases of typical pneumococcal pneumonia there were 2 deaths, in 11 cases of atypical pneumonia 3 deaths; all of 3 cases of pneumococcal bronchitis promptly improved. C. J. C. B.

Sulphathiazole. G. Carroll, L. Kappel, and B. Lewis (*J. Amer. Med. Assoc.*, 1940, **115**, 1350—1353).—Clinical review and discussion. C. A. K.

N^4-Methyl- and N^4-dimethyl-substituted sulphanilamides: synthesis, and pharmacological and therapeutic properties. R. A. Lewis and M. Tager (*Yale J. Biol. Med.*, 1940, **13**, 111—115).—Methylsulphanilamide is active against β-hæmolytic streptococci both *in vitro* and in mice. Dimethyl- and methyl-sulphanilamides are demethylated when administered to man or mouse. F. S.

Chemotherapeutic activity of N^4-acylsulphanilhydroxamides. B. Hampil, G. W. Webster, and M. L. Moore (*J. Pharm. Exp. Ther.*, 1941, **71**, 52—58; cf. A., 1940, II, 340).—3 of 14 compounds tested, the *n*-valeryl, *n*-hexoyl, and *n*-heptoyl derivatives, compared favourably with sulphanilamide and sulphapyridine in combating experimental streptococcal infections in mice. They were also effective against a strain of meningococcus. E. M. S.

Effect of N^1-dodecoylsulphanilamide and of sulphapyridine on experimental tuberculosis in rabbits. C. Muschenheim, C. E. Forkner, and D. R. Duerschner (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 556—559).—No beneficial effect was produced by administration of 0·4 g. 4 times daily for 57 days. V. J. W.

Influence of inorganic oxidising chemical compounds on experimental tuberculosis in guinea-pigs. K. Yanagisawa, Y. Oobayashi, and M. Takano (*Jap. J. exp. Med.*, 1940, **18**, 105—116).—Subcutaneous injections of KIO_3, $KMnO_4$, and $K_2Cr_2O_7$ accelerated the development of experimental tuberculosis in guinea-pigs. C. J. C. B.

Gold treatment in pulmonary tuberculosis. T. Wacker (*Dtsch. Tuberk.-Bl.*, 1940, **14**, 2—14).—Of 80 cases of various types treated with full courses of Solganol, Solganol-B and -B ol., 56 were not benefited and 24 became worse. Complications affected the kidneys (41 cases, 3 fatal), the intestine (ol. 7 cases, 6 fatal), skin and oral mucosa (5 cases), central nervous system (2 cases). Most of the fatal complications resulted from exacerbations of extrapulmonary tuberculosis. E. M. J.

"Thyteban" and other specific remedies in treatment of tuberculosis. G. Schröder (*Dtsch. Tuberk.-Bl.*, 1940, **14**, 45—56).—A review. E. M. J.

Effect of *p*-aminobenzoic acid on the bacteriostatic action produced by sodium *p*-nitrobenzoate on a strain of *Streptococcus viridans*. J. K. Miller (*J. Pharm. Exp. Ther.*, 1941, **71**, 14—19).—Na *p*-nitrobenzoate (up to 0·1%) inhibited the growth of a strain of *Strep. viridans*. Higher concns. (up to 0·4%) were without effect, and the presence of amino-compound was detected in the culture. The bacteriostatic action of lower concns. was prevented by the addition of Na *p*-aminobenzoate, although this compound alone had no growth-stimulating activity on the strain. E. M. S.

Cinchona alkaloids in pneumonia. Sulphur derivatives of *apo*cupreicine ether and aminoquinolines.—See A., 1941, II, 79.

Chemotherapy in non-specific infections of urinary tract. E. P. Alyea and L. C. Roberts (*J. Amer. Med. Assoc.*, 1940, **115**, 1345—1350).—A review and report of 208 cases. C. A. K.

Germicidal efficiency of some medicinal dyes compared with group of non-dye disinfectants. A. J. Salle, I. L. Shechmeister, and W. A. McOmie (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 614—617).—Effects of a large no. of dyes and other disinfectants on bacteria and on the chick heart are compared and tabulated. The antiseptic effect of the dyes is extremely small. V. J. W.

Ulcerative reaction from gentian-violet in treatment of impetigo contagiosa. L. Goldman (*Arch. Dermat. Syphilol.*, 1940, **42**, 1122—1123).—A case report. C. J. C. B.

Sulphydryl compounds and wound repair. J. F. Riley (*Brit. Med. J.*, 1940, II, 516—519).—Cysteine hydrochloride (applied locally) increased the rate of healing of wounds produced in rabbits by excision and by burns. It was also effective in Ra and *X*-ray burns in man. C. A. K.

Benzyl benzoate for scabies. R. E. King (*Brit. Med. J.*, 1940, II, 626—627). C. A. K.

Barberry: ancient remedy; new germicide. G. F. Dick (*Arch. Surg., Chicago*, 1940, **41**, 287—291)—500 g. of crushed algerita root (*Berberis trifoliatus*) boiled for 30 min. in 2 l. of water and filtered through gauze inhibited cultures of *C. diptheriæ*, streptococci, and other organisms in concns. of 1—2%. The root contains 1·5% of berberine ($C_{20}H_{19}O_5N$) and the sulphate inhibits cultures of streptococci in a concn. of 0·01%. F. S.

Potentiation and paralysis of adrenergic effects by ergotoxine and other substances. C. S. Jang (*J. Pharm. Exp. Ther.*, 1941, **71**, 87—94; cf. A., 1941, III, 216).—Ergotoxine, yohimbine, and F. 933 (piperidylmethylbenzdioxan), in very low concns., sensitised the rabbit's ear to the action of adrenaline. High concns. antagonised the effect of adrenaline and adrenergic stimulation. On the cat's nictitating membrane the effect of adrenaline was abolished, without diminishing the effect of sympathetic stimulation. No sensitisation occurred in the frog's heart and the spinal cat. The action of ergotoxine towards adrenaline is fundamentally similar to that of cocaine. E. M. S.

Depressor effect of potassium thiocyanate before and after bilateral splanchnicotomy in normal and hypertensive dogs. L. Davis and M. H. Barker (*J. Lab. clin. Med.*, 1941, **26**, 658—663).—Intravenous KCNS produces its depressor effect as the result of general vasodilatation. This is increased by removal of the thoracic sympathetic trunk and splanchnic nerves above the diaphragm. C. J. C. B.

***Veratrum viride* in eclampsia.** R. D. Bryant and J. G. Fleming (*J. Amer. Med. Assoc.*, 1940, **115**, 1333—1339).—*V. viride* was successfully used as a vasodilator in 120 cases of eclampsia. There were 2 deaths due to sepsis. C. A. K.

Drugs in cardiac arrhythmias. R. L. Levy (*J. Amer. Med. Assoc.*, 1940, **115**, 848—851).—A review. C. A. K.

Calcium and diuresis in heart failure. N. Morris and A. S. Rogen (*Lancet*, 1940, **239**, 545—546).—Intravenous Ca gluconate had little immediate effect on urinary output in cases of congestive heart failure but enhanced the subsequent action of digitalis. Parathyroid hormone increased the action of mersalyl and digitalis. C. A. K.

Histamine in rabbit skin. M. Rocha e Silva (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 586—589).—Histamine content of skin decreases with age, though histamine injection causes "spread" of intravenous trypan-blue more in adult than in young rabbits (cf. A., 1940, III, 680). V. J. W.

Intravenous histamine in horse and dog. D. Brocq-Rousseu, G. Roussel, and J. Verge (*Compt. rend. Soc. Biol.*, 1939, **132**, 446—447).—The fatal intravenous dose of histamine in the horse is 0·5—1 mg. per kg. and in the dog 10 mg. per kg. P. C. W.

Modified flow-meters for anæsthetic gases. E. A. Pask (*Lancet*, 1940, **239**, 680—681).—Description of apparatus. C. A. K.

Effect of anæsthetics on blood-ascorbic acid. C. Reiss (*Compt. rend. Soc. Biol.*, 1940, **133**, 291—294).—In guinea-pigs anæsthesia has either no immediate effect (ether and "narconumal") or produces a slight decrease (urethane) in the ascorbic acid content of the blood. The content is raised several hr. after administration of the anæsthetic, probably due to secondary effects. P. C. W.

Divinyl ether anæsthesia. H. M. Livingstone, G. A. Light, A. F. Heidrick, and V. N. Kable (*J. Amer. Med. Assoc.*, 1940, **115**, 1353—1357).—The clinical use of divinyl ether in 2050 cases is described. C. A. K.

Further studies with ethyl *n*-propyl ether. W. E. Brown and G. H. W. Lucas (*Canad. Med. Assoc. J.*, 1940, **43**, 526—527).—Low concns. of ethyl *n*-propyl ether added to N_2O–

O_2 mixtures give a light third-stage anæsthesia, with adequate O_2 (20%) without producing an explosive mixture. Nausea was less frequent than when ethyl ether was used as an addition, and recovery from the anæsthetic was almost as prompt as with N_2O alone. C. J. C. B.

Local anæsthetics in the naphthalene series.—See A., 1941, II, 99.

Alkamine esters of 4-acetylferulic and 3 : 4-dimethoxycinnamic acids [as local anæsthetics].—See A., 1941, II, 97.

Local anæsthetic activity and toxicity of alkamine esters of *p*-fluorobenzoic acid. E. E. Campaigne, A. C. Starke, jun., L. S. Fosdick, and C. A. Dragstedt (*J. Pharm. Exp. Ther.*, 1941, **71**, 59—61).—Diethylaminoethyl *p*-fluorobenzoate resembled procaine in anæsthetic potency, was less toxic, and produced little tissue irritation. 5 other compounds retained the anæsthetic activity with reduced toxicity, but were severe irritants. E. M. S.

Adalin and noctal concentration in brain of rabbits during anæsthesia. U. Grüninger and G. Scheurenberg (*Z. ges. exp. Méd.*, 1940, **107**, 529—531).—0·7 g. of adalin was given by mouth. The brain contained 0·102 mg. of Br in org. and 0·707 mg. in inorg. combination, which is equiv. to 0·306 mg. of undestroyed adalin (3·8 mg.-%). After administration of 0·3 g. of noctal, less than 1 mg. of noctal was found in the brain. A. S.

Distribution of alcohol introduced into the stomach between various organs and body fluids. P. Lande, P. Dervillée, and J. Godeau (*Ann. Méd. légale Crim. Police sci.*, 1937, **17**, 11—22; *Chem. Zentr.*, 1938, ii, 3712).—Details are given of experiments on rabbits, which received 3 c.c. of alcohol per kg. in 50% solution. A. J. E. W.

Alcohol level in blood and urine of persons showing signs of drunkenness. P. Nelis and M. van Temsche (*Ann. Hyg. publ., ind. soc.*, 1937, **15**, 1—11; *Chem. Zentr.*, 1938, ii, 3712).—Determinations by Nicloux's method have been made in a variety of cases. Definite symptoms of drunkenness are produced by 0·25% of alcohol, but 0·1% causes perceptible external signs. A. J. E. W.

Pharmacological relationship of isomeric barbituric acid derivatives. E. E. Swanson and W. E. Fry (*J. Amer. Pharm. Assoc.*, 1940, **29**, 509—514; cf. A., 1938, III, 426, 1038).—The min. lethal and anæsthetic doses, and the duration of action of the min. anæsthetic dose, of 33 barbiturates of the type CEtR:(CO·NH)$_2$:CO (R is C_{3-9} alkyl group) in rats are tabulated: the vals. show considerable variation amongst isomerides. The duration of action is independent of the dose. F. O. H.

Electrolytic dissociation of morphine derivatives and certain synthetic analgesic compounds. F. W. Oberst and H. L. Andrews (*J. Pharm. Exp. Ther.*, 1941, **71**, 38—41).—No correlation was found between analgesic or toxic properties of the drugs and the vals. of either the dissociation consts. or equiv. conductance at infinite dilution. E. M. S.

Effects of certain chemical changes on addiction characteristics of drugs of the morphine, codeine series. C. K. Himmelsbach (*J. Pharm. Exp. Ther.*, 1941, **71**, 42—48; cf. A., 1940, III, 63).—By means of a substitution technique, clinical data were obtained on the potency and duration of physical dependence action of morphine, codeine, and their derivatives. The results are related to chemical changes by comparison of pairs of drugs, differing in one structural respect. E. M. S.

Pharmacological studies in experimental alcoholism. I. Effect of sympathomimetic substances on blood-alcohol level in man. M. Rinkel and A. Myerson (*J. Pharm. Exp. Ther.*, 1941, **71**, 75—86).—The blood-alcohol level, following oral administration, was lowered by benzedrine, paredrine, adrenaline, and atropine (named in order of diminishing effectiveness), due to decreased absorption of alcohol from the alimentary tract, and to delay in the emptying time of the stomach. E. M. S.

Further study of central stimulation from sympathomimetic amines. J. W. Schulte, E. C. Reif, J. A. Bacher, jun., W. S. Lawrence, and M. L. Tainter (*J. Pharm. Exp. Ther.*, 1941, **71**, 62—74; cf. A., 1939, III, 1087; 1940, III, 252).—A study of the effects of 75 compounds on spontaneous activity in rats. Optimum central stimulation resides in the *d*-phenyl*iso*propylamine (*d*-benzedrine) structure, and all deviations from this configuration are accompanied by reductions in potency. E. M. S.

Action of caffeine-free coffee. W. Kretschmer (*Schweiz. med. Wschr.*, 1940, **70**, 1110—1112).—Caffeine-free coffee has an analeptic effect due to aromatic substances. A. S.

Cases of abortion with apiol. E. Schifferli (*Dtsch. Z. ges. gerichtl. Med.*, 1938—39, **30**, 55—58).—Prompt abortion was observed in 16 cases of self-medication with apiol preps.; in 4 "unsuccessful" cases dosage was apparently too small. No severe intoxications were seen. The drug was most effective when taken at the time of an expected period. E. M. J.

Cardiovascular effects of potassium, calcium, magnesium, and barium. A. W. Winkler, H. E. Hoff, and P. K. Smith (*Yale J. Biol. Med.*, 1940, **13**, 123—132).—The effects were produced by slow intravenous injection of solution of salts in anæsthetised dogs and cats. K produces intraventricular block and diastolic arrest. Ca produces in sequence vagal bradycardia, ventricular arrhythmias, ventricular fibrillation. The initial effect of Mg is vasodilatation and toxic effect on the heart appears only at concns. incompatible with spontaneous respiration. Ba in small doses causes hypertension and ventricular arrhythmias. F. S.

Toxicity of strontium and calcium. V. V. Cole, B. K. Harned, and R. Hafkesbring (*J. Pharm. Exp. Ther.*, 1941, **71**, 1—5).—Sr is much less toxic than Ca in mice, but in rats the difference is slight. Preliminary administration of phenobarbitone decreases the toxicity of Sr. With Sr death is due to respiratory failure, with Ca to heart failure. E. M. S.

Treatment of syphilis of central nervous system. H. W. Maier (*Helv. med. Acta*, 1938, **5**, 633—656).—A review. M. K.

Comparison of the response of yaws and syphilis in the rabbit to therapy with mapharsen and neoarsphenamine. B. J. Longley, N. M. Clausen, and A. L. Tatum (*J. Pharm. Exp. Ther.*, 1941, **71**, 49—51).—The 2 experimentally induced diseases were cured with equal ease. The therapeutic index of neoarsphenamine was superior to that of mapharsen, in single intravenous doses. E. M. S.

Intravenous drip chemotherapy of syphilis. Council on Pharmacy and Chemistry (*J. Amer. Med. Assoc.*, 1940, **115**, 857—859).—A review. C. A. K.

Acetylglycarsenobenzene in treatment of syphilis. W. H. Guy, B. A. Goldmann, G. P. Gannon, and J. Slone (*Arch. Dermat. Syphilol.*, 1940, **42**, 1046—1058).—Results obtained with acetylglycarsenobenzene were similar to those reported with mapharsen. Nitritoid reactions did not occur, but exfoliative dermatitis was more frequent than with other arsenicals. C. J. C. B.

Excretion of bismuth in urine of patients treated with bismuth ethylcamphorate. F. M. Thurmon and N. Benotti (*Arch. Dermat. Syphilol.*, 1940, **42**, 1073—1082).—As judged by the average daily excretion of Bi in the urine, 2 c.c. (80 mg.) of Bi ethylcamphorate administered intramuscularly at 7-day intervals maintain effective therapeutic serum-Bi concns. C. J. C. B.

Pityriasis-like dermatitis following gold therapy. U. J. Wile and C. J. Courville (*Arch. Dermat. Syphilol.*, 1940, **42**, 1105—1112).—A report of two cases. C. J. C. B.

Physiology of rhenium compounds. F. Maresh, M. J. Lustok, and P. P. Cohen (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 576—579).—Re is only slightly toxic, the lethal dose to rats being 0·9—1 g. per kg., given as $NaReO_4$. It has not the hæmopoietic quality of Co, but tends to cause tetanic convulsions. V. J. W.

Acute response of guinea-pigs and rats to inhalation of the vapours of *iso*phorone. H. F. Smith, jun., and J. Seaton (*J. Ind. Hyg.*, 1940, **22**, 477—483).—The early symptoms were irritation of the eyes and nose, dyspnœa, and light narcosis; death, which usually occurred during exposure, was caused by narcosis or by lung irritation. Animals surviving exposure showed a 10—15% decrease in red blood cells and hæmoglobin. In fatal cases there were hæmorrhages in the lungs, congestion of stomach and liver, with general toxic changes. The compound was less toxic than other ketones; 300 p.p.m. was irritating to the nose and eyes of human subjects, and there were some complaints of headache and nausea. E. M. K.

Toxic effects on rats and rabbits of *N*-benzyl-*N*-amyl-*cyclo*hexylamine. W. Deichmann and K. L. Kitzmiller (*J. Ind. Hyg.*, 1940, **22**, 484—487).—Whatever the mode of administration lethal doses caused excitation, mild cyanosis, lachrymation, pyrexia, muscular weakness, and dyspnœa, with death in coma. Sublethal doses caused restlessness, mild cyanosis, irregular breathing and loss of appetite. Fatally poisoned animals showed non-sp. acute toxic changes in the liver, heart, blood vessels, lungs, and kidneys. A prep. as used for spraying appeared to be harmless. E. M. K.

Toxic effects upon rabbits and rats of lauryldiethylenetriamine. W. Deichmann, K. L. Kitzmiller, and F. Spiegel (*J. Ind. Hyg.*, 1940, **22**, 488—491).—Lethal doses caused mild cyanosis, salivation, increased respiration, and lowered blood pressure, followed by muscular weakness, convulsions, and death from respiratory failure. Application to the skin caused extensive local damage. In fatal cases there was distension of the heart and large vessels, œdema, emphysema, and hæmorrhage in the lungs, with congestion of the liver. E. M. K.

Toxicological and pharmacological properties of the proteolytic enzyme, ficin. H. Molitor, C. W. Mushett, and S. Kuna (*J. Pharm. Exp. Ther.*, 1941, **71**, 20—29).—Lethal doses, for oral and intravenous administration, are given for various species. Toxicity depended on the total amount given, not on the concn. The drug was less toxic when given in divided doses. Ficin caused severe irritation of the gastro-intestinal tract, tissue damage on injection, and on local application to conjunctiva and abraded skin. Small intravenous doses reduced the erythrocyte count and prolonged the blood clotting time. E. M. S.

Inactivation of cobra venom by finely dispersed emulsion. A. C. Frazer and H. C. Stewart (*Brit. J. exp. Path.*, 1940, **21**, 361—366).—A lethal dose of cobra venom was rendered innocuous to mice when it was mixed with a finely dispersed oil-in-water emulsion and given intravenously. When the mixture was given intraperitoneally creaming occurred and the rate of creaming coincided with the rate of development of the symptoms of intoxication. Soap stabilised emulsion creams if mixed with salt solutions or acids, but not when it is protected with protein. Cobra venom is therefore inactivated by adsorption at the oil/water interface of an oil-in-water emulsion, which, if it is given intravenously, is protected by the plasma-proteins. F. S.

Effect of injection of cobra venom on ascorbic acid content of guinea-pig tissues. A. C. Majumdar (*J. Indian Chem. Soc.*, 1940, **17**, 332—339).—Intramuscular injection of 0·75 min. lethal dose (M.L.D.) of cobra venom in 48 hr. into guinea-pigs considerably decreases the ascorbic acid content of the brain, liver, adrenals, small intestine, and kidney, but is without effect on the spleen. 0·1 M.L.D. produces a smaller decrease but is without effect on the adrenal and spleen. 0·33 M.L.D. on two successive days depletes the ascorbic acid content of the tissues more than does one injection, or one on each of 3 successive days. J. L. D.

Influence of p_H on absorption of nicotine from bladder and subcutaneous tissues. J. Travell (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 552—556).—Nicotine was injected into the bladder or subcutaneously in cats, and degree of absorption determined by toxic symptoms and movement of the nictitating membrane. Absorption was delayed or prevented at a p_H below 6 and increased as p_H increased to 9. V. J. W.

Effect of low body temperature on toxicity of drugs. A. J. Leser, C. H. Thienes, and D. B. Tyler (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 682—684).—Mice cooled to 18—20° show increased mortality to strychnine, nicotine, amphetamine, cocaine, and procain, but no change towards metrazol or morphine. Survival time is increased. V. J. W.

Granulocytopenia after causalin (amidopyrin). F. H. McGovern (*J. Amer. Med. Assoc.*, 1940, **115**, 1359).—Case report. C. A. K.

Selenium [poisoning]. L. L. Woods (*J. Chem. Educ.*, 1940, **17**, 483—484).—Se poisoning in plants, animals, and human beings is discussed. L. S. T.

[Stock poisoning by] peach-leaf poison bush. W. L. Hindmarsh (*Agric. Gaz. New South Wales*, 1940, **51**, 429—430).—A cow, a steer, and two sheep fed *Trema cannabina*, syn. *T. aspera*, in the ration died after 3, 4, and 6 days, respectively. Autopsy showed congestion of the abomasum and intestine. Free blood was present in the ileum, cæcum, and colon. A. W. M.

Bromide intoxication. Council on Pharmacy and Chemistry (*J. Amed. Med. Assoc.*, 1940, **115**, 933—935).—A review. C. A. K.

Action of iodine on diseases of skin as influenced by season and weather. F. R. Schmidt (*Arch. Dermat. Syphilol.*, 1940, **42**, 1083—1091).—Psoriasis, alopecia areata, and certain forms of pruritus are especially responsive to I; the reaction in the same person varied at different seasons. C. J. C. B.

Nail polish dermatitis. J. F. Burgess (*Canad. Med. Assoc. J.*, 1940, **43**, 544—546).—10 case reports. C. J. C. B.

Derris root dermatitis. M. Dorne and T. B. Friedman (*J. Amer. Med. Assoc.*, 1940, **115**, 1268—1270).—Case report. C. A. K.

Soaps and dermatitis of hands. J. W. Jordon, F. A. Dolce, and E. D. Osborne (*J. Amer. Med. Assoc.*, 1940, **115**, 1001—1006).—A review and discussion. C. A. K.

Dermatitis from new resin. L. Schwartz, L. W. Spolyar, F. M. Gastineau, J. E. Dalton, A. B. Loveman, M. B. Sulzberger, E. P. Cope, and R. L. Baer (*J. Amer. Med. Assoc.*, 1940, **115**, 906—911).—Outbreaks of dermatitis in Canada and U.S.A. were attributed to the use of new resin fabric finishes in wearing apparel, *e.g.*, stockings and pyjamas. The chief irritant was an acid ester gum. C. A. K.

Chemical and mechanical prevention of syphilis and gonorrhœa. H. H. Hazen, I. V. Hiscock, P. S. Pelouze, W. F. Snow, H. Zinsser, and R. H. Everett (*J. Amer. Med. Assoc.*, 1940, **115**, 1185—1186).—Recommendations by the American Social Hygiene Association and the United States Public Health Service. C. A. K.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Temperature acclimatisation in amphibia. K. Mellanby (*J. Physiol.*, 1940, **98**, 27—28P; cf. A., 1940, III, 852).—The behaviour of the frog and the salamander, like certain insects, at low temp. is greatly influenced by the conditions (temp.) of exposure during the 24 hr. previous to the experiment. Temp. appears to alter the properties of the general protoplasm of the animals. Activity (*i.e.*, mobility) and rate of heart beat are used as indicators. J. A. C.

Preliminary survey of industrial hygiene problem in United States. J. J. Bloomfield *et al.* (*U.S. Publ. Health Bull. No.* 259, 1940, 132 pp.).—Industrial hygiene surveys in 15 States are analysed. Control measures for various industrial dusts and fumes are discussed and certain conclusions and recommendations are made. C. G. W.

Control of tuberculosis. I. Pulmonary tuberculosis in applicants for employment. A. C. Reid (*J. Ind. Hyg.*, 1940, **22**, 303—314).—Fluoroscopy as a screening method was of most val. in detecting pulmonary tuberculosis in apparently healthy groups. The incidence of pulmonary tuberculosis among 25,171 applicants was 1·2%, and of clinically significant tuberculosis 0·8%. The peak of active tuberculosis was reached earlier in life in women than in men. E. M. K.

Anthracite dust and tuberculosis. S. L. Cummins (*Brit. Med. J.*, 1940, II, 623—624).—Rabbits were inoculated with bovine tubercle bacilli by intratracheal administration. Animals given also a small quantity of anthracite dust survived much longer than controls; this is attributed to adsorption of toxic products. C. A. K.

Smoke and bacteria in air. C. C. Twort and A. H. Baker (*Lancet*, 1940, **239**, 587—589).—Cardboard and incense smokes were lethal to bacteria in air. Other smokes may interfere with the effect of a phenolic germicidal aërosol. C. A. K.

Biochemistry of silicic acid. IX. Isolation and identification of minerals in lung residues and air-borne dusts from coal mines. G. Nagelschmidt and E. J. King (*Biochem. J.*, 1941, **35**, 152—158).—The isolation of mineral residues from lungs by digestion with H_2O_2 and removal of coal from these residues and from air-borne dusts by heating to 380° are described. The minerals in the residues are identified by *X*-ray diffraction methods. Data are given for the con-

stituents present in a lung residue and a mine dust; quartz and a member of each of the kaolin and mica groups are the main constituents. J. N. A.

Problems in dust determination. H. Landsberg (*Penna. Dept. Labour & Ind., Safe Practice Bull.* 24, 1940, 6 pp.). C. G. W.

Health hazard in manufacture of fluorescent signs. B. H. Dulin and W. J. Burke (*Ind. Hyg. Bull., N.Y. State*, 1940, **19**, 162—163, 192—193).—In the manufacture of fluorescent signs, workers may be exposed to dust in the mixing and prep. of the fluorescent powders; org. vapours from the solvents in which these materials are suspended; CO when poorly designed gas-heated appliances are used; high-voltage currents; Hg vapour when metallic Hg is used; and aspiration or ingestion during glass-blowing operations of small amounts of particulate matter. C. G. W.

Acute response of guinea-pigs and rats to inhalation of the vapours of tetraethyl orthosilicate (ethyl silicate). H. F. Smith, jun., and J. Seaton (*J. Ind. Hyg.*, 1940, **22**, 288—296).—The animals exhibited irritation of eyes and nose, lacrymation, tremors, respiratory difficulty, and finally narcosis. Post-mortem examination showed petechial hæmorrhages in the lungs, with toxic changes in the liver and kidneys. Following exposure the blood showed a decrease in the no. of red cells and of lymphocytes, with a rise in polymorphs. The max. concn. tolerated for 1 hr. without serious symptoms was 0·2%; that for several hr. was 0·05%. Comparison of the effects in dry air and in air of 70% R.H. suggested that slight hydrolysis of the ester lowers its toxicity. E. M. K.

Dermatitis venenata resulting from contact with an aqueous solution of ethyl mercury phosphate. F. J. Vintinner (*J. Ind. Hyg.*, 1940, **22**, 297—300).—42 cases occurred among workers treating wooden planks with this solution. A burning sensation appeared 3 hr.—3 days after contact, followed by swelling and bleb formation. Preventive measures are described. E. M. K.

Occupational leukoderma. E. A. Oliver, L. Schwartz, and L. H. Warren (*Arch. Dermat. Syphilol.*, 1940, **42**, 993—1014).—A lecture. C. J. C. B.

XXII.—RADIATIONS.

Evolution of radiology. A. Rosselet (*Helv. med. Acta*, 1938, **5**, 512—514).—A lecture. M. K.

Roentgenographic findings in neurocutaneous syndromes. G. W. Heublein, E. P. Pendergrass, and B. P. Widmann (*Radiology*, 1940, **35**, 701—727).—A review. E. M. J.

Influence of intracellular acidity on radiosensitivity of various organisms. R. E. Zirkle (*J. Cell. Comp. Physiol.*, 1940, **16**, 301—311).—*Drosophila* eggs were exposed to *X*-rays in various concns. of CO_2. Radiosensitivity, as shown by % survival and hatching rate, is max. at 80, 200, and 350 mm. Hg of CO_2 and min. at 150 and 250 mm. V. J. W.

Action of short waves on metamorphosis of tadpoles. F. Ludwig and J. von Ries (*Schweiz. med. Wschr.*, 1940, **70**, 1108—1109).—Growth of germinating grain is stimulated by irradiation with 6-in. ultra-short waves for 2—5 min.; exposure for 10 min. inhibits growth. Metamorphosis of tadpoles and the development of frog's spawn are inhibited by exposure for 5 min. and accelerated by irradiation for 10 min. A. S.

Roentgen ray therapy in treatment of herpes zoster. P. McCombs, A. Tuggle, and C. M. Guion (*Amer. J. med. Sci.*, 1940, **200**, 803—808).—Roentgen therapy relieved the herpetic syndrome in 72 cases. C. J. C. B.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Mathematical molecular biophysics. N. Rashevsky (*Bull. Math. Biophysics*, 1940, **2**, 177—181).—The possibility of a single mol. or of a few mols. controlling the basic metabolic reactions in a cell is discussed from a mol.-kinetic viewpoint. It is shown that, for a single mol. in a cell to control a reaction proceeding at a rate of 1 μg. per c.c. per sec. and involving concns. of 10 μg. per c.c., at least one intermediate stage must be postulated. F. O. H.

Elasticity of myxomycete *Physarum polycephalum*. C. H. Norris (*J. Cell. Comp. Physiol.*, 1940, **16**, 313—322).—Young's modulus for strands of this organism is 9×10^4 dynes per sq. cm. at room temp. for increases in length up to 40%. At 10° this val. is doubled, and the strands no longer follow Hooke's law. Saponin produced no change in elastic properties. V. J. W.

Effect of temperature on viscosity of *Amœba dubia* **protoplasm.** Q. Murphy (*J. Cell. Comp. Physiol.*, 1940, **16**, 401—404).—Viscosity, as determined by centrifuging, increased with a fall in temp. V. J. W.

Osmotic pressure of ovalbumin solutions. H. B. Bull (*J. Biol. Chem.*, 1941, **137**, 143—151).—The mol. wt. of anhyd. ovalbumin is 45,160. Assuming 36% of hydration, the calc. diffusion const. of a spherical ovalbumin mol. agrees closely with the experimental val. The no. of amino-acid residues in the mol. is calc. to be 354. E. M. W.

Effect of serum-proteins on light absorption of phenol-red in phosphate buffer solution. H. W. Robinson and C. G. Hogden (*J. Biol. Chem.*, 1941, **137**, 239—254; cf. A., 1936, 876; 1937, III, 411).—The p_H of 0·067M-PO_4''' buffer solution remains practically unaffected by addition of 5% of its vol. of serum. Spectrophotometric examination in the region 500—600 mμ. of the buffer solution thus treated with serum after addition of phenol-red shows that, at 560 mμ., very little decrease in optical density is produced by dog's serum. The decrease produced by human serum is much less than that produced by rabbit's serum. With all the sera, the effect is almost entirely due to albumin, the optical density at 565 mμ. being, with rabbit and human sera, directly related to the albumin concn. The vals. obtained with pathological human sera of low albumin content agree with those found for normal sera of the same albumin content. Serum added to 0·005N-NaOH or 0·067M-PO_4''' buffer solution of p_H 11·2 does not adsorb phenol-red. Comparison of PO_4'''- and veronal-buffer solutions shows that the buffer solution used affects the magnitude of the optical density and the position of max. absorption. W. McC.

Ultracentrifugal analysis of diphtheria proteins. M. L. Petermann and A. M. Pappenheimer, jun. (*J. Physical Chem.*, 1941, **45**, 1—9).—In 0·172M-NaCl purified diphtheria toxin is stable over the p_H range 5·6—10·1. This p_H-stability range corresponds with that judged by toxicity in animal experiments. Below p_H 5·6 the toxin is insol. and at p_H 10·8 it sediments more slowly, showing that some change has taken place. At p_H about 7·3 sedimentation of the toxin is independent of the toxin concn. over the range 0·24—1·02%. From diffusion data the mol. wt. of the toxin = 74,000 and from the shape factor the calc. ratio of major to minor axes (r) = 4·7 : 1. Electrodialysed antitoxic pseudoglobulin has been similarly examined. The untreated pseudoglobulin has mol. wt. 184,000 and r = 7·0 : 1. The protein obtained by splitting the pseudoglobulin with pepsin at p_H 4·2 has mol. wt. 113,000 and r = 5·3 : 1. Partial digestion of diphtheria toxin by pepsin increases the average potency per g., but since the mol. wt. has decreased a corresponding amount, the average potency per mol. is approx. the same, thus indicating that the fraction removed has carried none of the activity with it. The close agreement between change in r after pepsin treatment and changes in mol. wt., carbohydrate content, and potency is evidence that the mol. of diphtheria toxin has been split in a plane normal to the major axis and that a real change in symmetry has occurred. The inactive pseudoglobulin associated with the toxin is split by pepsin in the same way as is the toxin itself. C. R. H.

Control of protoplasmic streaming. N. Kamiya (*Science*, 1940, **92**, 462—463).—Protoplasmic streaming is controlled in a specially-constructed chamber by the application of pressures slightly greater than atm. The pressure required to immobilise the protoplasm is not greater than 28 cm. of water, and movement is sensitive to changes of pressure of approx. 0·2 cm. of water. The spontaneous changes in protoplasmic activity can be followed graphically, and a picture of the rhythm in the activity obtained. L. S. T.

Denaturation of soya glycinin. I. Heat-denaturation. E. Volkov and R. Razgon (*Kolloid. Shurn.*, 1940, **6**, 129—132).—The % (p) of glycinin of soya bean which is sol. in 0·2% NaOH is reduced from 100 to 87 or 30 when glycinin is heated for 2 hr. with water at 75° or 100° respectively. Drying of

glycinin at 55—90° for 6 hr. slightly reduces p. In the course of prep. of glycinin involving action of water at 75° for 5 min. and drying at 55°, p is lowered to 93. The method of prep. is gentle enough. J. J. B.

Denaturation of sericin. II. Isoelectric point of α-sericin. Z. Hirose (*J. Agric. Chem. Soc. Japan*, 1940, **16**, 1101—1106; cf. A., 1940, III, 505).—The isoelectric points of α-sericin in the sol. sericin fraction and in the outside layer of the raw cocoon are more alkaline than those of the insol. fraction and of the inside layer of the cocoon respectively. J. N. A.

Ecological aspects of the intertidal area of the estuary of the Aberdeenshire Dee.—See A., 1941, I, 134.

XXIV.—ENZYMES.

Enzymes in fruits and vegetables. V. Peroxidase. H. Naito, K. Ishimaru, and Y. Hosoda (*Bull. Inst. Phys. Chem. Japan*, 1940, **19**, 1377—1386).—Methods for determination of peroxidase are examined. A. Li.

Effect of potassium cyanide on diamine-oxidase. E. A. Zeller (*Helv. Chim. Acta*, 1940, **23**, 1418—1441).—The system of the diamine–diamine-oxidase reaction rapidly absorbs one half of a mol. of O_2 per mol. of substrate (DDR1) whilst the consumption of a second half mol. occurs much less rapidly (DDR2). KCN influences the degradation of diamines by obstruction of the prosthetic group, by strengthening the self-restriction by superoptimal substrate concn. (summation effect), by acceleration owing to the formation of cyanohydrin with the aldehyde produced, by displacement of the reaction equilibrium in the direction of a more complete degradation of the substrate, and by elimination of DDR2 with consequent indirect restriction of DDR1 as a consequence of incomplete removal of the products of the reaction. DDR1 is not restricted by Na_2S or thiourea; its restriction by KCN is reversible. H. W.

Enzymic degradation of polyamines. VIII. Application of indigotindisulphonate in enzyme technique. E. A. Zeller (*Helv. Chim. Acta*, 1940, **23**, 1502—1508).—Indigotindisulphonate is oxidatively decolorised by the enzymic degradation of diamines and the reaction gives a very simple method of determining diamine-oxidase. The enzyme is restricted by methylamine, amylamine, and choline. The summation effect can be observed with choline and putrescine. The diamine-oxidase content of the livers of pregnant albino rats exceeds that of the livers of normal animals. H. W.

Enzymic reduction of cytochrome *c*. Cytochrome *c* reductase. E. Haas, B. L. Horecker, and T. R. Hogness (*J. Biol. Chem.*, 1940, **136**, 747—774).—The prep. and properties of cytochrome *c* reductase are described. It is a flavoprotein with alloxazine mononucleotide as the prosthetic group, and mol. wt. 75,000. It is unstable in acid or at high temp. It rapidly oxidises triphosphopyridine nucleotide and reduces cytochrome *c*. R. L. E.

Mechanism of hydrogen transport in animal tissues. II. Reactions involving cytochrome *c*. E. E. Lockhart and V. R. Potter. **III. Cyanide inhibition of cytochrome *c* reduction.** V. R. Potter (*J. Biol. Chem.*, 1941, **137**, 1—12, 13—20).—I. Reduction of cytochrome *c* takes place in the presence, but not in the absence, of cytochrome *b*. It is unlikely that the various cytochromes represent alternative paths rather than a single path of H transport. Reduction of cytochrome *c*, which is inhibited by 0·01M-CN′, does not take place in the presence of diaphorase alone.

II. It is cytochrome *c* itself, and not the enzyme which reduces it, that is affected by 0·01M-CN′. Ferricytochrome *c*, but not ferrocytochrome *c*, combines with CN′ causing a shift of the 530 mμ. absorption band of approx. 5 mμ. towards the red. P. G. M.

Activation of cocarboxylase by thiamin. M. A. Lipton and C. A. Elvehjem (*J. Biol. Chem.*, 1940, **136**, 637—651).—Activation of cocarboxylase by thiamin (aneurin) depends on the type of yeast used; that occurring with bakers' yeast is not due to synthesis of cocarboxylase from the added vitamin, since it is unaffected by the presence of inhibitors, absence of PO_4''', etc. A heat-labile substance, which adsorbs cocarboxylase without production of active enzyme, is probably present in yeast. Activation may be due to excess of thiamin, which saturates this substance and permits the adsorption of cocarboxylase on the active apoenzyme. The heat-labile substance is probably protein in nature and may be an oxidised (and inactive) form of the enzyme. Brewers' yeast shows but little activating capacity. P. G. M.

Preparation of *d*-galacturonic acid.—See A., 1941, II, 59.

Effects of ultra-violet radiation on *Cypridina* luciferin and luciferase. A. M. Chase and A. C. Giese (*J. Cell. Comp. Physiol.*, 1940, **16**, 323—339).—Purified luciferin is largely destroyed by light of λ shorter than 300 mμ., and can be sensitised to visible light by adding *Cypridina* extract, eosin, fluorescein, or riboflavin. The last abolishes the prolonged light emission which occurs on adding luciferase to a mixture of luciferin and oxidised luciferin. Luciferase is inactivated only by less than 280 mμ. Max. absorption by each solution is at 240—280 mμ. V. J. W.

Identity of hyaluronidase and spreading factor. E. Chain and E. S. Duthie (*Brit. J. exp. Path.*, 1940, **21**, 324—338).—The enzyme acts on hyaluronic acid, the polysaccharide acid present in synovial fluid and vitreous humour and responsible for the mucinous character of these fluids. The enzyme rapidly reduces the viscosity of hyaluronic acid to that of water, and hydrolyses the acid with the liberation of *N*-acetylglucosamine and glucuronic acid. Hyaluronidase was found in all sources of the spreading factor of Duran-Reynals and McClean. No spreading activity was found in the absence of the enzyme. It is found in mammalian testis, in some bacterial filtrates, and in snake and bee venoms. Substances closely resembling hyaluronic acid were isolated from the skin of rabbits and from the sexual skin of monkeys during œstrus. Salivary, gastric, and dudodenal mucin, and mucin of the cervix uteri are not attacked by hyaluronidase. F. S.

Diffusing factors. Hyaluronidase activity of testicular extracts, bacterial culture filtrates, and other agents increasing tissue permeability. D. McClean [with C. W. Hale] (*Biochem. J.*, 1941, **35**, 159—183).—An attempt is made to correlate the hyaluronidase and spreading activities of testis extracts, bacterial culture filtrates from *Cl. welchii* and *œdematis* etc., and Russell's viper venom. In some experiments vitreous humour, but in most cases mucoprotein from umbilical cords, was used as substrate, whilst purified preps. of hyaluronic acid were made from the latter containing 3% of total N and 0·5—1·0% of P. The testicular and bacterial enzymes were prepared by known methods, and the dried viper venom (Stypven) was used. Diffusing activity in the skin is preferred to the viscosimetric technique as a criterion of activity since it is much more delicate though less accurate than the latter, and enzyme preps. fall into the same order of activity. K hyaluronate effects a large increase in hyaluronidase of *Cl. welchii* filtrates, and sulphanilamide and sulphapyridine do not inhibit either its production or its *in vitro* activity. There is no correlation between hyaluronidase and amylase or phosphatase activity of enzyme preps., nor is it associated with an action on heparin in the viper-venom preps. Various reducing agents possess an activity similar to that of hyaluronidase. Both the viscosity and the diffusion phenomena produced by the enzyme are specifically neutralised by the appropriate autisera. P. G. M.

Cholesterol esterase in liver and brain. W. M. Sperry and F. C. Brand (*J. Biol. Chem.*, 1941, **137**, 377—387).—Blood-free liver tissue preps. esterify cholesterol with fatty acids at p_H 4·92 to 5·88, and cause hydrolysis of cholesterol esters when incubated with blood serum. Cholesterol is esterified when incubated in carbon tetrachloride with a dried pancreas prep. and Na taurocholate or glycocholate. Liver tissue is inactive under these conditions, and no cholesterol esterase was detected in brain tissue. The constancy of the ratio of free to combined cholesterol, and the slow rate of reactions catalysed by cholesterol esterase, are quoted against the theory that these reactions are important in fat absorption. R. L. E.

Histaminase. Council on Pharmacy and Chemistry (*J. Amer. Med. Assoc.*, 1940, **115**, 1019—1021).—A review. C. A. K.

Enzymic hydrolysis of *d*-peptides. J. Berger, M. J. Johnson, and C. A. Baumann (*J. Biol. Chem.*, 1941, **137**, 389—395).—Sera from rats with carcinoma and from human cancer cases hydrolyse *dl*- but not *d*-leucyl peptides. Peptidases from chick mucosa, malt, yeast, and some bacteria

hydrolyse *dl*-leucyl peptides 2—30 times as fast as the *d*-peptides. No *d*-peptidase was found in rat or mouse serum after injection of *dl*-leucylglycine. R. L. E.

Chymopapain: a new crystalline proteinase from papaya latex. E. F. Jansen and A. K. Balls (*J. Biol. Chem.*, 1941, **137**, 459—460; cf. A., 1939, III, 1097).—The new enzyme is stable at 10° and p_H 2. It is more sol. than papain, and its ratio of milk-clotting to hæmoglobin-digesting activity is twice that of papain. R. L. E.

Proteinases of *Clostridium histolyticum*. W. E. van Heyningen (*Biochem. J.*, 1940, **34**, 1540—1545).—Continued subculture of a strain of *Cl. histolyticum* produces, among other variations, a change in the proteinase from an extracellular enzyme activated by cysteine to an extracellular enzyme inhibited by cysteine and an intracellular enzyme activated by cysteine. P. G. M.

Comparison of action of crystalline papain on native and urea-denatured proteins. H. Lineweaver and S. R. Hoover (*J. Biol. Chem.*, 1941, **137**, 325—335).—The max. rate of digestion of denatured hæmoglobin occurs when the concn. of substrate is 2%. The initial rate of digestion by papain in a solution of urea the concn. of which is greater than 5—6M. is at least 100 times as great as in aq. solution, whilst a later rate may be as much as 6000 times as great. This increase in digestibility is similar to the decrease in solubility of hæmoglobin when it is denaturated by urea. The rates of digestion of hæmoglobin which has been denatured by heat or by neutral or alkaline urea are practically identical. The relative rates of digestion of native hæmoglobin by papain and chymotrypsin are not related to those of denatured hæmoglobin, and the digestion of the former is not limited by a rate of denaturation since the same increase in digestion occurs when either the period of digestion or the concn. of enzyme is doubled. Probably native hæmoglobin is directly attacked by papain. The increase in the rate of digestion of a protein after denaturation appears to be different for each enzyme, and the increase in rate of digestion by a single enzyme also differs with different protein substrates. It is concluded that denaturation renders peptide linkings more available or sensitive to proteolytic enzymes. J. N. A.

Enzymic proteolysis. Amino-acids of caseinogen phosphopeptone.—See A., 1941, II, 115.

Kinetics of degradation of starch by wheat amylase. K. H. Meyer and H. P. Bernfeld (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 89—91).—As β-amylase attacks the terminal group in the starch mol., and as each mol. of maltose split off leaves the same terminal group, the rate of hydrolysis of starch by the enzyme should remain unchanged so long as the starch mol. is incompletely broken down or until branching chains distort the picture. J. L. D.

Constitution of amylopectin.—See A., 1941, II, 87.

Degradation of starch constituents by β-amylase.—See A., 1941, II, 59.

Unimolecular films of invertase.—See A., 1941, I, 110.

XXV.—MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY. ALLERGY.

Effect of ultra-violet light on living yeast cells. J. N. Davidson (*Biochem. J.*, 1940, **34**, 1537—1539).—Although derivatives of adenylic acid occur among the N compounds liberated by intact yeast cells into the surrounding medium under the influence of ultra-violet light, there is insufficient evidence to show that these are the growth-stimulating substances present. P. G. M.

Proliferation-promoting properties and ultra-violet absorption spectra of yeast fractions. E. S. Cook, M. J. Hart, and M. M. Stimson (*Biochem. J.*, 1940, **34**, 1580—1587).—Most of the yeast growth-promoting activity of aq. alcoholic extracts of yeast can be conc. in an acetone-sol. fraction with a potency of 22 growth units per mg. It is not pptd. by alcoholic $Ba(OH)_2$. Respiratory activity runs parallel to growth-promoting properties, but there is no direct correlation between ultra-violet absorption at 2600 A. and the proliferation-promoting activity of these fractions. This indicates either a difference in the nature of the intercellular wound hormones from proliferants of the normal bios type, or predominance of a certain fraction of proliferants produced by injury. P. G. M.

Effect of carbon monoxide on endogenous respiration of bakers' yeast. J. N. Stannard (*J. Cell. Comp. Physiol.*, 1940, **16**, 389—398).—High O_2 consumption vals. are decreased by presence of 80% CO, and low vals. are usually increased. In light, inhibition is reversed, but stimulation not affected. The mechanism is not the same as in striated muscle (A., 1940, III, 796) but depends on the yeast utilising non-carbohydrate materials in presence of air. V. J. W.

Pyruvic acid and alcoholic fermentation in a synthetic medium. E. Haag (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 71—73).—Many yeasts grown in a medium (details given) with glucose as the only source of C produce pyruvic acid even when growth is poor. The acid is decarboxylated to acetaldehyde, which successively yields methyl α-hydroxyethyl ketone and butane-βγ-diol. J. L. D.

Mechanism of accumulation of pyruvic acid during alcoholic fermentation in a synthetic medium. E. Haag and C. Dalphin (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 73—75).—Yeasts grown (many passages) at 25° in a medium with glucose as the only source of C produce pyruvic acid when the concn. of cocarboxylase is below 3×10^{-9}%. It is this factor rather than the p_H that determines formation of pyruvic acid. J. L. D.

Anticomplementary factor in fresh yeast. L. Pillemer and E. E. Ecker (*J. Biol. Chem.*, 1941, **137**, 139—142).—A hygroscopic powder prepared from yeast, insol. in hot H_2O, org. solvents, and cold alkali, specifically inactivates the third component of complement. E. M. W.

Molecular constitution of an insoluble polysaccharide from yeast, *Saccharomyces cerivisiæ*.—See A., 1941, II, 87.

Production of phoenicin on synthetic media. I. *Penicillium phoeniceum*, van Beyma. II. *P. rubrum*, Grasberger–Stoll. T. Curtin, G. Fitzgerald, and J. Reilly (*Biochem. J.*, 1940, **34**, 1605—1610).—*P. phoeniceum* produces 51 mg. of phoenicin per 100 c.c. when grown on acid Czapek–Dox medium, as compared with 44 mg. on a beer wort medium. The optimum yield is obtained on a medium containing 1·5 g. of $NaNO_3$ per l. and pigmentation is almost entirely inhibited in the presence of 4·0 g. per l. *P. rubrum* produces 2½—3 times as much phoenicin as *P. phoeniceum*. The optimum concn. of $NaNO_3$ is 3·0 g. per l., and of $MgSO_4,7H_2O$ 0·3 g. per l. 18 days is the optimum period for growth of both organisms, which can utilise phoenicin as a source of C. Phoenicin has two colour changes, yellow to red at p_H 1·8—3·4, and red to violet at p_H 5·4—6·4. P. G. M.

Formation of *l*-αβ-dicarboxyethylene oxide by moulds. V. K. Sakaguchi and T. Inoue (*J. Agric. Chem. Soc. Japan*, 1940, **16**, 1015—1016; cf. A., 1939, III, 327).—Acetic, *dl*-lactic, citric, and succinic acids and *l*-αβ-dicarboxyethylene oxide are formed from glucose by the action of *Monilia formosa*. A substance which gives Fenton's reaction is also formed. J. N. A.

Physiology of *Cytospora sacchari*, Butl., causal fungus of stem canker disease of sugar-cane. J. C. Lutkra, A. Sattar, and S. S. Sandhu (*Proc. Indian Acad. Sci.*, 1940, **12**, 172—188).—Growth of the organism on different media and the effects of different carbohydrates are examined. The optimum growth temp. is 30° and p_H 3·8. A. G. P.

Growth of *Trichophyton interdigitale* on wool fabric with and without additional nutritive media. R. E. Rogers, D. J. Hirschmann, and H. Humfeld (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 729—733).—This organism failed to grow on agar containing only mineral salts, but grew on wool placed in such a medium. V. J. W.

Morphological effects of penicillin on bacteria. A. D. Gardner (*Nature*, 1940, **146**, 837—838).—Microscopical changes in growth produced by addition of penicillin to the fluid media are described for *Cl. welchii*, *S. typhi*, *Vib. choleræ*, *B. coli*, *B. anthracis*, *Streptococcus pyogenes*, and *S. viridans*. In general, rod-shaped organisms show lengthening of the cells at dilutions up to 30 times that which inhibits growth completely. With the staphylococci the morphological change consists of spherical enlargement of the cell and imperfect fission. There is no morphological effect with *Meningococcus*. L. S. T.

Enzyme from bacteria able to destroy penicillin. E. P. Abraham and E. Chain (*Nature*, 1940, **146**, 837).—An extract made by crushing a suspension of *B. coli* contains a substance that destroys the growth-inhibiting property of penicillin. The active substance is an enzyme since it is destroyed by heating at 90° for 5 min., and by incubation with papain activated by KCN at p_H 6, and it is non-dialysable through Cellophane membranes. It is pptd., with loss of much activity, by 2 vols. of alcohol. Activity of penicillinase is slight at p_H 5, but marked at p_H 8—9. No O_2 uptake occurs during the inactivation of penicillin, which proceeds equally well under aërobic and anaërobic conditions. The enzyme was absent from extracts of *Staphylococcus aureus*, yeast, and *Penicillium notatum*. It was present in *M. lysodeikticus*, and in a Gram-negative rod contaminating some *Penicillium* cultures. Tissue extracts and autolysates and staphylococcal pus are without action on the growth-inhibiting power of penicillin. L. S. T.

***p*-Aminobenzoic acid as a bacterial growth factor.** S. D. Rubbo and J. M. Gillespie (*Nature*, 1940, **146**, 838—839).—Experiments with 9 species of *Clostridium acetobutylicum* show that *p*-aminobenzoic acid and its derivatives act as growth factors for this organism. *p*-Aminobenzoic acid can be recovered as the benzoyl derivative from a yeast concentrate factor. Removal of *p*-aminobenzoic acid from the concentrate removes its growth factor activity. Woods' results (A., 1940, III, 611) on the anti-sulphanilamide action of this acid are confirmed; 1 mol. of acid antagonises 23×10^3 mols. of sulphanilamide. L. S. T.

Biotin as growth factor for *C* 203 *S* strain of hæmolytic streptococcus, group *A*. G. A. Hottle, J. O. Lampen, and A. M. Pappenheimer, jun. (*J. Biol. Chem.*, 1941, **137**, 457—458; cf. A., 1940, III, 936).—Cryst. biotin is an essential growth factor for *C* 203 *S* strain of hæmolytic streptococcus, max. growth being obtained with 0·08 μg. of biotin per l. R. L. E.

Growth factor and other nutritional requirements of acetone butanol organism, *Cl. acetobutylicum*. A. E. Oxford, J. O. Lampen, and W. H. Peterson (*Biochem. J.*, 1940, **34**, 1588—1597).—In addition to biotin, another growth factor is required by *Cl. acetobutylicum*. Difco yeast extract is the best source of this factor, the purification of which to an oil containing 1 growth unit in 0·05 μg. is described. Caseinogen, skim milk powder, and molasses etc. contain little of the active principle, which is adsorbed on C at p_H 4 and eluted by acetone–NH_3 or alcohol–NH_3 but not by 50% alcohol. It is not adsorbed on permutit etc. It is stable to 2N-NaOH or H_2SO_4 for 10 min. at 100° or autoclaving (15 lb.) for 30 min. at p_H 7 but, unlike biotin, it is destroyed by bromination at 25° in $CHCl_3$. It is not identical with any known growth factor for micro-organisms. There is no regular correlation between growth and fermentation, and other factors may be necessary for normal solvent production. P. G. M.

Vitamin-B_1 and synthesis of oxaloacetate by *Staphylococcus*. D. H. Smyth (*Biochem. J.*, 1940, **34**, 1598—1604).—Oxaloacetate or fumarate can replace aneurin for a limited period as a catalyst in the dismutation of pyruvate by *S. albus* or *aureus* in the presence of glycerol. This effect is not obtained in staphylococci grown on vitamin-sufficient media. There is no lag period on addition of pyruvate before dismutation reaches its max. rate. Succinate, fumarate, and malate are formed by staphylococci from either oxaloacetate or pyruvate. P. G. M.

Vitamin-B_1 and bacterial oxidations. I. Dependence of acetic acid oxidation on vitamin-B_1. J. H. Quastel and D. M. Webley (*Biochem. J.*, 1941, **35**, 192—206; cf. A., 1939, III, 1099).—Complete oxidation of acetic acid by propionic acid bacteria occurs in presence of vitamin-B_1 in 10^{-7}M. concn., whilst oxidation of formic and butyric acids is unaffected and that of propionic acid is slightly stimulated. Less pyruvic acid accumulates in the presence than in the absence of -B_1 during oxidation of lactic acid, propionic acid, etc., but none during oxidation of acetic acid. The vitamin also enhances the oxidation of *l*-malic acid and *l*-glutamic acids, glycine, etc., but not α-glycerophosphoric and hexosediphosphoric acids. With the exception of its effect on acetic acid oxidation, the stimulating action is probably due to the effect on the oxidation of intermediately formed pyruvic acid. The active form of the vitamin is probably cocarboxylase. The pyrimidine and thiazole components together are as effective as -B_1, but separately are inactive. The propionic acid bacteria can synthesise -B_1 from a mixture of the two components even in low concn. P. G. M.

Purine and pyrimidine bases as growth substances for lactic acid bacteria. E. E. Snell and H. K. Mitchell (*Proc. Nat. Acad. Sci.*, 1941, **27**, 1—7).—The purine and pyrimidine bases which occur naturally in nucleic acids are limiting growth factors or growth-stimulating factors for lactic acid bacteria. In general the naturally occurring amino-derivatives are replaceable by the corresponding hydroxy-derivatives and in some cases guanine and adenine are interchangeable but with inferior growth resulting. H. G. R.

Physico-chemistry of bacterial growth. VI. Influence of toxic substances on growth rate, stationary population, and fermentation reactions of *B. lactis aërogenes*. VII. Influence of phenol on death rate of *B. lactis aërogenes*. E. A. Poole and C. N. Hinshelwood (*J.C.S.*, 1940, 1565—1572, 1573—1574; cf. A., 1940, III, 75).—VI. Experiments with *B. lactis aërogenes* propagated in veal bouillon (p_H 7·6), glucose–PO_4''', or peptone–NaCl–glucose (mannitol, galactose) show that the growth rate of the bacterium, the max. stationary population which the medium will support, and the rate at which carbohydrates are fermented in the stationary phase, decrease with increase in the concn. of added toxic substance (phenol, $HgCl_2$, formaldehyde, $CuSO_4$). Curves expressing the relationship between concn. of toxic substance and ratio of growth rate or gas evolution in presence to that in absence of toxic substance are of varying types which range from the linear to those exhibiting an abrupt fall to zero at crit. concn. of toxic substance. The substances cause parallel variations in the growth rate and the max. stationary population and mathematical explanation of this is given. Toxic substances probably interfere with the lag phase, cell division, metabolism, and death rate. The observed similarities and contrasts provide a basis for tentative rough analysis of underlying cell mechanisms.

VII. Phenol has less effect on the death rate of the cells than on the rate of cell division and the extent of the toxic action depends on the stage of growth. The stationary phase is attained by cessation of division, not by equalisation of death and division rates. W. McC.

Hydration of carbon dioxide and its influence on germicidal activity of hypochlorite aërosols. A. H. Baker and S. R. Finn (*Nature*, 1940, **146**, 747).—An aërosol produced from a solution containing NaOCl 1, NaCl 16·5, and Na_2CO_3 0·05% shows no difference in the killing rate of aërially dispersed *E. coli* either in presence or absence of CO_2. A good kill is obtained in the first 5 min., after which the rate becomes slower. This is contrary to what would be expected if hydration of CO_2 is a slow process, and the liberation of HOCl dependent on it alone. Hypochlorite aërosols become decreasingly effective in acid, neutral, and alkaline solution, but the neutral solution gives the best results when persistence of action is considered. HOCl as vapour is relatively ineffective, and addition of glycerol is of doubtful utility. The addition of a salt has an effect similar to that of glycerol by retarding the evaporation of H_2O from the droplet. L. S. T.

Bactericidal property of monohydric saturated alcohols. U. P. Kokko (*Arch. Hyg.*, 1938—39, **121**, 44—56).—The bactericidal power of monohydric saturated alcohols increases with increase of the no. of C atoms in the mol. M. K.

Resistance of bacillary spores. R. von Angerer (*Arch. Hyg.*, 1938—39, **121**, 12—55).—The fat content of spores and their adsorption by porous substances do not inhibit their destruction by heat. Treatment of streak preps. with fat-reducing substances (chloral hydrate solution) for 12 days caused partial loss of resistance. Benzene, acetone, amyl alcohol, and carbon tetrachloride were ineffective; aq. NaCl accelerated the destruction of spores. Groat's agar is the most suitable medium for the cultivation of resistant spores. Addition of vitamins, milk, or soap did not increase resistance. Spores were more rapidly destroyed in boiling normosal than in NaCl solution or weak acid solution. Of all the adsorption substances investigated only granular C had an inhibiting effect on destruction of spores. Impregnation of the C with agar or gelatin increased the destruction. Casein and peptone inhibited it markedly. Treatment with neutral fat or soap was ineffective. M. K.

Use of serum for clearing solid culture media. M. S. Spink (*J. Path. Bact.*, 1941, **52**, 147—147).—With 40 c.c. of serum per l. a clear filtrate can be obtained with neutral agar, MacConkey agar, and nutrient gelatin in the same time as with egg white. C. J. C. B.

Measures of respiratory activity with resting cells. R. H. Burris and P. W. Wilson (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 721—726).—O_2 uptake per mg. of N is the most const. measure of respiratory activity of washed *Rhizobium* cells. V. J. W.

Kinetics of luminescent flashes from *Achromobacter fischeri* at different temperatures. G. M. Schoepfle (*J. Cell. Comp. Physiol.*, 1940, **16**, 341—360).—The flash occurring on adding O_2 to an anaërobic bacterial suspension was recorded by an oscillograph. Mathematical analysis shows that the total light is a function solely of the temp. at which it is produced, and various possibilities are discussed. V. J. W.

Oxidation of pyruvic acid by bacteria. H. K. Chen and P. S. Tang (*J. Cell. Comp. Physiol.*, 1940, **16**, 293—299).—Aërobic oxidation of pyruvate by *Staph. aureus*, *Ps. pyocyaneus*, *E. coli*, and yeast is reduced by KCN, and this inhibition is counteracted by methylene-blue. CO_2 production and O_2 consumption are affected simultaneously and to the same extent. V. J. W.

Indole as precursor in synthesis of tryptophan by bacteria. P. Fildes (*Brit. J. exp. Path.*, 1940, **21**, 315—319).—Certain bacteria which require tryptophan for growth can grow when indole is supplied. Therefore, tryptophan is synthesised by bacteria from NH_3 in stages, one of which is indole. F. S.

Methane fermentation. V. Biochemical activities of *Methanobacterium omelianskii*. H. A. Barker (*J. Biol. Chem.*, 1941, **137**, 153—167).—With CO_2 as oxidising agent, *M. omelianskii* effects the oxidation of simple primary and *sec.* alcohols to fatty acids and ketones. Other compounds tested are not oxidised. O_2 and NO_3' are toxic to the organism, SO_4'' and methyl alcohol have no effect, whilst formate is decomposed to CH_4 but only in the presence of CO_2. A linear relation exists between the quantities of cell material and of acetic acid formed in the oxidation of ethyl alcohol. 60% or more of cell C is derived from the alcohol and 30% or less from CO_2. The conversion into cell material of 1·5% of the CO_2 reduced is demonstrated using radioactive C. E. M. W.

Dissimilation of fructose by heterofermentative lactic acid bacteria. M. E. Nelson and C. H. Werkman (*Iowa State Coll. J. Sci.*, 1940, **14**, 359—365; cf. A., 1937, III, 35).—Glucose and fructose were fermented separately in a medium (details given) by *Lactobacillus lycopersici* and *Leuconostoc dextranicus* under anaërobic conditions at 30° and the products of fermentation determined. The two series of products were qualitatively similar. Fructose yields much mannitol with either strain, though *L. dextranicus* produces less mannitol and more alcohol than does *L. lycopersici*. Glucose yields no mannitol. When glucose is fermented with acetylmethylcarbinol, less alcohol and glycerol and more acetic acid are produced. The products are similar to those produced in the fermentation of fructose, which suggests that, apart from the proportion of fructose acting as a H-acceptor in competition with other intermediate products, the dissimilation of glucose and fructose proceed similarly. J. L. D.

Nutritive requirements of heterofermentative lactic acid bacteria. H. G. Wood, C. Geiger, and C. H. Werkman (*Iowa State Coll. J. Sci.*, 1940, **14**, 367—378).—*Lactobacillus mannitopoeus*, *L. buchneri*, and *L. lycopersici* were grown on a "complete" medium lacking thiamin, riboflavin, ether extract of yeast extract, and tryptophan in different experiments, the effect on growth at 30° being determined by the amount of acid formed. With *L. buchneri*, absence of riboflavin had no effect, and thiamin little effect, on growth. Riboflavin and thiamin stimulate growth in the other two species and can replace one another. Without ether extract of yeast extract, no growth is obtained on serial transfer with any of the three species. Alanine, valine, glutamic and aspartic acid, cystine, methionine, serine, threonine, phenylalanine, tyrosine, arginine, and lysine are essential for max. growth and acid production, together with leucine or *iso*leucine. Tryptophan is essential only for *L. buchneri*. J. L. D.

Tryptophanase–indole reaction. IV. Production of tryptophanase by *E. coli*; effect of glucose and amino-acids on formation of tryptophanase. W. C. Evans, W. R. C. Handley, and F. C. Happold (*Biochem. J.*, 1941, **35**, 207—212).—Tryptophan is necessary for the production of the tryptophanase system by culture of *E. coli*, but if there is no indole formation in cultures containing glucose and tryptophan, there will be no enzyme system produced. Indole formation is completely inhibited by addition of gelatin to Fildes' medium but, of the amino-acids present in gelatin hydrolysates, only tyrosine and phenylalanine effect complete inhibition. This action, which is exerted only during the stage of cell division, does not take place with washed cells either in the presence or the absence of glucose. P. G. M.

Production of amines by bacteria. IV. Decarboxylation of amino-acids by organisms of *Clostridium* and *Proteus* groups. E. F. Gale [with G. L. Brown, F. C. MacIntosh, and P. B. White] (*Biochem. J.*, 1941, **35**, 66—80).—The p_H optima for the decarboxylases of histidine, ornithine, tyrosine, and glutamic acid are 2·5—3·0, 5·5, 5·0, and 4·0, respectively. All the *Clostridia* which possess decarboxylases are also strongly saccharolytic, but some (*e.g.*, *Cl. butyricum*) which are saccharolytic have no decarboxylase activity. The presence of fermentable carbohydrate stimulates the production of histidine decarboxylase by *Cl. welchii* etc., whilst 0·001M-$KMnO_4$ or chloramine T completely inhibits both decarboxylase activity and the fermentation of glucose. Concns. of less than 0·01M-CN′, -F′, -urea, etc. have no effect. Decarboxylation of glutamic acid by the *Clostridia* and *B. coli* invariably gives rise to γ-aminobutyric acid and not the α-amino-acid. The thermolability of the decarboxylases varies from organism to organism. *B. coli* differs from the *Clostridia* or *Proteus* in forming decarboxylases more actively at 27° than at 37°. Of 9 strains of *Proteus* tested, 7 decarboxylated glutamic acid and 3 ornithine. 60—70% yields of the respective amines were usually obtained with the *Clostridia*. No significant pathological effect is produced by absorption of histamine into the blood from infected tissue in cats infected with *Cl. welchii*, which in no case appears in the blood. P. G. M.

Hæmolysis and production of opalescence in serum and lecitho-vitellin by α-toxin of *Clostridium welchii*. R. G. Macfarlane, C. L. Oakley, and C. G. Anderson (*J. Path. Bact.*, 1941, **52**, 99—103).—The opalescence produced in human serum by *Cl. welchii* toxins is due to free fat released by the α-toxin from combination with protein in presence of ionised Ca. Lipoid material is similarly set free by α-toxin from lecitho-vitellin solutions. This reaction is more rapid, more sensitive, and more marked than the corresponding reaction with serum. Either human serum or lecitho-vitellin can be used as an indicator in toxin–antitoxin reactions; the vals. for the test dose of toxin and the unitage of antitoxin so obtained run parallel with those obtained in hæmolytic and lethal tests. C. J. C. B.

Estimation of the combining power of *Cl. welchii* (type *A*) toxoid. F. P. O. Nagler (*J. Path. Bact.*, 1941, **52**, 105—110).—An *in-vitro* method is described for estimating the combining power of *Cl. welchii* (type *A*) toxoid and alum-pptd. toxoid. Injections of alum-pptd. toxoid of known combining power were effective in stimulating antitoxin production in rabbits, but toxoid of similar combining power was relatively ineffective. C. J. C. B.

Nomenclature of gas-gangrene toxins. M. L. Smith (*Nature*, 1941, **147**, 87).—The English nomenclature in which the lethal factor is called *alpha*-toxin and the more hæmolytic factor *zeta*-toxin should be used. L. S. T.

Rapid diagnostic method for testing the virulence of corynebacteria. V. B. Dolgopol and H. T. Markus (*J. Lab. clin. Med.*, 1940, **26**, 553—556).—The bacterial suspensions for guinea-pig inoculation are prepared from colonies of corynebacteria cultured from the nose and throat swabs on blood agar–K tellurite plates. C. J. C. B.

Intranasal combined immunisation of rabbits with diphtheria and staphylococcal mixed toxoids. S. Sato and T. Kodama (*Kitasato Arch. exp. Med.*, 1940, **17**, 250—267).—Diphtheria antitoxin response following intranasal instillations with the mixture of diphtheria and staphylococcal toxoids was more pronounced than that with single diphtheria toxoid, whereas the staphylococcal antitoxin response remained unchanged.

With nasal instillations of mixed toxoids in rabbits no undue reaction was observed. C. J. C. B.

Influence of syphilis on resisting power [to diphtheria toxin]. M. Fujimori (*Jap. J. exp. Med.*, 1940, **18**, 117—130).—Rabbits show decreased resistance to diphtheria toxin when a testicular syphilitic tumour is induced. Guinea-pigs also show decreased resistance following intraperitoneal injection of syphilitic material. (10 photomicrographs.) C. J. C. B.

Nicotinic acid as growth factor for *H. pertussis*. J. W. Hornibrook (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 598—599).—Nicotinic acid (0·001 μg. per c.c.) can replace yeast as a growth factor for phase I *H. pertussis*. V. J. W.

Preparation and properties of *Hæmophilus pertussis* endotoxin. L. P. Strean and G. A. Grant (*Canad. Med. Assoc. J.*, 1940, **43**, 528—531).—The procedure adopted is repeated freezing and thawing, and subsequent extraction in the presence of conc. electrolyte, but omitting the prolonged grinding of the organisms. An endotoxic extract is produced, containing little bacterial antigen. C. J. C. B.

Complement fixation test in diagnosis of meningococcal meningitis. R. Cruickshank (*J. Path. Bact.*, 1941, **52**, 142—145).—The complement fixation test is a useful method for demonstrating antibodies in the blood of patients with meningococcal infection. During an epidemic the reaction is often positive in the 2nd week of infection in cases of cerebrospinal meningitis and perhaps earlier in cases of meningococcal septicæmia. C. J. C. B.

Simple apparatus for small-scale cultivation of bacteria requiring partial carbon dioxide atmosphere. J. B. Polding and W. Edwards (*J. Path. Bact.*, 1941, **52**, 145—147).—The apparatus consists of three parts, a "Sparklet" soda-water siphon, a displacement bottle, and a McIntosh and Fildes jar. C. J. C. B.

Preparation and properties of substrate of lysozyme. L. A. Epstein and E. Chain (*Brit. J. exp. Path.*, 1940, **21**, 339—355).—A high-mol. polysaccharide acted on by lysozyme has been isolated by fractional pptn. with alcohol and acetone of solutions of *M. lysodeikticus* in cold alkaline NaOCl or hot formamide. Lysozyme hydrolyses the polysaccharide over the range of p_H 2—9 with the liberation of a *N*-acetylated aminohexose and a substance giving all the reactions of a ketohexose. The polysaccharide is present in bacteria in an insol. form, possibly in a higher polymerised state or in combination with a protein resistant to pepsin. F. S.

Sputum studies in type III pneumonia. A. W. Frisch (*Amer. J. clin. Path.*, 1940, **10**, 873—881).—In 57 cases of type III pneumonia the amount of capsular substance produced rather than the no. of invading micro-organisms determined the outcome of the infection. C. J. C. B.

Electrophoresis of staphylococci. I. Factors affecting electrophoretic velocity. II. Correlation between electrophoretic velocity and biological characteristics. W. F. Verwey and M. Frobisher, jun. (*Amer. J. Hyg.*, 1940, **32**, B, 55—62, 63—68).—I. Effects of storage, heat, and p_H on electrophoretic velocities were investigated with 40 strains of staphylococci. The velocity of individual cells was sufficiently uniform to permit measurement by the technique employed. Characteristic velocities were only slightly affected by storage of the organisms, and heating reduced the mobility of some strains. The surfaces of certain strains were amphoteric while others were not. The data showed that electrophoretic velocity is a fairly const. strain characteristic.

II. Experiments with 84 strains of staphylococci showed that although their electrophoretic velocities formed a continuous series, most of the strains having velocities of 4·1 μ. per sec. per v. per cm. or lower produced coagulase and toxin, originated from pathogenic conditions, and to a smaller extent fermented mannitol, hæmolysed rabbit blood agar, produced pigment, and gave a positive reaction on Chapman crystal-violet. Strains having higher velocities were mainly negative to these reactions. The correlations of electrophoretic grouping with coagulase production, toxin production, and pathogenicity were 93%, 92%, and 93% respectively. Type-sp. precipitins could not be considered the essential feature determining the rate of electrophoretic mobility. B. C. H.

Laboratory procedures in staphylococcal food poisoning. R. J. Wilson (*Canad. Publ. Health J.*, 1940, **31**, 607—612).—It is proposed that the toxigenic properties, both qual. and quant., be utilised in the identification of individual strains of staphylococci. Some of the most readily assayed are the α-hæmolysin (rabbit erythrocyte lysin), β-hæmolysin (sheep erythrocyte lysin), the enterotoxin or food-poisoning substance, and the *Lh* dose, or the amount of filtrate required to neutralise 1·0 standard unit of staphylococcus antitoxin. The vals. obtained from these four tests may be used to compare and to establish the identity of strains of staphylococci under examination. C. G. W.

Typing of human hæmolytic streptococci and their relation to diseases and distribution on mucous membranes. R. Kobayashi (*Kitasato Arch. exp. Med.*, 1940, **17**, 218—241).—Typical β type of hæmolytic streptococcus can be classified into 3 types by the production of β type or α type of hæmolytic zones around the superficial as well as deep colonies in horse blood, glucose and horse blood, and sheep or goat blood agar media. Type I appeared to cause disease, type II were normal commensals of the mucous membranes, and type III was an enterococcus. C. J. C. B.

Suppurative polyarthritis (joint-ill) in lambs [rôle of streptococci]. F. Blakemore, S. D. Elliott, and J. Hart-Mercer (*J. Path. Bact.*, 1941, **52**, 57—83).—20 strains of α hæmolytic streptococci were recovered from lambs affected with suppurative polyarthritis. They formed chains of medium length, had low pathogenicity for mice, produced a final p_H of 4·4—4·9 in glucose broth, and failed to hydrolyse Na hippurate. The fermentation reactions were not const. Serologically the strains were related to group *C*, but treatment of the crude extracts with ethyl alcohol pptd. a protein substance sp. to the streptococci recovered from lambs. A sustained bacteræmia was induced in normal lambs by a single intravenous injection of α hæmolytic streptococci of the joint-ill type, but not by the injection of other α hæmolytic streptococci tested; the disease produced immune bodies against these organisms. Acute infective endocarditis was present in 6 out of 27 young lambs severely affected with streptococcal joint-ill. (12 photomicrographs.) C. J. C. B.

Precipitin reactions in rheumatoid arthritis. J. G. Bruce and M. Caswell (*J. Lab. clin. Med.*, 1940, **26**, 464—467.—The sera of 22 out of 32 cases of rheumatoid arthritis showed precipitins to *Streptococcus hæmolyticus* in high titre. Four of 15 cases of osteo-arthritis had a positive precipitin reaction, and none of 10 normal controls was positive. C. J. C. B.

Chemistry of scarlet fever toxin. E. S. G. Barron, G. F. Dick, and C. M. Lyman (*J. Biol. Chem.*, 1941, **137**, 267—282).—The sp. toxin (N 11·33, amino-N 1·04, carbohydrate 1·43—1·54, glucosamine 0·73%, P nil) of scarlet fever streptococci is readily water-sol., has mol. wt. between 4000 and 13,000, and isoelectric point p_H 5·55 at 3·5°. It is inactivated by keten, HNO_2, I (at p_H 7·02 and 4·63, not at 3·01), and porphyrindin but not by pepsin, trypsin, or substances which combine with thiol or thio groups. It is more stable in acid than in alkaline solution but is unaffected by large changes in p_H (1·08—11·01) and is very resistant to heat (not destroyed in 45 min. at 100°). Probably it is a non-conjugated protein containing amino-groups essential for its activity. It is freed from some nitrogenous impurities by electrophoresis. W. McC.

Experimental infection of guinea-pig with syphilis. M. Fujimori (*Jap. J. exp. Med.*, 1940, **18**, 131—135).—Following intraperineal inoculation of syphilitic rabbit testicle material into the male guinea-pig, a gangrenous ulcer appeared at the site of inoculation after the incubation period of 4 weeks and motile *Spirochæte pallida* was found in the lesion. Infection could be caused in series in the guinea-pigs. C. J. C. B.

Infectiousness of vaginal secretions and menstrual blood of syphilitic women. H. Pariser (*J. invest. Dermatol.*, 1940, **3**, 375—400).—Of 30 untreated syphilitic women examined, the vaginal secretions of 7 produced syphilis on injection into rabbits' testicles. Five of these 7 showed local cervical lesions. The duration of the clinical manifestations of disease in these instances varied from 1 week to 6½ years. The sixth "positive" result was obtained from the menstrual blood of a woman with secondary syphilis who had no local cervicovaginal lesions. C. J. C. B.

Comparison of Hinton, Kahn, Kline, and Mazzini tests for syphilis. E. L. Breazeale, R. A. Greene, and H. B. Harding

(*J. Lab. clin. Med.*, 1941, **26**, 637—642).—Since the Mazzini test is more sensitive than the Kline and Kahn diagnostic tests and the Hinton test, it gave a lower incidence of negative, and a higher incidence of positive, findings. The Kline, Kahn, Hinton, and Mazzini tests gave a relative agreement of 95·3% and an abs. agreement of 93·9%. C. J. C. B.

Purification of antigen for microscopic slide precipitation test for syphilis. B. S. Kline (*Amer. J. clin. Path.*, 1940, **10**, 853—857).—The technique used for removing water-sol. impurities is detailed. C. J. C. B.

Antigen pipette for Kline syphilitic test. E. S. Powell (*J. Lab. clin. Med.*, 1940, **26**, 562). C. J. C. B.

Combined immunisation with tetanus toxoid and T.A.B. I. H. Maclean and L. B. Holt (*Lancet*, 1940, **239**, 581—583).—Combined inoculation with tetanus toxoid and T.A.B. was given at an interval of 4 weeks between the 2 doses. The response to the T.A.B. antigens was as good as with an interval of 1 week and the serum concn. of tetanus antitoxin was 5 times that with the usual 4—6-week interval. Reactions were no greater than with T.A.B. alone. C. A. K.

Neuritis caused by tetanus immunisation. K. Mészáros (*Dtsch. Z. ges. gerichtl. Med.*, 1938—39, **30**, 45—49).—A case of radiculitis of the right 5th and 6th cervical nerve developing after injection of tetanus antitoxin for a wound of the right elbow and ushered in by serum sickness is described in which working capacity 2 years later was still diminished by 20%. E. M. J.

Specific and non-specific cell polysaccharides of an avian strain of tubercle bacillus. S. A. Karjala and M. Heidelberger (*J. Biol. Chem.*, 1941, **137**, 189—203).—The proportion of serologically active material in the polysaccharide of an avian strain, No. 531, of tubercle bacillus is intermediate between those of human (Heidelberger and Menzel, A., 1937, III, 183) and bovine (A., 1939, III, 334) strains though the total yield was lower. The sp. polysaccharides of all three types exhibit the same immunological specificities, activity being highest in fractions containing pentose. In avian types the portion corresponding to the *C* fraction of the other types is weakest. No sol., inactive, phosphorylated carbohydrate similar to that found in the bovine strain was detected. H. G. R.

Cutaneous reactions to tuberculin and histamine. A. Rouslacroix, J. Brahic-Veyron, and Capmana (*Compt. rend. Soc. Biol.*, 1940, **133**, 144—146).—Cutaneous reactions to tuberculin and histamine injections in the deltoid region and in the region of the first intercostal space corresponding to the area of the summit of the lung were studied bilaterally in 21 tubercular patients. Positive reactions to both types of injection were more frequent or intense in the intercostal regions. There was some degree of parallelism between the reactions to the two injections. P. C. W.

Value of fluorescence microscopy in detection of *B. tuberculosis*. J. W. Jung (*Dtsch. Tuberk.-Bl.*, 1940, **14**, 65—69).—*B. tuberculosis* was seen in the fluorescence microscope in 22·6% of Ziehl–Neelsen negative material (sputa, urines, and exudates). 3% of fluorescence microscopically negative material was proved positive by animal inoculation whereas animal experiment proved the absence of *B. tuberculosis* in 2 out of 30 cases found positive with the fluorescence microscope. E. M. J.

Agglutination reactions in blood and tissues after death. C. M. Cattabeni (*Dtsch. Z. ges. gerichtl. Med.*, 1938—39, **30**, 33—42).—Agglutination of *B. paratyphosus A* was detectable in high titre in the blood and organ extracts of infected rabbits 36 hr. after death. The extracts were prepared by first grinding the organs with sand. Serum titres were increased after the removal of globulins without giving rise to aspecific reactions. E. M. J.

Liquefaction of gelatin by *Bact. typhi flavum*. H. Anft (*Arch. Hyg.*, 1938—39, **121**, 319—330). M. K.

Purification of Vi-antigen of *B. typhosus*. H. Ogonuki (*Kitasato Arch. exp. Med.*, 1940, **17**, 268—272).—The Vi-antigen was highly purified by pptn. at the isoelectric point. C. J. C. B.

Virus diseases acquired from animals. S. P. Bedson (*Lancet*, 1940, **239**, 577—579).—A lecture. C. A. K.

Attempts to transmit poliomyelitis virus to rodents. J. F. Kessel and F. D. Stimpert (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 665—666).—All attempts to transmit a human virus to rodents failed, and it is suggested that the Armstrong virus is a rodent virus which has become adapted to the monkey. V. J. W.

Cytology of fox encephalitis and effects of centrifugation on intranuclear inclusions. A. M. Lucas (*Amer. J. Path.*, 1940, **16**, 739—760).—The life cycle of intranuclear inclusions produced by fox encephalitis virus is described in detail. C. J. C. B.

Experimental western equine encephalomyelitis. J. Zichis and H. J. Shaughnessy (*J. Amer. Med. Assoc.*, 1940, **115**, 1071—1078).—Hyperimmune rabbit serum was successfully used against western equine encephalomyelitis in mice 48 hr. after injection of the virus and in guinea-pigs after the onset of fever. A commercial horse serum was ineffective. C. A. K.

Experimental meningococcal meningo-encephalitis in mice. C. H. Andrewes and D. Lush (*J. Path. Bact.*, 1941, **52**, 85—90).—A strain of type III meningococcus was transmitted in series through the brains of mice and caused meningo-encephalitis which was often fatal. Meningeal infection did not occur when inoculations were made by routes other than the intracerebral. Some human and other sera neutralised the activity of infective brain suspensions when mixed with them and inoculated intracerebrally into mice; there was no correlation between this neutralising activity and agglutinin content. C. J. C. B.

Canine rabies vaccination. (A) Efficacy of a single intraperitoneal injection with phenol-treated vaccine. H. N. Johnson and C. N. Leach. **(B) Efficacy of a single subcutaneous injection with chloroform-treated vaccine.** C. N. Leach and H. N. Johnson (*Amer. J. Hyg.*, 1940, **32**, B, 69—73, 74—79).—(A) 52 dogs vaccinated intraperitoneally with a single 5-c.c. injection of phenol-treated canine rabies vaccine were inoculated with street virus; 36·5% died of rabies against 54% deaths of 63 controls. Of 105 dogs vaccinated subcutaneously with the same vaccine and similarly inoculated with street virus 24·8% died against 55% deaths out of 120 controls. 5 c.c. of phenol-treated vaccine confers a higher protection when injected subcutaneously than when intraperitoneally. The test virus was inoculated into the masseter muscle one month after vaccination.

(B) 50 dogs vaccinated by a single subcutaneous injection of 5 c.c. $CHCl_3$-treated rabies vaccine were inoculated intramuscularly with street virus; 4% died as against 61·8% of 55 controls. The $CHCl_3$-treated vaccine produced a significantly higher degree of protection than a similar amount of phenol-treated vaccine. B. C. H.

Artificial cultivation of vaccine virus. M. Okuwada (*Kitasato Arch. exp. Med.*, 1940, **17**, 203—217).—After repeated trials, cultures of vaccine virus were obtained, using Sukegawa's method. C. J. C. B.

Physical properties of alfalfa mosaic virus. M. A. Lauffer and A. F. Ross (*J. Amer. Chem. Soc.*, 1940, **62**, 3296—3300).—Sedimentation and electrophoresis indicate that this virus is essentially homogeneous but that frictional coeffs. and perhaps electrical charges are distributed about a nodal val. The sedimentation const. is $73·9 \pm 5·2 \times 10^{-13}$ cm. per sec. in unit field. The sp. vol. is 0·673. The solutions do not show double refraction of flow and, when centrifuged, give jelly-like pellets, which show no birefringence except that characteristic of the photo-electric effect. The particles are thus essentially spherical. On this basis the average diameter is 16·5 mμ. and the mol. wt. $2·1 \times 10^6$. The p_H-mobility curve in alkaline solution is determined. The isoelectric point is at p_H approx. 4·6. R. S. C.

Electrophoretic analysis of digested antitoxic sera. J. van der Scheer and R. W. G. Wyckoff (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 634—636).—30 min. peptic digestion causes disappearance of the "*T*" component which has developed in the serum during hyperimmunisation (A., 1940, III, 613). V. J. W.

Technique and comparative values of cross-agglutination methods: centrifuge, slide, and hanging-drop technique. N. W. Henry (*J. Lab. clin. Med.*, 1940, **26**, 557—559).—The centrifuge method and the open slide method have approx.

the same degree of sensitivity and both are superior to the hanging-drop method. C. J. C. B.

Accelerated tissue response to *Cysticercus pisiformis* in passively immunised rabbits. A. B. Leonard (*Amer. J. Hyg.*, 1940, **32**, D, 117—123).—60 rabbits were infected with *Taenia pisiformis*. 30 of these had been immunised 24 hr. previously, and 30 remained as controls. The infected livers of immunised rabbits showed an accelerated speed of tissue response resulting in firm encapsulation of the lesion by the 6th or 7th day. Fibrocytes, numerous by the 4th day, proliferated rapidly. There was no polymorphonuclear leucocyte phase of tissue reaction but large macrophages were mobilised around the larvæ. Developing larvæ were inhibited early and a greater percentage of deaths occurred amongst larvæ reaching the livers of immunised animals. B. C. H.

Loss of *Trichinella* larvæ fed to immune rats; mechanism of immunity. O. R. McCoy (*Amer. J. Hyg.*, 1940, **32**, D, 105—116).—Rats were made resistant to *Trichinella* larvæ by feeding 3 or more sublethal doses at monthly intervals. Test doses were fed to these rats and the animals were killed and examined at varying times after feeding. As compared with control rats, larvæ rapidly passed from the intestine and considerable nos. were found in the fæces even after 3 hr. Immunised rats rapidly developed diarrhœa and nearly all larvæ were eliminated 8—18 hr. after feeding. These larvæ were unaffected and capable of infecting normal animals. No change was noted in the intestinal wall of immune animals. Increased secretion of mucus and increased peristalsis appeared to account for rapid expulsion of larvæ from the intestine of resistant rats. The resistance appears to be mechanical and probably depends on sensitisation of the intestinal mucosa. B. C. H.

Anaphylaxis after tetanus toxoid. A. A. Cunningham (*Brit. Med. J.*, 1940, II, 522—523).—A case record. The reaction is probably due to sentisation to Witte's peptone present in the medium in which *Cl. tetani* was grown. C. A. K.

Local anaphylaxis after histaminase. S. S. Greenbaum (*J. Amer. Med. Assoc.*, 1940, **115**, 847).—In 2 cases injections of histaminase produced local urticaria. C. A. K.

Practical aspects of allergy. A. T. Henderson (*Canad. Med. Assoc. J.*, 1941, **44**, 33—38).—A lecture. C. J. C. B.

Histamine therapy in allergy. L. D. Porch (*J. Lab. clin. Med.*, 1940, **26**, 499—512).—8 patients with peptic ulcer syndromes + demonstrable ulcers were treated with a bland diet, supplemented by injections of histamine according to a desensitisation schedule, without alkali. Similar treatment was given in 3 other patients with similar symptom syndromes but without demonstrable evidence of ulcer. The ulcer patients experienced relief of symptoms in most instances following the fourth histamine injection, and enjoyed a fuller diet than the routine in similar cases and *X*-rays showed healing of the ulcer. There was a return of appetite and comfort in a cancer patient. C. J. C. B.

Significance of scratch test reactions to purified house dust extracts. B. G. Efron, C. H. Boatner, and M. R. Pabst (*J. invest. Dermat.*, 1940, **3**, 401—407).—Using 360 cases it was concluded that positive scratch tests with extracts of purified house dust are diagnostic of allergic disease attributable to house dust in 90±3% of instances. C. J. C. B.

Value of elimination diets in treatment of infantile eczema. A. R. Birt (*Canad. Med. Assoc. J.*, **43**, 521—525).—The diets used in the author's hospital are detailed. This method of diagnosis is considered valuable. C. J. C. B.

Purified extracts of ragweed pollen. C. H. Boatner, B. G. Efron, and M. R. Pabst (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 637—640).—Aq. extracts are fractionated by water-miscible org. liquids (dioxan), and the resultant products again purified by high concns. of sulphates which are later removed by dialysis. V. J. W.

XXVI.—PLANT PHYSIOLOGY.

Permeability of plant tissues to thiochrome. W. H. Schopfer (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 100—105; cf. A., 1940, III, 692).—Epidermal cells of *Cœlogyne cristata*, *Helleborus niger*, and *Funkia*, immersed in 10^{-4}M- or 5×10^{-3}M-thiochrome at p_H 7, do not exhibit high concns. of the dye. When the shoots of young plants, especially *Impatiens parviflora*, are immersed in the solution, at first only the xylem fluoresces in ultra-violet light, but after 12 hr. the entire hypocotyl, petiole, and cotyledons fluoresce. After some days the fluorescence disappears. Fragments of tissue absorb thiochrome to varying extents, depending on the plant species. *Saccharomyces cerevisiæ* and *Endomyces magnusii* do not absorb it. J. L. D.

Photosynthesis with radioactive carbon. II. Chemical properties of intermediates. S. Ruben, M. D. Kamen, and W. Z. Hassid. **III. Ultracentrifugation of intermediate products.** S. Ruben, M. D. Kamen, and L. H. Perry. **IV. Mol. wt. of intermediate products and tentative theory of photosynthesis.** S. Ruben and M. D. Kamen (*J. Amer. Chem. Soc.*, 1940, **62**, 3443—3450, 3450—3451, 3451—3455).—II. The light and dark assimilation of CO_2 previously reported for higher plants (A., 1939, III, 533) has been investigated with the alga, *Chlorella*. The rate of CO_2 reduction, using ^{11}C as the radioactive indicator, is identical with the rate given by the Warburg manometric method, indicating that almost all is photosynthesis. Light and dark CO_2 reductions show the same sensitivity to inhibitors as does normal photosynthesis. The dark assimilation is reversible and independent of the concn. of chlorophyll. The rate of photosynthesis for *C. pyrenoidosa* is greater than that for *C. vulgaris* as is the dark assimilation of CO_2. The water-sol. material formed in both light and dark contains at least one alcoholic hydroxyl and one carboxyl group but identification has proved unsuccessful. Almost all the CO_2 taken up in the dark is in the carboxyl groups but in the light these groups contain a smaller but appreciable amount of the reduced CO_2. Even with very short exposures, ^{11}C was not found in formaldehyde or other volatile substances.

III. The mean val. for the sedimentation velocity const. of radioactive mol(s). formed by *C. pyrenoidosa* in the light and dark is $7{\cdot}0 \times 10^{-14}$, about 4 times that of sucrose, indicating that the mol. wt. is approx. 4 times that of sucrose.

IV. The mol. wt. of the first detectable products formed by *C. pyrenoidosa* is approx. 1000. A tentative theory of photosynthesis is advanced. W. R. A.

Effect of neutrons on photosynthesis. Y. Nishina, H. Nakamura, and H. Nakayama (*Bull. Inst. Phys. Chem. Res. Japan*, 1940, **19**, 1343—1347).—The photosynthesis of *Chlorella ellipsoidea* and *Scenedesmus nanus* is markedly inhibited by neutron irradiation, but respiration is unaffected. Assuming the effect to be caused by recoil protons, produced by neutrons, calculation shows that the no. of chlorophyll mols. affected by one recoil proton is very large, and hence that some kind of chain reaction occurs. A. J. M.

Anti-sporulating action of sulphanilamide on algæ. F. Chodat and R. Olivet (*Arch. Sci. phys. nat.*, 1940, [v], **22**, *Suppl.*, 143—145).—Sulphanilamide inhibits the development of cultures of *Schizococcus* in a medium containing inorg. salts and glucose. The action is proportional to the concn. of the drug and consists of a reduction in the no. of spores and an increase in the no. of mother cells. J. L. D.

XXVII.—PLANT CONSTITUENTS.

Growth and ripening of banana. V. K. Leley, N. Narayana, and J. A. Daji (*J. Univ. Bombay*, 1940, **9**, Part 3, 180—200).—Changes are recorded in physical properties, contents of N, starch, sugars, and acid-hydrolysable matter, astringency, and acidity of the pulp and peel, and in the SiO_2, CaO, MgO, K_2O, P_2O_5, Cu, and Fe content of the whole fruit, of the *Basrai* banana during 120 days of growth, and in acidity and contents of H_2O, sugars, and alcohol-insol. matter in the pulp and peel, and in respiratory and catalase activity, of the *Rajapuri* banana during storage. A. Li.

Tissue proteins of cryptogams. Amide, tyrosine, and tryptophan contents. J. W. H. Lugg (*Biochem. J.*, 1940, **34**, 1549—1553).—The amide, tyrosine, and tryptophan contents of protein preps. of the photosensitising tissues of *Lunularia cruciata*, *Pteridium aquilinum*, and *Selaginella* species are 5·52, 2·43, and 1·70; 4·92—5·14, 2·06—2·20, and 1·13—1·19; and 5·31, 2·60, and 1·43% respectively of the protein-N. These vals. are of the same order as those for phanerogams previously examined. Corresponding vals. for leaves of *Tri-*

folium subterraneum are 5·29—5·39, 2·53—2·64, and 1·62—1·75, whilst the amide content of petiole protein is 5·91%. P. G. M.

Pigments of *Iris pseudacorus*. W. F. O'Connor and P. J. Drumm (*Nature*, 1941, **147**, 58—59).—The carotenoids present in *I. pseudacorus* have been resolved into 5 different fractions. β-Carotene is present, and from the mixture of other pigments, which are xanthophylls, violaxanthin and lutein have been isolated. Spectroscopic examination showed the presence of small amounts of zeaxanthin (?). A dark red, wax-like substance with absorption bands at 496, 465, and 436 mμ. (in CS_2) has also been isolated. L. S. T.

Palm oil carotenoids. I. Lipoid pigments from "Sherbro" palm oil. R. F. Hunter and A. D. Scott (*Biochem. J.*, 1941, **35**, 31—38).—When the oil is saponified at low temp. and the unsaponifiable matter is successively extracted with light petroleum and ether, the solvents being removed in an atm. of CO_2, chromatographic adsorption on Al_2O_3 and separation of adsorbed materials in CO_2 yields α-, m.p. 187·0—187·5° (uncorr.), $[\alpha]_D$ +640° in benzene, β-, m.p. 184·5° (uncorr.), and γ-carotene, lycopene, neolycopene, neolutein, a carotenoid absorbing light at a position intermediate between γ- and β-carotene, and, probably, neo-γ-carotene. The α- and β-carotene samples are probably purer than any so far obtained. In the biogenesis of carotenoids, lycopene and β- and γ-carotene are probably derived from the same intermediate complex, α-carotene being produced by subsequent asymmetric isomerisation of the β-compound. W. McC.

Alkaloids of *Aconitum thalassicum*.—See A, 1941, II, 111.

South African *Senecio* alkaloids.—See A., 1941, II, 110.

XXVIII.—APPARATUS AND ANALYTICAL METHODS.

New model mouse cage. R. L. Greene (*J. Lab. clin. Med.*, 1941, **26**, 701—702). C. J. C. B.

Operating board for small animals. R. John (*J. Physiol.*, 1941, **99**, 157—160).—A swivelling operating board, electrically heated, and with adequate space for instruments, is for use with rats and mice. An anæsthetic mask is described. J. A. C.

Integrating voltmeter for the study of nerve and muscle potentials. E. Jacobson (*Rev. Sci. Instr.*, 1940, **11**, 415—418).—A detailed description of the neurovoltmeter is given. D. F. R.

Inexpensive constant-temperature paraffin oven. R. E. Miller and R. P. Morehead (*J. Lab. clin. Med.*, 1940, **26**, 559). C. J. C. B.

Convenient turntable for staining jars. A. B. Leonard and A. E. Leonard (*J. Lab. clin. Med.*, 1940, **26**, 562). C. J. C. B.

Improved paraffin schedules for plant tissues. T. E. Rawlins and W. N. Takahashi (*Stain Tech.*, 1941, **16**, 7—8).—Methods of imbedding described cause less distortion than usual. In the first, the tissues after fixing and washing are impregnated with 10% aq. glycerin, and the water is slowly evaporated; the glycerin is then gradually replaced by *n*-butyl alcohol, which is in turn replaced by melted paraffin wax. In the second method, the tissue is impregnated as before with butyl alcohol, which is then replaced by cedar-wood oil, and in turn by melted paraffin wax. Details are given in full. E. E. H.

Section-smear method for plant cytology. H. E. Warmke (*Stain Tech.*, 1941, **16**, 9—12).—Root-tip material for chromosome investigation is killed in a fluid containing H_2CrO_4, washed, and imbedded in paraffin wax as usual. Sections are stained by a Feulgen technique, the hydrolysis being prolonged to 45 min., and the sections washed for 10 min. between the fuchsin and the SO_3'' treatment. Sections are finally mounted in thin Canada balsam, and local pressure is applied to the coverglass while under the microscope until the cells have separated and the chromosomes flattened. The prep. is permanent. E. E. H.

Making permanent mounts of portions of decolorised whole leaves. J. C. Bates (*Stain Tech.*, 1941, **16**, 38).—Decolorised leaves are dehydrated in alcohol, and passed through carbol-xylene to pure xylene. Portions are cut out and mounted under a coverslip in a drop of hyrax. E. E. H.

Staining bacteria and yeasts with acid dyes. W. E. Maneval (*Stain. Tech.*, 1941, **16**, 13—19).—Acid dyes such as acid-fuchsin and fast-green can be used advantageously instead of basic dyes for staining bacteria. Staining is rapid and differential, and debris and mucin stain lightly. The slides need little washing; the staining is permanent. Phenolic solutions of the dyes, acidified with acetic acid, and containing $FeCl_3$ are used. Details are given of concns. and staining methods for various purposes. E. E. H.

Reaction of certain stains with bacteria. T. M. McCalla (*Stain Tech.*, 1941, **16**, 27—32).—The reaction of stains with bacteria is an exchange reaction, the stain replacing similarly charged ions already adsorbed by the cell. E. E. H.

***p*-Aminodimethylaniline monohydrochloride as an indicator of microbial action on fats.** C. H. Castell (*Stain Tech.*, 1941, **16**, 33—36).—When fat globules are broken down by bacteria characteristic colour reactions are given with certain dyes which are oxidised by the acids formed; with the above dye shades of red, blue, and amber are obtained. A table is given of the colour reactions in fat globules inoculated with pure cultures of numerous bacterial species. E. E. H.

Use of solid carbon dioxide (dry ice) in the preparation of museum specimens. R. E. Bieren (*Arch. Path.*, 1940, **30**, 1240—1242). C. J. C. B.

Modern spectrography. F. Rohner (*Helv. med. Acta*, 1938, **5**, 268—283).—A review of spectrographic methods of investigation in medicine, chemistry, and pharmacy. M. K.

Determination of phenol-red with Evelyn colorimeter. H. Shay, J. Gershon-Cohen, F. L. Munro, and H. Spilet (*J. Lab. clin. Med.*, 1941, **26**, 732—733).—A modification of the Hollander method for determining phenol-red applicable to the Evelyn colorimeter is described. C. J. C. B.

Apparatus for the study of rapid chemical reactions.—See A., 1941, I, 131.

Recovery of carbon tetrachloride from tissue. I. Weber (*J. Lab. clin. Med.*, 1941, **26**, 719—722).—A low-temp., low-pressure distillation method for the recovery of CCl_4 after addition to tissue is described. C. J. C. B.

Apparatus for Van Slyke determination of amino-nitrogen.—See A., 1941, II, 80.

Nature of the Feulgen reaction with nucleic acid. (A) C. S. Semmens. (B) H. N. Barber and J. R. Price (*Nature*, 1940, **146**, 808).—(A) A reply to criticism (cf. A., 1940, III, 386). (B) A further comment. L. S. T.

Use of optical rotation in study of protein hydrolysis.—See A., 1941, II, 115.

Determination of tyrosine in protein hydrolysates.—See A., 1941, I, 115.

Separation of higher monoamino-acids by countercurrent, liquid–liquid extraction; amino-acid composition of wool.—See A., 1941, II, 88.

Labile sulphur. Use of thallous nitrate. H. Zahnd, R. Alfin, and M. Schneider (*Ind. Eng. Chem.* [*Anal.*], 1941, **13**, 44—45).—Aq. $TlNO_3$ is added to a solution of the material in boiling 20% NaOH; labile S is indicated qualitatively by darkening of the solution (Tl_2S). Determination of labile S is carried out by a similar method, the Tl_2S being separated, oxidised, and S determined as $BaSO_4$. J. D. R.

Electrophotometric determination of phosphorus by the method of Fiske and Subbarow. D. J. McCune and A. A. Weech (*Proc. Soc. Exp. Biol. Med.*, 1940, **45**, 559—562).—The blue colour of this method gradually increases in intensity for at least 72 hr., but transmission at λ 400—430 mμ. becomes const. after 30 min. so that accurate photometry is possible if light of this band is used. V. J. W.

Photometric determination of iron. R. S. Pereira (*J. Biol. Chem.*, 1941, **137**, 417—428).—Fe is determined colorimetrically using protocatechuic acid in alkaline solution. Ions normally found in biological materials do not interfere. The material is ashed with H_2SO_4, HNO_3, and $HClO_4$. R. L. E.