

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

MAY, 1944



A III—PHYSIOLOGY. BIOCHEMISTRY. ANATOMY

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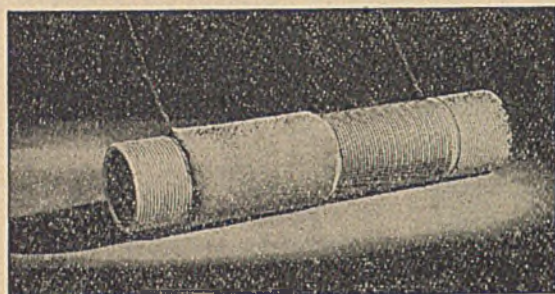
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I.—GENERAL ANATOMY AND MORPHOLOGY.

Recent advances in vascular anatomy. E. Ludwig (*Schweiz. med. Wschr.*, 1943, 73, 413—415).—A lecture. A. S.

Function of fin in teleosts. V. V. Vasnetzov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 503—506).—Fins, paired and unpaired, act as lateral or ventral rudders but maintenance of equilibrium of fish is achieved without their help. J. D. B.

Constitutional peculiarities of muscular system of various types of Karakal sheep. R. M. Schachunianz (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 499—502). J. D. B.

Experimental analysis of growth pattern and rates of appositional and longitudinal growth in rat femur. L. J. Aries (*Surg. Gynec. Obstet.*, 1941, 72, 679—689).—The femurs of 62 rats aged 10—305 days were examined macro- and microscopically in cross- and longitudinal section. The rats had been injected intraperitoneally with 2% alizarin-red S solution at frequent intervals. Longitudinal growth of long bones proceeds by superposition of serial cones in the diaphyseal portion of the shaft, the epiphyseal plate forming the base of the cone. The periosteum deposits bones on the circumference of the shaft but does not contribute to longitudinal growth. The distal end of the femur grows faster than the proximal end. Both longitudinal growth and growth in width decelerate with increasing age. Growth of the Haversian system occurs on the surfaces of the vascular canals; the diameter of the canals during appositional growth decreases with age. The form of the bone is compared with that of engineering supports. P. C. W.

Mobilisation and deposition of bone-calcium by electrolysis. C. W. Walter and K. K. Van Slyke (*Surgery*, 1941, 10, 145—146).—When 1.5 v. were applied for 3 days to the femur of a rabbit through subperiosteally placed Pt ring electrodes, the bone-Ca was mobilised from under the anode and was deposited over this electrode in a thin layer. When bone removed from the body was similarly treated only the mobilisation of Ca occurred. There was no reaction around the cathode. G. P.

Autogenous cartilage grafts. F. Young (*Surgery*, 1941, 10, 7—20).—Autogenous rib cartilage transplanted into the abdominal wall of dogs remained living without change of size or wt. for 1½ years. Calcification and bone and bone marrow formation occurred in the old transplants. Finely chopped pieces of autogenous rib cartilage, scattered over the fascia of rectus abdominis in dogs, became fused into a solid sheet of cartilage-like material. G. P.

Accuracy of roentgen estimates of pelvic and fetal diameters. A. L. Dippel and E. Delfs (*Surg. Gynec. Obstet.*, 1941, 72, 915—922).—A comparative study of different methods and crit. analysis. P. C. W.

Congenital malformations induced in rats by maternal nutritional deficiency; cleft palate. J. Warkany, R. C. Nelson, and E. Schrafenberger (*Amer. J. Dis. Child.*, 1943, 65, 882—894).—Cleft palate was produced by maternal nutritional deficiency in strains of animals which were free of these malformations under adequate nutritional conditions (cf. A., 1942, III, 913). C. J. C. B.

Prolapsus uteri associated with spina bifida and clubfoot in newborn infant. R. Torpin and C. M. Burpee (*Amer. J. Dis. Child.*, 1943, 66, 627).—A case report. C. J. C. B.

Double uterus, vagina, and rectum. W. E. Ladd and T. C. Chisholm (*Amer. J. Dis. Child.*, 1943, 66, 629—634).—A case report. C. J. C. B.

Rare anomaly of penis (diphallus) associated with imperforate anus. W. J. Cochrane and R. L. de C. H. Saunders (*J. Urology*, 1942, 47, 810—817).—Case report with suggestions on aetiology. J. D. B.

Exstrophy of urinary bladder in twins. C. C. Higgins (*Cleveland Clin. Quart.*, 1943, 10, 138—141).—The twin boys were born with 1 placenta and 2 umbilical cords. The testes were descended in both cases and normal. A. S.

Hernia of stomach through right side of diaphragm. F. L. H. W. Laws (*Canad. Med. Assoc. J.*, 1944, 50, 62—63).—A case report. C. J. C. B.

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Duplication of hypophysis in 10-mm. pig embryo. J. O. McCall (*Anal. Rec.*, 1943, 87, 215—219).—The specimen exhibited duplication of two parts—the diencephalic floor and the hypophysis. The anterior neuropore, normally closed at this stage, was patent. It is considered that during development the infundibulum became divided, producing duplication of the pars neuralis. There was a persisting adherence of surface ectoderm to the neural tube over a limited median area. The latter was previously divided, with the resulting duplication of the pars neuralis, and thus a doubling of Rathke's pouch followed. W. F. H.

Process of absorption of terminations of pulmonary veins into heart in mammals and man. V. N. Shedenov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 494—498).—A description of the development of the pulmonary veins in relation to the establishment of the definitive left atrium in a no. of mammals. A discussion is added on the development of the left atrium in lower vertebrates. J. D. B.

Circulation in shark embryo. F. J. Brinley (*Lloydia*, 1941, 4, 57—64).—A developmental study of the heart and principal blood vessels in the embryo of the nurse-shark. L. G. G. W.

Development of fish heart; brown trout (*Salmo fario*) and Northern pike (*Esox lucius*). F. J. Brinley (*Lloydia*, 1940, 3, 145—156).—A study of the development of the heart to see if any morphological or histological changes accompany the ingrowth of the cardiac nerves in these two fishes. In the trout embryo a short time after circulation is established all blood from the yolk enters the heart through the left vitelline vein, which after all the yolk is consumed becomes the hepatic vein. For neither fish was any evidence obtained of changes in heart development accompanying nerve ingrowth. L. G. G. W.

Reversal of medulla in *Amblystoma* embryos. S. R. Detwiler (*J. Exp. Zool.*, 1943, 94, 169—180).—Antero-posterior reversal of the medulla was carried out in embryos of stage 23 and the embryos were then joined laterally to normal embryos of the same stage; the operated embryos are unable to feed and they fail to progress unless this fusion is effected. The reversed medulla develops as an essentially normal structure in that the presumptive small caudal end becomes the large anterior end, and vice versa, and there is also an adjustment towards the normal of cellular proliferation. The ganglionic masses on the free aspect of the medulla are as well developed as in the normal embryo; on the fused aspect the ganglia are reduced in both components owing to the reduction in the peripheral somatic areas. The otic vesicles develop as reversed structures. Mauthner's neurones are either absent or show defective development of the axones. H. L. H. G.

Neurulation in *Amblystoma*. A. S. Burt (*Biol. Bull.*, 1943, 85, 103—115).—The cellular changes in normally neurulating embryos are compared with those in embryos whose neurulation has been inhibited by LiCl, by hypertonic Ringer's solution, and by appropriately directed mechanical pressure. Neurulation is autonomous to the medullary plate and is accompanied, and perhaps aided, by mitotic activity. The mechanism of neurulation is discussed. G. P. W.

Relative significance of outer and inner layer of neural plate in formation of neural tube in *Anura*. T. Detlaf (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 180—183).—Transplant experiments (*Rana temporaria*—*R. esculenta*, *Bufo vulgaris*—*R. esculenta*, *R. temporaria*—*Pelobates*) are described which appear to demonstrate that the outer layer of the neural plate in *Anura* gives origin to the neuroglia while the inner layer produces the neuroblasts. It is concluded that these two components of the central nervous system are "determined" early in development. J. D. B.

Implants consisting of young buds, formed in anterior regeneration in *Clymenella*, plus the nerve cord of the adjacent old part. L. P. Sayles (*J. Exp. Zool.*, 1943, 94, 145—159).—Buds resulting from the implantation of tissues from the anterior end of *C. torquata* into posterior segments of hosts of the same species show only tail features. If regeneration of anterior tissues is allowed to take place *in situ* and

then the regenerated tissue and the neighbouring nerve cord is transplanted into posterior segments, young heads may appear in the buds; if regeneration has lasted for more than 6 days before transplantation these head features are retained; if less than 6 days the head features, after forming, gradually regress and a tail bud is formed.
H. L. H. G.

Regeneration of *Eisenia fetida*. E. Liebmman (*J. Morph.*, 1943, 73, 583—610).—Regeneration is determined by the chloragogue (lymphotrophic) system. Two kinds of eleocytic bodies are found, (1) a head body which is permanent and is instrumental in head regeneration, (2) a tail body which is not normally present but is formed from the chloragogue system during regeneration of the posterior part of the body. These bodies differ in structure but both are functionally polarised and each seems to be sp. in its function. The head bodies are unaffected by sexual activity, starvation, etc., and correspondingly the rate of head regeneration is independent of these conditions, whereas in tail regeneration such conditions reduce the no. of eleocytes available to form the tail body and the rate of tail regeneration is decreased. The head regeneration gradient is thus determined by the extent of the head body, the tail gradient by the extent of chloragogue tissue available to form the tail body. The eleocytic bodies perform integrating, regulating, and formative functions.
H. L. H. G.

Life history and chromosome cycle of *Adelina deronis*. T. S. Hauschka (*J. Morph.*, 1943, 73, 529—582).—This coecidian is parasitic in the coelomic mesoderm of the oligochaete *Dero limosa*. Schizogony is normally self-limited to 2 generations, the first of which shows no sexual differentiation, while the second produces male and female gametocytes; each generation matures in 3—4 days, a complete life cycle lasting 18 days. The only diploid nucleus in the life cycle is found in the synkarion stage, and the haploid chromosome no. (10) is re-established by the first division of the zygote. In contrast to schizogony, karyokinesis is not synchronous during sporogony; the determination of primary sex difference probably occurs during zygotic meiosis.
H. L. H. G.

Sex determination in aphids. C. A. Lawson (*Biol. Bull.*, 1943, 85, 60—68).—In parthenogenetic female aphids, the sizes of the germaria and of the nurse-cell nuclei are related to the type of embryo being produced (*i.e.*, whether males, parthenogenetic females, or gamic females).
G. P. W.

Studies of quadruplets. I. C. Gardner and H. H. Newman (*J. Hered.*, 1943, 34, 259—263).—A record of the physical and mental characteristics of the Morlok "one-egg" quadruplets at 10 years.
L. G. G. W.

Genetic resistance to deficiency of riboflavin in chick. W. F. Lamoreux and F. B. Hutt (*Genetics*, 1943, 28, 79—80).—Strains of White Leghorn fowls relatively resistant in the chick stage to riboflavin deficiency have been developed.
L. G. G. W.

Influence of previous history of species on its subsequent evolution. J. M. Olenov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 157—160).—A discussion based on *Drosophila* data.
J. D. B.

Individual differences in inbred rats. L. Loeb, H. D. King, and H. T. Blumenthal (*Biol. Bull.*, 1943, 84, 1—12).—In the course of long series of brother-sister matings, in two strains of albino rats, a gradual increase in homozygosity was shown by lessening severity of the reactions of animals against transplants from others of the same strain. Even after 102 generations, however, a completely homozygous condition had not yet been attained.
G. P. W.

Heredity and influence of environmental factors on optical activity of biological material. G. F. Gause (*Biodynamica*, 1940, 3, 105—123).—Mainly a review.
L. G. G. W.

Variations in chromosome number in somatic tissues of cat. S. A. Pletnev (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 491—493).—Chromosome counts of between 32 and 65 were found in cells from different somatic tissues in the cat.
J. D. B.

Genetics of Wensleydale breed of sheep. III. Arithmetical aspects of selection. F. W. Dry (*J. Genet.*, 1943, 45, 265—268).—The numerical aspects of selection from a simple heterozygote and selection for a fancy point (blue complexion) as considered from the livestock breeding angle are discussed.
W. F. H.

Incompatibility sieve for producing polyploids. D. Lewis (*J. Genet.*, 1943, 45, 261—264).—In fruit trees, heat-shocks applied to the pollen mother cells, followed by self-pollination, is effective in producing triploids. The method is dependent on the sieve-like action of incompatibility on pollen, allowing only diploid pollen tubes to reach the ovary. Since only pollen grains which carry two different S genes are compatible the heat-shock must be given before these genes segregate. By this method triploids were produced from diploid pears. The treatment temp. varied between 40° and 46°, and the duration of treatment from 20 min. to 2 hr.
W. F. H.

Polygenes affecting manifestation of scute in *Drosophila melanogaster*. G. M. L. Haskell (*J. Genet.*, 1943, 45, 269—276).—The gene scute in *D. melanogaster* reduces the no. of abdominal chaetae but the precise no. of chaetae on a scute fly is subject to polygenic

control. The mean no. of chaetae on scute males, after back-crossing, did not parallel the mean no. of chaetae on non-scuta brothers. Thus the polygenes affecting the manifestation of scute are not the same, and they do not have the same action as those operating in non-scuta flies. There is some evidence that some of the polygenes affect both scute and non-scuta phenotypes.
W. F. H.

III.—PHYSICAL ANTHROPOLOGY.

Physical measurements and serology of people of Sharqiya (Egypt). A. Ammar (*J. Roy. Anth. Inst.*, 1940, 70, 147—170).—In the north, hair and skin colours are lighter, the head tends to be broader and higher, the face longer and broader, and stature on the whole greater. There is an east to west gradation in eye colour, in most cranial measurements, and in blood groups. The distribution of blood group frequencies gives a picture of the degree and distribution of Arab influence in Sharqiya. In general O is higher and B lower wherever Arab influence is strong. Bedouins give a high frequency of O and a very low frequency of B.
W. F. H.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Larval maxillary glands of *Euphausia superba*. M. V. Schorstein (*Proc. Roy. Soc. Edin.*, 1943, 61, 375—384).—The larva possess a pair of typical maxillary segmental excretory organs, each composed of an end sac, sphincter valve, duct, and exit tube. The histological characters of the gland and the sphincter valve are described. The duct is a syncytium containing 10 nuclei and is an intermediate type between the paucicellular and multicellular forms.
W. F. H.

Changes in vascular pattern of ovary of albino rat during oestrous cycle. D. L. Bassett (*Amer. J. Anat.*, 1943, 73, 251—291).—The vascularity of follicles consists of an inner capillary plexus in the theca interna supplied by branches from an outer plexus in the theca externa. Following rupture of a follicle, the granulosa is invaded by vascular sprouts from the inner capillary plexus. Capillaries of this plexus which grow into the corpus luteum become transformed into typical sinusoids about 24 hr. after the onset of heat. In 48 hr. radially oriented sinusoids traverse the luteinised granulosa. 72 hr. after the onset of heat the corpus luteum is well supplied with a dense network of sinusoidal capillaries and differentiation of arterial and venous channels from enlarged radial sinusoids has occurred. As a rule only one large venule drains outwards from the central portion of the corpus luteum into the veins of the theca externa. The behaviour of the vascular pattern during the stages of regression is described.
W. F. H.

[Influence of thyroxine on] mitotic activity of heart cells of chick embryo cultivated *in vitro* at different ages. A. F. Ivanitzkaja (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 818—819).—The mitotic coeff. of heart cells grown in plasma from thyroidectomised animals is lower than that of cells grown in normal plasma.
J. D. B.

Histological demonstration of ascorbic acid. S. A. Barnett and R. B. Fisher (*J. exp. Biol.*, 1943, 20, 14—15).—The whereabouts of ascorbic acid within the cell cannot safely be inferred from the site of the Ag ppts. obtained by the AgNO₃ method.
G. P. W.

Microscopical demonstration of zymohexase [in muscle]. R. J. L. Allen and G. H. Bourne (*J. exp. Biol.*, 1943, 20, 61—64).—Zymohexase can be demonstrated microscopically by incubating sections with a mixture containing Na hexose diphosphate, MgCl₂, NH₄Cl, and aq. NH₃, and then treating with CoCl₂ and NH₄ sulphide. The enzyme is diffused more or less uniformly through the cells in skeletal heart, and smooth muscle.
G. P. W.

Preparation of nucleo-histone from mammalian organs and direct demonstration of its nuclear origin. A. W. Pollister and A. E. Mirsky (*Genetics*, 1942, 27, 160—161).—A nucleoprotein isolated from liver, kidney, and spleen contains 3.8% of P, all in the form of deoxyribonucleic acid. The protein is a histone, sol. in 0.2M- and 1.0M-NaCl but insol. in 0.14M-NaCl. The prep. in M-NaCl (but not in 0.2M-NaCl) is viscous and shows birefringence. It has an absorption band at 2540 Å. Up to 1/3 of the deoxyribonucleic acid of liver cells has been isolated in the form of this histone. Treatment of sections of frozen liver with aq. NaCl shows that the cell nuclei respond to NaCl treatment just as the isolated histone does.
L. G. G. W.

Nucleoproteins of chromosomes. A. E. Mirsky and A. W. Pollister (*Genetics*, 1943, 28, 82—83).—Histone is an almost universal nuclear constituent. Nucleoproteins from the chromosomes of mature sperm, immature gonads, erythrocytes, and liver of *Salmo salar* and *S. fario* show differences in the nature of the basic proteins.
L. G. G. W.

Rapid staining method for Gram-positive and Gram-negative organisms in frozen and paraffin sections. A. A. Krajian (*J. Lab.*

clin. Med., 1943, 28, 1602—1605).—Frozen sections are mounted, stained for 3 min. with alkaline methylene-blue, washed in tap water, dehydrated with 3 applications of anhyd. isopropanol or abs. alcohol, and differentiated rapidly with cresote-xylene; the liquid is poured off and cresote-fuchsin applied; after blotting cresote-xylene is applied 2 or 3 times, agitating the slide constantly for even decolorisation or until most of the excess of red colour leaves the section; the slide is blotted, cleared for 2 min. in xylene, and mounted in gum dammar. Paraffin sections are deparaffinised with 2 applications of xylene and 2 applications of abs. alcohol or isopropanol, brought down to tap-water, and then treated by the method described. With the use of this method, nuclei are red, Gram-positive organisms blue, Gram-negative organisms red, devitalised Gram-positive organisms red, monilias and actinomyces blue, Negri bodies bright red with bluish chromatin bodies, and fibrin sometimes blue and sometimes red. All staining solutions are stable. C. J. C. B.

Hæmalum-aurantia-aniline-blue. A general purpose staining method. A. Marshall and O. A. Trowell (*J. Physiol.*, 1943, 102, 9f).—The dye stains nuclei dark brown, muscle cytoplasm golden-yellow, epithelial cytoplasm pale purplish-brown, collagen dark blue, elastic laminae (e.g., arteries) bright yellow, and red blood cells bright orange. W. H. N.

V.—BLOOD AND LYMPH.

Physiology of hæmatopoietic system in infants and young children, including blood picture at birth and in young infants. P. Lee (*J. Pediat.*, 1943, 23, 676—679).—A review. C. J. C. B.

Oval blood cells in human subjects tested for linkage with taste for phenylthiocarbamide, mid-digital hair, hair colour, A-B agglutinogens, and sex. B. S. Burks and H. Wyandt (*Genetics*, 1941, 26, 223—233).—A study of families characterised by the appearance of oval blood cells shows a possible linkage between this character and the A-B agglutinogens but little evidence for other linkages. L. G. G. W.

Erythropoietic substance in serum of anæmic animals. N. Krumdieck (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 14—17).—Serum from rabbits rendered anæmic by bleeding caused on injection into normal rabbits an increased reticulocyte count which was max. on the 3rd day after injection. There was no change in red-cell count or hæmoglobin. V. J. W.

Specific stimulators of hæmatopoiesis from beef liver. D. L. Turner and F. R. Miller (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 177—179).—The substances previously described (A., 1943, III, 625) in urine of leukæmic patients are also present in the acid fraction of lipins from normal ox liver. They cause proliferation of myeloid or lymphoid cells in guinea-pigs. V. J. W.

Depression of experimental polycythæmia by stomach, U.S.P.; presence of choline in stomach, U.S.P. J. E. Davis (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 193—195).—In dogs made polycythæmic by administration of CoCl_2 or pituitary extract, daily doses of 10 g. of "ventriculin" (Parke Davis) reduced the red-cell count. The effect is attributed to the presence of choline (cf. A., 1940, III, 281). V. J. W.

Effect of ephedrine sulphate on red-cell count of man. A. M. Harris and J. E. Davis (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 195—196).—Daily administration of 50 mg. of ephedrine sulphate caused a rise in red-cell count of about 500,000 per cu. mm. in 7 normal men within 3 weeks. The count returned to normal in the 4th week in spite of continued ephedrine administration. V. J. W.

Constituents in red blood cells of value in wound healing. S. Caspe (*Amer. J. Pharm.*, 1943, 115, 461—463).—In a short review it is pointed out that red cells contain glutathione, creatine, and allantoin, all substances helpful to tissue growth. The application of red cells to wounds is suggested. C. J. C. B.

Experiments on blood regeneration and their significance for life span of erythrocytes. H. S. Baar (*Arch. Dis. Childh.*, 1943, 18, 65—87).—A curve representing the rise of hæmoglobin or of red blood cells does not indicate the real regeneration but is the result of two factors, the formation (release from the bone marrow) of red blood cells and their destruction. These two factors were separated in experimental anæmia by calculating the real regeneration or the daily hæmoglobin intake from the no. of reticulocytes and their maturation time determined *in vitro* or *in vivo*, and estimating the destruction, subtracting the observed rise of hæmoglobin from the intake determined in this way. Anæmia was produced by subcutaneous injection of phenylhydrazine hydrochloride in rabbits and guinea-pigs. Full details of the procedure and the calculations are given. The shape of the hæmoglobin regeneration curves is characteristic and indicates that the "master reaction" determining the blood regeneration and hæmoglobin intake under these experimental conditions is an autocatalysed reversible reaction, and is determined by the multiplication of nucleated cells in the bone marrow. C. J. C. B.

Effect of different sodium chloride concentrations on nuclei from chicken erythrocytes. M. Laskowski and D. L. Ryerson (*Arch. Biochem.*, 1943, 3, 227—233).—When chicken erythrocyte nuclei are treated with 2—10% or 0.8—0.05% aq. NaCl the nuclear contents gradually dissolve in the aq. solution. The nuclei do not dissolve completely and the nuclear framework remains undissolved. These nuclei do not appear to possess a selectively permeable membrane. When tissue is extracted with physiological saline only traces of nuclear constituents dissolve, but higher or lower concns. of NaCl cause loss of nuclear material. J. N. A.

Sickle cell disease with special regard to its non-anæmic variety. J. Bauer and L. J. Fisher (*Arch. Surg., Chicago*, 1943, 47, 553—563). F. S.

Pernicious anæmia in negroes. S. O. Schwartz and M. Gore (*Arch. intern. Med.*, 1943, 72, 782—785).—Pernicious anæmia in negroes occurs at the rate of 36 per 100,000 hospital admissions, contrasting with the rate of 170 per 100,000 in Caucasians. The incidence was somewhat higher in negro females than in males. C. J. C. B.

Anæmia in gastric carcinoma. J. P. Currie (*Glasgow med. J.*, 1943, 21, 41—46).—Hæmatological (including marrow) findings in 25 cases of gastric carcinoma. G. H. B.

Deficiency and dys hæmatopoietic anæmias of infancy and childhood. R. R. Kracke and W. R. Platt (*J. Pediat.*, 1943, 23, 691—713).—A review. C. J. C. B.

Pyridoxine deficiency in swine, with particular reference to anæmia. Biochemical defect in nicotinic acid deficiency. II. Nature of the anæmia.—See A., 1944, III, 270.

Induced polycythæmia in salamander by cobalt, ascorbic acid, and other water-soluble vitamins. Y. T. Chang, J. M. Chen, and T. Shen (*Arch. Biochem.*, 1943, 3, 235—239).—Intraperitoneal injection of 0.2 c.c. of 0.1% ascorbic acid or 0.005% CoCl_2 daily for approx. 30 days into female salamanders increases the no. of erythrocytes, and their rate of formation in the spleen. The precursors of the erythrocytes are reproduced by amitosis and not by mitosis. A similar effect is probably produced in males. The other water-sol. vitamins may induce polycythæmia in the salamander. J. N. A.

Comparison of erythrocyte-protoporphyrin concentration with reticulocyte percentage under experimental and clinical conditions. C. J. Watson, M. Grinstein, and V. Hawkinson (*J. clin. Invest.*, 1944, 33, 69—79).—In rabbits suffering from acute phenylhydrazine anæmia, the curves of reticulocyte % and erythrocyte-protoporphyrin content follow each other closely. The cryst. protoporphyrin isolated from the erythrocytes was ætioporphyrin III. In pernicious anæmia patients, the erythrocyte-protoporphyrin curves usually reached their peaks some time after the max. reticulocyte %. This delayed rise is not correlated with the relative age of the reticulocytes, as determined by the amount of substantia reticulofilamentosa. The first reticulocytes appearing after liver therapy may be derived from megaloblasts and contain less porphyrin than those derived from normoblasts and entering the circulation later. Correlation was not observed between the reticulocyte % and erythrocyte-protoporphyrin content in other diseases. Increased erythrocyte-protoporphyrin was observed in post-hæmorrhagic, Fe-deficiency anæmias, in hæmolytic anæmias, and in certain toxic states. The vals. in untreated pernicious anæmia were within the normal range. Sterile incubation of various blood samples for 24—48 hr. increased the erythrocyte-protoporphyrin in spite of a decreasing reticulocyte %. Erythrocyte-protoporphyrin may be formed *in vivo* from hæmoglobin, under certain circumstances. At least 3 factors account for erythrocyte-protoporphyrin: normoblastic activity in the bone marrow; Fe deficiency or interference in utilisation of Fe in hæmoglobin synthesis; and hæmoglobin degradation in intact red blood cells. C. J. C. B.

Muslim blood groups with particular reference to United Provinces [of India]. D. N. Majumdar (*Current Sci.*, 1943, 12, 269—270).—There is a larger % of O and a lower % of B blood groups among Muslims of U.P. (especially Shias) as compared with other Muslims. C. J. C. B.

Blood typing and criteria for blood-typing serums. W. Thalhimer (*J. Pediat.*, 1943, 23, 714—720).—A summary. C. J. C. B.

Pathogenesis of erythroblastosis foetalis. P. Levine (*J. Pediat.*, 1943, 23, 656—675).—A review. C. J. C. B.

Heredity and distribution of Rh blood types. A. S. Wiener, E. B. Sonn, and R. B. Belkin (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 238—240).—The distribution of different Rh types differs widely in white, Chinese, and negro populations, whereas other blood groups have an approx. similar distribution throughout. V. J. W.

Genetic theory of Rh blood types. A. S. Wiener (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 316—319; see preceding abstract).—There are 3 anti-Rh agglutinins, anti-Rh, anti-Rh₁, and anti-Rh₂. Human sera containing anti-Rh and -Rh₁ are called anti-Rh'; those containing anti-Rh and -Rh₂ are called anti-Rh''. There are therefore

5 varieties of agglutinogens, *Rh*, *Rh₁*, *Rh₂*, *Rh'*, and *Rh''*, which give 8 blood types of which 7 have been found. It is suggested that the heredity of these types depends on 6 allelic genes. (Cf. A., 1944, III, 94.) V. J. W.

Diseases of blood in infants and young children, including hæmorrhagic states. H. G. Poncher (*J. Pediat.*, 1943, 23, 680—690).—A review. C. J. C. B.

Amino-acids in hæmoglobin formation. F. S. Robschey-Robbins (*Fed. Proc.*, 1942, 1, 219—224).—None of the 15 amino-acids identified in globin is more potent than another in promoting hæmoglobin formation, even those (leucine, isoleucine, lysine, and histidine) that make up 45% of the total. Oral administration of a casein digest to dogs results in production of both hæmoglobin and plasma-protein, but a protein-free basal ration containing 11 pure amino-acids is ineffective. P. G. M.

Capillary permeability to intravenously administered gelatin.—See A., 1944, III, 242.

***o*-Benzoic sulphinide (saccharin) ferridehæmoglobin.** R. D. Barnard (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 146—148).—Many hydro-acids (e.g., HCNO, fulminic acid, HF) form complex compounds (ferridehæmogloins) with methæmoglobin (ferrihæmoglobin) but not with parahæmatin. Saccharin behaves similarly. L. L. W.

Reaction of hæmoglobin with nitrite. L. A. Greenberg, D. Lester, and H. W. Haggard (*J. Biol. Chem.*, 1943, 151, 665—673).—1 mol. of NO_2^+ reacts *in vitro* with 2 mols. of hæmoglobin to form 2 mols. of methæmoglobin, these vals. being unaffected by temp., $[\text{NO}_2^+]$, or pH. The reaction is rapid and complete in acid solution, but in neutral or slightly alkaline solution is slow and the rate depends on $[\text{NO}_2^+]$. The amount of methæmoglobin formed *in vivo* per mol. of NO_2^+ utilised cannot be determined but is probably the same. H. G. R.

Verdohæmochromogens. I. R. Havemann (*Biochem. Z.*, 1941, 308, 1—9).—Hæmoglobin (1 mol.) with H_2O_2 (3 mols.) in presence of KCN gives verdohæmoglobin (1 mol.), the conversion being due to oxidation of two of the $\cdot\text{CH}_2\cdot$ linkings to a $\cdot\text{CH}_2\cdot$ linking and two $\cdot\text{OH}$ groups. The globin moiety is unchanged. A new verdohæmochromogen [absorption spectrum (max. in red at 620 μ .) unchanged by CO or reduction] is formed by the action of H_2O_2 on hæmoglobin in presence of slight excess of NaNO_2 . F. O. H.

Specific colour reaction of cyanamide and ferrihæm. Mechanism of action of certain tissue poisons. R. D. Barnard (*J. Amer. Pharm. Assoc.*, 1944, 33, 24—28).— $\text{CN}\cdot\text{NH}_2$ combines with methæmoglobin to form a compound analogous to methæmoglobin cyanide, with ferrihæm to form a cyanamide ferrihæmochromogen cyanamide, and with other ferrihæmochromogens to form the corresponding ferridehæm (nomenclature of Pauling and Coryell, A., 1936, 616, 867). $\text{CN}\cdot\text{NH}_2$ and its salts may be detected by their colour reaction with cetylpyridinium ferrihæmochromogen. $\text{CN}\cdot\text{NH}_2$ is without effect on the normal blood pigments. The mechanism of tissue asphyxiation by ferridehæm formers, based on their physical and chemical properties, is discussed. Certain members of the vitamin-B group probably owe their physiological properties to their ability to co-ordinate with ferrihæm. F. O. H.

Nuclein-like action on white blood cells of ether-insoluble fraction of lipins from beef brains. E. H. Tompkins (*Johns Hopkins Hosp. Bull.*, 1943, 72, 347—370).—Intravenous injections of rabbits with the ether-insol. fraction of brain-lipins (protagon) had the same effect on white blood cells and bone marrow as injections of Na nucleate. Neutropenia within $\frac{1}{2}$ hr. was followed by neutrocytosis 1—4 hr. after injection. Decrease in lymphocytes and monocytes continued until 11—12 hr. and then returned to normal in 24 hr. Repeated injections of brain-lipins resulted in sustained leucocytosis and increased polymorphonuclears and lymphocytes and in myeloid hyperplasia of the marrow. The intensity of reaction to individual injection of a series decreased as the duration of injections increased, but was unaccompanied by indications of change in myeloid activity or sustained leucocytosis. T. F. D.

Hodgkin's disease: incidence, distribution, nature, and significance of lymphogranulomatous lesions in bone marrow. P. E. Steiner (*Arch. Path.*, 1943, 36, 627—637).—A review with original data. Lymphogranulomatous foci in one or more sections of various bones were found in 11 of 14 consecutive cases of Hodgkin's disease. The lymphogranulomatous foci were found in 38 of the 62 sections examined. C. J. C. B.

Mechanism of fever production with inflammation. V. Menkin (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 184—186).—Intravenous injection of "necrosin" (A., 1944, III, 97) causes a rise of temp. of up to 3° F. in dogs, reaching a max. about 5 hr. after injection. V. J. W.

Pathology of lymph nodes: diagnosis and prognosis. N. A. Murray and A. C. Broders (*Amer. J. clin. Path.*, 1943, 13, 450—463).—From a study of 479 lymph glands from normal, inflammatory, and malignant conditions, it was found that germ centres may be absent occasionally from non-inflammatory, non-neoplastic lymph

nodes; various types of giant cells may occur in non-inflammatory, non-neoplastic lymph nodes; mitotic figures may occur outside the germ centres in non-inflammatory, non-neoplastic lymph nodes; invasion of the capsule of a lymph node by mature lymphocytes bears no definite relation to any malignant process; lymph cords may be present or absent in either malignant or non-malignant lymph nodes. The increasing loss of structure (disappearance of follicles, cords, and sinuses, flowing together of cords and follicles, and the proliferation of a single cell type) points strongly away from a benign lesion and towards a malignant lesion, and genuine pathological mitotic figures almost certainly signify malignancy. In the diagnosis or grading of primary malignancy in the lymph nodes, all of the criteria enter into a quant. relationship, and the presence or absence of any isolated structure is not in itself sufficient evidence for diagnosis or grading. C. J. C. B.

Serial sedimentin indices in pulmonary tuberculosis. G. Day (*Lancet*, 1943, 245, 99—102).—Serial sedimentin indices appeared to reflect the clinical course in 6 cases of pulmonary tuberculosis. C. A. K.

Concentration and drying of serum for intravenous use. M. Bick (*Med. J. Austral.*, 1943, II, 227—229).—The serum-proteins were pptd. by alcohol and ether after concn. of the serum in Cellophane casings. The resulting product was finely divided and readily sol. The reconstituted dried serum had the same protein concn. and serum titre or group-sp. reducing power as the original serum. F. S.

Plasma volume of dogs in dehydration, with and without salt loss. J. Hopper, jun., J. R. Elkington, and A. W. Winkler (*J. clin. Invest.*, 1944, 33, 111—117).—In dogs changes in plasma vol. parallel those in extracellular fluid vol. only under certain limited conditions. Depletion of extracellular salt and water results in a more severe circulatory embarrassment than can be attributed to the diminution in extracellular fluid vol. alone. C. J. C. B.

Relationship of blood platelets to mechanism of hæmostasis. G. Reid (*Med. J. Austral.*, 1943, II, 244—246).—When blood platelets break down they release a vasoconstrictor substance, thrombocytin, which produces hæmostasis of arterioles and larger vessels. Patients suffering from thrombocytopenia yield serum with only feeble vasoconstrictor activity, but there is no evidence that the vasoconstrictor substance from platelets causes capillary constriction. The blood platelets of a case of athrombocytopenic purpura did not differ from ordinary platelets in the liberation of thrombocytin. F. S.

[Effect of] rectal administration of dicumarol [on blood-clotting time]. O. O. Meyer and M. Spooner (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 88).—Rectal administration of dicumarol by suppository or in aq. suspension caused prolongation of blood-clotting time in 4 out of 36 patients. V. J. W.

Kephalin, protamine, and antithromboplastic activity of normal and hæmophilic plasmas. L. M. Tocantins (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 94—97).—Normal human plasma reduces the blood-clotting activity of brain extracts by acting on the kephalin moiety of the thromboplastic lipoprotein. Hæmophilic plasma has a greater effect than normal plasma, and resembles plasma to which protamine has been added. V. J. W.

Prothrombin time in hypertensives with special reference to cerebral accidents. E. de Savitch and C. Jenkins (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 214).—In hypertensive subjects no difference in prothrombin was found between those who had cerebral accidents and those who had not. V. J. W.

Multiple myeloma with liver infiltration and low prothrombin purpura.—See A., 1944, III, 257.

Infarction of liver and hypoprothrombinæmia.—See A., 1944, III, 256.

Recent studies of factors involved in blood coagulation and of vitamin-K. S. Freeman and F. S. Grodins (*Internat. Abst. Surg.*, May, 1941, 417—444).—A review with 204 references. P. C. W.

Hæmorrhagic sweet clover disease. XII. Effect of *l*-ascorbic acid on the hypoprothrombinæmia induced by 3:3'-methylenebis-(4-hydroxycoumarin) in guinea-pigs. W. R. Sullivan, E. O. Gangstad, and K. P. Link (*J. Biol. Chem.*, 1943, 151, 477—485; cf. A., 1943, III, 227).—The duration and extent of hypoprothrombinæmia induced in guinea-pigs by 3:3'-methylenebis-(4-hydroxycoumarin) are increased in scurvy. Repeated doses, but not a single 100-mg. dose, of ascorbic acid prevented the hypoprothrombinæmia. Deficiency or excess of ascorbic acid did not affect the prothrombin time of 12.5% plasma but the clotting time of whole plasma is increased in scurvy. R. L. E.

Gravity shock in rabbits. I. Lack of correlation between plasma-protein and -specific gravity. W. H. Cole, J. B. Allison, and A. A. Boyden (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 215—216).—In normal rabbits plasma-protein is proportional to sp. gr. In rabbits which have been held up by the ears until they become unconscious correlation is very low, protein being usually less than the sp. gr. would indicate. V. J. W.

Chemical composition of human blood-proteins. III. Globin. P. Bálint and M. Bálint (*Biochem. Z.*, 1941, **308**, 83—87; cf. A., 1943, III, 789).—Analysis of globin from blood of 37 persons, chiefly diseased (no fevers or anæmia), showed that the tyrosine, tryptophan, cystine, arginine, and histidine contents of the globin are not affected by disease. The min. mol. wt. of the globin, calc. by the method of Bergmann and Niemann (A., 1937, III, 168), is 34,500. W. McC.

Plasma-proteins in disseminated lupus erythematosus. A. F. Coburn and D. H. Moore (*Johns Hopkins Hosp. Bull.*, 1943, **73**, 196—214).—Hyperglobulinæmia is a const. characteristic of the lupus state. Electrophoretic analysis shows that the increase in globulin is mainly in the γ -fraction, which may react *in vitro* with phospholipin giving false positive Wassermann and Kline tests. The vascular lesions and disturbances in nutrition observed in this disease may be associated with the presence of a high concn. of circulating γ -globulin. T. F. D.

Disturbances in water and electrolyte balance. J. L. Davidson (*J. Amer. Vet. Med. Assoc.*, 1943, **103**, 160—161).—A note on hæmoconcn. resulting from loss of fluid from the body by fever, vomiting, diarrhoea, or hæmorrhage. E. G. W.

Transfers of intracellular potassium in experimental dehydration. J. R. Elkinton and A. W. Winkler (*J. clin. Invest.*, 1944, **33**, 93—101).—Loss of intracellular K in excess of that associated with protein catabolism is a general response to water depletion from any cause. Loss of intracellular water accompanied this loss of excess K with the result that the loss of extracellular water is minimised. Renal activity is essential to effect this loss of K. Hypertonicity of the body fluids is a favourable but not an essential condition for this response. C. J. C. B.

Experimental hypertonicity: alterations in the distribution of body-water, and the cause of death. A. W. Winkler, J. R. Elkinton, J. Hopper, jun., and H. E. Hoff (*J. clin. Invest.*, 1944, **33**, 103—109).—Dogs may be killed by the introduction of sufficient NaCl into the body, provided the total body-water is unchanged; there is an increase in the vol. of the extracellular fluid with a comparable decrease in the intracellular fluid vol.; both phases become hypertonic. The cardiovascular system is unaffected; the e.c.g. is little changed; plasma vol. and renal function are well maintained. Death results from respiratory failure owing, it is suggested, to dehydration affecting the cells of the respiratory centres. There is no evidence for the existence of a crit. lethal concn. of either Na or Cl. C. J. C. B.

Urea is not equally distributed between the water of blood cells and plasma. J. O. Ralls (*J. Biol. Chem.*, 1943, **151**, 529—541).—The average distribution ratio for urea between the water of blood cells and that of the plasma, based on 66 blood samples from individuals in the post-absorptive state, is 1.14. The difference from 1 is not due to "arginase error," nor is it accounted for by considering only free, instead of total, water content. During active urea production after a meal, the ratio tends to be slightly less than 1. E. C. W.

Lowering of blood-uric acid by uricase injections. E. H. Oppenheimer and H. G. Kunkel (*Johns Hopkins Hosp. Bull.*, 1943, **73**, 40—53).—Single intramuscular injections of sterile filtered pigs' liver uricase solutions into chickens, made "gouty" by a high-protein diet, caused a continued lowering of plasma-uric acid even though maintained on the same "gout"-producing diet. Daily administration of uricase prevents plasma-uric acid level from rising to a "gouty" level in chickens simultaneously fed a "gout"-producing diet. T. F. D.

Circulation of plasma-phospholipins, and transport to thoracic duct lymph. W. O. Reinhardt, M. C. Fishler, and I. L. Chaikoff (*J. Biol. Chem.*, 1944, **152**, 79—82).—Radiophospholipin injected intravenously in dogs can be detected in the lymph within 37 min., and 9—20% appears within 3—6 hr. P. G. M.

Physical theory of acid anion displacement [in blood] and recovery following exercise. M. F. Morales and N. W. Shock (*J. Gen. Physiol.*, 1944, **27**, 155—165).—A simple theoretical model which simulates the variation in HCO_3^- concn. in blood after exercise is presented. Methods for evaluation of the consts. of rational equations to describe the concn., in muscle cells, plasma, and removal cells, of the anions produced in exercise are devised. When applied to data from 23 experiments close agreement between observed and predicted vals. for plasma is found. From mathematical analysis of the data, vals. for permeability of anions produced during exercise are estimated as 75×10^{-3} and 5.9×10^{-5} cm. per sec. between muscle cell and blood (extracellular fluid), and between plasma and removal cells, respectively. J. N. A.

Behaviour of blood-pyruvic acid *in vitro*, and its estimation in normal adults. L. Golberg and T. Gillman (*S. Afr. J. Med. Sci.*, 1943, **8**, 117—128).—Blood-pyruvic acid was estimated by the method of Lu (A., 1939, III, 540) with slight modifications. Stasis or clenching of the fist did not alter the normal vals. Blood-pyruvic acid returns to normal $1\frac{1}{2}$ —2 hr. after light exercise. By adding Na

iodoacetate and K oxalate in a concn. of 0.5% of each the blood can be kept at room temp. for 60 min. with little rise in pyruvic acid content. Tungstic and trichloroacetic acids are equally effective as protein precipitants though the former is recommended so that it is possible to eliminate interference caused by acetoacetic acid in the blood. The normal blood-pyruvic acid was 0.79 ± 0.19 mg. per 100 g. in 83 men and 0.85 ± 0.19 mg. per 100 g. in 23 women. P. C. W.

Osmotic pressure of "defatted" human serum. G. Popják and E. F. McCarthy (*Biochem. J.*, 1943, **37**, 702—705).—Extraction of serum by ether after freezing removes practically all the cholesterol, $\frac{2}{3}$ of the phospholipins and neutral fat, and some globulin. The extracted serum has a higher osmotic pressure per g. of protein, due to the increased albumin-globulin ratio. The lipins removed do not themselves affect the osmotic pressure of the proteins. R. L. E.

Spectrographic determination of lead in blood. A. Tracy and J. McPheat (*Biochem. J.*, 1943, **37**, 683—686; cf. C., 1944, Part 2).—The blood of most normal subjects not exposed to Pb contains 20—60 μg . of Pb per 100 ml. (full range 5—120, mean 40 μg . per 100 ml.). There are frequent wide variations in concn., partly due to dietary Pb. Some Pb is excreted in the urine. Pb is transmitted to infants through the maternal blood and milk. R. L. E.

Blood choline-esterase value of patients with glaucoma.—See A., 1944, III, 248.

Variations of plasma-vitamin-A after administration of large doses of vitamin-A in liver disease.—See A., 1944, III, 257.

Carotene content of the blood plasma of dairy cattle in relation to vitamin-A deficiency. Relation between hepatic and plasma concentrations of vitamin-A in man.—See A., 1944, III, 267.

VI.—VASCULAR SYSTEM.

Assimilation of carbon dioxide by isolated mammalian heart. V. Lorber, A. Hemingway, and A. O. Nier (*J. Biol. Chem.*, 1943, **151**, 647—650).—The C of CO_2 is fixed in tissue-glycogen by completely isolated, working, mammalian cardiac muscle and it is concluded that the glycogen is constantly being broken down and reconstituted. H. G. R.

Mechanical response of isolated mammalian heart in anoxia. V. Lorber and G. T. Evans (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 1—4).—In the isolated cat's heart, reduction of O_2 tension of perfusing blood caused dilatation and reduced output when tension reached 10—15 mm. Hg. If CO_2 was absent output was sometimes increased, this being associated with the rise in pH. V. J. W.

Action of adrenaline, acetylcholine, and potassium in relation to innervation of isolated auricle of spiny dogfish (*Squalus acanthias*). E. P. Hiatt (*Amer. J. Physiol.*, 1943, **139**, 45—48; cf. Lutz, *Biol. Bull.*, 1930, **59**, 211).—Adrenaline (1/2000—1/100,000) caused a temporary inhibition of the isolated sinus auricle of the dogfish followed by a stimulation. Dil. adrenaline solutions, however, caused only stimulation without change in rate. As these effects are not blocked by atropine the action is not on the vagus endings but directly on the myocardial cells. Dogfish auricle is more resistant to acetylcholine in the absence of an inhibitor of choline-esterase than the auricles of frog and turtle hearts but reacts to acetylcholine after prostigmine in the same manner and with the same sensitivity as do other vertebrate auricles. The inhibitory actions of acetylcholine and the depression of auricular beat due to K excess are markedly antagonised by adrenaline (1/1,000,000). T. F. D.

Direct current dielectrograph for recording movements of heart. N. R. Joseph (*J. clin. Invest.*, 1944 **33**, 25—28).—A d.c. amplifier for recording electrical capacitance changes is described. It is shown theoretically that capacitance varies directly as the dielectric const. and the vol., and that the p.d. across the condenser plates varies inversely with the capacitance. Owing to many complicating factors, the results have only qual. and empirical significance. C. J. C. B.

Cardiovascular manifestations in pernicious anæmia. J. B. Carter and E. F. Traut (*Arch. intern. Med.*, 1943, **72**, 757—766).—Cardiovascular manifestations were found in 257 of 300 cases of pernicious anæmia. All the usual criteria of cardiovascular disease may occur solely as the result of anæmia. Cardiovascular manifestations often occur with hæmatological decompensation and disappear after treatment or during a remission. The literature is reviewed. C. J. C. B.

Electrocardiographic changes associated with thiamin deficiency in pigs. M. M. Wintrobe, P. Alcayaga, S. Humphreys, and R. H. Folliis, jun. (*Johns Hopkins Hosp. Bull.*, 1943, **73**, 169—195).—E.c.g. changes caused by vitamin-B₁ lack in the pig are probably an expression of the disturbance in metabolism. They include bradycardia and prolonged P-R interval as well as second degree auriculo-ventricular block, abnormalities in P waves, inversion of T₄, nodal and ventricular premature beats, auriculo-ventricular dissociation, complete block with ectopic ventricular rhythm, and auricular

fibrillation. The bradycardia, attributable more to the $-B_1$ lack than to inanition, may be due to vagal overaction. T. F. D.

Acquired bicuspid aortic valve with obliteration of commissural raphe. S. Koletsky (*Arch. Path.*, 1943, 36, 602—607).—4 cases are reported of rheumatic origin. C. J. C. B.

Pathogenesis of paroxysmal tachycardia. R. F. Öhnell (*Naturwiss.*, 1943, 31, 248—249).—A patient suffering from paroxysmal tachycardia showed, between the attacks, a shortened P-R interval and a broadened and deformed QRS complex. Postmortem examination showed a band of muscle fibres (approx. 50) of 0.5 cm. length which ran from the left auricle into the left ventricle. 4 members of the patient's family suffered from paroxysmal tachycardia. A. S.

Quantitative measurements of cerebral blood flow in macaque monkey. R. R. Dumke and C. F. Schmidt (*Amer. J. Physiol.*, 1943, 138, 421—431).—The vol. of blood flowing through the internal carotid arteries into the brain of rhesus monkeys under nembutal anesthesia, measured with a "bubble" flowmeter, averaged 0.60 c.c. per g. per min.; the total cerebral flow, including that through the basilar artery, is 0.86 c.c. Stimulation of the cervical sympathetic had no significant effect (except in 1 experiment) on the cerebral flow. Anoxia increased the flow more strikingly than hypercapnia; breathing pure O_2 decreased the blood flow. Intracarotid injection of small doses of adrenaline or benzedrine produced marked diminution; caffeine, theophylline, histamine, and mecholyl increased the flow; ergotamine and posterior pituitary extract caused a decrease in cerebral flow and arterial blood pressure. On intravenous injection adrenaline increased the flow as the blood pressure rose; when the pressure fell the cerebral flow diminished at the same or a faster rate (producing a subnormal flow). Caffeine and theophylline sometimes increased the flow although the blood pressure decreased; nitroglycerin or insulin had no direct action on cerebral flow. There was considerable variation in the part contributed by each when the flow through the basilar and the internal carotid arteries was measured simultaneously (the ratios varied from 26 to 80%). Flow through each system increased when the other was closed, with great individual variations. A. S.

Apparatus for prevention of postoperative circulatory stagnation. H. D. Cogswell and C. A. Thomas (*Surgery*, 1941, 10, 323—325).—Bicycle pedals are fixed to the bed for exercise of legs. G. P.

Factors influencing ability to counteract gravitational interference with circulation in rabbit. A. Locke, R. B. Locke, and A. P. McIlroy (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 113—117).—Resistance to gravitational shock (cf. A., 1943, III, 331) is impaired by hæmorrhage, lack of NaCl, inaction, infection, $NaNO_2$, and slightly by sulphanilamide. It is increased by paredrine, ephedrine, coramine, ascorbic acid, thyroid, and activity. $NaNO_2$ impairment is antagonised by paredrine or benzedrine but not by coramine. Impairment by hæmorrhage is lessened by large (300 mg.) intravenous doses of Na ascorbate. V. J. W.

Study of factors (emotional) responsible for changes in the pattern of spontaneous rhythmic fluctuations in volume of vascular bed of finger tip. C. Neumann, W. T. Lhamon, A. E. Cohn, and C. Galati (*J. clin. Invest.*, 1944, 33, 1—9).—Spontaneous variations in the vol. of the finger tips are classifiable in 3 major types: a combination of small alpha waves with large pulse waves (type IA); small alpha waves with small pulse waves (type IB); and alpha waves with varying size of pulse waves (type IIIC). Type IA records were obtained only from subjects in a state fully relaxed and contented. Type IB occurred when anxiety was dominant. With less anxiety or with elation or resentment, type IIIC records were obtained. With depression, no uniform alpha-pulse wave pattern was observed. Slight resentment or slight anxiety or a combination of various emotions, none of which was dominant, occurred with intermediate types of records. C. J. C. B.

Observations on ætiology of vasomotor disturbances [arterial spasm] following peripheral nerve section. L. N. Atlas (*Surgery*, 1941, 10, 318—322). G. P.

Splenoportal venous obstruction without splenomegaly. P. Ravenna (*Arch. intern. Med.*, 1943, 72, 786—794).—In 12 consecutive instances in which portal obstruction was independent of splenic disease, the spleen was not larger than normal and in 3 it was smaller. This agrees with the observations that the experimental ligation of the splenic vein produces not enlargement but atrophy of the spleen and that chronic passive hyperæmia due to cardiac failure does not cause marked enlargement of the spleen and often induces its atrophy. Passive hyperæmia alone is thus not sufficient for the production of chronic splenic enlargement: obstruction of the portal venous circulation in cases of fibrocongestive splenomegaly represents not the cause but a complication of the splenic disease. C. J. C. B.

Effect of carbon arc irradiation and adrenal cortical preparations on capillary permeability. J. S. Graham (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 101—102).—Rabbits were abdominally shaved and

irradiated for 30—40 min. 4 hr. later they received intravenously 8—10 c.c. of 1% trypan-blue, and 2 hr. later were killed. The skin and viscera were stained very much more deeply than those of controls. The effect was abolished by previous injection of 10 mg. of deoxycorticosterone acetate or 5 c.c. of cortin. (Cf. Menkin, A., 1943, III, 322.) V. J. W.

Angiotonin myotropism. F. F. Yonkman, R. Jeremias, and D. Stilwell (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 204—206).—Angiotonin has no effect on salivary secretion or the pupil. Its pressor effect, unlike that of adrenaline, is not abolished by ethylalohimine, and it causes no fall of blood pressure in small doses. V. J. W.

Renin substrate and angiotonase in dogs' lymph and plasma. M. Friedman, W. Marx, and E. Lindner (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 221—223).—Renin substrate (hypertensinogen) is present in equal concn. in cervical lymph and blood plasma, but lymph contains less angiotonase (hypertensinase) than plasma. V. J. W.

Water metabolism [polyuria] in hypertensive rats. K. A. Oster and O. Martinez (*J. Exp. Med.*, 1943, 78, 477—487).—The water intake of rats made hypertensive by renal ischæmia increased by 75% above the preoperative level, associated with polyuria. Removal of the normal kidney aggravated, that of the ischæmic kidney abolished or mitigated, the symptoms. Polyuria is a primary sequel of ischæmia. A. S.

Eclampsia and postecclampsic hypertension. L. C. Chesley and W. H. Somers (*Surg. Gynec. Obstet.*, 1941, 72, 872—888).—A follow-up study of 187 cases, with an analysis of factors affecting the remote prognosis. P. C. W.

Hypertension in only one of identical twins. M. Friedman and J. S. Kasanin (*Arch. intern. Med.*, 1943, 72, 767—774).—Only 1 of a pair of identical twins had hypertension and coronary artery disease. The renal blood flow was found to be similarly reduced in both twins and the glomerular filtration rates also were similar. E.c.g. of the patient showed evidence of myocardial damage while his brother was normal. C. J. C. B.

Treatment of angina pectoris and peripheral vascular disease with sex hormones. G. F. Strong and A. W. Wallace (*Canad. Med. Assoc. J.*, 1944, 50, 30—33).—20 cases of angina were treated with sex hormones, either perandren (25 mg.) or di-ovocylin (5 mg.), by injection for 12 days at 4—5-day intervals. 3 showed no improvement, 6 showed marked improvement, and 11 showed slight to moderate improvement. Of 4 cases of peripheral vascular disease treated, 3 showed slight improvement. C. J. C. B.

Clinical manifestations and results of treatment of twenty-two patients with Raynaud's symptoms. C. A. Johnson (*Surg. Gynec. Obstet.*, 1941, 72, 889—907).—Raynaud's disease is not a separate clinical entity, and its peripheral manifestations are the symptoms of some more fundamental disease. In a series of 22 patients sympathectomy was a failure but medical management gave relief in some patients. P. C. W.

Venous circulation in lower extremities in pregnancy. J. R. Veal and H. H. Hussey (*Surg. Gynec. Obstet.*, 1941, 72, 841—848).—Popliteal venous pressures were recorded during exercise. The results agree with the assumption that postural dependent œdema and varicose veins in pregnant women are due to localised obstructions in the deep veins. The size and position of the uterus are factors affecting the incidence. P. C. W.

Pathology of experimental traumatic shock. J. E. Dunphy, J. G. Gibson, and J. L. Keeley (*Surg. Gynec. Obstet.*, 1941, 72, 823—833).—Shock was induced in dogs by burning the abdominal walls or hammering the hind legs. 4 hr. after such procedures there was a significant decrease in blood vol. and hæmoconcn. without any evidence of capillary injury or fluid loss from the viscera; these symptoms develop later. The initial hæmoconcn. and decreased blood vol. are attributed to fluid loss at the site of the trauma. Similar but much slighter late changes were produced by the anæsthetic (Na pentobarbital). P. C. W.

Biochemical findings in normal and trauma-resistant rats following trauma. A. H. Neufeld, C. G. Toby, and R. L. Noble (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 249—252).—In rats made resistant to trauma by gradual increase in no. of turns of the Noble-Collip apparatus, subsequent traumatization caused no increase in blood-non-protein-N or -pyruvic acid. They showed a smaller increase in blood-sugar and blood- and muscle-lactic acid, and no change in serum- $PO_4^{'''}$, which became doubled in control rats. Na, K, and glycogen vals. were similar in resistant and control animals. V. J. W.

VII.—RESPIRATION AND BLOOD GASES.

Relation of humoral and reflex factors in regulation of breathing. B. L. Kravtchinski (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, 39, 167—169).—Breathing in frogs is controlled by nervous impulses originating from chemoreceptors in the aorta. Section or treatment

with novocaine of the afferent nerves from this zone leads to cessation of breathing followed by progressive general inhibition of the central nervous system and death in 30—40 min. A. H. G.

Forms of inadequate ventilation in normal and emphysematous lungs, analysed by means of breathing pure oxygen. R. C. Darling, A. Cournand, D. W. Richards, jun., and B. Domanski (*J. clin. Invest.*, 1944, 33, 55—66).—The effectiveness of the process of mixture of inhaled tidal air with the air already present in the pulmonary spaces was studied by means of the analysis of the respiratory gases during the breathing of pure O_2 in normal subjects and in patients with pulmonary emphysema. If intrapulmonary mixing of air is perfect, then the concn. of N_2 in the lungs at the end of any given no. of breaths of pure O_2 can be calc. when the effective tidal air vol., functional residual air vol., initial "alveolar" (intrapulmonary) N_2 concn., and rate of washing out of the dissolved N_2 in the body are known. The formula describing this phenomenon has been derived. For normal subjects, the divergence between predicted and measured vals. was generally small; 4 out of 5 emphysema subjects showed markedly higher N_2 concns. in the lung than predicted, indicating a marked degree of unequal mixing.

C. J. C. B.

Emphysema of lungs. R. V. Christie (*Brit. Med. J.*, 1944, I, 105—108, 143—146).—In emphysematous lungs there is a decrease of vital capacity and an increase of residual air; the elasticity of the lungs is diminished and the intrapleural pressure even at the end of a full inspiration is not always negative; in severe cases the O_2 saturation of the blood is 80%, the CO_2 tension in arterial blood is 73—93 mm. Hg and in alveolar air 68—71 mm. Hg. The causes of the impaired hæmo-respiratory exchange, the physical signs, diagnosis, and treatment are discussed.

I. C.

Effects of low atmospheric pressures on activity of thyroid, reproductive system, and anterior pituitary of rat. A. S. Gordon, F. J. Torretta, S. A. D'Angelo, and H. A. Charipper (*Endocrinol.*, 1943, 33, 366—383).—Adult male rats subjected to continuous or discontinuous low atm. pressure (250—280 mm. Hg) for 14—20 days showed increases in adrenal wt. and decreases in the wt. of testes, seminal vesicles, thymus, prostate, and thyroid glands. Body wt. was diminished; pituitary wt. was unaffected. The decrease in testicular wt. was mainly due to degeneration of spermatid tissue. Injections of chorionic and serum-gonadotrophin caused stimulation of the interstitial testicular tissue, but no restoration of spermatogenesis, which is restored by similar treatment in hypophysectomised rats. The gonadotrophin content of the pituitary was reduced, the no. of basophil cells was increased, and castration cells then appeared. Thyroid activity was slightly reduced, as was the thyrotropin content of the blood. The thyrotropin content of the pituitary was unaffected. Similar but less marked changes were produced in the females.

P. C. W.

Blood studies on dogs subjected to discontinuous exposure to low oxygen tension. J. C. Stickney, D. W. Northup, and E. J. Van Liere (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 151—152).—In 5 dogs exposed for 8 hr. daily for 88 days to an O_2 tension of 80 mm. Hg red-cell fragility showed no change. Hæmoglobin increased by 53% and red-cell count by 67%. Blood sp. gr. rose from 1.0569 to 1.0719 and plasma-protein concn. fell by 9.7%.

V. J. W.

Comparison of survival to decompression in air and in oxygen. D. E. Stullken and W. A. Hiestand (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 260—261).—Mice can withstand a lower O_2 tension than chicks without dying, possibly because of their more rapid breathing.

V. J. W.

Drug prophylaxis against lethal effects of severe anoxia. VI. Neostigmine bromide and diphenylhydantoin. G. A. Emerson (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 252—254).—Diphenylhydantoin gives some protection against anoxia in mice as well as in rats. Some protection is also given by 0.1 mg. per kg. intraperitoneally, or 0.2 mg. per kg. orally, of neostigmine bromide, but larger doses are harmful, probably because they produce convulsions and salivation.

V. J. W.

Myocardial damage resulting from high oxygen tension. J. Kaunitz (*J. Aviat. Med.*, 1942, 13, 267—271).—Mice subjected to 1 atm. pressure of pure O_2 died after 3 days with bronchial obstruction, pulmonary atelectasis and oedema, visceral congestion, and myocardial degeneration. (2 photomicrographs.)

F. S.

Effects of exposure to oxygen at high pressure on higher functions of central nervous system. J. W. Bean and S. Wapner (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 134—135).—Exposure to pure O_2 at 65 lb. pressure for 16 periods of 15 min. over 10 days caused no difference in the learning of a maze by rats as compared with controls, but produced great impairment of the memory of a maze previously learnt.

V. J. W.

Carbon dioxide absorbers for anaesthesia. J. Adriani and E. A. Rovenstine (*Anesthesiology*, 1941, 2, 1—19).—An apparatus was devised which simulated breathing and in which the various factors during "rebreathing anaesthesia" could be experimentally controlled and their effect on the efficiency of soda-lime CO_2 absorbers determined. The efficiency of CO_2 absorption by soda-lime is the

same at 37° and at 28°. Optimum absorption is obtained when the tidal vol. of respiration is equal to the air space of the filled soda-lime canister. Wet and dry soda-limes have the same efficiency and granules of 4 × 8-mesh are the most satisfactory. The heat developing during CO_2 absorption does not alter the chemical composition of any of the present-day inhalation anaesthetics. There is no danger of infection from breathing through an infected soda-lime canister. The various conditions were studied with the "to and fro" and "circle" type of absorber; the former has certain advantages over the latter.

G. P.

Effect of oxygen deprivation on relation between stimulus intensity and latency of visual after-images.—See A., 1944, III, 249.

VIII.—MUSCLE.

Properties of muscle fibres subjected to vitrification by extremely rapid cooling. G. Thoennes (*Biodynamica*, 1940, 3, 145—156).—Muscle fibres from the frog's sartorius cooled rapidly to -195° in liquid air and rewarmed rapidly in Ringer's solution responded to electrical stimulation. If the warming was slow, response to the stimulation was rare. Untreated fibres given repeated stimulation fail to respond due to fatigue, from which they recover. When treated fibres fail to respond due to repeated stimulation they die.

L. G. G. W.

Protein of aqueous extracts of skeletal muscle. N. S. Drozdov, W. L. Minkovskaja, and N. P. Dreiling (*Biochem. Z.*, 1941, 308, 116—121; cf. Liu and Wu, A., 1934, 1018).—Water extracts approx. 20% of the total N, including approx. 13% of the protein-N, of minced ox muscle. The extracts so obtained closely resemble muscle press-juice. At $\pm 1^\circ$, methyl alcohol reversibly ppt. protein of the extracts, but at higher temp. denaturation occurs. Curves plotted from results of pptn. with methyl alcohol (10—90%) indicate the presence of two proteins. One, apparently identical with Weber Meyer's globulin X (A., 1933, 1318), contains 25% of the protein-N and is completely pptd. by 20—25% methyl alcohol; the other, probably myogen, requires 80% methyl alcohol for pptn.

W. McC.

Reversible conversion of myoglobin into cytochrome. H. Fischer and H. Gibian (*Biochem. Z.*, 1941, 308, 129).—Spectroscopic examination shows that pyridylhydrazine hydrate reduces the vinyl group of pyrrole pigments, and presumably also of ox hæmoglobin, to ethyl. This accounts for the 10-m μ . shift in the spectrum of myochromogen solutions observed by Bechtold and Pfeilsticker (A., 1944, III, 100) and attributed by them to conversion of myochromogen into cytochrome.

W. McC.

(A) Influence of ascorbic acid on contractions and incidence of fatigue of different types of muscles. N. M. Basu and P. Biswas. (B) Effect of vitamin-C on incidence of fatigue in human muscles. N. M. Basu and G. K. Ray (*Indian J. Med. Res.*, 1940, 28, 405—417, 419—426).—(A) The contractions of electrically stimulated frog's skeletal and cardiac muscle, and to a small degree of intestinal muscle, in Ringer's solution are stronger in presence of vitamin-C than without it, and the onset of fatigue is delayed. This effect is not due to change in pH.

(B) The onset of fatigue, measured by the fatigue curve of finger muscle, was delayed in 3 persons when they were saturated with -C.

S. E. M.

Oxygen consumption of regenerating skeletal muscle. B. Lazere and H. M. Hinks (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 41—42).— O_2 consumption *in vitro* of the rat's soleus after crushing the tibial nerve was determined. The regenerating muscle consumed slightly more O_2 per g. than the normal muscle of the opposite side, but no more per g. than the opposite muscle if this was denervated by cutting, and so decreased in wt.

V. J. W.

Choline-esterase and behaviour problem in *Amblystoma*. III. Distribution of choline-esterase in nerve and muscle throughout development. IV. Choline-esterase in nerveless muscle.—See A., 1944, III, 235.

IX.—NERVOUS SYSTEM.

Effect of biotin on chick spinal ganglia in tissue culture. A. S. Burt (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 191—193).—Biotin caused no stimulation of growth in cultured nerve cells or macrophages (cf. Hamilton and Plotz, A., 1942, III, 804).

V. J. W.

Diseases of spinal roots. R. Bing (*Schweiz. med. Wschr.*, 1943, 73, 345—348).—A review.

A. S.

Variations in cutaneous and visceral pain sensitivity in normal subjects. W. P. Chapman and C. M. Jones (*J. clin. Invest.*, 1944, 33, 81—91).—200 normal subjects, of various races and ages, were tested for cutaneous pain sensitivity by a modification of heat-radiation apparatus of Hardy *et al.* (A., 1940, III, 716). 29 were also tested for visceral sensitivity by balloon distension of the lower oesophagus. 2 end-points were measured for cutaneous pain, a beginning sharp jab sensation for the pain-perception threshold;

and the first evidence of wincing, as observed at the outer canthus of the eye, for the pain-reaction threshold. The only readily recognisable end-point for initial visceral sensitivity was a sensation of substernal fullness produced by balloon distension. Considerable variation was found, both as regards pain-perception and pain-reaction. Pain sensitivity decreased with age. Negroes had a lower pain-perception threshold and reacted more readily than the Northern European to the pain stimulus. The Mediterranean races tested responded like the negroes. Of a no. of possible modifying factors, such as the administration of adrenaline or acetyl- β -methylcholine, severe acidosis and alkalosis, mental and physical fatigue, nervous tension, and 48-hr. fasting, only mental fatigue and nervous tension produced any changes in cutaneous pain sensitivity.

C. J. C. B.

Histomechanical analysis of nerve reunion in rat after tubular splicing. P. Weiss and A. C. Taylor (*Arch. Surg., Chicago*, 1943, 47, 419—447; cf. A., 1943, III, 635).—The fibrin clot uniting the nerve ends becomes detached from the protecting tube and by longitudinal tension from the ends the fibrin fibres are oriented lengthwise by the second day. These provide guides for the regenerating sheath cells and axons. The main framework of the nerve union is completed by the end of a week.

F. S.

Peripheral nerve injuries. H. J. Seddon (*Glasgow med. J.*, 1943, 21, 61—75).—A lecture.

G. H. B.

Sensory areas of brain. E. D. Adrian (*Lancet*, 1943, 245, 33—35).—A lecture.

C. A. K.

New answer to question of macular sparing.—See A., 1944, III, 248.

Negative conditioned reflexes versus absence of response elicited from external inhibition. W. F. Allen (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 169—170).—External inhibition may cause a delay in reflex response which simulates a negative conditioned reflex. It may be differentiated by the fact that it is accompanied by an inhibition of respiration. It may be present after removal of cortical areas which abolishes true conditioned reflexes (cf. A., 1943, III, 875).

V. J. W.

Inhibition of brain respiration by picrotoxin. J. R. Klein [with M. Hack] (*J. Biol. Chem.*, 1943, 151, 651—657).—Respiration of a cat brain prep. and the oxidation of glutamate, fumarate, and pyruvate by the prep. *in vitro* are inhibited by picrotoxin. The effect on glutamate and succinate is probably due to inhibition of oxidation of fumarate or pyruvate rather than to the first stages of oxidation of glutamate and succinate. The effect on oxidation of pyruvate may be due to inhibition of fumarate catalysis since the latter decreases the extent of the inhibition.

H. G. R.

Pyridoxine deficiency in swine, with reference to epileptiform convulsions.—See A., 1944, III, 270.

Influence of lowered barometric pressure on electroencephalogram. H. Hailman, M. Kessler, and E. Gellhorn (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 74—76).—In unanæsthetised rats, lowering of barometric pressure to 130 mm. Hg abolishes cortical potentials in air but does not affect them in pure O₂. Below this pressure potentials seen in O₂ resemble those at low pressures in air.

V. J. W.

Review of neuropsychiatry for 1943. S. Cobb (*Arch. intern. Med.*, 1943, 72, 795—806).

C. J. C. B.

Successful treatment of hysterical paralysis with pentothal sodium and psychotherapy. R. Somerfield and R. M. Tovell (*Anesthesiology*, 1941, 2, 59—60).—Report of one case.

G. P.

Pellagra in psychiatric practice. S. W. Hardwick (*Lancet*, 1943, 245, 43—45).—Pellagra occurred in 10 cases of chronic psychosis. Temporary psychosis developed in 2 other cases of pellagra.

C. A. K.

Experimental cerebral trauma. II. Fluid content of brain following trauma. C. Pilcher (*Surg. Gynec. Obstet.*, 1941, 72, 755—757).—The fluid content of the brain in dogs was unaffected by trauma of the head (dropping a 1000-g. wt. twice from a distance of 5 ft.).

P. C. W.

Significance of spleen in structural metabolism of central nervous system. E. Schmitz and G. Heymann (*Biochem. Z.*, 1941, 308, 230—246).—The structural metabolism of the central nervous system of the dog is unaffected by splenectomy. The amount of cholesterol in the central nervous system of normal dogs, however, is greater than the amount of phosphatides, but in splenectomised dogs, the amount of phosphatides is greater than that of cholesterol. Hence the spleen acts as a regulatory organ for the amounts of cholesterol and phosphatides in the central nervous system.

J. N. A.

Familial cerebral degeneration with cortical atrophy. H. M. Keith (*Amer. J. Dis. Child.*, 1943, 68, 624—626).—Report of 2 cases.

C. J. C. B.

Neuropathology of malnutrition associated with prolonged alcoholism. M. Scheinker and C. D. Aring (*Arch. Path.*, 1943, 36, 615—620).—Widespread changes in the cerebral cortex, spinal cord, and peripheral nerves may be found in the nutritional deficiency associ-

ated with alcoholism. The cortical changes may include extensive formation of rod cells (hypertrophied microglia of Hortega).

C. J. C. B.

Porencephaly. A. G. de Sanctis, M. Green, and V. de P. Larkin (*J. Pediat.*, 1943, 22, 689).—A review and report of 5 cases. Porencephaly is a cystic defect of the brain communicating with the ventricles or separated from them by a thin layer of brain tissue and covered on the outside by the arachnoid. A clinical diagnosis is often possible, based on the "complete" syndrome of Jacksonian convulsions and paralysis of the arms and legs, or both, the convulsions and paralysis being limited to the same side of the body. Limitations or extensions of this syndrome occur, ranging from the "silent" porencephaly to one manifested by the "complete" syndrome hemianopsia, blindness, sensory changes, mental retardation, and various other findings. This clinical diagnosis can be confirmed by encephalography and ventriculography, and valuable information can be obtained from an electroencephalogram. Surgical intervention will often result in marked motor improvement and relieve the convulsive phenomena partially or entirely.

C. J. C. B.

Ætiology of congenital cerebral palsy. Clinical and statistical study. H. Yannet (*J. Pediat.*, 1944, 24, 38—45).—In 86 patients with cerebral palsy the average age of the mother at the time of birth of the affected child was greater than that in the general population; the affected children have a later ordinal birth rank; there is a significant incidence of similarly affected siblings of patients with cerebral palsy; the incidence of mental deficiency in the non-affected siblings is raised; there is raised incidence of associated physical defects, especially those involving the eyes, in the patients with cerebral palsy. Developmental malformations, of which a proportion may be genetically determined, play an important rôle in the production of cerebral palsies.

C. J. C. B.

Subdural hæmatoma in infancy. F. D. Ingraham and D. D. Matson (*J. Pediat.*, 1944, 24, 1—37).—An extensive review of 98 cases.

C. J. C. B.

Return of function of sweat glands after cutting or crushing sympathetic nerves. C. Neumann, H. Grundfest, C. M. Berry, C. Rule, and A. E. Cohn (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 27—28).—Water output from the pads of the feet was measured by taking it up in a stream of dry air which was then passed through a cooled coil. After nervous control of the sweat glands had been abolished, the first signs of its re-establishment were observed 15—30 weeks after nerve section and 15 weeks after crushing. In the latter case complete recovery was much quicker.

V. J. W.

X.—SENSE ORGANS.

Ophthalmology and refraction: historical notes on their interrelation. H. Melhuish (*Dioptric Rev.*, 1944, 4, 13—15).—Although the use of spectacles is of great antiquity, the exact mathematical correction of errors of refraction dates only from the latter part of the last century and there is still divergence of opinion as to the status refraction should occupy in the work of the oculist.

A. J. B. G.

Recent progresses in ophthalmology. S. N. Ghosh (*J. Indian Med. Assoc.*, 1943, 13, 47—48).—A very brief survey, without references, of some of the developments which have taken place in ophthalmology during the past 20 years.

A. J. B. G.

Ocular findings in feeble-minded male castrates. R. G. Scobee (*Amer. J. Ophthalm.*, 1943, 26, 1289—1294).—17 male castrates were given 21 daily intramuscular injections of testosterone propionate in oil. The differences in ocular findings before and after injections were not significant except for development of exophoria in 10 cases and decrease of retinal hæmorrhages and exudates in the one diabetic case. One immature cataractous lens opacity improved while two cases developed lenticular opacities.

M. G. M.

Soviet research in physical optics. J. H. Prince (*Dioptric Rev.*, 1944, 4, 10—13).—A brief review of the facilities provided for research by the Soviet State, and of some of the results already achieved.

A. J. B. G.

Military ophthalmology. W. T. Davis (*Amer. J. Ophthalm.*, 1944, 27, 26—44).—A review of ocular injuries including those due to vesicant gas met with in war, and the factors affecting night vision, the tests and training for which are described. In a section on aviation ophthalmology the effects on visual function of anoxia, toxic states, changes in temp. and barometric pressure, acceleration, and fatigue are discussed.

A. J. B. G.

Ocular pathology in army as it affects the optician. M. Cholerton (*Dioptric Rev.*, 1944, 4, 16—20).—A classification of, and notes on, ocular pathological conditions met with in the New Zealand forces.

A. J. B. G.

Significance of visual defects in war production effort. H. S. Kuhn (*J. Amer. Med. Assoc.*, 1943, 123, 1085—1088; cf. A., 1944, III, 23).—Visual skills are of the utmost importance not only in selection of men for the armed forces but for selection of men and

women in war industries. Standards were made according to: (1) uncorr. acuity for distant and near vision; (2) acuity with glasses habitually worn; (3) muscle balance for distant and near vision; (4) stereopsis; (5) colour vision. P. G.

Size [of facets of compound eye] in *Habrobracon*. G. C. Risman (*Genetics*, 1942, 27, 166).—In *Habrobracon* the size of the facets of the compound eye is less in haploid (parthenocarpic) than in diploid males but the size for diploid females is no greater than for haploid males. L. G. G. W.

Biometric refraction. H. B. Marton (*Dioptric Rev.*, 1944, 4, 5-8).—Ametropia presents more than a simple problem in physical optics and biological processes may result in aberrations in development making the eye very different from that of mathematical theory. A. J. B. G.

Comparison of new sensitometric method with usual techniques of refraction. M. Luckiesh and F. K. Moss (*Arch. Ophthalmol.*, 1943, 30, 489-493).—The sensitometric method of refraction is a subjective test in which the dioptric power producing max. visibility is determined by the Luckiesh-Moss sensitometer, depending on brightness contrast rather than acuity thresholds. Binocular convergence without relative accommodation is obtained by means of a large convergence target in the plane of fixation, which provides sufficient stimulus for the one but not for the other. By this method the normal adult non-presbyopic eye is found to be myopic to an average extent of 0.75 D., and for such an eye there is no evidence of any lag of accommodation within the usual range of near vision. J. H. A.

Orthoptics for infant squinter one to four years old. E. V. Roth (*Amer. J. Ophthalmol.*, 1944, 27, 57-60).—Active squint training is to be deprecated until the patient is of an age to co-operate and attempts may create a permanent distaste in the child's mind. Much can, however, be done in assessing the visual acuity, preventing or improving amblyopia ex anopsia, and dealing with abnormal retinal correspondence particularly if the measures are presented to the child as games. A. J. B. G.

Prisms in orthoptics. C. Burri (*Amer. J. Ophthalmol.*, 1944, 27, 61-66).—Prisms are one of the simple primary tools for investigating muscle anomalies and duction power. In training, they are of doubtful val. in squint, but are most useful in dealing with phorias, particularly exophoria, being used in duction exercises to increase the amplitude of fusion. Arguments against the wearing of prisms in the treatment of concomitant squint are given, and the view adopted is that in the treatment of phorias, re-education rather than the prescription of prisms should be the aim. A. J. B. G.

Recurring attacks of concomitant exotropia followed by transient esotropia. Migraine the probable cause. F. H. Verhoeff (*Arch. Ophthalmol.*, 1943, 30, 727-731).—Case report of a woman of 28 whose previous 24 attacks could be divided into two periods. In this attack she had 40-prism diopters of exophoria followed in 1 week by 4-prism diopters of exophoria or even esophoria and later by 15-prism diopters of esophoria which gradually disappeared. She had no spasm, no lack of accommodation, and no paresis but all the symptoms of migraine previous to the attack. She was the "migraine type" and one brother had migraine. She had no organic disease and was not hysterical. Three possible explanations are suggested: (1) a vasomotor disturbance in the Vth nerve nuclei might cause hypertonia of the nuclei with inhibition of internal recti; (2) a vasomotor disturbance (vasoconstriction) might have reduced the tone of the nuclei of the internal recti with consequent reduction of inhibition of the external recti; (3) if Perlia's nucleus can be regarded as a convergence centre, a vasomotor disturbance in this nucleus might remove sufficient tone in the internal rectus muscles to cause divergence. Possibility (3) is considered most probable, since Perlia's nucleus is almost continuous with the IIIrd nerve nucleus which is associated with migraine. M. G. M.

Treatment of amblyopia. F. B. Fralich (*Amer. J. Ophthalmol.*, 1943, 26, 1195-1199).—The early recognition and treatment of that form of acquired amblyopia which develops in connexion with a squint or with gross anisometropia in children offers the most encouraging results. It is impossible in most cases to decide whether the case is one of congenital or acquired amblyopia without continuous and total occlusion of the good eye for several months. A. J. B. G.

Amaurosis following nasal hæmorrhage. A. E. Long (*Amer. J. Ophthalmol.*, 1943, 26, 1179-1182).—Blindness may follow severe hæmorrhage, either immediately or at an interval which may be longer than a fortnight. It is by no means common after severe bleeding and most commonly follows hæmatemesis or hæmoptysis and factors other than pure ischæmia have to be invoked in explanation of its occurrence in many cases. A case is described following epistaxis, and the facts and theories in regard to this type of amaurosis are briefly reviewed. A. J. B. G.

Epidemic keratoconjunctivitis. T. D. Allen (*Amer. J. Ophthalmol.*, 1944, 27, 16-18).—A sufferer's account of an attack of this condition with comments on the physical and psychological reactions to the disease and to its treatment. A. J. B. G.

condition with comments on the physical and psychological reactions to the disease and to its treatment. A. J. B. G.

Graphic representation of binocular findings. E. Krinsky (*Amer. J. Ophthalmol.*, 1943, 26, 1199-1204).—In recording the evaluation of binocular function the deviation, fusion amplitude, and recovery points, for both far and near, may be recorded by a simple line graph, which, once its principles are understood, can give the examiner at a glance much information about the binocular status. A. J. B. G.

Mitotic activity of corneal epithelium. Effects of colchicine, ether, cocaine, and ephedrine. W. Buschke, J. S. Friedenwald, and W. Fleischmann (*Johns Hopkins Hosp. Bull.*, 1943, 73, 143-168).—By counting cells in meridional strips $\frac{1}{2}$ mm. wide over the whole corneal diameter it is estimated that the cornea of a 80-150-g. rat has 2,000,000 epithelial cells of which 1 in 250 is found in mitosis. Ether, cocaine, and ephedrine, but not colchicine, diminish the rate of entrance of cells into mitosis in the corneal epithelium of the living rat. Colchicine arrests mitosis in metaphase. Ether may increase the duration of the mitotic cycle. The combined use of colchicine and other drugs affords a means of distinguishing between effects of such drugs on the duration and rate of entrance into mitosis. T. F. D.

Hereditary corneal dystrophy. J. R. Mutch (*Brit. J. Ophthalmol.*, 1944, 28, 49-86).—After describing the condition and referring to many attempts at classification, a suggested division into granular, reticular, and macular types, the clinical differences between which are mainly the shape and situation of the opacities, is given. All types are hereditary, the first two being transmitted as a dominant, the last as a recessive character. A case of granular dystrophy which became the basis of investigations of a pedigree through seven generations is described. No connexion between dystrophy and blood was found in 52 members of the pedigree. The eyes of 24 affected members are described; the condition is not sex-linked or connected with any other disease. As avascularity is a common property of cornea, lens, and articular cartilage their pathology is compared as regards opacities, and sensitivity and the relationships of corneal dystrophy to the nutrition of the cornea is discussed. M. G. M.

Groenouw's corneal dystrophy. J. O. Wetzel (*Amer. J. Ophthalmol.*, 1943, 26, 1183-1194).—A case with a pedigree extending over three generations of affected individuals is described and the literature briefly reviewed. A. J. B. G.

A clear corneal implant acquires dystrophy from its host. R. von der Heydt (*Trans. Amer. Acad. Ophthalm. Otolaryngol.*, 1943, Nov.-Dec., 59-61).—The patient, with a corneal dystrophy of hereditary type, had a corneal graft operation which improved his vision considerably, but some two years afterwards the implant developed dystrophic changes said to be characteristic of his familial type. This suggests that certain hereditary changes may be due to an altered biological chemistry. A. J. B. G.

Study of mustard gas lesions of eyes of rabbits and men. I. Mann and B. D. Pullinger (*Amer. J. Ophthalmol.*, 1943, 26, 1253-1277; cf. A., 1942, 111, 588).—In rabbits local lesions due to const. doses of liquid mustard gas on the cornea, limbus, lids, and conjunctiva were studied separately. The morphology and pattern of invading vessels as well as deposits of fat and cholesterol in severe vascularisation were observed with the slit-lamp. A study of the lesions in man in recent accident cases and those of long standing showed that the clinical pathology of limbal lesions was similar in man and the rabbit. M. G. M.

Technique of tonometry and care of tonometers. M. J. Schoenberg (*Amer. J. Ophthalmol.*, 1944, 27, 70-71).—Notes on the method of taking tonometric readings, the data to be recorded, and the cleansing of the instrument. A. J. B. G.

Pupillary reflex to darkness. O. Lowenstein and I. Givner (*Arch. Ophthalmol.*, 1943, 30, 603-609).—Experiments are described which were previously carried out to investigate this reflex in man and animals. After adaptation to light and then to darkness it is known that, whereas the pupil in animals dilates and then contracts, in man there is a third phase called the secondary dilatation. Reference is made to the light and darkness reflexes in the "neurotonic" pupil in which one might be present without the other. A case is reported of a patient operated on for pinealoma in which the light reflex was absent and the darkness reflex exaggerated. This dissociation suggests different pathways for the reactions but it has since proved not to be a universal characteristic of the non-syphilitic Argyll-Robertson phenomenon. M. G. M.

Spasm of accommodation. W. R. Coates (*Dioptric Rev.*, 1944, 4, 20-27).—True spasm of accommodation is rare and the author admits that his two cases are not "text-book." He suggests that the amount of spasm may be recorded by the best vision obtainable bracketed with the estimated true visual acuity. A theoretical explanation of the mechanism of spasm is offered. Attention is drawn to the confusion which exists over spasm, latent accommodation, and other conditions. A. J. B. G.

Reticulin content and prognosis in malignant melanoma of uvea. I. S. McGregor and J. Hill (*Arch. Ophthalmol.*, 1943, 30, 291—297).—In 41 cases the cell type, pigment and reticulin content of the tumour were correlated with the survival rate of the patient. A definite correlation between cell type and, to a smaller degree, between pigment and reticulin content with length of survival period could be established. These findings are in general agreement with those of Callender and Wilder (*Amer. J. Cancer*, 1935, 25, 251). A. G. L.

Genetic studies on ectopia lentis. Pedigree of simple ectopia of lens. H. F. Falls and J. L. Cottermann (*Arch. Ophthalmol.*, 1943, 30, 610—620).—The inheritance of ectopia lentis is found to be dominant with only two instances of "lack of penetrance." Cataract was a common characteristic but no conspicuous associated anomalies were observed in the iris, cornea, or pupil. There seemed to be no association between the ectopia lentis and the length of extremities as in the syndrome of arachnodactyly. The investigation covers a pedigree of seven generations of which 29 members are affected and whose cases are described in detail. M. G. M.

Congenital (cataractous) dislocated lens. O. R. Wolfe, R. M. Wolfe, and P. Georgariou (*Amer. J. Ophthalmol.*, 1943, 28, 1313—1314).—In one such case operations were performed at the age of six. The vision of each eye with glasses was nearly normal in 12 months and it is thought that such patients would benefit by operation in childhood rather than in adult life. M. G. M.

Neurodermatitis with cataract. C. E. McDannald (*Arch. Ophthalmol.*, 1943, 30, 767—769).—The condition is described as cataract associated with a dermatitis and an unbalanced sympathetic system. Two cases are described, both young white patients, who were emotionally unstable, and reacted to allergic tests. The cataracts developed during the dermatitis and matured quickly. M. G. M.

Classification of experimental cataracts in rat: recent observations on cataract associated with tryptophan deficiency and other experimental conditions. W. Buschke (*Arch. Ophthalmol.*, 1943, 30, 735—750).—Two chief varieties of cataract were observed in tryptophan-deficient rats: (1) acute, nuclear type, which matured in 3 weeks; (2) chronic, superficial type, which failed to mature. Both were arrested by the addition of tryptophan to the diet though not necessarily immediately. There was globular degeneration of lens fibres and proliferation of epithelium in type (1). Tryptophan was still present in the lenses; minor changes in the lenses of some control animals were observed. Associated lesions included vascularisation of the cornea. Similarity between tryptophan, T1, and riboflavin cataracts are noted and distinguished from diabetic and tetanic cataracts. The first three belong to the dystrophic group. M. G. M.

Dystrophic cataracts and their relation to other metabolic cataracts. W. Buschke (*Arch. Ophthalmol.*, 1943, 30, 751—762).—The three main groups of experimental cataract are described. The cataracts of the dystrophic group are described under five headings and distinction is drawn between experimental cataracts and those associated with various skin diseases, mongolism, and dystrophia myotonica. The following points of comparison are noted: (1) the primary importance of the endocrine glands in diabetic and tetanic cataract is obvious but whereas lesions of the glands are found in dystrophic syndromes these cataracts cannot be arrested by administration of any endocrine extract; (2) the dystrophic cataracts are associated with lesions in the cornea, skin, and testes and it is suggested that the metabolism of the affected tissues may be at fault, and cataracts similar to the clinical variety can be produced experimentally by deficiency diets; (3) some of the varieties are definitely associated with heredity, and in the light of modern biochemical theory on enzymic processes there may be a metabolic connexion between the endogenous or hereditary type and the purely experimental cataract due to a nutritional deficiency. It is possible that some metabolic link exists between the endogenous and exogenous forms of dystrophic cataract and emphasis is placed on the hereditary rather than on the endocrine theory described above. M. G. M.

X-Ray therapy of inflammatory and neoplastic diseases of eye. J. Borak (*Amer. J. Ophthalmol.*, 1943, 26, 1170—1174).—In X-ray therapy of ocular lesions particular attention should be paid to the protection of the lens. All the other X-ray injuries to the eye are temporary. A list of lesions—both of inflammatory and neoplastic nature—amenable to radiotherapy is given. A. G. L.

Biomicroscopic examination of vitreous. M. L. Berliner (*Eye, Ear, Throat*, 1943, 22, 455—462).—Although advances in the technique of biomicroscopy cannot settle the nature of the fibrillary structures seen in the vitreous they extend the area which can be examined. The behaviour of the gel in certain conditions is of interest, particularly the separation and shrinkage which may take place in myopia, senility, and retinal detachment. A. J. B. G.

Autofunduscopy. L. C. Drews (*Amer. J. Ophthalmol.*, 1943, 26, 1143—1154).—The mode of stimulation of the retina employed in the formation of Purkinje images facilitates the observation of, and accentuates, after-images. The combination of after-images of

known size and Purkinje images helps in the subjective localisation of small lesions in the central area and in the study of the behaviour of scotomata produced by such lesions as compared with that of the normal scotoma due to the nerve head. The phenomena of simultaneously produced dissimilar after-images in each eye are of interest in the physiology of retinal correspondence and retinal rivalry. A. J. B. G.

Peripheral retinal holes without detachment. A. Knapp (*Arch. Ophthalmol.*, 1943, 30, 586—590).—Five cases are reported, in three of which lesions began with vitreous hæmorrhage. The adhesions between retina and choroid may cause the hole or prevent detachment after retinal tear but no such adhesions were present in three of these cases. Changes in the vitreous are discussed including movement, liquefaction contraction, or detachment as causes of retinal detachment, also the importance of position of tear and subsequent influence of gravity. The non-development of retinal detachment may be due to absence of any one of these factors. M. G. M.

Lipæmia retinalis. M. L. Kauffman (*Amer. J. Ophthalmol.*, 1943, 26, 1205—1208).—Nearly all recorded cases of this condition (59 out of 62) have been associated with diabetes mellitus. The serum-fat and -lipin content necessary to produce lipæmia varies considerably, and few detailed analyses have been made. The particles of fat in the blood are said to be in the form of a true emulsion and it may be that the ophthalmoscopic recognition depends on the size of the dispersal phase. The presence of acidosis may also be a factor. A. J. B. G.

Chemical aspects of visual process. R. A. Morton (*Nature*, 1944, 153, 69—71).—Spectroscopic evidence for the chemical nature of the chromophoric group of visual purple is surveyed. The failure to detect vitamin-A in visual purple solutions may be due to its transformation into -A aldehyde or further oxidation products. The probable optical properties of the hypothetical -A aldehyde are compared with those of -A and retinene. The possible direct participation of flavin derivatives in scotopic vision is also discussed. The primary photochemical process *in vivo* may consist in their oxidation to yellow enzyme. This is again reduced in the dark by -A aldehyde. A mechanism of this kind, involving both -A and -B₂, may explain that deficiency of scotopic vision can be due to avitaminosis-A or -B₂. E. Br.

Testing dark adaptation. W. J. B. Riddell (*Glasgow med. J.*, 1943, 21, 149—157).—Description of a method. G. H. B.

Visual acuity at low brightness levels. M. Luckiesh and A. H. Taylor (*Amer. J. Ophthalmol.*, 1944, 27, 53—57).—For purposes such as car driving, contrast sensitivity is of greater val. than visual acuity at night. For reading maps or instrument scales with the dim lights permissible in wartime, visual acuity has to be subserved. The val. of different illuminants for this purpose is assessed and the advantage of red light indicated. A. J. B. G.

Defective night vision among soldiers; dark adaptation results and their use in diagnosis. I. C. Michaelson (*Brit. J. Ophthalmol.*, 1944, 28, 140—147).—The min. illumination vals. for light and form senses were investigated with the Koch dark adaptometer in two groups of cases, one normal, the other complaining of defective night vision. There is great variation in the min. form sense in non-complainers, and estimation of this alone seems to be of little val. Correlation of the findings for min. light and form senses affords a sufficient measure of the individual ability to see in the dark and the data suggest that it may be possible to separate, on the findings, the complainers into physiogenic and psychogenic groups. A. J. B. G.

Nature of normal trichromatic and dichromatic vision. F. H. G. Pitt (*Proc. Roy. Soc.*, 1944, B, 132, 101—117).—It is shown that if the dichromatic-isocolour lines, plotted on any colour diagram of the usual type, are extended, either they will meet at a point which will represent a missing fundamental sensation, or they will be parallel to a line joining the points representing two fundamental sensations which are fused. Using these properties it is shown that protanopia is caused by the absence of the R' sensation, that tritanopia is caused by the absence of the B' sensation, and that deuteranopia is caused by the R' and G' sensations being identical. The evidence is considered to indicate that the Young-Helmholtz theory is fundamentally correct, but the essential difference between the B' sensation and the G' and R' sensations is stressed. E. N. W.

Total colour-blindness of hysterical origin. R. W. Pickford (*Nature*, 1944, 153, 256).—A case is recorded in which a totally colour-blind person temporarily recovered some degree of colour vision during a period of amnesia and also under hypnosis. He was then found to be red-green-blind, like other members of his family. E. N. W.

Influence of prolonged wearing of meridional size lenses on spatial localisation. H. M. Burian (*Arch. Ophthalmol.*, 1943, 30, 645—666).—When the patient wears the lenses for several days he first experiences distortion which gradually disappears owing to complete

adaptation but when he was placed in surroundings lacking perspective and unocular clues the difference in size of the images was still appreciated as measured by various standard instruments. The awareness of the image-size differences seemed to decrease after the lens had been worn for some time. The results of experiments with an instrument with a rotating frontal plane are given and the implications of these results are discussed with regard to the theory of space perception and to metamorphopsias and especially to the question of how patients with aniseikonia deal with spatial orientation. From all these experiments it was concluded that the perspective factors minimise the effect of disparity, that there is a difference between the results of the right and left eyes which may have some connexion with ocular dominance, and that some persons with normal binocular vision allow unocular factors to influence spatial localisation derived from disparity clues more than others. Physiological compensation and psychological adaptation are discussed as possible explanations of many of the above facts.

M. G. M.

Visual functions in strephosymbolia. S. T. Orton (*Arch. Ophthalmol.*, 1943, 30, 707—717).—It is suggested that strephosymbolia or word blindness is due to lack of recognition of words and not to lack of ability to recognise them and has a hereditary or developmental origin rather than a congenital one. It was found that the master eye was not that with better vision but was usually on the same side as the master hand. Some children wrote and read "mirror writing" quite easily and it was thought that "mirror writing" might be a physiological stage in reading. The reading disability was not connected with inability to see words since it could occur in children with negligible refractive errors. The strephosymbolia syndrome represents intergrades between right- and left-sided familial tendencies and reading disability follows definite hereditary trends, associated also with developmental deviations of speech and explained on the basis of confused cerebral dominance rather than on abnormal vision.

M. G. M.

Effect of darkness and temperature on retinal pigment and visual cells of frog's eye when transferred into belly cavity. L. B. Arey and W. K. Jennings (*J. Comp. Neurol.*, 1944, 79, 487—499).—Experiments described give data on the movements of retinal pigment and visual cells of frogs under light and dark adaptation. A study of excised eyes indicates to what extent these responses are independent of body influences, and for this purpose the excised eyeballs are cultured in the abdominal cavity of frogs. Results are given on the effect of temp. on these movements.

R. H. K.

Choroideræmia. R. G. Scobee (*Amer. J. Ophthalmol.*, 1943, 26, 1135—1143).—Two cases of this rare and interesting condition are described. The author draws attention to the presence of an early nerve-type deafness in both cases, an association which also occurs in primary pigmentary degeneration of the retina (retinitis pigmentosa). He discusses theories of the genesis and possible relationships of choroideræmia.

A. J. B. G.

Optic nerve regeneration with return of vision in anurans. R. W. Sperry (*J. Neurophysiol.*, 1944, 7, 57—69).—Previous work by the author on *Triturus* (A., 1943, III, 879) has been extended to six species of anura. Similar results were obtained. Regeneration of the optic nerve resulted in a return of the capacity to respond to movement and position of objects. The orientation of the response depended on whether the retina had been rotated or left in its normal position after cutting the nerve. It appears that optic fibres re-establish functional connexion in the same areas in the optic lobe.

R. H. K.

Studies of cerebral function in learning. XII. Loss of maze habit after occipital lesions in blind rats. K. S. Lashley (*J. Comp. Neurol.*, 1944, 79, 431—462).—Results are given on effects of (a) peripheral blindness, (b) section of the posterior thalamic radiation, and (c) destruction of the striate areas with adjacent structures on retention of the maze habit. Of the lesions tried, only complete destruction of the visual cortex appears to produce serious deterioration in maze-learning capacity.

R. H. K.

Noise-induced seizures in rat and their modification by cerebral injury. F. A. Beach and T. Weaver (*J. Comp. Neurol.*, 1944, 79, 379—392).—Using rats known to be susceptible to noise-induced seizures, the authors give evidence that an intact cerebral cortex is not essential to the appearance of the seizures. Cortical injury on the other hand tends to increase the frequency of the attacks and to decrease the threshold of stimulation. The study includes an account of the effect of brain injuries on various phases of the seizures.

R. H. K.

Absence of audiogenic seizures in wild Norway and Alexandrine rats. W. J. Griffiths (*Science*, 1944, 99, 62—63).—In 141 wild rats tested no evidence was found for the presence of the seizures commonly produced by high-frequency sounds in domestic rats. The possible effects of a no. of influences which might induce these seizures in laboratory conditions are discussed.

R. H. K.

Hearing—a post-war problem. J. C. Howard (*Ann. Otol. etc.*, St. Louis, 1943, 52, 843—849).—A general discussion is given of the effects of noise traumata on hearing with reference to the post-

war employment of service men. Every man tested who had been a member of a gun crew for as long as 8 months showed impairment of hearing, usually in the higher frequencies. If the subtraction to noise was long enough there was also impairment in the lower, conversational frequencies.

K. T.

Deafness resulting from gunfire and explosions. S. Suggit (*J. Laryngol. Otol.*, 1943, 58, 313—326).—Three types of deafness are produced by gunfire and explosions in general: (1) middle ear deafness due to rupture of the tympanum which usually shows complete recovery so long as there is no subsequent infection of the middle ear; (2) gradual loss of high frequencies due to prolonged cochlea trauma; this type requires an exposure of months or years to the damaging noise and the impairment is permanent; (3) sudden high-tone loss (concussion deafness) due to exposure to blast; this type is characterised by an abrupt loss of hearing at a given frequency, usually between 1000 and 4000 c.p.s., often with a very little recovery at higher frequencies; the tympanum is not usually ruptured. In type 2 there is a general degeneration in the organ of Corti, probably beginning at the point in the basal coil corresponding to 4000 c.p.s. (accounting for the tonal dip). It is suggested that type 3 is due to hæmorrhages confined to the basal coil of the cochlea, caused by the sudden rise of pressure in the internal ear which follows passage of the blast wave either through the external and middle ear or through the skull. Suggestions are made for protective helmets for gun crews similar to those worn by air crews.

K. T.

Therapy of deafness. IV. Report of cases. L. Guggenheim (*Laryngoscope*, 1943, 53, 653—688; cf. A., 1944, III, 105).—A discussion of the causes of deafness in adults with special reference to the importance of general health and well-being and adequate nutrition, followed by a description of the routine examination and treatment, with 19 case reports.

K. T.

Relations between dissonance and context. R. W. Pickford (*Nature*, 1944, 153, 85—86).—Remarks on the effect of context on dissonance.

P. G.

Investigation of Ménière's disease. C. S. Hallpike (*J. Laryngol. Otol.*, 1943, 58, 349—362).—Tests carried out on patients under treatment for Ménière's disease led to conclusions about the effect of unilateral labyrinthectomy very different from the classical ones of Bárány. It is claimed that the caloric tests described show, first, that Ewald's law (that the external semicircular canal reacts chiefly to an ampullo-petal flow of endolymph) does not apply in the intact human subject, but that the canal exhibits bi-directional sensitivity to endolymph movement; secondly, that the directional preponderance of nystagmus towards the intact labyrinth, which follows unilateral labyrinthectomy, is due to changes in the central responses of the external canal. It is suggested that this directional preponderance is due to unilateral elimination of tonic impulses normally reaching the vestibular nuclei from the utricles. Destruction of an external canal crista, on the other hand, would be expected to produce neither spontaneous nystagmus nor directional preponderance but only a reduction of caloric responses from the affected side (canal paresis). Of 100 cases of Ménière's disease, 21 showed directional preponderance, 49 canal paresis, and 12 normal reactions. Other types (18 cases), falling into neither of these groups, are thought to be due to a combination of lesions of both the canal and utricle.

K. T.

Treatment of Ménière's disease. T. E. Cawthorne (*J. Laryngol. Otol.*, 1943, 58, 363—371; cf. A., 1943, III, 880).—Where conservative treatment (usually sedatives) does not keep the symptoms in check, the function of the diseased labyrinth is destroyed by removing part of the membranous labyrinth from the external semicircular canal. The operation is described.

K. T.

Labyrinth surgery for Ménière's disease. K. M. Day (*Laryngoscope*, 1943, 53, 617—630).—The term "Ménière's disease" should only be used for cases in which the symptoms are due to an increased labyrinthine pressure of unknown cause. This appears to be a disease entity although its nature and ætiology are unknown. Conservative treatment, designed to relieve the distension (e.g., histamine, dehydration, etc.) seldom cures but often alleviates the condition to the extent of making it tolerable to the patient. In 8 cases which did not respond the vestibule was destroyed by a light coagulating current leaving the cochlea intact. In all these cases the vertigo disappeared but the effect on hearing was varied; 2 cases (with both labyrinths involved) lost all hearing, 3 showed a further loss after operation, 2 were unaffected, and one improved. The effect of the current is not known; it may coagulate and destroy the utricle (and perhaps the saccule) or it may kill the vestibular nerve branches to the utricle and superior semicircular canal. It is suggested that the loss of cochlea function in 2 cases was due to accidental complete removal of all the endolymph.

K. T.

Oscillographic study of olfactory system of cats. C. A. Fox, W. A. McKinley, and H. W. Magoun (*J. Neurophysiol.*, 1944, 7, 1—16).—The action potentials obtained in the rhinencephalon resulting from single shock stimulation of the olfactory bulb of cats

have been studied. Responses appear to be confined to the prepyriform cortex, the anterior olfactory lobe, the olfactory tubercle, and the pyriform lobe. R. H. K.

Peripheral unit for pain. G. H. Bishop (*J. Neurophysiol.*, 1944, 7, 71—80).—Using an electrical method of stimulation, structural and functional characteristics of sensory units on the human arm are described. The isolation of units for pricking pain by a local anaesthesia technique is described and their possible function in mediating other sensations discussed. R. H. K.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Ductless glands of crustacea. R. W. Pyle (*Biol. Bull.*, 1943, 85, 87—102).—The histology and development of the sinus gland and X-organ are described in *Pinnotheres maculatus* and *Homarus americanus*. The sinus gland (but not the X-organ) gives histological evidence of cyclic secretion phenomena associated with moulting. G. P. W.

Review of pathogenesis and surgical treatment of thyroid disease. B. P. Colcock (*Surgery*, 1941, 10, 336—355). G. P.

Tremor in hyperthyroidism: its value in diagnosis and assessment of the condition. S. Lazarus and G. H. Bell (*Glasgow med. J.*, 1943, 22, 77—86).—A photographic method of recording tremor of the finger was applied in 41 normal persons and in 93 cases of hyperthyroidism. Both frequency and amplitude of tremor increase with increasing severity of the condition. The amplitude of the tremor is much more closely correlated with clinical severity than either frequency of tremor or pulse rate. G. H. B.

Mode of action of thiourea on thyroid gland of rabbits. E. J. Baumann, N. Metzger, and D. Marine (*Endocrinol.*, 1944, 34, 44—49).—Administration of thiourea caused thyroid hyperplasia in rabbits in spite of the simultaneous administration of I. Under these conditions there was a rapid decrease in the total I and thyroxine-I in the thyroid gland. The I was excreted in the urine. P. C. W.

Cretinism in rats induced by thiouracil. A. M. Hughes (*Endocrinol.*, 1944, 34, 69—76).—Rats injected daily with thiouracil from birth to weaning and having their drinking-water replaced by thiouracil solutions afterwards showed marked retardation of growth, arrested development, mild anaemia, and changes similar to those in cretinism. These effects were not produced if the thiouracil administration was discontinuous or if thyroxine was administered simultaneously. The litters of thiouracil-treated mothers were apparently normal but showed thyroid hyperplasia at the age of 1 day and retarded development at 10 days, indicating passage of thiouracil through placenta and mammae. P. C. W.

Active rôle of thyroid gland in hypothermic states in the rabbit.—See A., 1944, III, 262.

Renal function in myxoedema.—See A., 1944, III, 257.

Water and fat content of orbital tissues of guinea-pigs with experimental exophthalmos produced by extracts of anterior pituitary gland.—See A., 1944, III, 247.

Decreased phosphorus appetite of parathyroidectomised rat. C. P. Richter and S. Helfrick (*Endocrinol.*, 1943, 33, 349—352).—Rats with access to water and 1% Na₂HPO₄ solution showed an increased water, and decreased phosphate, intake following parathyroidectomy. Food intake was unaffected. Normal intakes were restored by daily injections of parathyroid extracts or dihydroxycholesterol. P. C. W.

Site of action of parathyroid hormone in normal and nephrectomised rats. T. H. Ingalls, G. Donaldson, and F. Albright (*J. clin. Invest.*, 1943, 22, 603—608).—Parathyroid extract produced marked osteitis fibrosa in rats in 60 hr.; the bone lesions were the same, whether or not the rats were first nephrectomised. Nephrectomy alone produced bone resorption in rats in 60 hr.; the bone lesions, however, were qualitatively and quantitatively distinguishable from the lesions produced by parathyroid extract. The lesions produced in nephrectomised rats by parathyroid extract were already present in 20 hr. whereas lesions produced by nephrectomy had not yet appeared at that time. The authors conclude that the parathyroid hormone acts directly on the bone and not through the kidney. (8 photomicrographs.) C. J. C. B.

Activity of parathyroid hormone in nephrectomised rat. H. C. Stoerk (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 50—53).—Injection of 100 units of hormone (Lilly) raised serum-Ca of normal rats from 10.7 to 12.3 mg.-%, and of nephrectomised rats from 6.5 to 10.5 mg.-%. V. J. W.

Effect of hormone of thymus gland on tissue oxidations. E. M. Schulte (*Biochem. Z.*, 1941, 308, 69—77).—Analysis [tests for protein and sugar and determination of the ratios C:N and O:N (O being the amount of O₂ required for complete oxidation of C)] of the urine of male rats receiving injections of the hormone of the thymus in wheat-germ oil shows that the hormone increases the ratios. Later

glycosuria sets in. Since injections of hormone, given after glycosuria ceases, fail to increase the ratios, it is concluded that, after a few days, compensatory action by some other endocrine gland occurs. W. McC.

Alloxan diabetes in dog. M. G. Goldner and G. Gomori (*Endocrinol.*, 1943, 33, 297—308).—A single intravenous injection of 100 mg. per kg. causes death within a few hr.; 75—100 mg. per kg. produces a diabetic-uræmic syndrome and death within one week; 50—75 mg. per kg. produces typical diabetes with no renal lesions. The main histological changes were a disappearance of beta-cells from the islets of Langerhans, vacuolation of the epithelium of the pancreatic duct, and fatty changes in the liver. Doses of 25 mg. per kg. have no effect. P. C. W.

Fate of injected insulin. J. Mark and R. C. Lewis, jun. (*Johns Hopkins Hosp. Bull.*, 1943, 72, 246—248).—In rats, injection of insulin into the liver, or into the spleen so that it passed through the liver before reaching the peripheral tissues, resulted in the same degree and duration of hypoglycaemia as was produced by subcutaneous injection of similar amounts. Incubation of insulin with blood for 4 hr. at 37° *in vitro* did not cause inactivation. T. F. D.

Error of biological assay of insulin by mouse-convulsion test. J. O. Irwin (*Quart. J. Pharm.*, 1943, 16, 352—362).—Data for tests on 101 separate samples of insulin are statistically analysed. J. N. A.

Homoioplastic adrenal grafts to cerebral cortex of rat. C. M. Pomerat, C. G. Breckenridge, and L. Gordon (*Endocrinol.*, 1944, 34, 60—68).—A technique is described for the successful transplantation of the adrenal gland from new-born rats on to the cerebral cortex of adult rats, allowing the latter to survive removal of both adrenals. P. C. W.

Utilisation of intravenously injected salt in normals and in patients with Cushing's syndrome before and after administration of deoxycorticosterone acetate. L. J. Soffer, G. Lesnick, S. Z. Sorkin, H. H. Sobotka, and M. Jacobs' (*J. clin. Invest.*, 1944, 33, 51—54).—In normal individuals, the injection of hormone decreases the urinary excretion of Na⁺ and Cl⁻. In patients with Cushing's syndrome, the injection increases in the urinary excretion of Na⁺ and Cl⁻. This test may be of val. in the diagnosis of hyperfunction of the adrenal cortex. C. J. C. B.

Effect of deoxycorticosterone acetate administration on plasma volume and electrolyte balance of normal humans. M. Clinton, jun., and G. W. Thorn (*Johns Hopkins Hosp. Bull.*, 1943, 72, 255—264).—Increases in plasma vols. (17.5%), without any toxic symptoms, were produced in man by intramuscular injection of 10 mg. of deoxycorticosterone acetate and smaller increases (7%) by sublingual administration of 30—40 mg. in divided doses. Simultaneous supplementary NaCl did not augment the response. T. F. D.

Salt, carbohydrate, and water appetite of adrenalectomised rats before and after treatment with deoxycorticosterone pellets. J. Mark (*Johns Hopkins Hosp. Bull.*, 1943, 72, 243—245).—Following adrenalectomy the NaCl intake of 13 rats, given access to 3% NaCl solution, distilled water, and sucrose solution, increased greatly, but the water intake decreased slightly and the sucrose intake decreased moderately. Absorption of an average of 0.38 mg. of deoxycorticosterone decreased the NaCl intake to normal but caused a further decrease in sucrose intake and slight increase in water intake. T. F. D.

Resistance of rats to potassium poisoning after administration of thyroid or deoxycorticosterone acetate. B. E. Lowenstein and R. L. Zwemer (*Endocrinol.*, 1943, 33, 361—365).—Deoxycorticosterone acetate (2 mg. per 100 g. daily) protects the normal rat from KCl poisoning, and causes physiological atrophy of the adrenal cortex. When the accumulated hormone has disappeared from the body the adrenal atrophy causes an increased sensitivity to KCl poisoning. Thyroid feeding increased the toxicity of KCl and caused hypertrophy of the adrenal cortex, which decreased the toxicity of KCl when the effects of the thyroid feeding had worn off. Simultaneous administration of thyroid and deoxycorticosterone acetate caused mutual inhibition of their separate actions. P. C. W.

Assay of adrenal cortical extracts in adrenalectomised rats exposed to cold. A. Roos (*Endocrinol.*, 1943, 33, 276—281).—Adrenalectomised rats exposed to a temperature of 1° 12—24 hr. after operation show a progressive fall in colonic temp. The fall may be diminished by an injection of adreno-cortical extract given immediately before the exposure, and can be used as a method of assay. P. C. W.

Influence of cortin-like material in urine on water intoxication in adrenalectomised rat. S. Schiller and R. I. Dorfman (*Endocrinol.*, 1943, 33, 402—404).—Urine extracts prepared by the method of Dorfman *et al.* (A., 1943, III, 559) protected adrenalectomised rats against water intoxication in a similar way to adreno-cortical extracts or steroids. P. C. W.

Protection of normal rats against death from water intoxication with adrenal cortical substances. R. Gaunt (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 19—21).—Large doses of cortical extract or 12 mg.

of deoxycorticosterone acetate protected rats from lethal effects of large amounts of water given by stomach tube. V. J. W.

Effects of adrenal cortical compounds on lactation. W. O. Nelson, R. Gaunt, and M. Schweizer (*Endocrinol.*, 1943, 33, 325—332).—Lactation cannot be induced in hypophysectomised guinea-pigs by injections of lactogenic hormone alone, but can be if adrenotropic hormone or adrenal cortical extracts are given at the same time. Deoxycorticosterone acetate was ineffective but 17-hydroxy-11-dehydrocorticosterone was active. Deoxycorticosterone acetate (2 mg. daily) caused mammary growth whilst 3 mg. daily inhibited lactation. P. C. W.

Decidua formation with deoxycorticosterone acetate. G. Masson (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 196—197).—Daily subcutaneous administration of 10 mg. of deoxycorticosterone acetate caused the appearance of deciduomata after uterine trauma in 9 sprayed rats. Similar treatment with cholesterol had no effect in 9 controls. V. J. W.

Gonadotrophic action of deoxycorticosterone acetate in *Xenopus laevis*. N. Sapeika (*S. Afr. J. Med. Sci.*, 1943, 8, 115—116).—Deoxycorticosterone acetate has the same gonadotrophic potency as progesterone in *Xenopus* (66% ovulations produced by 330 µg.). P. C. W.

Changes in adrenals following prolonged treatment with methyltestosterone. H. Selye, E. M. Rowley, and C. E. Hall (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 141—143).—Daily injections of 5 mg. of methyltestosterone in 70-g. rats for 76 days caused involution of the zona glomerulosa, thickening of connective tissue, and fatty degeneration in the zona fasciculata and reticularis. There was no change in serum-K. V. J. W.

Influence of nicotinic acid on blood-sugar level and its relation to adrenaline hyperglycaemia.—See A., 1944, III, 270.

Removal of red cells from active circulation by sodium pentobarbital [rôle of spleen: action of adrenaline].—See A., 1944, III, 238.

-Tropic versus -trophic in pituitary hormone terminology. G. W. Corner (*Endocrinol.*, 1943, 33, 405—408).—Historical review and recommendation of the latter form. P. C. W.

Differentiation and significance of argentaffin granules in hypophysis.—See A., 1944, III, 237.

Differential concentration of hormones in central and peripheral zones of bovine anterior pituitary gland. G. K. Smelser (*Endocrinol.*, 1944, 34, 39—43).—The gonadotropin, thyrotropin, and adrenotropin content of beef anterior pituitary was greater in the central than in the peripheral portions of the gland. The cortical portion of the gland is predominantly composed of acidophil and chromophobe cells, the central portion of basophil cells. The ratio between basophil, and other, cells in extracts of central and peripheral portions of the gland was fixed; the ratio of gonadotropin (2:1), adrenotropin (7:1), and thyrotropin (20:1) was not. This suggests that the hormones are formed or stored by different cell types which have different spatial distribution throughout the gland. P. C. W.

Study of crop-sac weight method for prolactin assay. S. R. Hall (*Endocrinol.*, 1944, 34, 1—13).—The slope of the regression line is only valid for crop-sacs weighing 2200—2500 mg. Lower wts. fall on a significantly flatter curve. Addition of muscle extracts to purified prolactin solutions may augment or decrease the crop-sac response according to the proportion of extract added. The crop-sac response is 50% higher after subcutaneous than after intramuscular injection. The response in male pigeons is slightly greater than in females after subcutaneous injection, but the same after intramuscular injection. 5 different preps. were tested 53 times during 1 year and showed wide individual variations in response; the variation was less when the crop glands weighed less than 2300 mg. P. C. W.

Prolactin assay by comparison of two crop-sacs of same pigeon after local injection. S. R. Hall (*Endocrinol.*, 1944, 34, 14—26).—Differences of 20% in dose can be detected when the response of one crop gland is compared with that of the other gland of the same pigeon after intradermal or subcutaneous injection of the two doses locally. The range of individual variation in gland proliferation in different pigeons renders comparisons of the abs. level of response in groups of pigeons only accurate in detecting differences of 100% in dosage. The response is affected by the site of injection and by the vol. of solution injected. Suspensions of fresh or acetone-dried pituitaries are less effective than equiv. doses of extracts. Acetone-dried suspensions are less effective than fresh suspensions. P. C. W.

Preparation of pituitary corticotrophic hormone. A. H. Neufeld (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 90—92).—To a purified extract is added 0.5 vol. of conc. aq. NH_3 and it is kept at 25° or 37° for 10—14 hr. The resulting product contains adrenotropic hormone, but no growth, thyrotrophic, or gonadotrophic hormone or prolactin. V. J. W.

Bioassay of adrenocorticotrophic hormone. M. E. Simpson, H. M. Evans, and C. H. Li (*Endocrinol.*, 1943, 33, 261—268).—One unit is defined as the total dose required to repair the adrenal cortex in female rats hypophysectomised when 26—28 days old; the first injection is given 14 days after operation and 3 equal injections are given at daily intervals. The min. response is a partial obliteration of the sudanophobe zone which develops after hypophysectomy. The second unit proposed is the daily dose necessary to maintain the adrenal wt. for 15 days after hypophysectomy in 40-day-old male rats. All injections are intraperitoneal. P. C. W.

Similarity of response of thymus and lymph nodes to administration of adrenotropic hormone in rat. M. E. Simpson, C. H. Li, W. O. Reinhardt, and H. M. Evans (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 135—137).—Purified hormone from sheep (A., 1943, III, 886) causes in normal rats a decrease in size and wt. of thymus and cervical lymph nodes. This does not occur in adrenalectomised rats. V. J. W.

Is gonadotrophic activity of pituitary body in lower vertebrates increased by zinc salts? P. A. Wunder (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, 39, 38—40).—The addition of 1 mg. of ZnSO_4 per c.c. to extracts of homologous pituitary glands produced premature ovulation in 10 of 15 *Rana ridibunda* when injected in autumn (extracts of 3—4 glands in 4 doses in 2 days) and in 6 of 7 when injected in spring (0.5 gland in 1 dose), whereas without Zn the extracts produced reactions in 0 of 10 and 2 of 9 respectively. F. S.

Local maintenance of spermatogenesis in hypophysectomised rats with low dosages of testosterone from intratesticular pellets. S. Dvoskin (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 111—113).—Implantation beneath the tunica albuginea of cholesterol pellets containing 5% of testosterone caused maintenance of spermatogenesis in that testis and not in the other. The ventral prostate was also larger than in controls. The wt. loss of the pellets averaged 2.5 µg. per day. V. J. W.

Limited effects of certain steroid hormones on mammary glands of hypophysectomised rats. J. F. Smithcors and S. L. Leonard (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 109—111).—Injection of 30 mg. of progesterone over 10 days caused some mammary growth if injections were begun immediately after hypophysectomy. The effect was increased by the daily addition of 5 µg. of oestrogen. If treatment was postponed to 4 days after hypophysectomy no effect was produced. Deoxycorticosterone was without action. V. J. W.

Zinc content of pancreas of normal and hypophysectomised dogs. L. Horvai (*Biochem. Z.*, 1941, 308, 301—308).—The amount of Zn in the pancreas of 9 normal dogs varied from 133.9 to 249 (average 195.3) µg. per g. With 9 hypophysectomised dogs, the average content was 233.7 with extreme vals. of 146.1 and 356 µg. per g., whilst with 4 dogs with various ailments, the amount of Zn, although considerably less, was practically const. and varied only between 122 and 127 µg. per g. J. N. A.

Factors affecting action of antigonadotropic sera in immature rats. W. H. McShan, H. R. Wolfe, and R. K. Meyer (*Endocrinol.*, 1943, 33, 269—275).—Antisera prepared by injecting rabbits or goats with crude sheep-pituitary extract had greater antigonadotropic potency against crude sheep, hog, or cow gonadotropin when the 2 injections were given separately than if they were mixed *in vitro* before injection. Partial purification of sheep gonadotropin resulted in antigonadotropic potency being demonstrated by separate or combined injections. Aq. extracts of horse, human, or rat pituitary glands, pregnant mare's serum, or purified chorionic gonadotropin had their gonadotrophic activity inhibited by the antiserum to an equal extent by separate or combined injections, presumably owing to the greater activity per unit wt. of these gonadotropins when compared with those above. P. C. W.

XII.—REPRODUCTION.

Reproduction in chimpanzee.—See A., 1944, III, 235.

Effect of sex hormones on erythrocyte number in blood of domestic fowl.—See A., 1944, III, 238.

Fluorescence, birefringence, and histochemistry of rat ovary during reproductive cycle. E. W. Dempsey and D. L. Bassett (*Endocrinol.*, 1943, 33, 384—401).—Ovarian sections were examined to localise birefringent crystals, autofluorescent materials, acetone-sol. keto-compounds, and sterol substances reacting with H_2SO_4 . Substances giving the characteristic reaction of sterol hormones were detected in the theca interna, corpus luteum, and interstitial tissue, but not in the membrana granulosa. The amounts of these substances in the different structures varied according to the stage of the oestrous cycle. P. C. W.

Prepubertal state in young girls. J. D. Pilcher and H. Tuchewicz (*Amer. J. Dis. Child.*, 1943, 65, 296—304).—Vaginal changes that precede onset of menstruation were observed in 50 young girls. The tissues about the hymen become hypertrophic and are succulent and greyish; the reaction of the vaginal secretions changes from

alkaline to acid, and the type of flora from coccal to bacillary. These changes persist after onset of menstruation. The change may occur rapidly, during 1 week. C. J. C. B.

Colour measurement in sexual skin in *Macacus rhesus* by Munsell system. R. Cleveland, S. Wilkes, and G. Sabotka (*Endocrinol.*, 1943, 33, 289—296). P. C. W.

Reproduction on purified rations containing sulphaguanidine. B. H. Ershoff and H. B. McWilliams (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 227—228).—Presence of sulphaguanidine (0.5%) + *p*-aminobenzoic acid in, or absence of inositol from, the diet had no harmful effects on fertility or growth of female rats. Fertility was markedly reduced and lactation failed if both inositol and sulphaguanidine were present. V. J. W.

Synthetic oestrogenic compounds related to stilbene and diphenylethane. II. E. C. Dodds, L. Golberg, E. I. Grünfeld, W. Lawson, C. M. Saffer, jun., and (Sir) R. Robinson (*Proc. Roy. Soc.*, 1944, B, 132, 83—101; cf. A., 1939, II, 312).—The most active synthetic oestrogen so far described is *meso*-4:4'-dihydroxy- γ - δ -diphenylhexane (hexoestrol), m.p. 185°, which has an activity of 5×10^6 units per g. *trans*-4:4'-Dihydroxy- α - β -diethylstilbene (stilboestrol) and 4:4'-dihydroxy- γ - δ -diphenyl- $\Delta^{8,9}$ -hexadiene have activities of 3×10^6 and 2.5×10^6 , respectively. Variations of the alkyl substituents attached to the α - β -C atoms of the stilbene or dihydrostilbene mol., alteration of the position of the phenolic OH groups, and substitution of alkyl or OH by NH_2 or halogen, all cause a very marked loss of potency. For new compounds investigated see A., 1944, II, 128. H. B.

Attempt to induce formation of fibroids with oestrogen, in castrated female rhesus monkey. L. Vargas, jun. (*Johns Hopkins Hosp. Bull.*, 1943, 73, 23—30).—Treatment of 4 oophorectomized monkeys with subcutaneous tablets of oestradiol produced no fibroid tumours or disseminated miliary nodules. One had a keloid plaque of fibrosis over the stomach and another had pronounced operative adhesions and fibrosis at the site of the laparotomy. Two animals showed a pronounced fibrosis of the myometrium particularly around the cervix uteri. T. F. D.

Inactivation of oestradiol in liver. A. Cantarow, K. E. Paschkis, A. E. Rakoff, and L. P. Hansen (*Endocrinol.*, 1943, 33, 309—316).—Little or no oestrogen could be recovered from the liver of dogs 3—48 hr. after the intravenous injection of 250,000 i.u. of α -oestradiol. 24—48 hr. after the injection 3000—7500 i.u. could be recovered from the gall-bladder bile, though there was none in the liver, spleen, intestine, or hepatic vein blood; there was a relatively high concn. in the portal vein blood in 1 of 3 experiments. The liver of rats poisoned with CCl_4 inactivated α -oestradiol *in vitro* quite normally. It is suggested that oestrogen is stored in an inactive form in the liver and is reactivated during excretion by the hepatic cells. P. C. W.

Reproductive capacity in adult male rats treated prepuberally with androgen. J. G. Wilson and H. C. Wilson (*Endocrinol.*, 1943, 33, 353—360).—Groups of male rats were injected daily with testosterone propionate for 28 days at different periods between birth and puberty. Total doses were 36 mg. Their reproductive capacity was tested 3—5 months after stopping treatment, when there was a marked reduction in sexual potency and libido, which was most pronounced in those treated earliest. Those treated from birth to 28 days of age were adversely affected by total doses of 0.75—1.5 mg. P. C. W.

Inactivation of stilboestrol by liver *in vitro*. B. Zondek, F. Sulman, and J. Sklow (*Endocrinol.*, 1943, 33, 333—336).—Stilboestrol is inactivated *in vitro* by liver pulp. Twice as much tissue is required to inactivate a given amount of stilboestrol as is required for the same amount of oestrone. To this fact is attributed the greater oral efficacy of stilboestrol and the nausea it produces. In rats treated with large doses of stilboestrol the capacity of the liver to inactivate stilboestrol is increased. P. C. W.

Inactivation of oestrone and diethylstilboestrol by micro-organisms.—See A., 1944, III, 296.

Diethylstilboestrol excretion in tumour-bearing rabbits.—See A., 1944, III, 263.

Carcinogenic hydrocarbons and synthetic oestrogens.—See A., 1944, III, 261.

Relation of diabetogenic effect of diethylstilboestrol to adrenal cortex in rat.—See A., 1944, III, 251.

Hair loss in male dogs fed stilboestrol. R. M. Mulligan (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 21—22).—Oral administration of stilboestrol, in doses of 330 mg. in 129 days to 2985 mg. in 291 days, caused partial loss of hair in 4 dogs. V. J. W.

Effect of follicular hormone on anaphylactic shock. L. Farmer (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 5).—4—5 injections of α -oestradiol benzoate, totalling 12,450—16,600 rat units, did not increase the anaphylactic response of female guinea-pigs to horse serum. V. J. W.

Metabolism of oestrogens. E. A. Doisy, S. A. Thayer, and J. T. van Bruggen (*Fed. Proc.*, 1942, 1, 202—208).— β -Oestradiol has not so far been identified in human pregnancy urine and is not an important end product of oestrogen metabolism in monkeys. There is some evidence for its conversion into α -oestradiol via oestrone. The reverse action has been demonstrated in rabbits. The evidence for the production of sex hormones by the adrenals is reviewed, together with the catabolism of oestrogens by various species and their *in-vitro* oxidation. P. G. M.

Experimental effect of testosterone propionate and oestradiol dipropionate on cholesterol content of blood and aorta in castrate female rabbits. M. Bruger, I. S. Wright, and J. Wiland (*Arch. Pathol.*, 1943, 36, 612—614).—Castration does not alter the cholesterol content of the blood or the aorta in young female rabbits. Testosterone propionate and oestradiol dipropionate administered at frequent intervals over a period of 100 days have no action in female castrates. Feeding cholesterol produces hypercholesteræmia and increased deposition of cholesterol in the aorta regardless of the presence or the absence of the female gonads. Testosterone propionate and oestradiol dipropionate inhibit the hypercholesteræmia and prevent the excess deposition of cholesterol in the aorta of the female rabbit fed cholesterol but when the gonads are removed this protective action is abolished. C. J. C. B.

Action of testosterone and prolactin on corpora lutea of rat. C. F. Fluhmann and G. L. Laqueur (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 223—225).—Administration to rats in late oestrus of testosterone in total dosage of 2.5—5 mg. over 10 days enhances luteal activity so as to permit the production of uterine deciduomata. Larger doses cause luteal hypertrophy resembling that of pregnancy. Doses of 600—2400 i.u. of prolactin allow production of deciduomata but do not cause luteal hypertrophy. V. J. W.

Influence of hatching order on intensity of testis pigmentation in *Ephestia kuehniella*.—See A., 1944, III, 236.

Histological study of testes of sockeye salmon (*Oncorhynchus nerka*).—See A., 1944, III, 237.

Changes in optic function and ophthalmoscopic picture observed in four patients of the eunuchoid skeletal type who were being treated with an orchic extract.—See A., 1944, III, 248.

Effect of injections of testosterone propionate on male subject, with nephrotic syndrome.—See A., 1944, III, 257.

Serological factors as possible causes in spontaneous abortions.—See A., 1944, III, 241.

Transfer of androgens in parabiotic rats. E. G. Shipley, R. K. Meyer, and C. Biddulph (*Amer. J. Physiol.*, 1943, 140, 230—233).—One partner of pairs of castrated male-male parabiotic (celio-anastomosis) rats was injected with 15—1000 μ g. of testosterone propionate daily; transfer of the equiv. of 8 μ g. of testosterone propionate to the uninjected parabiont took place at the level of 300 μ g. or more. Seminal vesicles and prostate glands equal in wt. to those of single normal rats, or to those of single castrates receiving 8 μ g. per day, were obtained in uninjected parabionts when 1000 μ g. of testosterone propionate was injected into the other partner. T. F. D.

Dehydroisoandrosterone sulphate from normal male urine. P. L. Munson, T. F. Gallagher, and F. C. Koch (*J. Biol. Chem.*, 1944, 152, 67—77).—Colorimetric determinations of 17-ketosteroids were made before and after hydrolysis by a modified Holtorf-Koch method (A., 1940, III, 946). Butyl alcohol extracts of male urine yielded, on fractionation, three types of 17-ketosteroid: one, extracted from butyl alcohol by aq. NaOH at pH above 9, a second extracted by water at pH below 9 and not pptd. as semicarbazone, and a third more sol. in butyl alcohol than water and forming an insol. semicarbazone in aq. alcohol. The third fraction yielded Na dehydroisoandrosterone sulphate semicarbazone, after acid hydrolysis of which the ketosteroid was identified as the benzoate. Following injection of dehydroisoandrosterone 25% of the conjugated neutral 17-ketosteroids initially extracted by butyl alcohol from the urine of a woman with pituitary disease consisted of the unchanged compound. P. G. M.

Pregnancy maintenance in hypophysectomised-oophorectomised rats injected with oestrone and progesterone. W. R. Lyons (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 65—68).—Ovaries and pituitaries were removed from rats 1 week after mating. Subsequent daily administration of 1 μ g. of oestrone and 4 mg. of progesterone brought about survival of a majority of fetuses, but smaller doses failed to do so. V. J. W.

Metabolism of human placenta. I. Oxygen consumption in relation to ageing. H. W. Wang and L. M. Hellman (*Johns Hopkins Hosp. Bull.*, 1943, 73, 31—39).—The *in vitro* O_2 consumption of *brevi* from human placentas in Ringer-phosphate solution decreases gradually as pregnancy advances, being related histologically with the change in the chorionic epithelium, disappearance of Langhans' layer at the middle of pregnancy, and some syncytial degeneration at term. The O_2 consumption of the full-term placenta is not

influenced by the use of analgesics or anaesthetics during labour or by the addition of glucose to the *brei*. T. F. D.

Relaxation of pelvic ligaments of castrate hysterectomized guinea-pigs induced by progesterone. N. W. Fugo (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 200—201).—Relaxation, which Hisaw *et al.* failed to produce (*Anat. Rec.*, 1942, 84, 467), occurs in response to progesterone after preliminary oestradiol if 17 days are allowed for recovery from operation before beginning treatment. V. J. W.

Prolongation of pseudopregnancy by induction of deciduomata in rat. B. H. Ershoff and H. J. Deuel, jun. (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 167—168).—Pseudopregnancy (faradisation of cervix) without uterine trauma lasted 12—15 days before vaginal cornification occurred. Uterine trauma prolonged the condition to the 22nd day, the animals showing maintenance of corpora lutea, inhibition of follicular development, leucocytic vaginal smear, and a "metrial gland" (Selye and McKeown, *Physiol. Abs.*, 1936, 21, 572). V. J. W.

Hormone factors of male behaviour in rat. R. Koster (*Endocrinol.*, 1943, 33, 337—348).—Normal virgin female rats may exhibit male mating behaviour (mounting and copulatory movements) even before the vagina is open if they are placed with an oestrous female. Females injected with testosterone propionate will also copulate with oestrous females and will receive males. One testosterone-treated female copulated with 2 normal males despite resistance. Females injected with oestradiol show even stronger masculine behaviour, including muscular movements corresponding to ejaculation in the male. A total dose of 2000 r.u. is needed to produce this reversal, which persists for long periods after stopping the injections. Such oestradiol-treated females are attractive to males but resist them strongly. P. C. W.

Electron microscope study of sperm. M. R. B. Baylor, A. Nalbandov, and G. L. Clarke (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 229—232).—Bull and fowl sperms were magnified up to 100,000. In the fresh, unfixed, and unstained sperm of the bull, the head is always enveloped by a protoplasmic cap which is easily damaged. The tails end in a long brush of free filaments, a similar structure being shown if the tail is broken. (7 photomicrographs.) V. J. W.

Relation of number of injections to titre of sperm isoagglutinins in mice. G. D. Snell and H. Poucher (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 261—263).—Intraperitoneal injections of mouse spermatozoa into female mice produced a high titre of sperm agglutinins when 21 injections were made during 7 weeks, but 4—5 injections were ineffective. V. J. W.

Electrophoretic patterns of seminal plasma from some "abnormal" human semens. V. Ross, E. G. Miller, jun., D. H. Moore, and H. Sikorski (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 179—181).—No abnormalities were found in the patterns from abnormally viscous or azoospermic specimens. V. J. W.

XIII.—DIGESTIVE SYSTEM.

Visceral nervous system of the earthworm. II. Evidence of chemical transmission and action of sympathetico-mimetic and parasympathetico-mimetic drugs on tone of alimentary canal. N. Millett (*Proc. Roy. Soc.*, 1943, B, 131, 362—373).—The action of adrenaline, ephedrine, tyramine, and acetylcholine on the tone of the alimentary canal of the earthworm is considered in relation to the effects of nerve stimulation (cf. A., 1943, III, 552). The similarity between the effect of the drugs and nerve action indicates that the antagonistic groups of nerves which indirectly influence the tone of the gut are probably cholinergic and adrenergic. The indication of cholinergic nerves is confirmed by experiments where the effect of electric stimulation of the augmentor nerves to the gut was found to be abolished by atropine but potentiated by eserine. The similarity existing between the type of indirect control of the gut in the earthworm and vertebrates is thus extended. The results are compared with those described by workers on other invertebrates. The type of chemical transmission in earthworm resembles that in vertebrates. C. J. C. B.

Effect of nervous and hormonal stimulation on zymogen secretion. J. E. Thomas (*Fed. Proc.*, 1942, 1, 261—267).—A review of the control mechanism of the secretion of the salivary and gastric glands and the pancreas. No conclusions regarding the possible trophic effects of hormones can yet be drawn. The secretion of enzymes is largely a function of the nervous system. P. G. M.

Digestion of whole wheat and white breads in the human stomach.—See A., 1944, III, 265.

Histamine ineffective in rat as gastric secretory stimulant. M. H. F. Friedman (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 42—44).—In rats gastric secretion is continuous, and is not affected by doses of histamine up to 5.5 mg. per kg. V. J. W.

New pepsin inhibitor [sodium lauryl sulphate]. F. Steigmann and A. R. Marks (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 25—26).—

200 mg. of Na lauryl sulphate caused a rise in pH and fall in peptic activity of gastric contents in peptic ulcer patients. 100 mg. caused no change in either respect. V. J. W.

Effect of sodium alkyl sulphate on peptic activity of gastric contents in man and in vitro. J. B. Kirsner and R. A. Wolff (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 11—13).—Na alkyl sulphate (cf. Shoch and Fogelson, A., 1942, III, 894) does not inhibit peptic activity in patients receiving a diet rich in lipins. *In vitro*, the same inhibiting action is shown by lecithin, glycerin, and many fats, but not by lard, olive oil, or mineral oil. V. J. W.

Secretion of dyes by gastric glands and pancreas. M. B. Visscher (*Fed. Proc.*, 1942, 1, 246—255).—A review of investigations on the microscopy of the gastric mucosa and pancreas, the electrochemical properties of dyes, and their absorption from the stomach. Only those dyes of which the chromogen can be positively charged appear in the gastric juice, whilst the chromogen of dyes which appear in the pancreatic juice can occur as an anion in either the oxidised or reduced form. Alternative mechanisms are discussed. P. G. M.

Formation of acid by gastric glands. J. S. Gray (*Fed. Proc.*, 1942, 1, 255—260).—A review of the evidence for the carbonic anhydrase theory of acid formation by the parietal cells of the gastric glands, and the possible mechanism of utilisation of the energy of the cell. P. G. M.

Shock in perforated peptic ulcer. L. Soutter (*Surgery*, 1941, 10, 233—241).—Profound shock (circulatory collapse, subnormal temp., pallor, sweating, and coldness of skin) occurred in 3, and mild degrees of shock in 17, out of 335 cases of perforated gastric ulcer. G. P.

Toxicity of intestinal content and of transudate from obstructed loop. F. C. Hill and M. E. Stoner (*Surgery*, 1941, 10, 250—264).—Normal intestinal contents of dogs, or the transudate collected in a rubber bag placed around an obstructed and strangulated intestinal loop, were toxic and produced leucopenia when injected intravenously to dogs. No evidence could be obtained by the intravenous injection of these contents as to the rôle of the intestinal toxic substances in the causation of the symptoms of intestinal obstruction. G. P.

Phytic acid and iron absorption. R. A. McCance, C. N. Edgecombe, and E. M. Widdowson (*Lancet*, 1943, 245, 128—128).—Control serum-Fe levels were obtained weekly for 4—8 weeks in 9 healthy adults and ranged from 48 to 208 µg. per 100 c.c., with considerable variations from time to time. Administration of large doses of sol. Fe^{II} or Fe^{III} salts raised serum-Fe vals. by 35—250 µg.-%. When Na phytate was added to the bread the rise of serum-Fe was 12—167 µg. per 100 c.c. with Fe^{II} salts and 21—94 µg. per 100 c.c. with Fe^{III} salts. Thus Na phytate interfered with Fe absorption. NaH₂PO₄ had a similar but smaller effect. C. A. K.

Treatment of epidemic diarrhoeas and dysenteries in infants and young children. K. Glaser and J. W. Bruce (*J. Pediat.*, 1944, 24, 53—61).—The main principles of the treatment suggested are: starvation period (12 hr.); oral and intravenous hydration and combat of acidosis; feeding of buttermilk, skimmed boiled milk, or protein milk at 3—4-hr. intervals, sulphathiazole and sulphaguanidine; plasma and blood transfusions; sp. antiserum therapy and Bi and paregoric only in resistant patients. C. J. C. B.

Colonic spasm as cause of intestinal obstruction. R. Colp (*Surgery*, 1941, 10, 270—286).—Review of literature and report of 5 cases. G. P.

Vitamin requirements of caecetomised rats.—See A., 1944, III, 268.

XIV.—LIVER AND BILE.

Critical factors in recovery oxygen consumption of rat liver slices following anoxia in vitro. F. A. Fuhrman and J. M. Crismon (*J. Biol. Chem.*, 1944, 152, 213—214).—After 70 min. exposure to N₂, the Q_{O₂} is greater in "intracellular medium" than in Ringer's solution, lactic acid production being 5.0 mg. per g. in the former and 1.6 in the latter. The low val. for liver slices from fasted rats in Ringer's solution after anoxia is probably due to the low glycogen content of the liver and the inability of the liver to utilise added glucose during anoxia. The higher recovery and lactic acid output in an "intracellular medium" are probably due to added glucose being made available for energy-yielding reactions in presence of larger amounts of K. H. G. R.

Infective hepatitis. I. Gordon (*Brit. Med. J.*, 1943, II, 807—811).—Clinical description of 168 cases of infective hepatitis. In 14 cases the hippuric acid test by the oral method was performed when the icterus was at its height and impaired liver function was demonstrated. The same test shows that recovery of liver function is slow in some cases, liver insufficiency after total disappearance of jaundice occurring in 4 cases. I. C.

Gastrointestinal tract and liver.—See A., 1944, III, 193.

Proteases and peptidases of liver.—See A., 1944, III, 217.

In-vitro hydrolysis and synthesis of cocarboxylase by [mechanically damaged] liver tissue. W. M. Govier and M. E. Greig (*J. Pharm. Exp. Ther.*, 1943, 79, 240—245).—The results of Ochoa (A., 1939, III, 940), that liver slices aerobically synthesise and anaerobically hydrolyse cocarboxylase, were confirmed. In addition it was found that homogenised liver tissue hydrolyses cocarboxylase both aerobically and anaerobically. The degree of aerobic hydrolysis depended on the severity of the mechanical damage to the liver cells.

G. P.

Therapy with sulphonamide compounds for patients with liver damage.—See A., 1944, III, 204.

Incidence of a carcinogenic factor in the livers of cancer, non-cancer, cirrhotic, and negro patients.—See A., 1944, III, 195.

Liver principle effective against shock from burns.—See A., 1944, III, 173.

Effect of partial obstruction of common bile duct. N. W. Thiessen and R. F. Hanzal (*Surg. Gynec. Obstet.*, 1941, 72, 854—859).—Partial obstruction of the bile duct with or without cholecystectomy was performed in dogs. The symptoms produced were qualitatively the same as those produced by complete obstruction. In presence of obstruction with an intact gall bladder the cholesterol esters in the bile increased when the total cholesterol decreased and vice versa; when the gall bladder was removed the esters varied directly with the total cholesterol. These changes are not due to nutritional states but to variations in liver damage with secondary effects due to the presence or absence of the gall bladder.

P. C. W.

XV.—KIDNEY AND URINE.

Structure of renal tubule of spiny dogfish (*Squalus acanthias*).—See A., 1944, III, 160.

Pressor and depressor substances from kidney.—See A., 1944, III, 164.

Effect of hæmorrhagic shock on concentration of renin and hypertensinogen in plasma in unanæsthetised dogs.—See A., 1944, III, 174.

Renal blood vessels in hypertension.—See A., 1944, III, 174.

Serum-lipins. III. Interrelations in patients with diseases of the kidneys.—See A., 1944, III, 168.

Acacia in renal oedema.—See A., 1944, III, 173.

Prevention of renal obstruction in sulphadiazine therapy.—See A., 1944, III, 208.

Anti-uranic substance—V-factor—which protects kidney from action of uranium and alters its excretion.—See A., 1944, III, 212.

XVI.—OTHER ORGANS, TISSUES, AND BODY-FLUIDS. COMPARATIVE PHYSIOLOGY (not included elsewhere).

Geometrical basis of biological properties. G. F. Sleggs (*Growth*, 1943, 7, Reprint, 2 pp.).—Methods on which may be based the application of Fourier and other analyses to organic form are discussed; thus, biological functions are related to lattices and other geometrically arranged at patterns in protoplasm and specialised tissues.

F. O. H.

Size of samples necessary for establishing significance of the difference in responses to two different treatments. S. Swaroop (*Indian J. Med. Res.*, 1940, 27, 1149—1172).—Tables for statistical calculation of the size of samples are given.

J. H. B.

Injuries produced by blast in water. J. C. Goligher, D. P. King, and H. T. Simmons (*Lancet*, 1943, 245, 119—123).—The effects of under-water blast in 17 cases are described. All had abdominal injuries consisting chiefly of intramural hæmatomas and perforations of lower end of œsophagus, stomach, and small intestines. The solid abdominal viscera were rarely affected. Lung injuries were found in 7 cases.

C. A. K.

Production of experimental granulating wounds. H. E. Hutchison (*Lancet*, 1943, 245, 75—76).—In rats wounds were made on the back of the neck and a "Viskap" (normally used as occlusive seal on bottles) was inserted. After allowing some days for granulation to develop the Viskap can be removed after preliminary softening. The animal cannot interfere with the wound. The effects of antiseptics on granulation can readily be studied.

C. A. K.

Polyploidy in parthenogenetic Curculionidae. E. Suomalainen (*Hereditas*, 1940, 26, 51—64).—In four bisexual species of weevil the diploid chromosome no. is 22 but amongst parthenogenetic species studied, one was diploid, three tetraploid, and five triploid. In these the egg cells pass through one maturation division only.

L. G. W.

Triploidy in *Triton taeniatum*. Laur. J. A. Boök (*Hereditas*, 1940, 26, 107—114).—A record of an individual of *T. taeniatum* with triploid testes.

L. G. W.

Pigmentary effector system. X. Relation of colour change to surface absorption of radiation [in frogs]. L. Hogben and R. L. Kirk (*Proc. Roy. Soc.*, 1944, B, 132, 68—82).—Exposure of frogs in still air to radiation of intensity 100 cal. per sq. m. per sec., above or below the 1.0- μ . range, produced a rapid rise of temp. in the lymph space, the temp. of pale frogs lagging 1° behind that of dark frogs. The final level after 30—45 min. was near the thermal death-point. The rectal temp. was 5° below that of the lymph sac. Dark and pale frogs did not differ in water loss or in the reflective power of the skin. Within a wide range the body temp. of frogs in rapidly circulating air tallied closely with the wet-bulb reading.

F. S.

Low temperature and cleavage in *Triton taeniatum*. J. A. Boök (*Hereditas*, 1943, 29, 195—197).—Eggs of the salamander (*T. taeniatum*) given low-temp. (1—2°) treatment undergo abnormal cleavage and cells with variable chromosome nos. are produced.

L. G. W.

Dust as inhibiting factor in reproduction of insects. S. E. Flanders (*J. Econ. Entom.*, 1941, 34, 470—472).—A review.

A. A. M.

Changes in water, dry substance, and total nitrogen content in the silkworm *Antheraea pernyi*, G., during development. N. S. Demianovskaja and A. V. Sokolskaja (*Biochimia*, 1943, 8, 77—84).—Variations in dry substance and total N during development during spring and summer-autumn hatching have shown a similarity to that reported for *Bombyx mori*. Differences found between earlier and later seasons are ascribed to variations in the composition of the leaves of *Quercus robur*, L., which served as food for the larvae.

H. G. R.

Radioactive tracer methods for determination of the disposition of arsenic in the silkworm. L. B. Norton and R. Hansberry (*J. Econ. Entom.*, 1941, 34, 431—437).—Analyses of body fluids and tissues of silkworms fed with radioactive AsO_4^{4-} show that the initial elimination of insol. AsO_4^{4-} , which is less effective, is more rapid and greater than that of the sol. and more effective AsO_4^{4-} . Elimination of As is slowest but greatest for completely absorbed arsenates; the major part of the As is found in the midgut wall. Transference of As from gut to body tissues depends on the arsenical, and the toxicity of arsenates is approx. proportional to the As concns. in these tissues. Their absorption as complex ions probably accounts for the different behaviour of AsO_4^{4-} .

A. A. M.

Investigations of the distribution of manganese in the animal organism with ^{55}Mn as indicator. H. J. Born, H. A. Timofeff-Ressowsky, and P. M. Wolf (*Naturwiss.*, 1943, 31, 246—247).— ^{55}Mn was injected into rats and the amount of radioactive Mn in the blood, liver, kidney, spleen, salivary gland, genital gland, brain, adrenal capsule, and thyroid gland was measured after periods of $\frac{1}{2}$, 1, 2, 4, 6 hr.

J. F. H.

Component fatty acids of human depot fat. D. L. Cramer and J. B. Brown (*J. Biol. Chem.*, 1943, 151, 427—438).—The fats were analysed by fractionation of the methyl esters and crystallisation at low temp. Tetra- and hexa-decenoic (5—8%) acids were identified, and the presence of arachidonic acid was confirmed. Isomeric octadecenoic and octadecadienoic acids are present with oleic (44—47%) and linoleic (8—11%) acids, which are the chief unsaturated C_{18} acids. Palmitic (24—26%) and stearic (5—9%) are the other main component acids.

R. L. E.

Occurrence [and detection] of squalene in natural fats. J. Fitelson (*J. Assoc. Off. Agric. Chem.*, 1943, 26, 506—511).—Squalene is detected microscopically as hexachloride and determined by halogen absorption in the unsaponifiable matter unadsorbed on Al_2O_3 . Vals. are tabulated for various oils and fats; they range from none in cacao butter to a max. of 708 mg. per 100 g. in one sample of olive oil. Butter contains 7 mg. per 100 g.

A. A. E.

Determination of pectin in biological materials. Modification of pentose-furfuraldehyde method. E. F. Bryant, G. H. Palmer, and G. H. Joseph (*Ind. Eng. Chem. [Anal.]*, 1944, 16, 73—76).—Data are presented on the normal levels of furfuraldehyde-yielding substances in various organs and fluids from rabbits (for analytical procedure see C., 1944, Part 2).

J. D. R.

Distribution of lipins in animal tissues. M. Kaucher, H. Galbraith, V. Button, and H. H. Williams (*Arch. Biochem.*, 1943, 3, 203—215).—The distribution of cephalin, lecithin, sphingomyelin, free and combined cholesterol, cerebroside, and neutral fat in various tissues is determined. Ox brain has nearly 50% whilst stomach has less than 5% of essential lipin. The essential lipin varies directly with the phospholipin content. With the exception of brain which contains approx. 10% of free cholesterol, the other ox organs contain only small amounts of cholesterol. Cholesteryl esters are a significant lipin fraction of most tissues. The essential lipin concn. of the tissues is related to the extent and variety of their physiological activities. The distribution of the other lipin fractions as well as the individual phospholipin components is more directly related to tissue function. Cardiac and skeletal muscles contain much cerebroside which comprises a much greater portion of the cellular lipins than does cholesterol. Ox liver and turtle egg contain no cerebroside. The amounts of cerebroside and cholesterol appear to

vary inversely. Sphingomyelin is more abundant in soft organs than in skeletal muscle. The importance of each lipid constituent as well as the concn. of the essential cellular lipids in relation to functional activity of various types of tissue is discussed.

J. N. A.

Amino-acid yield from various animal and plant proteins after hydrolysis of fat-free tissue. R. J. Block and D. Bolling (*Arch. Biochem.*, 1943, 3, 217—226).—Except for gelatin, hæmoglobin, and keratin, the animal proteins (based on 16% N content) yield S 1, cystine 1—2, arginine 5—7, histidine 2—3, lysine 5—8, tyrosine 3—5, tryptophan 1—2, phenylalanine 5—6, threonine 4—6, valine 4—6, leucine 10—20, and isoleucine 3—5%. Yeast, maize, and wheat germ, and soya bean yield approx. the same amounts of these amino-acids, whilst gelatin, hæmoglobin, keratin, maize, maize-gluten and -albumin, and wheat gluten are poorly balanced in essential amino-acids. The determination of amino-acids for nutritional evaluation of proteins is discussed.

J. N. A.

[Use of thiourea as measure of change in body-water.] T. S. Danowski (*J. Biol. Chem.*, 1944, 152, 207—212).—Injected thiourea is distributed through a vol. of fluid in dogs that approximates to or equals that assigned to total body-water. The vol. is const. providing the time allowed for diffusion is the same and any change in vol. indicates a change in total vol. of body-water. Measurements of change in total water by studies of thiourea distribution agree within 4% of the animal's body wt. with that obtained by metabolic experiments.

H. G. R.

Molecular structure of synthetic egg-albumin fibres.—See A., 1944, I, 100.

Catgut and collagen [as suture materials]. H. Feriz (*Surgery*, 1941, 10, 326—335).—Catgut behaves as a foreign body in the tissues; it is either destroyed by local inflammatory reaction, or is encapsulated and impregnated with Ca salts. "Brocafil," or collagen thread, is prepared by dissolving cattle-tendon in acid, forcing the viscous collagen solution in ribbon form into an alkaline solution, and then drying. Brocafil is assimilated in the tissues by invasion with fibroblasts without an inflammatory reaction and it is not absorbed.

G. P.

XVII.—TUMOURS.

Comparative histological study of anterior hypophysis and ovaries of two strains of rats, one of which is characterised by high incidence of mammary fibroadenoma. J. M. Wolfe and A. W. Wright (*Cancer Res.*, 1943, 3, 497—507).—The histology of the anterior hypophyses and ovaries of the Albany strain (high mammary cancer) and of the Vanderbilt strain (low mammary cancer) of rats was studied at different ages. In all age groups the % of eosinophils in the hypophyses of Albany rats was lower and the % of chromophobes higher than in Vanderbilt rats. The relative no. of basophils was the same. In both strains structural changes in the hypophysis occurred with advancing age. Most of these changes occurred earlier and were more intense in the Albany rats. In the ovaries advancing age was associated with decrease in the no. of normal follicles, total follicles, and corpora lutea. Partial failure of ovulation and increase of follicular atresia were also observed. These changes were earlier and more intense in the Albany strain.

F. L. W.

Cancer family manifesting multiple occurrence of bilateral carcinoma of breast. D. A. Wood and H. H. Darling (*Cancer Res.*, 1943, 3, 509—514).—Data are presented for a cancer family over 4 generations in which bilateral carcinoma of the breast had occurred in a no. of instances. In the 3rd generation 3 sisters all had breast cancer. One female sibling of the 4th generation had breast cancer at 18 years. Transmission appeared to be through the maternal line. Breast cancer occurred only in women nursed by their mothers. In all cases examined mammary tissue was hyperplastic and compatible with the changes induced by hyperoestrogenisation.

F. L. W.

Sebaceous glands and experimental skin carcinogenesis in mice. W. L. Simpson and W. Cramer (*Cancer Res.*, 1943, 3, 515—518).—The carcinogenic activity of methylcholanthrene is almost completely suppressed when it is dissolved in melted anhyd. lanolin and the melted solution is applied to the skin of mice thrice weekly for 14 weeks.

F. L. W.

Attempts to induce stomach tumours. I. Effect of cholesterol heated to 300°. A. H. M. Kirby (*Cancer Res.*, 1943, 3, 519—524).—Cholesterol heated at 270—300° for $\frac{1}{2}$ hr. in air was fed at a level of 20 mg. daily to albino rats up to 2 years. No significant stomach lesions occurred. Pyrolytic decomp. products of cholesterol include a substance having a blue ultra-violet fluorescence.

F. L. W.

Human neoplasms in tissue culture. II. Observations on cells derived from peritoneal and pleural effusions. D. R. Coman (*Cancer Res.*, 1943, 3, 526—530; cf. A., 1943, III, 331).—Cells derived from pleural and peritoneal effusions were grown in tissue culture by the roller-tube method. Macrophages, polymorphs, mesothelial cells, and fibroblasts were cultured from all fluids. Endothelial cells were found in one case and these produced capillary-like structures.

Cells from carcinomas and sarcomas grew vigorously. Support is given to the view that carcinomatosis of serous membranes can occur by implantation.

F. L. W.

Nucleolar vacuoles in living normal and malignant fibroblasts. W. H. Lewis (*Cancer Res.*, 1943, 3, 531—536).—A large no. of cultures of living normal and malignant fibroblasts were made in various media and examined for nucleolar vacuoles. Some normal fibroblasts had no vacuoles, some few, some many. Malignant fibroblasts from some tumours had no vacuoles, those from others had few, and those from a few tumours had many. Normal fibroblasts had 1—30 and malignant ones 1—60 vacuoles per nucleolus. Malignant fibroblasts cannot usually be distinguished from normal ones by the relative no. of cells with nucleolar vacuoles, by the no. of vacuoles per nucleolus, or by the size of the vacuoles.

F. L. W.

Yolk sac cultivation of tumours. A. Taylor, R. E. Hungate, and D. R. Taylor (*Cancer Res.*, 1943, 3, 537—541).—A method is described for cultivating tumours from mouse or rat in the yolk sac of the developing chick embryo.

F. L. W.

Effect of yolk sac-cultivated tumours on hæmoglobin level in embryonic chick. D. R. Taylor, M. McAfee, and A. Taylor (*Cancer Res.*, 1943, 3, 542—545).—Mammary carcinomas of mice were grown in the yolk sacs of 51 embryonic White Leghorn chicks. The hæmoglobin level of these chicks was considerably depressed by the 17th—18th day of incubation (up to 70% in individual cases). The severity of the depressant action was related to the size of the tumour. Diminution in chick size and liver damage also occurred.

F. L. W.

Growth of alien strain tumours in parabiotic mice. M. Harris (*Cancer Res.*, 1943, 3, 546—549).—Mice of the same strain were united and inoculated with alien tumours known to induce an immunity in the hosts. Primary inoculation of tumour in one of the parabiotics, 25 days after operation, resulted in rapid proliferation of the implants. The eventual size of these tumours was the same as that attained in single mice. Inoculation of the same tumour 10 days later into the other parabiotic was not followed by growth of the implant.

F. L. W.

Vitamin-C and tumour growth. A. Brunschwig (*Cancer Res.*, 1943, 3, 550—553).—An excess of vitamin-C mildly stimulates the growth of certain transplantable tumours. This stimulatory action cannot be constantly elicited under apparently uniform experimental conditions.

F. L. W.

Carcinogenic constituents of shale oil. I. Berenblum and R. Schoental (*Brit. J. exp. Path.*, 1943, 24, 232—239).—Chromatic fractionation of blue shale oil yielded fractions with distinct banded fluorescence spectra including the characteristic band system of 3:4-benzopyrene, the presence of which was confirmed by conversion into its dimethoxy-derivatives. The concn. of 3:4-benzopyrene in blue shale oil was estimated by spectrofluorimetry to be about 0.01%. A fraction giving no fluorimetric evidence of benzopyrene was strongly carcinogenic. Benzopyrene was absent in CHCl_3 extracts of the solid shale from which shale oil is derived by retorting. The results support the view that the carcinogenic constituents of the blue shale oil are similar to those in coal tar and their presence is due to temp. effects during the process of its production from the shale.

F. S.

Immunological protection against tumour hæmorrhage. P. A. Zahl, S. H. Hutner, and F. S. Cooper (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 48—50).—Immunisation of mice with *Shigella paradysenteriae* endotoxin gave protection against the hæmorrhagic action of this toxin on implanted sarcoma 180.

V. J. W.

Action of bacterial toxins on tumours. VI. Protection against tumour hæmorrhage following heterologous immunisation. P. A. Zahl, S. H. Hutner, and F. S. Cooper (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 187—189).—Mice immunised with endotoxins of *S. paradysenteriae*, *Salmonella typhimurium*, or *Rhodospirillum rubrum* became protected against induction of hæmorrhage in implanted tumours by any one of these endotoxins whether it was the one used for immunisation or not.

V. J. W.

Malignancy in rats injected with crude ether-extracted wheat-germ oil. L. G. Rowntree and W. M. Ziegler (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 121—123).—Intraperitoneal injections of such extracts caused in 2 out of 4 strains of rats peritonitis with adhesions. In an average of 32% this went on to malignancy, either sarcomatous or carcinomatous, in 220—670 days.

V. J. W.

Metabolic studies in patients with gastro-intestinal cancer. XV. Lipotropic properties of inositol. J. C. Abels, C. W. Kupel, G. T. Pack, and C. P. Rhoads (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 157—158).—The fatty infiltration of the liver, characteristic of such patients, has been shown to disappear through administration of 8 g. of lipocain. This dose contains 280 mg. of inositol, and the same result follows administration of the inositol alone.

V. J. W.

Inhibition of experimental liver cancer in rats by addition of adsorbent to diet. A. H. Hanszen and W. A. Selle (*Proc. Soc. Exp.*

Biol. Med., 1943, 54, 225—226).—18 out of 20 rats fed with *p*-dimethylaminoazobenzene developed liver cancers. The addition to the diet of an adsorbent clay (montmorillonite) reduced incidence to 1 out of 20. The animals receiving the clay excreted 53% less dye in the urine. V. J. W.

Mucinous carcinoma of breast. O. Saphir (*Surg. Gynec. Obstet.*, 1941, 72, 908—914).—Discussion and classification. P. C. W.

Submucous lipomas of stomach. M. J. Rumold (*Surgery*, 1941, 10, 242—249).—33 cases of submucous lipoma of the stomach have been described in the literature since 1835. One additional case is reported. G. P.

Gastric cancer: experimental approach to problem of causation. P. R. Peacock (*Glasgow med. J.*, 1943, 21, 117—137).—A lecture.

Carcinoma of the stomach: prognosis based on a combination of Dukes' and Broders' methods of grading. G. R. Dochat and H. K. Gray (*Amer. J. clin. Path.*, 1943, 13, 441—449).—The results in 1045 cases are discussed. C. J. C. B.

Cutaneous melanophore eruptions in young fishes during stages preceding melanotic tumour formation.—See A., 1944, III, 237.

Relation between hepatic and plasma concentrations of vitamin-A in man.—See A., 1944, III, 267.

Effect of B vitamins in diet on tumour transplants. B vitamins in cell nuclei.—See A., 1944, III, 268.

Egg white and avidin concentrates in cancer patients.—See A., 1944, III, 271.

Surgical management of post-radiation scars and ulcers.—See A., 1944, III, 284.

d-Peptidases. V.—See A., 1944, III, 287.

XVIII.—ANIMAL NUTRITION.

Nutritional problems in relation to the nation's health. J. R. Murlin (*Fed. Proc.*, 1942, 1, 209—213).—A review of the National Nutrition Conference's programme of essential research on the conservation of nutrient factors and their optimal intake in different physiological conditions. P. G. M.

Food consumption and dietary recommendations. H. K. Stiebeling (*Fed. Proc.*, 1942, 1, 327—330).—A review, chiefly of the position in the U.S.A. W. McC.

Evaluation of feeds on the basis of net available nutrients. M. Kriss (*J. Animal Sci.*, 1943, 2, 63—79).—The observed net energy val. of a diet is affected by the test adopted, e.g., maintenance, growth, or milk production. Experimental conditions must be carefully controlled. The observed val. for maintenance is affected by the plane of nutrition if based on fasting heat production, and by environmental temp. in experiments based on maintenance of equilibrium. Body growth is the most reliable basis for determination of net energy val. The net energy vals. of feeding stuffs depend on the other ingredients of the diet, and are not simply additive. R. L. E.

Guiding principles for fortification of foods. F. C. Bing (*Fed. Proc.*, 1942, 1, 336—342).—A review dealing chiefly with the fortification of table salt with I, milk with vitamin-D, margarine with vitamin-A, and flour and bread with Ca, Fe, thiamin, riboflavin, and nicotinic acid or nicotinamide. W. McC.

Nutritive value of white and whole wheat breads. R. F. Light and C. N. Frey (*Cereal Chem.*, 1943, 20, 645—660).—The results of dietary experiments in which rats were fed exclusively on bread supplemented with vitamin-A, -D, and -E showed that white bread is deficient in lysine, valine, -B₂, and minerals. White bread fortified with 0.25% of lysine, 0.27% of valine, 2% of Osborne-Mendel salt mixture, and 0.8 mg. of -B₂ per lb., together with -A, -D, and -E, was more efficient in promoting wt. gains in young rats than was either white bread containing 6% of milk solids or wholemeal bread, which were equal in efficiency. N. L. K.

Value of lucerne and certain of its fractions in the nutrition of breeding ewes. C. L. Shrewsbury, F. N. Andrews, C. Harper, and M. R. Zelle (*J. Animal Sci.*, 1943, 2, 209—220).—Breeding ewes were fed a basic ration of oat straw, maize, and maize silage and the nutritive vals. of various supplements were estimated by the effects on growth, maintenance, and the production of milk and healthy lambs. Dehydrated oat grass proved the most efficient, while dehydrated lucerne, lucerne press juice, and casein were all beneficial. There appeared to be an unidentified water-sol. factor in lucerne which was essential. J. F. M.

War-time dietary. Substitutes in the event of a shortage of rice.—See B., 1944, III, 47.

Fodder cellulose.—See B., 1944, III, 49.

[Food]-proteins and blood formation.—See A., 1944, III, 168.

Effect of dietary urea on kidneys and liver of steers. S. H. Work, C. J. Hamre, L. A. Henke, and L. E. Harris (*J. Animal Sci.*, 1943, 2, 166—169).—Feeding experiments lasting 244 days show that urea, at a level of 0.88—2.29% of the dry matter of the ration, does not damage the liver or kidneys of steers under dry lot management. Similarly, no damage is caused, during 186 days, by replacing the cottonseed meal supplement of steers on pasture by a daily supply of 0.18 or 0.35 lb. of urea per head. The harmful level for urea in the diet of steers is between 2.29 and 2.8% of the dry matter of the ration. W. McC.

Sterol requirements of several insects. G. Fraenkel and M. Blewett (*Biochem. J.*, 1943, 37, 692—695; cf. A., 1944, III, 264).—Six insect species need a sterol for normal growth. The amounts needed vary slightly, but sterols of the same group substantially satisfy all six species. R. L. E.

Significance of essential fatty acids. G. O. Burr (*Fed. Proc.*, 1942, 1, 224—233).—A review in which attention is drawn particularly to the vitamin-sparing action of linoleic acid in treatment of skin affections, and to the possible further implications of its lack. P. G. M.

"Falling disease" of cattle. H. W. Bennetts (*J. Dept. Agric. West. Australia*, 1941, 18, 133—136; cf. A., 1943, III, 900).—This disease was associated with a very low Cu content of pastures and animals. Administration of Cu alone prevented anaemia and other symptoms of Cu deficiency in cows, whilst Denmark lick (Cu 0.6%) gave marked improvement in the health of treated herds and apparently prevented "falling disease." A. A. M.

Copper deficiency of cattle and the fatal termination of "falling disease." H. W. Bennetts, R. Harley, and S. T. Evans (*J. Dept. Agric. West. Australia*, 1942, 19, 96—104).—Sudden death by heart failure from extensive deterioration of heart muscle is presumed to be the final result of prolonged and severe Cu deficiency in cattle. A. A. M.

"Stringy" wool and copper deficiency in Western Australia. H. W. Bennetts (*J. Dept. Agric. West. Australia*, 1942, 19, 7—13).—A review. A. A. M.

Role of iron in anaemia during scurvy.—See A., 1944, III, 162.

Pigs on rations extremely low in manganese. S. R. Johnson (*J. Animal Sci.*, 1943, 2, 14—22).—Pigs grow well on diets containing less than 0.5 p.p.m. of Mn, which cause perosis in chicks. Reproduction and lactation generally failed on this diet but were successful when the Mn content was raised to 6 p.p.m. by adding dried young cereal grass. Bodies of pigs born to sows on a diet with 100 p.p.m. of Mn contained 1.29—1.42 mg. of Mn per kg. dry matter; those from sows on the lowest Mn diet had 0.13—0.21 mg. per kg. Some of these were reared successfully on sow's and later cow's milk. R. L. E.

Metallic contamination of foodstuffs. III. Effect of tin from tinned-brass vessels on growth. Excretion and absorption of tin in the rat. N. C. Datta (*Indian J. Med. Res.*, 1940, 28, 451—461; cf. B., 1935, 1162).—Food prepared in tinned-brass vessels retarded the growth of rats by 15% compared with food prepared in glass. 90—95% of the Sn was excreted in the faeces, most of it rapidly, but some was retained in the body for some time. A single dose of SnCl₂ was excreted in 7 days. Very little was excreted in the urine. The kidney contained more Sn than the liver. S. E. M.

Changes produced in growth, reproduction, blood, and urine of rats by ingestion and oral administration of cobalt salts. E. G. Smith (*Iowa State Coll. J. Sci.*, 1943, 18, 87—88).—Co in amounts less than 25 p.p.m. of the ration is without effect on growth rate, success of lactation, and reproduction of rats. Co is deposited mainly in liver and kidneys. The lethal dose of Co [as CoCl₂ or Co(NO₃)₂] is approx. 20 mg. Co per 100 g. body wt.; the extent of hyperglycaemia due to ingestion of these salts is recorded. F. R. G.

Food poisoning. Bacterial toxins and infections.—See A., 1944, III, 223.

Vitamins.

Foods as sources of vitamins. F. C. Bing (*Fed. Proc.*, 1942, 1, 296—303).—A review. W. McC.

Biological action of vitamins. C. A. Elvehjem (*Fed. Proc.*, 1942, 1, 304—309).—A review. W. McC.

Vitamins as pharmacological agents. H. Molitor (*Fed. Proc.*, 1942, 1, 309—316).—Rats suffering from hyperthyroidism produced by administration of thyroxine do not differ from healthy rats in their sensitivity to large doses of thiamin. In adult dogs, the time required to reach the urinary levels of riboflavin which accompany pre-collapse and collapse due to riboflavin deficiency is not affected by concurrent pantothenic acid deficiency. The toxicity of thiamin to rats is not increased by riboflavin deficiency. The difference between the amount of a vitamin consumed and the amount excreted serves as a guide in determining appropriate therapeutic dose but is not necessarily an indication of requirement for that vitamin. The toxicity of vitamins varies with the route (intravenous > sub-

cutaneous > oral) and rate of injection. In dogs, intravenous injection of very large doses of thiamin sensitises to anaphylactic shock. Endurance in rats, as measured by ability to carry a load while swimming, decreases to a very low level during thiamin deficiency and administration of thiamin then improves the ability greatly even if food intake remains restricted. Thiamin does not influence the course of diabetes mellitus, the beneficial effect produced being probably due to correction of mild deficiency caused by rigid diet. In mice, infection with influenza virus does not affect the riboflavin content of the liver but diminishes the pantothenic acid content.

W. McC.

Vitamins in medical practice. N. Jolliffe and R. Goodhart (*Fed. Proc.*, 1942, 1, 316—319).—A review.

W. McC.

Vitamins and public health. W. H. Sebrell (*Fed. Proc.*, 1942, 1, 319—323).—A review.

W. McC.

Clinical observations bearing on food requirements. E. S. Gordon (*Fed. Proc.*, 1942, 1, 330—335).—A review covering vitamin-A, thiamin, riboflavin, nicotinic acid, ascorbic acid, and Fe.

W. McC.

Infections and vitamins.—See A., 1944, III, 222.

Vitamins from rose hips.—See B., 1944, III, 52.

Vitamin content of spray-dried whole egg. Retention of vitamins in meats during storage, curing, and cooking.—See B., 1944, III, 48.

Importance of growth-promoting substances in the metabolism of *Pythium indigoferae*. Butler.—See A., 1944, III, 219.

Nutrition [vitamin-A deficiency] in relation to bone growth and the nervous system. E. Mellanby (*Proc. Roy. Soc.*, 1944, B, 132, 23—46).—Inco-ordination in vitamin-A-deficient puppies is due to nerve degeneration. A function of -A is to control the activity of osteoblasts and osteoclasts. In its absence the bones are thickened and altered in shape so that they ultimately cause inco-ordination by pressure on the nervous system. (2 photomicrographs.)

F. S.

Biological value of spectro-vitamin-A in liver.—See B., 1944, III, 52.

Chemical and physical determinations of vitamin-A in fish-liver oils. B. L. Oser, D. Melnick, and M. Pader (*Ind. Eng. Chem. [Anal.]*, 1943, 15, 717—724).—The results obtained in the determination of vitamin-A by the spectrophotometric and colorimetric (SbCl_3) methods are presented (see C., 1944, Part 2). An improved method of plotting the ultra-violet absorption curves of -A products is presented and applied to studies of cryst. -A acetate, oils, and concentrates to determine factors which distort the curves. The importance of conducting the determination on the unsaponifiable fraction, regardless of potency, is emphasised, and a method is described for extracting this fraction without loss of -A or the introduction of irrelevant absorbing material. The U.S.P. reference cod liver oil No. 2 is shown to be unsuitable as a spectrophotometric or colorimetric standard.

J. D. R.

Administration of carotene. M. L. Rochlina, S. D. Balachowski, and A. A. Bodrova (*Biochimia*, 1943, 8, 168—170).—Parenteral administration of carotene in oil or colloidal aq. solution to A-avitaminotic rats is ineffective, whilst oral administration is effective. Decolorised solutions are inactive.

P. G. M.

Effect of atropine on absorption of vitamin-A.—See A., 1944, III, 192.

Plasma-vitamin-A during pregnancy.—See A., 1944, III, 168.

Vitamin content of bee foods. III. Vitamin-A and riboflavin content of bee bread. M. H. Haydak and L. S. Palmer (*J. Econ. Entom.*, 1941, 34, 37—38; cf. A., 1939, III, 497).—Vitamin-A activity of bee bread was 6 and 8.4 i.u. per g. of fresh and dry matter, respectively. Riboflavin content was 28 μg . per g. of dry matter.

A. A. M.

Varietal differences and inheritance of vitamin-A and -C in potatoes.—See A., 1944, III, 228.

Microscopical properties of some of the crystalline water-soluble vitamins. G. L. Keenan (*J. Assoc. Off. Agric. Chem.*, 1943, 26, 514—516).—Optical data and microchemical tests are given for ascorbic acid, Ca pantothenate, nicotinic acid, nicotinamide, riboflavin, and thiamin hydrochloride.

A. A. E.

Specific physiological disturbances induced by marginal deficiencies of vitamin-C and -B₁. C. G. King (*Fed. Proc.*, 1942, 1, 293—296).—A review.

W. McC.

Vitamin-B complex requirements of several insects. G. Fraenkel and M. Blewett (*Biochem. J.*, 1943, 37, 686—692; cf. A., 1942, III, 830).—*Tribolium confusum*, Duv., and *Ptinus tectus*, Boield., need aneurin, riboflavin, pyridoxine, nicotinic and pantothenic acids, and grow better with choline chloride, and probably inositol and p-aminobenzoic acid. Biotin is needed for optimum growth. *Lasioderma serricorne*, Fab., *Sitodrepa panicea*, L., and *Silvanus surinamensis*, L., do not need some of these vitamins, which are provided by synthesis by intracellular symbiotic organisms. The

insects do not appear to need other B-vitamins, or any water-insol. factor from yeast other than biotin and a sterol.

R. L. E.

Antioxidant activity in sources of the B vitamins. P. György and R. Tomarelli (*J. Biol. Chem.*, 1942, 147, 515—524).—Coupled oxidation of butter-yellow is reduced in the system corn starch-butter-yellow-linoleic acid when the last-named is substituted by its methyl ester; grains (oats, wheat, corn) and the oat-flour prep. "Avenex" exhibit high antioxidant activity in this system. Aq. rice bran extract and sources of the vitamin-B complex (yeast, yeast extract, liver extract, molasses, milk sugar residue) are potent antioxidants. The antioxidants of polished or unpolished rice, rice bran extract, "Avenex," and yeast are destroyed by autoclaving at 120° for 30 min. in neutral solution but there is no destruction in yeast or rice bran extract at pH 10. The antioxidant in rice bran extract is dialysable and partly sol. in linoleic acid. p-Aminobenzoic acid is the only -B member to exhibit antioxidant activity and it is not the site of the activity of rice bran extract and potent liver fractions. -E and quinol are only moderately active in the system examined and sulphanimide and sulphguanidine have a slight activity but exert a synergistic effect with p-aminobenzoic acid.

H. G. R.

Effect of vitamin-B₁ on growth of rice.—See A., 1944, III, 231.

Royal jelly and bee bread as sources of vitamin-B₁, -B₂, -B₆, -C, and nicotinic and pantothenic acids. M. H. Haydak and L. S. Palmer (*J. Econ. Entom.*, 1942, 35, 319—320).—Royal jelly contained 50 and bee bread 5 μg . of vitamin-B₆ per g. of fresh substance. Thiamin, riboflavin, and ascorbic, nicotinic, and pantothenic acids occurred in amounts which fluctuated more in bee bread than in royal jelly.

A. A. M.

Thiamin content of some Spanish flours.—See B., 1944, III, 47.

2 : 4-Diamino-5-(4'-methyl-5'- β -hydroxyethylthiazolium chloride)-methylpyrimidine hydrochloride, analogue of aneurin.—See A., 1944, II, 146.

Elimination of lactoflavin in normal and adrenalectomised animals under various conditions.—See A., 1944, III, 186.

Adult and infant pellagra in South African Bantu. S. L. Kark (*S. Afr. J. Med. Sci.*, 1943, 8, 106—114).—An analysis of 96 cases.

P. C. W.

Minimum requirement of nicotinic acid for the growing pig. E. H. Hughes (*J. Animal Sci.*, 1943, 2, 23—26).—Young growing pigs need 5—10 mg. of nicotinic acid daily per 100 lb. live wt.

R. L. E.

Mechanism of cozymase synthesis in human erythrocyte : comparison of rôles of nicotinic acid and nicotinamide.—See A., 1944, III, 162.

Nutritional basis of abnormal behaviour in rats. IV. Convulsive seizures associated with pyridoxine deficiency. R. A. Patton, H. W. Karn, and H. E. Longenecker (*J. Biol. Chem.*, 1944, 152, 181—191).—Young rats suckling from mothers maintained since parturition on synthetic diets deficient in pyridoxine but supplemented with aneurin, riboflavin, pantothenic acid, and choline develop spontaneous convulsive seizures towards the end of lactation. These may be alleviated by 10 μg . of pyridoxine per day but amounts up to 50 μg . per day do not give protection against similar seizures that regularly appear when the animals are given standard auditory tests over a 40-day period. No spontaneous seizures are observed when the mothers receive 25—150 μg . per day but a high incidence of sound-induced seizures occurs from weaning at 21 days until 45—90 days. No level of pyridoxine below 150 μg . was sufficient to give continued protection against sound-induced seizures, but at the higher levels they are delayed and less severe. It is suggested that pyridoxine is not the only factor concerned in the incidence of this type of seizure.

H. G. R.

Application of *Neurospora sitophila* to assay of pyridoxine in tomato plants.—See A., 1944, III, 232.

Chemical test for vitamin-B₆ in foods. M. Swaminathan (*Indian J. Med. Res.*, 1940, 28, 427—439; cf. A., 1940, III, 594; C., 1944, Part 2).—The vitamin-B₆ content of 22 foodstuffs was determined. Dried brewer's yeast contained 54, rice polishings 20, sheep liver 14, whole cereal grains 7—10 μg . per g. Milled raw rice and white flour contained approx. half the amount present in the whole cereals. Vegetables and milk are poor sources.

S. E. M.

Non-identity of biotin crystallisates from egg yolk and liver. F. Kögl and E. J. ten Ham (*Naturwiss.*, 1943, 31, 208).—Direct comparison shows that biotin (now termed a-biotin), m.p. 220°, $[\alpha]_D^{20} +51^\circ$ in 0.1N-NaOH (methyl ester, m.p. 161—162°, $[\alpha]_D^{25} +47^\circ$ in CHCl_3), from yolk of egg is not identical with that (β -biotin), $\text{C}_{10}\text{H}_{16}\text{O}_2\text{N}_2\text{S}$, m.p. 232—233°, $[\alpha]_D^{20} +91^\circ$ in 0.1N-NaOH (methyl ester, m.p. 163—164°, $[\alpha]_D^{25} +39^\circ$ in CHCl_3), derived by the authors from liver. The activity in the yeast test of β - somewhat exceeds that of a-biotin but is of the same order of magnitude. The question of the identity of β -biotin with the liver-biotin of du Vigneaud et al. (A., 1940, III, 820) remains undecided.

H. W.

Detoxicating effect of p-aminobenzoic acid [on drug actions].—See A., 1944, III, 212.

Metabolism of ascorbic acid in the horse. P. B. Pearson, M. K. Sheybani, and H. Schmidt (*J. Animal Sci.*, 1943, 2, 175—180).—The plasma-ascorbic acid of Shetland ponies on a controlled diet was 0.32 mg. per 100 g. and the daily urinary excretion was 0.37 mg. per kg. body wt. Feeding 6 g. of ascorbic acid led to a significant average rise of 0.15 mg. per 100 g. in the plasma level, and of 72.8 mg. in the daily excretion. Injection of the acid led to 31—77.3% recovery in the urine in 24 hr. J. F. M.

Relation of ascorbic acid to breeding performance in horse. G. K. Davis and C. L. Cole (*J. Animal Sci.*, 1943, 2, 53—58).—Good-breeding heavy and light mares had plasma-ascorbic acid vals. of 0.15 and 0.129 mg. per 100 ml. respectively; poor breeders had 0.07 and 0.09 mg. per 100 ml. Plasma-ascorbic acid rises when mares go out on pasture. Ascorbic acid may be necessary for production of motile sperm. R. L. E.

Effect of *l*-ascorbic acid and related compounds and of hydrogen peroxide on isolated heart of frog.—See A., 1944, III, 169.

Molar concentration [of electrolytes] and alkali reserve in blood of scorbutic guinea-pigs.—See A., 1944, III, 169.

Reduction of methæmoglobin by ascorbic acid.—See A., 1944, III, 167.

Apparent vitamin-C in foods. F. Wokes, J. G. Organ, J. Duncan, and F. C. Jacoby (*Biochem. J.*, 1943, 37, 695—702).—"Apparent vitamin-C" which interferes with the titration of -C by 2:6-dichlorophenol-indophenol may be formed by heating or storage of carbohydrate constituents of foods, and may include reductone, reductis, dihydroxymaleic, and hydroxytetronic acids. The formation of these substances may obscure the loss of -C during storage of foods. They can be distinguished from -C by their different rates of reaction with formaldehyde under suitable conditions. R. L. E.

Germinating seeds as source of vitamin-C in human nutrition. II. Germinating and processing of blue boiler peas (*Pisum sativum*) as palatable source of vitamin-C. J. W. H. Lugg and R. A. Weller (*Austral. J. Exp. Biol.*, 1943, 21, 211—214; cf. A., 1943, III, 826).—At 10—45° peas retained unchanged viability for 2 years. After germination for 72 hr. in the dark at 15—25° the total ascorbic acid content of the seedlings is approx. 0.3 mg. per g., this val. becoming 0.5 mg. if the peas are exposed to the daylight during germination. In boiling dil. brine the peas lose approx. 33% of their total ascorbic acid in 20 min. but half of the lost vitamin is recoverable from the cooking liquid. W. McC.

Function of ascorbic acid in respiration of potato.—See A., 1944, III, 228.

Effect of potassium iodide on ascorbic acid content and growth of tomato plants.—See A., 1944, III, 229.

Influence of carbon dioxide, oxygen, and ethylene on vitamin-C content of ripening bananas.—See B., 1944, III, 48.

Biological and chemical determination of vitamin-C in raw-preserved and heat-preserved fruit.—See B., 1944, III, 49.

Effect of vitamin-E-free diet on adrenal cortex.—See A., 1944, III, 185.

Synergism between vitamin-E and folliculin (œstrogen).—See A., 1944, III, 189.

Mode of action of the vitamins- K_1 and K_2 . P. Karrer and F. Koller (*Helv. Chim. Acta*, 1943, 26, 2114—2115).—Na and ethyl phthalate had no appreciable vitamin-K action on a patient who reacted readily to 2-methylnaphthaquinol phosphoric ester. It is therefore unlikely that phthalic acid is the actual -K and that - K_1 and - K_2 are merely provitamins. H. W.

Antihæmorrhagic factor of maize stigmata (vitamin- K_3). D. M. Michlin (*Biochimia*, 1943, 8, 158—167).—An antihæmorrhagic factor, vitamin- K_3 , has been isolated from maize stigmata. It accelerates the coagulation of blood 2—3 times, and is clinically effective by oral administration in alcohol or oil, or by subcutaneous or intramuscular injection in oil. It is present in the lipid fraction and is destroyed by saponification. The max. effect is produced in 2—4 hr. and it is not influenced by simultaneous administration of heparin. It differs from other members of the -K group in raising the blood-prothrombin by up to 75%. P. G. M.

Analyses of blood plasma of chicks deficient in vitamin-K.—See A., 1944, III, 164.

Rôle of kephalin and thromboplastin in coagulation of vitamin-K-deficient chick plasma.—See A., 1944, III, 165.

Pharmacology of two water-soluble vitamin-K-like substances.—See A., 1944, III, 164.

Relation between vitamin-M, xanthopterin, and folic acid. J. R. Totter, C. F. Shukers, J. Kolson, V. Mims, and P. L. Day (*J. Biol. Chem.*, 1944, 152, 147—155).—The folic acid content of foodstuffs cannot be correlated with their vitamin-M activity. Pantothenic acid, choline, *p*-aminobenzoic acid, pyridoxine, and inositol do not prevent nutritional cytopenia in monkeys. Synthetic xanthopterin

produces a reticulocyte response and increases in red and white blood cells in cytopenic monkeys and it, or some allied substance, may be required for normal hæmocytopenia but some unidentified substances may also be necessary. H. G. R.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Respiratory metabolism during development in two species of *Amblystoma*.—See A., 1944, III, 159.

Effect of sulphonamides on cellular respiration.—See A., 1944, III, 204.

Oxygen consumption of normal rat liver slices in serum and in lymph taken from legs before and after severe burns. J. Muus and E. Hardenbergh (*J. Biol. Chem.*, 1944, 152, 1—8).—Calf lymph from a severely burned area contains a substance (or substances) which increases the O_2 consumption of rat liver slices as compared with consumption in normal lymph. The effect increases with time. With serum there is a similar but less marked effect. One experiment with dog lymph gave an even more definite stimulation. The material responsible is ultrafilterable and quite stable. E. C. W.

Basal metabolism of albino rat fed on goitrogenic diet.—See A., 1944, III, 185.

Effect of removal of adrenal glands on animal metabolism.—See A., 1944, III, 186.

Determinations of metabolisable energy of feeding stuffs for cattle. E. B. Forbes and E. J. Thacker (*J. Animal Sci.*, 1943, 2, 226—230).—Determinations of the metabolisable energy of different feeding stuffs were made by various methods. The gross energy minus the energy of faeces and urine was measured experimentally; vals. for methane were measured and also computed by means of the formulae of Bratzler and Forbes and of Kriss. These computed vals. differed from the measured val. by 8.4% and 10.6% respectively. Finally vals. were computed from the factors of Axelsson, which do not need a knowledge of the faeces and urine vals. These proved to be satisfactory if a factor of 3.3 instead of 7.8 g.-cal. was used for the digestible ether extract. J. F. M.

Effect of testosterone and allied compounds on mineral, nitrogen, and carbohydrate metabolism of a girl with Addison's disease.—See A., 1944, III, 187.

Influence of rate of protein metabolism on creatine-creatinine transformation and excretion in the rat. H. H. Beard (*Arch. Biochem.*, 1943, 3, 181—187).—When a diet containing 5% of protein is fed to rats, only very small amounts of creatine and creatinine are excreted in the urine. Injection of glycine or arginine under these conditions does not cause much formation of creatine. With 20% of protein there is an immediate increase of over 600% in creatine excretion, and in some cases a simultaneous increase in creatinine excretion. The rate of protein metabolism has no effect on excretion of injected creatine and creatinine, and there is no evidence that injected creatine is converted into creatinine. Injection of creatinine causes over 500% increase in creatine excretion which is independent of the rate of protein metabolism. The body probably metabolises and excretes administered or injected creatine and creatinine differently from that formed during the normal rate of protein metabolism. J. N. A.

Amino-acid requirements and protein metabolism of avian organism. H. J. Almquist (*Fed. Proc.*, 1942, 1, 269—273).—Chiefly a review. The methionine requirement of the chick appears to be about 0.5% of the diet when 0.4% of cystine is also present and about 0.9% when cystine is absent. When the diet is deficient in methionine, betaine does not improve utilisation of homocystine. W. McC.

Transamination. P. P. Cohen (*Fed. Proc.*, 1942, 1, 273—280).—A review suggests that possibly the chief rôle of transamination is to permit rapid interconversion of respiratory mediators. It provides a "shuttle" mechanism whereby key proteins and carbohydrates are quickly interconverted. W. McC.

Metabolism of *d*-amino-acids. C. P. Berg (*Fed. Proc.*, 1943, 1, 281—287).—A review. W. McC.

Relation of vitamin-C to metabolism of aromatic amino-acids. R. R. Sealock (*Fed. Proc.*, 1942, 1, 287—292).—A review. W. McC.

Intermediary metabolism of *l*-tryptophan. A. E. Braunschtein and E. V. Goriatschenkova (*Biochimia*, 1943, 8, 37—44).—Injections of thiamin in rabbits fed a diet of polished rice do not affect excretion of kynurenine on administration of *l*-tryptophan. No evidence of oxidative deamination of *l*-kynurenine with rabbit liver slices or transamination with either pyruvic or α -ketoglutaric acid in presence of minced muscle, liver, or kidney tissue was obtained. H. G. R.

Influence of vitamin deficiency and various methods of nutrition on histidine metabolism.—See A., 1944, III, 198.

Effects of oestrone, ascorbic acid, and testosterone propionate on nitrogen storage and insulin requirements in dogs. O. H. Gaebler and S. M. Tarnowski (*Endocrinol.*, 1943, **33**, 317—324).—1 mg. of oestrone injected daily for 4—10 days, or 1.2 g. of ascorbic acid fed in 3 days, caused slight N retention in depancreatized bitches receiving a const. dose of insulin. Neither treatment increased the sensitivity to insulin. Both treatments enhanced the N loss, glycosuria, lipaemia, and ketonuria produced by pituitary growth prep. 25 mg. of testosterone propionate daily for 4—6 days caused less N retention than pituitary growth prep. in intact bitches but caused slight N storage and no glycosuria, ketonuria, or lipaemia in the depancreatized bitches. There was a rise in N output and disproportionately greater glycosuria after stopping treatment.

P. C. W.

Turnover of fatty acids in congenitally obese mice. J. Salcedo, jun., and D. Stetten, jun. (*J. Biol. Chem.*, 1943, **151**, 413—416; cf. A., 1943, III, 757).—Determination of the D content of the body-water and of the rate of decrease of concn. of D in fatty acid of congenitally obese female mice that have consumed ethyl esters of deuterio-fatty acids of linseed oil shows that, in such mice, the proportion of dietary fatty acids directly stored in the depots is normal but that the rate of turnover of the depot fatty acids is lower than in normal mice. The obesity is possibly due to a diminution in the rate of oxidation of fatty acids.

W. McC.

Metabolism of mannose. Effect of its administration on blood-sugar and -lactic acid, and liver-glycogen in adult rabbits. W. H. Bailey, 3rd, and J. H. Roe (*J. Biol. Chem.*, 1944, **152**, 135—146).—Administration of mannose increases blood-glucose and -lactic acid, and liver-glycogen. It is utilised to a high degree (96%) by the rabbit after oral or intraperitoneal administration. Direct conversion of mannose into glucose by epimerisation etc. is apparently excluded, since fructose cannot be detected at any stage.

P. G. M.

Production of glycogen from C₄-dicarboxylic acids in liver. W. Kutscher and F. Krabbenhöft (*Naturwiss.*, 1943, **31**, 210—211; cf. Stöhr, A., 1939, III, 174).—Production of glycogen from C₄-dicarboxylic acids is not increased by simultaneous administration of glucose or its degradation products but, when the acids are administered as K or NH₄ salts instead of as Na salts, the production is doubled.

W. McC.

Influence of previous diet on preferential utilisation of foodstuffs. I. Fasting ketosis and nitrogen excretion as related to fat content of the preceding diet.—See A., 1944, III, 197.

Metabolism of acetaldehyde with acetoin formation. E. Stotz, W. W. Westerfeld, and R. L. Berg (*J. Biol. Chem.*, 1944, **152**, 41—50).—Acetaldehyde is metabolised when incubated with rat or pigeon brain suspensions, the rate of disappearance being greatly accelerated by pyruvate and still further by diphosphothiamin. The (already high) rate of metabolism of pyruvate is accelerated by acetaldehyde. The disappearance of acetaldehyde is accompanied by acetoin formation, and pyruvate and diphosphothiamin both appear to be essential for this conversion. *In vivo*, acetaldehyde is toxic but rapidly metabolised; by a special procedure acetoin can be detected in the blood of rats injected with acetaldehyde.

E. C. W.

Alcohol metabolism in thiamin deficiency. R. L. Berg, E. Stotz, and W. W. Westerfeld (*J. Biol. Chem.*, 1944, **152**, 51—58).—Alcohol disappears at the same rate from the blood of thiamin-deficient and of normal pigeons, and administration of pyruvate increases the rate equally in thiamin-deficient and normal dogs. Blood-pyruvate is increased, and the lactate-pyruvate ratio decreased, in thiamin-deficient dogs, and the administration of alcohol to such animals decreases the pyruvate and increases the lactate. Alcohol given to the same dogs after thiamin treatment decreases both pyruvate and lactate.

E. C. W.

Dehydration. N. Morris (*Lancet*, 1943, **245**, 91—94).—A lecture.

C. A. K.

McClure-Aldrich test of water balance. D. S. MacIntyre, S. Pedersen, and W. G. Maddock (*Surg. Gynec. Obstet.*, 1941, **72**, 834—840).—The test is not a reliable index of the state of hydration of normal subjects or of surgical patients.

P. C. W.

McClure-Aldrich test of water balance. P. H. Giddy and J. M. Inglis (*S. Afr. J. Med. Sci.*, 1943, **8**, 99—105).—There are wide individual variations in the rate of absorption of 0.2 ml. of physiological saline injected intradermally into the forearm, and the rate is not increased in cases of oedema. Intradermal injections at the site of the oedema are rapidly absorbed. The test only gives information of the local state of fluid balance at the injection site.

P. C. W.

Fate of pentachlorophenol in the animal organism. W. Machle, W. Deichmann, and G. Thomas (*J. Ind. Hyg.*, 1943, **25**, 192—194).—1 mg. per kg. given daily to rabbits caused a barely demonstrable and non-progressive retention in the blood during 90 days. A large sublethal dose caused a sharp rise in urinary excretion with only a small increase of pentachlorophenol in the blood. This suggests that urinary determinations may offer a sensitive means of estimating the extent of human absorption.

E. M. K.

XX.—PHARMACOLOGY AND TOXICOLOGY.

Penicillin treatment of early syphilis. J. F. Mahoney, R. C. Arnold, and A. Harris (*Amer. J. Publ. Health*, 1943, **33**, 1387—1391).—48 intramuscular injections each of 25,000 units of penicillin cleared primary sores of spirochaetes in 16 hr.

C. J. C. B.

Penicillin therapy in sulphonamide-resistant gonorrhoea in men. C. J. Van Slyke, R. C. Arnold, and M. Buchholtz (*Amer. J. Publ. Health*, 1943, **33**, 1392—1394).—6 intramuscular injections of 20,000 units of penicillin at 3 hr. intervals over 15 hr. gave satisfactory cure.

C. J. C. B.

Excretion of penicillin in bile. C. H. Rammelkamp and J. D. Helm, jun. (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 31—34).—Penicillin was assayed (A., 1943, III, 338) in bile obtained by a duodenal tube or from a fistula, and in serum after intravenous injection. Concn. in bile was found to be higher than in serum.

V. J. W.

Concentration and preservation of crude penicillin. T. T'ung (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 103—105).—Air is drawn by a filter-pump through crude penicillin solution at 60° and pH 6 to a 25-fold concn. The product can be kept indefinitely at —76° but only for 1 month at 5°.

V. J. W.

Present status of sulphonamides. R. J. Fosbinder (*J. Amer. Pharm. Assoc.*, 1944, **33**, 1—10).—A review of the mode of action, pharmacology, clinical use, and toxicity of the principal sulpha-drugs (49 references).

F. O. H.

Relation between chemical structure and bacteriostatic activity of sulphanilamide-type compounds.—See A., 1944, III, 294.

Blood-sulphanilamide levels after powdered drug administration by inhalation. H. Romence and H. N. Haskins (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 8—10).—Insufflation of sulphanilamide into the trachea of dogs gives up to 33.2 mg.-% in the blood and 1660 mg.-% in the urine. It causes cough and bronchial irritation for several days.

V. J. W.

Pharmacology of sodium sulphanilylsulphanilate. H. D. Ratish and J. G. M. Bullock (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 216—218).—After a 5-g. oral dose in man only traces were found in the blood. 39.5% was recovered from the faeces and 4.5% from the urine. After intravenous administration blood concn. falls from 12 to 1 mg.-% in 5 hr. After oral administration to rabbits, the greatest organ concn. was found in gall-bladder bile.

V. J. W.

Effects of sulphapyrazine and sulphadiazine on mice infected with haemolytic streptococcus, pneumococcus, and *Staphylococcus aureus*. G. W. Raiziss, M. Severac, and J. C. Moetsch (*J. Lab. clin. Med.*, 1943, **28**, 1580—1585).—When mice are given a diet (total daily amount 4 g.) containing 0.25—0.5% of sulphadiazine or sulphapyrazine they tolerate both drugs equally well. When the drug concn. is 0.7—1% of the diet sulphapyrazine is better tolerated than sulphadiazine.

C. J. C. B.

Treatment of infectious coryza in chickens with sulphathiazole. C. M. Hamilton (*J. Amer. Vet. Med. Assoc.*, 1943, **103**, 144—146).—Feeding a mash containing 1 g. of sulphathiazole per 30 g. of mash cured 2 of 3 birds with infectious coryza. With individual dosing, 5—7 g. of the drug given over a period of 2—3 days brought about complete recovery in most of the birds treated.

E. G. W.

Acetylsulphanilylguanidine. A. Divinski and S. Vorobieva (*Compt. rend. Acad. Sci. U.R.S.S.*, 1942, **36**, 203—205).—Acetylsulphanilylguanidine is a highly efficient agent for treating dysentery in children. In doses of 0.3 g. per kg. its effects on intoxication and on local intestinal phenomena do not differ from those of sulphathiazole. Its use is not accompanied by vomiting. No collateral phenomena have been observed in children or adults. On the 2nd day after administration the general state of the patient usually improves sharply and the toxic phenomena diminish or disappear. It is suggested that acetylation of these drugs may generally diminish toxicity without lowering therapeutic efficiency. (See also A., 1944, II, 127.)

H. W.

Response of pigs given large doses of *Salmonella choleraesuis* to sulphaguanidine, nicotinic acid, thiamin, and pyridoxine. G. K. Davis, E. B. Hale, and V. A. Freeman (*J. Animal Sci.*, 1943, **2**, 138—145).—Sulphaguanidine protects pigs from the effects of administration of *S. choleraesuis*. Nicotinic acid does not afford protection but accelerates recovery from the effects and promotes subsequent gain in wt. Vitamin-B₁ and -B₆ have no such beneficial effects.

W. McC.

Sulphonamides in bacillary dysentery. E. Bulmer and W. M. Priest (*Lancet*, 1943, **245**, 69—71).—492 cases of bacillary dysentery due to various organisms were treated with sulphonamides and the results compared with those in 600 untreated controls. Sulphaguanidine was the most effective drug and was almost non-toxic, sulphapyridine was effective but nausea and vomiting occurred, and sulphanilamide was ineffective.

C. A. K.

Sulphapyridine in Sonne dysentery. R. Swyer (*Lancet*, 1943, **245**, 71—72).—57 cases of bacteriologically confirmed Sonne dysentery

were treated with sulphapyridine and 35 other cases served as controls. In the treated group the stools became free of *Sonne bacilli* in 5 days (untreated = 21 days), normal stools appeared in 9 days (untreated = 20 days), and there were no bacteriological relapses. C. A. K.

Supersaturated sulphathiazole solutions for local application. J. A. De Loureiro (*Lancet*, 1943, 245, 102).—Na sulphathiazole solution is mixed with a $\text{PO}_4^{'''}$ buffer to give 0.5–1.0% sulphathiazole solution at pH 7.4. Below 40° pptn. occurs in 15–30 min. C. A. K.

Prophylactic use of sulphonamides in wound treatment. E. Baumann (*Schweiz. med. Wschr.*, 1943, 73, 606–612).—56 wounds, including compound fractures and open joints, were treated with sulphathiazole, 20 with Na irgamide, and subsequently sutured. 54 cases healed by first intention. 16 control cases of comparable wound types, treated without drugs, healed equally well. Graphs are shown of the rapid increase in drug concn. in the blood after administration of sulphonamides into the peritoneal, uterine, or joint cavity. A. S.

Phytochemistry of leaves of *Celastrus scandens*, L.—See A., 1944, III, 383.

Local use of sulphonamides in nasal and sinus infection. N. D. Fabricant (*Amer. J. med. Sci.*, 1943, 206, 546–553).—A crit. review. C. J. C. B.

Propamidine in surgical infections. E. C. B. Butler (*Lancet*, 1943, 245, 73–75).—10 cases are described. Propamidine jelly should not be used if the wound is to be sutured. C. A. K.

Bacteriostatic properties of azo-dyes.—See A., 1944, III, 295.

Case of quinine idiosyncrasy. K. Braun and J. Czertok (*Trans. R. Soc. trop. Med. Hyg.*, 1943, 37, 221–224).—A case of quinine idiosyncrasy is reported. The skin reaction to local application of quinine was positive. The main symptoms were: rigor, hyperpyrexia, diarrhoea, cramp-like pains in the abdomen, vomiting, and headache. The similarity of the rigor to an attack of malaria is stressed. C. J. C. B.

Unsymmetrical diacyl derivatives of 4:4'-diaminodiphenyl sulphone.—See A., 1944, II, 131.

Comparative effects on experimental tuberculosis of 2:4'-dichlorobenzophenone and 4:4'-diaminodiphenyl sulphone. W. H. Feldman, H. C. Hinshaw, and H. E. Moses (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 60–62).—2:4'-Dichlorobenzophenone has no therapeutic effect in tuberculosis in guinea-pigs although it is powerfully bacteriostatic *in vitro*. The sulphone was highly effective (cf. A., 1943, III, 672, 831). V. J. W.

Distribution and excretion of atebtrin in experimental animals. J. V. Scudi and M. T. Hamlin (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 127–131).—After oral or intravenous administration of large doses of atebtrin to dogs or rats the blood concn. remains low (max. 1 mg.-%) but may be maintained for several days after a single dose. The max. concn. is in the liver, which contains a large amount for at least 14 days after administration has ceased. Excretion is mainly by the gut. V. J. W.

Urinary excretion products of atebtrin. J. V. Scudi and V. C. Jelinek (*J. Biol. Chem.*, 1944, 152, 27–37).—Administration of atebtrin to the dog is followed by excretion of at least 4 acridine derivatives (as revealed by the absorption spectra of various fractions), one of which is atebtrin itself, together with other substances not derived from acridine. The urinary excretion of atebtrin varies in different species. E. C. W.

Effect of atebtrin on urinary porphyrin output in rat. J. V. Scudi and M. Hamlin (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 132–134).—Urinary coproporphyrin, determined in acid urine by spectrophotometer at λ 400 m μ , is not increased by oral administration of sufficient atebtrin to cause severe liver damage. V. J. W.

Ethylene disulphonate in treatment of allergic children. V. P. Wasson (*Arch. Pediat.*, 1943, 60, 511–517).—18 of 20 allergic patients at a municipal clinic benefited from intramuscular injection of "ethylene disulphonate" (amount not stated); none showed any untoward reactions; relief from symptoms in some instances was prolonged and is continuing. C. J. C. B.

Application of alkaline hypochlorites in therapeutics and technique of preparation of Dakin-Daufresne solution. D. T. de Lacerda (*Rev. Brasil. Quim.*, 1943, 16, 330–334).—Dakin's solution prepared by Daufresne's formula is stable for 90 days. F. R. G.

Formation of invisible, non-perceptible films on hands by cationic soaps. B. F. Miller, R. Abrams, D. A. Huber, and M. Klein (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 174–176).—After application of a cationic detergent, e.g., 1% Zephiran, the hands appear sterile as judged by culture results obtained from aq. washings, but, if this washing is carried out with ordinary soap, numerous organisms are found to be present. These results are attributed to the formation on the skin of an imperceptible film which is bactericidal on its outer but not on its inner surface. V. J. W.

Effect of certain organic compounds on germicidal efficiency of mercuric chloride. A. J. Salle and Y. W. Ginoza (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 85–87).—Glucose, sucrose, and maltose had no action. Glycine, aspartic acid, glutamic acid, arginine, and lysine caused considerable and equal inactivation, and cysteine still more. Gelatin, aminoacids, and peptone had some effect, which varied with the no. of NH_2 groups present. V. J. W.

Salicylate and quinine deafness and Mygind-Dederding view of hearing tests.—See A., 1944, III, 249.

Derivatives of acetanilide.—See A., 1944, II, 127.

Cholinergic porphyrin lachrymation and paradoxical mydriasis in rat. Possible hem nature of choline-esterase. R. D. Barnard (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 254–258).—The mydriasis sometimes caused by pilocarpine and, to a greater degree, by cyanamide is due to pressure on the oculomotor nerve through swelling of the Harderian gland. This swelling and the resultant raised intra-orbital pressure are prevented by atropine. V. J. W.

Amino-alcohols. Optical isomerides in the ephedrine series of compounds.—See A., 1944, II, 131.

Comparison of ergot alkaloids. I. General toxicology. A. C. White (*Quart. J. Pharm.*, 1943, 16, 344–352).—Intracardiac injection of ergosine, ergosinine, and ergocristine in the monkey causes pallor, polypnoea, difficulty of maintaining sustained movement, and sleep. Ergotamine causes drowsiness, but ergotamine produces no symptoms. Ergometrine intracardially in large doses causes polypnoea, difficulty in maintaining sustained movement, and drowsiness; isoergine and ergine cause similar effects. A large dose of isolysergic acid intracardially causes drowsiness, whilst a much smaller dose of lysergic acid intramuscularly produces no symptoms. In the fowl, ergosine and ergocristine cause symptoms similar to those produced by ergotamine (cf. A., 1923, i, 420). Ergosinine has a similar but less marked effect, whilst ergometrine is inactive. Ergine and isoergine cause similar symptoms, whilst the lysergic acids cause only transitory cyanosis of the comb. Ergosine and ergosinine produce equilibrium disturbances and dyspnoea in the canary. In the cat, ergosine, ergosinine, and ergocristine cause "sham rage," drowsiness, roughened hair, polypnoea, mydriasis, and then myosis and paresis. Ergometrine causes only mydriasis and timidity. isoErgine and ergine cause mydriasis, paresis, "sham rage," drowsiness, and timidity, whilst the lysergic acids cause ataxia and delayed myosis. In the rabbit, ergosine causes polypnoea and exophthalmos, hyperthermia, increased bronchial secretion, and paresis, whilst ergosinine produces polypnoea and mydriasis. In the guinea-pig, ergosine and ergosinine produce dyspnoea, fluid in upper air passages, and twitching of muscles leading to convulsions. Ergometrine produces no symptoms in the frog, and ergosine and ergosinine only cause lethargy. J. N. A.

Actions of β -(3-hydroxy-4-methoxy-2-allylphenyl)isopropylamine. J. D. P. Graham (*Quart. J. Pharm.*, 1943, 16, 362–366).—The min. lethal dose of this amine for intraperitoneal injection in mice is 0.27 g. per kg.; 0.05 g. per kg. increases general activity, which is followed by quiescence. With toxic doses, death is caused by respiratory failure; initially there are general clonic convulsions, although small doses may produce only tremor and ataxia. The amine depresses the isolated rabbit heart, but stimulates the isolated cat heart. The blood pressure in spinal cats and in rabbits anaesthetised with urethane is decreased. The pressor effect of adrenaline in the spinal cat is decreased, but prolonged, by previous administration of the amine. The amine abolishes the bronchial spasm and fall in blood pressure induced in the spinal cat by histamine. It stimulates rat and guinea-pig uterus, and causes contraction of cat and rabbit intestine *in vivo*, and relaxation *in vitro*. J. N. A.

Methylcellulose as colloid laxative. M. L. Tainter (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 77–79).—Given to rats as 10% of their diet, methylcellulose caused no toxic symptoms. 10 g. daily in man increased frequency of stools, and doubled their vol. V. J. W.

Circulatory effects from cyclopropane administered after haemorrhage. S. G. Hershey and E. A. Rovenstein (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 68–70).—Average blood pressure in 18 dogs was 120 mm. Hg before and 64 mm. Hg after bleeding, when the pulse rate rose from 87 to 174. During subsequent anaesthesia with cyclopropane blood pressure averaged 104 mm. Hg and pulse rate fell to 71. Results in 4 cats were similar. V. J. W.

Endotracheal anaesthesia: relation of nasotracheal and orotracheal intubation to respiratory morbidity. N. A. Gillespie and W. A. Conroy (*Anesthesiology*, 1941, 2, 28–36).—2719 cases of endotracheal anaesthesia are statistically analysed with respect to frequency of respiratory morbidity after nasotracheal and orotracheal intubation. G. P.

Ether anaesthesia and cerebral anoxia. C. B. Courville (*Anesthesiology*, 1941, 2, 44–58).—A discussion on complications following ether anaesthesia. It is suggested that "ether convulsions" are the results of cerebral anoxia or disturbed respiration of the nervous tissues. A case of decerebrate rigidity and blindness after ethyl

chloride-ether anaesthesia and a case of spasticity and psychosis after ether anaesthesia in a chronic alcoholic are reported. G. P.

Influence of general anaesthetic agents on bacterial flora of upper respiratory tract. M. M. Schapiro and L. Arnold (*Anesthesiology*, 1941, 2, 80—89).—Swabs were taken from the pharynx of 165 patients before and at varying intervals after ethylene, ethylene + ether, or cyclopropane anaesthesia. The swabs were washed in 5 ml. of sterile broth and 0.1 ml. of this broth was spread over agar and blood-agar plates. Colony counts were made after 12, 24, and 48 hr. incubation. The no. of colonies was slightly greater from swabs taken 1—2 hr. after than from those taken before the anaesthesia. G. P.

Regional anaesthesia for operations about the head and neck. L. H. Mousel (*Anesthesiology*, 1941, 2, 61—73).—Description of technique of local anaesthesia for operations on the thyroid, tonsils, cranium and brain, nose and accessory cavities, and eye. G. P.

Detoxication of local anaesthetics [pontocaine hydrochloride]. H. Wastl (*Anesthesiology*, 1941, 2, 74—79; cf. A., 1940, III, 251).—The min. lethal dose (m.l.d.) of pontocaine hydrochloride for cats was 2 mg. per kg. intravenously. Animals receiving intravenously various Ca salts prior to the injection of pontocaine hydrochloride tolerated larger doses: with 200 mg. per kg. of Ca laevulate the m.l.d. was increased 3.03 times, with 200 mg. per kg. of Ca gluconate 2.36 times, with 200 mg. per kg. of Ca lactate 1.83 times, and with 100 mg. per kg. of CaCl_2 1.66 times. G. P.

Effect of yeast extracts on local anaesthetic action of cocaine. E. S. Cook (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 203—204).—Presence of 5% of yeast extract in 1.7% solution of cocaine hydrochloride decreased the duration of local anaesthesia produced in the rabbit's cornea from 30 to 13.5 min. provided that the pH of the mixture was kept to 4.8 by added HCl. V. J. W.

Stability of amethocaine-glucose solution for spinal anaesthesia. F. A. Hudson (*Quart. J. Pharm.*, 1943, 16, 337—341).—A hyperbaric solution (d 1.025) containing amethocaine hydrochloride (1%) and glucose (6.3%) is described. The solution is sterilised in sealed ampoules by autoclaving at 115° for 30 min. The pH of the solution before sterilisation is slightly greater than that of a solution of amethocaine hydrochloride alone, whilst after heating to 115° the pH is slightly less, due to presence of the glucose. The spinal is more stable than the simple solution when stored at room temp. and requires only a very little more alkali than does the simple solution to increase the pH to 6.4. J. N. A.

Basic-alkyl esters of *p*-aminoalkylbenzoic acids.—See A., 1944, II, 134.

Alkyl and dialkylaminoalkyl esters of 4-fluoro-3-aminobenzoic acid.—See A., 1944, II, 134.

Bis(dialkylaminoalkyl) esters of 4-fluoroisophthalic acid.—See A., 1944, II, 135.

Clinical and experimental studies on paraldehyde. M. Bodansky, J. L. Jenkins, H. Levine, and A. J. Gilbert (*Anesthesiology*, 1941, 2, 20—27; cf. A., 1940, III, 154, 550, 867).—The blood-paraldehyde concn. in a patient who received 30 ml. of paraldehyde in 60 ml. of olive oil per rectum for obstetrical analgesia reached 28 mg.-% 2 hr. after administration. In another patient, who received the same dose by stomach tube, the concn. reached 18 mg.-%. 50 mg. per kg. of metrazol intravenously promptly aroused dogs from paraldehyde coma. G. P.

Toxicity of hypnotics as affected by temperature, thyroxine, and adrenalectomy. R. K. Richards (*Anesthesiology*, 1941, 2, 37—43).—The toxicity of paraldehyde for frogs increases as their temp. is increased from 10° to 30°. The toxicity of pentothal- and pentobarbital-Na for frogs is greater at 10° than at 20° but greatest at 30°. Pretreatment of frogs with 0.1 mg. of thyroxine per day for 5—6 days increased their susceptibility to pentobarbital-Na. Adrenalectomy in mice increased the toxicity of pentothal-Na, especially at high environmental temp. G. P.

Barbiturates containing the Δ^2 -cyclopentenyl group.—See A., 1944, II, 144.

Pharmacology of sec-amyl- β -bromoallylbarbituric acid and its combination with antipyrine. S. Krop, W. Modell, and H. Gold (*J. Amer. Pharm. Assoc.*, 1944, 33, 10—14).—The barbiturate and its mixture with antipyrine are rapidly absorbed after oral or rectal administration in cats. The action of the barbiturate is persistent and generally resembles that of other barbiturates. The convulsant action of antipyrine is abolished by the barbiturate. The two drugs show synergism or antagonism at certain dosages. F. O. H.

Paramecium caudatum as test animal for organic arsenicals. H. E. Potts (*J. Franklin Inst.*, 1943, 236, 499—505).—Various concns. of drugs were added to const. suspensions of organisms at pH 7. Examinations were made every hr. for 6 hr. and at 24 hr. and drugs were classified into 4 groups according to concn. needed to kill all organisms within different times. As^V was only slightly toxic; of trivalent compounds, the pyridones were inactive; so were reduced

arsacetin and arsenophenylglycine. The most active compounds were the tervalent oxides and chlorides of benzene and pyridine, especially 2:2'-dichloro-5:5'-arsenopyridine. Activity against paramecium can be correlated with that against trypanosomes. V. J. W.

More care with mercury. A. Stock (*Z. physikal. Chem.*, 1941, A, 189, 53—69).—The danger of chronic Hg poisoning through breathing Hg vapour is emphasised. A few μg . of Hg per cu.m. of air will produce serious effects on mental energy and memory. Hypersensitiveness may result from breathing a poisonous dose, and in this case a few tenths of 1 μg . per cu.m. is sufficient to produce the symptoms. A. J. M.

Late effects of lead poisoning on mental development.—See A., 1944, III, 246.

Sulphur-feeding tests for control of ectoparasites of animals. O. G. Babcock and I. B. Boughton (*J. Amer. Vet. Med. Assoc.*, 1943, 103, 209—212).—The daily feeding of S to calves and goats in doses up to 5 g. per 100 lb. of body wt. for 257 days had no effect on the louse populations of the animals. E. G. W.

Action of pyrethrum on German cockroach. J. M. Hutzel (*J. Econ. Entom.*, 1942, 35, 933—937).—Excitation and paralysis depend on the diffusion rate of pyrethrins through integumentary secretions, and this is influenced by dose, concn., and η of the pyrethrum solution. The oily film on the ventral surface of the roach moistens the pyrethrum powder, facilitating diffusion of pyrethrins through the body. Pyrethrum affects the nervous system, and the initial excitatory effect is due to stimulation of successive sensory endings in the integument. Final paralysis depends on the speed at which pyrethrins reach the thorax and affect the thoracic ganglia. A. A. M.

Toxicity of extracts of derris root for mice. H. B. Haag, I. Taliaferro, and L. D. Goodhue (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 140—141).—All toxicity is removed by CHCl_3 extraction, and is due to these extractives, to rotenone, and to the red colouring matter, but is not exactly correlated with any one of the three. V. J. W.

Chemicals depressing the thyroid gland.—See A., 1944, III, 250.

Production of pulmonary oedema by thiourea in rat, and its relation to age. J. B. Mackenzie and C. G. Mackenzie (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 34—37).—Adult rats were killed by about 50 mg. per kg. of thiourea given intraperitoneally, whether normal or thyroidectomised. At the age of 1 month they survived doses of 180 mg., i.e., 50 adult lethal doses, but showed greater thyroid enlargement than adults. V. J. W.

Disintegration of organic complexes by pepsin in toxicological analysis. A. Borque (*Rev. Fac. Cienc. Quím., La Plata*, 1942, 17, 203—208).—Proteolysis of animal proteins is little affected by As_2O_3 , HgCl_2 , Pb acetate, and alkaloids. F. R. G.

Effect produced by phytoncides on the organism. I. Toroptzev (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, 38, 254—257).—Rabbits were made to inhale vapour from fresh onion paste for 4 min. 10 times daily for 10 days. Microscopical examination of the tissues showed only slight catarrhal changes in the respiratory tissues and very slight evanescent degenerative changes in the liver. F. S.

Acute toxicity of vapours of several monoalkyl ethers of ethylene glycol. H. W. Werner, J. L. Mitchell, J. W. Miller, and W. F. von Oettingen (*J. Ind. Hyg.*, 1943, 25, 157—163).—Mice were exposed to vapour-air mixtures of known concn. There was no evidence of narcotic action, dyspnoea was the most constant sign of toxic action, while severe haemoglobinuria usually followed nearly lethal concn. Deaths usually occurred 7—32 hr. after commencing exposure. Fatal cases usually showed congestion and follicular phagocytosis of the spleen, with occasional changes in liver, lungs, and kidneys. Min. lethal concn. [(m.l.c.) killing 50%] in mg. per l. indicated toxicities decreasing in the following order: butyl, methyl, *n*-propyl and ethyl, isopropyl. "Hazard index," indicating potential hazard to man, is the no. of mouse m.l.c. in air saturated with vapour under ordinary conditions of temp. and pressure. E. M. K.

Chronic toxicity of Aerosol-OT. A. E. Benaglia, E. J. Robinson, E. Utey, and M. A. Cleverdon (*J. Ind. Hyg.*, 1943, 25, 175—180).—Rats fed Aerosol-OT mixed with their food survived daily doses up to 0.87 g. per kg. for 6 months; red, white, and differential white cell counts were not affected. Dogs survived daily doses of 0.25, monkeys 0.125, and rabbits 0.5 g. per kg. There was some evidence of gastro-intestinal irritation, but no pathological changes were found after death. E. M. K.

Reaction between *Vipera russellii* venom and its antivenene. B. N. Ghosh and N. L. Kundu (*Indian J. Med. Res.*, 1940, 27, 1121—1127).—The neutralisation curve of *V. russellii* venom can be represented by an equation. When a given quantity of the venom is added to an equiv. amount of the antivenene in 2 instalments at 30 min. interval, slight toxicity develops. The possibility of titration *in vitro* of antivenene against the venom by comparison of turbidity is indicated. J. H. B.

Chemistry and pharmacological action of *Entada pursaetha*, DC (*E. scandens*, Benth). R. N. Chopra, J. C. Gupta, G. S. Chopra, and B. K. Ghosh (*Indian J. Med. Res.*, 1940, 28, 469—473).—Two white amorphous saponins were isolated by alcohol extraction of the seeds. Both were equally toxic, causing hæmolysis, fall of blood pressure, and respiratory failure. The min. lethal dose for frogs was 0.1 mg. and for mice 0.3 mg. per g. body wt. S. E. M.

Treatment of war burns. C. P. G. Wakeley (*Surgery*, 1941, 10, 207—232).—Practical details of treatment are described based on British war experience. G. P.

Symptoms and therapy of poison gas injuries, especially pulmonary damage. W. Löffler. Review of poison gases acting on respiration. F. Schwarz. Prophylaxis and therapy of injuries by skin-affecting poison gases. H. Kuske. Respiration in gas mask. F. von Tavel. Eye damage by poison gases. E. B. Streiff. Effects of mustard gas. H. Jaeger. Symptoms and treatment of green, blue, and white cross and explosion gas injuries. H. Fischer. Materials required for treatment of poison gas casualties. W. Müller (*Schweiz. med. Wschr.*, 1943, 73, 282—286, 286—289, 289—294, 294—296, 296—298, 298—304, 316). A. S.

Sensitisation to mustard gas. G. Miescher (*Schweiz. med. Wschr.*, 1943, 73, 304—306).—Repeated exposure of human or rabbit's skin produces an allergic hypersensitivity reaction to previously subthreshold concn. of mustard gas in 50% of the cases. A. S.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Effect of work on calcium and phosphorus retention by Percheron geldings. A. L. Harvey, B. H. Thomas, C. C. Culbertson, and E. V. Collins (*J. Animal Sci.*, 1943, 2, 103—111).—During a period of 9 weeks, two Percheron geldings each weighing about 1660 lb. were maintained, with small loss of wt., on a diet of oats and timothy hay supplemented, during periods of work, with sugar and dextrinised starch. The average daily intakes of Ca and P were 18—19 g. Throughout the period the Ca and P balances were negative although the N balance was positive. The Ca and P balances were not affected by various amounts of work (0—1.27 h.p. for more than 4 hr. daily). W. McC.

Study of industrial workers exposed to sulphur dust. S. S. Pinto, R. A. Brown, and B. H. Carlton (*J. Ind. Hyg.*, 1943, 25, 149—151).—Impinger and dust counter samples were used to assess the exposure. 400 employees of a S mining company were X-rayed; there were no abnormal lung appearances among 65 men heavily exposed to S, and the incidence of abnormal appearances among the other employees was slightly less than among a group from other industries. E. M. K.

Plumbism resulting from oxyacetylene cutting of painted structural steel. I. R. Tabershaw, B. P. W. Ruotolo, and R. P. Gleason (*J. Ind. Hyg.*, 1943, 25, 189—191).—14 men engaged on salvaging structural steel were examined. The work was done out of doors, and the men wore respirators, yet all were ill at some time with minor or major symptoms of Pb absorption, all but one had a urinary Pb content outside the normal range, and most showed typical blood changes. Scrapings from the girders contained 7% of Pb. E. M. K.

Carbon tetrachloride from the health viewpoint. H. P. Quadland (*Rubber Age* [N.Y.], 1943, 53, 141—142).—Various health aspects of the use of CCl_4 as a solvent are reviewed. D. F. T.

Toxic effects of exposure to chlorinated naphthalene and chlorinated [di]phenyls with suggestions for prevention. H. von Wedel, W. A. Holla, and J. Denton (*Rubber Age* [N.Y.], 1943, 53, 419—426).—Chlorinated C_{10}H_8 and Ph_2 compounds used for electrical insulation purposes have been found to be capable of ill-effect on the workers' health. A study of the toxic effects on experimental animals is recorded and protective measures are recommended for workers. D. F. T.

XXII.—RADIATIONS.

Stimulative effects of X-rays on plants. H. J. Kersten, H. L. Miller, and G. F. Smith (*Plant Physiol.*, 1943, 18, 8—18).—Root growth was stimulated by irradiating dry maize seeds at voltages of about 17.5—20 peak kv. Suitable apparatus is described. R. H. H.

Effect of radiation on pollen grain development, differentiation, and germination.—See A., 1944, III, 230.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Physico-chemical aspects of secretory process. R. Höber (*Fed. Proc.*, 1942, 1, 240—246).—A study of physico-chemical factors involved in investigations on the passive penetration of the secretory cell layer, and the active transfer of anions and cations. P. G. M.

Anomalous viscosity and flow-birefringence of protein solutions.—See A., 1944, I, 103.

XXIV.—ENZYMES.

Biotin and *p*-aminobenzoic acid content of crystalline enzymes. D. R. Miller, J. O. Lampen, and W. H. Peterson (*J. Amer. Chem. Soc.*, 1943, 65, 2369—2370).—Free and bound biotin contents, respectively, are recorded as follows: beef liver catalase 1.50, 1.56, concanavalin A 0.032, 0.47, rennin 0.71, 1.12, urease 0.05, 0.58, yeast-polypeptidase 0.033, 3.90, phosphorylase 0.84, 11.3, rabbit muscle extracts, (a) 0.44, 0.32, and (b) 0.32, 0.32, phosphorylase (adenylic acid) —, 0.30 and (non-adenylic acid) —, less than 0.01 μg . per g. *p*-Aminobenzoic acid contents, liberated by autoclaving with, respectively, water, 2N-HCl, and 5N-NaOH are: beef liver catalase 4.3, 17, 19, concanavalin A 0.25, 9.2, 22, rennin 1.0, 7.5, 19, yeast-polypeptidase 6.6, 120, 130, phosphorylase 2, 3.6, 13, and rabbit muscle extract 1.7, 5.0—6.0, 23—25 μg . per g. Assumption of 1 mol. of these components per mol. gives excessive mol. wts. for the enzymes and proteins, whence it is concluded that these components are present as impurities. Use of such determinations as tests of purity is suggested. R. S. C.

Carbonic anhydrase in mammalian tissues. W. Ashby [with D. V. Chan] (*J. Biol. Chem.*, 1943, 151, 521—527).—Tissues of several mammalian species were examined (see C., 1944, Part 2). Kidney cortex gave higher results than the medulla. In human muscle, low activity was associated with malignancy, tuberculosis, and old age. The results, both as between species and between individuals, were in general very variable. No activity, however, was found in the adrenal gland or in (rat) embryonic tissue, and in 8 species, including man, the activity of the central nervous system was relatively constant at about 10% of that of the blood. E. C. W.

Succinic acid dehydrogenase from cucumber seeds. K. P. Basu and J. N. Karkun (*J. Indian Chem. Soc.*, 1943, 20, 277—281).—A succinic acid dehydrogenase capable of using 2:6-dichlorophenol-indophenol as H acceptor is described. Narcotics, particularly octyl alcohol, reduce its activity under anaerobic conditions, whereas KCN is the most effective inhibitor of aerobic activity. Incubation with Cu before testing reduces the activity. R. L. E.

Biocatalysts in cancer tissue. III. Succinic dehydrogenase and cytochrome oxidase.—See A., 1944, III, 195.

Preparation and properties of highly purified ascorbic acid oxidase. W. H. Powers, S. Lewis, and C. R. Dawson (*J. Gen. Physiol.*, 1944, 27, 167—180).—The prep. of the oxidase from summer crook-neck squash is described. The method involves pptn. with $(\text{NH}_4)_2\text{SO}_4$, dissolution in Na_2HPO_4 , pptn. with MgSO_4 , adsorption on $\text{Al}(\text{OH})_3$, followed by elution with Na_2HPO_4 , fractional pptn. with Pb subacetate, adsorption on $\text{Al}(\text{OH})_3$, elution with Na_2HPO_4 , and dialysis. The oxidase contains 0.24% of Cu, and small amounts of catalase but no peroxidase. It is approx. 1.5 times as active as the prep. of Lovett-Janison and Nelson (A., 1940, III, 764), which contained 0.15% of Cu. The activity of the oxidase is proportional to the Cu content and the proportionality factor is the same as that reported by Lovett-Janison. When freed from salts by dialysis the blue conc. oxidase solutions ppt. a dark greenish-blue protein which carries the activity. This pptn. is prevented by presence of 0.1M- Na_2HPO_4 in the conc. protein solution. The oxidase rapidly and irreversibly loses activity when it is diluted unless done with a dil. inert protein solution, such as gelatin. The enzyme has optimum pH 5.6 in presence or absence of gelatin. With increase of concn. of substrate there is a decrease in the original rate of oxidation by the oxidase, but in presence of gelatin there is very little difference between the rates. J. N. A.

Inactivation of ascorbic acid oxidase. W. H. Powers and C. R. Dawson (*J. Gen. Physiol.*, 1944, 27, 181—199).—In absence of protective agents highly purified ascorbic acid oxidase is rapidly inactivated during enzymic oxidation of ascorbic acid under optimum conditions. This "reaction inactivation," which is different from the loss of activity that frequently results when the conc. enzyme is diluted, is indicated by incomplete oxidation of ascorbic acid. The total amount of O_2 absorbed during the enzymic oxidation before the enzyme is completely inactivated varies with pH in approx. the same manner as the enzymic activity varies with pH. A minor part of the reaction inactivation appears to be due to environmental factors such as rate of shaking, pH, and concn. of substrate and oxidase. Presence of gelatin considerably reduces this environmental inactivation, but the major part of the reaction inactivation appears to be due to some factor inherent in the ascorbic acid-oxidase- O_2 system. It is not caused by dehydroascorbic acid, but may be due to a highly active redox form of O_2 other than H_2O_2 or water. The enzyme is markedly protected against inactivation by small amounts of native catalase or peroxidase, native or denatured methæmoglobin, and hæmin. Cytochrome-*c*, ovalbumin, gelatin, and denatured catalase or peroxidase are without effect. None of these protective agents affects the initial rate of O_2 uptake or changes the total O_2 absorbed for complete oxidation of ascorbic acid, and hence does not act by removal of H_2S , *per se*. NaN_3 and NH_4OH ,

which inhibit catalase and peroxidase, also inhibit the protective action of these enzymes.

J. N. A.

Enzymic reduction of dehydroascorbic acid. V. N. Bukin (*Biochimia*, 1943, 8, 60—76).—Ascorbic oxidase is not identical with the enzyme catalysing the reduction of dehydroascorbic acid in presence of glutathione. The name ascorbic reductase is suggested for the enzyme which catalyses reduction of dehydroascorbic acid but has no oxidising action on ascorbic acid. Both enzymes constitute an oxidising system which can function satisfactorily in the respiration of plant tissues only if sufficiently intense reduction of oxidised glutathione occurs. Oxidised glutathione is probably one of the acceptors for H mobilised by the dehydrogenases since it is rapidly reduced by dehydrocozymase in a simple, non-enzymic reaction.

H. G. R.

Glycine oxidase. S. Ratner, V. Nocito, and D. E. Green (*J. Biol. Chem.*, 1944, 152, 119—133).—Glycine oxidase was found in liver and kidney of all animals investigated. Acetone-dried pig kidney powder is extracted with water, 30 g. of $(\text{NH}_4)_2\text{SO}_4$ per 100 c.c. of filtrate are added, and the ppt. is collected and redissolved in water. To this solution are added 24 g. of KH_2PO_4 per 100 c.c., the ppt. is collected and suspended in water, and 10% aq. Na_2CO_3 is added to pH 8.2. The ppt. is discarded and the pptn. with KH_2PO_4 is repeated. The clear greenish-yellow enzyme solution retains activity for 7—10 days at 0—5°, but dialysis against distilled water results in 80% loss after 12 hr. The optimum pH is 8.3. The above prep. requires addition of flavin-adenine dinucleotide to activate it; adenylic acid, riboflavin, etc. are not effective. Unsplit preps. of the enzyme are obtained by Na_2SO_4 pptn. from an acetate extract at pH 4.8. Pig's kidney appears to contain a factor that destroys flavin-adenine dinucleotide at neutral reactions but is inhibited at pH 4.8. Although the above preps. are contaminated with *d*-amino acid oxidase, the enzyme is distinct. It catalyses the oxidation of glycine to glyoxylic acid and NH_3 , and of sarcosine to glyoxylic acid and methylamine. The further oxidation of glyoxylic to oxalic acid by xanthine oxidase has also been studied.

P. G. M.

***d*-Amino acid oxidase, uricase, and choline oxidase in normal rat liver and in nuclei of normal rat liver cells.**—See A., 1944, III, 194.

Lipoxidase. H. Süllmann (*Helv. Chim. Acta*, 1943, 26, 2253—2263).—Lipoxidase from the seeds of Leguminosæ does not dialyse through a Cellophane membrane, is thermolabile, and can be pptd. by $(\text{NH}_4)_2\text{SO}_4$ or acetone. Proteolytically active enzymes destroy lipoxidase, which is inactivated by oxidising agents and acids. The region of activity of lipoxidase extends to unsaturated fatty acids and their esters; according to Strain (A., 1942, III, 418) the group $\text{CH}_2\text{CH}[\text{CH}_2]\text{CO}$ in *cis*-configuration must be present. The soy enzyme does not cause absorption of O_2 (beyond that due to autoxidation if occurring) by palmitic, erucic, undecenoic, fumaric, maleic, and ascorbic acid, pyrocatechol, quinol, bixin, carotene, or cholesterol. The occurrence of lipoxidase, or a similarly active enzyme, in plants so distinct as Leguminosæ and potato arouses the expectation of its occurrence in other plants but the distribution does not appear general and it is not present in all oil seeds (not in hemp, linseed, or castor oil seeds). As far as can be inferred from the behaviour of the separated enzyme its biological function differs in different plants.

H. W.

Fermentation of Ceylon tea. IV. Determination of oxidase activity. V. Comparative rates of oxidation of polyphenols by tea oxidase. VI. Nature of tea oxidase system. VII. Prosthetic group of tea oxidase. H. B. Sreerangachar (*Biochem. J.*, 1943, 37, 653—655, 656—660, 661—667, 667—674; cf. B., 1941, III, 17).—IV. Acetone-dried tea leaf is extracted with water containing an excess of ascorbic acid, whereby polyphenols are completely removed. The final prep. has only a very low ascorbic acid oxidase activity, but a slightly increased polyphenol oxidase activity. The optimum conditions for the mixed and insol. enzymes are pH 5.0 and 5.4, respectively, at 27°. The proposed ascorbic acid method for measuring enzyme activity obviates both condensation errors due to *o*-quinones and the necessity for use of tannin-free enzyme preps.

V. The comparative rates of oxidation of pyrocatechol, tea tannin, ascorbic acid, etc. have been investigated. Discrepancies between the results and those of other workers are shown to be due to the inhibiting effect of condensation products under their conditions. Only one enzyme appears to be involved.

VI. Tea oxidase is not identical with cytochrome oxidase, as evidenced by spectroscopic examination of highly active preps. The theory that the tea-fermentation enzyme is a polyphenol oxidase is supported by experimental results.

VII. Acetone-dried leaf powder is extracted with buffer solution at pH 10, and the extract is adjusted to pH 6.0—6.5 with acetic acid. Addition of $(\text{NH}_4)_2\text{SO}_4$ (75—100% saturation) pptns. an enzyme fraction, which is dialysed. Fractional pptn. by Pb acetate or cold acetone does not effect any purification. Two adsorptions on $\text{Ca}_2(\text{PO}_4)_2$ gel at pH 6.5, followed by elution with 0.5M- K_2HPO_4 , yield an enzyme prep. 60—70 times as active as the acetone-dried powder. Some inactivation occurs during dialysis but this can be reduced by neutralisation of the alkaline extract before dialysis.

Such preps. (N 6.6, Cu 0.08%) are 800 times as active as fresh leaf, and contain no Fe. Polyphenol oxidase activity is proportional to Cu content, and complete removal of Cu, by dialysis against KCN solution, irreversibly inactivates the enzyme.

P. G. M.

Effect of barbiturates on serum-choline-esterase.—See A., 1944, III, 169.

Muscular activity and choline-esterase.—See A., 1944, III, 176.

Chemical mediator of nervous effects. Action of acetylcholine and its enzyme in controlling nervous activity.—See A., 1944, III, 177.

Choline-esterase at nerve terminations in sphincter pupillæ of turtles.—See A., 1944, III, 180.

Action potential and enzyme activity in electric organ of *Electrophorus electricus*. II. Phosphocreatine as energy source of action potential.—See A., 1944, III, 180.

Manner of inactivation of thiamin by fish tissue. L. O. Krampitz and D. W. Woolley (*J. Biol. Chem.*, 1944, 152, 9—17).—Destruction by carp tissue of thiamin is not due to combination with a protein but to enzymic cleavage between the thiazole and pyrimidine rings. The enzyme responsible consists of a heat-labile, non-dialysable part and a heat-stable, dialysable part. There is probably an intermediate product.

E. C. W.

Influence of certain physiological and pathological agents on the transamination of glutamic acid in animal tissues. E. D. Vischepan (*Biochimia*, 1943, 8, 45—59).—Transamination of glutamic acid in muscle tissue of normal rabbits is 7.5—12 mg. per 2 g. of tissue. No difference is observed between red and white muscle or in denervated or desympathised muscle. A decrease sometimes occurs in tetanus intoxication but cannot be ascribed to a direct action of the toxin on the enzyme. No change is caused by severe fatigue, in muscles degenerated during alimentary dystrophy, or in liver after poisoning with P or CCl_4 . A considerable decrease is observed in kidney after $\text{UO}_2(\text{NO}_3)_2$ poisoning, when degeneration and necrosis of the epithelium occurs, indicating that glutamico-aminopherase in kidney is localised in the epithelial cells.

H. G. R.

Preparation and partial purification of the co-enzyme of aspartic aminopherase. A. E. Braunschtein and M. G. Kritzman (*Biochimia*, 1943, 8, 1—8).—The co-enzyme is prepared from pig heart boiled juice by pptn. of inactive material with Pb acetate followed by Hg^{II} acetate and AgNO_3 in acid solution, when the active substance is pptd. by alternate addition of AgNO_3 and NaOH . The ppt. is decomposed with H_2S and the filtrate conc. The co-enzyme is basic, sol. in water, and insol. in alcohol, ether, and acetone. It is pptd. by Ag salts or Hg^{II} acetate in alkaline solution but pptn. is incomplete in neutral solution or with basic Pb acetate, phosphotungstic or picrolonic acid. It is stable in alkaline solution but rapidly inactivated in *N*-acid. The material gives a positive reaction for pentose and amino-N and negative reactions with biuret, Millon, xanthoprotein, histidine, Molisch, thiochrome, and free- and bound-P tests. The co-enzyme cannot be replaced by known enzyme activators or muscle extractives in the aspartic aminopherase test.

H. G. R.

Formation of creatine from ammonium carbonate and sarcosine *in vitro*. H. H. Beard (*Arch. Biochem.*, 1943, 3, 175—180).—Rat muscle contains an enzyme, creatase, which causes *in vitro* formation of creatine from $(\text{NH}_4)_2\text{CO}_3$ and sarcosine. $(\text{NH}_4)_2\text{CO}_3$ can replace guanidine carbonate in the synthesis of creatine from sarcosine and guanidine carbonate. Creatine is the substance which is responsible for the coloration produced in the Jaffe reaction.

J. N. A.

Animal peptidases. XVIII. Peptidase of serum which hydrolyses *d*-leucylglycine. E. Maschmann (*Naturwiss.*, 1943, 31, 199—200).—Experiments with *d*- and *dl*-leucylglycine show that the *d*-peptidase which occurs in an inactive condition in the serum of rabbit and guinea-pig acts anaerobically after activation by SH (cysteine) + bivalent heavy metal (Mn, Fe, Zn, Co). The *d*-peptidase content varies greatly with species and individual even where diet is const., highest vals. being found in the serum of rabbits on a diet of white cabbage. There is no correlation between power to hydrolyse *d*- and *dl*-leucylglycine and the ratio of the extents of hydrolysis of *l*- and *d*-leucylglycine is not const.

W. McC.

Proteolytic enzymes and mutations.—See A., 1944, III, 159.

Effect of chlorides on activity of plant amylase. S. S. Baslavskaja (*Biochimia*, 1943, 8, 213—221).— NaCl and KCl are not direct *in vitro* activators of amylase in the pea, potato, or tobacco, but prolonged culture on media with a high concn. of Cl^- increases amylolytic activity.

P. G. M.

Enzymes present in germinating seeds. N. V. Bhide and D. L. Sahasrabudha (*J. Univ. Bombay*, 1943, 12, A, Part 3, 81—84).—Germinated seeds of bajri and gram contain amylase and proteinase which increase up to 72 hr. germination, and then decrease. Bajri amylase acts equally on the flours from two cereals and two pulses, but gram amylase and both proteinases attack pulse flours faster than cereal flours.

R. L. E.

α -Amylase [and] β -amylase [of barley].—See A., 1944, III, 232.

Mechanism of the Pasteur effect. V. A. Engelhardt and N. E. Sakov (*Biochimia*, 1943, 8, 9—36).—Since fermentation of hexose diphosphate is not inhibited by oxidising agents and the formation of glucose 6-phosphate cannot be inhibited by respiratory metabolism the point of application of the Pasteur effect must occur at stages preceding the formation of hexose diphosphate and cannot be located at stages preceding glucose 6-phosphate. Isomerisation of hexose monophosphate is unaffected by oxidising agents and must also be ruled out. The enzyme Neuberg-ester-phosphophorase is very sensitive to the action of oxidising agents but is not affected by their reduced forms and the reaction is inhibited by redox indicators with E_0 greater than 0.05 v. The effect of oxidants is diminished by the presence of the substrates of the enzyme and, to a smaller degree, by adenylic acid but hexose diphosphate has no such effect. The action can be inhibited by phenolase in presence of a polyphenol and by the cytochrome system. Cytochrome-*c* does not act directly but inhibits on addition of a polyphenol, and in presence of the latter and catalytic quantities of cytochrome-*c* and cytochrome oxidase complete inhibition of hexose diphosphate formation occurs. The "Pasteur enzyme" of Stein and Melnick probably acts as a link between the cytochrome and the Neuberg-ester-phosphophorase system. H. G. R.

Coccarboxylase phosphatase in dog serum. M. E. Greig and W. M. Govier (*J. Pharm. Exp. Ther.*, 1943, 79, 246—249).—A phosphatase, which hydrolyses coccarboxylase, was found in dog serum. $M/15$ PO_4''' or BO_3''' buffers (pH 7.4), 0.01M- P_2O_5''' , or 0.08M-CN⁻ inhibited the activity of the enzyme. NaF and $CHCl_3$ had a slight inhibitory effect. 0.05M-barbital buffer (pH 7.4) had no effect on the enzyme activity, which increased with change of pH from 7 to 8.5. G. P.

Mechanism of cozymase synthesis in human erythrocyte: comparison of rôles of nicotinic acid and nicotinamide.—See A., 1944, III, 162.

Mechanism of ketol formation from pyruvate and aldehydes.—See A., 1944, II, 91.

XXV.—FUNGI. MICRO-ORGANISMS. IMMUNOLOGY. ALLERGY.

Biology of *Polyporus basilaris*. H. E. Bailey (*Bull. Torrey Bot. Club*, 1941, 68, 112—120).—*P. basilaris* when grown on *Cupressus macrocarpa* wood appears to utilise all the main wood constituents. The sporophore of the fungus contained water-sol. constituents 30.14, cellulose 43.4, lignin 13.35, and pentosans 26.9%.

Biology of *Polyporus rheades* (Pers.) Fries. H. E. Bailey (*Bull. Torrey Bot. Club*, 1941, 68, 198—201).—*P. rheades* appears to utilise all the main components of the wood of *Quercus agrifolia*.

Enzymic processes in surviving mushroom tissue (*Psalliota campestris*). A. L. Kursanov (*Biochimia*, 1943, 8, 201—212).—Both closed and open mushrooms synthesise sucrose from a mixture of glucose and fructose, and the invertase has no hydrolytic action. The proteolytic enzymes also exhibit a predominantly synthetic action, whilst phosphatases have both synthetic and hydrolytic activity. The former decreases and the latter increases with age. P. G. M.

Significance of the growth-substances for *Psalliota hirsutis*. C. Treschow (*Naturwiss.*, 1943, 31, 210).—Growth of fungus which has been rendered very poor in growth-promoting substances by repeated propagation on glucose-agar medium is promoted by addition of biotin but growth equal to that produced by 1% of beer wort occurs only when biotin is supplemented with pantothenate, nicotinamide, and aneurin. The effect of biotin is not appreciably increased by adding any of the last three substances alone. The growth-promoting effect of dung is partly due to its content of growth-substances. W. McC.

Chemical induction of genetic changes in *Aspergilli*. R. A. Steinberg and C. Thom (*J. Heredity*, 1940, 31, 61—63).—Nutrient solutions containing mannitol and $NaNO_3$ induce mutation in *A. niger*, *A. amstelodani*, *A. fumigatus*, *A. fischeri*, and *A. varicolor*. In the mutants the length and colour of the aerial hyphae may be changed and in all mutants induced by $NaNO_3$ sexual reproduction was reduced or entirely suppressed but asexual reproduction was not uniformly affected. Many other chemical substances induced mutations in these *Aspergilli* when no NO_3^- was present. L. G. G. W.

Biotin and growth of *Fusarium avenaceum*. W. J. Robbins and R. Ma (*Bull. Torrey Bot. Club*, 1941, 68, 446—462).—A strain of *F. avenaceum* which did not grow in mineral-sugar solution grew if agar was added, the improved growth being due chiefly to the biotin contained in the agar. Agar extract had a greater stimulating effect than its biotin content would account for. It may contain another growth-substance which is probably not pyridoxine, panto-

thenic acid, thiamin, nicotinamide, pimelic acid, *i*-inositol, riboflavin, glutamine, *p*-aminobenzoic acid, vitamin-K, or ascorbic acid. Some *Fusarium* mutations will grow in biotin-deficient media. L. G. G. W.

Mechanism of enzyme action. XXII. Elementary sulphur as hydrogen acceptor in dehydrogenations by living fusaria. L. J. Sciarini and F. F. Nord (*Arch. Biochem.*, 1943, 3, 261—267; cf. A., 1944, III, 141).—S serves as a useful H acceptor in dehydrogenation of isopropyl alcohol and glycerol and fermentation of *d*-glucose and *d*-xylose by fusaria. The S is reduced to H_2S which in turn is oxidised partly to S and partly to SO_4^{4-} . H_2S does not inhibit the respiratory system of fusaria, and the amount of aneurin synthesised in presence of S is unaltered. During fermentation of glucose in presence of S there is less accumulation of pyruvic acid, the amount of which decreases with increase in S, and correspondingly greater production of alcohol. The significance of the results is discussed. J. N. A.

Growth of *Rhizopus sinuatus* as affected by certain growth factors. C. L. Worley (*Plant Physiol.*, 1942, 17, 278—288).—Growth of *R. sinuatus* is stimulated by thiamin, meso-inositol, liver infusion, and urine, and inhibited by biotin. Yeast contains water-sol. stimulators and inhibitors. R. H. H.

Factor Z in hybrid maize. W. J. Robbins (*Bull. Torrey Bot. Club*, 1941, 68, 222—228).—The growth of *Phycomyces* in a solution containing sugar, minerals, asparagine, and thiamin is increased by water extracts of maize grains. Hybrid grain showed a greater stimulating effect than the grain of two inbred strains. L. G. G. W.

Microbiological aspects of streptothricin. II. Antibiotic activity of streptothricin. J. W. Foster and H. B. Woodruff (*Arch. Biochem.*, 1943, 3, 241—255; cf. A., 1944, III, 142).—Streptococci as a group are more resistant to streptothricin than are staphylococci. The susceptibility of the Gram-negative bacteria to streptothricin is in sharp contrast to penicillin. Yeasts are sensitive to streptothricin, whilst pathogenic and saprophytic fungi are more resistant. Penicillin and streptothricin together show an additive effect. Streptothricin appears to have definite bactericidal, as distinct from bacteriostatic, properties, and organisms probably acquire resistance towards it. It is similar to penicillin in that its activity is independent of the amount of inoculum. The activity is affected by pH of the medium and presence of inorg. salts; max. activity is observed at alkaline reactions. Glucose, maltose, and sucrose decrease the inhibitory effect of streptothricin, since the organisms metabolise the sugar to acid which lowers streptothricin activity. Bacteria subjected to the action of streptothricin show increase in size and a tendency to incomplete fission so that chains of cells are formed. J. N. A.

Antibacterial substances produced by moulds. IV. Detection and occurrence of suppressors of penicidin activity. V. Mechanism of action of suppressors. N. Atkinson and N. F. Stanley (*Austral. J. Exp. Biol.*, 1943, 21, 249—253, 255—257).—IV. After incubation for 24 hr. at 37°, casein hydrolysate, peptone, serum (horse, sheep, man), and liver infusion contain suppressors of the activity of penicidin. Na thioglycollate suppresses the activity without incubation.

V. The action of penicidin is specifically inhibited by compounds [thioglycollate, cysteine, and (especially) glutathione] containing the SH group, the effects of cysteine and glutathione being approx. proportional to their concns. Other compounds (ascorbic acid, pyrogallol, N_2H_4 , H_2O , $FeSO_4$) have no inhibitory effect. Inhibition is probably due to chemical interaction of penicidin with -SH. W. McC.

Mould count recording device. G. A. Pitman (*J. Assoc. Off. Agric. Chem.*, 1943, 26, 511—513).—Paper attached to the mechanical stage of the microscope and moving with the slide is punctured by means of a fixed camera cable release without removing the eyes from the microscope. A. A. E.

Some effects of carcinogens on yeasts. C. W. Dodge, N. S. Dodge, and G. T. Johnson (*Ann. Miss. Bot. Gardens*, 1941, 28, 1—30).—Cultures of champagne and Tokay strains of *S. ellipsoideus*, Rees emend. Hansen, grown in media prepared by dissolving all other ingredients in saturated aq. methylcholanthrene or other carcinogens, showed generally with methylcholanthrene a larger "lag" phase when large amounts of inoculum were used, and a slightly lower dry wt. than the controls. In concns. above 4% saturation methylcholanthrene depressed growth of *Castellania tropicalis*. Results with *Mycocandida onychophila* and *Zymonema dermatitidis* were somewhat irregular. The carcinogens seemed to stimulate the division of injured and senescent cells. The stock cultures used undergo long cycles of physiological activity and this renders reproduction of results difficult unless frequent sub-culturing is carried out. L. G. G. W.

Quantitative investigations on the reaction of yeast to certain biologically active substances. A. Levan and C. G. Sandwall (*Hereditas*, 1943, 29, 164).—Colchicine and acenaphthene even in conc. (saturated aq.) solution have no effect on cell division in yeast (*Saccharomyces cerevisiae*). Saturated solutions of camphor and of

borneol and to a smaller extent of naphthylacetic acid inhibit the normal budding process of the yeast cell, which either lengthens and divides or gives a bud which grows out into a tubular cell. The two cells and their products of division remain attached and a mycelium is produced. This effect is most marked if, in addition to the saturated solution, solid camphor or borneol is present.

L. G. G. W.

Biological degradation of acetic acid. II. Action of malonic acid on the degradation of acetic acid by yeast. F. Lynen (*Annalen*, 1943, 554, 40—68; cf. A., 1943, III, 352).—In all essentials, the dehydrogenase of yeast is identical with the corresponding enzymes of bacteria and animal tissue. Marked inhibition of dehydrogenation is caused by malonic acid in very small concn. This is a concurrent inhibition caused by the simultaneous presence of malonic and succinic acids at the active surface of the enzyme. If the concn. of malonic acid is fixed, the inhibition is determined by the succinic acid present. 0.33M-Na succinate has little or no influence on the absorption of O_2 by yeast whereas the free acid is considerably oxidised; the increase of respiration depends on the concn. of the acid. In living yeast a decisive rôle is played by the diffusion of the acid, and the inability of an added substance to alter the metabolism of yeast, particularly in the case of multivalent ions, may be due to lack of penetrative power rather than to inactivity. Among compounds similar to succinic acid only the free acids diffuse sufficiently rapidly but with concn. exceeding 0.04M. there is a danger of damaging the enzyme. Malonate has no influence on the respiration of yeast in general and particularly on the degradation of acetic acid. At similar concn. the free acid strongly inhibits the acetate degradation by interrupting the cycle between succinic and fumaric acid. Introduction of the latter acid has a pronounced effect which does not attain the same magnitude as in parallel experiments without malonic acid since the diffusion of fumaric acid sets a limit to the activation. Fumaric acid alone, *i.e.*, without acetic acid, increases the respiration of malonate-poisoned yeast. Malonic acid is almost without influence on the dehydrogenation of alcohol to acetic acid but almost completely inhibits the further degradation of the acid. In a malonate-poisoned system, therefore, fumaric acid has no influence on the first phase of alcohol degradation but influences the degradation of the intermediate acetic acid. This is explained by the degradation of acetic through citric acid but not by the theory of Szent-Györgyi. Experiments on the dehydrogenation of alcohol by yeast impoverished in C_4 -dicarboxylic acids so that the degradation of acetic acid occurs but slowly when little alcohol is present show that the dehydrogenation of alcohol to acetic acid takes place at the same rate in all cases. The C_4 -acids therefore do not behave as H carriers in the respiratory system of yeast but only as catalysts of the degradation of acetic acid.

H. W.

New type of carotene pigment from red yeast (*Torula rubra*). P. Karrer and J. Rutschmann (*Helv. Chim. Acta*, 1943, 26, 2109—2114).—Extraction of red yeast with cold (not hot) acetone followed by chromatography over $ZnCO_3$, pptn. of the Na salt by Na methoxide in methyl alcohol, and crystallisation gives torularhodin, m.p. 201—203° (cf. Lederer, A., 1934, 220; Fink *et al.*, *ibid.*, 562, 810). The only other pigment present in appreciable amount is β -carotene. The absorption spectrum of torularhodin lies further in the region of long λ than that of any other carotenoid and there is no difference between its spectrum and that of its Na salt in ethyl alcohol. Torularhodin does not appear to give an oxime and is stable towards boiling alcoholic alkali; $SbCl_3$ in $CHCl_3$ gives an immediate MnO_4^- colour which rapidly disappears completely and is then replaced by a pale blue shade. Like all carotenoids in which the system of conjugated double linkings is terminated by two carbonyl or carboxyl groups torularhodin in pyridine is reduced by Zn dust and acetic acid to a pale yellow (? dihydro-) product which gives a moderately stable blue colour with $SbCl_3$ and retains the acidic character.

H. W.

Technique for the detection of melibiose-fermenting yeasts. L. J. Wickerham (*J. Bact.*, 1943, 46, 501—505).—The yeast is inoculated in 4% raffinose and incubated at 30°. Gas is measured at regular intervals in an inverted tube and when the formation of gas ceases the culture is inoculated with a strong melibiose-fermenting yeast. If no further gas is produced the yeast under test had already fermented the melibiose.

F. S.

Synthesis of pyridoxine by a "pyridoxineless" X-ray mutant of *Neurospora sitophila*.—See A., 1944, III, 200.

Physiological functions of the nucleus in amoeba. A. M. Clark (*Austral. J. Exp. Biol.*, 1943, 21, 215—220; cf. A., 1943, III, 368).—Mononucleate amoebae die within 2 or 3 days when the nucleus is pricked and coagulated but survive for about 7 days when the nucleus is removed. Multinucleate amoebae require only one nucleus for maintenance of life, others being digested if pricked and coagulated. The digestive enzymes of amoebae appear as a result of nuclear action and hence power to digest food is eventually lost when the nucleus is destroyed or removed, possibly because of the failure of zymogens to be activated in the dedifferentiating cytoplasm. Experiments with dyes show that the nuclear membrane

is freely permeable to dissolved substances. The surface of the contractile vacuole is permeable to water but not to most other substances. The permeabilities of the plasmalemma and food vacuole surfaces are similar.

W. McC.

Unique polyene pigment of the marine diatom *Navicula torquatum*. H. H. Strain and W. M. Manning (*J. Amer. Chem. Soc.*, 1943, 65, 2258—2259).—A polyene forms 25—33% of the pigments from this diatom. Its general character is shown by its adsorption and solubilities, and by its absorption spectrum which closely resembles that of violaxanthin and ϵ -carotene. Attempts at isomerisation show it to be the stable (*trans*-) form.

R. S. C.

***Anopheles annulipes*, Walk., as possible vector of malaria. I. Relative susceptibility of *A. annulipes* and *A. punctulatus* var. *mohuccensis*, S.W., to infection with malaria parasites.** F. H. S. Roberts (*Austral. J. Exp. Biol.*, 1943, 21, 259—262).—*A. annulipes*, Walk., is as hospitable to *Plasmodium vivax* as is *A. punctulatus* var. *mohuccensis*, S. W. and S. W. de G.

W. McC.

"Steilbrust" bacteriological culture bottles. A. Janke (*Zentr. Bakt.*, 1943, II, 105, 459—466).—These bottles (made by Jenaer Glaswerk Schott & Gen.) are cylindrical in the lower two thirds and conical in the upper third. They are easily cleaned, well-balanced, economical of space, and adaptable.

F. S.

Bactericidal action of oestrogens *in vitro*. G. H. Faulkner (*Lancet*, 1943, 245, 38—40).—Diethylstilboestrol and hexoestrol are bacteriostatic in small concns. and bactericidal in higher concns. to Gram-positive cocci, *C. diphtheriae*, and *N. catarrhalis*. Gram-negative bacilli were not inhibited. The min. lethal concn. was 1 in 5000 to 1 in 500,000. Tubercle bacilli were killed *in vitro* by 1 in 5000 of stilboestrol. The bactericidal activity of stilboestrol is reduced by serum. Oestrone, oestradiol, and diethoxytriphenylbromoethylene have no bactericidal action.

C. A. K.

Bactericidal properties of fly larvae. D. N. Taliev (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, 39, 164—166).—After treatment of the larvae of *Lucilia sericata*, *Musca domestica*, and *Calliphora erythrocephala* with 10% formaldehyde solution followed by further treatment in 0.025% $HgCl_2$ solution for 1 hr. the intestines were removed aseptically, divided into three sections, and tested separately for bacterial growth, aerobically and anaerobically on meat peptone medium. The media inoculated with the hindmost sections of the intestines showed the weakest growth. This is most marked with those larvae in the earliest stages of development, thus indicating the existence of a bactericidal substance which loses potency as the larvae age. Maintenance of the larvae at 4° also lowers their bactericidal activity.

A. H. G.

Accelerating effect of sublethal heat on spore germination in mesophilic aerobic bacteria. F. R. Evans and H. R. Curran (*J. Bact.*, 1943, 46, 513—523).—Temp. of 65—95° were effective accelerators of spore formation, the greatest effect being obtained at 85° for 8—10 min.

F. S.

Selective reversible inhibition of microbial growth with pyriithamine. D. W. Woolley and A. G. C. White (*J. Exp. Med.*, 1943, 78, 489—497).—1-(4-Amino-2-methyl-5-pyrimidylmethyl)-2-methyl-3- β -hydroxyethylpyridinium bromide hydrobromide inhibited the growth of organisms in which growth was stimulated by thiamin or its component pyrimidine and thiazole portions. The amount of pyriithamine producing growth inhibition was related to the thiamin requirements of the various species; the least amount for inhibition was needed in organisms requiring intact thiamin for normal growth; those utilising pyrimidine and thiazole portions were not so readily inhibited. In all instances the inhibition of growth was overcome by adequate amounts of thiamin.

A. S.

Phytoncides and their bactericidal properties. A. Filatova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, 38, 145—148).—Fresh juice expressed from onions or the vapour of a fresh onion extract had a slight bacteriostatic effect on agar cultures of staphylococci and *Sarcina*. Chewing garlic or onion for 1—10 min. was occasionally sufficient to sterilise the mouth.

F. S.

Antibacterial effects of quinones.—See A., 1944, III, 209.

Enrichment and purification of chromogenic spore-forming an aerobic bacteria. L. S. McClung (*J. Bact.*, 1943, 46, 507—512).—Heated and unheated dilutions of mud are inoculated into plain corn mash and after the appearance of pigmentation serial cultures are made in which the inocula are subjected to pasteurisation. Final purification is accomplished by plating in yeast-infusion starch agar.

F. S.

Characteristics of green-fluorescent pigment-producing bacteria. W. A. Selen and C. N. Stark (*J. Bact.*, 1943, 46, 491—500).—The cultural characters, biochemical reactions, and resistance to phenol, NaCl, and NaCN of 199 strains are described.

F. S.

Bile acid metabolism. IV. Separation and identification of ketocholanic acids formed during oxidation of cholic acid by *Alcaligenes*

fecalis. W. M. Hoehn, L. H. Schmidt, and H. B. Hughes (*J. Biol. Chem.*, 1944, 152, 59—66).—When *A. fecalis* is grown in media containing cholic acid, the first product is probably 3:12-dihydroxy-7-ketocholic acid and the second is 3-hydroxy-7:12-diketocholic acid. The OH groups of cholic acid are thus oxidised in the same order as they are by CrO_3 . E. C. W.

Destruction of nicotine by bacteria. H. Bucherer (*Zentr. Bakt.*, 1943, II, 105, 445—448).—Two nicotine-destroying bacteria were isolated from tobacco leaves. One is identical with *B. nicotiphagum* (A., 1943, III, 523), and the other is a new species, *Bact. nicotianum*. (1 photomicrograph.) F. S.

Effect of long ultra-violet and short visible radiation (3500 to 4900 Å.) on *Escherichia coli*. A. Hollaender (*J. Bact.*, 1943, 46, 531—541).—The effects of the two types of radiation on *Bact. coli* are compared with respect to the energy necessary to kill, shape of killing curve, temp. coeff., extent of retarded-growth phase, and survival after irradiation in physiological salt solution. F. S.

Fixation of carbon dioxide and production of succinic acid by a cell-free enzyme preparation of *Escherichia coli*.—See A., 1944, III, 216.

Induced changes in the morphology of *Bacterium lactis aerogenes*. Theory of the balance and adaptive variation of certain enzyme processes in bacteria. C. N. Hinshelwood and R. M. Lodge (*Proc. Roy. Soc.*, 1944, B, 132, 47—67).—A strain of this organism grew normally in a standard glucose-phosphate- $(\text{NH}_4)_2\text{SO}_4$ medium but formed long snake-like forms associated with a delay in division when grown in much lower concns. of glucose. With successive passages in the synthetic medium the power to give long forms was lost and was not easily revived by passage through bouillon. The tendency was enhanced by passage through a medium containing asparagine. It is suggested that two factors, one diffusible into the medium and the other retained by the cells, are responsible respectively for elongation and division. (6 photomicrographs.) F. S.

Amino-acid requirements of *Lactobacillus arabinosus* 17-5. D. M. Hegsted (*J. Biol. Chem.*, 1944, 152, 193—200).—Single omission of arginine, cystine, glutamic acid, isoleucine, leucine, methionine, phenylalanine, tryptophan, tyrosine, or valine from an adequate medium containing 19 amino-acids prevents the growth of *L. arabinosus*, although a mixture of these 10 amino-acids only is inadequate for growth. Further addition of aspartic acid allows growth but threonine and lysine are required in addition for good growth. Casein and edestin contain leucine 6.70—8.10, 5.14—5.62, phenylalanine 3.70, 4.02—4.36, and valine 4.87—5.20, 4.70—4.73%, respectively, as determined by microbiological assay. H. G. R.

Growth requirements of *Clostridium tetani*. II. Factors exhausted by growth of the organism. III. A "synthetic" medium. R. E. Feeney, J. H. Mueller, and P. A. Miller (*J. Bact.*, 1943, 46, 559—562, 563—571).—II. Growth of *C. tetani* on a casein hydrolysate medium reinforced with various growth accessories and certain inorg. ions eventually ceases because of depletion of the medium in respect to one or more nutritives. Under conditions of max. toxin production, the Fe is first to disappear, being presumably linked in org. combination in the cells. In the presence of more Fe other substances disappear in the following order: tryptophan, biotin, oleic acid, folic acid, histidine, and glutamic acid.

III. In addition to those previously reported (A., 1943, III, 281) uracil, pyridoxine, nicotinic acid, arginine, histidine, tyrosine, valine, isoleucine, leucine, and tryptophan are essential for growth. Threonine, phenylalanine, serine, lysine, aspartic acid, and methionine stimulate growth. Mg is essential for optimal growth. F. S.

Anaerobic infections of war wounds in middle east. J. D. MacLennan (*Lancet*, 1943, 245, 63—66, 94—99, 123—126).—20—30% of all war wounds in the Middle East campaigns from June, 1940, to October, 1942, contained sporing anaerobes (clostridia). The organisms usually disappeared rapidly but in about 5% there were varying degrees of cellulitis. Gas gangrene occurred in 164 cases (0.32% of all wounds, 1% of those contaminated by anaerobic organisms). Cultures in 146 of the wounds showed the following organisms in order of frequency: *Cl. welchii*, *Cl. oedematis*, *Cl. septicum*, *Cl. histolyticum*, *Cl. bifermentans*, and *Cl. fallax*. Anaerobic streptococcal infection occurred in 19 wounds. Combined serum-sulphonamide therapy was considered an effective adjuvant to debridement and wound excision. C. A. K.

Influence of metals on diphtheria infection. M. H. Petherick and E. Singer (*Austral. J. Exp. Biol.*, 1943, 21, 221—229).—Compounds of Fe (e.g., haemoglobin, FeSO_4), Cu, and Zn (but not those of Mn, Ni, or Co) injected into guinea-pigs together with living diphtheria bacilli or diphtheria toxin inhibit development of the skin reaction. In presence of redox substances (ascorbic acid, glutathione, adrenaline) they also inactivate the toxin *in vitro*. W. McC.

Laboratory diagnosis of diphtheria. H. A. Wright (*Edinb. Med. J.*, 1943, 50, 737—745).—Loeffler's serum culture method is liable to error and should be supplemented by plating on Hoyle's (tellurite) medium which is of special val. when bacilli are scanty, in eliminating

false positives in aural and nasal swabs, and in facilitating isolation of strains for further study. H. S.

Diphtheria alum-precipitated toxoid. G. Bousfield (*Brit. Med. J.*, 1943, II, 706—710).—Two injections of alum-pptd. toxoid containing a min. no. of Lf units were given at a monthly interval and their effect followed up with the Schick test. With these doses the primary stimulus should consist of not less than $\frac{1}{2}$ or more than $\frac{3}{4}$ of the total Lf units provided and the larger of two unequal doses should be administered first. Children 7—8 years old are less easily immunised than other age groups, possibly because of the increased body wt. and the smaller exposure to diphtheria infection in relation to older children. There is no difference in the results whether alum-pptd. toxoid is given in conc. or diluted form. It is suggested that two injections of 15 Lf units each at 14 or more days' interval might have great practical advantages. I. C.

Intradermal immunisation with diphtheria toxoid. F. O. Wishart (*Canad. Publ. Health J.*, 1943, 34, 509—512).—The intradermal administration of diphtheria toxoid according to the technique described does not constitute an efficient method of primary immunisation. Alum-pptd. toxoid is not suitable for intradermal administration. C. G. W.

Antitoxin response to diphtheria toxoid of low alum content. C. M. Horner, F. O. Wishart, and G. G. Waters (*Canad. J. Publ. Health*, 1943, 34, 564—567).—Diphtheria toxoid of low alum content (0.5% K alum) is capable of eliciting a good antitoxin response. The antitoxin titre is increased by lengthening the interval between doses of toxoid. The total amount of toxoid given is important, i.e., 2 c.c. gave a higher antitoxin titre than 1 c.c. Skin sensitivity may occur following the use of diphtheria toxoid with a low alum content. The interval between doses of toxoid may be important in the development of this sensitivity. C. G. W.

Pencillin: its use in media for isolation of *H. influenzae* from laryngeal cultures in obstructive laryngitis. L. Buxbaum and N. F. Fiegoli (*J. Bact.*, 1943, 46, 543—547). F. S.

Intradermal test for susceptibility to and immunisation against whooping cough using agglutinin from phase I *H. pertussis*. E. W. Florsdorf, H. M. Felton, A. Bondi, and A. C. McGuinness (*Amer. J. med. Sci.*, 1943, 206, 421—425).—The skin test utilising purified pertussis agglutinin as reagent classifies immune and susceptible individuals in accord with their history of incidence of infection and vaccination with *H. pertussis*. In individuals with an existing immunity to pertussis at the time of the test, a marked increase is produced in the agglutination titre. In those with no initial immunity, repeated doses produce a reversal of the test and an agglutination titre. C. J. C. B.

***Listeria monocytogenes* in infectious mononucleosis.** R. A. Webb (*Lancet*, 1943, 245, 5—10).—*Listeria monocytogenes* was isolated by blood culture from a typical case of glandular fever. Cultural and biological tests for the organism, lesions produced in experimental animals, and its relation to certain types of human meningitis, meningo-encephalitis, and to infectious mononucleosis are discussed. C. A. K.

Effect of heat on toxic and antigenic properties of meningococcus. C. P. Miller, R. M. Becker, D. Schad, and M. W. Robbins (*J. infect. Dis.*, 1943, 73, 248—256).—Heating at 50° for 16 hr. had no effect on toxicity or antigenicity, neither had heating at 55—65° for 1 hr. At 80° there was impaired ability to produce homologous agglutinins and mouse protective antibodies in 1 hr., and loss of ability to develop active immunity in mice against meningococcal infection in 8 hr. Agglutinability in heterologous immune sera began at 4 hr. and increased until 16 hr. The toxicity of meningococci withstood heating at 80° for 4 hr. and 100° for 30 min. After 8 hr. at 80° and 4 hr. at 100° it was reduced to about $\frac{1}{4}$. Additional heating at 100° for 16 hr. failed to destroy this remaining toxicity. F. S.

Requirement of biotin for growth of pneumococci. N. Bohonos and Y. Subbarow (*Arch. Biochem.*, 1943, 3, 267—259).—Biotin is an essential growth factor for 33 cultures (26 types) of pneumococci tested. J. N. A.

Phenomenon of "satellite zones" produced by *Staphylococcus aureus* on solid media.—See A., 1944, III, 209.

Antigenic composition of group A haemolytic streptococci. I. Effects of proteolytic enzymes on streptococcal cells. R. C. Lancefield (*J. Exp. Med.*, 1943, 78, 465—476).—Proteolytic enzymes destroy the type-sp. M antigen of group A haemolytic streptococci not only when the M substance is contained in cell-free extracts but also when it is a component of the living cell. The injection of enzyme-treated cultures into rabbits does not result in formation of M antibodies but produces T antibodies; thus, anti-T sera free from M antibodies can be prepared. These enzymes do not kill the bacteria. Virulence and the ability to form M substance are restored on subculture and animal inoculation. A. S.

Food-borne streptococcal poisoning and infection. Differentiation of staphylococcal enterotoxin from toxic substances produced in

minced meat tissue media by hæmolytic streptococci and other agents. G. E. Foley, S. M. Wheeler, and V. A. Getting (*Amer. J. Hyg.*, 1943, 38, 250—259).—Group A hæmolytic streptococci isolated from an epidemic in which gastroenteritis and scarlet fever were associated when grown on ground tissue media gave filtrates which were enterotoxigenic when injected intravenously into kittens. The enterotoxigenic substance was distinct from erythrogenic toxin. Filtrates from tissues treated with other bacteria, trypsin, papain, lactic acid, NaOH, and filtered aq. extracts of frozen and dried cultures of hæmolytic streptococci showed similar toxic activity except under anaerobic conditions or when autoclaved tissue media were used, whereas extracts of untreated meats were negative; heat-killed organisms were non-toxic. Proteins in the culture media were probably split into toxic amines by enzymes associated with bacterial metabolism. Active fractions were dialysable, pptd. by alcohol, and heat-stable, resisted a wide range of pH changes, and showed positive biuret, Millon, and Molisch tests. Kittens became resistant after repeated injections. Rats, rabbits, and guinea-pigs were not affected; white mice could be killed by small intraperitoneal doses. The toxic substance was distinct from staphylococcal enterotoxin which could be produced in media without tissue-protein, was not inhibited by anaerobic conditions, and when fed to kittens caused vomiting and diarrhoea. Feeding to kittens is recommended as the most reliable test for the presence of staphylococcal enterotoxin. B. C. H.

Streptococcal hæmolysis in various blood media. E. F. Traut and M. S. Johnson (*J. Lab. clin. Med.*, 1943, 28, 1740—1742).—The ability or inability of several strains of streptococci to hæmolyse depended on the origin of the blood used to enrich the culture medium. Hæmolytic ability or lack of it remained const. at least 4 months for a given type of blood used in culturing. Besides an abs. difference between colonies hæmolyzing one kind of blood and failing to hæmolyse another, there were quant. differences between amounts of hæmolysis produced in the 2 kinds of blood. In the group of bacteria tested, human blood was hæmolyzed as often as sheep's blood. The hæmolyzing or non-hæmolyzing character of a given strain remained const. for a given type of blood regardless of the method used to test hæmolysis. C. J. C. B.

Efficacy of phenol and tetanus antitoxin in treatment of experimental tetanus. W. D. Thompson and L. Friedman (*Surg. Gynec. Obstet.*, 1941, 72, 860—871).—Intrathecal administration of 0.25% phenol hastens the death of dogs injected intravenously with a lethal dose of tetanus toxin. 1% phenol given intravenously was lethal in doses of 0.3—0.35 g. per kg., the amount of renal and hepatic damage being proportional to the dose given. Such injections had no protective or detoxifying action when tetanus toxin was given simultaneously. The effects of intravenous toxin could be neutralized by sufficient antitoxin given within 6 hr.; when given later it was impossible to prevent some tetanus symptoms developing, suggesting an irreversible fixation of some of the injected toxin. Common preservatives used in antitoxin preps. are irritants of the central nervous system, and such preps. should not be given intrathecally. P. C. W.

Immunisation to typhoid and paratyphoid fevers. D. Longfellow and G. F. Luippold (*Amer. J. Hyg.*, 1943, 38, 139—151).—A review of recent work carried out by the Typhoid Research Unit of the Army Medical School including an account of Wakeman's work on the isolation of a sp. immunising polysaccharide from the typhoid bacillus. T.A.B. vaccine strains were chosen on the basis of their virulence and ability to produce active immunisation in mice. Initial vaccination of young adult males with T.A.B. vaccine produced significant amounts of protective antibodies against *Bact. typhosum*, *Bact. paratyphosum A*, *Bact. paratyphosum B*, *Bact. enteritidis*, *Bact. typhi murium*, and against coliform organisms containing salmonella "O" antigens I and II and VI and V respectively. No protective substances were found against *Bact. cholerae-suis*, *Bact. oranienberg*, or *Pr. morganii*. Mice inoculated with typhoid vaccine were protected against 10 m.l.d. of *Bact. paratyphosum B* and vice versa. No protection was shown to *Bact. paratyphosum A* by these two organisms nor did a paratyphoid A vaccine protect against typhoid and paratyphoid B bacilli. Immune substances produced in human beings by inoculation with typhoid vaccine are similar to those produced in rabbits by the same procedure and polyvalent protection against antigenically related types of salmonella was demonstrated. B. C. H.

Preparation of typhoid suspensions for the V agglutination test. J.-M. Desranleau (*Canad. Publ. Health J.*, 1943, 34, 502—508).—Highly agglutinable suspensions of *E. typhosa* V were prepared in 75% alcohol. These suspensions kept well for months in alcohol, but when, after centrifuging, the bacteria were resuspended in distilled water and in glycerol-saline solution, they slowly lost their agglutinability by V serum; in saline solution they not only lost their agglutinability by V serum, but also rapidly became agglutinable by O serum. A method is described for preparing, in 75% alcohol, a stock suspension of *E. typhosa* V from which suspensions in buffered glycerol saline may be prepared for routine work. C. G. W.

Virus reproduction. I. Amino-acids and the multiplication of bacteriophage. II. Influence of compounds of metabolic significance on multiplication of bacteriophage. J. Spizizen (*J. infect. Dis.*, 1943, 73, 212—221, 222—228).—A no. of amino-acids and related compounds supported both phage multiplication and the growth of the sensitive bacterium, *Bact. coli*, while others did neither. Glycine, glycine anhydride, and hippuric acid supported considerable phage multiplication but no bacterial growth in a concn. of 0.2%. The primary utilisation of glycine did not involve a primary deamination or decarboxylation and glycine anhydride did not split to glycine. Aminomethanesulphonic acid inhibited phage multiplication when supported by α -amino-acids and related compounds.

II. Bacterial cells were suspended in low concns. of glycine anhydride, so that they could not multiply, but could, when infected, support considerable phage multiplication. In these conditions phage multiplication was stimulated by certain phosphorylated compounds, including nucleic acid, glycerophosphoric acid, adenosine triphosphate, and coenzyme I, the 4-C dicarboxylic acids, α -ketoglutaric acid, and certain ions, Fe^{++} , Fe^{+++} , Mn^{++} , and Mg^{++} . CN^- , iodoacetate, AsO_3^{---} , 2:4-dinitrophenol, and *p*-aminophenol inhibited virus multiplication in very low concns. The sulphonamides inhibited multiplication and *p*-aminobenzoic acid relieved the inhibition. F. S.

Transmission of equine encephalomyelitis to western burrowing owl *Speotyto cunicularia hypugæa* (Bonaparte). J. T. Syverton and G. P. Berry (*Amer. J. Hyg.*, 1941, 33, B37—41).—Filtered extracts of brain tissue from guinea-pigs infected with western equine encephalomyelitis virus proved fatal for owls when inoculated intracerebrally and intracutaneously in 0.1-c.c. amounts. 5 successive passages were made in owls and of the 7 birds used for this purpose all died in 5 days. One owl inoculated intracerebrally with 0.05 c.c. of material from a guinea-pig infected with the eastern type virus died in 72 hr.; the virus was passed from the owls brain to guinea-pigs. B. C. H.

Encephalomyelitis following vaccination in Fife. G. M. Fyfe and J. B. Fleming (*Brit. Med. J.*, 1943, II, 671—674).—8 cases of vaccinal encephalomyelitis occurred among a group of 52,772 recently vaccinated persons and 1 case in a group of 20,197. The mortality rate was 44%. In six cases the symptoms were entirely of cerebral origin and in two of spinal origin. Prompt use of parental immune serum in large doses was beneficial. I. C.

Laboratory transmission of western equine encephalomyelitis virus by mosquitoes of genera *Culex* and *Culiseta*. W. McD. Hammon and W. C. Reeves (*J. Exp. Med.*, 1943, 78, 425—434).—Western equine encephalomyelitis virus has been transmitted by *Culex tarsalis* and *Culiseta inornata* and *incidens*. The virus survived for more than a few days in *Culex stigmatosoma* and *Psorophora ferox*, transmission possibly occurring by the former. *Culex tarsalis* infection occurred from feeding on inoculated guinea-pig, duck, and virus-blood suspensions; after 10—30 days' incubation at above 25° the mosquitoes infected chickens and a guinea-pig and virus was demonstrated in the blood of the former and in the brain of the latter. *Anopheles maculipennis freeborni* and *Culex pipiens* found naturally infected have not transmitted the virus under laboratory conditions. A. S.

Neutralising and complement-fixing antibody production and resistance following vaccination in experimental encephalitis infections. J. Casals (*J. Exp. Med.*, 1943, 78, 447—463).—Neutralising and complement-fixing antibodies, in mice subcutaneously vaccinated with different doses of virulent western equine encephalomyelitis virus or with formalised vaccine, paralleled resistance to some extent, but they also appeared in animals where resistance was undetectable, or persisted at a const. level in spite of different titres of resistance, or after resistance had become negligible. In mice vaccinated subcutaneously with different doses of virulent St. Louis encephalitis virus or with formalised vaccine, neutralising and complement-fixing antibodies showed little relation to resistance; neutralising antibodies appeared only after resistance was diminishing; complement-fixing antibodies developed equally well in groups with or without resistance. A. S.

Poliomyelitis. J. A. Toomey (*Amer. J. Dis. Child.*, 1943, 66, 635—651).—A review. C. J. C. B.

Poliomyelitis in cynomolgus monkey. I. Comparison of upper portion of alimentary tract with lower gastrointestinal portion as portal of entry with special reference to peripheral ganglia. II. Resistance to spread of infection in central nervous system following exposures of mucous membranes to virus, with comments on non-paralytic poliomyelitis. H. K. Faber, R. J. Silberberg, and L. Dong (*J. Exp. Med.*, 1943, 78, I, 499—518; II 519—526).—I. Clinical evidence of infection did not appear following administration of dried poliomyelitis virus in fat-covered capsules to 26 monkeys. Subsequent application of the virus to the tongue caused paralytic poliomyelitis in 1 out of 18 of these monkeys. Virus given by enema caused no clinical signs in 11 cases. 1 out of 7 monkeys, after oronasal spraying with virus, developed typical paralytic signs, indicating that the virus entered through the different nerves

of the oropharynx and, possibly, oesophagus. The 6 surviving monkeys were exposed to virus by inhalation; 1 developed paralysis through olfactory entry. The 5 surviving monkeys received virus by intracerebral inoculation; 1 developed paralysis; all had central nervous system lesions. The peripheral ganglia in 12 monkeys showed typical poliomyelitis lesions, mainly in the Gasserian and cervical sympathetic ganglia. The coeliac ganglion was involved in 7 cases; there was no evidence of spread of the infection to the spinal cord.

II. Repeated non-traumatic exposures to poliomyelitis virus of the mucous membranes of the upper respiratory tract and of various parts of the alimentary canal in 5 monkeys for 9–14 months produced limited resistance to intracerebral inoculation in 4 animals; 1 monkey developed paralysis, the others were free from symptoms (92% of 25 previously untreated controls developed paralysis). The 4 non-paralytic cases showed typical central nervous system lesions (in 2 extending into the spinal cord); lesions were found in peripheral ganglia corresponding to the mucous membranes exposed to the virus; lesions in the central nervous system indicating invasion prior to the intracerebral inoculation were not found.

A. S.

Efforts toward selective extraction of poliomyelitis virus. E. Herrarte and T. Francis (*J. infect. Dis.*, 1943, 73, 206–211).—Those procedures which pptd. proteins most completely were most effective in recovering the virus. Lipin solvents had no uniform influence but some of them induced the formation of insol. layers in which the virus could be demonstrated. When protein precipitants were added to a suspension of infected brains and spinal cords of mice, and the material then shaken with ether and centrifuged, much of the protein and nearly all the virus was attracted to a small solid layer which collected beneath the supernatant ether. The insol. layer was readily sol. in alkaline buffer, giving a clear non-particulate material.

F. S.

Vaccination against typhus fever. J. B. Penfold (*Brit. Med. J.*, 1944, I, 114).—23 people were vaccinated with a Cox vaccine against typhus fever, and revaccinated three months later. Before vaccination the Weil-Felix reaction of these individuals showed low normal agglutinin titres, which were increased after vaccination, and in the case of OX 19, after revaccination. Reactions to the vaccine were slight.

I. C.

Pathogenic and antigenic properties of dermal vaccinia virus propagated in the chorio-allantois of chick embryos. G. J. Buddingh (*Amer. J. Hyg.*, 1943, 88, 310–322).—A dermal strain of vaccinia propagated for 9 years through 240 passages in the chorio-allantois of the chick embryo, without intervening mammalian passage, induced a reaction which was milder, more superficial, and of shorter duration in the rabbit, and a milder lesion in man, than the original calf virus from which the strain was derived. No differences in the evolution of the lesion were noted following human infection with either type of virus. Immune serum from rabbits or human subjects 1 month after primary infection with either virus showed no difference in neutralising capacity nor did the estimation of variola virus neutralising capacity by the pock counting method indicate any difference in antibody level of human serum. Reactions to revaccination and the determination of the vaccinia and variola virus neutralising capacity of serum 14 months after primary vaccination showed no difference in immunity attained by 6 persons immunised with the passaged virus and by 4 immunised with calf virus.

B. C. H.

Fate of the virus of lymphogranuloma venereum in infected mice receiving sulphonamide therapy. E. C. Rodaniche (*J. infect. Dis.*, 1943, 73, 173–179).—There was active multiplication of the virus in the brains of mice treated with 0.5–2% of sulphadiazine or sulphathiazole in the diet. Virus was not usually recovered from the spleens of such animals, although it was readily isolated from the spleens of untreated mice. *p*-Aminobenzoic acid had some antagonistic action against sulphathiazole. The virus did not become resistant to sulphonamide therapy within 7 mouse passages.

F. S.

Filterable virus causing enteritis and pneumonia in calves. J. A. Baker (*J. Exp. Med.*, 1943, 78, 435–446).—The disease is characterised by fever, diarrhoea, and pneumonia, followed soon by recovery; there is a catarrhal enteritis and a bronchopneumonia usually confined to the anterior lobes. Serial inoculation of lung extracts produced pneumonia in white mice. Intranasal or intratracheal inoculation of lung suspensions of pneumonic mice into calves caused a disease like the natural infection; in 2 cases pen contact of normal with inoculated calves resulted in the typical disease. The causative agent was found in the lungs and intestines in early stages of the disease, but later it was generally distributed. Calves, recovered from the induced or natural disease, are resistant to subsequent infection and their blood serum neutralised the causative agent. Material passed through Berkefeld N filters produced the characteristic disease.

A. S.

(A) Evidence of virus character of cytoplasmic inclusion bodies reported in throat and other epithelial tissues. (B) Increased incidence of cytoplasmic virus bodies in human throats in the New York City

area. J. Broadhurst, E. Maclean, and I. Taylor (*J. infect. Dis.*, 1943, 73, 191–194, 195–197).

F. S.

Specific biological activity of tobacco-mosaic virus as influenced by age of lesion and nitrogen supply. E. L. Spencer (*Plant Physiol.*, 1942, 17, 210–222).—Virus in the inoculated leaf continues to increase in amount and in sp. biological activity for 20 days, the increases being inhibited in N-starved plants (cf. A., 1942, III, 497). Comparison of the virus isolated from the inoculated leaf and that from the more recently invaded top of the plant confirmed that virus in young lesions shows only a fraction of its potential biological activity. The relative rates of sedimentation in the analytical ultracentrifuge indicated that some of the particles in the preps. from young lesions may be considerably larger than those from older lesions.

R. H. H.

Reproduction of tobacco-mosaic virus from its acyl derivatives. P. Agatov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, 38, 139–140).—Virus recovered from tobacco plants inoculated with acetyl and benzoyl derivatives of the virus contained no acetyl or benzoyl groups but was identical with the original virus, although the tobacco plant contains no enzymic system capable of saponifying the acyl derivatives of the virus protein.

F. S.

Relation between secondary structure of an aluminium hydroxide and immunising power of a vaccine adsorbed on it. K. O. Hobohm and G. Pyl (*Kolloid-Z.*, 1943, 102, 66–69).—The effectiveness of an inoculation material adsorbed on $Al(OH)_3$ suffers a diminution on freezing. The hydroxide is prepared by pptn., drying, and heating to 120°, after which treatment it has the approx. formula $Al_2O_3 \cdot 2H_2O$. After freezing it has the characteristics of $Al_2O_3 \cdot H_2O$. The loss in effectiveness of the vaccine is attributed to the loss of water from the gel and the sealing up of the vaccine in its pores due to the change in structure on freezing. When the gel is very rapidly frozen, giving a finer structure, about 20% of the val. of the vaccine is preserved. The activity of the prep. can be restored by grinding after freezing. If glycerol is added before freezing the activity is maintained in the frozen material.

C. E. H.

Significance of erythrocytic pseudoagglutination.—See A., 1944, III, 163.

Production of *Rh* antiserum by inoculation of guinea-pigs with human erythrocytes.—See A., 1944, III, 163.

Generalised vaccinal reactions in allergic subjects. L. S. P. Davidson and L. J. Davis (*Lancet*, 1943, 245, 103–104).—4 cases are reported.

C. A. K.

XXVI.—PLANT PHYSIOLOGY.

Permutoids.—See A., 1944, I, 82.

Effect of day length on dormancy in tree seedlings.—See B., 1944, III, 39.

Respiration of whole and dehulled sunflower seed and of flax seed. R. K. Larmour, H. R. Sallans, and B. M. Craig (*Canad. J. Res.*, 1944, 22, F, 9–18).—Rates of CO_2 production at various moisture contents are shown graphically. The max. moisture content for safe storage of whole sunflower seeds is 9.5, of the dehulled seeds 6, and of flax seeds 10.5–12%.

R. H. H.

Effect of temperature on respiration rate and respiratory quotient of some vegetables. H. Platenius (*Plant Physiol.*, 1942, 17, 179–197).—In general, the rate of respiration gradually declined with time at all temp. Temp. coeffs. (expressed as Q_{10} vals.) for the respiration rates of ten vegetables in the ranges 0.5–10.0° and 10.0–24.0° are recorded. The R.Q. was usually highest soon after harvest, and was smaller at lower temp. levels. Low-temp. injury had no marked effect on the R.Q.

R. H. H.

Respiration in healthy and mosaic-infected tobacco plants. V. F. C. Glasstone (*Plant Physiol.*, 1942, 17, 267–277).—The increase in the respiration rate of diseased plants was about 50% more than that of healthy plants.

R. H. H.

Respiration of mosaic-infected tobacco plants. F. L. Wynd (*Plant Physiol.*, 1943, 18, 90–98).—The rate of O_2 consumption by leaves is greatly increased 4 days after inoculation of a lower leaf, i.e., about 10 days before the general appearance of the mosaic agent in infectious concn. By the time the infectious concns. appear in the upper leaves the rate of O_2 consumption is less than that by normal leaves. The observed metabolic changes are probably cellular in nature, and not dependent on metabolic activity of the virus material.

R. H. H.

Respiration and enzymic activity of wheat kernel during ripening. A. I. Smirnov [with Z. S. Bronovitzkaja, K. V. Pschenova, S. D. Tschigirev, and E. N. Uschakova] (*Biochimia*, 1943, 8, 149–157).—As the wheat kernel ripens there is a decrease in respiration and sugar content, accompanied by a decrease in amylase activity and accumulation of starch. Activity of dehydrogenases decreases, whilst

phenoloxidase and tyrosinase activity bears no relation to degree of ripening. Greater enzymic activity, as well as water content, is responsible for reduced stability during storage of the unripe kernel, even after normal drying. P. G. M.

Ascent of sap in plants. I. O. Renner's development of the cohesion theory. II. Extrafascicular components of the stream of sap. S. Strugger (*Naturwiss.*, 1943, 31, 181—194).—A review. W. McC.

"Vegetable dynamics" and plant tissue cultures. P. R. White (*Plant Physiol.*, 1942, 17, 153—164).—A lecture. Problems connected with the workings of biological entities, cells, tissues, organs, etc. which have been solved, or await solution, by the development of suitable tissue-culture technique are discussed. R. H. H.

Oxidation-reduction potentials of tissue fluid of cabbage. E. Airola and J. W. Crist (*Plant Physiol.*, 1943, 18, 107—113).—The relation between pH and E_h of the tissue fluid was definite and regular. The E_h was low in young leaves, rose to a max. in fully developed leaves, and then declined. Two to four exposures of the plant to low temp. caused a sharp drop in E_h ; further exposures led to a slight rise, followed by the maintenance of a level below that of unexposed plants. R. H. H.

Physiological ontogeny in tobacco plant. Effect of varying water supply on drifts in dry weight and leaf area and on components of leaves. A. H. K. Petrie, J. I. Arthur, and J. G. Wood (*Austral. J. Exp. Biol.*, 1943, 21, 191—200).—Pot experiments show that temporary or permanent drought decreases the net assimilation rate (protein basis) and increases the percentage uptake of N from the soil by tobacco plants. When drought is permanent, max. protein content in the leaves is attained later than in fully-watered tobacco plants, protein production possibly being limited by carbohydrate content. Senescence and accompanying loss of protein from the leaf are delayed by drought so that growth rate eventually becomes greater than in fully-watered tobacco in later stages of development. The net assimilation rate increases approx. to that found in fully-watered tobacco plants when subjection to drought is followed by conditions of full water supply but the growth rate and the protein content of the leaves then become greater than those of fully-watered plants. W. McC.

Response of *Cyperus rotundus*, L., to five moisture levels. C. H. Davis (*Plant Physiol.*, 1942, 17, 311—316).—Tuber development was significantly decreased by decreasing soil moisture from a point 2% below the moisture equiv. Top growth was increased 250%, and tuber growth 150%, by raising the min. soil-moisture from 9 to 18%. The tuber : top ratio did not change significantly between 9 and 15% min. moisture. R. H. H.

Non-osmotic force in water relations of potato tubers during storage. C. J. Lyon (*Plant Physiol.*, 1942, 17, 250—266).—The calc. net osmotic pressures were usually significantly above the observed vals. The discrepancy, which appears in early storage and varies with the season and the storage temp., is an approx. measure of the non-osmotic force. R. H. H.

Hygroscopic equilibrium of sunflower seed, flax seed, and soya beans. R. K. Larmour, H. R. Sallans, and B. M. Craig (*Canad. J. Res.*, 1944, 22, F, 1—8).—Equilibrium moisture vals. for sunflower seed, flax seed, and soya beans at R.H. of 31—93% are recorded. Hygroscopicity curves are presented and discussed. R. H. H.

Flax. II. Effect of artificial drought on growth and oil production in linseed. N. S. Tiver and R. F. Williams (*Austral. J. Exp. Biol.*, 1943, 21, 201—209; cf. A., 1943, III, 216).—Pot experiments with Punjab linseed (*Linum usitatissimum*) show that artificial drought, beginning after the flowering stage, decreases net assimilation rate (protein-N basis) and hence also growth of the whole plant. The oil content of the seed is slightly and the yield of oil at maturity greatly decreased. The competitive demand for nutrients by the various parts of the plant explains the differences between the reactions of linseed and flax to drought. On the assumption that temp. is the limiting factor of the environment, the net assimilation rate serves as an inverse index of the N status of these plants. Before flowering, the N status of flax is high and that of linseed very high. W. McC.

Foliar hydration of cotton plant. V. Further experiment with potassium. E. Phillis and T. G. Mason (*Ann. Bot.*, 1943, 7, 391—397; cf. A., 1943, III, 697).—Dry wt. of the whole plant, hydration in the leaf and in the bark, and sp. conductivity of the sap of leaf and bark following varying K supply are recorded. Increased K supply, so long as it led to little or no increase in dry wt., caused increased hydration, which was associated with increased sap concn. Changes in K supply had a similar effect on the degree of hydration in the bark and in the lamina. R. H. H.

Partition of mineral elements in cotton plant. IV. Nitrogen, phosphorus and labile carbohydrate. T. G. Mason and E. Phillis (*Ann. Bot.*, 1943, 7, 399—408; cf. A., 1939, III, 1016; 1942, III, 948).—With increasing N supply, the crystalloid-N concn. rose continuously, whilst the protein-N concn. rose to a max. and then

declined. With increasing P supply, the concns. of both sap-sol. and -insol. P rose continuously. The relation between starch and sugar is controlled by factors quite unlike those prevailing for N and P. R. H. H.

Use of ion-exchange materials in studies on maize nutrition. C. D. Converse, N. Gammon, and J. D. Sayre (*Plant Physiol.*, 1943, 18, 114—121).—A technique permitting the addition of each major element separately is outlined. The ion-adsorbing materials used included bentonite (exchange capacity, 80 mg.-equivs. per 100 g.); Miami subsoil clay colloid (65 mg.-equivs.); Decalco, an artificial Na-zeolite (230 mg.-equivs.); Zeo-Karb-H, a granular base-free H⁺-exchange material made from coal (200 mg.-equivs.); and De-Acidite, an aniline-anion-fixing material (120 mg.-equivs.). Typical results obtained by the method are given. R. H. H.

Effect of calcium and phosphorus on manganese in forage crops. W. A. Albrecht and N. C. Smith (*Bull. Torrey Bot. Club*, 1941, 68, 372—380).—Pot cultures of 4 forage plants in a well-weathered prairie soil (Putnam silt loam) of pH 5.5, low in org. matter and P, and on which legumes give poor yields, showed that when CaCO₃ was mixed with the whole of the soil in the pots Mn concn. in, and total absorption by, the plants was depressed. When CaCO₃ was put on the surface of the soil, Mn absorption was increased. Addition of Ca phosphate increased growth and Mn absorption so that Mn concn. was little affected. CaCO₃ and phosphate together increased Mn absorption. L. G. G. W.

Intake and distribution of magnesium and its rôle in the higher green plants.—See B., 1944, III, 40.

Potassium-boron and -calcium relationships in plant nutrition. E. Reeve and J. W. Shive (*Soil Sci.*, 1944, 57, 1—14).—Symptoms of B toxicity in sand-cultured tomato plants are accentuated by increasing K and diminished by increasing Ca concns. in the nutrient. At a given level of B supply, and especially at high levels, the B intake of the plant increases with [K⁺] of the nutrient. With high [B] and increasing [Ca⁺⁺] in the nutrient the B intake diminishes; with low and moderate [B] and increasing [Ca] the B intake increases. Ca and K have similar capacities of intensifying B-deficiency symptoms in the plant. With const. [Ca⁺⁺] and [B] in the nutrient increase in [K⁺] is associated with diminishing Ca/B ratio in the plant. The level of Ca supply has little or no influence on the K/B ratio in plant tissue. The response of the plant to B is determined by metabolic relationships between Ca and B; K influences this response through its effect on Ca intake. A. G. P.

Calcium-boron balance in plants as related to boron needs. H. E. Jones and G. D. Scarseth (*Soil Sci.*, 1944, 57, 15—24).—Each plant species has a sp. requirement of Ca and B. The intake of Ca and B is conditioned by the amounts of these nutrients available in the soil. Optimum plant growth is associated with a particular ratio of Ca : B in the plant tissue (tobacco 1200 : 1, soya bean 500 : 1, sugar beet 100 : 1). Restricted intake of Ca, e.g., in acid soils, lowers the B tolerance of the plants. On soils of high Ca content the B requirement of plants is correspondingly high. A. G. P.

Chemical and biological studies of aqueous solutions of boric acid and of calcium, sodium, and potassium metaborates. W. E. Colwell and R. W. Cummings (*Soil Sci.*, 1944, 57, 37—49).—Measurements of sp. conductance of aq. Na, K, and Ca metaborates demonstrate a fundamental difference in the Ca salt, which appears unstable, the pH of the solution moving gradually towards 7.0. The B in all three salts migrates during electrodialysis at similar though not identical rates as part of an anion. The solubility of CaB₂O₄ varies with the amount of excess solid in contact with the solution and with the period of contact. The amount of B absorbed by sunflower plants from aq. media containing H₃BO₃ or the metaborates was proportional to the [B] of the substrate, irrespective of the source of B, and to the time during which absorption occurred. In sand cultures with media containing 0.25 p.p.m. of B, B-deficiency symptoms appeared when the plants were 25 days old regardless of the B source. Similarly, with media containing 2.05 p.p.m. of B toxicity symptoms appeared after 20 days irrespective of the form in which B was supplied. A. G. P.

Histologic-pathologic effects of boron deficiency [in plants]. J. C. Walker (*Soil Sci.*, 1944, 57, 51—54).—Deficiency of B in plants induces the following sequence of pathological effects : interruption of cell differentiation and cell wall formation, necrosis, death of plants. In the vascular cambium deficiency of conducting elements results (e.g., sugar beet). In storage tissue, e.g., cabbage pith, necrosis is accompanied by hyperplasia and hypertrophy and by abnormal differentiation into thick-walled cells. A. G. P.

Boron nutrition of the grape. L. E. Scott (*Soil Sci.*, 1944, 57, 55—65).—Symptoms of B deficiency appeared in early-developing leaves, notably after the appearance of blossom clusters, but seldom in late-season growth. The B content of leaves was min. early in the season. In deficient vines the set of fruit was small and was frequently diminished appreciably in vines the leaves of which showed little sign of deficiency. For some varieties B deficiency

was associated with the formation of parthenocarpic fruit. Application of borax increased the fruit set of self-sterile varieties and the B content of leaves. A. G. P.

Nutrition of *Brassica* and potatoes. F. B. Chandler (*Soil Sci.*, 1944, 57, 67—73).—B-deficiency symptoms were more prevalent in broccoli grown in high- than in those in low-Ca nutrients. The level of supply of N, K, and Mg had no apparent influence. In potatoes low B supply was associated with stem-end browning and with a more severe deficiency symptom described. A. G. P.

Iron : manganese ratio in relation to respiratory carbon dioxide and deficiency-toxicity symptoms in soya beans. I. I. Somers, S. G. Gilbert, and J. W. Shive (*Plant Physiol.*, 1942, 17, 317—320).—An Fe : Mn ratio exceeding 2.5 leads to necrosis, and a ratio less than 1.5 to chlorosis. In both cases the yield of respiratory CO_2 is low. R. H. H.

Necessity of zinc for *Pinus radiata*. M. E. Smith and N. S. Bayliss (*Plant Physiol.*, 1942, 17, 303—310).—Symptoms of Zn deficiency in the seedlings are: slow growth rate, inwardly folded apical needles (later exhibiting yellow mottling, followed by bronzing), and short, stiff, dark green secondary needles in unopened fascicles. Conical swelling of the root tips may occur. R. H. H.

Essentiality of silicon for growth of beetroot. G. J. Raleigh (*Plant Physiol.*, 1939, 14, 823—828).—Beetroot seedlings grown in Si-deficient nutrient media showed slow growth, root decay, and a notably high mortality due to "damping-off." $\text{NH}_4\text{H}_2\text{PO}_4$ used in preparing nutrient solutions is a likely source of Si. A. G. P.

Molybdenum as an essential element for higher plants. D. I. Arnon and P. R. Stout (*Plant Physiol.*, 1939, 14, 599—602).—Mo-deficient tomato plants recovered and resumed normal growth after spraying with aq. molybdic acid (0.5 p.p.m. of Mo). Injurious effects of such sprays appeared only when the concn. reached 10 p.p.m. of Mo (= 2 mg. of Mo per plant). A. G. P.

Chemical composition of soya beans during maturation. A. C. Wolfe, J. B. Park, and R. C. Burrell (*Plant Physiol.*, 1942, 17, 289—295).—The fat and protein of the seed are probably produced mainly from substances brought into the seed from other parts of the plant at the time of synthesis. Modifications of analytical methods suitable for this type of plant material are described. R. H. H.

Process of oil formation and accumulation in macadamia. W. W. Jones and L. Shaw (*Plant Physiol.*, 1943, 18, 1—7).—Starting from carbohydrate (probably hexose sugar which moves into the fruit from outside sources), short-chain saturated fatty acids are formed and accumulate. These are, later, converted into long-chain unsaturated fatty acids. R. H. H.

Relation of temperature to the ascorbic acid content of cow pea plants. M. E. Reid (*Bull. Torrey Bot. Club*, 1941, 68, 519—530).—Cow pea seedlings grown in the dark show at first an increase and then a decrease in ascorbic acid. The rate of increase and later the rate of disappearance of ascorbic acid, and the respiration and growth rates, are all successively higher at 22°, 26°, and 29°. In an 18-hr. period in the dark, losses of ascorbic acid in light-grown plants occur only if conditions are favourable for growth. The lower ascorbic acid content of plants grown at high temp. is probably due to an increased rate of metabolism of the ascorbic acid. L. G. G. W.

Metabolism of ascorbic acid in cow pea plants. M. E. Reid (*Bull. Torrey Bot. Club*, 1941, 68, 359—371).—The ascorbic acid content of cow pea seedlings may increase in the dark so long as reserves of food remain in the cotyledon. After this there is a loss of ascorbic acid which is accompanied by growth. Ascorbic acid is utilised in the dark but in the light any utilisation is masked by ascorbic acid synthesis. The synthesis of ascorbic acid that occurs in the early stages of growth may be the reconstitution of a precursor stored in the seed. L. G. G. W.

Interconversion of sucrose and starch in plant cells. D. I. Lisitzin (*Biochimia*, 1943, 8, 177—181).—Conversion of sucrose into dextrans and starch in minced sorghum stems occurs via hexoses and vice versa. P. G. M.

Tropical fruits. XV. Hemicellulose metabolism of banana fruit during storage and ripening. H. R. Barnell (*Ann. Bot.*, 1943, 7, 297—323; cf. A., 1943, III, 535).—The pulp of the green banana contains (fresh wt. basis) 8—10% of hemicellulose, which rapidly declines to 1—2% during ripening at 11.7° or at 20°, whilst the cellulose content is 1—3%, changing little during storage at 11.7° and decreasing slightly during ripening at 20°. The amount of hemicellulose disappearing is not correlated with increase in sugar formation; suggestions to account for this are advanced. R. H. H.

Early and virescent marigolds. T. M. Little, J. H. Kantor, and B. A. Robinson, jun. (*J. Heredity*, 1940, 31, 73—78).—In *Tagetes erecta* "virescent" is a character in which chlorophyll development in stem and leaves is delayed. The character finds expression only in cool weather and long days and is partly lethal. "Early"

character causes early flowering under long-day conditions. With short days, "early" and "late" plants bloom at the same time. L. G. G. W.

Plastid development in various types of chlorophyll mutations. A. Gustafsson (*Hereditas*, 1942, 28, 483—492).—All the chlorophyll mutations of barley studied possessed plastids although in some cases (e.g., albina mutation) they were very minute. L. G. G. W.

Chlorophyll content and productivity of some lakes in North Eastern Wisconsin. W. M. Manning and R. E. Juday (*Trans. Wisconsin Acad. Sci.*, 1941, 33, 303—385).—The total chlorophyll content of lake water is not a reliable measure of photosynthetic capacity. At optimum light intensity photosynthesis results in the production of 7 mg. of O_2 per mg. of chlorophyll per hr. corresponding with the reduction of 1 mol. of CO_2 per mol. of chlorophyll each 18 sec. L. G. G. W.

Chlorophyll deficiency in safflower (*Carthamus tinctorius*, L.). R. B. Deshpande (*Current Sci.*, 1943, 12, 273—274).—In the progeny of a strain of safflower approx. 20% showed a chlorophyll deficiency, which appears to be inherited on a monofactorial basis. The condition is recessive and appears to have arisen by a gene mutation. P. G. M.

Structure of chloroplast and location of chlorophyll. E. A. Roberts (*Bull. Torrey Bot. Club*, 1940, 67, 535—541).—Photomicrographs of young sporophytes and gametophytes of ferns show that chloroplasts are made up of units (plastidules) themselves composed of globular plastid granules. The chlorophyll is present in the colloidal substance of each plastic granule. Chloroplasts are similar in non-starch-forming plants (*Gladiolus* sp. and *Dahlia variabilis*) and starch-forming plants. L. G. G. W.

Photosynthesis in the leaves of sugar cane. E. G. B. Gooding (*Trop. Agric., Trinidad*, 1942, 19, 45—47).—Sugar cane showed a rise in apparent assimilation to a max. of 10—12 mg. of CO_2 per hr. per sq. dm. of leaf surface in the morning, then a sharp drop reaching a min. just after noon, and a second but lower max. followed by a decline in late afternoon. A. A. M.

Apparent photosynthesis and transpiration of pecan leaves treated with Bordeaux mixture and lead arsenate. A. J. Loustalot (*J. Agric. Res.*, 1944, 68, 11—19).—Neither Bordeaux mixture nor Pb arsenate had any appreciable effect on apparent photosynthesis or transpiration of the mature leaves. R. H. H.

Cytological effect of different seed treatments on X-rayed barley. O. E. V. Gelin (*Hereditas*, 1941, 27, 209—219).—The reaction of chromosomes to X-ray dosage (10,000 r.) is influenced by the condition of the treated seeds. Seeds with 10% of water show 12.66% of disturbed divisions, with 15% of water, 27.99%, whilst seeds soaked for 23 hr. in water or 0.01% aq. heteroauxin show 53.8 and 50.99% of disturbances respectively. L. G. G. W.

Germination and sprouting ability of oats and wheat following different X-ray dosages. K. Fröier (*Hereditas*, 1941, 27, 360—370).—An X-ray dosage of 45,000—50,000 r. is necessary to reduce the germination of Victory oats (water content about 13%) by 5—20%. L. G. G. W.

Failure of root tips of tomato seedlings germinated from X-rayed seeds to grow *in vitro*. H. Kersten and G. F. Smith (*Plant Physiol.*, 1942, 17, 321—323).—The inability to grow *in vitro* is probably associated with factors necessary for continuous meristem activity in the root tip, which were present in the seed at the time of irradiation. R. H. H.

Production of polyploids in *Gossypium*. J. O. Beasley (*J. Heredity*, 1940, 31, 39—47).—*Gossypium* polyploids may be produced by immersing apical meristems in 0.2% aq. colchicine for 24 hr. Polyploids produced from sterile hybrids are generally fertile and the fibres produced by polyploids are usually wider and longer than those produced by the types from which the polyploids have been derived. L. G. G. W.

Colchicine-induced tetraploids in dioecious and monoecious species of the *Amaranthaceae*. M. J. Murray (*J. Heredity*, 1940, 31, 477—485).—In a variety of species of this family colchicine-induced tetraploids have larger cotyledons, leaves, stomata, pollen grains, flowers, stamens, ovules, and seeds than diploids. The tetraploids of two monoecious species show no change in sex. L. G. G. W.

Effect of colchicine on a hepatic. G. B. Wolcott (*J. Heredity*, 1941, 32, 67—70).—Colchicine inhibits spindle formation but not chromosome division in the liverwort *Pallavicinia*, resulting in a doubled chromosome no. L. G. G. W.

Intra-nuclear polyploidy in bean induced by naphthylacetic acid. H. Derman (*J. Heredity*, 1941, 32, 133—138).—Cytological preps. of a tumour-like growth produced on bean by the application of 0.25% naphthylacetic acid in lanoline showed the initiation of numerous root primordia and the presence of polyploid cells. L. G. G. W.

Colchicine-induced tetraploid in *Cosmos*. E. H. Newcomer (*J. Heredity*, 1941, 32, 161—164).—A colchicine-induced tetraploid in

Cosmos had larger flowers, pollen, petals, epidermal cells, stomata, plastids, and seeds than the diploid from which it was derived, but the plants were not taller than the diploids. L. G. G. W.

Polyploid cassava. E. A. Graner (*J. Heredity*, 1941, 32, 281—288).—In colchicine-induced polyploid cassava (*Manihot utilissima*) obtained by treatment of the stem apex with colchicine, new tetraploid shoots were produced whereas the root system remained diploid. In tetraploid shoots stomata were larger, the leaves had longer lobes, and the parts of the flowers were larger than in diploids. An octoploid plant in appearance resembled the tetraploid but its development was much slower. L. G. G. W.

Polyploids in the genus *Cucumis*. O. Shifriss (*J. Heredity*, 1942, 33, 144—152).—Colchicine-induced tetraploids of the cucumber, *C. sativus*, show an accentuated leaf margin serration and are larger than diploids. Tetraploidy causes a reduction in stomatal frequency but the stomatal index is not changed and no change in the size or abundance of the chloroplasts occurs. L. G. G. W.

Colchicine stimulation of seed germination in *Petunia axillaris*. L. Bond (*J. Heredity*, 1942, 33, 200—201).—Germination of *P. axillaris* seed is accelerated by colchicine treatment, the optimum colchicine concn. being 0.04%, but the growth of the resulting seedlings is retarded. L. G. G. W.

Effect of acenaphthene and colchicine on mitosis of *Allium* and *Colchicum*. A. Levan (*Hereditas*, 1940, 26, 262—276).—Acenaphthene is like colchicine in its effect on mitosis in *Allium* but the effect is slower (due probably to its lower solubility). Whereas *Colchicum* is immune to the effects of colchicine it is affected by acenaphthene. L. G. G. W.

Effects of sulphanilamide and colchicine on mitosis of the generative cell in the pollen tube of *Tradescantia occidentalis* (Britton), Smyth. O. J. Eigsti (*Genetics*, 1942, 27, 141—142).—Both substances at concns. of 10—1000 p.p.m. induce mitotic abnormalities whilst higher concns. of each inhibit pollen tube formation. L. G. G. W.

New material and cross combinations in *Galleopsis* after colchicine-induced chromosome doubling. A. Muntzing (*Hereditas*, 1941, 27, 193—201). L. G. G. W.

Colchicine-induced tetraploidy in *Sequoia gigantea*. H. Jensen and A. Levan (*Hereditas*, 1941, 27, 220—224).—Seeds of *S. gigantea*, germinated on filter-paper moistened with 0.2% aq. colchicine, showed the typical colchicine effects, e.g., swollen tissues and retarded elongation. These plants were polyploids and later gave plants with branches coarser and more erect and needles thicker and broader than normal. L. G. G. W.

Macroscopic colchicine effect—a hormonal action? A. Levan (*Hereditas*, 1942, 28, 244).—Dormant root primordia of *Allium fistulosum* previously subjected to X-rays germinated normally in water but developed tumours in aq. colchicine. Early root growth was due entirely to cell enlargement and prominent tumours formed before any mitoses occurred. L. G. G. W.

Plant breeding by induction of polyploidy and some results on clover. A. Levan (*Hereditas*, 1942, 28, 245—246).—By colchicine treatment, chromosome doubling has been induced in *Trifolium pratense*, *T. hybridum*, and *T. repens* and trials with the first two species indicated that the tetraploids gave a much greater yield of green material with a rather higher water content than the diploids. The crude protein content of the leaves of the diploids and tetraploids was similar. L. G. G. W.

Response of some flax strains to tetraploidy. A. Levan (*Hereditas*, 1942, 28, 246—248).—Colchicine-induced tetraploids of 6 strains of flax showed in general fewer and shorter side branches, fewer seed capsules and fewer seeds per capsule, reduced production of dry matter, and longer petals than the corresponding diploids. L. G. G. W.

Physiological differences within a natural polyploid series. A. Love (*Hereditas*, 1942, 28, 504—506).—In *Rumex*, subgenus *Acetosella* comprising four dioecious species, *R. anguicarpus*, *R. tenuifolius*, *R. acetosella*, and *R. graminifolius*, as the chromosome no. increases the pollen grain size increases. Osmotic pressure is sometimes highest in the polyploids but in experimentally produced polyploids it is generally lower than in diploids. The diploid species possessed the smallest amount of leaf pigment and the highest amount of oxalic acid in the leaves and the sap pH was lowest in the diploid and highest in the hexaploid type, whilst ascorbic acid content was inversely related to chromosome no. The diploid species may be short-day and the tetraploid and hexaploid species long-day plants. L. G. G. W.

Mechanism of *c*-mitotic action. A. Levan and G. Östergren (*Hereditas*, 1943, 29, 381—443).—Colchicine has a powerful *c*-mitotic action but the *a*-derivatives of naphthalene show a similar action and their activity is negatively correlated with their water-solubility. β -Derivatives of naphthalene are also active but alcohol inhibits the activity of colchicine. *Pisum* is more sensitive than *Allium* to colchicine but less sensitive to acenaphthene and naphthalene derivatives. L. G. G. W.

Connexion between *c*-mitotic activity and water-solubility in some monocyclic compounds. G. Östergren and A. Levan (*Hereditas*, 1943, 29, 496—498).—With halogen-substituted benzene derivatives, with a cyclohexane series, and with a thiophen series, *c*-mitotic activity is negatively correlated with water-solubility, suggesting that the *c*-mitotic effect is due to the physical rather than to the chemical properties of the compounds investigated. L. G. G. W.

Chemistry of cellular respiration and growth processes in oat coleoptiles. C. S. Koschojantz (*Compt. rend. Acad. Sci. U.R.S.S.*, 1942, 36, 219—221).—NaF applied in gelatin blocks to the decapitated oat coleoptile restricts growth, probably by preventing the normal production of auxin. A. G. P.

Growth, auxin, and tropisms in decapitated *Avena* coleoptiles. F. W. Went (*Plant Physiol.*, 1942, 17, 236—249).—Following decapitation of the coleoptiles, both the auxin content of the tissues and the growth rate fell off during the first 2 hr. and then increased. Growth rate is correlated with the amount of extractable auxin, but not with the amount of diffusible auxin (i.e., not with the rate of auxin production). The amount of diffusible auxin is correlated with geo- and photo-tropic sensitivity. R. H. H.

Effects of certain growth-regulating substances on growth correlation in lettuce seedlings. R. B. Stephenson (*Plant Physiol.*, 1943, 18, 37—50).—The effects of adding growth substances (thiamin, thiourea, nicotinic acid, naphthylacetamide, naphthyl- and indolyl-acetic acids) in concns. of 0.01—10 mg. per l. to cultures of intact seedlings, excised roots, excised shoots, and excised roots together with excised shoots in the same flask are recorded and discussed. R. H. H.

Effect of some purines and related compounds on seedling growth of *Avena sativa*. L. R. F. Jones and H. G. Baker (*Ann. Bot.*, 1943, 7, 379—390).—The seedlings, grown in the dark at 26°, were treated with dil. solutions of adenine, hypoxanthine, xanthine, guanine, uric acid, and allantoin. The compounds caused different degrees of root inhibition, and none markedly stimulated growth during the first 48 hr. after germination. R. H. H.

Plant responses to carcinogenic agents and growth substances and their relation to crown gall and cancer. M. Levine (*Bull. Torrey Bot. Club*, 1940, 67, 199—226).—Of many carcinogens applied to a variety of plants, one, e.g., Scharlach Red (1% in ether), applied to the apical internode of *Kalanchoe diagraphmontiana* after decapitation produced overgrowths like crown galls. Other carcinogenic substances produced necrosis but in *K. diagraphmontiana* and *Bryophyllum calycinum* roots appeared in the internode below the treated area. Indolylacetic acid in lanoline applied to decapitated or injured stems induced root formation and in some cases small nodular outgrowths or overgrowths in decapitated plants similar to crown galls. Heteroauxin-induced outgrowths show only limited proliferation, only a few generations of cells being produced, whereas *Bacterium tumefaciens* produces crown galls which show continued proliferation, long life, and appreciable differentiation of tissues. L. G. G. W.

Effect of sulphanilamide and other sulphur compounds on nuclear condition in plants. H. P. Traub (*J. Heredity*, 1941, 32, 157—159).—Seedlings of *Phaseolus vulgaris* obtained by germinating seed soaked for 1½ hr. in 0.5% sulphanilamide showed delayed growth and, later, much branched root systems, and if transplanted when full grown did not lose their leaves. The leaves of plants from the treated seeds were generally mis-shapen, with stomata often larger than normal. Cuttings treated by standing in 0.5% sulphanilamide before rooting showed similar effects. The results suggested that polyploidy had been induced, and experiments with onion bulbs showed that here sulphanilamide treatment caused abnormal mitosis and the production of binucleate cells. L. G. G. W.

Measurements of small concentrations of ethylene and automobile exhaust gases and their relation to lemon storage. P. W. Rohrbraugh (*Plant Physiol.*, 1943, 18, 79—89).—The quantity of ethylene necessary to cause noticeable epinasty of pea seedlings, or to cause lemon colouring, was 0.025—0.05 p.p.m. of air. Epinasty tests indicated that the effect of 1 ml. of a motor exhaust gas was equiv. to that of 0.002 ml. of ethylene. R. H. H.

Effect of root system on tomato stem growth. F. W. Went (*Plant Physiol.*, 1943, 18, 51—65).—Submergence of the whole of the roots in a nutrient solution of pH not less than 6 leads to decreased rate of stem growth, and to chlorosis which cannot be cured by doses of Fe and minor elements, even when these are sprayed on the leaves. The condition is not improved by aeration of the solution. Normal stem growth is obtained when part of the root system is exposed to the moist air. This portion of the root supplies one or more factors (caulocalines) required for stem growth. R. H. H.

Sterilisation technique for grass seeds. R. B. Stephenson (*Plant Physiol.*, 1942, 17, 324—325).—Adequate sterilisation of the seeds is obtained by pretreatment with alcohol followed by treatment with Ca(OCl)₂. Subsequent sterile germination is best carried out on 2% agar. R. H. H.

Mycorrhizal habit in relation to forestry. IV. **Mycorrhizal response in *Pinus* and other conifers.** M. C. Rayner and I. Levisohn (*Forestry*, 1941, 15, 1—36).—The failure (partial or complete) of many conifers to establish on Wareham Heath is associated with an absence of mycorrhiza. This condition can be corr. by addition of compost to the soil, and is due primarily to the presence in the soil of toxic factors that inhibit fungal growth. L. G. G. W.

Studies on atypical growth in plants from a cytogenetic point of view. D. Kostoff (*J. Genet.*, 1940, 39, 469—484).—Tumour-like growths are produced in many plants in response to parasite attack or to chemical agents. In many *Nicotiana* hybrids tumours appear in place of side branches. Here meristematic tissue proliferates but does not differentiate into stem and leaves. Tumours also form in response to wounding. In these *Nicotiana* tumorous cells with a doubled no. of chromosomes are rare. In *N. vavilovi* colchicine inhibits the growth of the tumours or causes necrosis which kills them completely or partially. L. G. G. W.

Potato virus-X: mixtures of strains and the leaf area and yield of infected potatoes.—See B., 1944, III, 41.

Chlorazol-black E as a stain for root-tip chromosomes.—See A., 1944, III, 161.

XXVII.—PLANT CONSTITUENTS.

Phytochemistry of leaves of *Celastrus scandens*, L. I. D. L. Cook, L. M. Parks, M. F. W. Dunker, and A. H. Uhl. II. **Non-saponifiable material.** D. L. Cook, M. F. W. Dunker, and A. H. Uhl (*J. Amer. Pharm. Assoc.*, 1944, 33, 15—17, 18—21).—I. The leaves yielded stearic, palmitic, myristic, linolenic, linoleic, oleic, propionic, acetic, and formic acid, glycerol, dulcitol, and glucose or a glucoside.

II. The non-saponifiable fraction yielded β -amyrin and luteol (both characterised as acetate and benzoate), a hydrocarbon, $C_{30}H_{50}O$, m.p. 61.5—62.5° (? octacosane), and a triterpene alcohol, *scandol*, $C_{50}H_{80}O$, m.p. 161—163°, $[\alpha]_D^{25} +56.9^\circ$ in $CHCl_3$ (acetate, m.p. 165—168°, $[\alpha]_D^{25} +60.5^\circ$ in $CHCl_3$; benzoate, m.p. 210—212°, $[\alpha]_D^{25} +73.84^\circ$ in $CHCl_3$). F. O. H.

Components of seed coats of common bean, *Phaseolus vulgaris*, and their relation to water retention. A. C. Ott and C. D. Ball (*Arch. Biochem.*, 1943, 3, 189—192).—The seed coats contain approx. 19 and 21% (based on dry wt.) of polyuronides and "true pentosans" respectively, and approx. 5% of protein. Treatment with 1% aq. acetic acid or 1% aq. $NaHCO_3$ does not alter the contents of polyuronides and "true pentosans," but both are decreased by 0.8% aq. NaOH. Treatment with $NaHCO_3$ slightly, and with NaOH markedly, decreases the protein content. Polyuronides and "true pentosans" are probably involved in the retention of water in the dried seed coats. J. N. A.

Examination of the roots of *Derris elliptica*. F. A. Gunther and F. M. Turrell (*J. Econ. Entom.*, 1942, 35, 941).—The location of the rotenone-, starch-, and tannin-containing cells in fresh *D. elliptica* roots, and the physical nature of the resin bodies, are discussed. Aq. extracts of *D. elliptica* contain fructose, glucose, sucrose, and xylose; the physical properties of such extracts indicate the presence of large quantities of saponin-like substances, including haemolysing saponins, in the root. A. A. M.

Vitamin-C content of cultivated and wild plants growing in high regions of Pamir. V. D. Kostenko (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, 38, 42—43).—Both cultivated and wild plants growing in elevated regions showed a high vitamin-C content. The fruits of some varieties of wild rose contained up to 4% of -C. R. H. H.

Vitamin-C content of Mexican vegetables.—See A., 1944, III, 201.

Storage and artificial germination of forest tree pollens. L. P. V. Johnson (*Canad. J. Res.*, 1943, 21, C, 332—342).—The highest % of germinations followed storage in the dark at 2° for 1 year, and was 95—99 for *Pinus* at 50—75% R.H., 58—63 for *Picea* at 10—75% R.H., and 46 for *Quercus* at 25—35% R.H. The best medium for the germination of *Pinus* pollen was sucrose 10% in agar 0.75%; that for *Picea* was 1.13% of bean pod agar. R. H. H.

Gutta-percha in bark of roots and trunks of spindle trees, *Euonymus verrucosus*, Scop., and *E. velutina*, F. and M. D. I. Lisitzin and N. V. Samsel (*Biochimia*, 1943, 8, 182—187).—The gutta-percha content of the trunk bark of spindle trees increases towards the root but is a min. adjacent to the root. It is a max. in the upper parts of the root, and it increases with age, whilst the resin content decreases. P. G. M.

Transformation of tannins in tea leaf. A. L. Kursanov (*Biochimia*, 1943, 8, 188—200).—Sol. tannins decrease during the manufacture of black tea. Polyphenols decrease particularly in the first hr. of fermentation, and subsequently water-insol. condensation products accumulate. This process involves mainly pyrocatechol

and phloroglucinol, which form the basis of the quercetin nucleus of natural tea tannin, and resembles the natural evolution speeded up by the greater availability of O_2 . P. G. M.

Resinous substance obtained from yellow rust infection in resistant cereals and other sources. A. Noll (*Zentr. Bakt.*, 1943, II, 105, 448—459).—The substance was produced in the host tissues in response to infection to *Puccinia glumarum* and other fungi and bacteria. It is insol. in strong acids and alkalis, it can be destroyed by most of the Cl-containing oxidisers, and it has little affinity for org. dyes. (1 photomicrograph.) F. S.

Novel sesquiterpene hydrocarbon from the leaf oil of *Cedrus atlantica*, Manetti.—See A., 1944, II, 125.

Seasonal changes in lignin and cellulose content of some Montana grasses. II. A. R. Patton (*J. Animal Sci.*, 1943, 2, 59—62; cf. C., 1944, Part 2).—Cellulose and lignin vals. for 9 grasses at 5 stages of growth are listed. Both are high in remnants of the previous year's growth, and both increase in the new grass with age, except in Blue Grama [*Bouteloua gracilis* (H. B. K.), Lag.], which shows little seasonal change. R. L. E.

Growth-substances in a hybrid corn and its parents. W. J. Robbins (*Bull. Torrey Bot. Club*, 1940, 67, 565—574).—Extracts of germinated grains of a hybrid maize had a greater effect than the extract from the grains of the parents on the growth of *Phycomyces* in the presence, but not in the absence, of thiamin, and not on the growth of *Ashbya gossypii* in the absence of biotin. L. G. G. W.

High yields of β -2-trichloroethyl-D-glucoside and β -2-trichloroethylgentiobioside from tobacco plants treated with chloral hydrate. L. P. Miller (*Contr. Boyce Thompson Inst.*, 1943, 13, 185—200).—Following the addition of large amounts of chloral hydrate to the nutrient medium, tobacco leaves contained (dry basis) about 13% of a mixture of β - β' -trichloroethyl-D-glucoside and β - β' -trichloroethylgentiobioside (isolation described), m.p. 204—206° (decomp.), $[\alpha]_D^{25} -41.2^\circ$ in water. The roots accumulated only the β -gentiobioside. R. H. H.

Tetrasomic inheritance in *Lotus corniculatus*, L. C. D. R. Dawson (*J. Genet.*, 1941, 42, 49—72).—Two types of *L. corniculatus*, L. alike morphologically, exist, one containing a cyanogenetic glucoside and the other not. *L. australis*, *L. arabeus*, and *L. tenuis* similarly exist in two forms but cyanogenetic glucosides have not been found in *L. uliginosus*, *L. angustissimus*, or *L. hispidus*. L. G. G. W.

Distribution of growth hormones in two species of pine. N. T. Mirow (*J. Forestry*, 1941, 39, 457—464).—In *ponderosa* and Torrey pines the lowest concn. of hormones in the developing shoot is in the apical 5 mm. Further from the tip the amount increases and reaches a max. near the base of the current shoot. In *ponderosa* pine hormone concn. was higher in quick- than in slow-growing trees and in the slow-growing (but not in the rapid-growing) trees the leading shoots contain more hormone than the laterals. It appears that in the Torrey pine auxin is stored in the xylem of old and new shoots. L. G. G. W.

Possibility of simple biochemical tests for differentiation between species of the genus *Pinus*. N. T. Mirow (*J. Forestry*, 1942, 40, 953).—Oleoresin of Jeffrey pine stains dark purple whilst that of *ponderosa* pine is unstained by Schiff's reagent. Fragments of wood in the resin upset the test as the woods contain aldehyde which reacts with the reagent. L. G. G. W.

Antheridial pigments of *Chara* species. P. Karrer, W. Fatzer, M. Favarger, and E. Jucker (*Helv. Chim. Acta*, 1943, 26, 2121—2122).—The antheridia are separated from the green parts of the plant, finely powdered, and extracted with light petroleum. The extracts are chromatographed over $Ca(OH)_2$, whereby small amounts of β -carotene are readily separated. The red layer, after elution, is separated by $Al(OH)_3$ into lycopene and γ -carotene which are obtained cryst. *C. ceratophylla*, Wallr., and *Nitella syncarpa* (Thuill.) have been thus investigated. Extraction of the comminuted whole plant with light petroleum followed by cold alkaline hydrolysis and chromatography over $Ca(OH)_2$ and $Al(OH)_3$ leads to the three pigments with α -carotene but the isolation of cryst. γ -carotene appears impossible owing to the presence of large proportions of oily impurities. H. W.

Pigments of cotton flowers. IX. **Occurrence of popunetin in Indian cotton flowers.** P. S. Rao and T. R. Seshadri (*Proc. Indian Acad. Sci.*, 1943, 18, A, 204—205).—*Gossypium herbaceum* flowers contain popunetin (cf. Neelakantam et al., A., 1943, II, 170), identified by complete methylation to *tetramethylpopunetin*, m.p. 164—166°. The latter loses water at 95—100°, and is identical with a sample prepared from *Thespesia populnea*. D. G.

Pigment content of polyploid plants. A. Levan (*Hereditas*, 1943, 29, 255—268).—In 11 genera diploids had generally higher content of chlorophyll but a lower water content than polyploids. The lower pigment of the polyploids is probably due in part to their thicker leaves with a reduced surface/wt. ratio. L. G. G. W.

LIST OF ABBREVIATIONS ETC. USED IN ABSTRACTS.

absolute	abs.	electrocardiogram	e.c.g.	parts per million	p.p.m.
alternating current	a.c.	electromotive force	e.m.f.	per cent.	%
ampere	amp.	electron-volt(s)	e.v.	potential difference	p.d.
Ångström unit	Å	equivalent	equiv.	precipitate	ppt.
anhydrous	anhyd.	feet, foot	ft.	precipitated	pptd.
approximat-e, -ly	approx.	for example	e.g.	precipitating	pptg.
aqueous	aq.	freezing point	f.p.	precipitation	pptn.
Assignor in patent titles {	Assr.	gallon(s)	gal.	preparation	prep.
Assignee } only	Assee.	gram(s)	g.	qualitative	qual.
atmosphere, -es, -ic	atm.	horse power	h.p.	quantitative	quant.
atomic	at.	hour(s)	hr.	recrystallised	recryst.
atomic weight	at. wt.	hydrogen-ion concentration [H']	[H']	refractive index	n
boiling point	b.p.	inch(es)	in.	relative humidity	R.H.
British thermal unit	B.Th.U.	inorganic	inorg.	respiratory quotient	R.Q.
calculated	calc.	insoluble	insol.	revolutions per minute	r.p.m.
Calorie (large)	kg.-cal.	kilogram(s)	kg.	Roentgen unit	r.
calorie (small)	g.-cal.	kilovolt(s)	kv.	saponification value	sap. val.
candle power	c.p.	kilowatt(s)	kw.	second(s) (time only)	sec.
centimetre	cm.	litre(s)	l.	†secondary	sec.
cerebrospinal fluid	c.s.f.	maximum	max.	soluble	sol.
coefficient	coeff.	melting point	m.p.	specific	sp.
concentrated	conc.	metre(s)	m.	specific gravity	sp. gr.
concentration	concn.	micron(s)	μ.	square centimetre(s)	sq. cm.
constant	const.	milliampere(s)	ma.	temperature(s)	temp.
corrected	corr.	milligram(s)	mg.	†tertiary	terti.
critical	crit.	millilitre(s)	ml.	vacuum	vac.
crystalline		millimetre(s)	mm.	value	val.
crystallised (adjective only) }	cryst.	millivolt(s)	mv.	vapour density	v.d.
cubic centimetre(s)	c.c.	minimum	min.	vapour pressure	v.p.
cubic metre(s)	cu.m.	minute(s)	min.	viscosity	η
current density	c.d.	molecul-e, -ar	mol.	volt(s)	v.
decimetre(s)	dm.	molecular weight	mol. wt.	volume	vol.
decompos-ing, -ition	decomp.	namely	viz.	watt(s)	w.
density	ρ, d.	normal	N.	wave-length	λ
dilute	dil.	number	no.	weight	wt.
direct current	d.c.	organic	org.		

† The abbreviations for secondary and tertiary are used only in connexion with organic compounds.

In addition, elements, groups, and easily recognised substances are denoted in the text by symbols and formulæ. The groups are as follows: methyl, Me; ethyl, Et; *n*-propyl, Pr^a; isopropyl, Pr^β; *n*-butyl, Bu^a; isobutyl, Bu^β; *tert*-butyl, Bu^γ; phenyl, Ph; acetyl (CH₃·CO), Ac; benzoyl (C₆H₅·CO), Bz. (In Section A., III this applies only to inorganic compounds, excluding water, and to chloroform and carbon tetrachloride.) "Oleum" is allowed to describe fuming sulphuric acid and "room temp." for "the ordinary temperature." The symbol for 10 A. is mμ. (not μμ.) and for the International X-ray unit it is X, not XU. The symbol for 10⁻⁶ g. is μg. (not γ).

The following symbols are used except in Section A., III: >, greater than; ≫, much greater than; ≧, not greater than (and <, ≪, ≦ conversely); ∝, (is) proportional to; ~, of the order of, or approximately.

The principal Pharmacopœias are denoted by B.P., U.S.P., and D.A.B., followed in each case by the identifying numeral.

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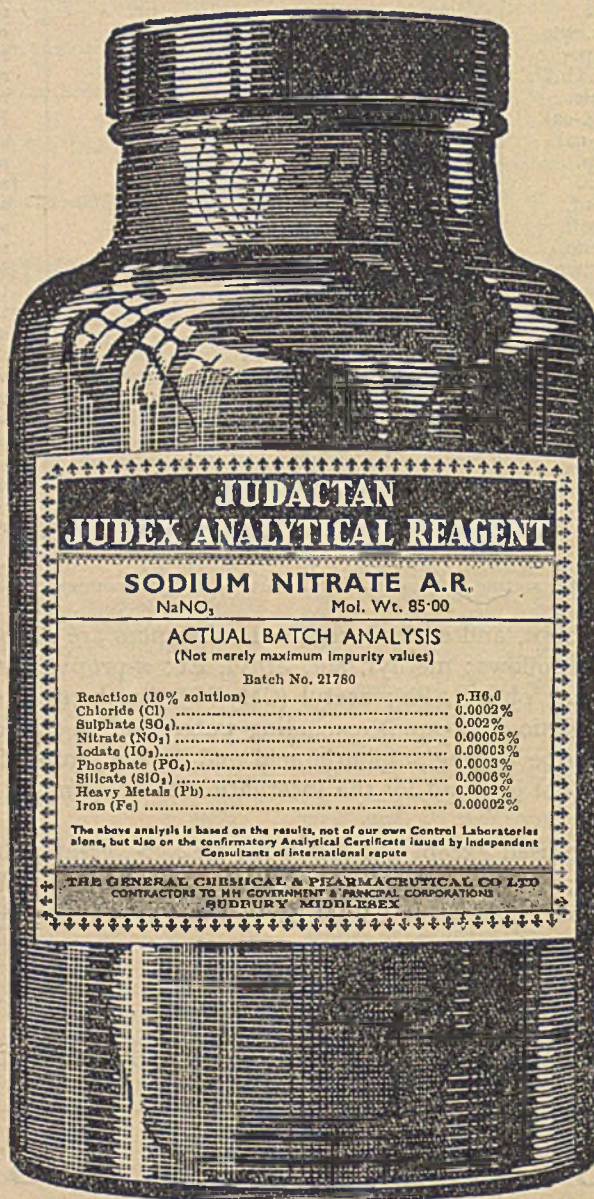
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