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A III—PHYSIOLOGY. BIOCHEMISTRY. ANATOMY

CONTENTS

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B I—CHEMICAL ENGINEERING AND INDUSTRIAL INORGANIC CHEMISTRY.
B II—INDUSTRIAL ORGANIC CHEMISTRY.
B III—AGRICULTURE, FOODS, SANITATION, ETC.
C—ANALYSIS AND APPARATUS.

COLLECTIVE INDEXES

DECENNIAL INDEX 1923—1932.
QUINQUENNIAL INDEX 1933—1937.

INDEX OF AUTHORS' NAMES, A III.

FEBRUARY, 1944.

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A III—Physiology. Biochemistry. Anatomy.

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I.—GENERAL ANATOMY AND MORPHOLOGY.

Homology and analogy. A. Boyden (*Quart. Rev. Biol.*, 1943, **18**, 228—242).—A review of the changing ideas on these conceptions during the past hundred years. J. D. B.

Functional and morphological adaptations in forelimbs of slow lemurs. R. A. Miller (*Amer. J. Anat.*, 1943, **73**, 153—183).—The Lorisinæ are distinguished by the ability to hang suspended in the reversed position and by extreme deliberation of movement. Morphologically these adaptations are shown in the musculature of the forelimbs. Muscles acting on the shoulder are expanded and strengthened for rotation of the joint. The extensors and supinators of the forearm are best developed. The hand is highly specialised and permanent flexion of the distal phalanges is an adaptation for clinging. Lorises have postural habits like those of sloths and there is a degree of similarity between the two groups as the result of adaptive convergence. Slow lemurs also exhibit characteristics in the muscles of shoulder flexion, supination, and digital extension which occur in brachiating apes. W. F. H.

Parietal intermuscular plexus of thoracic nerves. W. E. Bishop, B. W. Carr, B. J. Anson, and F. L. Ashley (*Quart. Bull. Northwest. Univ. Med. Sch.*, 1943, **17**, 209—216).—In adult males and females there is a nerve plexus on the antero-lateral abdominal wall in the cleavage plane between the internal oblique and transverse abdominal muscles. 75% of the plexuses involved thoracic 10 and 11, 11 and 12, 12 and lumbar 1. Division of the thoracic nerves occurs as far proximally as the costal cartilages of the lower ribs, suggesting that where not hindered from doing so by obstructing anatomical barriers, nerves tend to enter into a plexiform arrangement. In the lumbar region plexus formation occurs a short distance beyond the vertebral bodies; in the thoracic region, only late plexus formation is possible, the ribs maintaining a segmental pattern on the thoracic wall; the plexus is developed in the area of broadest expanse of the abdominal wall. 70% of the nerves terminated in the lateral third of the rectus muscle; the lowermost nerves terminate at the inferior extremity of the muscle. 62% of the nerves entered the rectus muscle in its middle (longitudinal) half. A. S.

Blood supply of first part of duodenum. H. A. Wilmer (*Surgery*, 1941, **9**, 679—687).—The blood supply was studied post mortem in 2 6-month fœtuses, 3 new-born infants, 1 5-day infant, and 1 adult by the celloidin injection technique. Wide individual variations were noted. There are usually 2 pancreatico-duodenal arcades, united by large anastomosing vessels with long courses on the postero-medial wall. These are in turn united by smaller anastomising vessels constituting the gastro-duodenal plexus. This is distinct from the sub-mucosal plexus of smaller and shorter vessels arising on the posterior wall from the gastro-duodenal plexus. P. C. W.

Variations in ileocæcal valve : factors underlying incompetency. R. E. Buirge (*Anat. Rec.*, 1943, **86**, 373—385).—In 500 subjects the classical type of ileocæcal valve was found in 54%. The anatomical variations observed are classified according to deficiencies of the frenula valvuli coli. Sufficiency or insufficiency of the ileocæcal valve depend largely on the size and shape of the ileocæcal eminence and orifice, the absence or incompleteness of one or both frenula, and the variability of the superior and inferior lips. Incompetency of the valve due to the presence of a pedunculated polyp of the superior lip is reported. W. F. H.

Anatomy of bronchial and vascular trees of human lung. S. F. Oosthuizen and J. A. Keen (*Clin. Proc.*, 1943, **2**, 160—167).—The bronchial and pulmonary vascular trees were demonstrated in detail in human lungs, removed at autopsy or from the dissecting room, by injection with radio-opaque material and *X*-irradiation. The arterial and venous diameters are very similar at the same levels throughout their course. The effects of formalin fixation are discussed. P. C. W.

Growth of major long bones in healthy children. M. M. Maresh (*Amer. J. Dis. Child.*, 1943, **66**, 227—257).—Seriatim roentgenograms of the left arm and leg were taken in 52 girls and 61 boys, at half-yearly intervals up to 12 years of age; the lengths of the humerus, radius, ulna, femur, tibia, and fibula were tabulated. Growth rate, up to 10 years of age, is orderly. High coeffs. of correlation (0·9915—0·9990) were found between the lengths of the bones and between stature and lengths of the bones. Under 6 months, lengths of the bones are proportionately greater in relation to stature than later. In the early postnatal months the trunk is growing in length faster than the rest of the axial skeleton. C. J. C. B.

Protruded intervertebral disc and hypertrophied ligamentum flavum. Criteria for diagnosis and indications for operations. J. C. Yaskin and A. S. Tornay (*Amer. J. med. Sci.*, 1943, **206**, 227—233).—An analysis of 50 surgically treated cases. C. J. C. B.

Herniated intervertebral discs. O. R. Hyndman, A. Steindler, and J. Wolkin (*J. Amer. Med. Assoc.*, 1943, **121**, 390—401).—Low back pain with sciatic radiation may be due to lumbosacral root compression (most commonly due to a herniated intervertebral disc) or to myofascial trauma. In the latter, local anæsthetisation of tender spots by procaine injection abolishes the pain temporarily; in the former it has no effect. C. A. K.

Comparative results in use of living and preserved fascia as suture material in bone. A. R. Koontz and R. T. Shackelford (*Surgery*, 1941, **9**, 493—502).—Living and alcohol-preserved strips of fascia were equally effective in suturing fractures of the olecranon in dogs, provided the parts were immobilised. Ossification of both types of fascia by replacement with ingrowing bone occurred. When immobilisation was incomplete so that fibrous union took place both types of fascia were intact months after implantation. Both types of fascia were rapidly absorbed when implanted in bone with no function to perform. P. C. W.

Unusual osseous dystrophy. J. F. Brailsford (*Arch. Dis. Childh.*, 1943, **18**, 98—101).—A case of osseous dystrophy is described, characterised by dense epiphyses which fused early though development of other ossific centres was markedly delayed. Grotesque dwarfing with normal intelligence is associated with severe spinal curvature and bilateral coxa vara. C. J. C. B.

Significance of somatic stigmatisation in childhood. R. Wagner (*J. Mt. Sinai Hosp.*, 1943, **10**, 365—373). E. M. J.

Horseshoe kidney and associated vascular anomalies in domestic cat. H. E. Story (*Anat. Rec.*, 1943, **86**, 307—319).—In the case described it is suggested that normal migration occurred and that rotation was incomplete. The evidence points to an early date of fusion. The renal arteries were displaced proportionately to the dystopia of the kidneys and a large branch of the right renal artery supplied the fused area. The ovarian arteries arose from the posterior mesenteric artery. The left common iliac vein was absent. The embryonic left postcardinal vein was retained and the right subcardinal–postcardinal anastomosis persisted. W. F. H.

Diverticulum of urinary bladder. A. J. C. Hamilton (*Edinb. Med. J.*, 1943, **50**, 513—534).—A lecture describing ætiology, diagnosis, and treatment in a series of 22 cases. H. S.

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Stimulation of nephrogenic tissue by normal and abnormal inductors. P. Gruenwald (*Anat. Rec.*, 1943, **86**, 321—339).—The metanephric blastema of chick embryos was exposed to the influence of grafted nervous tissue instead of the normal inductor, the ureteric bud. The blastema formed tubules which were equiv. in structure and rate of differentiation to those of the mesonephroi. Similar observations were made in spontaneous malformations. The experiments confirm the suggestion that the metanephric blastema is capable of both mesonephric and metanephric type of differentiation and that mesonephric and metanephric portions of nephrogenic tissue are potentially very similar. W. F. H.

Liver extirpation and implantation in *Amblystoma* embryos with particular reference to blood formation. W. M. Copenhaver (*Amer. J. Anat.*, 1943, **73**, 81—105).—Removal of the liver anlage from *A. punctatum* and *A. tigrinum* embryos shortly after the beginning of circulation did not affect the growth rate or blood picture during

embryonic stages before yolk-resorption. Approx. 1 week after yolk-resorption (15—18 days after operation) the animals became very anæmic and in the terminal phases there were practically no cells of the erythrocyte line left in circulation. The max. survival period was 40 days beyond yolk-resorption stage. Mean survival time was much less. In experimental animals the spleen was small and subnormal in erythropoietic activity. Granulocytopoietic tissue corresponding to normal subcapsular, perihepatic tissue developed in the ventral mesentery, in the complete absence of liver parenchyma. Liver feeding and injections did not prolong survival or prevent anæmia. When liver tissue was implanted anæmia did not develop. Some animals were reared beyond metamorphoses with no liver tissue other than the implant. W. F. H.

Assimilation of avian yolk and albumin under normal and extreme incubating temperatures. A. L. Romanoff (*Anat. Rec.*, 1943, **86**, 143—148).—The rate of assimilation of yolk and albumin is similar in all species of birds studied. Liquefied (thin) yolk appears after a few days' incubation and its appearance coincides with a rapid decrease of albumin. Liquefied yolk disappears about mid-period of incubation. At hatching the yolk decreases to about one third its original wt. Albumin is completely assimilated a few days before hatching. Extremes of temp. (34·5° and 39·5°) modify the rate of assimilation of yolk and albumin. W. F. H.

Sex and season in relation to malformations of chicken embryos. W. Lamdauer (*Anat. Rec.*, 1943, **86**, 365—372).—Among chicken embryos which had died during the second half of the incubation period otocephaly was much more common in females. Micro- or an-ophthalmia rose from mid-winter to early summer. Embryos with various types of duplications increased from September to May. W. F. H.

Development of wild type and bar eyes of *Drosophila melanogaster*. A. G. Steinberg (*Canad. J. Res.*, 1943, **21**, 277—283).—Histological differentiation of "clusters" and "goblets" begins between 48 and 72 hr. after hatching in both types. Thereafter the histological picture is the same in both forms with the exception of the pigmented region of bar eye. "Clusters" and "goblets" are the precursors of the ommatidia, and the pigmented, unfacetted region of the bar eye does not result from degeneration of already formed ommatidia. The data are discussed in the light of several hypotheses that have been advanced to explain the development of bar eye. W. F. H.

Hair pigmentation and genetics of colour in greyhounds. M. Burns (*Proc. Roy. Soc. Edin.*, 1943, **B**, **61**, 462—490).—Evidence from 1272 matings indicates that the colours black, brindle, and red or fawn in greyhounds depend on allelomorphic genes. The genetic relations of blue-brindle and blue-fawn are discussed. The pattern "white-flecked" is also discussed. Eye-colour is independent of coat-colour except in blue-dilute hounds. In all coloured hounds only granular pigment was found. Blue, blue-brindle, and blue-fawn-brindle all exhibit aggregation of pigment granules in the hairs. In non-blue hairs no clumping of granules occurs. The action of H_2O_2 solution on black, red, and blue hair is described. It is suggested that the extension series of genes may take effect by controlling the amount of pigment available to the growing hair. W. F. H.

The Hardy–Weinberg law. C. Stern (*Science*, 1943, **97**, 137—138).—Evidence that the Hardy population formula was independently derived by Weinberg is given. E. R. R.

III.—PHYSICAL ANTHROPOLOGY.

Ancient Cephallenians—the population of a Mediterranean island. J. L. Lawrence (*Amer. J. phys. Anthrop.*, 1943, [ii], **1**, 229—260).—Ancient Greeks as a whole, including the Submycenæan inhabitants of Cephallenia, are usually heterogeneous. The high variability, about 7% above normal, allows six arbitrary morphological types to be distinguished. The large Basic White type, and east Mediterranean relative of the Atlanto-Mediterranean, is the key among Cephallenians. Contrast is drawn with Alpine-dominated Greek mainlanders of the Early Iron Age. The linear Megalithic component of Basic White is much stronger among Cephallenians than among Mycenæans. Cephallenians in general combine long and angular brain cases with short, low-orbitted, broad-nosed and slightly prognathous faces. Where they diverge from Mycenæans, Cephallenians approach closely to Sardinians. These similarities suggest that Cephallenians represent a third millennium B.C. Mediterranean island population surviving into the Iron Age with slight local specialisation and little admixture. W. F. H.

Relative variability of Indian and White cranial series. T. D. Stewart (*Amer. J. phys. Anthrop.*, 1943, [ii], **1**, 261—270).—Mean sigmas of the principal anthropometric measurements and indices are presented by sex for a max. of 15 South American Indian cranial series and comparisons are made with North American Indians and Europeans. In general the Indians show lower variabilities. Notwithstanding the small size of the series, and individual biases in sexing, it is considered that the results prove that the Indian is less variable than the European. W. F. H.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Karyotype of *Macacus rhesus*. M. I. Sorokina (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 377—379).—Chromosome counts (spermatogonia, primary and secondary spermatocytes) on sections of testes of *M. rhesus* are recorded. In spermatogonial metaphases the chromosome no. was usually 41—43. In three cases it was 45—50. In primary spermatocytes tetrads numbered 21, with a surplus or a deficiency of 1—2 in some cells. Secondary spermatocyte counts numbered 21—22. It is concluded that the orthoploid chromosome no. of this monkey is 42. The male possesses a pair of heteromorphic (sex) chromosomes. J. D. B.

Influence of vitamin-*D* and parathyroid hormone on healing of bone fractures. S. A. Ivanova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 711—713).—The histological details of the processes of bone healing in rats suffering from vitamin-*D* lack or excess of parathyroid hormone are described and are compared with the histogenetic relations observed in the region of endochondral ossification of growing bone. J. D. B.

Ependyma of explants of cerebral ventricles. N. G. Chlopin (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 705—706).—Observations are recorded on the shape and differentiation of ependymal cells grown *in vitro* by the hanging drop method. J. D. B.

Growth and differentiation of pineal gland *in vitro*. J. D. Chlopina (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 707—710).—The growth and differentiation of pineal explants from new-born rabbits are described. J. D. B.

Growth mechanisms in tumour and regenerative processes in axolotl. N. N. Schevtschenko (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 507—509).—A description of the experimental production of sarcoma-like tumours in the axolotl by the implantation of cryst. methylcholanthrene into extremity muscles and a comparison of the histological changes with those occurring in regeneration after amputation. J. D. B.

Fluorescent granules at glomerular pole of human kidney. H. Popper and E. Loeffler (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 68—69).—Variable nos. of fluorescent granules are sometimes present at the glomerular pole of normal adult human kidneys. They are absent in children, in normal animals, and in hypertensive dogs. They have no relation to renin. V. J. W.

Anti-mitotics of sterol group. H. Lettré (*Z. physiol. Chem.*, 1943, **278**, 206—207).—Equilin is converted into equilin glycol which, by elimination of water, yields 7-ketocœstrone. The dioxime of this ketone with Na and alcohol yields 7 : 17-diamino-3-hydroxy-1 : 3 : 5-œstratriene, which has no anti-mitotic power. The compound obtained in the same way from the 3-methyl ether of equilin glycol has strong anti-mitotic action in doses of 1 μg. per c.c. 7-Aminocholesterol and the 17-amino-derivative obtained from equilinoxime have no anti-mitotic power. W. McC.

Relationship between anti-mitotic action and constitution in colchicine derivatives. H. Lettré and H. Fernholz (*Z. physiol. Chem.*, 1943, **278**, 175—200; cf. Brues and Cohen, A., 1936, 1294).—Treatment of chick heart fibroblasts and ascites tumour in mice with colchicine, colchiceine, and hydrocolchicine shows progressive decrease in anti-mitotic power which accompanies alterations in the methoxymethyl group. Since deacetylcolchicine, from trimethylcolchicinic acid and CH_2N_2, is anti-mitotic in doses of 0·05 μg. per c.c., the presence of an *N*-acetyl group is not essential for the activity, which, however, requires that the NH_2 and/or hydroxymethyl group carry a substituent. Methylcolchiceine is anti-mitotic in doses of 0·05 μg. per c.c. Ethyl-, propyl-, and butyl-colchiceine show progressively decreasing anti-mitotic power. Colchicamide has anti-mitotic power. *N*-Acetyl-β-*p*-anisyl-γ-3 : 4 : 5-trimethoxyphenylpropylamine has no anti-mitotic action on fibroblasts. The *N*-acetyl derivatives of α-*p*-anisyl-γ-3 : 4 : 5-trimethoxyphenyl-, α-*p*-anisyl-γ-3 : 4-dimethoxyphenyl-, αγ-di-*p*-anisyl-, γ-phenyl-, α-*p*-anisyl-α-phenyl-γ-3 : 4 : 5-trimethoxyphenyl-, α-phenyl-γ-3 : 4-dimethoxyphenyl-, α-phenyl-γ-*p*-anisyl-, and αγ-diphenyl-propylamine have no anti-mitotic power. Mescaline, *N*-acetyl-, -propionyl-, -*n*-butyryl-, and -*iso*valeryl-mescaline and *N*-acetyl-α-(*p*-anisyl)ethylamine, hordenine, αβ-diphenylethylamine, and *p*-methoxybenzhydrylamine also have no anti-mitotic power. α-Phenyl-β-(*p*-anisyl)ethylamine is possibly the simplest anti-mitotic compound so far known. (For new compounds see A., 1944, II, 48.) W. McC.

Anti-mitotic action of œstrogenic substances. H. Lettré (*Z. physiol. Chem.*, 1943, **278**, 201—205).—Mitosis in chicken heart fibroblasts in inhibited by diethylstilbœstrol and œstradiol (as Na_2 œstradiol phosphate) in doses of not less than 40 μg. per c.c. Higher doses prevent growth. The difference between the min. anti-mitotic dose of these substances and the min. œstrogenic doses

contrasts with the equality of the anti-mitotic and pressor doses of the oxidation product of adrenaline. The results and structural analogies to colchicine suggest that amino-derivatives of œstrogenic compounds, produced by addition of NH_3, should have anti-mitotic power. W. McC.

Differential staining of degenerating fascicles in peripheral nerves. L. H. Ungewitter (*Stain Tech.*, 1943, **18**, 187—188).—Methods are described for impregnation of the hyperplastic neurilemma of degenerating fibres in the vago-sympathetic trunk of puppies after section of thoracic ventral roots. K. C. R.

Two new methods of staining vaginal smears. D. Fuller (*J. Lab. clin. Med.*, 1943, **28**, 1474—1475).—A staining method is given for studying the menstrual cycle by vaginal smears and another method for examination for malignant cells. C. J. C. B.

Surface staining of embedded tissues. D. E. Copeland (*Stain Tech.*, 1943, **18**, 165—174).—Thin paraffin sections undergo distortion during cutting and floating out. Fine cellular detail without this distortion may be obtained from preps. made by first exposing the cut surface of a block of embedded tissue to routine staining solutions, then trimming the block to a thickness of 2—3 mm., and finally mounting the thick paraffin slice (stained surface uppermost) between a coverslip and slide. The paraffin transmits sufficient light for the stained surface to be examined under oil immersion. K. C. R.

Supersaturated solutions of fat stains in dilute *iso*propanol for demonstration of acute fatty degenerations not shown by Herxheimer technique. R. D. Lillie and L. L. Ashburn (*Arch. Path.*, 1943, **36**, 432—435).—The use of supersaturated solutions of Sudan IV, oil-red 4B, and Sudan-brown in 50 and 60% *iso*propanol demonstrates fatty substances which may be partly or even entirely lost when 70% ethyl alcohol and acetone are employed as the solvent. Pptn. is also less with the *iso*propanol solutions. By this method Sudan IV gives to fats a deep orange-red colour, oil-red 4B a purer red, Sudan brown a deep orange-brown. C. J. C. B.

Buffered Romanowsky staining of collodion-coated sections. R. D. Lillie (*Stain Tech.*, 1943, **18**, 193—194).—When paraffin sections are coated with collodion subsequent staining with buffered Romanowsky solutions is unsatisfactory. Improvement was obtained by increasing the stain concn. and using *iso*propyl alcohol for dehydration. K. C. R.

Dioxan as aid in staining insect cuticle. H. A. Levy (*Stain Tech.*, 1943, **18**, 181—182).—A methylene-blue–erythrosin stain, using dioxan as the dye solvent and dehydrating agent, was successfully used for serial sections of may-flies. K. C. R.

Effects of salts of metals and other chemicals on fixation. A. Petrunkevitch (*Anat. Rec.*, 1943, **86**, 387—399).—Distortion effects produced on the nuclear structures by a series of salts of heavy metals are described. Aq. solutions of all heavy metals in which the cation alone contains the metal produce distortion of the nucleus. Aq. solutions in which the anion alone contains the metal give normal fixation of nuclei, and the same holds for solutions of salts in which one metal forms part of the anion, while another metal forms part of the cation. Sb salts render the cytoplasm of amphibian erythrocytes glass-clear, and neither eosin nor acid fuchsin has any power to stain it. Cu salts were found the most satisfactory and the formulæ for 3 new cupric fixing fluids is given. W. F. H.

Use of Cellophane in pollen tube technique. L. La Cour and A. C. Fabergé (*Stain Tech.*, 1943, **18**, 196).—Pollen was sown on squares of Cellophane floating on nutrient solution. The pollen tubes adhered to the Cellophane, which was carried through fixation and staining (particularly the Feulgen technique) and mounted in balsam without disturbing the prep. K. C. R.

Progress in standardisation of stains. H. J. Conn (*Stain Tech.*, 1943, **18**, 153—158).—A list is given of the tests applied to 53 stains for certification by the Commission on Standardisation of Biological Stains. K. C. R.

Preservation of adrenal glands. B. B. Dey, P. S. Krishnan, and V. Srinivasan (*Current Sci.*, 1943, **12**, 244—246).—The efficacy of various methods of storing glands (freezing at different temp., addition of toluene, immersion in alcohol, etc.) before extraction of vitamin-C and adrenaline was studied. Greater decomp. occurred in sheep glands than in cattle glands. There is no great loss for 2—3 days provided the temp. is kept low. Alcohol storage is effective up to 7 days at room temp. for preserving adrenaline but -C is destroyed. P. C. W.

V.—BLOOD AND LYMPH.

Improved method of sternal marrow aspiration. J. Litwins (*J. Lab. clin. Med.*, 1943, **28**, 1482—1483).—The use of a two-way valve is described which permits the removal of the syringe while the needle remains *in situ* until after filling the white cell pipette and making smears. The needle is then removed. C. J. C. B.

Morphology of the peripheral blood of rats. I—III.—See A., 1944, III, 39.

Effect of freezing on erythrocytes. L. Florio, M. Stewart, and E. R. Mugrage (*J. Lab. clin. Med.*, 1943, **28**, 1486—1490).—Pooled specimens of human blood that were frozen rapidly below −40° and thawed deteriorated no more rapidly than the controls after the first 48 hr. The O_2-carrying capacity and the ability to type the blood were not altered by freezing. The fragility of the frozen and unfrozen cells was the same. Fragility was decreased in proportion to the % of glucose in the blood. Drying from the frozen state was not successful. C. J. C. B.

Non-hæmatin iron in erythrocytes. S. Granick (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 255—256).—When teased spleen of the horse, and occasionally of guinea-pig, rabbit, or man, is treated with H_2S certain red cells show a grey coloration due to FeS. It is suggested that this Fe has been set free from hæmatin by a secretion from cells lining the splenic sinuses. V. J. W.

Electrophoresis and antibody nitrogen determinations of a cold hæmagglutinin. D. Stats, E. Perlman, J. G. M. Bullowa, and R. Goodkind (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 188—190).—A human cold agglutinin had the electrophoretic mobility of γ-globulin, and a solution with a titre of 1/2560 was equiv. to 1·473 mg. per ml. of antibody-N. V. J. W.

Polyagglutinability of human red blood cells. J. C. Gaffney and H. Sachs (*J. Path. Bact.*, 1943, **55**, 489—491).—Polyagglutinability is a transitory agglutinability of red cells developed *in vivo* and characterised by the agglutination of the cells by a proportion of normal sera independently of their group agglutinins; it is not connected with auto-agglutination. Such agglutinability is dependent on the temp., agglutination being strongest in the refrigerator, weaker at room temp., and absent at body temp. Polyagglutinability was observed in a patient with congenital syphilis and a healthy individual. Polyagglutinable red cells absorb from sera the agglutinins against themselves. C. J. C. B.

***Rh* factor and its importance in transfusion for the anæmias of erythroblastosis and other causes.** H. R. Brown, jun., and P. Levine (*J. Pediat.*, 1943, **23**, 290—295).—In 5 of 6 cases of erythroblastosis fœtalis verified at autopsy, the mother was *Rh*− and the father and affected infant were *Rh*+. The survival of transfused *Rh* −blood and the continued destruction of erythroblastotic infant's *Rh*+ blood is indicated by the temporary change of its *Rh* reaction from positive at birth to negative after transfusion with *Rh*− blood. The antigenicity of the *Rh* factor by repeated transfusions was demonstrated in 1 case. C. J. C. B.

Heredity of variants of *Rh* type. A. S. Wiener and K. Landsteiner (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 167—170).—From blood examinations in 47 families, it is deduced that types Rh_1 and Rh_2 are transmitted by allelic genes Rh_1, Rh_2, and *rh*, that Rh_1 is dominant over Rh_2, and that both are dominant over *rh*. V. J. W.

Heparin and agglutination of platelets *in vitro*. I. D. Baronofsky and A. J. Quick (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 173—174).—Over 0·1 mg. of heparin per c.c. is necessary to prevent agglutination of platelets in human blood, but no decrease in no. of platelets is produced. V. J. W.

Preparation of precipitating sera for identification of animal species. H. Proom (*J. Path. Bact.*, 1943, **55**, 419—426).—Sp. pptg. sera of high potency were regularly prepared in rabbits by intramuscular injection of alum-pptd. antigen; in 165 rabbits 84% responded satisfactorily to 1 or 2 injections. Attempts to prepare sp. sera against heated proteins, which would be suitable for detecting the nature of cooked meats, were unsuccessful. It was possible to identify the nature of lightly cooked meats using pptg. sera prepared with unheated material. C. J. C. B.

Transmissibility of malaria by plasma transfusions. E. L. Lozner and L. R. Newhouser (*Amer. J. med. Sci.*, 1943, **206**, 141—146).—In 20 administrations of thawed plasma from patients with active malaria, which had been "shell" frozen in a solid CO_2–alcohol bath, no transmission of malaria was observed. In 3 administrations of restored plasma which had been dried from the frozen state, no transmission occurred. In 2 administrations of restored plasma preserved in the liquid state for 1 day, there was 1 definite and 1 probable transmission. In 5 administrations of plasma preserved in the liquid state for 1 week, there was 1 very doubtful transmission. In 5 administrations of plasma preserved in the liquid state for 2 weeks no transmissions were observed. C. J. C. B.

Spirochætal survival in frozen plasma. Viability of *Treponema pallidum* in stored plasma.—See A., 1944, III, 70.

Guide to replacement therapy for loss of blood or plasma. H. P. Jenkins, P. W. Schafer, and F. M. Owens (*Arch. Surg., Chicago.*, 1943, **47**, 1—3).—A chart is given from which the replacement vol. of blood or plasma required can be read when body wt. and hæmatocrit val. are known. F. S.

Method for concentration of blood-plasma and serum. W. Antopol, S. Glaubach, L. M. Goldman, and E. Katzin (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 125—126).—By freezing at −10° and partial thawing at 4°, 75% of the water of plasma can be removed as ice whilst the remaining 25% contains 70% of the original solids. V. J. W.

Hydrolysed protein in hæmorrhagic shock. R. Elman and C. E. Lischer (*J. Amer. Med. Assoc.*, 1943, **121**, 498).—Infusion of hydrolysed protein solutions containing amino-acids and polypeptides prolonged the survival time of dogs subjected to repeated bleeding. The blood pressure was better maintained and a greater amount of bleeding could be tolerated than in untreated controls or animals given 10% glucose in saline. A solution of pure cryst. amino-acids was less effective than hydrolysed protein. C. A. K.

Complement activity of serum of healthy persons, mothers, and newborn infants. B. Traub (*J. Path. Bact.*, 1943, **55**, 447—455).—The serum complement of 127 apparently healthy blood donors showed no differences according to blood groups and sex. The complement activity in infants was lower than that of their mothers or of healthy women. The serum complement of mothers immediately after delivery was higher than that of healthy women. No correlation was found between the serum complement of mothers and that of their children. Naturally occurring anti-sheep hæmolysins did not influence the complement titre as determined by the 50% hæmolysis end-point. In the cord blood very little, if any, anti-sheep hæmolysin was found. C. J. C. B.

Density findings with heparin in blood, plasma, and serum. A. L. Copley and M. E. Whitney (*J. Lab. clin. Med.*, 1943, **28**, 1501—1502).—Heparin has a sp. lowering action on the density of blood, plasma, serum, and protamine sulphate solution. Increasing amounts of heparin decrease the density more markedly, but not in linear proportion. C. J. C. B.

Polysaccharide polysulphuric esters and similar compounds which inhibit the coagulation of blood. P. Karrer, H. Koenig, and E. Usteri (*Helv. Chim. Acta*, 1943, **26**, 1296—1315).—Polysaccharide hydrogen phosphates, obtained by the action of $POCl_3$ on starch, trihexosan, chitosan, and gelatin (P, 9—24%), do not appreciably inhibit the coagulation of blood. This is also true of cellulose hydrogen glycollate $(C_6H_9O_4{\cdot}O{\cdot}CH_2{\cdot}CO_2H)_n$ and cellulose hydrogen β-hydroxyethanesulphonate $(C_6H_9O_4{\cdot}O{\cdot}[CH_2]_2{\cdot}SO_3Na)_n$ and of the hydrogen polysulphate of the simpler carbohydrates, *e.g.*, β-glucosan hydrogen polysulphate. Relatively powerful inhibiting action is shown by the hydrogen polysulphates of several polysaccharides, in particular by chondroitin and cellulose hydrogen sulphates. The latter substances are, however, very poisonous. The possibility that this effect is due to hydrolysis with separation of the insol. polysaccharide in the organism is supported by the observation that Na cellulose disulphate glycollate $(CO_2Na{\cdot}CH_2{\cdot}O{\cdot}C_6H_7O_2[O{\cdot}SO_3Na]_2)_n$ is much less toxic than cellulose hydrogen polysulphate but retains its inhibiting action. Chondroitin sulphate polysulphate, cellulose hydrogen glycollate sulphate, and cellulose β-hydroxyethanesulphonate polysulphate are the most active synthetic compounds of the heparin type with apparently the most favourable therapeutic ratio; the effect is 4—6 times smaller and the toxicity 3—4 times greater than with heparin. With regard to duration of action, the synthetic products are superior to heparin. The η of cellulose glycollate polysulphate obtained from non-pptd. cellulose is greater than that from re-pptd. material but the preps. differ little in toxicity and restricting action. The η of chondroitin sulphate polysulphate is very similar to that of heparin. The marked differences in action and toxicity cannot therefore be due to differences in η or mol. size and must be attributed to different structural influences. H. W.

Kinetics of blood coagulation. R. G. Legler (*Helv. Chim. Acta*, 1943, **26**, 1512—1552).—From the experimental results of various authors it is shown that the equation $t_p = kc_p^{-a}$ expresses closely the relation between prothrombin concn. (c_p) and prothrombin time (t_p); k and a are consts. and the prothrombin content is that determined by Quick's method. Since the graphic representation of the logarithmic form of the equation is a straight line, it offers a possibility of obtaining "standard plasma dilution curves" since it is only necessary to determine two vals. of t_p at different concns. Extrapolations are possible. k, as parameter magnitude, is a relative const. which can have very different vals. according to mass units etc. and is only const. for definite experimental conditions; it increases with decreasing prothrombin content. The dependence of k' on dilution v is given by the equation $k' = kv^a$. a is largely independent of the prothrombin content of the plasma and of other experimental conditions; it varies between 0·4 and 1 (usually 0·6—0·8). Addition of heparin increases a and k. Qualitatively, it is therefore possible in a simple manner to decide whether increase in t_p is caused by a deficit in prothrombin or by the presence of excess of an inhibitor. A "heparin–antithrombin error" can thus be excluded and the difference in mechanism of a dicoumarin inhibition and a heparin inhibition can be established. A simple clinical method of determining heparin simultaneously with prothrombin is described. The expression "coagulating activity = 100 × t_p of normal plasma/t_p of pathological plasma" gives high results when prothrombin concns. are below normal and vice versa. It can only be applied when the coagulation times do not vary considerably from the normal. The accuracy of Fischer's equation (A., 1935, 1002), $v = 1/t = kc^a$ (v = velocity and t = time of coagulation; c = concn. of coagulant, a and k = consts.) is confirmed in the case of thrombokinase. The relationship between concn. of inhibitor and time of coagulation is expressed by $t_h - t_0 = kc_h^a$ (t_h = time of coagulation after addition of heparin or hirudin of concn. c_h; t_0 = time of coagulation without addition of inhibitor; k and a are consts.). The relationship between c and t is expressed by the equation $t_i = kc_i^{-a}$, analogous to the expression for prothrombin. The same relationship exists between ninhydrin concn. and time of coagulation of fibrinogen as between thrombin concn. and time of coagulation. A possibility of detecting still smaller amounts of antithrombin, based on Quick's method, is suggested. H. W.

Hæmophilia and blood-prothrombin content; vitamin-*K* determination and liver function test. E. Hecht (*Schweiz. med. Wschr.*, 1943, **73**, 14—17).—Normal blood-prothrombin concns. (89—121% of the average concn. in normal bloods) were found in 8 patients suffering from sporadic or hereditary hæmophilia. 3 cases of hereditary hæmophilia with low blood-prothrombin vals. are reported. They responded well to natural vitamin-*K* but not synthetic -*K* preps. A. S.

Vitamin-*K* and prothrombin levels: influence of age. Anti-hæmorrhagic vitamin effect of honey.—See A., 1944, III, 49.

Significance of variations of prothrombin activity of dilute plasma. C. E. Brambel and F. F. Loker (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 218—220).—In post-operative or parturient patients clotting time (Quick's method) is normal for undiluted plasma, but shows a reduction from control vals. if diluted 1 : 8. V. J. W.

Production of hypoprothrombinæmia and hypocoagulability of blood with salicylates. O. O. Meyer and B. Howard (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 234—237).—Daily administration by mouth of 20—80 grains of acetylsalicylic acid or Na salicylate caused in 13 subjects an increase in coagulation time. This was prevented by simultaneous administration of 2 mg. 3 times daily of 2-methyl-1 : 4-naphthaquinone. V. J. W.

Prothrombinopenic effect of salicylate in man. S. Shapiro, M. H. Redish, and H. A. Campbell (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 251—254).—Prothrombin determinations were made on 1 : 8 dilutions of plasma. Results agree with those of Meyer and Howard (preceding abstract). V. J. W.

Sickling trait in a white adult associated with hæmolytic anæmia, endocarditis, and malignancy. L. Greenwald, J. B. Spielholz, and J. Litwins (*Amer. J. med. Sci.*, 1943, **206**, 158—168).—A case report. C. J. C. B.

Sickle cell anæmia in Indian woman. L. Berk and G. M. Bull (*Clin. Proc.*, 1943, **2**, 147—152).—A case is described. There were 2 hæmolytic crises following blood transfusion; in 1 the hæmolysis affected the donor's blood only; in the 2nd, while the transfused blood was still diminishing in quantity, the patient's blood underwent hæmolysis. P. C. W.

Effect of oxygen, soya-bean lecithin, carbamylcholine, and furfuryltrimethylammonium iodide on experimental polycythæmia. J. E. Davis (*J. Pharm. Exp. Ther.*, 1943, **79**, 37—41).—In splenectomised and normal dogs, in which polycythæmia was induced by pituitrin injections, the red-cell count was reduced by exposure to 100% O_2 for 1 hr. daily, by 3 g. daily by mouth of soya-bean lecithin, by injections of 0·1 mg. daily of carbamylcholine, or by injections of furfuryltrimethylammonium iodide. White-cell count was not affected. V. J. W.

Mechanism of erythræmia: erythræmia resulting from traumatic shock in dogs and from injections of adrenaline into human beings and dogs. R. D. Taylor and I. H. Page (*Arch. Surg., Chicago*, 1943, **47**, 59—68).—Approx. 65% of the rise in hæmatocrit index in tourniquet shock and 50% of that in shock induced by intestinal manipulation was accounted for by splenic contraction and discharge of highly cellular blood from the spleen. This portion of erythræmia, which occurred during the first 1—2 hr., was eliminated by splenectomy and partly by infusion of 3-piperidomethylbenzdioxan. 35% of the rise in hæmatocrit index in tourniquet shock was prevented by applying plaster casts to the traumatised hind limbs. Adrenaline produced a slight rise in the hæmatocrit index in 6 normal persons but not in 6 splenectomised persons. The rise was one third of that in dogs. F. S.

Radioactive iron absorption by gastro-intestinal tract. Influence of anæmia, anoxia, and antecedent feeding. Distribution in growing dogs. P. F. Hahn, W. F. Bale, J. F. Ross, W. M. Balfour, and G. H. Whipple (*J. Exp. Med.*, 1943, **78**, 169—188).—The normal non-anæmic dog absorbs little Fe from the gastro-intestinal mucosa; 5—15 times the normal Fe absorption occurs in chronic anæmia

due to blood loss. Sudden production of severe anæmia (within 24 hr.) does not significantly increase immediate Fe absorption; the body-Fe stores are first depleted to form new hæmoglobin and Fe absorption is increased within 7 days. Anoxæmia (50% normal O_2 concn.) for 48 hr. does not significantly enhance Fe absorption. Ordinary doses of Fe given 1—6 hr. before radioactive Fe cause "mucosa block" (intake of radio-Fe diminished); Fe given intravenously some days before the labelled Fe does not inhibit Fe absorption. Plasma-radio-Fe absorption curves vary greatly; they show sharp peaks in 1—2 hr. when Fe was given in an empty stomach and in 6 hr. when given with food; the plasma-Fe returns to normal within 6—12 hr. Gastric, duodenal, or jejunal pouches show very active Fe absorption; the plasma concn. may reach a max. before the Fe is removed from the gastric pouch. Spleen, heart, upper gastro-intestinal tract, bone marrow, and pancreas in growing pups showed more radio-Fe than anticipated, cardiac muscle containing 3 times as much as voluntary muscle. Physiological mucosal saturation with Fe may explain acceptance or refusal of absorption of ingested Fe; desaturation occurs in a matter of days; saturation may occur within 1—2 hr. A. S.

Local myelopoiesis in myeloid leukæmia. W. Schiller (*Amer. J. Path.*, 1943, **19**, 809—829).—A case report in which the liver showed gradual transformation of Kuppfer cells into eosinophil myelocytes which entered the blood of the sinusoids as eosinophil granulocytes. (9 photomicrographs.) C. J. C. B.

Cellular changes in lymph nodes of experimental mice with special reference to plasma cell development. L. D. Parsons (*J. Path. Bact.*, 1943, **55**, 397—407).—A generalised plasmacytosis occurred in the lymph glands of *X*-irradiated and tumour-bearing mice. The fixed reticulum cells proliferating in these lymph nodes are suggested as the direct precursors of the plasma cells. (17 photomicrographs.) C. J. C. B.

Acute infectious lymphocytosis. P. A. Duncan (*Amer. J. Dis. Child.*, 1943, **66**, 267—272).—A case report. C. J. C. B.

Antigenic properties of native and regenerated horse serum-albumin. J. O. Erickson and H. Neurath (*J. Exp. Med.*, 1943, **78**, 1—8).—Cryst. horse serum-albumin, fraction A, was prepared, using the method of Kekwick, denatured by 8M-urea solutions, and regenerated. The mean antigenic activity of the regenerated protein was less than 10% of that of the native although both antigens were immunologically equiv. The immunisation experiments were carried out in rabbits. A. S.

Chemical basis of injury in inflammation. V. Menkin (*Arch. Path.*, 1943, **36**, 269—288).—Inflammatory exudates from man or dogs contain a substance which injures the skin of rabbits and dogs. This substance produces locally acute inflammation with superficial necrosis and lymphatic blockade. The active agent is either the euglobulin of the exudate or is associated with it. Leucotaxin and the leucocytosis-promoting factor do not induce severe injury when introduced into the skin of rabbits. This potent injurious euglobulin fraction of exudate is termed necrosin. Necrosin is absent from normal non-hæmolysed serum, but is present in the serum of an animal with acute pleural inflammation. The pseudoglobulin and albumin fractions of exudate do not cause tissue reaction. Necrosin does not depress the blood pressure of the cat. Its intravenous injection in dogs is followed by leucopenia, pyrexia, and damage to the liver and kidneys. The leucopenia is eventually followed by leucocytosis. C. J. C. B.

Blood-diastase in mumps. J. P. Murphy, G. S. Bozalis, and E. J. Bieri (*Amer. J. Dis. Child.*, 1943, **66**, 264—266).—Blood-diastase is increased in mumps; in 58 determinations on 35 patients only 7 vals. were below 200 units (normal 80—150). C. J. C. B.

Reactions in blood and organs of dogs on intravenous injection of solution of glycogen. W. C. Hueper (*Arch. Path.*, 1943, **36**, 381—387).—A 5% solution of glycogen (10—60 c.c.) injected intravenously into dogs in single or in repeated doses caused primary transitory leucopenia, secondary leucocytosis, anæmia, accelerated erythrocytic sedimentation, and increased clotting time. The livers show hydropic swelling and fatty infiltration of the liver cells and a negligible amount of glycogen. The aorta and the myocardial and renal arteries exhibit intimal and medial lesions of a proliferative and degenerative nature. (5 photomicrographs.) C. J. C. B.

Formation of phospholipin by the hepatectomised dog as measured with radioactive phosphorus. I. Site of formation of plasma-phospholipins.—See A., 1944, III, 51.

Serum-cholesterol values for infants and children. R. G. Hodges, W. M. Sperry, and D. H. Andersen (*Amer. J. Dis. Child.*, 1943, **65**, 858—867).—Serum-cholesterol in 417 normal persons 1 month—14 years of age showed no systematic trend with advancing age; the ratio of combined to free cholesterol in 344 instances also showed no significant trend. The mean val. for the total cholesterol was 205·7±38 mg.-% and for the ratio 2·58±0·29. In 78 patients with wasting total serum-cholesterol fell (mean val. 123·0±29 mg.-%), with a return toward normal during recovery of wt. The mean ratio of combined to free cholesterol fell to 2·15±0·36. The falls are attributed to undiscovered infection. In 18 patients with severe uncomplicated anæmia the mean val. for total cholesterol was 126·8±40 mg.-% and for the ratio of combined to free cholesterol, 2·32±0·26. In 25 patients with infection, 9 with positive blood cultures, 10 with acute catarrhal jaundice, and 15 with atresia of the bile ducts, the ratio fell slightly, owing to acute damage to the hepatic cells. In 11 patients with non-obstructive cirrhosis total cholesterol and the ratio were normal, except in the presence of some secondary complication. C. J. C. B.

VI.—VASCULAR SYSTEM.

Effect of certain drugs on properties of human atrioventricular node. G. Decherd and A. Ruskin (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 215—217).—In a patient with reciprocal rhythm, the refractory period of the node (the retrograde conduction time below which reciprocal stimulation did not occur, as given by the *RP* interval) was increased to a degree proportional to digitalis saturation. Rate and refractory period of the ventricle were not affected. Prostigmine slightly and quinidine markedly prolonged the refractory period. Prostigmine and adrenaline slowed conduction, and neosynephrin quickened it, all effects being greater for retrograde than for forward conduction. V. J. W.

Influence of barium chloride and potassium chloride on cultures of chick embryo myocardium and somatic muscle.—See A., 1944, III, 4.

Cardiovascular response to neosynephrine in oil.—See A., 1944, III, 57.

Pharmacology of crab heart.—See A., 1944, III, 57.

Diagnosis of congenital heart disease. M. L. Sussman, A. Grishman, and M. F. Steinberg (*Amer. J. Dis. Child.*, 1943, **65**, 922—936).—A general review. C. J. C. B.

Early radiological recognition of mitral valve disease. B. S. Epstein (*J. Pediat.*, 1943, **23**, 381—390).—The earliest enlargement of the heart due to mitral valve disease is left auricular enlargement which can best be diagnosed fluoroscopically by examining the patient in the right anterior oblique projection after administering a Ba bolus. Even a slight degree of posterior deviation of the œsophagus is significant and may occur long before the cardiac outline is otherwise altered. C. J. C. B.

Congenital idiopathic cardiac hypertrophy. A. N. Rosen (*Amer. J. Dis. Child.*, 1943, **65**, 905—908).—A case report. (2 photomicrographs.) C. J. C. B.

Quantitation of changes of vasomotor tone. Change of vasomotor tone as cause of Traube-Hering waves. H. D. Green, R. N. Lewis, and N. D. Nickerson (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 228—229).—Change of vasomotor tone can be best expressed as the ratio of arterio-venous pressure difference in vasoconstriction to this difference in vasodilatation with the same venous flow. In an experiment where a dog's hind limb was perfused under const. pressure, this ratio varied from 1 to 1·7 in a 17-sec. cycle. V. J. W.

Influence of spinal and regional anæsthesia on vasoconstriction and vasodilatation of small peripheral blood vessels. C. Neumann, E. A. Sellers, E. A. Rovenstine, A. E. Cohn, and C. Rule (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 159—160).—Plethysmographic records were made of fingers and toes before and during spinal anæsthesia, which was found to cause increased pulsations in the toes and compensatory decreased pulsations in the fingers. The large alpha waves, at 5—7 per min., became decreased in both regions. V. J. W.

Method for study of circulation time through vascular system. M. H. Nathanson and R. Merliss (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 261—262).—Intravenous injection of fluorescein causes fluorescence of the conjunctiva and of a histamine wheal of the skin. Circulation time between arm and eye, or arm and any other skin area, can thus be timed. V. J. W.

Evaluation of ratio of aortic rigidity to peripheral resistance. H. J. Ralston, O. E. Guttentag, and E. Ogden (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 154—156).—This ratio (E/W of Wezler and Böger) is given by pulse rate per min. × (systolic pressure − diastolic pressure) ÷ (30 × mean arterial pressure), and is independent of stroke vol. Vals. calc. after administration of adrenaline or pitressin, or after pyrotherapy or exercise, accord with the expected physiological results of these procedures. V. J. W.

Physiological studies on five patients following ligation of inferior vena cava. G. E. Burch and T. Winsor (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 135—138).—The inferior vena cava was tied in 5 female patients of 21—67 years of age. Good circulatory compensation occurred in all 5 but they showed increased pressure in the dorsal veins of the foot. 4 of them had permanent œdema, but rate of water loss from skin of legs and feet was normal by the 8th day. V. J. W.

Prognosis of untreated patent ductus arteriosus and the results of surgical intervention. Clinical series of 50 cases and analysis of 139 operations. M. J. Shapiro and A. Keys (*Amer. J. med. Sci.*, 1943, **206**, 174—183).—Most patients with this defect suffered no serious disability or restriction of activity during most of their lives, but their life expectation was greatly shortened by the continued presence of the defect. Ligation of the uninfected ductus can be made with a mortality of less than 10%. Ligation of the ductus in the presence of subacute bacterial endarteritis cured 20 of 33 cases; most of these were followed, however, for months only. Most patients with patent ductus arteriosus should be operated on for ligation; there was no evidence of recanalisation. C. J. C. B.

Incomplete rupture of aorta, not followed by dissecting aneurysm. F. Wenger (*Arch. Path.*, 1943, **36**, 253—261). C. J. C. B.

Circulatory adjustments in high spinal anæsthesia.—See A., 1944, III, 58.

Circulatory effects from pentothal sodium administered soon after hæmorrhage.—See A., 1944, III, 58.

Croton oil shock. Shock produced by intra-arterial croton oil injection.—See A., 1944, III, 61.

Selective permeability of skin capillaries. U. Friedemann (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 139—141).—In the frog the cerebral capillaries are permeable to both acid and basic dyes; in rabbit and guinea-pig they are permeable to basic dyes only, whilst those of the skin are permeable only to acid dyes. V. J. W.

Experimental hypertension. XXI. Purification of renin. Y. J. Katz and H. Goldblatt (*J. Exp. Med.*, 1943, **78**, 67—74).—Finely-ground fresh hog kidney extracted with water and adjusted to pH 7·8 with NaOH, and then treated with trichloroacetic acid and acetone, gives a good yield of renin (15 units per mg. N) suitable for further purification. By treatment with ethyl alcohol and $(NH_4)_2SO_4$ a prep. was obtained containing 130 units per mg. N. This prep. was free of depressor substances and of hypertensinase. It forms a heat-stable angiotonin when incubated with dog or beef serum (not with human serum); on intravenous injection, it produces a slow and prolonged rise in blood pressure; repeated injection in chloralosed cats has a tachyphylactic effect; there is no reversal of the pressor effect of renin in a cat previously treated with 3-piperidomethylbenzdioxan (933 F); the pressor effect was not potentiated by cocaine; the pressor effect was abolished if the renin, in 1% NaCl solution at pH 7·4, was heated at 60° for 5 min.; it is non-dialysable; it is insol. in ½-saturated $(NH_4)_2SO_4$, 25% alcohol, and 50% acetone; it gives the biuret reaction; at pH 7·6, it migrates to the anode in the Tiselius electrophoresis apparatus; 2 electrophoresis studies at pH 7·6, PO_4''' buffer, 0·2 ionic strength, and 4·1 v. per cm., showed a single peak in the schlieren diagram after over 50 min. of electrophoresis. It is concluded that the purified renin is a protein. A. S.

Hypotension and loss of pressor response to angiotonin as result of trauma to central nervous system and severe hæmorrhage. I. H. Page (*J. Exp. Med.*, 1943, **78**, 41—58).—Injury to the central nervous system in dogs and cats produces hypotension and loss of response to angiotonin; this also occurred after extirpation of both kidneys and adrenal glands. Refractoriness to angiotonin does not develop when the nervous system is quickly and expertly destroyed or deeply depressed by widespread injection into it of a local anæsthetic. Responsiveness to angiotonin is temporarily restored by glycine and methyl*iso*thiourea. Adrenal cortex hormone, adrenaline, pituitrin, Ca gluconate, Na glycerophosphate, prostigmine, hypertonic glucose, acacia, paredrine, ephedrine, acute O_2 deficiency, ascorbic acid, yeast-nucleic acid, benzedrine, adenosine, dichloroindophenol, cystine hydrochloride, atropine, tyrosine, and glycollic acid were ineffective. Undiminished pressor responses were obtained to adrenaline, tyramine, and methyl*iso*thiourea during complete angiotonin refractoriness. After the syndrome has developed elevation of the blood pressure by whole blood or gum acacia transfusion does not restore the responsiveness to angiotonin. The angiotonin refractoriness and hypotension following severe hæmorrhage was also observed after nephrectomy and adrenalectomy. A. S.

Kinetic analysis of renin–angiotonin pressor system and standardisation of renin and angiotonase. A. A. Plentl and I. H. Page (*J. Exp. Med.*, 1943, **78**, 367—368).—The formation and destruction of angiotonin consists of 2 consecutive reactions which follow the laws of first-order kinetics. Each reaction was studied separately; the reaction coeff. was proportional to the enzyme concn. The reaction of a mixture of renin and angiotonin with the α-globulin serum fraction (rapid increase followed by a slow decline in angiotonin concn.) was found experimentally to correspond closely to the calc. theoretical vals. The curve obtained explains the characteristic pressor response to intravenous injections of renin. An accurate method for the determination of renin in the presence of angiotonase is described and the mathematical basis for the various statements is given. A. S.

Treatment of experimental renal hypertension with vitamin-*A* concentrates. G. E. Wakerlin and W. G. Moss (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 149—152).—Striking therapeutic results followed administration of one sample of a vitamin-*A* concentrate, but other samples, prepared by the same method, were without effect. V. J. W.

Prognosis in hypertension. R. M. Daley, H. E. Ungerleider, and R. S. Gubner (*J. Amer. Med. Assoc.*, 1943, **121**, 383—389).—A review. C. A. K.

VII.—RESPIRATION AND BLOOD GASES.

Rôle of hyperventilation in production, diagnosis, and treatment of certain anxiety symptoms. E. A. Stead, jun., and J. V. Warren (*Amer. J. med. Sci.*, 1943, **206**, 183—189).—Any of the cerebral symptoms produced by voluntary hyperventilation may appear in the anxious patient who unknowingly hyperventilates. Production of these symptoms by voluntary overbreathing is not only of diagnostic aid, but is useful in demonstrating to the patient that his symptoms have a physiological rather than a pathological basis. Observation of the effects of voluntary hyperventilation should be a routine procedure in the examination of patients complaining of fainting, giddiness, or a far-away feeling, and patients with breathlessness, particularly those with cardiac disease without evidence of congestive failure. C. J. C. B.

Lowest barometric pressure compatible with life in an atmosphere of 100% oxygen. H. F. Hallman (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 221—222).—Respiratory failure occurs in rats in a closed chamber containing soda–lime and supplied with pure O_2 when barometric pressure reaches 60—75 mm. Hg (average 65). If pressure is maintained for 20 min. at 75—90 mm. Hg failure occurs when it is lowered to 50—70 mm. (average 60 mm.). V. J. W.

Postoperative pulmonary collapse in childhood. C. J. Molony (*Amer. J. Dis. Child.*, 1943, **66**, 280—301).—21 cases of postoperative atelectasis in children are described. C. J. C. B.

VIII.—MUSCLE.

Effect of hormones on contraction of striated muscle and on choline-esterase activity. C. Torda (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 121—125).—Sensitivity of frog's rectus to acetylcholine is increased and choline-esterase activity is decreased by follicle-stimulating hormone, progesterone, œstrogens, testosterone, and the pressor fraction of pituitary extract. These agents, as well as deoxycorticosterone and cholesterol, also increase sensitivity to K. The oxytocic pituitary fraction has no effect. V. J. W.

Comparative morphology of muscle striations and of periodic precipitation in capillary tubes. E. J. Carey (*Biodynamica*, 1941, **3**, 251—319).—Various types of periodic pptns. were produced in capillary tubes corresponding to various muscle striations. The character of muscle striations (fineness, spacing, etc.) vary in different fibres from the same muscle and even along the same fibres and the striations may disappear altogether. The patterns of muscle striations are regarded as transitory structures. L. G. G. W.

Reversible conversion of myoglobin into cytochrome. E. Bechtold and K. Pfeilsticker (*Biochem. Z.*, 1941, **307**, 194—206).—Myoglobin is reversibly converted into cytochrome by N_2H_4,H_2O or by pyridine in presence of a reducing agent at a pH equal to or greater than 7. Nicotinamide is also effective, but conversion is slower. This myoglobin-cytochrome is converted into oxymyoglobin by O_2, whilst with CO it forms CO-myoglobin. Comparison of the absorption curves and spectra of cytochrome prepared from myoglobin shows that it is similar to native cytochrome. Denatured myoglobin is not converted into cytochrome by N_2H_4,H_2O or pyridine, but forms myochromogen. The latter is slowly converted by N_2H_4,H_2O into another pigment, the absorption bands of which are approx. 10 mμ. nearer the ultra-violet end of the spectrum, and they occupy the same positions as those of cytochrome-*c*. Neither this pigment nor myochromogen can be converted into oxymyoglobin. Determination of redox potentials of myoglobin-cytochrome solutions in presence and absence of O_2 shows that the rate of transfer of O_2 with cytochrome is much greater than with myoglobin. J. N. A.

Muscle contraction and solubility of muscle-proteins. F. Kamp (*Biochem. Z.*, 1941, **307**, 226—244).—During muscle contraction there are changes in form and solubility; the changes in solubility and contraction become smaller during fatigue. In living animals, both changes are far-reaching in a few sec. aërobically and are completely reversible in a few min. The change of solubility and of contractibility is due to a colloidal change in the muscle-protein myosin. The decrease in solubility of muscle pulp and the decrease in solubility due to fatigue are due to similar causes. The solubility effect does not depend on the metabolically controlled change of ion stability of muscle nor on pH. The decrease in solubility in

old muscle pulp is retarded by dilution and can eventually be abolished. J. N. A.

Glycogen of native muscle.—See A., 1944, II, 39.

Changes in thymus with special reference to myasthenia gravis. F. Homburger (*Arch. Path.*, 1943, **36**, 371—380).—In 6000 autopsies, 14 instances of thymic enlargement in adults were encountered. There were 3 cases of carcinoma, 3 of persistence of the thymic gland in association with thyrotoxicosis, 6 of unknown origin, and 2 cases of non-cancerous thymic tumour associated with myasthenia gravis. Thymic epithelial metaplasia was moderate in all patients with thyrotoxicosis, was rare with incidental enlargement of the thymus, but was striking and accompanied by extreme scarcity of the corpuscles of Hassall in the 2 thymic tumours associated with myasthenia gravis. (10 photomicrographs.) C. J. C. B.

Acetylcholine in chick embryo.—See A., 1944, III, 3.

Influence of barium chloride and potassium chloride on cultures of chick embryo myocardium and somatic muscle.—See A., 1944, III, 4.

IX.—NERVOUS SYSTEM.

Peripheral neuroglia. II. Neuroglia of sensory ganglia.—See A., 1944, III, 5.

Acetylcholine in chick embryo. I. Variations in course of development of striated muscle and brain.—See A., 1944, III, 3.

Plasma clot suture of nerves. I. M. Tarlov, C. Denslow, S. Swaz, and D. Pineles (*Arch. Surg., Chicago*, 1943, **47**, 44—58).—A rubber mould for suturing nerve grafts and a combined thread and plasma clot technique for suturing nerves under tension are described. (2 photomicrographs.) F. S.

Pathologic alterations in surface relationship and morphology at human synapse. J. Minckler (*Amer. J. Path.*, 1942, **18**, 1061—1099).—The spinal cords were removed at autopsy by the Kernohan method and the sections treated with Cajal's $AgNO_3$ modification 4; eosin-hæmatoxylin, cresyl-violet, Marchi, Weigert, and Masson's trichrome stains were used. Normal cellular surface areas in the various columns varied from 510 to 56,479 μ^2. Cell processes of the lateral groups of the final common path cells contribute 81% of the total surface area. The surface area of a cell of this group is 4 times that of a cell of equal size of the dorsal nucleus. 18% of the cells of the somatic efferent groups account for over 50% of the total synaptic contact surface in the cord. Pathological processes may increase or decrease the no. of terminals in the spinal cord; in evaluating such alterations the age of the individual must be considered. Approx. 12% more of the granular forms and correspondingly fewer regular forms occurred in the various neuropathological cases. The total average % for the entire series were 31 granular and 69% regular boutons of 40,660 counted around 9700 cell sections; similar findings were obtained in the aged. Apart from granular forms, vesiculation, particularly of fibrillated bulbs, and swelling and paling of neurofibres were conspicuous. Scarcely any boutons were demonstrable in 2 cases of tetanus. Alterations in no. and morphology of the boutons varied with the duration of the pathological processes. Where irritative lesions were extramedullary and confined to the entering fibres in acute cases the terminals adjacent to the cells of the dorsal nuclei were morphologically altered but not diminished in no.; in subacute cases with intramedullary pathology the no. of terminals was diminished with the same proportion of remaining terminals altered morphologically. In 3 cases of parenchymatous cortical cerebellar atrophy Purkinje cells disappeared with persistence of basket terminals and fewer boutons ending around the dentate nucleus cells. Axon reaction was absent around cells of the posterolateral group in the lumbar cord after leg amputation. There was no evidence of trans-synaptic degeneration. Individual case data are presented on findings in poliomyelitis, other type of inflammatory myelitis, meningitis, direct cord injury from trauma or tumour, cord synapses with cerebral lesions, toxic myelitis, inanitition, malnutrition and metabolic disturbances, and arteriosclerosis. A. S.

Anatomical basis of linguo-maxillary reflex. M. Blais, R. Genest, and E. Robillard (*Rev. Canad. Biol.*, 1943, **2**, 128—133).—The afferent pathway of the linguo-maxillary reflex in the dog runs in the maxillary and mandibular nerves; the efferent fibres run in the facial, mandibular, hypoglossal, and the first cervical nerves. The muscles involved are the digastric, geniohyoid, and sternohyoid muscles. A. S.

Effect of thymoxyethyldiethylamine on various pain thresholds with special reference to referred pain.—See A., 1944, III, 59.

Effect of opiates on pain threshold in post-addicts.—See A., 1944, III, 59.

Influence of spinal section on tissue permeability. F. Homburger (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 258—259).—After transection of the cord in the upper thoracic region in rabbits and a dog, subcutaneously injected India ink spread through the connective tissue more rapidly than in controls, in areas both above and below the level of transection. V. J. W.

Effect of vitamin-*E* therapy on central nervous system in amyotrophic lateral sclerosis. C. Davison (*Amer. J. Path.*, 1943, **19**, 883—893).—10 cases of amyotrophic lateral sclerosis were treated with vitamin-*E* and α-tocopherol; only one responded clinically. Histopathologically, however, in 6 of the intensely treated cases, the destruction of the myelin sheaths and axis cylinders was less intense than in the untreated cases. (15 photomicrographs.) C. J. C. B.

Representation of central foveæ and horizontal meridians in the visual radiation (radiatio optica) of human brain. Striate area of primates.—See A., 1944, III, 25.

Rôle of premotor cortex in human motor activity. J. Minckler and R. M. Klemme (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 264—265).—In a patient whose pre-motor cortex was excised for relief of limb tremor, the resultant degenerations showed that this region gives rise to bundles passing (1) to the pre-motor cortex of the opposite side, and (2) through the internal capsule to the thalamus, brain-stem nuclei, and cord. V. J. W.

Electro-encephalography on children. N. L. Low (*Amer. J. Dis. Child.*, 1943, **65**, 898—904).—A report on 73 electro-encephalograms made on 67 children gives a general idea of the definite val. of this procedure in determining the causes and types of convulsions in children. C. J. C. B.

Influence of various drugs on threshold for electrical convulsions. M. L. Tainter, E. G. Tainter, W. S. Lawrence, E. N. Neuru, R. W. Lackey, F. P. Luduena, H. B. Kirkland, jun., and R. I. Gonzalez (*J. Pharm. Exp. Ther.*, 1943, **79**, 42—54).—An a.c. was passed through the brain of an unanæsthetised rabbit by electrodes on the palate and cranial vault. The circuit contained a const. high resistance and voltage was controlled by a variable transformer. Epileptiform convulsions occurred when the current reached 20 ± 1 ma. This threshold was raised by the hypnotic drugs, and by cocaine, mescaline, and the sympathomimetic amines. It was lowered by picrotoxin. It was unaffected by morphine, and the results of the analeptic group were irregular. V. J. W.

Effect of striated muscle paralysis induced with erythroidine on electro-encephalogram. E. Girden (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 163—164).—Such paralysis in dog or monkey does not affect the electro-encephalogram provided that adequate artificial respiration is maintained. The contrary result obtained by Feitelberg and Pick in the frog (A., 1942, III, 805) is due to lack of O_2. V. J. W.

Electrical convulsion therapy. D. K. Henderson, H. Tod, and B. G. Daly (*Edinb. Med. J.*, 1943, **50**, 641—660).—A description is given of the technique (Solus-Bini apparatus) and of the types of reactions in 260 cases of mental disorder. In 128 depressional states 64% of the involutional group and 46% of "other depressions" recovered; 80% and 74% respectively improved. In schizophrenia of over 3 years' duration results were poor (29 cases) but in 68 "recent cases" 32% of women and 9% of men recovered and 24% and 38% respectively improved. Of 27 psychoneuroses 6 only were benefited (2 recovered) and in 8 patients with paranoid reactions 4 were improved. Electrical convulsion therapy is probably the treatment of choice in cases of depression. H. S.

Fatigue in neuropsychiatric patients [due to hypoglycæmia]. S. A. Portis and I. H. Zitman (*J. Amer. Med. Assoc.*, 1943, **121**, 569—573).—Fatigue in many neuropsychiatric patients is attributed to hypoglycæmia due to hyperinsulinism produced by overstimulation of the right vagus from emotional reactions. Injection of atropine restores blood-sugar curves to normal. C. A. K.

Epileptiform attacks [? due to hypoglycæmia] with calcified adrenals. W. Lintz (*J. Amer. Med. Assoc.*, 1943, **121**, 505—506).—A boy with epileptiform convulsions for many years showed calcified adrenals on *X*-ray. Ingestion of 100 g. of glucose did not change the fasting blood-sugar, and the attacks were attributed to hypoglycæmia. Frequent glucose administration stopped the attacks. C. A. K.

Severe injury to kidneys and brain following sulphathiazole administration.—See A., 1944, III, 55.

Effect of sulphanilamides on cerebral and neuromuscular actions.—See A., 1944, III, 56.

Cerebral tumour in a dog resembling human medulloblastoma.—See A., 1944, III, 39.

Mental disturbances following nitrous oxide anæsthesia.—See A., 1944, III, 58.

Pyruvic acid metabolism in brain.—See A., 1944, III, 50.

Healing process in wounds of brain. A. H. Baggenstoss, J. W. Kernohan, and J. F. Drapiewski (*Amer. J. clin. Path.*, 1943, **13**, 333—348).—Wounds of 7 days' duration or less in human brain showed a central zone of hæmorrhage and necrosis and a peripheral zone of œdema and perivascular hæmorrhages. Degenerative changes predominated in both zones but proliferation of endothelial

cells of the capillaries and small blood vessels appeared on the 4th and was well developed by the 7th day. Between the 7th and 10th day, the zone of œdema was transformed into a zone of capillaries and proliferating endothelial cells and fibroblasts and a 3rd zone, consisting of hypertrophied astrocytes peripheral to the zone of capillaries, appeared. From the 12th day onward, the process of organisation continued; gradual absorption of the necrotic debris and its partial replacement by a network of capillaries and fibroblasts occurred. Numerous compound granular corpuscles were present between the capillaries and the reticular fibres. After a month, fibroblastic proliferation subsided but connective tissue fibrils were more numerous than before. After 6 months' duration complete repair had not yet taken place. In older wounds complete closure of the defect may or may not take place, depending on the extent of the original injury. Astrocytes play a minor rôle in the reparative process and participation of these cells in scar formation was not observed before 6 months' duration. The compound granular corpuscles do not arise from microglia but from capillary endothelial cells, adventitial cells of the larger blood vessels, and blood mononuclear cells. (16 photomicrographs.) C. J. C. B.

Bacillus pyocyaneus **meningitis following pneumoencephalography.** W. Z. Kerman, M. A. Perlstein, and A. Levinson (*Amer. J. Dis. Child.*, 1943, **65**, 912—915).—A fatal case report. C. J. C. B.

Hypertensive disease of brain. I. M. Scheinker (*Arch. Path.*, 1943, **36**, 289—296).—The characteristic histological features of hypertensive encephalopathy observed in 25 cases are reported; 2 cases are described in detail. Typical vascular alterations, confined to the arterioles and capillaries, were observed in all cases and consisted of hyaline degeneration and fibrotic thickening of the walls associated with narrowing obliteration of the lumen. Changes in the parenchyma of the brain consisted of diffusely scattered, circumscribed small foci of old and recent softening, perivascular hæmorrhage, massive hæmorrhage, and diffuse or localised œdema of the brain. (6 photomicrographs.) C. J. C. B.

Changes in cerebrospinal fluid following spinal anæsthesia. B. E. Konwaler (*Amer. J. clin. Path.*, 1943, **13**, 378—380).—No change in the c.s.f. was found in 31 patients, 1, 2, and 3 weeks after spinal anæsthesia. The following tests were performed: sugar, total protein, chlorides, cell count, colloidal Au, Takata–Ara, globulin, and Kahn. C. J. C. B.

Sympathetic anæsthesia in labour. H. B. Shumacker, C. P. Manahan, and L. M. Hellman (*Amer. J. Obstet. Gynec.*, 1943, **45**, 129).—Bilateral sympathetic block was established in 17 women in labour at various levels from the 11th thoracic to the 3rd lumbar. There was prompt relief of pain for up to 4 hr. in all cases. Pain recurred with deep descent of the head into the pelvis. There was no evidence of any effect on the course of labour or delivery. P. C. W.

X.—SENSE ORGANS.

Vocational training programme for the visually handicapped in Minneapolis public schools. K. F. Gruber (*Sight Saving Rev.*, 1943, **13**, 104—117).—A description of the general methods in use with satisfactory results illustrated by a few case histories. K. T.

Relation between body-size, walking activity, size of eyeballs, and the origin of social life in the primates. M. F. A. Montagu (*Nature*, 1943, **152**, 573—574).

Natural occurrence of riboflavin deficiency in eyes of dogs. T. D. Spies (*Science*, 1943, **98**, 369).—Inadequate nutrition produced weakness, refusal of food, and diarrhœa in dogs. Examination revealed the oral mucous membrane lesions characteristic of black-tongue; there was pronounced injection of the sclera and conjunctiva in both eyes similar to that seen in man. Injection of 150 mg. of nicotinamide resulted in a remarkable improvement. P. G.

Human eye worm. B. de Meillon and J. C. Gillespie (*S. Afr. Med. J.*, 1943, 5—6).—A female worm, probably *Filaria conjunctivæ* Addario, was successfully removed from the sub-conjunctival tissues just above the lower fornix of the right eye in a woman who was infected in Central Africa. F. S.

Measuring eye flash from arc welding. V. E. Kinsey, D. G. Cogan, and P. Drinker (*J. Amer. Med. Assoc.*, 1943, **123**, 403—404).—Welders in shipyards exposed to ultra-violet light showed severe signs of conjunctivitis. A Ta photoelectric cell was used to measure the ultra-violet intensity necessary to produce min. ocular signs and symptoms in man, rabbit, and dog. Proposals for the safety of the workers are made. P. G.

Band keratitis. O. G. Morgan (*Proc. Roy. Soc. Med.*, 1943, **36**, 627).—Case report. This condition goes more deeply than the epithelium and iridectomy is considered the most satisfactory treatment. P. G.

Causes of senile miosis and rigidity of pupil. S. Larsson and G. Österlund (*Acta Ophthal.*, 1943, **21**, 1—25).—A report of the histological examination of iris tissue taken from 14 cases operated on for senile cataract. All the irides showed deficient powers of dilatation ranging from a capacity of 7—8 mm. to complete immobility, making a progressive series. The age of the patients varied from 69 to 85 years. The results of the investigation are interpreted as showing that the primary change leading to pupil immobility is arteriosclerosis of the iris vessels giving rise to subsequent muscular degeneration and hyalinisation of the iris stroma. K. T.

Influence of liver therapy on uveal tract disease. R. D. Barnard (*Eye, Ear, Throat Month.*, 1943, **22**, 381—390).—Observations on over 100 patients spread over 2 years provided evidence that the parenteral administration of crude liver extracts was beneficial in many cases in which the primary lesion was a degeneration of the uveal tract. There was no indication that any sp. constituent of liver was involved or bore any especial relationship to the uveal tract. K. T.

Glaucoma after cataract operation. B. C. Sharma (*Indian J. Ophthal.*, 1943, **4**, 51—53).—Whereas glaucoma was never a complication after cataract operation if the conjunctival flap method was used, it occurred after 14 of 200 operations in which a plain corneal incision was made. Histological examination revealed that in all these cases the corneal epithelium had proliferated through the incision into the anterior chamber and across the filtration angle, thereby blocking the drainage of aqueous humour and causing glaucoma. K. T.

Bilateral buphthalmos with congenital anomalies of iris and subluxated lens. V. B. Purvis (*Proc. Roy. Soc. Med.*, 1943, **36**, 627).—Case report. There was no response to eserine therapy. Iridencleisis is proposed. P. G.

Indicator-yellow. A. C. Krause (*Amer. J. Physiol.*, 1943, **140**, 40—43).—Indicator-yellow is found after visual purple has been affected by light. About 10,000 retinæ were used for a fractionation with light petroleum. The first fraction contained pro-indicator-yellow and visual yellow. By alkaline hydrolysis indicator-yellow and a fatty acid were liberated. Light petroleum extracted the visual yellow from the alcoholic solution, leaving indicator-yellow to be extracted with ether. Indicator-yellow shows different properties from visual yellow. The spectral absorption curve shifts towards the longer λλ with the increase of acidity of the solution. P. G.

Ocular angiospasm. S. R. Gifford (*Trans. Amer. Acad. Ophth. Otol.*, 1943, **48**, 19—30).—A description of two eye diseases (central angiospastic retinopathy and periphlebitis retinæ) which are believed to be due to peripheral angiospasm. Several cases of both conditions are described; treatment for peripheral angiospasm was helpful in all cases. It is suggested that far too many eye conditions have been ascribed to angiospasm and uselessly treated with vasodilators. K. T.

Binocular focussing on repeating pattern. N. Henderson (*Nature*, 1943, **152**, 726).—Further investigations of Brewster's effect, viz., that if the eyes are focussed on a repeating pattern but converged on a point nearer or further, such that images of different units of the pattern fall on corresponding points of the retina, the pattern may then appear nearer or further than its true distance. The full effect was found only in 4 out of 8 subjects, who seem to rely more on convergence than accommodation in judging distance, and to depend to a great extent on the type of marker used for indicating the apparent distance of the image; a thread placed sagittally after the apparent distance had been estimated subjectively gave the most marked effect. K. J. W. C.

Peripheral visual acuity of 100 subjects. F. N. Low (*Amer. J. Physiol.*, 1943, **140**, 83—88).—Peripheral visual acuity is a very variable val. and an independent visual function. The poorer is the peripheral visual acuity for any point, the greater is the variation for that point. Evidence collected with this new test indicates that peripheral visual acuity can be trained. P. G.

Specification of foveal adaptation. P. Moon and D. E. Spencer (*J. Opt. Soc. Amer.*, 1943, **33**, 444—456).—The Holladay and Stiles–Crawford formulæ for the "equiv. background brightness" produced by glare sources are extended by calculation to cover various shapes, sizes, and colours of glare sources. K. J. W. C.

Theories of trichromatic vision. H. Hartridge (*Nature*, 1944, **153**, 45—46).—Trichromatic theories might postulate either three types of response by a single type of cone to light of different λλ or three different cone-types with different spectral sensitivities. Present evidence favours the latter view. K. J. W. C.

Mental maladjustment and colour vision. K. Dunlap (*Science*, 1943, **98**, 470—472).—On the basis of 12 cases of "mental maladjustment" it is suggested that a high proportion of such individuals are colour-blind. The standard tests for colour-blindness are criticised. E. N. W.

Influence of vestibular stimulation on fusion frequency of flicker. E. Simonson, M. S. Fox, and N. Enzer (*Arch. Otolaryngol.*, 1943, **38**, 245—251).—In 16 normal subjects tested, caloric stimulation pro-

duced a depression of the flicker fusion frequency which lasted after the nystagmus and dizziness had passed off. The same observations were made on 16 patients suffering from a post-concussion syndrome. In 8 of these the initial fusion frequency was markedly low compared with normal subjects but in all 14 caloric stimulation raised the val., the increase being about the same as the decrease found in the control subjects. The fact that only half the patients showed an abnormal fusion frequency while all reacted abnormally to caloric stimulation is explained by the suggestion that the fusion frequency is dependent on the condition of the visual pathway while the reactions to caloric stimulation also involve the pathways of the vestibular apparatus which is particularly sensitive to concussion. K. T.

Neurology in otolaryngology. H. Brunner (*Laryngscope*, 1943, **53**, 602—614; cf. A., 1943, III, 388).—A review of the literature of 1942—43 dealing with the neurology of the larynx, pharynx, nose, and ear (including labyrinth). K. T.

Congenital familial deaf-mutism in six children. C. H. Christoph (*Ann. Otol., etc., St. Louis*, 1943, **52**, 520—523).—The description of a family of nine between 15 years and 9 months of whom 5 certainly and 1 possibly (the youngest) are seriously but not completely deaf. All 5 have atrophic retracted drums and did not speak until about 6—7 years of age and all have defective speech. None suffered from any impairment of vestibular function. Neither parent has any family history of deafness. K. T.

Hearing aid from patient's point of view. W. Hughson and E. Thompson (*Arch. Otolaryngol.*, 1943, **38**, 252—260).—A report on the results of a questionnaire answered by 97 users of hearing aids inquiring into the extent to which these gave satisfaction. All the patients had been exceptionally carefully tested and fitted and 80% were satisfied with their aids as against 25% when cruder methods are used. K. T.

Simulation of deafness. W. E. Grove (*Ann. Otol., etc., St. Louis*, 1943, **52**, 573—580).—A description and explanation of some useful tests for unmasking consciously simulated total or partial deafness in one or both ears. K. T.

Therapy of deafness. L. Guggenheim (*Laryngoscope*, 1943, **53**, 571—588; cf. A., 1943, III, 805).—An analysis of the results of treatment of 36 children under 13 suffering from impaired hearing due to obstruction of the Eustachian tube. Treatment consisted of tubal dilatation often combined with removal of excess lymphoid tissue. The average improvement in hearing was 39·8 dcb. Four ears showed no improvement. K. T.

Use of radium in conduction deafness. G. E. Fisher (*Ann. Otol., etc., St. Louis*, 1943, **52**, 473—476).—45 cases of conduction deafness in which the orifices of the Eustachian tube were obstructed by hyerptrophied nasopharyngeal lymphoid tissue were treated with 2 g. of Ra applied for 1 min. to each side. The results were encouraging, all cases having had their hearing improved. 11 cases needed a second and 3 a third treatment. K. T.

Functional anatomy of Eustachian tube. C. S. Simkins (*Arch. Otolaryng.*, 1943, **58**, 476—484).—As a result of dissections as well as examination on the living subject, the following suggestions as to the mechanism of opening and closing of the Eustachian tube are put forward: the cartilage and spiral shape of the lumen of the tube tend to keep it collapsed; it is liable to be opened by movements which tend to release tension on the torus tubarius such as swallowing, elevating the soft palate, etc. The torus tubarius acts as a "flutter valve" actively closed by muscle tension (salpingo-palatinus and salpingopharyngeous) and passively opened by changes in air pressure either on the pharyngeal or the tympanic side. The tensor veli palatini muscle helps to hold the tube collapsed by pressing the laterotubal tissue into the lateral wall of the lumen. The levator veli palatini elevates the spiral of the cartilage and lumen, thus equalising the adjustments all along the lumen. K. T.

Quantitative tubal function. H. B. Perlman (*Arch. Otolaryngol.*, 1943, **58**, 453—465).—Quant. evaluation of the functioning of the Eustachian tube was obtained by means of an apparatus whereby the relative pressures on either side of the ear drum could be measured by recording changes in the intensity of a 60 c.p.s. tone. Control observations in a pressure chamber showed that this method could give accurate information about the pressures on either side of the drum. K. T.

Sound transmission through ear and its relation to sound injury. F. M. Grossman (*Ann. Otol., etc., St. Louis*, 1943, **52**, 666—674).—The tensor tympani produces a reflex contraction if the ear is subjected to a loud noise and this results in a reduced transmission of both high and low frequencies owing to a change in the impedance of the drum. The transmission of a band of middle frequencies is also reduced. The appearance of a tonal dip at around 4096 c.p.s. as a result of exposure to injurious noise is probably due to the fact that contraction of the tensor tympani does not give good protection against this part of the tonal spectrum. K. T.

Audiometric effect of voluntary contraction of tensor tympani muscles. H. D. Smith (*Arch. Otolaryngol.*, 1943, **38**, 369—372).—Contraction of the tensor tympani muscles in an individual who was able to do so at will produced a diminution of hearing for low tones. The bearing of this finding on the conventional interpretations of audiometric records is discussed. K. T.

Treatment of certain forms of deafness by benzyl cinnamate. J. Jacobson (*Arch. Otolaryngol.*, 1943, **38**, 365—368).—Beneficial results in reducing severe deafness were obtained in certain cases by intramuscular injections of benzyl cinnamate. It is thought that the treatment was most effective in cases of chronic catarrhal inflammatory lesions of the middle ear with conductive deafness and that this is because reabsorption of fluid is encouraged. K. T.

Responses to electrical stimulation of single sensory units of skin. G. H. Bishop (*J. Neurophysiol.*, 1943, **6**, 361—382).—Two different electrical stimulators have been designed, one for single and one for repetitive stimuli. The distribution of sensitivity over various regions for touch and prick shows characteristic patterns; spots of extreme sensitivity are surrounded by areas of lower sensitivity. Any area, from less than 2 mm. to more than 15 mm., may appear as a unit in the sense that any stimulus within it is referred to the same locus. Prick has a much lower threshold than touch, except on the balls of the fingers. Tactile endings associated with hair shafts can be differentiated from other tactile endings by the different sensory effects of suitable electrical stimulation. Itch without accompanying prick can be elicited by low-intensity, high-frequency stimulation of prick endings. Itch also follows as an after-effect of slowly repeated stimuli, each of which causes an initial sharp prick. The same sensory spot can give touch, prick, itch, or sharp pain, all below threshold for ordinary touch endings. P. G.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Prolongation of action of subcutaneously injected medicines [hormones] in man.—See A., 1944, III, 60.

Relation of endocrine system to regulation of calcium metabolism. I. L. Campbell and C. W. Turner (*Univ. Missouri Agric. Exp. Stat.*, 1942, *Res. Bull.* 352, 134 pp.).—The anatomical positions of the parathyroid glands are described in chicks, mice, rats, guinea-pigs, and goats. The wt. of the glands in normal rabbits, goats, and rats is recorded; the average wt. per unit body wt. decreased in that order. The glands are heavier in female rats than in males but not in the other two species. Ovariectomy had no effect on parathyroid wt. in rabbits. The wt. of the glands was increased during lactation, particularly in rabbits; the increase was diminished if the litter was reduced to 2 at birth. Removal of the parathyroid gland on one side in rabbits or rats causes compensatory hyperplasia of the contralateral gland. Parathyroidectomy in 2 goats produced lowering of the serum-Ca and death within 24 days without symptoms of tetany. The convulsions produced in mice by the intraperitoneal injection of 25% Na citrate could be prevented by injection of parathyroid extract (25—50 units) and this inhibition used as a method of assay. 2—3-day-old chicks were less sensitive to both citrate and parathyroid injections, and were unsuitable for assay purposes. No change in the blood-Ca was detected when 25 units of parathyroid extract were injected. Day-old chicks and mature rats were injected daily for 7 and 5 days with a crude extract of cattle pituitary; the extract represented a 70-fold concn. of the raw gland and contained large amounts of thyrotropin, gonadotropin, mammogen, adrenotropin, and prolactin. With total doses of 12—48 mg. in the chicks there was no increase in parathyroid wt. or in the mitotic activity of the gland following colchicine injection. Doses of 50 and 500 mg. failed to increase the parathyroid wt. in rats. Mice, chicks, and rats were injected with total doses of 300—4500 mg. of raw pituitary suspension from pregnant cattle over 5—10 days; there was no increase in parathyroid wt. or mitotic activity. In rats similar injections of a suspension of sheep pituitary tissue increased parathyroid wt. in 1 experiment; in this case the wt. of the control glands was abnormally low and there was a coincident increase in kidney wt. The parathyroid change may be secondary to the kidney damage. It is concluded that there is no present evidence for the existence of a parathyrotropic factor in the pituitary. There was an increase in parathyroid wt. in rats fed a Ca-deficient diet; a greater increase was produced if the diet was also deficient in vitamin-*D*. There was only a slight increase in wt. with a deficiency of -*D* alone. The increase was about 100% in growing rats maintained on the low-Ca diet for 100 days and there was little further increase in the succeeding days and little fall in wt. when the rats were returned to a normal diet for the 2nd 100 days. The rabbit parathyroid is more sensitive to Ca deficiency. It is suggested that deficiency of -*D* or Ca in the diet reduces the Ca available to the blood so that increased parathyroid secretion is needed to maintain blood-Ca. Oral administration of A.T. 10 (5—10 ml. of Hytakerol daily for 4

days) to lactating goats caused an increase in blood- and milk-Ca and of blood-inorg. PO_4'''. No changes were produces in milk yield, fat content, or appetite suggesting the prophylactic use of A.T. 10 in milk fever. Rats given 0·2 ml. of the same prep. daily for 5 days showed a 100% increase in serum-Ca and an almost complete suppression of parathyroid mitosis. Day-old chicks were injected daily for 3—5 days with total doses of 7—38 μg. of œstradiol benzoate or 5 mg. of testosterone propionate. Colchicine injections showed a decrease in the normal mitotic activity of the parathyroids. Similar findings were recorded in young rats injected with 5—7·5 mg. of testosterone propionate during 1—3 days. Injections of 2·5—100 μg. of diethylstilbœstrol into guinea-pigs during 5 days had no significant effect on blood-Ca. Ovariectomised rabbits injected daily with 10 μg. of œstrone for 5 weeks or with 20 μg. for 15 weeks grew faster than uninjected castrated rabbits though they did not deposit so much body-fat. At autopsy there were no differences in parathyroid wt. or serum-Ca but the bones of the œstrone-injected rabbits were longer, broader, and thicker; milk secretion was initiated by the treatment in some cases. Intact and parathyroid-ectomised female rats were injected with 33 μg. of diethylstilbœstrol daily for 167 days. The growth rate was retarded in all cases. The size of the bones in the stilbœstrol-treated rats was similar to that of normal younger rats of the same wt.; the calcification was similar to that of the mature controls. The stilbœstrol injections increased the ash content of the bones in both intact and ovariectomised rats. The literature is reviewed throughout (about 250 references) and the results are analysed and discussed. P. C. W.

Formation *in vitro* of highly active thyroproteins, their biologic assay, and practical use. E. P. Reineke and C. W. Turner (*Univ. Missouri Agric. Exp. Stat.*, 1942, *Res. Bull.* 355, 88 pp.).—3 methods are described for the biological assay of the thyroidal activity of iodinated proteins. The test substances were given daily by mouth to male guinea-pigs for 6 days and the increase in O_2 consumption was measured on the 4th or 5th days of treatment and the decrease in body-wt. on the 7th day. Curves are given relating the normal O_2 consumption and body wt. The O_2 consumption is lower in the summer and the sensitivity of the test increased. The decrease in body wt. is proportional to the dose of thyroid, and the increase in O_2 consumption proportional to the log of the dose. Assays were also carried out by measurement of the decrease in body length in tadpoles following intraperitoneal injection of the test substance. The decrease was proportional to log dose. Optimal conditions for the iodination of protein solutions at 38—40° in $NaHCO_3$ solutions were investigated. Sufficient $NaHCO_3$ must be present to maintain the pH at 7 or over. With skim milk or pure casein solutions the amount of I combined increases with the addition of increasing amounts of I to the reaction mixture. There is a corresponding increase in biological activity up to the point where the combined I is equiv. to 2 atoms per mol. of tyrosine present. Further increase in I content reduces the biological activity. The biological activity of iodoproteins formed by incubation at 38° is increased if they are subsequently incubated at 60° or if the incubation temp. is 60° from the start. The formation of active iodoprotein is catalysed by the presence of brass. The most active prep. exerted 10% of the activity of thyroxine in the tadpole test and 4% of its activity in the guinea-pig O_2 consumption test. This difference between the results in the 2 tests was shown by all the preps. tested. On the basis of I content the iodoproteins were as active as thyroxine. Similar iodination of proteins from soya bean and ovalbumin produced compounds with similar biological activity. Cryst. thyroxine was isolated from a hydrolysate of iodinated casein. The spectrographic absorptions of thyroxine and iodinated casein were studied. The iodinated casein (thyrolactin) was effective in restoring the normal body growth of thyroidectomised kids when given in daily doses of about 1 g. by mouth. Daily oral administration of 5—10 g. of one of the less active thyrolactin preps. to lactating goats for 5 days or of 50—100 g. for 3 days to lactating cows produced a 10% increase in milk output with an increase in fat content in 2 of 6 cases examined. There was a parallel increase in heart rate which persisted for longer than the effect on the milk output. The prep. used was 6 times less active than the most active preps. produced. The literature is reviewed throughout. P. C. W.

Liver function, pulse rate, and temperature of hyperthyroid dogs. V. A. Drill, C. B. Shaller, and R. Overman (*Amer. J. Physiol.*, 1943, **138**, 370—377).—A yeast-free diet renders dogs extremely susceptible to the effects of thyroid feeding, abnormal liver function being produced in an average of 22 days. The amount of *B* vitamins fed has a direct relationship to the time which elapsed before an abnormal liver function develops although a high-*B* diet delays but does not prevent the appearance of an abnormal liver function in hyperthyroid dogs. Hyperthyroid dogs on a yeast-free diet develop only a slight tachycardia which returns to normal in 10 days. In absence of -B_1, thyroid feeding does not produce tachycardia. Hyperthyroid dogs receiving a high-*B* diet maintained a high pulse rate for 80—100 days of thyroid feeding, after which the pulse rate fell towards normal. T. F. D.

Correlations between periarteritis nodosa, renal hypertension, and rheumatic lesions [action of deoxycorticosterone].—See A., 1944, III, 14.

Mode of excretion of creatine and creatine metabolism in thyroid disease.—See A., 1944, III, 51.

Graves' disease with dissociation of thyrotoxicosis and ophthalmopathy.—See A., 1944, III, 23.

Alterations in biological oxidation in thyrotoxicosis; thiamin metabolism.—See A., 1944, III, 50.

Procaine-esterase activity in human blood serum; new test for toxic goitre.—See A., 1944, III, 65.

Baby pig mortality. III. Experimental insulin hypoglycæmia in pig. J. Sampson and R. Graham (*J. Amer. Vet. Med. Assoc.*, 1943, **102**, 176—179).—Hypoglycæmia was produced in young pigs by insulin (10—40 units). The usual symptoms were listlessness, convulsions, and coma. Intraperitoneal injections of glucose were sometimes without effect in animals in which hypoglycæmic coma had existed for 4 hr. or longer. The blood-sugar fell as low as 14 mg.-% in hypoglycæmic coma. E. G. W.

Influence of previous diet on insulin tolerance. S. Roberts and L. T. Samuels (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 207—208).—Rats on a diet in which 85% of the calories was supplied by fat responded to insulin with the same blood-sugar level as those on a diet in which 83% of the calories was supplied by carbohydrate, but their rate of recovery from insulin hypoglycæmia was much greater. V. J. W.

Effect of massive doses of stilbœstrol on adrenal gland in rats. B. F. Heskett and J. W. Huffman (*Quart. Bull. Northwest. Univ. Med. Sch.*, 1943, **17**, 203—208).—Stilbœstrol was intramuscularly or subcutaneously injected in doses of 1—50 mg. There was congestion and hæmorrhage into the zona reticularis of the adrenal cortex; widespread hæmorrhage into the zona fasciculata was rarely observed and only after massive doses. The glands recover spontaneously after discontinuing the drug. The sp. toxic response to stilbœstrol is not an "alarm reaction." The animals lost wt. and became lethargic, with a coarse coat and hyperæmic conjunctiva, nasal discharge, and skin eruptions; there was no œdema. A. S.

Sudden death in bed of young athlete [relation to adrenaline]. W. Raab (*Arch. Path.*, 1943, **36**, 388—392).—The only striking abnormal finding was an excessively high concn. of adrenaline-like substances in the heart muscle (1622 colour units per g.). C. J. C. B.

Intraosseous injections of adrenaline. D. I. Macht (*Amer. J. Physiol.*, 1943, **138**, 269—272).—Whereas intramuscular and hypodermic injections of adrenaline into cats, rabbits, and dogs exert little or no effect on blood pressure, intraosseous and intramedullary injections produce rises similar to those produced by intravenous injection, although the response to intramedullary injection was slightly more prolonged. T. F. D.

Adrenal volume in male rats with reduced glucose tolerance. M. A. Geiss (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 107—108).—The larger size of adrenals of the Yale as compared with the Wistar strain of rats is due to the greater vol. of the cortex. The medulla is the same in both. V. J. W.

Relation of food consumption, hypophysis, and adrenal cortex to serum-albumin metabolism in the rat. L. Levin (*Amer. J. Physiol.*, 1943, **138**, 258—263).—After hypophysectomy rats voluntarily decrease their food consumption and show loss in body wt. together with decreased serum-albumin concn., symptoms which are similar to but more marked than those in normals following starvation. Forced feeding of hypophysectomised adults produces normal wt. gain and serum-albumin concn. With adequate adrenocortical function the rat can maintain its normal serum-albumin concn. at least as long as 3 weeks even when forced to subsist partially on its own tissues whereas in the absence of such function it requires quantities of food considerably larger than hypophysectomised or adrenalectomised animals voluntarily consume. T. F. D.

Antagonism of lipocaic to pituitary in fat metabolism. O. C. Julian, D. E. Clark, J. van Prohaska, C. Vermeulen, and L. R. Dragstedt (*Amer. J. Physiol.*, 1943, **138**, 264—268).—Parenteral administration of lipocaic prevents the accumulation of fat in the liver produced by the injection of pituitary ketogenic hormone in fasting guinea-pigs, and decreases the fatty infiltration in the liver due to fasting. The hypophysectomised–depancreatised dog develops the fatty liver of lipocaic deficiency just as rapidly as the depancreatised dog and is equally responsive to lipocaic therapy. T. F. D.

Effect of hypophysectomy and of purified pituitary hormones on liver-arginase activity of rats. H. Fraenkel-Conrat, M. E. Simpson, and H. M. Evans (*Amer. J. Physiol.*, 1943, **138**, 439—449).—Adrenocorticotropic hormone injections produced increases in liver-arginase activity levels above normal in intact rats and brought up to normal the low levels found in hypophysectomised rats. Growth hormone decreased liver-arginase activity in hypophysectomised

and normal rats at injection levels, however, which were above those required for growth stimulation. T. F. D.

Effect of pituitary adrenotropic hormone on lymphoid tissue. T. F. Dougherty and A. White (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 132—133). Injection of this purified hormone (Sayers *et al.*, A., 1943, III, 808) caused a decrease in wts. of inguinal, axillary, and mesenteric lymph glands and of the thymus as compared with controls. The spleen was not affected. V. J. W.

Reproducible diuresis and chloruresis for bioassay of [pituitary] antidiuretic activity. G. C. Ham (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 210—213).—The most consistent results were obtained by causing diuresis by the 2-dose method of Gilman and Goodman and recording diuresis as area of excretion curve. More accuracy was given by determinations of Cl′ than of water. V. J. W.

XII.—REPRODUCTION.

Probability of egg hatching in relationship to their weight. J. Hébert and H. Laugier (*Rev. Canad. Biol.*, 1943, **2**, 113—119).—The % of hatchability can be increased if small hen's eggs weighing less than 60 g. or higher, or pullet's eggs of more than 65 g., are eliminated. A. S.

Effect of hypophyseal stalk transection on gonadotrophic function in guinea-pig. C. R. Leininger and S. W. Ranson (*Anat. Rec.*, 1943, **87**, 77—83).—Following subtemporal transection of the hypophyseal stalk in virgin females it was possible to divide the animals into 4 groups on the basis of the post-operative sex cycles. 7 had normal cycles, 7 showed irregular cycles, the vagina of each of 4 animals was constantly open, and the vagina of 2 constantly closed. No positive correlation between the level of transection and the resulting sex cycle was found. It is suggested that the gonadotropic dysfunction after transection may be attributed to the extent of damage to the median eminence. W. F. H.

Sex, gonad development, and seasonal gonad changes in *Paphia staminea*, Conrad. D. B. Quayle (*J. Fish. Res. Bd. Canada*, 1943, **6**, 140—151).—The first sign of gonad development in the little-neck clam found in British Columbia occurs when the individuals are 1 mm. in length; sex differentiation when they are 15—30 mm. long (2nd—3rd year); and maturity at lengths of 22—35 mm. *P. staminea* is not protandric. The yearly cycle shows the tubules of the ovary to be filled with follicle cells from December to January; active growth of sex cells reaching a peak in March; first spawning in April and active spawning over by September–October. The male cycle is similar to the female cycle with slight time lag. Some males remain spawned-out throughout the winter. P. C. W.

Genital changes in female guinea-pigs resulting from destruction of median eminence. F. L. Dey (*Anat. Rec.*, 1943, **87**, 85—90).—Lesions of the median eminence abolished œstrous cycles in 15 of 22 animals. The results support the theory that the median eminence plays an important rôle in the control of the gonadotropic functions of the anterior pituitary. W. F. H.

Development and repair of organ changes induced by steroid compounds. H. Selye and E. Beland (*Rev. Canad. Biol.*, 1943, **2**, 271—289).—The effects of chronic administration of œstradiol, testosterone, androstenediol, progesterone, deoxycorticosterone acetate, pregnenolone, and cholesterol were tested in young male and female rats (44—55 g. body wt.). Adaptation may occur to one effect of a steroid while other effects show a cumulative increase. Some changes persist for a long time after discontinuing treatment; other effects are short-lived. The effects observed were those on body wt., pituitary, thyroid, adrenals, thymus, pancreas, testis, seminal vesicles, ventral and middle prostate, epididymis, coagulating and Cowper glands (or uterus, vagina, ovaries), preputial glands, liver, heart, spleen, and kidneys. A. S.

Endocrine therapy in gynæcology and obstetrics. E. C. Hamblen (*Amer. J. Obstet. Gynec.*, 1943, **45**, 147—160).—A review. P. C. W.

Endometrial interstitial cell and growths it gives origin to. B. Gilbert (*Clin. Proc.*, 1943, **2**, 214—221).—Review and discussion. P. C. W.

Case of Addison's disease associated with primary amenorrhœa. E. H. Adler and S. B. Abrams (*Amer. J. Obstet. Gynec.*, 1943, **45**, 123—126).—A case is reported. P. C. W.

Effect of environmental stilbœstrol in shortening prolonged gestation in lactating rat. C. K. Weichert (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 203—204).—In female rats mated on the day following parturition, sprinkling of stilbœstrol in the cage caused implantation to take place on the 6th day as compared with the 16th day in controls. V. J. W.

Effect of œstradiol on urinary excretion of ascorbic acid in dog. E. E. Selkurt, L. J. Talbot, and C. R. Houck (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 96—98).—In 3 female dogs, max. tubular reabsorptive capacity was determined by const. infusion of ascorbic acid and creatinine. Enough ascorbic acid to saturate the tubules was given. Daily injections of 1·66 mg. of œstradiol benzoate increased clearance of ascorbic acid which approximated to that of creatinine, indicating a decrease in tubular re-absorption, and plasma-ascorbic acid was reduced. V. J. W.

Reproductive capacity of adult female rats treated prepuberally with œstrogenic hormone. J. G. Wilson (*Anat. Rec.*, 1943, **86**, 341—363).—Injections of œstradiol dipropionate were given for a period of 28 days beginning at various prepuberal ages between birth and the 40th day. Reproductive capacity was studied 3 months later. Treatment begun on the 15th, 20th, 30th, and 40th days produced no permanent impairment of reproductive functions. When injections were begun on the 1st, 5th, or 10th days the animals did not display cyclic manifestations of œstrus and none mated. The ovaries in these were small and contained no corpora lutea. Follicles were few and did not progress beyond the early vesicular stage. Interstitial tissue became atrophic and the uteri were small and responded poorly to œstrogenic stimulation. Mammary ducts were abnormally thickened. W. F. H.

Excretion of œstrogens. III. Urinary œstrogens in normal menstrual cycle and in a case of essential dysmenorrhœa. O. W. Smith, G. V. Smith, and S. Schiller (*Amer. J. Obstet. Gynec.*, 1943, **45**, 15—22).—The ratio of total œstrogenic activity (Zn–HCl hydrolysis) to separated œstrogenic activity (HCl hydrolysis) is higher during the early part of the menstrual cycle than during the later part. The porportion of œstradiol to œstrone and œstriol is highest during menstruation and least during the luteal phase of the cycle. On the basis of previous results which show that the unaccounted for œstrogen is usually 10% of the amount of injected œstrogen, it is calc. that the average daily œstrogenic excretion is 3300 i.u. and is max. during the 1st three days of the cycle (6050 i.u. daily). Analyses made during 3 cycles in a case of dysmenorrhœa showed normal œstrogen excretion with low vals. for the separated œstrogens. There were 2 intermenstrual peaks in œstrogen excretion, and the proportion of œstradiol in the separated œstrogens was high up to 10 days before menstruation. It is suggested that there is a deficiency of luteal secretion and consequent slow rate of œstrogen degradation. In this case œstrogen withdrawal bleedings were painless, as was a menstrual flow which was delayed until the 40th day by the daily ingestion of 15 mg. of œstriol from the 14th day. Luteal activity was demonstrated throughout this delay by the presence of pregnanediol in the urine. P. C. W.

Tissue changes produced by œstrone injected into female dogs with bile fistulas. R. M. Mulligan, B. B. Longwell, and R. M. Morrell (*Amer. J. Path.*, 1943, **19**, 861—868).—More fat was found in the cells of the cortical portions of the renal collecting tubules, more Fe-containing pigment in the Kupffer cells of the liver, in the bone marrow, and in the spleen, and more Fe-free pigment in the bile canaliculi of the liver. Granulocytopoiesis was stimulated and megakaryocytosis suppressed. There was œstrogenic stimulation of the endometrium, endocervix, and vagina. (8 photomicrographs.) C. J. C. B.

Hormonal ambisexuality of ovarian grafts in female rats. T. Hernandez (*Amer. J. Anat.*, 1943, **73**, 127—151).—Androgenic and gynogenic endocrine functions of autoplastically transplanted ovaries in prostate and non-prostate strains were studied. Grafts in ears and legs maintained regular or irregular cycles or a condition of constant œstrus. The most extensive androgenic activity occurred with grafts in the tail, when const. œstrus resulted. All grafts produced increased quantities of androgens which induced abnormal stimulation of prostate and clitoris. Androgenic activity is closely associated with increase in no. and size of the theca cells and it is suggested that the latter are the producers of ovarian androgens. W. F. H.

Treatment of habitual abortion [with progesterone]. R. E. Campbell and E. L. Sevringhaus (*Amer. J. Obstet. Gynec.*, 1940, **39**, 573—578).—13 cases of habitual aborption (at least 2 successive spontaneous abortions) were treated with luteal extracts or progesterone. 11 of the cases went successfully to term. P. C. W.

Ovarian cysts in immature female cats following pregnant mare serum hormone administration. W. F. Starkey and J. H. Leathem (*Anat. Rec.*, 1943, **86**, 401—407).—The initial effect of injections of pregnant mare serum is the production of large multilocular cysts containing clear fluid and lined with granular cells. That such cysts probably secrete œstrin is indicated by the proliferative state of the uterine endometrium. The cysts may regress or persist as simple retention cysts lined by cubical epithelium. W. F. H.

Potentiation of pituitary extract with Δ^5-pregnenolone and additional observations on influence of various organs on steroid metabolism. H. Selye and E. Clarke (*Rev. Canad. Biol.*, 1943, **2**, 319—328).—The effect of a crude anterior lobe pituitary extract on the preputial glands in the rat was augmented by simultaneous treatment with Δ^5-pregnenolone, even in the hypophysectomised and ovariectomised animal. Pregnenolone, given alone, has only a moderately stimulating effect on the preputial glands. Steroid actions (Δ^5-pregnenolone, progesterone, androstenedione, testoster-

one, deoxycorticosterone acetate, œstradiol) were studied in ovariectomised, adrenalectomised, hypophysectomised, and partly hepatectomised rats. One effect may be increased, another decreased, by removal of an organ; an action of one steroid may be increased, that of another compound decreased. A. S.

Progestational activity of some sterol compounds. G. Masson (*Rev. Canad. Biol.*, 1943, 2, P244).—45 sterol compounds were examined in rabbits, using the McPhail technique. Ætiocholane derivatives are inactive (ætiocholanolone, pregnanediol, pregnanedione). The most potent compounds (progesterone, deoxycorticosterone, ethinyltestosterone) have an unsaturated keto-grouping in the α-β position. A side-chain with more than 4 C atoms at $C_{(17)}$ destroys all activity (norcholestenolone, norcholestenedione); absence of a side-chain at $C_{(17)}$ is compatible with luteinising activity (testosterone). Addition of a methyl, ethinyl, or vinyl grouping to a feebly active or non-active compound greatly increases its activity (methyl-, ethinyl-, vinyl-testosterone; methylandrostenediol). Luteinising action is destroyed by the simultaneous presence of OH at $C_{(3)}$ and a keto-group at $C_{(17)}$ (androsterone, dehydro*iso*-androsterone). Substances with double bonds at Δ^5 or completely saturated compounds can have luteinising activity (Δ^5-pregnenolone, androstanedione, androstanol). Compounds with OH in α-position are more active than those with OH at β (*trans*-testosterone, *cis*-testosterone). Luteinising action is independent of testicular, adrenal cortical, follicular, renal, or spermatogenic effects. A. S.

Proliferation in the genital tract of the normal mature guinea-pig treated with colchicine.—See A., 1944, III, 5.

Dietary factor in reproduction and lactation.—See A., 1944, III, 48.

Application of new classification of toxæmias of pregnancy in 318 fatal cases. P. F. Williams and E. Weiss (*Amer. J. Obstet. Gynec.*, 1943, **45**, 2—14). P. C. W.

Possible significance of vaginal smear as additional factor in diagnosis of incomplete abortion. P. F. Fletcher (*Amer. J. Obstet. Gynec.*, 1940, **39**, 562—572).—Method of obtaining human vaginal smears and a simplified hæmatoxylin–eosin staining technique are described. Smears were taken from normal patients during pregnancy and the puerperium and from patients with incomplete abortion. Smears from the latter cases show the presence of outer basal or pavement cells and inner basal or germinative cells. P. C. W.

Ovarian pregnancy associated with endometriosis in same organ. C. H. McKenzie (*Amer. J. Obstet. Gynec.*, 1943, **45**, 126—128).—A case is reported. P. C. W.

Histidine test (Kapeller-Adler) in diagnosis of pregnancy. M. J. Goodfriend and M. Daniel (*Amer. J. Obstet. Gynec.*, 1943, **45**, 140—143).—51 positive results were obtained in 56 pregnant women; 3 of the false negative results occurred in the first trimester, one in the second and one in the third. The results in 72 non-pregnant women were negative in 67 cases. The 5 positive results were given in 4 cases of primary or secondary amenorrhœa and 1 patient with an acute head injury. The urines of 26 post-menopausal women and of 6 men gave negative results. P. C. W.

Influence of nephrectomy on ovarian response to gonadotrophins. F. Bischoff and G. J. Clarke (*Amer. J. Physiol.*, 1943, **138**, 241—245).—The actions of gonadotrophins from sheep pituitary, pregnant mare serum, and human pregnancy urine have been compared on partly nephrectomised rats and controls with respect to changes in the wts. of body, ovary, kidney, heart, adrenal, and uterus and, in certain cases, in determinations of blood pressure, blood-non-protein-N, and dry wts. of hearts were made. Augmented responses of ovarian wt. increase were obtained in partly nephrectomised animals after injection of gonadotrophin compared with controls, indicating the importance of excretion and mode of administration (divided dosage) in assessing potency. Failure of prolan to produce increases in ovarian wt. proportional to increases in level of administration, in intact rats, is interpreted as due to low renal threshold for prolan. Less than 90% of injected sheep gonadotrophin was recovered in the urine of the mature rat during a 6-hr. period. T. F. D.

Effect of sex hormones on erythrocyte number in blood of the domestic fowl. E. Taber, D. E. Davis, and L. V. Domm (*Amer. J. Physiol.*, 1943, **138**, 479—487).—Erythrocyte counts made on normal males, females, capons, and sinistrally and bilaterally ovariectomised poulards confirmed previously published results. Testosterone increased the erythrocyte count of the fowl while œstrogens, probably because of changes in bone marrow activity, caused a decrease. T. E. D.

Response of hypophysectomised immature male rats to pregnant-mare serum. J. H. Leathem (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 209—210).—Injections of pregnant-mare serum extract in 30-day-old rats, begun 5 days after hypophysectomy and continued for 5 days, maintain testis wt. and increase vesicle wt. V. J. W.

Effect of chorionic gonadotropin on pouch of *Trichosurus vulpecula*. A. Bolliger (*J. Proc. Roy. Soc. New South Wales*, 1943, **76**, 137—141).—3 injections of 100—500 i.u. of chorionic gonadotropin given at 3—7-day intervals produced an initial contraction of the pouch of adult female *T. vulpecula* followed by an expansion of the pouch similar to that seen before parturition. The max. pouch size is attained 2 weeks after the initial contraction and is of sufficient size to house an infant $\frac{1}{10}$ the size of the mother. The max. size persists for 7 days and regresses over a period of 1—3 months. P. C. W.

Synechias of vulva in small children. H. E. Bowles and L. S. Childs (*Amer. J. Dis. Child.*, 1943, **66**, 258—263).—A review and analysis of 20 cases. C. J. C. B.

Amphibian sperm. B. R. Seshachar (*Current Sci.*, 1943, **12**, 247—249).—A comparative study of urodele, anuran, and apodan sperm. The anuran sperm is the simplest and resembles the apodan sperm; both have 2 centrioles closely associated with the nucleus and similar mitochondrial "middle pieces." The urodele sperm has 2 unique features: a great enlargement of the proximal centriole to form a solid body and the elongation of the distal centriole to form an accessory structure running the length of the tail. P. C. W.

Female obstructing prostate. A. I. Folsom and H. A. O'Brien (*J. Amer. Med. Assoc.*, 1943, **121**, 573—580).—A lecture and discussion. C. A. K.

Granulomatous prostatitis. F. H. Tanner and J. R. McDonald (*Arch. Path.*, 1943, **36**, 358—370).—34 surgically removed prostates showed granulomatous areas resembling confused tuberculous lesions. These granulomata were caused by partial obstruction of some of the prostatic ducts by inflammation or by the mechanical pressure of benign nodular hypertrophy. The stasis in the smaller ducts and acini and subsequent intraluminal infection produced destruction of the epithelial lining and walls of ducts and acini; the inflammatory products and altered prostatic secretions escaped into the interstitial tissues and produced a diffuse or local chronic inflammatory reaction, plus a "foreign body" type of inflammation with influx of numerous giant cells, foam cells, plasma cells, and lymphocytes. Slow resolution of the lesion occurred, with complete loss of glandular parenchyma and marked fibrous reaction. (12 photomicrographs.) C. J. C. B.

Androgen therapy of gynæcologic disorders. J. P. Greenhill and S. C. Freed (*Amer. J. Obstet. Gynec.*, 1940, **39**, 636—642).—22 women who benefited from androgen therapy in various menstrual disorders were studied 7—12 months after stopping treatment. Persistent good effects were reported in half the cases; more often in those suffering from dysmenorrhœa than in those with excessive menstrual bleeding. 11 of 12 new patients responded satisfactorily to androgen therapy. One woman developed hirsutism after receiving 350 mg. of testosterone propionate in 1 month. P. C. W.

Excretion of androgens, 17-ketosteroids, and œstrogens in dog following administration of androgens. K. E. Paschkis, A. Cantarow, A. E. Rakoff, L. P. Hansen, and A. A. Walkling (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 213—214).—Administration of testosterone propionate to normal dogs by injection or duodenal tube is followed by urinary excretion of œstrogens (mouse vaginal smear) but not of androgens or 17-ketosteroids. The same occurred in 2 castrated male dogs and in an adrenalectomised bitch. V. J. W.

Production of secondary deciduomata during lactation in rat. R. A. Lyon and W. M. Allen (*Anat. Rec.*, 1943, **86**, 417—423).—On the 4th—5th day after delivery of normal litters the endometrium of one horn was stimulated by passing a needle and silk thread through the uterus. Primary deciduomata were produced as a result of this trauma. A similar stimulation of the endometrium of the other horn on the 10th day failed to produce deciduomata. Secondary deciduomata were produced by injecting 12—13 μg. of œstrone over a period of 3—4 days beginning on the 8—9th day post-partum. W. F. H.

Histologic appearance of endometrium during lactation amenorrhœa and its relationship to ovarian function. P. Topkins (*Amer. J. Obstet. Gynec.*, 1943, **45**, 48—58).—145 endometrial biopsies were taken from 28 women during lactation amenorrhœa between the 6th and 31st post-partum weeks. 136 of the specimens were in the œstrogenic phase, 20 of them being hypoplastic. The 9 specimens showing progestational changes were from women that menstruated 1—10 days later. P. C. W.

Presence of hippuric acid in milk. J. V. Karabinos and K. Dittmer (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 111—112).—A cryst. substance obtained as a by-product in isolation of biotin from cows' milk was identified as methyl hippurate. The original milk contained at least 10 μg. of hippuric acid per g. V. J. W.

Lactation activity, chemical composition, and *in-vitro* metabolism of rat mammary tissue. M. Kleiber, A. H. Smith, and P. Levy (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 94—96).—Between parturition and the height of lactation aq. content of mammary tissue and protein content of dry mammary tissue increased. Metabolic rate *in vitro* of fresh tissue was unaltered, but metabolic rate per unit of N decreased. Small litters had less effect. V. J. W.

Importance of rest in initiation of breast feeding. C. B. Darner and G. W. Hunter (*Amer. J. Obstet. Gynec.*, 1943, **45**, 117—120).—100 babies whose mothers were forbidden visitors regained their birth wt. more frequently at discharge and suffered smaller initial wt. loss than 100 infants whose mothers had visitors. The undisturbed mothers had a more abundant supply of milk. P. C. W.

XIII.—DIGESTIVE SYSTEM.

Swallowing and gastrointestinal activity in fœtal monkey. H. Speert (*Amer. J. Obstet. Gynec.*, 1943, **45**, 69—82).—Swallowing and gastrointestinal activity were demonstrated in fœtal monkeys by serial roentgenograms taken after the injection of radio-opaque substances into the amniotic sac during the 99th—155th days of pregnancy. The rate of swallowing of amniotic fluid and the emptying time of the stomach decreased as pregnancy progressed. Defæcation did not occur *in utero*. Water was absorbed by the fœtal intestine. Rebreathing by the mother had no effect on the rate of propagation of the fœtal intestinal contents. P. C. W.

Dietary ulcers of œsophagus of rat. C. E. Brown (*Amer. J. Path.*, 1943, **19**, 785—791).—Rats were placed on a diet of fresh, finely ground, unpolished Texas rice mixed with cottonseed oil in the ratio of 20 c.c. of oil to 1000 g. of rice. This diet was supplemented daily with 1 g. of fresh carrot. Lesions of the œsophagus, including mucosal ulceration, hyperkeratosis, inflammation, and dilatation with muscle atrophy and fibrosis, occurred. When a full mixed vitamin supplement was added, no ulcers occurred. (14 photomicrographs.) C. J. C. B.

Alcohol and emptying time of the stomach.—See A., 1944, III, 60.

Effect of swinging and of binaural galvanic stimulation on motility of stomach in dogs. B. P. Babkin and M. B. Bornstein (*Rev. Canad. Biol.*, 1943, **2**, 336—349).—A combination of horizontal and vertical acceleration with a min. of rotating movement inhibited immediately all movements of the fasting stomach in dogs susceptible to motion sickness; hunger contractions ceased and gastric tone diminished; continuation of swinging induced vomiting in 5—15 min. The after-effect of swinging in these animals was either, in the minority of cases, a gradual recovery of gastric tone and return of hunger contractions or the appearance of special rhythmical contractions in conjunction with the lowered tone of the stomach within 15—120 min. This gastric hypermotility was not affected by atropine and could not be induced by prostigmine. In a dog less susceptible to motion sickness swinging likewise arrested the hunger contractions but vomiting occurred only after about 2 hr. of continuous swinging. The special rhythmical ("vestibular") contractions appeared during swinging but they were relatively weak and of irregular character. Bilateral labyrinthectomy abolished all symptoms of motion sickness. A. S.

Peptic ulcers in infancy and childhood. M. C. Benner (*J. Pediat.*, 1943, **23**, 463—470).—7 cases of duodenal and 1 of gastric ulcers in children from 2 days to 11 years of age are reported. C. J. C. B.

Supra-diaphragmatic section of vagus nerves in treatment of duodenal ulcer. L. R. Dragstedt and F. M. Owens, jun. (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 152—154).—In 2 patients, who habitually secreted about 1 l. of gastric juice during the night, vagal section reduced this secretion and raised its pH with resulting relief of symptoms. V. J. W.

Congenital atresia of duodenum and ileum. E. M. Miller, J. Greengard, W. B. Raycraft, and I. McFadden (*Amer. J. Dis. Child.*, 1943, **66**, 272—279).—Report of 2 cases with successful results following operation. C. J. C. B.

Experimental appendical mucocele, myxoglobulosis, and peritoneal pseudomyxoma. A. S. Rubnitz and H. T. Hermanns (*Arch. Path.*, 1943, **36**, 297—310).—Death in rabbits with experimental mucoceles (cf. *Surg. Gyec. Obstet.*, 1941, **73**, 345) could be attributed to 3 causes: the mucocele ruptured suddenly and the evacuated contents produced an intense toxic reaction; continued slow leakage produced extensive adhesions terminating in intestinal obstruction; the exudate formed a heavy deposit around whole organs leading to total arrest of function in these organs. In 2 of 24 experimentally produced mucoceles, myxoglobulosis was discovered. Two appendices showed a papillomatosis. (6 photomicrographs.) C. J. C. B.

Nitrogen and fat metabolism in infants and children with pancreatic fibrosis. A. T. Shohl, C. D. May, and H. Shwachman (*J. Pediat.*, 1943, **23**, 267—279).—Infants and children with pancreatic fibrosis showed fæces with a high residue and large N content and a moderate increase in fat. When fed on a diet containing N but no native protein, the dry wt., N content, and fat of the fæces were little affected. Addition of pancreatin to a diet containing both protein and fat was followed by some reduction in the N loss in the fæces but caused no change in fat excretion. The fæces became normal when a fat-free diet of casein hydrolysate and glucose was administered. C. J. C. B.

Nature of hyaline material in the pancreatic islands in diabetes mellitus. J. H. Ahronheim (*Amer. J. Path.*, 1943, **19**, 873—881).—Hyaline fibrosis in the islands of Langerhans is due to deposition of amyloid. In 67 of 105 middle-aged and older diabetic persons, amyloid deposition was demonstrated in the islands. Similar changes were found in 5 out of 50 consecutive autopsies on non-diabetic patients over 50 years of age. Amyloidosis of the islands was an isolated feature and is not usually found in generalised amyloidosis. It is neither a pathognomonic evidence of diabetes mellitus nor its cause. In a high % of cases amyloidosis of the islands in diabetic and non-diabetic persons was associated with hypertension. The morphological resemblance between the islands and the renal glomeruli suggests interference with the circulation in the highly vascular islands as a possible cause of increased blood pressure, in a manner comparable to that resulting in renal hypertension. C. J. C. B.

Effect of concentrations of different substances in intestinal contents on their absorption from small intestines. G. H. Lathe (*Rev. Canad. Biol.*, 1943, **2**, 134—142).—The rate of absorption of a solution in an isolated loop of small intestine in dogs was determined, taking into account changes in vol., concn. of the solution, and osmotic pressure. Glucose, *l*-xylose, glycine, urea, and norleucine are more rapidly absorbed from the jejunum at higher concns.; *dl*-alanine shows an initial increase, followed by a diminution. In a series of amino-acids, the rate of absorption decreases with increasing mol. size. Glucose was not absorbed when present in the intestine at a concn. of 100 mg.-%. Jejunal juice contains a reducing substance, presumably glucose. Between concns. of 0·6 and 1·3%, the rate of urea absorption is directly proportional to its concn.; the rate of urea absorption is 5 times that of glycine. The presence of PO_4''' does not accelerate the rate of glucose absorption from the jejunum. Ethyl alcohol in small concn. reduces the rate of absorption of glucose and *l*-xylose but not those of urea from the jejunum and NaCl from the ileum. *l*-Xylose is twice as rapidly absorbed from the ileum as from the jejunum; the absorption of NaCl from the jejunum is negligible but marked from the ileum. A. S.

Effect of deprivation of vitamin-*B* complex on intestinal absorption in dogs. G. H. Lathe (*Rev. Canad. Biol.*, 1943, **2**, 143—148).—*B*-avitaminotic dogs with jejunal fistulæ show a reduction of the rate of absorption of glucose and glycine from the jejunum; with ileac fistulæ, Cl absorption from the ileum was reduced. -*B* complex orally administered restored the normal rates of absorption of glucose, glycine, and Cl. A. S.

Action of cathartic salts on motility of Thiry–Vella jejunal loops.—See A., 1944, III, 57.

Influence of minor dietary changes on frequency of infants' stools. I. J. Wolman and S. Borowsky (*Amer. J. Dis. Child.*, 1943, **65**, 827—833).—The no. of stools is increased by minor changes in composition of a standard modified milk mixture for infant feeding (without alterations in caloric val. or in protein content) by (i) raising the lactose/fat ratio, (ii) substituting 1·6% of corn syrup for an equal quantity of lactose in the presence of an increased carbohydrate/fat ratio, and (iii) raising the lactose/fat ratio but omitting the addition of thiamin. The greatest increase in stool frequency accompanied the use of the milk-mixture with raised lactose/fat ratio as the only change. C. J. C. B.

Obstruction of large bowel in newborn infants due to congenital bands. J. Zaslow (*J. Pediat.*, 1943, **23**, 337—339).—2 unusual cases of large bowel obstruction in newborn infants due to congenital bands extending from the undersurface of the liver to the hepatic flexure of the colon are described. C. J. C. B.

XIV.—LIVER AND BILE.

Correlation of intravenous hippuric acid test of liver function with body size. M. M. Scurry and H. Field, jun. (*Amer. J. med. Sci.*, 1943, **206**, 243—248).—The excretion of hippuric acid following intravenous injection of Na benzoate as a test of liver function in 46 subjects without apparent liver disease was influenced by the size of the subjects, increasing with increase in size. Formulæ for the predicted normal excretion of hippuric acid, based on body wt. and on surface area, are presented. The correlation of hippuric acid excretion with these two measures of body size was almost identical. C. J. C. B.

Influence of hepatic function on metabolism of vitamin-*A*. K. A. Meyer, F. Steigmann, H. Popper, and W. H. Walters (*Arch. Surg., Chicago*, 1943, **47**, 26—43).—Vitamin-*A* concn. in plasma and in the liver (biopsy specimens) and its fluorescence-microscopic distribution in the liver are compared with the results of tests of hepatic function and routine histology in 75 patients. Plasma-*A* is low when the liver is damaged and is lower in cirrhosis with jaundice and in obstructive jaundice with hepatic damage than in cirrhosis without jaundice and obstructive jaundice without liver damage, respectively. The hepatic -*A* concn. is often, but not always,

reduced in liver damage. Severe irregularities of the fluorescent distribution of -*A* in the liver are present only in cases of hepatitis, cirrhosis, or obstructive jaundice with secondary hepatitis. The low blood-*A* in hepatic disease is due to impaired release of -*A* by the liver and of absorption of -*A* from the intestinal tract. (14 photomicrographs.) F. S.

Observations with ^{32}P of changes in acid-soluble phosphates in liver coincident with alterations in carbohydrate metabolism. N. Kaplan and D. M. Greenberg (*J. Biol. Chem.*, 1943, **150**, 479—480).—Fasted rats were injected with trace doses of $Na_2H^{32}PO_4$ after injection of glucose, insulin, or both. At varying times later, the rats were killed and the distribution of radioactive ^{32}P in the various acid-sol. fractions of the liver was determined. A max. in the ^{32}P concn. of the total acid-sol. P was usually obtained at 110—120 min. Glucose markedly altered the time at which a max. was attained in the P concns. of the various fractions. Both glucose and insulin produce an increase in the adenosine triphosphate-P and a decrease in residual and alcohol-pptd. P. Insulin induces a marked rise in total and inorg. P. Insulin and glucose together produce a greater rise in adenosine triphosphate-P than either does alone. This rise is inhibited by malonate, NaF, or phloridzin, but not by iodoacetate. E. C. W.

Nucleus in normal and hyperplastic liver of rat.—See A., 1944, III, 5.

Effect of adrenaline on heat formation in frog's liver.—See A., 1944, III, 28.

Relation of body weight to liver-glycogen storage potency of adrenal cortical extracts.—See A., 1944, III, 28.

***d*-Amino-acid oxidase in liver extracts from adult, tumour-bearing, and young rats.**—See A., 1944, III, 64.

Chemistry of heparin.—See A., 1943, III, 9.

Effect of single small dose of dicumarol [3 : 3′-methylenebis-(4-hydroxycoumarin)] in liver disease.—See A., 1944, III, 10.

Liver damage in thyroid disease.—See A., 1944, III, 27.

Liver and intensity of pancreatic and pituitary diabetes.—See A., 1944, III, 27.

Liver tumours following cirrhosis caused by selenium in rats.—See A., 1944, III, 39.

Blood-lactic acid in liver-glycogen disease. H. H. Mason and G. F. Sly (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 145—147).—In 2 infants with this (von Gierke's) disease, maintained on frequent feeds of glucose, blood-lactic acid is 20—50 mg.-%. If fructose is given in place of glucose, there is extreme hypoglycæmia and blood-lactic acid rises to 120—140 mg.-%. It is inferred that the hypoglycæmia of the disease leads to the breakdown of liver-glycogen which cannot be converted into glucose, but is converted into fructose diphosphate, lactic acid being one of the final end products. V. J. W.

Simultaneous Weltmann serum coagulation test, kephalin flocculation test, and modified Takata–Ara reaction in differential diagnosis of liver disease. M. Wachstein (*J. Lab. clin. Med.*, 1943, **28**, 1462—1465).—13 cases of diffuse hepatitis showed a frequent and pronounced prolongation of the coagulation band, a frequently positive kephalin test, and only an occasional positive Takata–Ara reaction. In 26 cases of obstructive jaundice there was either a shortened or normal coagulation band, an occasional positive Takata–Ara reaction, and only an occasional positive kephalin test. In 14 cases of cirrhosis of the liver a prolongated coagulation band, a positive Takata–Ara reaction, and a frequently positive kephalin test were found. Only in 1 out of 70 control cases did the clinical picture and result of the tests lead to the erroneous diagnosis of cirrhosis of the liver. C. J. C. B.

Effect of partial hepatectomy on resistance of rats to heat and cold. A. Desmarais, L. P. Dugal, and C. P. Leblond (*Rev. Canad. Biol.*, 1943, **2**, 332—335).—The animals were exposed to temp. of −2° and 37° for 3—4 hr. following extirpation of approx. 75% of the liver. The resistance to cold was diminished, that to heat remained unchanged. A. S.

Chronic effects resulting from downward traction on liver. W. M. Booker (*Arch. Surg., Chicago*, 1943, **47**, 76—85).—Downward traction on the liver in dogs for 50—60 min. caused damage to the kidney, probably by passive congestion, resulting in renal hypertension persisting for months. There was also myocardial damage probably due to the manipulation setting up a reflex over the vagus, which caused constriction of the coronary vessels. This reflex was blocked by atropine. (2 photomicrographs.) F. S.

Rate of emptying of biliary tract following section of vagi or of all extrinsic nerves. E. A. Boyden and C. Van Buskirk (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 174—175).—Section of both vagi in the cat, in contradistinction to section of one, does not delay emptying of the gall bladder after a meal of egg-yolk. Section of both vagi and splanchnics does not cause degeneration of post-ganglionic fibres in the sphincter of Oddi. V. J. W.

Growth and changes in epithelium of excised gall bladder. N. I. Grigoriev (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 84—86).—The gall bladders of pig (6—25-cm. stages), rabbit, and chick embryos, of young rabbits and chicks, of axolotls, frogs, and of some teleosts were used; the tissues were kept in "hanging drops" and observed for 4—6 weeks. The epithelium was similar in all species, except the size of the cells; there were some lymphocytes at various levels of the epithelial layers; the basal membrane was insignificant. There was extensive growth, starting in a layer of polygonal cells. The protoplasm of the epithelial cells contained fat vacuoles and, occasionally, mucoid enclosures. There was much chromation in mammalian specimens and karyogenesis in all cases. Epitheliation was complete within 1—2 days in mammals and birds, in 4—5 days in amphibia and reptiles. Growth of mesenchymal elements was observed; this amount decreases with age of the tissue cultures, partly by degeneration. A. S.

Treatment of acute cholecystitis. R. Zollinger and E. C. Cutler (*J. Amer. Med. Assoc.*, 1943, **121**, 481—485).—A review. C. A. K.

Effect of diet on cholesterol concentration in blood and bile.—See A., 1944, III, 41.

Do ingredients of Carter's Little Liver Pills cause the gall bladder to contract and stimulate flow of bile by liver?—See A., 1944, III, 57.

Excretion of sulphanilamide and sulphapyridine in human bile.—See A., 1944, III, 53.

XV.—KIDNEY AND URINE.

Glomerular development in kidney as index of fœtal maturity.—See A., 1944, III, 3.

Influence of thyroid activity on renal function.—See A., 1944, III, 27.

Tubular resorption of chloride in essential arterial hypertension. E. B. Farnsworth and M. H. Barker (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 160—162).—Comparison of urine : plasma ratios of Cl′ and inulin in a normal and a hypertensive subject showed that there was less reabsorption of Cl′ in the latter. V. J. W.

Effects of hypotension due to hæmorrhage and of blood transfusion on renal function in dogs. A. C. Corcoran and I. H. Page (*J. Exp. Med.*, 1943, **78**, 205—224).—Diodrast clearance, renal plasma flow, glomerular filtration rate, and rate of urinary secretion were measured in dogs under pentobarbital anæsthesia. Glomerular filtration rate was disproportionately decreased with regard to the decrease in renal blood flow during arterial hypotension due to bleeding. Blood transfusion to complete restoration of circulating blood vol. and arterial pressure produces return to normal of renal blood flow, associated with an increase in urine secretion above the control level. Diodrast clearance is not a measure of renal plasma flow during severe or prolonged hypotension and after restoration of arterial pressure by transfusion; in the former case it is decreased because of diminished renal extraction of diodrast from the blood; in the latter case diodrast is excreted which had accumulated in the tubules and, presumably, in the interstitial fluid during the hypotensive phase. Return of renal clearance and of renal blood flow to normal is slow and incomplete after blood transfusion in dogs with denervated kidneys; high spinal anæsthesia may interfere with recovery of renal circulation in cases of shock treated by transfusion. Prolonged and severe hypotension due to bleeding reduces the ability of normal and denervated kidneys of intact and anæsthetised dogs to respond to transfusion and restoration of arterial pressure by increasing renal clearance and renal plasma flow, because of renal vasoconstriction due to the release of circulating vasoconstrictor substances. A. S.

Disappearance of phosphatase from hydronephrotic kidney. H. A. Wilmer (*J. Exp. Med.*, 1943, **78**, 225—230).—Unilateral hydronephrosis in rabbits was produced by ureteral ligature; a no. of nephrotoxic substances were given 1—31 days after the operation (diethylene glycol, U nitrate, phloridzin, racemic acid). Somori's and Takamatsu's technique was employed. Alkaline phosphatase disappears from the kidney after periods of hydronephrosis of 2—5 days or more. Normally functioning cells were distinguished from non-functioning when ordinary histological technique showed no difference. A. S.

Metabolism of ischæmic kidney. I. Respiration and oxidase activity of ischæmic kidney. S. B. Raska (*J. Exp. Med.*, 1943, **78**, 75—89).—Respiration of ischæmic kidney slices of dogs, made hypertensive by the Goldblatt technique, is less than that of normal kidney. The oxidising ability of such slices, measured by O_2 uptake and NH_4^+ formation, in the presence of tyramine, *iso*amylamine, *dl*-alanine, and *l*-aspartic acid, is depressed. Kidney extracts were tested for amine oxidase, amino-acid oxidase, and polyphenol oxidase activity by measuring the increase in O_2 uptake and NH_4^+ production in the presence of tyramine, *iso*amylamine, *dl*-alanine, *l*-aspartic acid, *l*-adrenaline, histamine, *dl*- and *l*-dihydroxyphenyl-

alanine. Preps. from ischæmic dog and rabbit kidneys showed much lower activity. There was a direct relationship between the degree of renal constriction and the diminution in tissue-oxidising power. The product of enzymic tyramine oxidation was identified as *p*-hydroxyphenylacetaldehyde. A. S.

Life after nephrectomy. H. L. Kretschmer (*J. Amer. Med. Assoc.*, 1943, **121**, 473—478).—A review of clinical studies in 156 cases of unilateral nephrectomy. C. A. K.

Severe injury to kidneys and brain following sulphathiazole administration. Acute nephritis and effect of sulphanilamides on kidneys.—See A., 1944, III, 55, 56.

Effect of poliomyelitis virus on urinary bladder of rabbits. Attempts to isolate the virus from urine.—See A., 1944, III, 78.

Ureteritis. D. M. Morison (*Edinb. Med. J.*, 1943, **50**, 661—680).—The pathology and ætiology are obscure but abdominal pain is the main symptom. The lower end of ureter in the female is the commonest site and it is more prevalent in adults. The methods of diagnosis and treatment are discussed. Ureteral dilatation reinforced in selected cases by short-wave diathermy resulted in cure or definite improvement in 70% of 147 cases in this clinical survey. H. S.

Alkaline phosphatase level in urine in relation to renal injury. C. Breedis, C. M. Flory, and J. Furth (*Arch. Path.*, 1943, **36**, 402—412).—In rats and rabbits, renal injury by U nitrate is followed by increased excretion of alkaline phosphatase in the urine, and the appearance of phosphatase-rich casts in the renal tubules derived from the necrotised phosphatase-containing epithelium of the proximal convoluted tubules. After administration of U nitrate 13—46% of the phosphatase in the urine excreted is contained in the urinary sediment. Recently regenerated renal tubular epithelium is poor in alkaline phosphatase. (5 photomicrographs.) C. J. C. B.

Glutamine as source of urinary ammonia. D. D. Van Slyke, R. A. Phillips, P. B. Hamilton, R. M. Archibald, P. H. Futcher, and A. Hiller (*J. Biol. Chem.*, 1943, **150**, 481—482).—In dogs whose kidneys had been explanted so that blood could be drawn from the renal vein by skin puncture, all urea removed from the blood by the kidneys was excreted unchanged, as were adenosine and adenylic acid. α-Amino-N was removed from the blood in very small amount or not at all. The amide-N of glutamine was removed in much greater amounts than appeared as such in the urine; the excess provided 60% or more of the NH_3 in the urine. E. C. W.

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

Ætiology of certain degenerative processes (hyaline, fibrinoid, and amyloid degeneration). C. Oberling (*Rev. Canad. Biol.*, 1943, **2**, 290—318).—These degenerative changes are attributed to enzymic pptn. of proteins which become deposited in the tissues under pathological conditions. Slightly denatured rabbit plasma was intravenously injected into rabbits, and horse serum, liver extracts, and fœtal mouse extracts intraperitoneally into mice, over long periods. Hyaline degeneration of renal glomeruli was found in 2 rabbits and glomerulo-nephritis in the mice. (11 photomicrographs.) A. S.

Enzymic debridement in local treatment of burns. G. R. Cooper, G. R. Hodge, and J. W. Beard (*Amer. J. Dis. Child.*, 1943, **65**, 909—911).—A papain–cysteine–salicylate solution applied by wet compresses exerts a powerful proteolytic action *in vivo*. There was no action on the living tissue but there was rapid loosening of tannic acid eschars and slower digestion of the tenacious layer of eschars formed over burns treated with sulphadiazine or triple dye. C. J. C. B.

Isolation of an iron pigment from human red hair. S. Rothman and P. Flesch (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 134—135).—On boiling with 0·1N-HCl such hair yields about 40 mg.-% of sol. pigment which is pptd. at pH 7. It gives a narrow absorption band at 535 mμ., is dialysable, and one sample contained 9·17% of Fe. It is believed to be a complex phenolic Fe compound in which the phenolic OH group is attached to a heterocyclic ring containing N. V. J. W.

Relation between moult cycle and phosphorus content of blood and muscle in lobster. A. Hollett (*J. Fish. Res. Bd. Canada*, 1943, **6**, 152—157).—Total and inorg. P. of muscle of American lobster (*Homarus americanus*) show little variation with the moult cycle. In the blood and blood fractions, the P content (both total and inorg.) increases during the premoult period, reaching max. just before the moult. Immediately after moulting the vals. fall to their lowest levels, particularly the inorg. P of blood, rising with hardening of the shell to the normal level. J. M. S.

Fresh-water sponges of Wisconsin. J. R. Neidhoefer (*Trans. Wisconsin Acad. Sci.*, 1940, **32**, 177—198).—Eleven species of Spongillinæ in Wisconsin show in their distribution a relation with transparency, colour, bound CO_2, and SiO_2 contents and pH of the water but the distribution of the species appears to be unrelated to $[O_2]$ and org. content of the water. L. G. G. W.

Fate of hæmoglobin in *Rhodnius prolixus* (Hemiptera) and other blood-sucking arthropods. V. B. Wigglesworth (*Proc. Roy. Soc.*, 1943, **B**, **131**, 313—339).—In *Rhodnius* most of the hæmoglobin ingested is broken down in the lumen of the gut to protohæmatin, which is extracted unchanged. A small amount is absorbed and circulates in the hæmolymph as kathæmoglobin (parahæmatin). This is taken up by the salivary glands, where it appears as a cherry-red pigment with properties similar to those of hæmalbumin. Blood-pigment is also transferred to the yolk of the eggs and is conc. in the stomach of the newly hatched nymph as a bright red fluid (parahæmatin). Most of this is digested in the gut to give protohæmatin; some is transferred to the salivary glands. Blood-pigment in the hæmolymph of *Rhodnius* is taken up also by the pericardial nephrocytes and by the epithelial cells of the stomach and intestine. Here it is converted into a brown pigment (a modified hæm-pigment), into a green pigment (probably of the verdohæm type and resembling choleglobin), and finally into biliverdin. Biliverdin accumulates throughout life in the pericardial cells, which become bright green. In the gut it is discharged to the lumen and appears in the fæces. The free Fe accumulates throughout life in the cells of the stomach and intestine; in old insects these are heavily laden with Fe deposits. After the injection of hæmoglobin into the hæmolymph all the above processes are exaggerated. In addition, some breakdown of blood-pigment takes place in the Malpighian tubes, and the lumen of the tubes may become charged with massed droplets of biliverdin displaced from the pericardial cells. The process of excretion of this pigment by the cells is described. Comparative studies were made on some other blood-sucking arthropods. In all these hæmoglobin is digested in the gut more or less completely to protohæmatin. It is demonstrable in the hæmolymph in *Ornithodorus*, probably as alkaline hæmatin, and in *Ixodes*, in a form resembling methæmalbumin. It appears in modified form in the salivary glands in *Cimex* only. It is transferred to the eggs in *Cimex*, *Ornithodorus*, and *Ixodes* as alkaline hæmatin; in *Pediculus* apparently as unchanged oxyhæmoglobin. It is broken down to biliverdin in the Malpighian tubes of *Triatoma infestans*, *T. brasiliensis*, and *Eutriatoma*; in the pericardial nephrocytes of *Triatoma brasiliensis*, *Eutriatoma* (probably associated with bilirubin), and *Pediculus*; and in the lumen of the gut in *Pediculus*. An altered hæmatin and perhaps a verdohæm pigment similar to choleglobin were demonstrated as intermediates in *Triatoma brasiliensis*. C. J. C. B.

Relation between the inversion of spirally-twisted organisms and the molecular inversion of their protoplasmic constituents. G. F. Gause (*Biodynamica*, 1940, **3**, 125—143).—Bacteria, snails, etc. which are twisted show a small proportion of individuals with a twist in the direction the reverse of normal. The "reverse" and normal form of snails yield the same natural amino-acids. In the bacteria (*B. mycoides*) dextral and sinistral types grow better on the natural than on the unnatural isomerides of amino-acids. Inverse organisms are physiologically weaker than the normal, possibly with enzymic deficiencies and in snails less resistant to starvation. L. G. G. W.

Nucleic acids. VI. Obtaining oligo-nucleotides directly from animal tissues. F. G. Fischer and H. Lehmann-Echternacht (*Z. physiol. Chem.*, 1943, **278**, 143—154; cf. A., 1942, III., 377).—Nucleotides are obtained from the thymus by the action of dried pancreatic extracts, 75—85% of the total P of the gland being brought into solution in 12—14 hr. at 37°. The oligo-nucleotide thus obtained is purified by successive conversion into Pb and Mg salt. β-Thymonucleic acid (10—40 mononucleotide units) is obtained by heating the gland for 80 min. with 10% aq. NaOH and pptg. the Mg salt with methyl alcohol. If purified, non-proteolytic deribopolynucleotidase is used to degrade the gland, all nucleic acids are liberated as tetranucleotides. W. McC.

Cadmium in organisms. D. P. Maliuga (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 145—147).—Simultaneous polarographic determinations of Cd, Ni, Zn, and Co show the Cd contents of soils, one surface water (Urov river), aspen bark, fir-needles, numerous sea algæ, the organs of sick human beings to be about 1×10^{-4} to 4×10^{-3}%. The ratio Cd : Zn is generally 1 : 20. (See also C, 1944, Part I.) L. S. T.

XVII.—TUMOURS.

Neoplasm studies. IX. Effects in tissue culture of *NN*-dimethyl-*p*-phenylenediamine on rat liver tumours induced by *p*-dimethylaminoazobenzene. G. Cameron, M. J. Kopac, and R. Chambers. **X. Effects in tissue culture of some split products of *p*-dimethylaminoazobenzene on rat liver tumours.** M. J. Kopac, G. Cameron, and R. Chambers. **XI. Effects in tissue culture of *NNN'N'*-tetramethyl-*p*-phenylenediamine and other compounds on malignant lymph nodes.** R. Chambers, G. Cameron, and M. J. Kopac (*Cancer Res.*, 1943, **3**, 281—289, 290—292, 293—295).—IX. Normal gland-

ular epithelium of the rat liver grown in tissue culture is sensitive to *NN*-dimethyl-*p*-phenylenediamine in concn. as low as 10^{-4}M. Equiv. effects occur on ductal epithelium with concn. of 2×10^{-3}M. or higher. The resistance of ductal epithelium from normal liver is slightly less than that obtained from tumours. Glandular epithelium from parenchymatous carcinoma is also sensitive but survives 12—18 hr. longer. Na_2SO_3 (0·001—0·0002M.) suppresses the toxic action of the diamine. The compound is non-toxic when completely oxidised or reduced. The relatively higher resistance of ductal tissue to the toxic effect of the diamine explains the preponderance of cholangioma production in the livers of rats following the feeding of *p*-dimethylaminoazobenzene.

X. Aniline hydrochloride, aniline sulphate, and *p*-aminophenol hydrochloride in concn. of 0·001M. are non-toxic to both glandular and ductal epithelium when tested on tissue cultures of normal rat liver or rat liver tumours. *p*-Phenylenediamine or its hydrochloride under autoxidisable conditions is toxic at 0·001M. The toxic action is blocked by Na_2SO_3. None of these products is so toxic as *NN*-dimethyl-*p*-phenylenediamine.

XI. The action of various compounds was tested on the outgrowing cells of normal and neoplastic lymphoid tissues in tissue cultures. Indiscriminate destruction was produced by Na malonate (0·005M.), 8-hydroxyquinoline (0·2-saturation in serum), and rotenone (0·1-saturation in serum). *NN*-Dimethyl-*p*-phenylenediamine (0·001M.) destroyed all lymphoid cells but did not affect macrophages and fibroblasts. These were, however, destroyed at 0·004M. *NNN'N'*-Tetramethyl- and -tetraethyl-phenylenediamine resembled the dimethyl derivative in being more toxic to lymphocytes. The tetramethyl compounds were, however, more toxic to lymphoid cells of neoplastic than of normal lymph nodes. F. L. W.

Effect of pyridoxine and other *B* vitamins on production of liver cancer with *p*-dimethylaminoazobenzene. D. L. Miner, J. A. Miller, C. A. Baumann, and H. P. Rusch (*Cancer Res.*, 1943, **3**, 296—302).—Rats were fed highly purified diets containing *p*-dimethylaminoazobenzene and cryst. synthetic *B* vitamins. The dye was fed for 4 months and the liver inspected by laparotomy at 4 and 6 months. The incidence of tumours was low when the vitamins were fed in moderate amounts (adequate for maintaining adult rats for 6 months). When the level of all the *B* vitamins was raised well above maintenance amounts the tumour incidence reached 66% at 6 months. The incidence of tumours was greatly lowered on reduction of the pyridoxine level. Large amounts of pyridoxine fed to resistant rats increased the incidence of tumours. The addition of large amounts of riboflavin completely prevented the appearance of tumours in rats receiving only 12% of casein. The production of tumours was more difficult in animals raised to maturity on a diet of fortified milk than in those raised on a diet poor in *B* vitamins. F. L. W.

Biocatalysts in cancer tissue. II. Inhibition of the succinoxidase system by tumour extracts. H. G. Albaum and V. R. Potter (*Cancer Res.*, 1943, **3**, 303—308).—Experiments were carried out with an inhibitor from tumour tissues, using a succinoxidase prep. from liver as test system. Healthy tumour tissues contain no inhibitor. Necrotic tumour or healthy tumour after autolysis possesses such an inhibitor. Liver, after autolysis, also shows such an inhibitor. Pancreas, as well as cryst. trypsin, chymotrypsin, and ribonuclease, inhibits succinoxidase activity. The inhibitory action is not completely destroyed by heating and it is suggested that the inhibition is due to SH compounds and to ribonuclease in certain tissues. It is concluded that succinoxidase assays on healthy tumour tissue would not involve inhibitor action and would be valid. F. L. W.

Experimental fibroids in hypophysectomised female guinea-pigs. L. Vargas (*Cancer Res.*, 1943, **3**, 309—317).—Complete extirpation of the anterior lobe of the hypophysis had no influence on the experimental fibroid reaction in castrated adult female guinea-pigs. Incomplete removal gave the same results except for a difference in the development of the mammary gland. Completely hypophysectomised non-ovariectomised guinea-pigs showed the same results. F. L. W.

Inheritance of susceptibility to tumours induced in mice. II. Tumours induced by methylcholanthrene in the progeny of *C3H* and *JK* mice. W. J. Burdette (*Cancer Res.*, 1943, **3**, 318—320; cf. A., 1943, III, 747).—Progeny of *C3H* and *JK* mice had average and median appearance times for tumours induced by methylcholanthrene intermediate to those of the parental strains. The survival times of F_1 mice with tumours were longer than that of either parental strain. The predominant type of tumour was the same as that of the *JK* parents. No evidence was found for linkage of susceptibility factors to the *X*-chromosome or for the presence of extra-chromosomal influence. The results are compatible with the existence of more than one gene for susceptibility to induced tumours, at least one of which is dominant and at least one of which is recessive. F. L. W.

Spontaneous tumours in guinea-pigs. III. Chondrosarcoma of the iliac bone with metastasis to the mammary region. C. T. Olcott and G. N. Papanicolaou (*Cancer Res.*, 1943, **3**, 321—325).—A chondrosarcoma of the iliac bone with metastasis to the mammary region occurring in a guinea-pig 31 months old is described. Although the animal was subjected to the injection of adrenal cortical extract the tumour is believed to have arisen spontaneously. F. L. W.

Intradermal immunisation of *C3H* mice against a sarcoma that originated in an animal of the same line. L. Gross (*Cancer Res.*, 1943, **3**, 326—333).—115 mice of the *C3H* line were inoculated intradermally with doses of 0·01—0·03 ml. of a 20% cell suspension of a sarcoma induced by methylcholanthrene in a *C3H* mouse. 21 animals showed spontaneous regression. Repeated intradermal reinoculation of the animals that recovered was unsuccessful. F. L. W.

Distribution of doses of radioactive phosphorus in leukæmic patients. S. Warren (*Cancer Res.*, 1943, **3**, 334—336).—The deposition of radioactive P as determined in the tissues of 10 patients dead of leukæmia was greatest in those tissues that usually show a heavy infiltration of leukæmic cells. The liver, spleen, kidneys, and bone marrow contained relatively large amounts. Slowly metabolising tissues, as brain, fat, and cartilage, contained little. The concn. in the bile was sometimes high. The distribution of ^{32}P in human tissues is generally comparable with that obtained in rodents experimentally. F. L. W.

Incidence of methylcholanthrene-induced tumours in inbred strains of mice. W. J. Burdette and L. C. Strong (*Genetics*, 1941, **26**, 143).—Tumours developing following injection of methylcholanthrene included spindle-cell sarcomata, epidermoid carcinomata, rhabdomyosarcomata, and mixed tumours and they were malignant. The rate of tumour development differed in the different strains of mice tested. L. G. G. W.

Mammary carcinoma in mice following intranasal administration of methylcholanthrene. J. W. Orr (*J. Path. Bact.*, 1943, **55**, 483—488).—Mammary carcinoma was found in a high proportion of mice belonging to 2 pure strains which do not naturally develop this tumour, after intranasal administration of methylcholanthrene. In *IF* females, *IF* males treated with an œstrogen, and *CBA* females approx. 2/3 of the mice which survived long enough developed mammary carcinoma. Negative results occurred with non-œstrogen-treated *IF* females, but there was one mammary carcinoma in a *CBA* male. Within each strain there is no evidence that the frequency of skin tumours is significantly different in mice which develop mammary tumours. C. J. C. B.

Morphogenetic effect of carcinogenic hydrocarbon compounds in axolotls. D. M. Fedotov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 87—90).—5—10 mg. of 1 : 2 : 5 : 6-dibenzanthracene and 9 : 10-dimethyl-1 : 2-benzanthracene were dissolved in 2 c.c. of acetone impregnated with egg white and implanted under the skin of the extremities for periods up to 14 months. There is acute inflammation within a few days, followed by ulcerating processes which disappear after some weeks. There is epithelial proliferation with immigration of polymorphonuclear elements. Abscesses are formed. There was no evidence of malignant growth, in spite of atypical epithelial proliferation. The formation of "epithelial tubes" under the skin is due to the invaginator effect of the chemicals. A. S.

Urinary excretion of acid-decomposable hydrocarbon precursors following administration of polycyclic hydrocarbons. L. H. Chang and L. Young (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 126—129).—When naphthalene, phenanthrene, or anthracene was given by mouth to rats, there was excreted in the urine a compound which at room temp. and pH 1·5—2·5 was decomposed to yield about 15, 5, and 3% respectively of the original hydrocarbon. No further decomp. occurred after 8 hr. A no. of other hydrocarbons were examined, including 3 : 4-benzpyrene and methylcholanthrene, but no similar excretion was found. V. J. W.

Extensive breeding as adjunct to mammary gland carcinoma susceptibility in mice. L. C. Strong (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 257—258).—Female crosses between cancer-resistant and -susceptible strains usually inherit the mother's resistance, but, if they are maintained in incessant reproductive activity, both crosses show an equally high susceptibility. V. J. W.

Growth of dibenzanthracene-produced mouse sarcoma in chorio-allantoic membrane of chick. F. Jacoby, S. McDonald, and D. L. Woodhouse (*J. Path. Bact.*, 1943, **55**, 409—417).—The chorio-allantoic membrane of the chick embryo was used successfully as a culture medium for a dibenzanthracene mouse sarcoma. The histological features of these tumours and the non-sp. morphological reactions of the chorio-allantoic membrane are described. The sarcomatous cells when growing in this membrane do not produce argyrophil fibres. Inoculation of membrane tumour material into mice again gave rise to typical spindle-cell sarcomas, but transmission beyond the second generation was unsuccessful. (9 photomicrographs.) C. J. C. B.

Characteristics of liposarcoma grown *in vitro*. M. R. Murray and A. P. Stout (*Amer. J. Path.*, 1943, **19**, 751—757).—In tissue cultures, the actively growing lipoblasts can be distinguished readily from common fibroblasts on grounds of nuclear as well as of cytoplasmic

properties and of general growth pattern. They resemble the stem cells which appear in cultures of indifferent mesenchyme. (10 photomicrographs.) C. J. C. B.

Constitutional factors of cancer in rat parabiosis. C. Foâ and U. Monteiro (*Rev. Canad. Biol.*, 1943, **2**, 259—270).—One of two parabiotic rats developed an angio-endothelioma; the other animal was free of tumour. A. S.

Asymmetry of protoplasm and the structure of the cancer cell. G. F. Gause (*Biodynamica*, 1941, **3**, 247—250).—A review. L. G. G. W.

Morphology and growth of subcutaneous tumours induced with carcinogenic hydrocarbons in strain *C3H* male mice. M. B. Shimkin and W. R. Bryan (*J. Nat. Cancer Inst.*, 1943, **4**, 25—35).—Of 415 subcutaneous tumours induced with different doses of methylcholanthrene, benzpyrene, and dibenzanthracene 411 were spindle-celled sarcomas, 2 were carcinomas, and 2 were mixed tumours. Tumours induced with large doses of methylcholanthrene grew faster on the average than those induced with small doses. E. B.

Effects of Roentgen rays on cell–virus associations in virus-induced rabbit papillomas and fibromas. W. F. Friedewald and R. S. Anderson (*J. Exp. Med.*, 1943, **78**, 285—304).—Virus-induced rabbit's papilloma regress completely within a few weeks after *X*-irradiation with 5000 r. by inhibiting cellular division and producing degeneration of the cells; the virus, however, persists in undiminished amounts, and can often be extracted in increased yields. Fibroma virus in crude extracts or *in vivo* is more readily inactivated than the papilloma virus; 10,000 r. destroys 90% or more of the former, while at least 100,000 r. is required to inactivate 50% of the latter in extracts containing equal protein concns. Irradiation did not produce any qual. alteration of the papilloma or fibroma virus. A. S.

Ultracentrifugal studies of some complexes obtained from mouse milk, mammary tumour, and other tissues. H. Kahler, W. R. Bryan, and H. M. Sipe (*J. Nat. Cancer Inst.*, 1943, **4**, 37—45).—Two components with sedimentation rates 62 *s* and 90—92 *s* corresponding to mol. wts. of 3—4 and 5 million, present in extracts of mammary tumours from *C3H* mice, are nucleoprotein–lipin complexes. A substance corresponding to the 62 *s* component is present in chick embryo extract. Substances with similar sedimentation rates were found in transplanted mammary tumours, and in the milk from mice either susceptible or resistant to breast cancer. Determinations on mixed extracts indicated that intercombinations between components could occur. E. B.

Adaptation of the transparent-chamber technique to the mouse. G. H. Algire (*J. Nat. Cancer Inst.*, 1943, **4**, 1—11).—A skin flap of the mouse is allowed to grow in a transparent chamber (lucite) which is 18 mm. in diameter and held by Ag bolts. The chamber and fold of skin are held in a vertical position on the back of the mouse with splints and shields. Tumour cells may be implanted in the tissue. Light is transmitted from a W ribbon filament lamp or C arc along a quartz rod. Microscopical observations can be made on the living tissue for up to 30 or 40 days at magnifications up to 500 diameters. E. B.

Microscopic studies of the early growth of a transplantable melanoma of the mouse, using the transparent-chamber technique. G. H. Algire (*J. Nat. Cancer Inst.*, 1943, **4**, 13—20).—Small fragments of the Cloudman melanoma were placed on the surface of the vascular bed of the skin flap and placed in the chamber. Development was observed with a stereoscopic microscope at 120 diameters and with a compound microscope up to 500 diameters magnification for up to 36 days. Degeneration and phagocytosis occurred in some transplants, but others grew beyond the confines of the chamber. Growth of the tumour was not rapid until vascularisation had taken place. E. B.

Estimation of growth rates of tumours. H. F. Blum (*J. Nat. Cancer Inst.*, 1943, **4**, 21—24).—The no. of cells and possibly the vol. of the tumour should increase logarithmically with time. Equations of growth are discussed when one or two diameters of a spheroidal tumour are measured. The growth of tissue cultures in the form of a cylinder is also considered. E. B.

Depolymerases for yeast- and for thymus-nucleic acids in normal and neoplastic tissues. J. P. Greenstein (*J. Nat. Cancer Inst.*, 1943, **4**, 55—61).—Ribonucleodepolymerase and deoxyribonucleodepolymerase activity was lower in lymphomas than in normal lymph nodes, higher in mouse hepatomas than in mouse liver, but the same in rat hepatomas as in normal or regenerating rat liver. The highest activity of the enzymes was found in the pancreas and lymph glands. More of the enzymes occurred in the liver than in the kidney. E. B.

Colloid osmotic pressure of sera of rats bearing transplanted Jensen sarcoma. J. P. Greenstein and J. W. Thompson (*J. Nat. Cancer Inst.*, 1943, **4**, 63—64).—The colloid osmotic pressure fell steadily from 310—350 mm. H_2O to about 200 mm. in 3 weeks following inoculation with tumours. E. B.

Serologic and anaphylactic reactions of the cathepsins of normal and neoplastic tissues. M. E. Maver and M. K. Barrett (*J. Nat. Cancer Inst.*, 1943, **4**, 65—73).—Precipitin, complement-fixation, and anaphylactic tests indicate that the cathepsins of normal rat liver and rat hepatoma 31 are different proteins with some common groups. The cathepsins of the hepatoma more closely resemble those of the Jensen sarcoma than those of normal liver. Kidney and spleen cathepsins appear to differ antigenically from those of liver and tumours. E. B.

Accuracy and reproducibility in induction of tumours with ultraviolet radiation. H. F. Blum (*J. Nat. Cancer Inst.*, 1943, **4**, 75—79).—A high degree of reproducibility is possible, particularly if young mice are used. E. B.

Chemical treatment of tumours. V. Isolation of the hæmorrhage-producing fraction from *Serratia marcescens* (*B. prodigiosus*) culture filtrate. M. J. Shear, F. C. Turner, A. Perrault, and T. Shovelton. **VI. Method employed in determining the potency of hæmorrhage-producing bacterial preparations.** M. J. Shear, A. Perrault, and J. R. Adams. **VII. Nature of hæmorrhage-producing fraction from *Serratia marcescens* culture filtrate.** J. C. Hartwell, M. J. Shear, J. R. Adams, and A. Perrault. **VIII. Ultracentrifugal and electrophoretic analysis of the hæmorrhage-producing fraction from *Serratia marcescens* culture filtrate.** H. Kahler, M. J. Shear, and J. L. Hartwell (*J. Nat. Cancer Inst.*, 1943, **4**, 81—97, 99—105, 107—122, 123—129).—V. The active material was produced when the organism grew on a synthetic medium and was conc. by pptn. with $CHCl_3$, repeated pptn. with alcohol, and dialysis. The concentrates were assayed by their action on sarcoma 37 growing in mice. The min. hæmorrhage-producing dose contained 0·1 μg. of solid rich in polysaccharide.

VI. The sarcoma 37 was grafted subcutaneously into mice of the *Dba* and albino *ABC* strains. The test substance was injected intraperitoneally in 0·1—0·5 c.c., of water, 6—8 days after inoculation with the tumour. The end-point was the dose which produced grossly perceptible hæmorrhage in tumours of half of the treated mice. In doubtful cases the interior of the tumour was examined. The tumours used for grafting were examined for possible bacterial contamination.

VII. The activity was not reduced by tryptic digestion. Analysis gave the following average results: C 47·5, H 7·1, N 2·2, P 1·1, acetyl 2·2, ash 3·5%, methoxyl nil. Hydrolysis liberated aldohexose, hexosamine, methylpentose, and the components of a phospholipin. No polypeptide or protein could be found.

VIII. Ultracentrifugal analysis indicated that two components were generally present. The major component of one prep. had a diffusion const. of $0{\cdot}89 \times 10^{-7}$ cm.^{2} per sec. and a sedimentation const. of $70{\cdot}6 \times 10^{-13}$ c.g.s. unit, corresponding to mol. wt. of 8,000,000. E. B.

Stilbœstrol in carcinoma of prostate. B. G. Clarke and H. R. Viets (*J. Amer. Med. Assoc.*, 1943, **121**, 499—501).—Stilbœstrol was given to a patient with carcinoma of the prostate with metastases causing pressure on spinal nerve roots and blocking the c.s.f. pathway. Symptoms were rapidly relieved and serial lumbar punctures at appropriate levels showed removal of the block. C. A. K.

Cutaneous melanomas. J. N. Driver and D. N. MacVicar (*J. Amer. Med. Assoc.*, 1943, **121**, 413—420).—A clinical review of 60 cases. C. A. K.

Tumoral calcinosis. A. Inclan, M. G. Camejo, and P. Leon (*J. Amer. Med. Assoc.*, 1943, **121**, 490—495).—3 calcified tumours arising from bursæ are described. C. A. K.

Mediastinal chorionepithelioma with gynæcomasty; hormonal observations. L. C. Simard (*Rev. Canad. Biol.*, 1943, **2**, 245—247).—The male patient excreted 11,000 mouse units of prolan per c.c. of urine. A. S.

Two carcinomata of Leydig's interstitial testis cells and their comparison with experimental interstitial cell tumours in mice. P. Masson (*Rev. Canad. Biol.*, 1943, **2**, 168—243).—2 cases of malignant Leydig cell tumours of the testis are reported, similar in structure to adrenal cortex tumours. Metastases spread in one patient via the lymphatics, in the other vascularly. Marked hepatic hyperplasia was found in the vicinity of metastatic nodules. 1 tumour grew mitotically and amitotically, the other showed only amitotic growth. Normal Leydig cells were found in one tumour, but not in the other. 1 patient excreted in the urine 1 g. of androgens per day. The tumours are compared with the stilbœstrol and triphenylethylene tumours in mice. (20 photomicrographs.) A. S.

Carcinoma arising in congenital cysts of liver. R. A. Willis (*J. Path. Bact.*, 1943, **55**, 492—495).—Carcinoma arose diffusely and progressively in a young woman of 27 from the epithelium lining multiple developmental cysts of the liver. Metastases were present in the liver itself and in the lymph glands and lungs. (5 photomicrographs.) C. J. C. B.

Recurrent tumour of mesenchyme in adult. J. R. Gilmour (*J. Path. Bact.*, 1943, **55**, 495—498).—A recurrent tumour of the sub-

cutis of the back in an adult woman was composed of mucous connective tissue containing neoplastic capillaries, lipoblasts, primitive erythroblasts and erythrocytes, lymphocytoid wandering cells, and few nucleated blood cells other than erythroblasts. It differed from mesenchyme in that focal excess of mucus had led to the formation of cystic spaces which had become lined with mesothelium. (3 photomicrographs.) C. J. C. B.

Krukenberg tumour. S. M. Copland and S. H. Colvin (*Amer. J. Obstet. Gynec.*, 1943, **45**, 59—69).—The Krukenberg tumour is a primary or secondary tumour of the ovary of epithelial origin. It is usually bilateral and accompanied by ascites. Primary tumours are rare; the secondary tumours are usually metastases from the viscera, particularly the stomach. The typical cell has a signet-ring form, and is not usually of the same structure as the primary tumour. 4 cases are described. P. C. W.

Epithelial cysts and cystic tumours of skin. W. N. Warvi and O. Gates (*Amer. J. Path.*, 1943, **19**, 765—781).—A review. (3 photomicrographs.) C. J. C. B.

Primary infrapapillary adenocarcinoma of duodenum. J. Felsen and W. Wolarsky (*Arch. Path.*, 1943, **36**, 428—431).—A case report. (3 photomicrographs.) C. J. C. B.

Maintenance of sedimentation rate as test for malignant disease. L. Apter, E. Hull, and C. C. Adams (*Amer. J. med. Sci.*, 1943, **206**, 168—174).—Maintenance of the initial sedimentation rate in blood stored for 24 hr. is not a reliable criterion of malignant disease. C. J. C. B.

Coincidence of primary carcinoma of the lungs and pulmonary asbestosis. F. Homburger (*Amer. J. Path.*, 1943, **19**, 797—805).—Review and report of 3 cases. (10 photomicrographs.) C. J. C. B.

***d*-Amino-acid oxidase in liver extracts from adult, tumour-bearing, and young rats.**—See A., 1944, III, 64.

Effect of naphthacene on the fluorescence of hydrocarbons. Factors that alter the fluorescence of certain carcinogens.—See A., 1944, I, 28.

Growth mechanisms in tumour and regenerative processes in axolotl.—See A., 1944, III, 92.

Steroid excretion in a case of adrenocortical carcinoma. I. Isolation of a Δ^5-androstene-3(β) : 16 : 17-triol.—See A., 1944, II, 50.

Relation between age, structure, and agent content of Rous no. 1 sarcoma. Prolonged antibody production following recovery of fowls from Rous no. 1 sarcoma.—See A., 1944, III, 80, 81.

XVIII.—ANIMAL NUTRITION.

Medical evaluation of nutritional status. H. D. Kruse (*J. Amer. Med. Assoc.*, 1943, **121**, 584—591).—A review. C. A. K.

Composition of standard bread and its fortification with calcium. W. H. Seath (*Clin. Proc.*, 1943, **2**, 153—156).—A comparison of the composition of S. African standard and baker's flour with English national flour and recommendations for the fortification with $CaCO_3$. P. C. W.

Whole lactic acid evaporated milk does not require a refrigerator. H. G. Taylor and R. W. Roberts, jun. (*J. Pediat.*, 1943, **23**, 307—309).—Whole lactic acid evaporated milk can be left in open dishes at room temp. for 3 days before becoming infected with moulds and for 5 days before bacteria appear. C. J. C. B.

Use of cereal thickened formulæ to promote maternal nursing. C. A. Stewart (*J. Pediat.*, 1943, **23**, 310—314).—The routine use of cereal-thickened milk formula, fed by spoon to young infants, can compensate for deficiency in the breast milk. The introduction of semi-solid foods into the diet at an early age is recommended. C. J. C. B.

Quality in milk.—See B., 1944, III, 9.

Pasteurisation of milk and infant mortality rates in Toronto, Vancouver, and Victoria.—See A., 1944, III, 71.

Nutritive value of eggs.—See B., 1944, III, 9.

Comparison of metabolic effects of isocaloric meals of varying compositions : prevention of postprandial hypoglycæmic symptoms. See A., 1944, III, 52.

Biological value of proteins. Rice-protein. E. Flügge (*Biochem. Z.*, 1941, **307**, 173—183).—Comparison of rice and casein diets shows that rice-protein is a food protein of only moderate val. as far as structure metabolism is concerned; it has a high val. in regulatory metabolism and ensures regulation of the oxidation processes for the greatest efficiency of the total material oxidised. In spite of this favourable effect on oxidation, there is increased storage of glycogen in the liver due to a further regulating effect of rice-protein. J. N. A.

Nutritive value of potato-protein for the pig. J. C. D. Hutchinson, J. S. D. Bacon, T. F. Macrae, and A. N. Worden (*Biochem. J.*, 1943, **37**, 550—562).—Growth rates were observed in "fattening" pigs on diets containing equal amounts of N derived from barley or potato (equal parts of freshly boiled potatoes and commercial, dried potato flakes), with and without supplementary N from casein; the total N varied from 1·5 to 2·4%. The val. of the potato-N, alone or supplemented by casein-N, was consistently inferior to that of barley-N, the kg.-increase in wt. per kg. of digestible N intake being 16·5—20·3 for barley and 13·5—15·2 for corresponding potato rations. The supplementary effect of casein-N was the same for potatoes and barley. The potato-fed pigs were fatter for their carcass wt. than were the barley-fed pigs. The average vals. for coeff. of (apparent) digestibility of the potato mixture were 93·7% for energy and 81·5% for total N; the corresponding vals. for barley were 82·3 and 79·1%. The digestibility of potatoes was unaffected by admixture with casein or barley. Addition of 3% of casein to the barley ration produced the same rate of increase of wt. as did addition of 6% of casein to the potato ration. Data for carcass measurements and [with J. O. Irwin] for statistical analysis are appended. F. O. H.

Field peas as a source of protein for growth. E. Woods, W. M. Beeson, and D. W. Bolin (*J. Nutrition*, 1943, **26**, 327—335).—The principal growth-limiting deficiency in raw peas as the sole source of protein in the diet of growing rats is methionine. The growth-promoting properties of the protein, but not the food intake, are decreased by baking or autoclaving but the addition of 0·5% of cystine to the autoclaved peas gives a growth rate comparable to that with raw peas. Raw pea-protein fed at 10% level with 0·3% of methionine as the sole source of protein gives 47% more gain in wt. and requires 25% less food per unit gain than casein fed at the same level. H. G. R.

Effect of dry grinding on properties of proteins.—See A., 1944, II, 67.

Dihydroxyacyl derivatives of β-alanine and *l*-leucine from tunny fish liver. R. Kuhn and T. Wieland (*Ber.*, 1940, **73**, [*B*], 962—971).—A method is outlined for testing the requirement of *Streptobacterium plantarum* for nutrients (cf. Möller, *Angew. Chem.*, 1940, **53**, 204). A Sbm unit is defined with relation to sp. conditions of growth. Treating de-fatted, aq. tunny fish liver extract (1 c.c. equiv. to 20 g. of fresh liver; 160—200 mg. of residue on evaporation; approx. 15,000 Sbm units per g.) with mercurous acetate gives a solution (approx. 23,000 Sbm units per g.), whence by adsorption on C and elution by aq. pyridine–methanol a solution is obtained having approx. 50,000 Sbm units per g. Evaporation and pptn. from water by phosphotungstic acid gives a solution yielding a substance (approx. 65,000 Sbm units per g.), whence uridine (850 g. from 4 tons of liver) separates. In methyl alcohol $Ba(OH)_2$ then ppts. an active solid (approx. 10^5 Sbm. units per g.), which by decomp. with dil. H_2SO_4 and extraction with butyl alcohol at pH 1 gives a purity equiv. to approx. 170,000 Sbm units per g. Repetition of the phosphotungstic acid pptn. gives a substance (approx. 270,000 Sbm units per g.), which is adsorbed from water at pH 8·5 on Al_2O_3 previously treated with dil. HCl. The substance is adsorbed on Al_2O_3 more strongly than is Cl′ but less strongly than is SO_4''. Elution by $Ba(OH)_2$ gives a Ba salt having $1·5—3 \times 10^6$ Sbm units per g. and containing 4·5—5% of N but only approx. 0·54% of NH_2 (Van Slyke). Hydrolysis of this salt (5 g.) by boiling 2N-H_2SO_4 gives β-alanine (70—80 mg.), *l*-leucine (1·2 g.), *l*-α-hydroxy-$\beta\beta$-dimethyl-γ-*n*-butyrolactone (approx. 120 mg.), and a *homologue* (approx. 0·5 g.), $C_7H_{12}O_3$, m.p. 159—160°, $[\alpha]_D^{20}$ +15·4° to 15·7° in 20% HCl, of this lactone. The quantities isolated agree with existence of the alanine and butyrolactone in the liver as pantothenic acid, the Ba salt containing 4—5% thereof in agreement with its biological activity. Approx. 4×10^{-5} g. of *l*-leucine per c.c. are required by the bacterium for max. growth, but the products of its condensation with the homologous lactone are inactive. R. S. C.

Utilisation of calcium by rats on high-protein–low-calcium and high-carbohydrate–low-calcium diets. L. G. Wesson and P. E. Boyle (*Arch. Path.*, 1943, **36**, 237—242).—Two similar low-Ca diets, except that one was high in protein and the other in carbohydrate, were fed to rats over 12 months, with and without supplementary vitamin-*D*. -*D* increased the growth and survival of the rats on the high-carbohydrate diet, and improved their appetite and the retention of Ca and the Ca content of the bones; it had no effect in the rats on the high-protein diet. C. J. C. B.

Replenishment of depleted skeletal reserves of magnesium. J. Duckworth and W. Godden (*Biochem. J.*, 1943, **37**, 595—598).—Replacement of Ca by Mg in rat bone occurs during demineralisation, but not if dietary Mg is deficient. Mg bone reserves depleted by dietary deficiency are replaced only slowly on re-alimentation with Mg, and the rate of replacement is not dependent on the occurrence of bone growth. The significance of variations in human skeletal Mg is discussed. R. S. A.

Iodine in nutrition. G. M. Curtis and M. B. Fertman (*J. Amer. Med. Assoc.*, 1943, **121**, 423—430).—A review. C. A. K.

Effect of fluorine on dental caries.—See A., 1944, III, 2.

Domestic water and dental caries. Treatment of public water supply to correct fluoride deficiency.—See B., 1944, III, 20.

Vitamins.

Vitamin and hormone preparations.—See B., 1944, III, 15.

Night blindness and vitamin-*A*.—See A., 1944, III, 24.

Adsorption of vitamin-*A* from fish-liver oils. L. A. Swain (*J. Fish. Res. Bd. Canada*, 1943, **6**, 113—118).—In dogfish-liver oil, dissolved in benzene or $CHCl_3$ and washed free of vitamin-*A* alcohol, the glyceryl esters are more readily adsorbed on activated Al_2O_3 than the -*A* esters. With halibut-liver oil and a silicic acid column, -*A* alcohol is more easily adsorbed (from light petroleum) than its esters or the glyceryl and other fatty acid esters. J. M. S.

Vitamin-*A* deficiency and clinical urolithiasis. H. J. Jewett, L. L. Sloan, and G. H. Strong (*J. Amer. Med. Assoc.*, 1943, **121**, 566—569).—The rate of dark-adaptation and the thresholds of the completely dark-adapted eye were determined for 20 patients with urolithiasis and 40 normal subjects. The blood-vitamin-*A* content was also determined. In 78 cases of urolithiasis autopsy studies of respiratory and urinary tract epithelia were made. In none of the 98 cases of urolithiasis was there any evidence of -*A* deficiency. C. A. K.

Vitamin-A_2.—See A., 1944, II, 31.

Storage and interaction of water-soluble vitamins in Malpighian system of *Periplaneta americana*, L. R. L. Metcalf (*Arch. Biochem.*, 1943, **2**, 55—62).—The fresh Malpighian tube contained riboflavin 0·84—1·0, aneurin 0·033—0·050, nicotinic acid 0·20—0·46, pantothenic acid 0·08, and ascorbic acid 0·60—1·012 mg. per g. Free and bound riboflavin were present, and only traces of oxidising enzymes. E. R. S.

Results of feeding rats a human diet low in thiamin and riboflavin. G. M. Higgins, R. D. Williams, H. L. Mason, and A. J. Gatz (*J. Nutrition*, 1943, **26**, 347—359).—The diets varied only in the flours from which the bread components were made. Supplementing patent white flour with thiamin, riboflavin, and nicotinic acid improves the growth rate but not to the extent of that of animals receiving whole wheat flour. The daily calorie intake is increased from 26·8 to 40·0 by the addition of thiamin to the flour but the low intake of riboflavin is inadequate for satisfactory growth, the average gain in wt. being 1 g. per day. The addition of thiamin and riboflavin or the use of whole wheat flour prevents development of hypochromic anæmia and gives normal blood vals. It also prevents extensive peripheral necrosis associated with mild fatty degeneration of the liver but is not so effective as the use of whole wheat flour. The thyroid glands are hyperplastic, probably due to some dietary imbalance rather than to vitamin or I deficiency, and relative increases in the chromophobes and corresponding decreases in the acidophils of the pituitary gland are observed. The concn. of thiamin and riboflavin in the liver, skeletal muscles, kidneys, and testes is low. Fortification of the flour with thiamin, riboflavin, and nicotinic acid is insufficient to prevent these pathological changes or to promote satisfactory growth. H. G. R.

Ratio of ascorbic acid, riboflavin, and thiamin in raw and pasteurised milk. A. D. Holmes, C. P. Jones, A. W. Wertz, and J. W. Kuzmeski (*J. Nutrition*, 1943, **26**, 337—345).—Raw winter milk produced under controlled conditions by Ayrshire, Guernsey, Holstein, Jersey, and Shorthorn cows contains ascorbic acid 14—22·5 (average 19·7±0·18), riboflavin 1·35—1·75 (average 1·51±0·09), and thiamin 0·29—0·35 (average 0·33±0·02) mg. per l. After pasteurisation by the holding process for 30 min. at 143—145° F. in stainless steel equipment the respective vals. are 7·0—19·1 (15·9±2·7), 1·19—2·06 (1·48±0·01), and 0·21—0·34 (0·30±0·03) mg. per l. H. G. R.

Average American diet. II. Riboflavin, nicotinic acid, and pantothenic acid content. V. H. Cheldelin and R. R. Williams (*J. Nutrition*, 1943, **26**, 417—430).—The average American diet, prior to the use of enriched bread and flour, contains riboflavin 1·4, nicotinic acid 11, and pantothenic acid 4·9 mg. per 2500 kg.-cal. Enrichment of bread and flour increases the riboflavin to 1·6 and the nicotinic acid to 17 mg. Extensive tables of the contents of these vitamins in various foodstuffs are given. H. G. R.

Adequacy of the industrial lunch and the use of brewer's yeast as a supplement. C. A. Heller, C. M. McCay, and C. B. Lyon (*J. Nutrition*, 1943, **26**, 385—390).—Lunch as served in a cafeteria in the Brooklyn Naval Yard supplies thiamin 0·54, riboflavin 0·59, and nicotinic acid 3·37 mg. The supply of these vitamins may be supplemented by the addition of brewer's yeast, at levels so that the taste is not detected, to the meat dishes. H. G. R.

Vitamin-*B* in heartburn of pregnancy. B. F. Hart (*Amer. J. Obstet. Gynec.*, 1943, **45**, 120—122).—Beneficial results followed the administration of a vitamin-*B* complex to 16 pregnant women with heartburn. P. C. W.

Performance of normal young men on controlled thiamin intakes. A. Keys, A. F. Henschel, O. M. Mickelsen, and J. M. Brozek (*J. Nutrition*, 1943, **26**, 399—415).—Excretion of thiamin in the urine averaged about 10% of the dietary thiamin on an intake of 0·33 mg. per 1000 kg.-cal. and about 7% on 0·23 mg. No benefit of any kind was produced by an intake of more than 0·23 mg. of thiamin per 1000 kg.-cal. and muscular, neuromuscular, cardiovascular, psychomotor, and metabolic functions are in no way restricted neither are clinical signs, subjective sensations, and state of mind and behaviour affected. H. G. R.

Alterations in biological oxidation in thyrotoxicosis: thiamin metabolism.—See A., 1944, III, 50.

Liberation of aneurin on stimulation of peripheral nerve.—See A., 1944, III, 18.

Vitamin-B_1 and growth of spinal ganglia in tissue culture.—See A., 1944, III, 19.

Treatment of varicose ulcers with vitamin-B_1 and acetylcholine.—See A., 1944, III, 13.

Evaluation of blood and urinary thiamin determinations in vitamin-B_1 subnutrition. R. A. Benson, C. M. Witzberger, and L. B. Slobody (*J. Pediat.*, 1943, **23**, 437—445).—Blood-thiamin determination is of no val. but thiamin urinary excretion tests are useful. C. J. C. B.

Determination of thiamin hydrochloride in some Peruvian foodstuffs. G. V. Solis (*Bol. Soc. Quim. Peru*, 1943, **9**, 62—68).—Thiamin has been determined fluorophotometrically in Peruvian potatoes and vegetables. Although the vitamin is not destroyed by normal cooking, addition of cryst. thiamin to the diet is recommended. F. R. G.

Thiamin content of fresh and frozen peas and corn before and after cooking. B. Barnes, D. K. Tressler, and F. Fenton (*Food Res.*, 1943, **8**, 420—427).—Fresh peas, shelled or unshelled, and fresh, unhusked maize exhibit no loss of thiamin when stored at room temp. for 5 hr. or at −17·8° to −23·3° for 1 year. There is no loss of thiamin during cooking of frozen peas or maize; different cooking methods result in retention of 64—84% in the peas and 63—85% in the maize, variety having no effect on the quantity going into solution. The latter is increased by increasing the amount of cooking-water. The smaller vols. of cooking-water are more conc. sources of thiamin than the larger vols. H. G. R.

Effects of vitamin-B_1 on development of some flowering plants.—See A., 1944, III, 87.

Experimental variation of nicotinamide requirement of dysentery bacilli.—See A., 1944, III, 73.

Inhibition of bacterial growth by glucose in media devoid of nicotinic acid.—See A., 1944, III, 75.

Specificity of nicotinic acid as growth factor for isolated pea roots.—See A., 1944, III, 87.

Crystalline quinine salt of pantothenic acid. Synthesis and resolution of the racemate.—See A., 1944, II, 36.

Rôle of biotin and "folic acid" in nutrition of the rhesus monkey. H. A. Waisman and C. A. Elvehjem (*J. Nutrition*, 1943, **26**, 361—375).—No growth effects can be attributed to biotin when fed to monkeys exhibiting nutritional failure on a synthetic diet containing 8 cryst. members of the vitamin-*B* group and -*C* but it is concerned in some way with maintenance of normal fur. The addition of "folic acid" (norite eluate fraction of liver) completely cures the nutritional failure, normal growth is resumed, and the leucopenia quickly alleviated. The loss of hair together with slight dermatitis and "porphyrin-like" secretion on the skin produced in monkeys kept for long periods on 1 or 3% solubilised liver is rapidly corr. by administration of biotin. H. G. R.

Effect of biotin deficiency on duration of infection with *Trypanosoma lewisi* in rat. F. R. Caldwell and P. György (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 116—119).—In deficient rats the duration was prolonged by 50—100% according to the degree of deficiency. V. J. W.

Muscle and nerve in biotin-deficient rats.—See A., 1944, III, 17.

Pimelic acid, biotin, and certain fungi.—See A., 1944, III, 70.

Increased synthesis of *p*-aminobenzoic acid associated with the development of sulphonamide resistance in *Staphylococcus aureus*.—See A., 1944, III, 75.

***p*-Aminobenzoic acid (vitamin-*H*) and sulphonamides. I. Effect on higher animals.** L. Ahlström, H. von Euler, and G. Wallerström [with I. Säberg]. **II. Effect on yeast.** H. von Euler, L. Ahlström, I. Säberg, and G. Wallerström (*Arkiv Kemi, Min., Geol.*, 1943, **16**, **B**, No. 1, 9 pp.; No. 2, 6 pp.).—I. Colorimetric determinations of *p*-aminobenzoic acid using *p*-dimethylaminobenzaldehyde (method: Tauber *et al.*, A., 1941, II, 254), in extracts of ox heart and rat spleen [after hydrolysis with dil. H_2SO_4 for 1 hr. at 100° (bath)], show negative results, but ox blood and rat kidney and liver contain small amounts. The organs of rats fed with *p*-aminobenzoic acid–

vitamin-*B* were examined after 4·5 hr.; *p*-aminobenzoic acid was present mainly (80%) in the liver. Wt. increase of rats is apparently not affected after feeding the acid. Sulphapyridine produces small increases in wt.

II. Theoretical aspects of the antagonistic effects of *p*-aminobenzoic acid and sulphanilamide are discussed. A. T. P.

Ascorbic acid and lead absorption. E. E. Evans, W. D. Norwood, R. A. Kehoe, and W. Machle (*J. Amer. Med. Assoc.*, 1943, **121**, 501—504).—Ascorbic acid nutrition was generally poor in 400 workers in a Pb tetraethyl plant, but there was no evidence that ascorbic acid up to 100 mg. daily influenced absorption of Pb, its blood concn., or elimination in urine and fæces. No effects on symptoms, red cell count, or no. of stippled red cells were seen. C. A. K.

Production of scurvy-like condition by feeding of compound structurally related to ascorbic acid. D. W. Woolley and L. O. Krampitz (*J. Exp. Med.*, 1943, **78**, 333—339).—Addition of 10% of glucoascorbic acid to a basal diet in mice and cotton rats produced a scurvy-like condition in all animals within a week; the condition was not prevented or cured by ascorbic acid but was cured by discontinuing the administration of glucoascorbic acid. The condition was produced on a highly purified diet but not in mice fed a natural diet. A substance in certain plant products prevents the production of the condition. A. S.

Irreversible transformation of dehydroascorbic acid. B. Rosenfeld (*J. Biol. Chem.*, 1943, **150**, 281—303).—PO_4''' catalyses the non-oxidative breakdown of the 6-C chain of dehydroascorbic acid, probably existing in a stabilised form as enolised diketogulonic lactone, with formation of oxalic acid. The 6-C chain remains intact in the absence of PO_4''', or of CN′, which has a similar effect. There is an independent dismutation accelerated by PO_4''' and CN′, though these are not essential, yielding a substance with reducing properties even in acid solution and ultra-violet absorption like that of ascorbic acid, and an oxidation product of dehydroascorbic acid having an intense yellow colour at pH 7. R. L. E.

Action of *l*-ascorbic acid on isolated frog heart.—See A., 1944, III, 13.

Rôle of oxidising activity of vegetable tissue in synthesis of ascorbic acid.—See A., 1944, III, 83.

Vitamin-*C* in paprika.—See B., 1944, III, 11.

Vitamin-*C* in apples and other materials. O. H. Keys (*New Zealand J. Sci. Tech.*, 1942, **24**, B, 146—148).—The vitamin-*C* content of apples depends to a large extent on variety; of those grown in New Zealand, the variety Sturmer contained most -*C* (11—25 mg. per 100 g.). Leaves of *Primula* spp. contained up to 908 mg. of -*C* per 100 g. and Chinese gooseberries (*Actinidia chinensis*) 100 mg. per 100 g. G. H.

Autoxidation of ascorbic acid.—See A., 1944, I, 42.

Effect of vitamin-*D* on glucose-tolerance curve in man.—See A., 1944, III, 52.

Influence of vitamin-*D* on structure of teeth and bones of rats on low-calcium diets. P. E. Boyle and L. G. Wesson (*Arch. Path.*, 1943, **36**, 243—252).—Vitamin-*D* improved the structure of bones and teeth in rats on a high-protein–low-Ca and a high-carbohydrate–low-Ca diet. The teeth of animals on the vitamin-deficient diets were characterised by wide, uncalcified predentin and dentin showing globular calcification; the teeth of animals with -*D* supplements were almost normal. The bone trabeculæ of rats on either diet, with or without supplementary -*D*, showed little osteoid formation. The bone shafts and bony trabeculæ of animals on the diets supplemented with -*D* were atrophic but otherwise normal. The bony structures of animals on the -*D*-deficient diets showed active resorption and reformation with production of fibrous marrow spaces which simulated osteitis fibrosa of hyperparathyroidism. This process may be explained on the basis of a formation of functionally inadequate bone on a low-Ca, -*D*-deficient diet. (15 photomicrographs.) C. J. C. B.

Relative activities of free and esterified vitamin-*D*. B. E. Bailey (*J. Fish. Res. Bd. Canada*, 1943, **6**, 103—108).—In the liver oils of dogfish, cod, albacore, tuna, and swordfish, and the body oils of herring, pilchard, and salmon, the vitamin-*D* activity after saponification showed increases of 0—100%, which could not be correlated with the degree of skeletal calcification of the fish or the type of oil (liver or body). Similarly, synthetic -D_2 palmitate after hydrolysis showed an activity 2½ times that of the ester. Halibut-liver oil was anomalous, in that after storage for 2 or more weeks at 3°, the relative potencies before and after saponification were now the same. Evidence is that -*D* is not destroyed and it is suggested that isomerides are formed which are not more active in the free state than in the ester form. J. M. S.

Antirachitic activity of vitamin-D_3 precursors in rat. S. Lassen and E. Geiger (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 181—183).—When injected subcutaneously into rats which are subsequently irradiated, 7-hydroxycholesterol or 7-ketocholesterol has a higher antirachitic potency than 7-dehydrocholesterol. Oral administration is less effective for all these compounds. V. J. W.

Cod-liver oil and ultra-violet irradiation for intensively reared chicks. D. J. G. Black (*J. Min. Agric.*, 1943, **50**, 419—421).—An otherwise adequate diet containing 1% of cod-liver oil prevents rickets in chicks. Irradiation with an S1 lamp for 10 min. daily at 234 μw. per cm. is also effective. These supplements are only effective when the diet contains more than 0·7—0·75% of Ca and 0·4—0·5% of P, the optimum being about 1·1 and 0·7% respectively. P. G. M.

Relative efficacy of calcium carbonate and phosphate in preventing rickets in rats. J. Yudkin (*Biochem. J.*, 1943, **37**, 543—546).—Addition of 0·065% of $CaCO_3$ to wheatmeal bread fed to rats increases the ash content of the bones, but larger amounts decrease it, whilst amounts of $CaHPO_4$ up to 3% are effective. The application of the results to human nutrition is discussed. P. G. M.

Vitamin-*E* deficiency in the rat. V. Uterine changes in chronic deficiency. M. M. O. B. Sweeten (*Biochem. J.*, 1943, **37**, 523—525; cf. A., 1939, III, 169).—The degenerative pigmentation of the uterus produced by chronic vitamin-*E* deficiency can only be cured by administration of -*E* when accompanied by pregnancy, which increases circulation in the uterine muscle. P. G. M.

Vitamin-*E* deficiency in rats given succinylsulphathiazole in purified diets. F. S. Daft, K. M. Endicott, L. L. Ashburn, and W. H. Sebrell (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 130—131).—Addition of 1% of succinylsulphathiazole to a vitamin-*E*-deficient diet caused degenerative changes in striated muscle which were prevented by administration of 3 mg. weekly of α-tocopherol. Sulphaguanidine did not produce this effect. V. J. W.

Tocopherol level in human serum during oral tocopherol therapy. I. S. Wechsler, G. G. Mayer, and H. Sobotka (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 170—173).—Normal serum-tocopherol is 0·96 mg.-%. In amyotrophic lateral sclerosis and other myopathies it is 0·67 and 0·61 mg.-% respectively. Oral administration of 75—740 mg. daily can raise this level to as much as 2 mg.-%, and at least 200 mg. a day must be given to secure any therapeutic effect. None is present in the c.s.f. V. J. W.

Fish oils. IX. Certain fish oils as sources of nutritionally essential fatty acids. B. E. Bailey (*J. Fish. Res. Bd. Canada*, 1943, **6**, 109—112).—Salmon egg (mature ova of *Oncorhynchus nerka*), pilchard and herring oils are much less effective in curing the symptoms of essential fatty acid deficiency in rats than is methyl linoleate, herring oil being the least active. The effectiveness of fish oils in alleviating scaliness of the hind paw appears to increase with increasing I val., although the growth-promoting activities follow no such sequence. In general, the activities of fatty acids in curing or alleviating the syndrome are not simply a function of their unsaturation. J. M. S.

Experimental lathyrism in white rat. H. B. Lewis and M. B. Esterer (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 263—264).—Lathyrism developed in all rats fed on a diet containing 50% of ground decorticated sweet peas (*Lathyrus odoratus*), and no cases occurred in those receiving the same amount of ground edible peas (*Pisum sativum*). Similar results were given by cold aq. extracts. V. J. W.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Growth, ageing, chronic diseases, and life span in rats. C. M. McCay, G. Sperling, and L. L. Barnes (*Arch. Biochem.*, 1943, **2**, 469—479; cf. A., 1940, III, 47).—Rats were fed a basal diet of cooked starch (20), cellulose (2), cod-liver oil (8), lard (7), sucrose (5), lucerne leaf meal (1), salt mixture (6), dried yeast (14), crude casein (27), and dried liver (10 g.), and were then killed at regular intervals to determine the incidence of the common chronic diseases that usually terminate life prematurely. Retarded rats are much less subject to these diseases than those that grow normally when groups equal in age are considered. Retardation of growth up to 900 days has a favourable effect on the mean span of life. Rats can be retarded for a long as 1150 days and still resume normal growth when provided with adequate calories. Addition of milk, starch, meat, and sugar respectively to the basal diet has no significant effect on the total span of life. With equal amounts of vitamin-*E*, rats on the richer carbohydrate diet tend to become sterile early in life in contrast to retarded animals on the same diet. This premature sterility in the males has no effect on the total span of life. Rats retarded for 300 days respond to additional sources of calories in the same order as those allowed to grow normally from the beginning. Such rats do not attain the same body size as controls not subjected to retardation. Females fed the sugar supplement differ from those given the milk diet. Males given sugar and milk diets respectively live significantly longer than those fed a diet rich in liver. Males are less resistant than females to the chronic lung disease that afflicts rats during the latter half of life. Neither air-conditioning nor the relative dustiness of the diet

is an important factor in producing diseased lungs. The rat appears to be the species least stunted permanently by long retardation of growth. J. N. A.

Ageing, basal metabolism, and retarded growth. L. C. Will and C. M. McCay (*Arch. Biochem.*, 1943, **2**, 481—485).—Retarded rats at 850 days of age have significantly higher heat production per unit of wt. than normal rats, and significantly lower heat production per unit of surface area than the controls. Retarded rats at 1200 days of age have the same basal metabolism per unit of surface area as rats realimented at either 900 or 1500 days. Retarded rats do not differ per unit of wt. from rats realimented at 1150 days, but they have a higher heat production than rats realimented at 900 days. Retarded rats at 1200 days of age have a higher heat production per unit of surface area than retarded rats at 850 days. Heat production per unit wt. is not significantly different. There are no differences in basal metabolism between the sexes in normal and retarded rats. J. N. A.

Basal metabolism of normal boys and girls from 2 to 12 years old, inclusive. R. C. Lewis, A. M. Duval, and A. Iliff (*Amer. J. Dis. Child.*, 1943, **65**, 834—844).—The mean vals. for calories per hr. per sq. m. referred to age, and for calories per hr. referred to wt., height, and surface area, agreed with previous reports. C. J. C. B.

Basal metabolism of normal children from 13 to 15 years old inclusive. R. C. Lewis, A. M. Duval, and A. Iliff (*Amer. J. Dis. Child.*, 1943, **65**, 845—857).—The data are set out and statistically analysed. C. J. C. B.

Pasteur effect in bone marrow, studied with carbon monoxide–oxygen mixtures. C. O. Warren and C. E. Carter (*J. Biol. Chem.*, 1943, **150**, 267—270; cf. A., 1942, III, 703).—Exposure of rabbit bone marrow cells to high [CO] causes decreased respiration and increased glycolysis. There is no evidence for the presence of a Pasteur enzyme. R. L. E.

Differentiation in respiratory activity of isolated embryonic tissues.—See A., 1944, III, 4.

Relationship between hypothalamus and respiratory metabolism.—See A., 1944, III, 21.

Effect of neosynephrin on gaseous exchange in brain. Effect of iodoacetate on respiration and glycolysis in excised rat brain.—See A., 1944, III, 22.

Prevalence of mild hypothyroidism with normal metabolic rate. Maintenance of normal basal metabolic rate after thyroidectomy. Relation between basal metabolic rate and thyroid dosage in myxœdema.—See A., 1944, III, 26.

Effect of glutamic acid on the formation of acetylcholine. D. Nachmansohn, H. M. John, and H. Waelsch (*J. Biol. Chem.*, 1943, **150**, 485—486).—The addition of *l*(+)-glutamic acid to dialysed extracts of rat brain increases the rate of formation of acetylcholine. Succinic and citric acids behave similarly, as do *dl*-alanine, *dl*-methionine, and glutamine. *d*(−)-Glutamic acid has a small effect. *l*(+)-Aspartic acid, *dl*-serine, and *l*-malic, malonic, and α-keto-glutaric acids have no effect. E. C. W.

Acetylation of primary aromatic amines *in vivo* and *in vitro*. F. Zehender (*Helv. Chim. Acta*, 1943, **26**, 1338—1352).—The acetylation of *p*-aminobenzoic acid, 2-sulphanilamidothiazole, and sulphanilic acid in man and guinea-pig and *in vitro* under the action of acetic anhydride is more complete as the magnitude of the basic const. increases. Aniline is an exception in the animal since it is relatively little acetylated. The substances differ from one another in the animal with regard to the end-point attained and to the amount of acetyl derivative produced. Ultimately, *p*-aminobenzoic acid is completely eliminated in coupled form, whilst with 2-sulphanilamidothiazole and sulphanilic acid the 100% limit is not attained. H. W.

Specificity of *l*(−)-methionine in creatine synthesis. P. Handler and M. L. C. Bernheim (*J. Biol. Chem.*, 1943, **150**, 335—338; cf. Borsook and Dubnoff, A., 1940, III, 311; Du Vigneaud *et al.*, *ibid.*, 753).—Production of creatine from guanidoacetic acid by the action of slices of rat's liver is almost doubled by adding *l*(−)-methionine but is increased by only 50% by adding *d*(+)-methionine which takes part in creatine synthesis only after oxidative deamination. Benzoic acid inhibits the action of *d*(+)- but does not affect that of *l*(−)-methionine. *dl*-Methionine methylsulphonium chloride and α-keto-γ-methylthiolbutyric acid are as effective sources of methyl groups for synthesis of creatine as is *l*(−)-methionine but its sulphoxide and sulphone are ineffective. S of methionine is apparently not oxidised during transmethylation. W. McC.

Biological value of dietary proteins. III. Severe nutritional disturbance of metabolism: prevention by cystine.—See A., 1944, III, 41.

Experimental alkaptonuria in rat on high-tyrosine diet. L. De F. Abbott, jun., and C. L. Salmon, jun. (*J. Biol. Chem.*, 1943, **150**, 339—343; cf. A., 1942, III, 461).—Severe alkaptonuria (homogentisic acid isolated from urine) is produced within a few days by a diet containing 12% of *l*-tyrosine. Gentisic chemically resembles homogentisic acid but is not chemiluminescent under conditions in which homogentisic acid is strongly so. W. McC.

***N*-Methylnicotinamide, a metabolite of nicotinic acid in the urine.** J. W. Huff and W. A. Perlzweig (*J. Biol. Chem.*, 1943, **150**, 395—400; cf. A., 1944, III, 46).—The isolation, by evaporation, extraction with 95% alcohol, adsorption on zeolite, and elution with aq. KCl, of 1-methylnicotinamide from the urine of healthy persons who have ingested nicotinamide is described. The methylated amide is identical with the substance F_2. (See also C., 1944, Part I.) W. McC.

Methylation of nicotinamide by rat's liver *in vitro*. W. A. Perlzweig, M. L. C. Bernheim, and F. Bernheim (*J. Biol. Chem.*, 1943, **150**, 401—406).—At 37°, slices (but not pulp) of rat's liver (but not kidney and muscle) convert nicotinamide (but not nicotinic acid) into 1-methylnicotinamide, the extent of the transformation being usually increased by addition of methionine. No transformation occurs anaërobically. The rate of urinary excretion of the methylated amide by rats is possibly related to the rate of methylation of nicotinamide in their livers. W. McC.

Mechanism of coprosterol formation *in vivo*. II. Inhibition by succinylsulphathiazole and carbarsone. O. Rosenheim and T. A. Webster (*Biochem. J.*, 1943, **37**, 580—585; cf. A., 1941, III, 1039).—The bacteriostatic action of succinylsulphathiazole on intestinal coliform bacteria in rats is accompanied by a complete inhibition of coprosterol formation. A similar inhibition occurs when rats are freed from an infection of *Trichomonas muras* by administration of carbarsone (*p*-carbamylphenylarsonic acid). The interference with cholesterol formation by an antibacterial and an amœbicidal drug, however, is apparently unconnected with their respective action on bacteria or protozoa. F. O. H.

Fat oxidation in experimental animal diets. D. F. Clausen, R. H. Barnes, and G. O. Burr (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 176—178).—Oxidation of dietary fats causes appearance of toxic products. Peroxide vals. are plotted for a no. of fats under varying conditions. Oxidation of lard begins in 2 weeks and is delayed by presence of yeast and (less) by cod-liver oil. In butter oxidation begins in about 6 weeks and is delayed by wheat-germ oil. V. J. W.

Effect of glucose administration in diabetic acidosis. H. F. Root and T. M. Carpenter (*Amer. J. med. Sci.*, 1943, **206**, 234—243).—In diabetic coma, intravenous or oral administration of glucose solution does not, while insulin does, increase carbohydrate combustion. Only 10 g. of carbohydrate need be oxidised per hr. to check the ketosis. Glucose has a harmful effect; it may convert a moderate into a severe case of coma requiring excessive insulin dosage. In advanced coma, glucose administration may precipitate the final anuria. C. J. C. B.

Diabetes and the weather. W. F. Petersen (*Amer. J. med. Sci.*, 1943, **206**, 197—204).—The importance of change of weather, especially cold, in the diabetic is shown. More insulin may be required under such conditions. C. J. C. B.

Rôle of carboxy-labelled acetic, propionic, and butyric acid in production of liver glycogen. J. M. Buchanan, A. B. Hastings, and F. B. Nesbett (*J. Biol. Chem.*, 1943, **150**, 413—425; cf. A., 1943, III, 194).—The acids were prepared by the action of $^{11}CO_2$ on the corresponding Mg alkyl iodides and were administered orally as Na salts together with glucose. During the 2 hr. following administration, approx. 50% of the radioactive fatty acid absorbed was excreted as $^{11}CO_2$ in the respiratory gases. The radioactivity of the liver-glycogen showed that propionic and butyric acid were converted into liver-glycogen but that acetic acid was not. No conversion of acetic acid into liver-fat occurred. W. McC.

Developmental stages and glycogen metabolism of *Macracanthorhynchus hirudinaceus*.—See A., 1944, III, 4.

Action of vitamin-B_1 on carbohydrate metabolism and on urea synthesis.—See A., 1944, III, 44.

Ferritin. VI. Conversion of inorganic and hæmoglobin-iron into ferritin-iron in animal body. Storage function of ferritin. P. F. Hahn, S. Granick, W. F. Bale, and L. Michaelis (*J. Biol. Chem.*, 1943, **150**, 407—412; cf. A., 1944, I, 5).—Analysis of liver and spleen of dogs shows that after intravenous injection of Fe NH_4 citrate containing radioactive Fe, injected Fe is converted into ferritin-Fe in the liver and after intravenous injection of heparinised whole blood containing radioactive Fe in its hæmoglobin, Fe from this hæmoglobin is at least partly converted into ferritin in both organs. (The blood cells are destroyed, one day after injection of the blood, by subcutaneous administration of acetylphenylhydrazine.) Ferritin probably functions as an Fe-storing compound in the body. W. McC.

Effect of low-potassium diet and deoxycorticosterone acetate on cation content of erythrocytes and muscle of rat. A. H. Hegnauer (*J. Biol. Chem.*, 1943, **150**, 353—357; cf. Heppel, A., 1940, III, 241).—A diet containing only 0·046% of K decreases the K^+ and

Cl′ contents of the plasma and greatly decreases the K content of the erythrocytes and muscle, the Na content of the plasma being also decreased and that of the erythrocytes and muscle greatly increased. The Cl′ content of all the tissues is decreased. Repeated injections of deoxycorticosterone acetate given during the period of low-K diet produce the expected changes in the contents in muscle and plasma but restore the K content of the erythrocytes to the normal level. The results show that, in the erythrocytes, the K content is not directly influenced by the K content of the plasma but reflects its Na + K content and that certain functions of K are not transferable to Na. The mechanism by which K is conc. in the erythrocytes differs from that by which it is conc. in muscle. W. McC.

Mineral composition of the albino rat as affected by chloride deficiency. E. J. Thacker (*J. Nutrition*, 1943, **26**, 431—441).—The bodies of rats on a Cl-deficient diet containing 0·02% of Cl contained less Cl′, Na, and K but more Ca and P, and the retention of the intake of Na, K, Ca, and Mg decreased whereas that of Cl′ was increased. The adjustment of female rats to the restricted Cl′ intake was similar to but not as great as that of male rats. H. G. R.

Influence of growth and effect of thyroxine on phosphorus metabolism in mouse.—See A., 1944, III, 27.

Calcium and phosphorus metabolism in the chick.—See A., 1944, III, 42.

Fate of halogenated phenols in the organism. B. Zondek and B. Shapiro (*Biochem. J.*, 1943, **37**, 592—595).—2-Chloro-*m*-5-xylenol (*A*) and 6-chloro-*m*-cresol are partly excreted in the urine of rabbits after subcutaneous injection of oil solutions. In man, only *A* is detectable, and then only if the urine is alkaline. The *o-iso*propyl derivative of *A* is not excreted by man or rabbit, but esters and ethers of *A* yield *A* in the urine, the excretion being slower than with the uncombined phenol. *A* is excreted in man partly as glucuronide and partly as sulphate ester. Combined *A* undergoes slow enzymic dissociation in the urine, which becomes bacteriostatic on keeping. Blood concns. of chlorophenols remain low (about 1 mg. per 100 ml.) and absorption after injection and inunction is slow, the max. amounts in blood being found 1—5 hr. after treatment. *A* was not detected in c.s.f. The total recovery from rats (urine, fæces, and body) 48 hr. after injection was 55%. Absorption from the injection was incomplete at this time. (For determination see C., 1944, Part 1.) R. S. A.

XX.—PHARMACOLOGY AND TOXICOLOGY.

Chemotherapeutic effect of esters of penicillin. K. Meyer, G. L. Hobby, and M. H. Dawson (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 100—104).—The ethyl and *n*-butyl esters of penicillin (cf. A., 1944, III, 141) have no action on streptococcus *in vitro*, but 0·6 mg. of the ethyl ester subcutaneously gave 50% survival after 1000 lethal doses of culture. Much larger oral doses were necessary. LD_{50} of the ethyl ester is 6—7 mg. for mice. Results with the butyl ester were similar, and both also give protection against the pneumococcus. V. J. W.

Production of penicillin. Esters of penicillin. Mode of action of antibacterial mould products. Penatin. Antibiotic substance from *Aspergillus flavus*.—See A., 1944, III, 140, 141.

Cytotoxic and antibacterial activity of gramicidin and penicillin; comparison with other germicides by tissue culture methods. W. E. Herrell and D. Heilman (*Amer. J. med. Sci.*, 1943, **206**, 221—226).—For the 3 organisms tested, *D. pneumoniæ*, *S. aureus*, and *S. pyogenes*, penicillin was the most effective germicide. Gramicidin is effective in small amounts against *D. pneumoniæ* and *S. pyogenes*, but is relatively ineffective against *S. aureus*. Zephiran and phemerol were effective against all 3 test organisms. Penicillin has the lowest toxicity for tissues; gramicidin comes next, then phemerol and zephiran. There is no contraindication to the simultaneous use of gramicidin with penicillin or the anionic detergents including the ordinary soaps. C. J. C. B.

Action of chemotherapeutic drugs (including proflavine) and excipients on healthy tissue. F. R. Selbie and J. McIntosh (*J. Path. Bact.*, 1943, **55**, 477—481).—The least toxic drugs were sulphonamides and penicillin; next in order of toxicity were the acridine salts, whilst propamidine and some of the acridine bases are still more toxic. From the point of view of toxicity there is no reason why proflavine sulphate should not be used either as a solution or as a diluted powder on fresh wounds. (6 photomicrographs.) C. J. C. B.

Metabolism of sulphapyridine in dog. C. J. Weber, J. J. Lalich, and R. H. Major (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 190—192).—When sulphapyridine is given by mouth to dogs, there appears in the urine a glycuronide of a OH-derivative of sulphapyridine, in which the OH is attached to the pyridine ring. V. J. W.

Sulphamethazine (2-*p*-aminobenzenesulphonamido-4 : 6-dimethylpyrimidine). F. L. Rose, A. R. Martin, and H. G. L. Bevan (*J. Pharm. Exp. Ther.*, 1943, **77**, 127—142).—Sulphamethazine, m.p. 197—198° (corr.), was prepared by heating together at 130° equimol. amounts of sulphanilylguanidine and acetylacetone. Its solubilities, antibacterial action *in vitro* (resembling that of sulphapyridine) and in experimental infections of mice, absorption and excretion in mice and men, and toxicity are described. It has advantages over other sulphanilamides at present in use. G. P.

Comparative solubilities of sulphadiazine, sulphamerazine, and sulphamethazine and their N^4-acetyl derivatives at varying pH levels. D. R. Gilligan and N. Plummer (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 142—145).—Sulphadiazine and its acetyl derivative have their solubility increased by alkalisation more than do the other compounds, but in the acid range (pH 5—6) sulphamethazine and its acetyl derivative are more sol. than the other 2. V. J. W.

Effect of temperature on bacteriostatic action of drugs.—See A., 1944, III, 144.

Comparison of mechanism of action of arsenicals and sulphonamides. L. Peters (*J. Pharm. Exp. Ther.*, 1943, **79**, 31—36).—Both atoxyl and sulphonamides are bacteriostatic for *E. coli* and their effect is antagonised by *p*-aminobenzoic acid. Mapharside is also bacteriostatic but its action is not so antagonised. V. J. W.

Comparative effects of ammoniated mercury, sulphathiazole, and soap and water on surface bacteria of the newborn infant. W. R. MacLaren (*J. Pediat.*, 1943, **23**, 446—450).—Repeated skin cultures on 43 newborn infants during the first 5 days of life showed that 1 application of either 2·5% ammoniated Hg or 7·5% sulphathiazole ointment retarded the growth of skin bacteria more than soap and water baths on alternate days. *Staph. albus* was the most prevalent skin organism during the first 5 days of life but many *Staph. aureus* and β-hæmolytic streptococci were also present. On the surface *Staph. albus* the 2 drugs exert a greater effect than soap and water alone but on *Staph. aureus* the effect of soap and water was greater. On the surface β-hæmolytic streptococcus sulphathiazole had a greater retarding effect than the other method. Sulphathiazole is not absorbed through the intact newborn skin from a 7·5% ointment and does not produce skin irritation. C. J. C. B.

***In-vitro* action of urea–sulphonamide mixtures.**—See A., 1944, III, 145.

Treatment of pneumococcic pneumonia with 2-sulphanilamido-4-methylpyrimidine (sulphamerazine, sulphamethyldiazine) in man. H. F. Flippin, W. I. Gefter, A. H. Domm, and J. H. Clark (*Amer. J. med. Sci.*, 1943, **206**, 216—221).—Two groups of 80 adult patients with pneumococcal pneumonia were treated with sulphamerazine and sulphadiazine respectively. The mortality, course, and incidence of toxic reactions were the same in both groups. The sulphamerazine group showed a higher plasma concn. of free drug than the other group. C. J. C. B.

Treatment of experimentally induced type I pneumococcus pneumonia in albino rats. E. H. Loughlin, E. H. Bennett, M. E. Flanagan, and S. H. Spitz (*J. Lab. clin. Med.* 1943, **28**, 1455—1461).—Sulphathiazole, Na sulphathiazole, sulphadiazine, Na sulphadiazine, dimethylsulphadiazine, and conc. refined type I antipneumococcal rabbit serum were used alone and in combination in 93 rats, treatment being started 24 hr. after inoculation. In type I pneumonia in rats, treatment with serum alone and dimethylsulphadiazine alone resulted in higher survival rates than with any of the other sulphonamides when used alone; serum + sulphonamides gave better results than sulphonamides alone. Dimethylsulphadiazine + type I serum gave higher survival rates than the other sulphonamides. Sulphadiazine + serum was next in effectiveness, while Na sulphathiazole, Na sulphadiazine, and sulphathiazole, each combined with serum, were less effectual in this order. When compared with dimethylsulphadiazine alone, Na sulphadiazine, sulphadiazine, Na sulphathiazole, and sulphathiazole were less effective in this order in producing survival. C. J. C. B.

Treatment of meningococcic meningitis with 2-sulphanilamido-4-methylpyrimidine (sulphamerazine, sulphamethyldiazine) in man. W. I. Gefter, S. B. Rose, A. H. Domm, and H. F. Flippin (*Amer. J. med. Sci.*, 1943, **206**, 211—215).—Sulphamerazine therapy cured 42 of 45 consecutive cases of meningococcic meningitis. Clinical improvement with return of mental clarity occurred in 70% of the patients within 48 hr and normal temp. in 5·2 days. Toxic reactions occurred in 11 patients after the 5th day of treatment. C. J. C. B.

Treatment of Kaposi's varicelliform eruption with sulphonamides. A. Connor and J. E. Gonce, jun. (*J. Pediat.*, 1943, **23**, 335—336).—Kaposi's varicelliform eruption is a serious complication of atopic eczema. In 2 of 3 patients, sulphonamides brought about prompt recovery. C. J. C. B.

Sulphanilamide and sulphathiazole therapy in acute salpingitis. D. N. Barrows and J. S. Labate (*Amer. J. Obstet. Gynec.*, 1943, **45**, 82—88).—Analysis of 204 cases. P. C. W.

Sulphonamides and their action on virulent *C. diphtheriæ*. A. P. Berkowitz and J. F. Murray (*S. Afr. J. Med. Sci.*, 1943, **8**, 25—27).—Sulphapyridine had no protective action against the effects of *C. diphtheriæ* in guinea-pigs, nor had sulphanilamide any *in-vitro* action on the toxic effects of *C. diphtheriæ* cultures. P. C. W.

Elimination of ulcerative cæcitis from a rat colony by chemotherapy of mothers. A. L. Bloomfield (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 197).—Incidence of cæcitis in young rats fell from 55 to 4·5% when 0·5% of sulphaguanidine was added to diet of females during pregnancy and lactation. V. J. W.

Microcrystalline sulphathiazole in impetigo contagiosa. T. N. Harris (*J. Amer. Med. Assoc.*, 1943, **121**, 403—405).—A single application of microcryst. sulphathiazole rapidly cleared the lesions of impetigo contagiosa in 15 cases. C. A. K.

Preparation and properties of a dry powdered mixture of sulphanilamide and hæmostatic globulin. I. A. Parfentjev, M. A. Goodline, and F. L. Clapp (*J. Lab. clin. Med.*, 1943, **28**, 1465—1467).—Dry hæmostatic globulin withstands 8 hr. heating at 110°, with little loss of its thrombic activity. The mixture of hæmostatic globulin and sulphanilamide described may be of val. in the treatment of wounds, since it is both thrombic and bacteriostatic. C. J. C. B.

Use of suppository as vehicle in sulphonamide therapy. J. H. Park, jun. (*J. Pediat.*, 1943, **23**, 326).—7·7-g. and 15·4-g. suppositories of the preferred sulpha drug in cacao butter were generally satisfactory. C. J. C. B.

Sensitisation of skin to sulphathiazole. C. S. Livingood and D. M. Pillsbury (*J. Amer. Med. Assoc.*, 1943, **121**, 406—408).—In 12 patients with infected eczema, local application of 5% sulphathiazole ointment for more than 5 days produced sensitisation so that subsequent administration of small doses of sulphathiazole by mouth produced, within a few hr., malaise, fever, local exacerbation of the treated lesions, and a generalised " id "-like pruritic eruption. There were no blood changes, and no evidence of kidney or liver damage. Sensitisation was not produced in cases of simple impetigo contagiosa treated by local application of sulphathiazole. C. A. K.

Cutaneous sensitisation to sulphathiazole. M. H. Cohen, H. B. Thomas, and A. C. Kalisch (*J. Amer. Med. Assoc.*, 1943, **121**, 408—411).—In 2 patients with varicose eczema local application of 5% sulphathiazole ointment produced a generalised skin eruption which could subsequently be reproduced in 1 case by 8 mg. of sulphathiazole by mouth. C. A. K.

Cutaneous hypersensitivity to sulphathiazole. A. L. Weiner (*J. Amer. Med. Assoc.*, 1943, **121**, 411—413).—4 cases of cutaneous hypersensitivity to sulphathiazole showed positive patch tests. The ingredients of the ointment bases used were eliminated as causes of the skin eruptions. C. A. K.

Bactericidal action of propylene glycol vapour on micro-organisms suspended in air. II. Influence of various factors on activity of vapour. T. T. Puck, O. H. Robertson, and H. M. Lemon (*J. Exp. Med.*, 1943, **78**, 387—406).—The most favourable conditions for the lethal action of the vapour were a small no. of air-borne droplets and of organisms in the bacterial suspension, temp. below 80° F., and a relative atm. humidity of 45—70%. The bactericidal efficiency of propylene glycol was as marked in an 800-cu. ft. room as in a 2-cu. ft. space. Partially and completely dehydrated bacteria, organisms suspended in broth or in saliva succumbed equally well. However, there was little effect on a dispersion of unsterile dust collected from inhabited rooms. Pneumococci were killed in concns. of 1 g. of glycol in 20 cu. m. of air; concns. of 1 : 5 million to 1 : 10 million were required for streptococci and staphylococci. A bactericidal concn. of glycol accumulates in the bacterial droplet by contact and absorption of glycol mols. from the surrounding atm. A. S.

Effect of propylene glycol on bacterial spores. E. Bigg (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 120—121).—Propylene glycol as liquid or vapour is destructive to vegetative forms of *B. subtilis* but has no effect on spores. V. J. W.

Microbiology of streptothricin.—See A., 1944, III, 142.

Relationship of bactericidal potency to length of fatty acid radical of certain quaternary ammonium derivatives. A. K. Epstein, B. R. Harris, and M. Katzman (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 238—241).—In the series of compounds described by Epstein and Harris (U.S.P. 2,290,173; B., 1943, III, 279) the bactericidal effect decreased in the order C_{14}, C_{12}, C_{16}, C_{18}, C_{10}, C_8 when tested on *Staph. aureus* and *E. typhosa*. In the case of a no. of myristic acid esters of colaminoformylmethylammonium chloride, changes in the lower mol. wt. groups on the quinquevalent N did not alter the bactericidal effect. V. J. W.

Structure and insecticidal properties of organic compounds. N. N. Melnikov, N. D. Suchareva, and M. L. Fedder (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 610—613).—Data are given for the min. lethal doses of a series of esters of thiocyanoacetic and α-thiocyanobutyric acids against *Pediculus vestimenti* and *Cimex lectularius* and their ova. Esters of thiocyano-substituted acids are much more potent insecticides than are those of the corresponding chloro-acids and esters having no functional group in the alkyl group of the fatty acid. The insecticidal efficiency of the alkyl thiocyanoacetates increases with increase in mol. wt. of the alkyl group. In the case of the α-thiocyanobutyrates the most active is the *iso*amyl ester. In general an increase in the mol. wt. of the radical of the fatty acid causes a decrease in the efficiency of the esters. The insecticidal activity of allyl thiocyanoacetate and α-thiocyanobutyrate differs only slightly from that of the corresponding propyl esters. (For new compounds see A., 1944, II, 36.) J. N. A.

Synthetic mydriatics.—See A., 1944, II, 46.

Recent developments in synthetic antispasmodics. A. L. Raymond (*J. Amer. Pharm. Assoc.*, 1943, **32**, 249—255).—A review, mainly of synthetics of the papaverine and atropine types. F. O. H.

Pharmacology of *N*-substituted carbaminocholines. M. B. Bender, M. A. Sprites, and D. B. Sprinson (*J. Pharm. Exp. Ther.*, 1943, **77**, 107—112).—By substitution of one or two alkyl groups into carbamylcholine (doryl), $R{\cdot}NH{\cdot}CO{\cdot}O{\cdot}C_2H_4{\cdot}NMe_3Cl$, the muscarine effect of the compound is markedly reduced, but its nicotine action is retained. Phenyl substitution abolishes both its nicotine and muscarine effects. G. P.

Influence of addition of chlorine to side-chain on certain actions of acetylcholine. J. L. Morrison (*J. Pharm. Exp. Ther.*, 1943, **79**, 1—4).—Chloroacetylcholine has a much weaker muscarine-like action than acetylcholine, though it is hydrolysed less readily by cholinesterase. It has a nicotinic action about equal to that of acetylcholine, but it does not cause chromodacryorrhœa in rats. L. L. W.

Noble–Collip shock : therapeutic effects of autonomic depressants ; motion factors. P. A. Zahl, S. H. Hutner, and F. S. Cooper (*J. Pharm. Exp. Ther.*, 1943, **77**, 143—150).—Atropine, scopolamine, light nembutal anæsthesia, bandaging of abdomen, or conditioning by previous tumbling, protected rats from lethal effects of tumbling in the rotating wheel of Noble and Collip (cf. A., 1942, III, 383, 384), or of rapid up-and-down shaking. Eserine sensitised the rats to the Noble–Collip treatment. Pretreatment in the Noble–Collip wheel protected the rats also against the effects of shaking. G. P.

Effect of adrenaline and aminophyllin on blood pressure fluctuations in bronchial asthma. H. Osgood and F. E. Ehret (*J. Lab. clin. Med.*, 1943, **28**, 1415—1426).—Following the subcutaneous injection of adrenaline, if relief from asthma is obtained, the respiratory systolic fluctuation decreases to or near the normal; with aminophyllin, the decrease is less. Aminophyllin relieves asthma by increasing the blood flow through the pulmonary circulation by vasodilatation; its bronchodilator effect is of secondary importance. C. J. C. B.

Increased blood-specific gravity in anæsthetised dogs following pilocarpine injections. B. H. Burch and B. A. Westfall (*J. Pharm. Exp. Ther.*, 1943, **79**, 16—22).—In dogs in deep Na pentabarbitone anæsthesia, the sp. gr. of the blood shows a gradual rise. Injection of pilocarpine nitrate (0·2 mg. per kg.) causes a sharp increase in the rate of this rise, at a max. after 5 min. It is due to red cells from the spleen entering the circulation, and fluid leaving it via kidneys and intestine. V. J. W.

Mechanism of aspirin antipyresis in monkeys. F. Guerra (Perez-Carral) and H. G. Barbour (*J. Pharm. Exp. Ther.*, 1943, **79**, 55—61).—Pyrexia, induced by subcutaneous injection of yeast, is reduced by acetylsalicylic acid. It is accompanied by hydræmia, and the reduction of temp. is caused by sweating. V. J. W.

Action of strophanthidin 3-propionate, -butyrate, and -benzoate. F. A. Steldt, R. C. Anderson, N. Maze, and K. K. Chen (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 198—199).—In cats, the propionate is more, and the butyrate and benzoate are less, active than strophanthidin. V. J. W.

Potency of cymarin and coumingine hydrochloride as influenced by environmental temperature. K. K. Chen, R. C. Anderson, F. G. Henderson, and C. A. Mills (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 200—202).—Frogs kept in water at 33° were 5 times as sensitive to coumingine hydrochloride, and twice as sensitive to cymarin, as at 13°. V. J. W.

Propylene glycol makes quinidine injectable. H. Brass (*J. Amer. Pharm. Assoc., Pr. Pharm. Ed.*, 1943, **4**, 310).—A solution of 10 g. of quinidine hydrochloride in 75 c.c. of propylene glycol is suitable for intramuscular, but not intravenous, injection. It does not require either filtration or autoclaving. P. G. M.

Treatment of outbreaks of hæmonchosis. H. McL. Gordon, I. W. Montgomery, and L. K. Whitten (*J. Counc. Sci. Ind. Res. Australia*, 1942, **15**, 200—206).—Phenothiazine was of val. in controlling the worms in sheep. CCl_4 and $CuSO_4$–nicotine gave inferior results. A. G. P.

Effectiveness of phenothiazine in human nematode infections. H. Most (*Amer. J. trop. Med.*, 1943, **23**, 459—464).—Phenothiazine was safe and effective in the treatment of more than 200 patients

infected with *Enterobius vermicularis*. A total dose of 300 mg. per kg. administered during 3 days is suggested for further clinical trial. The drug, especially in large doses, is potentially toxic. The manifestations of poisoning are hæmolytic anæmia and hepatitis. The drug was ineffective against infections with *Ascaris lumbricoides*, *Necator americanus*, *Strongyloides stercolaris*, and *Trichocephalus trichiurus*. F. S.

Recent advances in anæsthesia. J. C. Krantz, jun. (*J. Amer. Pharm. Assoc.*, 1943, **32**, 287—293).—A review, principally of ethylene, divinyl oxide, *cyclo*propane and its methyl ether, and pentothal Na. F. O. H.

Analgesic properties of certain drugs and drug combinations. D. L. Smith, M. C. D'Amour, and F. E. D'Amour (*J. Pharm. Exp. Ther.*, 1943, **77**, 184—193).—The analgesic effect of various drugs and their combinations was tested on rats by measuring the reaction time when the tip of the tail is being burnt by a beam of strong light of const. intensity (cf. A., 1941. III, 670). Little analgesia was produced by the ordinary analgesics (aminopyrine, aspirin, etc.), either alone or in combinations, unless very large doses were used. Aminopyrine and cyclopal (a barbiturate), either alone or together, or $MgSO_4$ with cyclopal considerably augmented the analgesic effect of morphine or codeine. G. P.

Antagonistic effect of *N*-allylmorphine on morphine. K. Unna (*J. Pharm. Exp. Ther.*, 1943, **79**, 27—31).—*N*-Allylmorphine is as toxic as morphine but less analgesic. It prevents or abolishes the effects of morphine, whether given beforehand or afterwards. V. J. W.

Addiction liability of demerol. C. K. Himmelsbach (*J. Pharm. Exp. Ther.*, 1943, **79**, 5—9).—The addiction liability of demerol is similar to, though less than, that of morphine. L. L. W.

Danger of morphine in asthma. J. F. Brock (*Clin. Proc.*, 1943, **2**, 222—225).—11 fatal cases in the hospital records are reported in which death in asthmatic patients may have been precipitated by morphine administration. P. C. W.

Comparison of effects of cobra venom and morphine on unanæsthetised cat. D. I. Macht (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 225—227).—Morphine in any dosage causes excitement, and dilatation of the cat's pupil. Cobra venom extract, free from hæmo- and cyto-toxic factors, acts only as a sedative. Small doses do not affect the pupil; large doses cause myosis. V. J. W.

Induction of labour with small doses of powdered ergot. C. J. Ehrenberg, O. F. Robbins, and J. A. Haugen (*Amer. J. Obstet. Gynec.*, 1940, **39**, 653—658).—Labour was successfully induced in 128 out of 167 attempts by the use of standardised powdered ergot with castor oil, or with castor oil and pituitrin. The ergot was given in 2-hourly doses of 800 mg. by mouth. 1—3 doses were necessary. P. C. W.

Degradation products of dilantin [5 : 5-diphenylhydantoin]. F. L. Kozelka and C. H. Hine (*J. Pharm. Exp. Ther.*, 1943, **77**, 175—179).—After oral or intravenous administration of 5 : 5-diphenylhydantoin (dilantin) to man or dog, 1—4% of the drug was recovered from the urine unchanged, 1—5% as diphenylhydantoic acid, and 10—27% as α-aminodiphenylacetic acid. 65% of the administered drug could not be accounted for. G. P.

Metabolism of hydantoin derivatives related to dilantin [5 : 5-diphenylhydantoin]. C. H. Hine and F. L. Kozelka (*J. Pharm. Exp. Ther.*, 1943, **77**, 180—183).—The metabolism of 1-acetyl- and of 2-thio-5 : 5-diphenylhydantoin is similar to that of dilantin (see preceding abstract). After the injection of 2-dihydro-5 : 5-diphenylhydantoin, only α-aminodiphenylacetic acid was found in the urine (26% of the injected amount). After the oral administration of 3-methyl-5 : 5-diphenylhydantoin the compound and its cleavage products were excreted in the demethylated form. Only 8% of the injected 5 : 5-di-*p*-anisylhydantoin could be accounted for in the urine, partly as the unchanged compound, and partly as the corresponding hydantoic and amino-acids. 15% of the injected 5-phenyl-5-ethylhydantoin was excreted unchanged, 1% as phenylethylhydantoic acid, and 30% as α-amino-α-phenylbutyric acid. G. P.

Pharmacology of mercury. I. Water-soluble dispersion of mercury. T. H. Maren and B. B. Edwards (*J. Amer. Pharm. Assoc.*, 1943, **32**, 255—259).—Molten cetyl alcohol, on solidifying, effects dispersion of Hg with which it is stirred. A stable aq. dispersion of the mixture can be prepared, *e.g.*, cetyl alcohol 14, Hg 6, Na lauryl sulphate 1, glycerol 10, water 69%. Tests by injection or inunction in mice and rabbits show such an emulsion to have a toxicity less than that of corresponding doses of Hg_2Cl_2 emulsion; it is non-irritating, rapidly absorbed, and water-sol., and should prove of use in venereal prophylaxis. F. O. H.

Rate of urine secretion in dogs following administration of mercuric chloride and glucose solutions. R. L. Stehle and K. I. Melville (*Rev. Canad. Biol.*, 1943, **2**, 350—359).—$HgCl_2$ (3 mg. per kg.) was intravenously injected in dogs under Na phenobarbital anæsthesia. Rapid infusion of isotonic glucose solution causes rates of urine secretion equal to calc. rates of glomerular filtration. The average rate in 8 experiments was 0·34 c.c. per g. of kidney per min. This represents 9% of a renal blood flow of 4·0 c.c. per g. per min. The hæmatocrit val. was 31%, so that 13% of the plasma which entered the kidneys appeared as urine. A. S.

Recent advances in synthetic organic antisyphilitics. W. G. Christiansen and A. E. Jurist (*J. Amer. Pharm. Assoc.*, 1943, **32**, 281—287).—A review of recent types of org. As and Bi compounds and certain aspects of antisyphilitic therapy, *e.g.*, detoxication. F. O. H.

Effects of *p*-aminobenzoate and methyl *m*-amino-*p*-hydroxybenzoate on acute toxicity of *m*-amino-*p*-hydroxyphenylarsenoxide in mice. L. Peters (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 147—149).—No reduction in acute toxicity was produced. V. J. W.

Use of acetylarsan in treatment of congenital syphilis in children. J. Yampolsky and C. C. Power (*J. Pediat.*, 1943, **23**, 303—306).—Acetylarsan was not toxic in very young children. The Kahn test was not universally reversed in young children, even after a course of 30 treatments, indicating the necessity of using the drug for a long time. Rœntgenological improvement of osseous lesions was seen more often in young babies than in older children. Older children do not respond to the drug alone. C. J. C. B.

Lead intoxication from bullet in sphenoid sinus. C. E. Futch (*J. Amer. Med. Assoc.*, 1943, **121**, 580—582).—Case report. C. A. K.

Effect of sodium citrate administration on excretion of lead in urine and fæces. T. V. Letonoff and S. S. Kety (*J. Pharm. Exp. Ther.*, 1943, **77**, 151—153).—Excretion of Pb in urine and fæces of patients with chronic Pb poisoning increased during oral administration of 15 g. of Na citrate per day. G. P.

Allergy to argyrol. L. H. Criep (*J. Amer. Med. Assoc.*, 1943, **121**, 421—422).—Case report. C. A. K.

"Black dermographism." E. Urbach and D. M. Pillsbury (*J. Amer. Med. Assoc.*, 1943, **121**, 485—490).—Certain metals, *e.g.*, Ag, Cu, Al, Ni, Zn, produce a black line when stroked along skin covered with hard powders, pastes, etc. Black dermographism is a physical phenomenon and can also be produced on coarse paper, cloth, and wood. C. A. K.

Species differences [in formation of methæmoglobin] with acetanilide and phenacetin. D. Lester (*J. Pharm. Exp. Ther.*, 1943, **77**, 154—159).—The formation of methæmoglobin was studied after oral administration of acetanilide and of phenacetin; acetanilide is the more active in this respect. There is a threshold dose for each drug which varies with species and under which no methæmoglobin is formed; also beyond a certain dose no more methæmoglobin is formed. Man is half as sensitive to these drugs as the cat, the dog is half as sensitive as man, and the rat one sixth as sensitive as the dog. The monkey and rabbit form practically no methæmoglobin when treated with these drugs. G. P.

[Effect of] repeated administration of acetanilide and phenacetin [on formation of methæmoglobin]. D. Lester (*J. Pharm. Exp. Ther.*, 1943, **77**, 160—164).—Neither acetanilide nor phenacetin has cumulative effects on methæmoglobin formation when given to human subjects in doses of 1, 2, or 3 g. per day for several weeks. G. P.

Rôle of liver in metabolic destruction of quinine. C. A. Anderson, W. E. Cornatzer, and J. C. Andrews (*J. Pharm. Exp. Ther.*, 1943, **79**, 62—69).—Partial removal of the liver in rats or its injury by $CHCl_3$ in dogs causes increase in urinary excretion of quinine. Removal of the spleen is without effect. Regeneration of the liver causes quinine excretion to return to normal. V. J. W.

Metabolism of quinine in pregnant animals. A. F. Burton and F. E. Kelsey (*J. Pharm. Exp. Ther.*, 1943, **79**, 70—76).—Quinine readily passes through the rabbit's placenta and max. fœtal concn. is found on the 12th day of pregnancy. It is rapidly destroyed by the fœtus and does not accumulate. The quinine-destroying capacity of the mother varies during pregnancy and is max. at the end of the second trimester. V. J. W.

Toxicity of acetoin. L. A. Greenberg (*J. Pharm. Exp. Ther.*, 1943, **77**, 194—197).—Intoxication of rats to the point of loss of the "righting reflex" occurred after the intraperitoneal injection of repeated small vols. of 30% acetoin when the acetoin level in blood had reached 227—251 mg.-%. The corresponding figures for ethanol were 288—312 mg.-%. Respiratory failure occurred in rats when the blood-acetoin level had reached 742—770 mg.-%; the corresponding figures for ethanol were 900—952 mg.-%. The action of ethanol and acetoin, when given together, is directly additive. G. P.

Cellular response to methylated long-chain fatty acids. B. Gerstl and R. Tennant (*Yale J. Biol. Med.*, 1943, **15**, 347—357).—Intraperitoneal injections in rabbits of α-methylated fatty acids caused decreasing necrosis as the chain length increased from 19 C atoms to no necrosis at 27 C atoms while giant-cell formation appeared at 21 C atoms and increased with increasing chain length. With 10-methyl-substituted acids necrosis was extensive at 23 and 25 C

atoms; necrosis was less and giant cells became noticeable at 27 C atoms. (8 photomicrographs.) F. S.

Pulmonary manifestations following ingestion of kerosene. L. I. Lesser, S. Weens, and J. D. McKey (*J. Pediat.*, 1943, **23**, 352—363).—Pulmonary manifestations were observed in 77% of 33 patients examined rœntgenologically. The changes were pulmonary œdema, hæmorrhage, and inflammation, as shown in rabbit experiments and at autopsy. C. J. C. B

Contact dermatitis from rubber service gas mask. I. A. Lewe (*J. Amer. Med. Assoc.*, 1943, **121**, 422).—Case report. C. A. K.

Tsetse-fly repellents in veterinary science. H. E. Hornby and M. H. French (*Trans. R. Soc. trop. Med. Hyg.*, 1943, **37**, 41—54).—A technique is described in detail whereby the action of any substance in repelling tsetse flies can be compared with that of pyrethrum, which is the only one of 150 substances that has any efficacy in the veterinary field. A freshly prepared emulsion of 2% pyagra in dil. soap solution, thoroughly swabbed or sprayed on to a donkey, prevents tsetse feeding for more than 24 hr. in any weather except heavy rain. If, during this period, tsetse remain in contact with the skin for more than a few sec., they become poisoned, but may probe and possibly infect before death. C. J. C. B.

Isolation of photosensitising agents from buckwheat. S. H. Wender, R. A. Gortner, and O. L. Inman (*J. Amer. Chem. Soc.*, 1943, **65**, 1733—1735).—Extraction of flowering *Fagopyrum esculentum* with acetone and chromatography of the extract in ether on Al_2O_3–Na_2SO_4 gives three cryst. substances, differentiated by absorption spectra, and all producing photosensitisation when fed to white guinea-pigs. A fourth substance is also isolated. R. S. C.

Radioactive method of testing absorption from ointment bases. G. W. Johnston and C. O. Lee (*J. Amer. Pharm. Assoc.*, 1943, **32**, 278—280).—Absorption of radioactive NaCl from fatty bases occurs through the unbroken skin, indicated by detection of radioactivity in the hands and urine. F. O. H.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Effect of exercise on blood-pyruvic acid.—See A., 1944, III, 12.

Dietary conditions in industry.—See A., 1944, III, 41.

Industrial eye health problems.—See A., 1944, III, 23.

Strains of *A. cloacæ* causing illness in cotton workers.—See A., 1944, III, 73.

Industrial hygiene problems in the synthetic rubber industry.—See B., 1944, III, 19.

XXII.—RADIATIONS.

Photochemical experiments on single nerve fibres.—See A., 1944, III, 18.

Radiology in abdominal emergencies. S. F. Oosthuizen (*Clin. Proc.*, 1943, **2**, 205—213).—Review and discussion with illustrations. P. C. W.

Delayed lethal effect of *X*-rays on fibroblasts cultivated *in vitro*. L. Doljanski and G. Goldhaber (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 114—116).—Irradiation with 3000 r. does not cause permanent damage, but after 5000 r. the cultures cease to grow and die out after 3—7 sub-cultures. Irradiation was carried out from a tube working at 35 kv. and 2 ma. There was a Cu anticathode and the rays reaching the culture were mainly Cu *K*-rays. V. J. W.

Stimulation of development of avian embryo by *X*-rays.—See A., 1944, III, 30.

***X*-Ray studies in *Phaseolus vulgaris*. Relation of mitotic disturbances to *X*-ray dosage and polyploidy. Two *X*-ray mutations of morphological interest. Preliminary yield experiments with ten induced mutations in barley.**—See A., 1944, III, 84, 85.

Localised heat production in living tissue at a distance. R. E. Grant and R. M. Brickner (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 157—159).—An Fe wire or suspension of granulated Fe in water is placed at any required spot in an animal which is enclosed in an electromagnetic coil taking 122 amp. at 400,000 cycles. Destruction of surrounding tissue can be obtained in 1 min. V. J. W.

Therapeutic value of ultra-violet radiation. Council on Physical Therapy (*J. Amer. Med. Assoc.*, 1943, **121**, 513).—Effects of ultra-violet radiation on the skin, eye, and metabolism are reviewed. C. A. K.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Analysis of various biological processes by the study of the differential action of optical isomerides. G. F. Gause (*Biodynamica*, 1941, **3**, 217—246).—A review. L. G. G. W.

Absorption spectrum of luciferin and oxidised luciferin. A. M. Chase (*J. Biol. Chem.*, 1943, **150**, 433—445).—The visible absorption spectrum of luciferin (from the crustacean *Cypridina hilgendorfii*), measured on a recording spectrophotometer during spontaneous non-luminescent oxidation, shows first a displacement of the initial max. from 435 mμ. to 465 mμ. and then its disappearance as the solution becomes almost colourless. There are also changes in the ultra-violet. The same sequence of changes occurs, but about 100 times as fast, when luciferase is added and the reaction is luminescent; they do not occur when O_2 is excluded by saturation with H_2. Luciferin itself, and not impurities, is therefore responsible for the observed changes in absorption spectrum during exposure to air. Measurements in the ultra-violet are difficult, but max. appear to exist at 310—320, 280, and 260 mμ., with complete absorption below 240 mμ. E. C. W.

Potential, impedance, and rectification in membranes.—See A., 1944, I, 36.

Action current in *Nitella*. V. Partial response and the all-or-none law. W. J. V. Osterhout (*J. Gen. Physiol.*, 1943, **27**, 61—68; cf. A., 1938, III, 963).—Photographic records made in the manner previously described indicate the relationship between response to electrical stimulation and changes in the distribution of potential caused by diffusion of ions (*e.g.*, $K^{\cdot}$) in the outer and inner non-aq. layers which bound the aq. layer of protoplasm. If stimulation is repeated before completion of recovery from preceding stimulation no response, or only partial response, is elicited. Partial responses frequently appear to conform to the all-or-none law. W. McC.

Electrical activity of acetylcholine, choline, and adrenaline, and benzedrine.—See A., 1944, I, 40.

Electrophoretic properties of globin from various sources. M. P. Munro and F. L. Munro (*J. Biol. Chem.*, 1943, **150**, 427—431).—In PO_4''' buffer at pH 5·5, globins from human, bovine, and rabbit hæmoglobin migrate under electrophoresis as a single component with identical mobilities. Human globin migrates as a single component over the pH range 5·2—7·9, the isoelectric point being 7·5. In glycine–HCl buffer at pH 2·7, however, all three globins separate into two components; the separation is distinct and the mobilities are identical for bovine and rabbit globins, but human globin does not separate so distinctly, and the mobilities of the components are not the same as those of the other two globins and are closer together. E. C. W.

Magnetic properties of crystalline horseradish peroxidase and its derivatives. H. Theorell (*Arkiv Kemi, Min., Geol.*, 1943, **16**, **A**, No. 3, 11 pp.).—The magnetic susceptibility of the peroxidase over the pH range 3·99—12·7 is determined. The susceptibility is practically const. from pH 4 to 9, after which it decreases rapidly. The fluoride–peroxidase complex has susceptibility which agrees with that for 5 odd electrons and hence the Fe is bound with ionic bonds. With the CN' and SH' compounds the Fe is bound with essentially covalent bonds. Of the 3 possible H_2O_2 compounds at least one has a lower paramagnetic susceptibility than the peroxidase. The magnetic properties of ferro-peroxidase agree with those of ferro-hæmoglobin. CO forms a diamagnetic complex with ferro-peroxidase. The following rules for the relation between the spectrum and the way in which the Fe is bound in protohæmin proteins are given: Fe''' compounds with essentially ionic bonds are brown or green with clear absorption bands in the red, whilst with covalent bonds, the compounds are red and have one broad or two narrower rather flat bands in the green. Essentially ionic Fe'' compounds are purple-red with a broad band at approx. 560 mμ., whilst essentially covalent Fe'' compounds are brilliant red with two well-defined bands in the green. J. N. A.

XXIV.—ENZYMES.

Reduction of symmetrical trinitrotoluene by succinic dehydrogenase. B. B. Westfall (*J. Pharm. Exp. Ther.*, 1943, **79**, 23—26).—*s*-Trinitrotoluene is reduced to the 4-amino-compound by a succinic dehydrogenase prepared from ox heart muscle. L. L. W.

Distribution of quinine oxidase in animal tissues. F. E. Kelsey and F. K. Oldham (*J. Pharm. Exp. Ther.*, 1943, **79**, 77—80).—Extracts of organs were incubated with quinine at 37° for 1, 6, or 12 hr. Max. activity was shown by the liver of the rabbit. That of the rat was about half this val., and of other animals and man was slight or absent. Some was present in lung, kidney, and uterus, but not in other organs. V. J. W.

Influence of pregnancy on quinine oxidase of rabbit liver. F. K. Oldham and F. E. Kelsey (*J. Pharm. Exp. Ther.*, 1943, **79**, 81—84).—By the 29th day of pregnancy liver oxidase was reduced by 75% and did not return to normal until 42 days after parturition. V. J. W.

Isolation of creatinine oxidase and creatine anhydrase from rat fæces. H. H. Beard (*Arch. Biochem.*, 1943, **2**, 363—369).—The isolation from a suspension of fresh rat fæces of a creatinine oxidase which destroys creatinine under aërobic conditions, and of a creatine

anhydrase which converts creatine into creatinine under anaërobic conditions, is described. The oxidase, which has optimum pH 7, acts better at alkaline than at acid pH vals. When incubated with creatinine at 37° and pH 7 it destroys 0·26 mg. of creatinine per hr. It is highly sp. for creatinine and does not attack creatine or glycocyamidine under aërobic conditions. Organisms which grow on creatine also decompose creatinine. Some growth of these organisms occurs on glycine and creatine, more on arginine, and most of all on alanine, each as sole source of N and C. Growth does not occur on glycocyamine, glycocyamidine, hydantoin, methylhydantoin, guanidine acetate, or urea. Only those organisms which grow on creatine or creatinine destroy creatinine. A creatinine oxidase is also present in the mould that grows on top of rat urine when kept at room temp. for 3 days. It does not transform creatine into creatinine. J. N. A.

Nature of tea polyphenol oxidase. H. B. Sreerangachar (*Current Sci.*, 1943, **12**, 227—228).—This enzyme has been purified and shown to be a Cu protein. It was extracted from the acetone prep., pptd. by $(NH_4)_2SO_4$, dialysed, adsorbed on $Ca_3(PO_4)_2$ gel, and eluted. A concn. of 800 has been achieved. After the first few stages [Cu] was proportional to the enzyme activity, whereas Fe and Mn were completely removed; removal of the Cu by dialysis inactivates the enzyme. J. F. M.

Preparation and properties of crystalline horseradish peroxidase. H. Theorell (*Arkiv Kemi, Min., Geol.*, 1943, **16**, **A**, No. 2, 11 pp.).—The prep. of cryst. peroxidase and paraperoxidase from horseradish involves extraction of the crude enzyme with water, pptn. with $(NH_4)_2SO_4$ and 96% alcohol, electrophoresis, and pptn. of the paraperoxidase by 58% saturation with $(NH_4)_2SO_4$. After this stage the peroxidase, which is 90% pure, is cryst. repeatedly from aq. $(NH_4)_2SO_4$. It forms microscopic needles, of solubility approx. 1·5 g. per l. The peroxidase contains 1·47% of hæmin and 13·3% of N. Paraperoxidase has isoelectric point above pH 10·45. It is readily denatured, and is not of const. occurrence in horseradish. Cryst. peroxidase is easier to isolate in the winter or spring; during the autumn the roots contain polysaccharides which are difficult to remove. J. N. A.

Comparison of milkweed, horseradish, and turnip peroxidases. J. B. Sumner and E. C. Gjessing (*Arch. Biochem.*, 1943, **2**, 295—299).—Milkweed peroxidase differs from horseradish and turnip peroxidases in that it is more thermostable and requires a higher concn. of H_2O_2 for optimum action, and is not inhibited by high concn. of H_2O_2. It is inactivated to a greater extent than are the other two peroxidases in contact with H_2O_2 or pyrogallol. The initial rate of reaction with pyrogallol is greater for milkweed than for horseradish or turnip peroxidases. J. N. A.

Determination of peroxidase activity. J. B. Sumner and E. C. Gjessing (*Arch. Biochem.*, 1943, **2**, 291—293).—A modification of the method of Willstätter and Stoll (A., 1918, i, 555) for determination of peroxidase activity is described. The purpurogallin formed by the action of peroxidase and H_2O_2 on pyrogallol in presence of 0·5M-PO_4''' buffer at pH 6 is extracted with ether, and the purpurogallin in the filtered solution is determined by means of an electro-photometer by comparison with a standard curve. J. N. A.

Action of chloroform or toluene on yeast-catalase. K. Yamafuji, H. Imagawa, and T. Inouye (*Biochem. Z.*, 1941, **307**, 220—225).—Narcotics increase the catalase activity of yeast and the increase is approx. proportional to the intensity of respiration of the yeast before treatment. Activation is more pronounced in air than in N_2. Respiration of yeast is considerably disturbed by $CHCl_3$ or toluene although the cells are not killed by the narcotics. It is assumed that the narcotics together with O_2 activate the catalase before the cells lose their ability to absorb O_2. Catalase in the yeast cell is activated by H_2O_2, which is formed in most cases by active O_2 produced by the action of light, or by solid boundary surfaces, or by biological substances containing Fe, *e.g.*, hæmoglobin. The increase in catalase activity of yeast treated with $CHCl_3$ or toluene may be due to activation of O_2 at the boundary surface of the two liquids, water–narcotic, which then forms H_2O_2. In presence of hæmatin, there is still further increase in catalase activity in presence of narcotics. J. N. A.

Effect of cocaine, ergotamine, and yohimbine on the activity of phenol sulphur esterase. C. Torda (*J. Pharm. Exp. Ther.*, 1943, **77**, 123—126).—Cocaine inhibits, ergotamine and yohimbine increase, the activity of phenol S-esterase obtained from cat muscle. G. P.

Effect of muscular exercise on serum-choline-esterase level in normal adults and in patients with myasthenia gravis.—See A., 1954, III, 13.

Effect of *X*-rays on acetylcholine solutions showing the dilution and protection phenomena found for enzymes.—See A., 1944, III, 63.

Effect of heavy metals on activation and injury of tyrosinase. J. H. Bodine and T. N. Tahmisian (*Arch. Biochem.*, 1943, **2**, 403—411).—1×10^{-10}—1×10^{-8}M-$HgCl_2$ activates protyrosinase. Higher concns. cause increasing activation, but between 3×10^{-7} and 1×10^{-1}M. is toxic and at the last concn. the tyrosinase is irreversibly injured. Tyrosinase obtained by heat or by activation of protyrosinase with aerosol-OT is more resistant to toxic concn. of $HgCl_2$ than is tyrosinase formed by treatment with $HgCl_2$ alone. Concns. of $AuCl_3$ up to 5×10^{-8}M. do not activate protyrosinase. Activation occurs at 6×10^{-8}M. and attains a max. of 70% at 7×10^{-8}M. 5×10^{-7}M-$AuCl_3$ causes complete inactivation. Max. activation (approx. 10%) of protyrosinase results from concn. of 1×10^{-8}—6×10^{-8}M-H_2PtCl_6. With increase of concn. activity gradually decreases and becomes zero at 5×10^{-7}M. Activation with Pd begins at 2×10^{-9}M. and reaches 8% max. at approx. 8×10^{-8}M-$PdCl_2$. The enzyme is completely destroyed by 3×10^{-7}M-$PdCl_2$. $CuCl_2$ has a wide range of activation between 1×10^{-11} and 5×10^{-6}M. The enzyme is completely destroyed by 1×10^{-4}M-$CuCl_2$. At the optimum concn. of approx. 1×10^{-6}M. Cu causes approx. 20% activation of protyrosinase. $FeCl_3$, $NiCl_2$, $CoCl_2$, $CdCl_2$, $ZnCl_2$, $MnCl_2$, and $AlCl_3$ do not activate protyrosinase between concn. of 1×10^{-8} and 1×10^{-4}M. All the salts in high concn. are toxic for tyrosinase, the order of decreasing toxicity being Au, Pd, Hg, Fe, Pt, Ni, Co, Zn, Mn, Al, Cd, and Cu. The possible relation of toxicity of salts and the position of the respective metals in the electromotive series is discussed. J. N. A.

Activation of uricase by cysteine. B. T. Scheer and M. A. R. Scheer (*J. Biol. Chem.*, 1943 **150**, 359—361).—Great simplification and freedom from danger of inactivation by Ba^{++} are achieved in a method for preparing uricase from pig's liver by a modification of the procedures of Davidson (A., 1938, III, 844) and Holmberg (A., 1940, III, 162). Addition of cysteine causes increase, due to simultaneous oxidation of cysteine and urate, in O_2 uptake by a mixture of Li urate and uricase. In absence of urate cysteine is not oxidised rapidly by uricase. W. McC.

Relation of molecular configuration to rate of deamination of sympathomimetic amines by aminase. K. H. Beyer (*J. Pharm. Exp. Ther.*, 1943, **79**, 85—95; cf. A., 1943, III, 585).—O_2 uptake of 22 amines in presence of fresh ground-up guinea-pig liver was determined. *sec.* Amines were oxidised more rapidly than primary, and *tert.* not at all. Rate was increased (1) by presence of an asymmetrical β-C in the side-chain provided there was no OH on the aromatic nucleus, (2) by presence of a *p*-phenolic radical, (3) in 3 : 4-dihydroxyphenolic compounds. It was reduced (1) by presence of two methyl groups on the β-C, (2) by movement of the phenolic radical to the *o*-position, (3) by presence of an aliphatic OH or ketone group on the C which is β to the amino-group. V. J. W.

Chemistry of the chick embryo. IV. Aminopeptidase. M. Levy and A. H. Palmer (*J. Biol. Chem.*, 1943, **150**, 271—279; cf. A., 1941, III, 413).—Glycylglycyl-*d*-alanine (synthesis described) is hydrolysed by aminopeptidase only from the NH_2-end. The rate of hydrolysis was used to follow the accumulation of the enzyme in the chick embryo. The rate of accumulation varies during growth. R. L. E.

Effect of acetylation on specificity of pepsin. V. Hollander (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 179—180).—Acetylation of the free NH_2 groups of pepsin does not affect its power to hydrolyse either hæmoglobin or carbobenzyloxy-*l*-glutamyl-*l*-tyrosine, but further acetylation decreases it. Activity is restored by acid hydrolysis of *O*-acetyl, leaving *N*-acetyl groups intact. V. J. W.

Thrombin activity and fibrinolysis in purified coagulation systems.—See A., 1944, III, 10.

Proteolytic activity of thyroid gland.—See A., 1944, III, 27.

Pancreozymin, stimulant of secretion of pancreatic enzymes in extracts of small intestine.—See A., 1944, III, 34.

Diastase content of blood and urine in acute alcoholism.—See A., 1944, III, 59.

Glycolytic enzymes of synovial fluid.—See A., 1944, III, 1.

Rate of enzymic hydrolysis of phosphoric esters. II. Relation of structure to dissociation constant, Michaelis constant, and rate of hydrolysis. G. E. Delory and E. J. King (*Biochem. J.*, 1943, **37**, 547—550; cf. A., 1939, III, 941).—Aromatic phosphoric esters are more readily hydrolysed, being more acidic, than aliphatic esters, and addition of an aliphatic group (as in *o*-tolyl phosphate) to the aromatic nucleus lowers the rate of hydrolysis. Of the bromophenyl phosphates *p*- is most rapidly hydrolysed and *m*- most slowly. The results support the hypothesis that the enzyme has the properties of a weak base which would have the greatest affinity for the most strongly acid grouping, with resulting increased rate of hydrolysis and lower Michaelis const. P. G. M.

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

Antibiotic substance produced by submerged cultivation of *Aspergillus flavus*. C. M. McKee and H. B. MacPhillamy (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 247—248).—This mould was grown in a

Czapek–Dox medium at 25° with const. agitation. After 7—14 days the medium developed an alkalinity of pH 8·4 and contained an antibiotic substance identical with penicillin in all tests applied. V. J. W.

Mechanism of enzyme action. XXI. Intermediary phases in enzymic breakdown of *dl*-alanine by *Fusarium lini*, Bolley. J. C. Wirth and F. F. Nord (*Arch. Biochem.*, 1943, **2**, 463—468; cf. A., 1943, III, 520).—Pyruvic acid and H_2O_2 are intermediates in the degradation of alanine by fusaria. With phenylalanine keto-acid(s) and non-acidic carbonyl compound(s) are formed. Fusaria are able to dissimilate both *d*- and *l*-alanine. NO_3' is used only as a secondary source of N in presence of alanine. It is suggested that alanine is converted into the imino-acid and this into pyruvic acid, but the alternative route alanine → lactic → pyruvic acid may also be followed because when lactic acid is used as sole source of C, H_2O_2 and a keto-acid are formed. The central position of pyruvic acid in the course of enzymic degradation of hexoses, pentoses, and amino-acids by fusaria is discussed. J. N. A.

Abstracts on penicillin and other antibiotic substances.—See A., 1944, III, 88.

Penicillin, microbiological aspects, excretion, resistance to penicillin by pneumococci, use in experimental *Cl. welchii* infection.—See A., 1944, III, 53.

Production of penicillin. S. W. Challinor and J. MacNaughtan (*J. Path. Bact.*, 1943, **55**, 441—445).—Increased yields of penicillin were obtained by the addition of large amounts of PO_4''' buffer salts to a modified Czapek–Dox medium, and there was less variation between individual cultures in any one batch. These results were obtained with 6 different strains of *P. notatum*. After 10 days' incubation the average concn. of antibacterial substance was 6 units per ml. of culture fluid, compared with 2 units on the original modified Czapek–Dox medium. Higher yields (6—10 units per ml.) were obtained in a few experiments using a recently acquired strain of *P. notatum*. In a few experiments increased yields were obtained by culturing in the presence of $CaCO_3$. Less pigment was formed in the buffered medium and for this and other reasons the extraction and concn. of the active substance were facilitated. C. J. C. B.

Esters of penicillin. K. Meyer, G. L. Hobby, and E. Chaffee (*Science*, 1943, **97**, 205—206).—Methyl, ethyl, *n*-butyl, and benzhydryl esters of penicillin were prepared from the corresponding diazo-compounds. The esters are insol. in neutral and slightly alkaline buffers, very sol. in benzene, and not pptd. from $CHCl_3$–benzene solutions by dry NH_3. They contain about 10% of alkoxyl, and esters prepared from unfractionated penicillin are chromatographically separable into 3 components. They are relatively inactive *in vitro* (25 μg. per c.c.) against hæmolytic streptococci, but show a marked activity in mice; 1·5 mg. of ethyl or 2·5 mg. of methyl ester gave complete protection against a 10^{-3} dilution of the streptococci. The mouse is not protected by the benzhydryl ester, which apparently is not hydrolysed. (Cf. A., 1944, III, 131.) E. R. R.

Mode of action of some antibacterial mould products. O. Schales (*Arch. Biochem.*, 1943, **2**, 487—490).—The properties of penatin and penicillin *B* suggest that they are glucose oxidases. The concn. of H_2O_2 required to inhibit growth of *Staph. aureus* is less than that obtained by reaction of glucose oxidase with glucose. The bacteriostatic effects of penicillin *B*, penatin, and notatin are explained by their ability to produce H_2O_2 in presence of glucose and O_2. J. N. A.

Purification and properties of penatin, the second antibacterial substance produced by *Penicillium notatum*, Westling. W. Kocholaty (*Arch. Biochem.*, 1943, **2**, 73—86).—Penatin preps. were purified about 1000-fold by adsorption on kaolin at pH 3·5—4·0, elution with PO_4''' buffer at pH 6·3, and pptn. from 60—70% dioxan. It is a protein, showing antibacterial properties only in the presence of glucose, when H_2O_2 is produced. It is bactericidal to Gram-negative bacteria not susceptible to penicillin, although its action is chiefly bacteriostatic. Antibacterial substances different from penatin and suppression of penatin formation were produced by adding corn liquor or yeast extract to the Czapek–Dox medium, or by replacing glucose with malt extract or brown sugar. Penatin is very similar to, or identical with, notatin. E. R. S.

Biochemistry of lower fungi. Syntheses of phoenicin, *iso*phoenicin, and fumigatin.—See A., 1944, II, 49.

Relation of certain fungi to thiamin. W. J. Robbins and R. Ma (*Bull. Torrey Bot. Club*, 1943, **70**, 190—197).—Sixteen fungi (chiefly *Ceratostomella* sp.) were grown in media containing pyridoxine and biotin methyl ester and in addition thiamin or pyrimidine and thiazole, or pyrimidine or thiazole. Four of the fungi required thiamin as such and were unable to utilise its intermediates, five grew well when supplied with both pyrimidine and thiazole, and six grew well when given thiamin or both intermediates or pyrimidine only but not when given thiazole only. L. G. G. W.

Interaction between thiamin and four fungi. F. Kavanagh (*Bull. Torrey Bot. Club*, 1942, **69**, 669—692).—Thiamin disappears from cultures in which *Phycomyces blakesleeanus*, *Phytophthora cinnamomi*, *Mucor ramannianus*, or *Sclerotium rolfsii* are grown. *Phycomyces* destroys thiamin with liberation of pyrimidine and destroys thiazole, and addition of thiazole but not of pyrimidine to the culture increases growth. *Phytophthora* utilises thiamin without destroying thiazole or pyrimidine. *Mucor* synthesises pyrimidine and grows well only when a large amount of thiazole is present, whilst *Sclerotium* grown in solutions containing thiamin synthesises thiazole. L. G. G. W.

Production of thiamin by *Actinomyces*. J. A. Herrick and C. J. Alexopoulos (*Bull. Torrey Bot. Club*, 1943, **70**, 369—371).—The growth of *Phycomyces blakesleeanus* is stimulated by an extract prepared by autoclaving, after acidifying and filtering, a culture of any one of 22 species of *Actinomyces* and it is concluded that *Actinomyces* produce thiamin or its precursors. L. G. G. W.

Thiamin production by *Actinomyces viridochromogenus*. J. A. Herrick and C. J. Alexopoulus (*Bull. Torrey Bot. Club*, 1942, **69**, 569—572).—Culture filtrates of *A. viridochromogenus* autoclaved after acidification gave an extract that stimulated the growth of *Stereum gausapatum* and *Phycomyces blakesleeanus*, indicating the presence of thiamin in the extract and hence its synthesis by *A. viridochromogenus*. L. G. G. W.

Nomenclature and classification of the *Actinomycetes*. S. A. Waksman and A. T. Henrici (*J. Bact.*, 1943, **46**, 337—341). F. S.

Microbiology of streptothricin. I. Metabolism and streptothricin formation in stationary and submerged cultures of *Actinomyces lavendulæ*. H. B. Woodruff and J. W. Foster (*Arch. Biochem.*, 1943, **2**, 301—315).—The marked variability observed in surface cultures of actinomycetes is largely eliminated when the organisms are grown in submerged culture with forced aëration and mechanical agitation. *A. lavendulæ* and *A. antibioticus* produce streptothricin and actinomycin respectively; growth and formation of antibacterial substance are both accelerated in aërated as compared with stationary cultures. Use of neutralised corn steep liquor or soya-bean meal in the medium instead of tryptone results in increased formation of streptothricin. In such media growth rate differences between aërated and stationary cultures are greater than in tryptone medium. There is little difference in total tryptone consumption in aërated or stationary cultures, but it is much quicker in the former and parallels consumption of glucose. *A. lavendulæ* forms acid from sugar and this process is favoured by excessive aëration. The acid consists mainly of lactic acid in the case of tryptone medium and amounts to 25% conversion based on the sugar utilised. In a glycine medium, acidity is mainly due to volatile acid, probably acetic acid. Formation of acid in aërated cultures of *A. lavendulæ* is influenced by concn. of carbohydrate in the medium, especially in relation to org. N. In absence of or with only low concn. of glucose the medium gradually becomes alkaline due to formation of NH_3 from breakdown of tryptone. With *A. antibioticus* there is no formation of acid in stationary, but only in aërated, culture. Production of actinomycin is considerably greater in aërated culture and is first detected on the 5th day of growth when max. growth has been attained. It may be a product of cellular synthesis which is liberated rapidly by enzyme action or by autolysis after active growth has ceased. Actinomycetes have a high order of efficiency of C utilisation and convert 20—34% of the C of substrate consumed into cellular material. Stationary cultures are more efficient in this respect. Washed aërated culture actinomycete suspensions are suitable for general biochemical work. *A. lavendulæ* in PO_4''' buffer at pH 6·8 and 30° deaminates most amino-acids. Arginine and histidine are attacked most readily; β- is deaminated only approx. 33% as rapidly as is α-alanine. Nor- and *iso*-leucine are unaffected, whilst phenylalanine, methionine, leucine, hydroxyproline, tryptophan, and threonine are attacked to a very slight extent. The cup assay method for determination of streptothricin is discussed. J. N. A.

Production and activity of streptothricin.—See A., 1944, III, 56.

Synthesis of tryptophan from indole and serine by *Neurospora*. E. L. Tatum and D. M. Bonner (*J. Biol. Chem.*, 1943, **151**, 349).—Solutions of indole etc. were incubated with 3-day cultures of *Neurospora* mycelium. Addition of *dl*-serine produces rapid disappearance of indole (colorimetric determination), whilst pyruvic acid, α- or β-alanine, sucrose, and Cori ester etc. are ineffective. The rate of disappearance is proportional to concn. of *dl*-serine within the limits 0·2—1·0 mg. per c.c. 45% of the theoretical amount (colorimetric) of tryptophan is produced after 48 hr. incubation. It is qualitatively recognised by isolation of acetyl-*dl*-tryptophan. P. G. M.

Effects of yeast extracts and phenylmercuric nitrate on yeast respiration and growth. E. S. Cook and C. W. Keeke (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 222—225).—1 : 10^5 Hg phenyl nitrate is lethal to yeast as evidenced by respiration failure, methylene-blue staining, and plating. Presence of 1% of an aq.-alcoholic yeast extract (A., 1939, III, 606) maintains life as shown by staining and plating, but does not maintain respiration. V. J. W.

Growth-promoting action of amino-acids for yeast. N. Nielsen (*Biochem. Z.*, 1941, **307**, 187—193).—Of 32 amino-acids tested for their effect on the growth of yeast only β-alanine, lysine, arginine, methionine, aspartic acid, asparagine, and glutamic acid are active. The effective concns. of these amino-acids vary considerably. β-Alanine is active at 10^{-9}, methionine and lysine are active at 1 : 500,000 and 1 : 40,000 respectively, whilst still higher concn. of asparagine and aspartic and glutamic acids are necessary. The effects of these acids may be due to impurities and this probability is greater the larger is the concn. of acid required, but the effects of β-alanine and aspartic acid are considered not to be due to impurities, because β-alanine prepared from inactive β-alanylglycine and from β-hydroxypropionic acid is active, and aspartic acid prepared from inactive glycylaspartic acid is also active. β-Alanine and lysine cannot serve as sole source of N for yeast and their effects may be due to sp. stimulation or formation of special proteins. Methionine alone strongly inhibits growth of yeast, but this inhibition is annulled by aneurin or β-alanine. In presence of biotin, methionine stimulates growth. J. N. A.

Fluoride inhibition of metabolism of fresh and dried baker's yeast. R. Marcuse and J. Runnström (*Arkiv Kemi, Min., Geol.*, 1943, **16**, **A**, No. 20, 27 pp.).—Inhibition by F′ is considerably less if the F′ is added after, than when it is added before or simultaneously with, the substrate. Inhibition is markedly increased in presence of K. Metabolism of fresh yeast is unaffected by PO_4''' whilst that of dried yeast is only slightly affected. Inhibition is considerably greater at pH 5 than at 6 in the case of fresh yeast, whilst with dried yeast there is very little difference at these pH vals. Results are discussed and compared with those obtained with brewer's yeast under similar conditions. J. N. A.

New method for hybridising yeast. C. C. Lindegren and G. Lindegren (*Proc. Nat. Acad. Sci.*, 1943, **29**, 306—308).—Four spores from one single ascus of *Saccharomyces cerevisiæ* all produced persistently haplo-phase cultures. The haplo-phase cultures, *A*, *B*, *C*, and *D*, were paired in all combinations by mixing the cells together in a suitable medium. *A* and *D* were of the same mating type, and *B* and *C* belonged to the complementary type. The other pairings resulted in copulations and the zygotes were much larger than the original cells, suggesting that the hybrids were more vigorous than the parents. F. S.

Vitamin requirements of *Torula cremoris*. S. A. Koser and M. H. Wright (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 249—251).—In a medium containing $(NH_4)_2HPO_4$, KH_2PO_4, NaCl, $MgSO_4$, and glucose max. growth required addition of nicotinamide, biotin, Ca pantothenate, and thiamin. Slow growth occurred with nicotinamide alone, but none in its absence. V. J. W.

Vitamin deficiencies of fifty yeasts and moulds. P. R. Burkholder and D. Moyer (*Bull. Torrey Bot. Club*, 1943, **70**, 372—377).—In 33 yeasts and 17 moulds deficiencies in (*i.e.*, inability to synthesise) biotin, thiamin, pyridoxine, pantothenic acid, inositol, and nicotinic acid are found to occur, the first two most frequently. L. G. G. W.

Glucan of the yeast membrane.—See A., 1944, II,

Shock anæsthesia in myxomycetes. W. Seifriz and N. Epstein (*Biodynamica*, 1941, **3**, 191—197).—Protoplasmic flow in the plasmodia of myxomycetes ceases suddenly following a hit by a drop of water. This is regarded as shock anæsthesia, due to a sudden setting or reversible gelatinisation of the protoplasm and recovery follows if no wounding has occurred. L. G. G. W.

Nature of *Eimeria nieschulzi* growth-promoting potency of feeding stuffs. III. Pantothenic acid. E. R. Becker and L. Smith (*Iowa State Coll. J. Sci.*, 1942, **16**, 443—449; cf. *J. infect. Dis.*, 1941, **68**, 285).—Moderate increases in the nos. of oöcysts eliminated during *E. nieschulzi* infections were effected in rats by the addition of Ca pantothenate to a basal diet restricted in vitamin-B_1, -B_6, and pantothenate. The further addition of -B_6 caused a much greater increase in oöcyst counts. The addition of -B_1 or both -B_1 and -B_6 to the ration already supplemented with pantothenate did not cause the great decrease in the nos. of oöcysts eliminated characteristic of the -B_1 and -B_6 supplement in a diet deficient in pantothenate. F. S.

Nutritional requirements of *Colpoda duodenaria*. L. Garnjobst, E. L. Tatum, and C. V. Taylor (*J. Cell. Comp. Physiol.*, 1943, **21**, 199—212).—This organism needs riboflavin and the intact pantothenic acid mol. in addition to the factors previously (A., 1943, III, 823) reported. It also requires some other heat-stable factors which were not identified, but inositol, *p*-aminobenzoic acid, choline, biotin, pimelic acid, yeast-nucleic acid, and folic acid had no effect on growth. V. J. W.

Chronic toxoplasmosis [in mice]. D. Weinman (*J. infect. Dis.*, 1943, **73**, 85—92). F. S.

Inheritance of susceptibility to malaria infection as character of *Anopheles quadrimaculatus*, Say. M. F. Boyd and J. C. Russell (*Amer. J. trop. Med.*, 1943, **23**, 451—457).—The data derived from a line propagated for 6 generations of brother–sister matings did not permit any conclusion on the inheritance of susceptibility. F. S.

Improved technique for growing micro-organisms under anaërobic conditions. H. E. Morton (*J. Bact.*, 1943, **46**, 373—376).—The anaërobic jar is evacuated to a pressure of 152 mm. Hg and a mixture of 90% N_2 and 10% CO_2 is allowed to flow in until atm. pressure is attained. This procedure is repeated three times. The jar is then evacuated to 152 mm. Hg, H_2 is allowed to enter the jar until the pressure is increased by 50 mm. Hg, and then the N_2–CO_2 mixture is allowed to enter the jar until the pressure is 20 mm. below that of the atm. This technique is safer than other methods and supplies CO_2 in a concn. of 9%. F. S.

Vegetable bacteriological media as substitutes for meat infusion media. J. H. Brewer (*J. Bact.*, 1943, **46**, 395—396).—The medium can be prepared from cottonseed meal, peanut meal, soya-bean meal, various whole and sprouted grains, beans, and seeds. 30 g. of papain dissolved in 500 ml. of water are added to 5 g. of Na_2S dissolved in 100 ml. of water. This solution is added to the mixture of vegetable meal and water to make the total vol. of water 4000 ml. and adjusted to pH 5 with HCl. The mixture is incubated at 37° overnight, clarified by filtration, and the filtrate adjusted to pH 7·6, heated to boiling, and filtered. The medium is autoclaved and for use it may be diluted to 14 l. and 0·5% of NaCl added, giving a broth containing 2—3% of solids. The medium gives a good growth of all types of pathogenic bacteria. F. S.

Use of sodium azide and crystal-violet in selective medium for streptococci and *Erysipelothrix rhusopathiæ*. R. A. Packer (*J. Bact.*, 1943, **46**, 343—349).—A combination of NaN_3 1/2000 and crystal-violet 1/500,000 in 5% blood agar, pH 6·8, inhibited almost all organisms except streptococci. The same medium containing NaN_3 1/1000 and crystal-violet 1/100,000 inhibited all organisms except *E. rhusiopathiæ*. F. S.

Recovery of agar from used media. A. A. Anderson (*J. Bact.*, 1943, **46**, 396—397).—Sterilised used culture medium is dried, ground fine, washed in running tap-water, filtered on a Whatman No. 4 filter-paper in a Büchner funnel, and spread out in a 1-in. layer to dry. To make new medium, the reclaimed agar is melted at 100° in the required amount of water, 10 g. of activated charcoal per l. are added, and the material is filtered while hot through a Whatman No. 3 filter-paper on a Büchner funnel with suction. F. S.

Use of fireproof cotton in bacteriological work. L. J. Camagni (*J. Lab. clin. Med.*, 1943, **28**, 1475—1476).—This material was found completely satisfactory. C. J. C. B.

Growth-promoting substances from bacteriological filter pads. G. J. E. Hunter (*Biochem. J.*, 1943, **37**, 577—580).—Anomalous results were obtained in nutritional studies of various species of *Mycobacterium*, due to extraction of growth-stimulating Ca‴ and Fe‴ from filter pads (Seitz) used for sterilisation. F. O. H.

Inactivation of enzymes as cause of death in bacteria. O. Rahn and W. R. Schroeder (*Biodynamica*, 1941, **3**, 199—208).—The "logarithmic order of death" of bacteria will occur if death is due to the reaction of one single mol. If death is due to enzyme inactivation it would involve destruction of all enzyme mols., since if only some are destroyed the cell can produce new ones. With *Bacillus cereus* treated for periods of 0—80 min. at 46° or 50° the reduction in the no. of bacterial cells per c.c. is accompanied by a decreased but not by a proportionally decreased enzyme activity. When less than 0·000002% of the bacterial cells remain the catalase activity is still nearly 50% of its original val. L. G. G. W.

Effect of temperature on bacteriostatic action of sulphathiazole and other drugs. I. *E. coli*. S. W. Lee and E. J. Foley. **II. *Strep. pyogenes*.** S. W. Lee, J. A. Epstein, and E. J. Foley (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 243—245, 245—247).—I. Bacteriostasis by sulphathiazole in a salt–glucose medium increases from 24% at 37° to 45% at 42°. Above 37° *p*-aminobenzoic acid is also bacteriostatic and has no anti-sulphonamide effect.

II. Sulphathiazole, *p*-aminobenzoic acid, and urea are all bacteriostatic above about 40°, their effect increasing with temp. above this point. Urea has no synergistic effect with sulphathiazole on this organism. V. J. W.

Antibacterial action of stilbene derivatives. G. Brownlee, F. C. Copp, W. M. Duffin, and I. M. Tonkin (*Biochem. J.*, 1943, **37**, 572—577).—The following classes of substances (34 in all) were tested for antibacterial activity against strains of staphylococci and streptococci in broth media: deoxystilbœstrol and its dihydro-derivative; αα′-diethylstilbene, intermediates in its prep., and some derivatives; diethylstilbœsterol and derivatives; deoxydiethylstilbœstrol, intermediates and derivatives; amino-, cyano-, amidino-, and nitro-derivatives of stilbenes; naturally occurring steroids; penicillic acid and citrinin. Several of the compounds possess exceptionally high activity *in vitro*, the most active being *p*-hydroxy-αβ-diethylstilbene (Dodds *et al.*, A., 1939, II, 312), which is about 40 times as active as citrinin and as active as chloroxylenol under the conditions employed. The bactericidal and œstrogenic activities of the compounds are not necessarily concurrent. The compounds showed

little or no activity *in vivo* (orally in mice). (For new compounds, see A., 1944, II, 44.) F. O. H.

In-vitro action of urea–sulphonamide mixtures. W. M. M. Kirby (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 109—111).—Urea alone has a bacteriostatic effect, evident only during about the 1st 20 hr. of culture, and this summates with the bacteriostatic effect of sulphonamides. There is no potentiation as stated by Tsuchiya *et al.* (A., 1942, III, 938; 1943, III, 339), who made plate counts after 24 hr. growth. V. J. W.

Use of thioglycollate media for testing disinfectants.—See A., 1944, III, 56.

Ultra-violet irradiation as a means of disinfection of air.—See B., 1944, III, 19.

Comparative effect of certain sulphonamides on nicotinamide-stimulated metabolism [of bacteria].—See A., 1944, III, 55.

Simple method of preserving bacteria dried *in vacuo*. J. B. Polding (*J. Path. Bact.*, 1943, **55**, 502—505).—The bacteria to be preserved are grown for a suitable period on slants. The growth is then moistened with a little sterile blood. Sterile beads are introduced and after these have become coated with the blood mixture they are transferred to lightly plugged tubes and dried in a vac. desiccator over $CaCl_2$ for 1 or 2 days. The beads are then transferred to a Bayer venule which contains at the bottom a layer of $CaCl_2$, then a layer of sterile wool. The venule is evacuated and sealed. C. J. C. B.

Microbiology of the upper air. F. T. Wolf (*Bull. Torrey Bot. Club*, 1943, **70**, 1—14).—The air over Nashville, Tennessee, at heights of 1000—10,000 ft. contained an average of 0·21 organism per cu. ft. Bacteria (29 species) formed from 61·3 to 95·9% of the total, and fungi (16 genera) from 4·1 to 38·7%. Yeasts and actinomyces were also found. L. G. G. W.

Rise and fall of bacterial populations in fish muscle. H. L. A. Tarr (*J. Fish. Res. Bd. Canada*, 1943, **6**, 119—128).—In fish muscle containing less than 10^5 organisms per g. the direct count method is inapplicable and the viable count method has to be used. Although incubation for a day at 15° raises the nos. in such muscle (halibut and salmon) up to or beyond 10^5 per g., no correlation could be found between the direct (or viable) counts before and after incubation. J. M. S.

Mutability of nodule bacteria. N. A. Krasilnikov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 75—76).—Filtrates from 2-month-old cultures of *Rh. trifolii* were inoculated with nodule bacteria of peas, vetch, lucerne, soya bean, and phaseolus. All the bacteria, except the soya-bean strain, acquired in 1—5 months the ability to form nodules on clover roots. R. H. H.

Oxidation of *p*-aminobenzoic and anthranilic acids by specifically adapted enzymes of a soil bacillus. G. S. Mirick (*J. Exp. Med.*, 1943, **78**, 255—272).—A soil bacillus was isolated developing sp. enzymes which oxidise *p*-aminobenzoic acid to CO_2, water, and NH_4^+; the organism belongs to the Pseudomonaceæ family. The organism can also develop analogous but independent enzymes against anthranilic acid. Sulphapyridine is bacteriostatic for this bacillus, an effect which is inhibited by *p*-aminobenzoic acid. These sp. enzymes can be used for the identification of as little as 10 μg. of *p*-aminobenzoic or anthranilic acid. A. S.

Nutrition of dim and bright variants of species of luminous bacteria. A. C. Giese (*J. Bact.*, 1943, **46**, 323—331).—A variant, 4—5 times as luminescent as the original strain of *Achromobacter fisheri*, appeared when the liquid medium was allowed to become acid. Both strains were equally sensitive to pH and the stimulating effect of peptone on respiration. Glycerol was more effectively used by the variant. Both strains used succinic, fumaric, malic, and pyruvic acids readily, but the stimulating effect of adding acid on respiration was greater for the variant. The variant was pptd. on the acid side of pH 6·8, whereas the original strain was not pptd. at any viable pH. F. S.

Gluconic acid production by *Acetobacter* in the absence of a neutralising agent. N. Porges, T. F. Clark, and E. A. Gastrock (*Iowa State Coll. J. Sci.*, 1942, **16**, 451—469).—13 strains of *Acetobacter* were grown in 5% glucose and 0·5% yeast extract either undisturbed for 14 days or with vigorous air-agitation for 4 days. The aërated media were generally more acid than the other group; the lowest pH was 2·06, while 3 other strains produced pH vals. of 2·3. *A. gluconicum* was the best organism for the production of gluconic acid in the absence of a neutralising agent and under conditions of air-agitation. F. S.

Assimilation of acetic and succinic acids containing heavy carbon by *Aërobacter indologenes*. H. D. Slade and C. H. Werkman (*Arch. Biochem.*, 1943, **2**, 97—111).—*A. indologenes* reversibly converts acetic acid into succinic acid in the presence of glucose. The methyl-C is involved. Acetic acid is also reduced and condensed, via acetaldehyde, to βγ-butylene glycol, and the carboxyl-C is here involved. Acetic acid is also reduced to ethyl alcohol. E. R. S.

Mechanism of deamination of serine and threonine in biological systems. E. Chargaff and D. B. Sprinson (*J. Biol. Chem.*, 1943, **151**, 273—280; cf. C., 1944, Part 1).—Deamination of serine and threonine by *B. coli*, *Cl. welchii*, etc., or by cell-free liver extracts under anaërobic conditions, gives rise to pyruvic and α-ketobutyric acid respectively. Esterification or etherification of the OH group inhibits deamination. P. G. M.

Decomposition of vitamin-*C* by bacteria. R. M. Young and L. F. Rettger (*J. Bact.*, 1943, **46**, 351—363).—Many enteric bacteria, including the intestinal streptococci, decomposed vitamin-*C* in nutrient broth in anaërobic conditions. In the presence of easily fermented carbohydrate, like glucose, -*C* was protected from decomp. Bacteria which did not attack -*C* exerted a sparing action under aërobic conditions by removing O_2, thus preventing autooxidation. Ascorbic acid was utilised readily as a C food by the attacking bacteria when the medium contained a suitable source of org. N like peptone. Oxidation of -*C* was carried beyond the reversible dehydro-stage of decomp. and the attacking bacteria which produced gas from ordinary carbohydrates also brought about gas formation from ascorbic acid. A dehydrogenase was demonstrated by bacterial resting cells in a nile-blue indicator system with ascorbic acid as a substrate. F. S.

Kinetics of cell respiration. IX. Acceleration of pyruvate oxidation in *Escherichia coli* by certain amino-acids, ammonia, and 4-carbon dicarboxylic acids. P. S. Tang and T. Y. Hsueh (*Arch. Biochem.*, 1943, **2**, 15—21).—The rate of O_2 consumption by *E. coli* is accelerated by aspartate, arginine, serine, glutamate, malate, succinate, fumarate, or NH_4Cl. This is due to the combined action of NH_3 and dicarboxylic acid, which are formed by degradation of amino-acid. E. R. S.

Anaërobic dissimilation of pyruvate by cell-free extract of *Escherichia coli*. G. Kalnitsky and C. H. Werkman (*Arch. Biochem.*, 1942, **2**, 113—124).—A cell-free extract of *E. coli* at pH 6·2—7·0 anaërobically produced acetic, formic, lactic, and succinic acids and CO_2 from pyruvate. The enzyme prep. was dried without loss of activity, and contained strong formic dehydrogenase and hydrogenase activity. Fumarate and oxalacetate, but not acetaldehyde, were reduced in an atm. of H_2, and oxalacetate was decarboxylated. Inorg. PO_4''' (optimum concn. 0·018M.), Mn^{++}, and cocarboxylase were components of the enzyme system, which was inactivated by dialysis and reactivated only by addition of boiled yeast juice. E. R. S.

Rôle of phosphate in anaërobic dissimilation of pyruvic acid. M. F. Utter and C. H. Werkman (*Arch. Biochem.*, 1943, **2**, 491—492).—The so-called "hydroclastic" reaction (conversion of pyruvate into formate and acetate by a cell-free enzyme prep. from *Escherichia coli*) requires inorg. PO_4'''. As a result of the reaction adenosine triphosphate is synthesised from adenylic acid and inorg. PO_4'''. An acid-labile P compound, which resembles acetyl phosphate, is an intermediate in the reaction. This synthesis of adenosine triphosphate occurs under anaërobic conditions, in contrast to most other reactions involving such a synthesis. J. N. A.

Reduction of trimethylamine oxide by bacteria. I. Enterobacteriaceæ. A. J. Wood and E. A. Baird (*J. Fish. Res. Bd. Canada*, 1943, **6**, 194—201).—Of 650 cultures, representing 74 species of Enterobacteriaceæ (Bergey), all except members of the genera *Erwinia* and *Shigella* (*S. dysenteriæ*, *S. paradysenteriæ*) produce trimethylamine from trimethylamine oxide. J. M. S.

Chromatin structures suggesting a nuclear apparatus in large bodies of *B. funduliformis*. L. Dienes and W. E. Smith (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 195—196).—Further examination of the *L* forms previously described (A., 1942, III, 63; 1943, III, 356) shows that extrusion of filaments is followed by passage of chromatin into these filaments which then segment to form normal forms. Bacilli can also be formed by the segmentation of the cytoplasm around chromatin granules within the large forms. V. J. W.

Growth factor requirments of clostridia. J. O. Lampen and W. H. Peterson (*Arch. Biochem.*, 1943, **2**, 443—449).—Growth factor requirements for 20 strains of clostridia are determined. Biotin is essential for all. Most organisms of the *butylicum* type attain max. growth in presence of biotin alone, but *Cl. butylicum*, *Cl. felsineum*, and 7 strains of *Cl. acetobutylicum* require in addition *p*-aminobenzoic acid. Several *sporogenes* strains and *Cl. tertium* do not grow even when biotin and *p*-aminobenzoic acid are present. Using *Cl. acetobutylicum* S9 as test organism, methyl and ethyl *p*-aminobenzoate have only 0·1% activity whilst procaine is 10—20% as active. *N*-Acyl derivatives of *p*-aminobenzoic acid show only slight activity, but *p*-nitro- is almost as effective as *p*-aminobenzoic acid. The *N*-glucosides are apparently readily hydrolysed by the organism since they are as active as *p*-aminobenzoic acid. Pantocaine shows little activity and after hydrolysis of the dimethylethanolamine grouping, the compound is approx. 25% as active as *p*-aminobenzoic acid. *p*-Aminophenylacetic has only 0·1% of the activity of *p*-aminobenzoic acid. *o*-Aminobenzoic, *iso*nicotinic, *p*-hydroxybenzoic, uric, adenylic, glycuronic, and ascorbic

acid, urethane, *N*-phenylurethane, guanine, adenine, xanthine, uracil, *d*-ribose, *dl*-arabinose, *d*-xylose, and a folic acid concentrate are all inactive. A mixture of β-alanine, Ca pantothenate, riboflavin, pyridoxine, aneurin, inositol, pimelic acid, glutathione, and traumatic acid does not support growth. On the synthetic basal medium employed, the S9 strain synthesises those *B* vitamins which it does not require preformed for growth. J. N. A.

Production of $\beta\gamma$-butylene glycol by fermentation.—See B., 1944, III, 7.

Bacterial proteases. XVI. Aminopolypeptidases of anaërobic bacteria.—See A., 1944, III, 66.

Growth promotion on tryptophan-deficient media by *o*-aminobenzoic acid and its attempted reversal with orthanilamide. E. E. Snell (*Arch. Biochem.*, 1943, **2**, 389—394).—Anthranilic acid can replace tryptophan for growth of *Lactobacillus arabinosus* and *L. casei*, but not for several other species of lactic acid bacteria. Those cultures which utilise anthranilic acid can also utilise indole. Salicylic, *m*- and *p*-aminobenzoic acids have no growth-promoting action. It is concluded that these two organisms are able to synthesise tryptophan from anthranilic acid or indole. The growth-promoting action of anthranilic acid is unaffected by 10,000 times the concn. of orthanilic acid, orthanilamide, or 2-orthanilamidopyridine. The significance of the results is discussed. J. N. A.

Amino-acid nutrition of *Lactobacillus arabinosus*. S. Shankman (*J. Biol. Chem.*, 1943, **150**, 305—310).—*L. arabinosus* needs cystine, methionine, tryptophan, leucine, *iso*leucine, valine, glutamic acid, and threonine, the concns. needed being given. Arginine stimulates growth at two concns., with an inhibitory effect at an intermediate concn. R. L. E.

Respiration and nutritional requirements of *Mycobacteria*. N. L. Edson and G. J. E. Hunter (*Biochem. J.*, 1943, **37**, 563—571).—The respiration of *Mycobacteria* (three species of *M. phlei*, *M. smegmatis*, *M. stercoris*, *M.* sp. *Karlinski*, *M. ranæ*, *M.* sp. *leprous Kedrowsky*, *M. butyricum*, and a virulent and an avirulent strain of *M. tuberculosis hominis*) was studied under rigid conditions, including defined inocula. Pyruvate was the best general source of C for growth with heavy inocula; with small inocula in synthetic media, there was no growth when the source of C was glucose, fructose, glycerol, acetate, succinate, or citrate. The species varied widely with respect to the respiration of the resting cells and to O_2 consumption in the presence of different substrates. Under defined conditions, the growth of some species was stimulated by citric acid, α-amino-acids, histamine, Ca, and Fe. Citric acid was not oxidised, but disappeared from the medium; low concns. did not stimulate the growth of the tubercle bacilli, but effectively reduced the lag period and promoted the growth of acid-fast saprophytes. F. O. H.

Origin of sulphonamide-resistant pneumococci. L. H. Schmidt and C. L. Sesler (*J. Pharm. Exp. Ther.*, 1943, **77**, 165—174).—Passage of a pneumococcus strain, sensitive to sulphapyridine, through media containing increasing concns. of this drug led to the production of organisms of progressively greater sulphapyridine-resistance. A comparison of the sensitivities of individual pneumococci from sulphonamide-sensitive and -resistant strains showed that the organisms from resistant strains were significantly more resistant than any pneumococci in the sensitive strains. G. P.

Nutrition of *Proteus morganii*. Amino-acid and growth factor requirements. M. J. Pelczar, jun., and J. R. Porter (*Arch. Biochem.*, 1943, **2**, 323—332).—The amount of growth of *P. morganii* in a synthetic medium containing inorg. salts, glucose, cystine, pantothenic acid, and nicotinamide is approx. 50% of that which occurs in a glucose-meat infusion medium. Inorg. N will not serve as sole source of N. Members of the vitamin-*B* group, except pantothenic acid and nicotinamide, various hormones, and vitamins do not produce any increase in growth in the synthetic medium. Addition of certain purine and pyrimidine bases causes more rapid growth, but there is no increase in the total amount of growth. Addition of various amino-acids causes no significant increase in growth, but in presence of small amounts of crude animal or plant extracts, or caseinogen hydrolysate, there is increased growth. Cystine is an essential amino-acid for the organism, and the optimum concn. is 0·0001M. Methionine can replace cystine but it is less effective. 0·00066M-Norvaline, 0·00066M-norleucine, and 0·002M-*allo*threonine when added separately to the synthetic medium inhibit growth, but in presence of other amino-acids this inhibition is annulled. J. N. A.

Nutritional studies on *Streptococcus lactis*. I. Unidentified growth factor found in yeast extract. F. R. Smith (*J. Bact.*, 1943, **46**, 369—371).—An unknown substance in yeast extract was essential for the growth of certain strains of *Str. lactis*. It could not be replaced by any known vitamin or by a combination of 23 amino-acids. It was not pptd. by Pb, Ag, Hg, Cu, or Zn salts. It was not adsorbed by fuller's earth or Darco activated charcoal and was not sol. in any common lipin solvent. Heating to 210° under a vac. destroyed its activity. F. S.

Further studies on one type of paracolon organism. C. A. Stuart and R. Rustigian (*Amer. J. Publ. Health*, 1943, **33**, 1323—1325).—One type (32011) of paracolon *Aerobacter* was found in fæces from a no. of outbreaks of gastroenteritis but not in normal fæces over a period of 7 years. C. J. C. B.

Intestinal and urinary infections associated with *Bact. alkalescens*. P. Roux (*S. Afr. med. J.*, 1943, **17**, 6—7).—*Bact. alkalescens* was isolated from the fæces of 30 cases and also from the urine of 2 of these cases. Its presence was associated mainly with intestinal symptoms, but in one urinary infection it was associated with pyelitis. F. S.

Protective properties of α-antitoxin and antihyaluronidase occurring in *Cl. welchii* type *A* anti-serum. D. G. Evans (*J. Path. Bact.*, 1943, **55**, 427—434).—3 different strains of *Cl. welchii* type *A* were used to produce experimental gas gangrene infection in guinea-pigs. Only 2 of the strains, *S.*107 and *A.*118d, produced hyaluronidase in culture and *in vivo*. The inability of strain *S.R.*9 to produce hyaluronidase did not affect its power to cause fatal infection. A *Cl. welchii* type *A* antiserum with a high content of α-antitoxin and no antihyaluronidase effectively protected guinea-pigs against infection with each of the 3 strains of *Cl. welchii* used. On the other hand, an antiserum containing much antihyaluronidase and only a trace of α-antitoxin did not influence the course of the infection or enhance the protective action of α-antitoxin. The protective property of the British Standard gas gangrene antitoxin was dependent on α-antitoxin and independent of antihyaluronidase content. C. J. C. B.

Diphtheria on the Witwatersrand: bacteriological, clinical, and epidemiological survey. J. F. Murray (*S. Afr. med. J.*, 1942, **16**, 247—250).—Of 475 isolated strains of *C. diphtheriæ* 87·5% were mitis, 0·4% were intermedius, 4·2% were gravis, and 7·6% were atypical strains. 45% of the gravis strains were avirulent. The case fatality rate in 246 mitis infections was 9·3%. F. S.

Protection of the infant against diphtheria during first year of life following active immunisation of the pregnant mother. J. Liebling and H. E. Schmitz (*J. Pediat.*, 1943, **23**, 430—436).—Active immunisation of the pregnant mother results in an increased placental transfer of passive immune bodies to the offspring. Schick tests on pregnant mothers immune to diphtheria acted as secondary antigenic stimuli, causing increased antitoxin formation. This was sufficient to prolong the passive immunity in the offspring of this group of mothers. Schick tests on infants immune to diphtheria did not increase their antitoxin titres. C. J. C. B.

Incidence and significance of *H. influenzæ* in chronic bronchiectasis. P. R. Allison, J. Gordon, and K. Zinneman (*J. Path. Bact.*, 1943, **55**, 465—474).—*H. influenzæ* was found in 63 of 100 patients with bronchiectasis, in pure culture in 18, and predominating in 20. All but one of 30 strains of *H. influenzæ* tested by serological methods failed to correspond to any of the Pittman types. This one strain agglutinated with type *e* serum (Pittman). C. J. C. B.

Synergistic action of *Hæmophilus influenzæ suis* and the swine influenza virus on chick embryos. II. F. B. Bang (*J. Exp. Med.*, 1943, **78**, 9—16).—Blood cultures of chick embryos killed by the action of *H. influenzæ suis* and swine influenza virus are negative; swine influenza virus infected embryos may be killed both by filtered extracts of frozen and dried *Hæmophilus* and by suspensions of heat-killed bacteria. Addition of *Hæmophilus* to the chorioallantoic membrane of embryos infected with swine influenza virus causes the virus to spread to the allantoic fluid and embryo. Spreading of the infection was also observed when a purified hyaluronidase prep. was used instead of *Hæmophilus* although the increase in mortality was less pronounced. A. S.

Detection of mastitis in New Zealand dairy herds. III. Application of bromothymol-blue test for mastitis in the field. F. H. McDowall, J. P. James, and A. H. Ward. **IV. Hopkirk assessment and Breed cell count method of estimating leucocyte content of milk samples.** J. P. James and F. H. McDowall (*New Zealand J. Sci. Tech.*, 1941, **23**, A, 223—236, 237—243).—III. Personal error in the reading of the bromothymol-blue test seriously reduced its val. as an indicator of mastitis in large-scale field trials. Limitations of the method and suggestions for its improvement are discussed.

IV. The different Hopkirk classifications have been assessed in terms of Breed cell count. Taking a Breed cell count of 10^6 per mm. as the boundary-line between negative and positive mastitis infection, the Hopkirk classes 0 to 2 indicate negative and the classes 4 to 6 positive cases. Variations in the results of different observers, or in duplicate results of the same observer, are considered. R. H. H.

Advantages of egg culture technique in infectious diseases. I. Meningitis; (*a*) primary isolation of organisms from spinal fluid; (*b*) culture of spinal fluid during treatment with sulphonamide compounds. R. J. Blattner, F. M. Heys, and A. F. H. Hartmann (*Arch. Path.*, 1943, **36**, 262—268).—The egg culture method using the chorioallantoic membrane is useful for the prompt isolation and identification of the ætiologic agent in meningitis. This is true especially when no or doubtful organisms are seen in direct smears of c.s.f. C. J. C. B.

Occurrence and bacteriological characteristics of *Serratia marcescens* from case of meningitis. J. D. Aronson and I. Alderman (*J. Bact.*, 1943, **46**, 261—267).—A *S. marcescens*, isolated from a case of meningitis, was pathogenic for animals and produced a hæmolysin. The pigment produced by this organism consisted of fractions which differed in their light-absorption characteristics. (1 photomicrograph.) F. S.

Attempts to enhance virulence of *Hæmophilus pertussis* by serial passage in mice. L. P. Strean (*Amer. J. Dis. Child.*, 1943, **65**, 895—897).—The virulence was maintained but not enhanced. C. J. C. B.

Characteristics of *Proteus ammoniæ*. M. Fulton and P. E. Harrison (*J. Bact.*, 1943, **46**, 365—367). F. S.

Extracts of *Bact. shigæ* as immunising agents in mouse. H. Schuetze (*J. Path. Bact.*, 1943, **55**, 457—463).—Ethylene glycol and phenol extracts of the Shiga bacillus produce considerable immunity in the mouse to infection with fully toxigenic strains of *Bact. shigæ*. Protection is enhanced by prolonging the interval between the two immunising doses up to 6 weeks. Neither formalin nor merthiolate had any detrimental effect on the antigenicity of the extract. Marked differences in immunisability between the sexes and the two strains of mice used were observed. Large doses of formolised vaccine induce resistance to infection in mice almost as well as the extract but fail to elicit agglutinins to the same extent. C. J. C. B.

Antigenic relationships of *Shigella dispar*. P. L. Carpenter (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 129—130).—26 strains of *S. dispar* were compared with 11 of *S. ceylonensis*. Some of the *dispar* strains were antigenetically different, but strain 205 is identical with *ceylonensis* 167 as antigen, although its colonies develop a yellow pigment. V. J. W.

Clumping of pathogenic staphylococci in plasma. F. M. Berger (*J. Path. Bact.*, 1943, **55**, 435—440).—All coagulase-positive staphylococci were agglutinated by solutions of fibrinogen. Coagulase-negative strains were not affected. The clumping of pathogenic staphylococci in solutions of fibrinogen allowed rapid identification of coagulase-positive staphylococci and was as reliable as the coagulase test. As human and rabbit sera may contain natural agglutinins against certain strains of non-pathogenic staphylococci untreated plasma should not be used in the agglutination test for pathogenic staphylococci. The clumping of pathogenic staphylococci in plasma is not a true agglutination and no immune body is involved. The reaction is attributed to the ability of the cocci to ppt. fibrinogen on their surfaces; this causes them to stick together. Staphylocoagulase acted most readily on the CO_2-sol. fraction of fibrinogen, whereas the CO_2-insol. fraction, constituting the greater part of the fibrinogen of plasma, was coagulated only slowly. C. J. C. B.

Digestion of casein by staphylococci on milk agar containing serum. R. T. Fisk and O. E. Mordvin (*J. Bact.*, 1943, **46**, 392—393).—The medium was prepared by adding 30 ml. of skim milk to 20 ml. of distilled water containing 1·5 g. of agar. The milk and agar solutions were sterilised separately. 50 ml. of human serum were added after cooling to 50°. Zones of clearing surrounding colonies of caseinolytic strains on the medium usually appeared in 24 hr. but occasionally required 48 hr. In comparative tests the ability of staphylococci to produce caseinolysis and fibrinolysis was similar to their coagulase activity. F. S.

Fatal staphylococcal intoxication from goat milk. L. A. Weed, A. C. Michael, and R. N. Harger (*Amer. J. Publ. Health*, 1943, **33**, 1314—1318).—2 children who drank ¼ pint of milk from a goat with acute *Staph. aureus* mastitis died in 24 hr. The mammary tissue gave a positive kitten test. C. J. C. B.

Typing group *A* hæmolytic streptococci by *M* precipitin reactions in capillary pipettes. H. F. Swift, A. T. Wilson, and R. C. Lancefield (*J. Exp. Med.*, 1943, **78**, 127—133).—Type-sp. anti-*M* precipitin tests on group *A* hæmolytic streptococci were performed in 1-mm. capillary pipettes; 250 tests can be made with 1 c.c. of serum. A. S.

Comparison of experimental lesions by toxins of streptococcus of scarlatina with those in fulminating scarlatina. M. L. Menten and M. A. Andersch (*Arch. Path.*, 1943, **36**, 393—401).—The erythrogenic toxin elaborated by the NY5 strain of *Str. hæmolyticus* when injected subcutaneously in a single dose or in multiple doses produces degenerative lesions in the kidneys of mice and hamsters characteristic of acute nephrosis. Focal lymphocytosis was occasionally produced but never an acute interstitial non-suppurative lesion. In 5 children who died from fulminating scarlet fever, similar lesions were found, with an added focal non-suppurative reaction in 1 child. (7 photomicrographs.) C. J. C. B.

Relation between scarlet fever morbidity and streptococcal carrier rates. F. F. Schwentker (*Amer. J. Hyg.*, 1943, **38**, 207—210).—During an outbreak of scarlet fever in an army camp due to a type 19 strain of hæmolytic streptococcus, the incidence of cases in the different companies varied from 0 to over 10%. The log of the incidence rate of scarlet fever was directly proportional to the type 19 streptococcal carrier rate. This relationship was reflected in both the gross (all groups) and group *A* streptococcal carrier rates of which the type 19 rate was a part. Carrier rates for groups other than *A* and for all group *A* strains except type 19 were roughly the same in all companies. A rise in the type 19 streptococcal carrier rate accompanied the outbreak of scarlet fever caused by this strain. B. C. H.

Non-group-*A* streptococci associated with human infection. S. M. Wheeler and G. E. Foley (*J. Bact.*, 1943, **46**, 391—392). F. S.

Immunity to tetanus induced by third dose of toxoid two years after basic immunisation. M. M. Peshkin (*Amer. J. Dis. Child.*, 1943, **65**, 873—881).—2 years after the completion of basic immunisation with two 0·5-c.c. doses of combined alum-pptd. diphtheria and tetanus toxoids, 31 allergic children were given a 3rd or "booster" dose of 0·5 c.c. of combined alum-pptd. toxoids or of alum-pptd. tetanus toxoid alone. The incidence of local reactions after the 3rd dose of combined toxoids, after the 3rd dose of tetanus alone, and after the basic immunisation was 50, 25, and 25% respectively. The antitoxin titre by the 7th day after the 3rd injection was adequate and usually max. C. J. C. B.

Demonstration of tubercle bacilli in tissue by fluorescence microscopy.—See A., 1944, III, 6.

Multiplication of bacteriophage *in vivo* and its protective effect against experimental infection with *Shigella dysenteriæ*. R. J. Dubos, J. H. Straus, and C. Pierce (*J. Exp. Med.*, 1943, **78**, 161—168).—Anti-Shiga bacteriophage injected into the general circulation can multiply in the brain of mice infected intracerebrally with *Shigella dysenteriæ*; this active bacteriophage injection can protect mice against an otherwise fatal infection. The protection depends on the early establishment of a high bacteriophage level in the infected animal. A. S.

Fractional elution for purification of adsorbed bacteriophage. A. E. Kriss (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 72—74).—Phage from broth cultures was adsorbed by columns of activated ascanite. Nitrogenous impurities were removed by eluting thrice with saturated KH_2PO_4 solution (pH 3·93). The purified phage was liberated by shaking the ascanite with $NaHCO_3$ solution. R. H. H.

Virus of spontaneous encephalitis of mice. V. D. Soloviev and A. K. Schubladze (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 77—80).—Manifestations of the disease, which is confined to white mice, are described. The clinical picture and the pathohistological changes in the brains of sick mice indicate that the disease is caused by a neurotropic ultravirus. R. H. H.

Blood-sucking vectors of encephalitis: experimental transmission of St. Louis encephalitis to white Swiss mice by the American dog tick, *Dermacentor variabilis*, Say. R. Blattner and F. M. Heys (*J. Pediat.*, 1943, **23**, 371—375).—The St. Louis encephalitis virus can be transmitted from an infected female tick through her eggs, through all stages of subsequent development, and is present in the eggs of the second generation. The virus can be recovered regularly from the bodies of dormant ticks for at least 4 months after infection. Such transmission was carried out. C. J. C. B.

Equine and St. Louis encephalitis. W. M. Hammon (*J. Amer. Med. Assoc.*, 1943, **121**, 560—566).—Studies of outbreaks of encephalitis in 1941 in Washington, Arizona, New Mexico, and Texas suggest that eastern and western equine and St. Louis encephalitis are mosquito-borne. C. A. K.

Laboratory transmission of St. Louis encephalitis virus by three genera of mosquitoes. W. M. Hammon and W. C. Reeves (*J. Exp. Med.*, 1943, **78**, 241—253).—Successful transmission of the St. Louis virus was carried out in 9 species of mosquitoes from 3 genera: *Culex tarsalis, Culex pipiens, Culex coronator, Aedes lateralis, Aedes tæniorhynchus, Aedes nigromaculis, Aedes vexans, Theobaldia incidens, Theobaldia inornata.* Survival of the virus for more than a few days was seen in *Culex quinquefasciatus, Culex stigmatosoma, Psorophora ciliata,* and *Anopheles maculipennis freeborni.* In *Culex tarsalis* infection occurred from feeding on chicken and ducks previously inoculated by the subcutaneous route; these mosquitoes infected other chicken and virus was found in the latter's blood. A. S.

Susceptibility of raccoon to fox encephalitis. R. G. Green, C. A. Evans, and H. Y. Yanamura (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 186—187).—In 1 of 28 raccoons inclusion bodies were found in the spleen after intracerebral inoculation with virus, but all intraocular inoculations gave positive results and also caused immunity to subsequent inoculations. V. J. W.

Sensitive test for fox encephalitis virus. C. A. Evans, H. Y Yanamura, and R. G. Green (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 183—186).—Inoculation of the anterior chamber of the eye with virus is always followed by corneal opacity and the presence of inclusion bodies in cells scraped from the posterior surface of the cornea. V. J. W.

Titration and neutralisation of western strain of equine encephalomyelitis virus in tissue culture. C. H. Huang (*J. Exp. Med.*, 1943, **78**, 111—126).—The *in vitro* titration test of the western strain of

equine encephalomyelitis virus by means of tissue culture is more sensitive than animal inoculation, and may be preferable to animal inoculation for the detection of small amounts of the virus. The neutralisation in tissue culture is 100—1000 times as great as in the intracerebral mice test and is comparable with the potency in the intraperitoneal inoculation. There is evidence for the *in vitro* and *in vivo* reactivation of virus in neutral mixtures by dilution. The method can be applied to the study of other viruses, to the evaluation and standardisation of bacterial toxins and antitoxins, and to the testing of the toxicity of biological and chemical products. A. S.

Rôle of non-specific immunity factors in ætiology of poliomyelitis. N. J. Brooks (*Arch. Pediat.*, 1943, **60**, 381—400).—A review. C. J. C. B.

Distribution of poliomyelitis virus in central nervous system of mice paralysed after intracerebral inoculation. E. Herrarte and H. E. Pearson (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 112—114).—In mice which developed paralysis and were killed within 5 days, virus was equally distributed throughout the central nervous system. After 5 days no virus could be recovered from the brain, but the cord and medulla contained as much as in the earlier cases. V. J. W.

Susceptibility of *Cebus capucina* (South American ringtail monkey) and *Cercopithecus cephus* (African moustache monkey) to poliomyelitis virus. J. L. Melnick and J. R. Paul (*J. Exp. Med.*, 1943, **78**, 273—283).—*Cebus capucina* was infected with poliomyelitis virus in ultracentrifuged concentrates of poliomyelitic human stools and with sp. virus found in the spinal cords of rhesus and cynomolgus monkeys, initially derived from patients and from flies trapped in an epidemic area. The Hartford strain was successfully established in different generations in *Cebus capucina*. *Cercopithecus cephus* was infected by intra- and sub-cutaneous injection as readily as *Cercopithecus aethiops sabæus* and *Macaca mulatta*. A. S.

Neutralisation of *SK* murine poliomyelitis virus and of Theiler's virus of mouse encephalomyelitis by human sera. E. Seligmann and C. W. Jungeblut (*Amer. J. Publ. Health*, 1943, **33**, 1326—1332).—11 of 167 human sera, normal or convalescent, neutralised *SK* murine poliomyelitis virus in intraperitoneal tests in albino mice. None of 30 normal sera neutralised Theiler's virus in intracerebral tests in albino mice but 9 of 100 did on intraperitoneal tests. C. J. C. B.

Meningo-encephalic gliosis of nervous centres and of optic nerve. C. Oberling (*Rev. Canad. Biol.*, 1943, **2**, 120—127).—2 cases were observed; the gliosis is characterised by the predominance of astrocytes which produce abundant neuroglial tissue, coarse or more delicate in structure; nuclei of giant size, typical for tuberal sclerosis, were absent. The arachnoid is always involved and sometimes widely replaced by neuroglial tissue. The glial meningeal tissue is connected with the underlying nervous tissue by neuroglial bridges which arise from the tangential fibres. The gliosis is often complicated by a glioma and cerebellar gliomata may grow on tissue transformed by gliosis. The sites of predilection of gliosis are the cerebellum, midbrain, and optic nerve. A. S.

Antigenically different strains of virus from a localised influenza outbreak. T. P. Magill and J. Y. Sugg (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 104—106).—5 strains of virus, differing from each other and from the standard *PR*8 strain, were isolated from 40 cases of influenza admitted to the nurses' infirmary in one hospital. V. J. W.

Studies of antigenic differences among strains of influenza *A* by means of red cell agglutination. G. K. Hirst (*J. Exp. Med.*, 1943, **78**, 407—423).—Methods are described for using the agglutination technique for antigenic comparisons in spite of variables due to the red cells, virus suspensions, and the ferret antisera. No significant differences were found in 16 out of 18 influenza *A* virus strains obtained from the 1940—41 U.S.A. epidemic although they were obtained from individuals in widely separated regions of the country. A. S.

Measles. G. Rake (*J. Pediat.*, 1943, **23**, 376—380).—The virus of measles was cultivated in the developing chick embryo. Such egg-passage material on injection produced measles of mild character in 80% of known susceptible children. This mild disease affords some protection against the natural infection and it is not enhanced in virulence by at least one human passage. C. J. C. B.

Enhancement with phenol of serological reactivity of lymphogranuloma venereum antigens. C. Nigg and B. M. Bowser (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 192—194).—Presence of 0·5% of phenol in a 10% yolk-sac suspension enhances its complement-fixing potency 4—8 times, and it can be centrifuged, or boiled for 10 min., with no loss of this potency. V. J. W.

Toxic factor associated with agent of lymphogranuloma venereum. G. Rake and H. Jones (*Proc. Soc. Exp. Biol. Med.*, 1943, **53**, 86—88).—Infected yolk sacs contain a toxin which in mice causes death with symptoms differing completely from those of infection and consisting largely of hepatic necrosis. The toxin is associated with the bodies of the infective agent and can be filtered or centrifuged out with them, and it produces an antitoxin in rabbits. V. J. W.

Outbreak of psittacosis in pigeons, involving production of inclusion bodies, and transfer of the disease to man. J. E. Smadel, M. J. Wall, and A. Gregg (*J. Exp. Med.*, 1943, **78**, 189—203).—The tissues of the diseased pigeons contained many intranuclear inclusions; viruses isolated from the birds produced both intranuclear inclusions and elementary bodies in the cytoplasm of cells of the chorio-allantoic membranes of developing eggs. 2 subjects handling the diseased birds developed atypical pneumonia, caused by a member of the psittacosis–lymphogranuloma venereum group of viruses. A. S.

Influence of age of host and temperature of incubation on infection of chick embryos with vesicular stomatitis virus. B. Sigurdsson (*J. Exp. Med.*, 1943, **78**, 17—26).—Chick embryos of 7 days' incubation are more susceptible to vesicular stomatitis virus infection than 10-day embryos. All the 7-day embryos died. Virus growth curves were obtained in 7- and 10-day embryos incubated at 35—36° and 39—40°. At the higher temp. more than half of the 10-day embryos survived; all 10-day embryos died at the lower temp., but after a longer survival time than the 7-day embryos. In the latter series death occurred after 12 hr. at 39—40° and after 16 hr. at the lower temp. The virus titre in embryos of both ages reached at the higher temp. only 1% of that at 35—36°. A. S.

Stability of variola virus propagated in embryonated eggs. J. B. Nelson (*J. Exp. Med.*, 1943, **78**, 231—239).—After 24 transfers in embryonated eggs a strain of Chinese variola virus was established in the rabbit's testis by intratesticular injection and maintained unaltered for 11 passages at intervals of 7 days. Another strain (Minnesota) was transferred without alteration 180 times in embryonated eggs; subsequent attempts to maintain this strain in the rabbit by testicular passage failed. A. S.

Field studies on immune response to 17*D* yellow fever virus. Relation to virus substrain, dose, and route of inoculation. J. P. Fox, S. L. Kossobudski, and J. F. da Cunha (*Amer. J. Hyg.*, 1943, **38**, 113—138).—3 large-scale experiments were carried out. The first included 550 non-immune individuals and showed a close similarity between the antigenicity of 4 substrains of 17*D* yellow fever virus although substrains 17*D-NY* 104 and *EP* gave a slightly better immune response. Small virus doses were more effective than larger; the routine vaccination dose, however, should not contain less than 500 m.i.d. for mice. The second experiment showed that 15 sister lots of vaccine prepared under the seed-lot system were of uniform antigenicity and that serum-free vaccine could be used in dilutions as high as 1/100, since of 918 vaccinated persons all became immune. Up to the age of 14 years the degree of protection increased with age. Evidence was obtained in the third experiment that human susceptibility was greater to intradermal or intramuscular inoculation of virus substrain 17*D-NY* 104 than to subcutaneous inoculations although the level of immunity 1 year after vaccination was similar for all 3 routes of inoculation. Doses of small vol. (0·1 ml.) should be given intradermally; those of a larger vol. may be given subcutaneously. B. C. H.

Employment of rickettsial vaccine for antigen in diagnostic complement-fixation test. F. H. K. Reynolds and M. Pollard (*Amer. J. trop. Med.*, 1943, **23**, 433—435; cf. A., 1943, III, 925). F. S.

Increased resistance to viral infection as result of increased fluid in tissues. H. M. Taylor and D. H. Sprunt (*J. Exp. Med.*, 1943, **78**, 91—97).—Administration of α-œstradiol propionate increases the amount of extracellular fluid in the skin of rabbits, and increases the animal's resistance to vaccinia virus infection. The extracellular fluid content of the skin was increased by intraperitoneal injection of a mixture of 0·65% NaCl and 0·25% $NaHCO_3$; under these conditions, the spread of Indian-ink particles in the skin and the susceptibility to vaccinia virus infection were decreased to the same degree as in the animals treated with œstrogenic hormone. The common factor in these experiments is thought to be the increased vol. of extracellular fluid. A. S.

Denaturation of tobacco mosaic virus by urea. I.—See A., 1944, II, 67.

Studies in sensitisation to skin. I. Production of antibodies to skin by means of synergistic action of homologous skin antigen and staphylococcus toxin. R. Hecht, M. B. Sulzberger, and H. Weil (*J. Exp. Med.*, 1943, **78**, 59—65).—Skin antigens for intramuscular injection in rabbits and skin autolysates for serological and precipitin tests were prepared. Injection of rabbit's skin antigen and of staphylococcus toxin in rabbits resulted in the formation of antibodies (precipitin) to homologous skin. The antibody formation was slight, when homologous skin antigen alone was injected; injection of staphylococcus toxin alone produced antibodies sp. for the toxin. A. S.

Simplified serum dilution method for quantitative titration of precipitins in a pure antigen–antibody system. D. S. Martin (*J. Lab. clin. Med.*, 1943, **28**, 1477—1485).—A serum dilution method was satisfactory for the accurate titration of pptg. antibodies where the inhibiting effect of excess of antigen was excluded, by using, as a test dose, the smallest amount of antigen yielding a visible ppt. in the presence of excess of antibodies. C. J. C. B.

Rh factor and erythroblastosis fœtalis.—See A., 1944, III, 7.

Histamine-sensitivity and anaphylactic response. Effect of ascorbic acid-deficient diet. L. Farmer and S. R. Kassman (*Amer. J. clin. Path.*, 1943, **13**, 362—364).—Serum-sensitised guinea-pigs kept on an ascorbic acid-deficient diet for 6 or 9 days did not show an increase of anaphylactic response. Normal guinea-pigs kept on an ascorbic acid-deficient diet for 7 or 9 days showed slightly increased histamine-sensitivity. The ascorbic acid content of the adrenals of normal guinea-pigs kept on an ascorbic acid-deficient diet for 7 days showed only a moderate decrease. C. J. C. B.

Histamine-sensitivity and anaphylactic response. Theoretical considerations. L. Farmer (*Amer. J. clin. Path.*, 1943, **13**, 365—367).—The degree of histamine-sensitivity and subsequently of anaphylactic response is determined by the adrenal cortex hormones. C. J. C. B.

Pollen surveys in the United States. P. M. Gottlieb and E. Urbach (*J. Lab. clin. Med.*, 1943, **28**, 1426—1440).—A crit. review. C. J. C. B.

Automobile pollen trap. J. A. Mansmann (*J. Lab. clin. Med.*, 1943, **28**, 1491—1493).—A pollen trap holding glass slides which can be attached to the windscreen of a motor car is described. C. J. C. B.

XXVI.—PLANT PHYSIOLOGY.

Effect of the rate of cooling on the freezing point of living tissues. B. J. Luyet and G. Galos (*Biodynamica*, 1940, **3**, 157—169).—Pieces of living potato tuber tissue show a lowered f.p. when the rate of cooling is rapid. When the rate of cooling was 0·1° per min., living and dead tissues had the same f.p. L. G. G. W.

Physiological significance of the vacuome. J. Dufrenoy (*Biodynamica*, 1940, **3**, 171—189).—Phenolic compounds are often stored in plant cell vacuoles, and such cells will concentrate vital stains. Cytochrome oxidase occurs in cell vacuoles, and phenolic compounds may act as H_2 carriers so that the vacuole may function as the respiratory system in the cell. L. G. G. W.

Relation between the form of the vacuoles, their vital staining, and their chemical composition. J. Dufrenoy (*Biodynamica*, 1940, **3**, 100—103).—Staining sections of peach twigs with neutral-red shows large vacuoles staining deep purple and smaller faintly stained vacuoles in the same cell. The vacuoles rich in polyphenols stain purple. Phloem cell vacuoles stain orange-yellow, indicating a pH of about 7, whilst lignified wood cell walls are acid and stain purple. L. G. G. W

Permeability of cellulose cell wall. M. Skene (*Ann. Bot.*, 1943, **7**, 261—273).—A method is described for measuring the resistance of the thin, unaltered cellulose wall to the passage of solutes (sucrose, glucose, glycerol, $MgSO_4$, $CaCl_2$, NaCl, KCl, and KNO_3). Comparisons are made between the cell wall and the much more resistant protoplast. R. H. H.

Relation between xylem thickening in primary roots of *Vicia faba* seedlings and elongation as shown by soft *X*-ray irradiation.—See A., 1944, III, 63.

Absorption and accumulation of solutes by living plant cells. X. Time and temperature effects on salt uptake by potato discs and influence of storage conditions of tubers on metabolism and other properties. F. C. Steward, W. E. Berry, C. Preston, and T. K. Ramamurti (*Ann. Bot.*, 1943, **7**, 221—260).—Effects of aëration, time, concn. and supply of solute, and surface–vol. relations of discs of tissue on the uptake of ions are rediscussed. The effects of temp. on respiration and Br′ uptake are compared. Following prolonged storage of tubers at 2°, discs cut from them, despite high respiration rate and initially high osmotic pressure, fail to accumulate salts and even lose electrolytes previously stored in their vacuoles. The effect of storage time and temp. on the composition and subsequent behaviour of discs from tubers has been investigated. Storage at 2° diverts N metabolism from the sequence amino-acid → NH_3 → unstable amide → protein; in tissue from tubers stored at 11°, the first stages of this sequence are associated with salt uptake. R. H. H.

Sulphur in plants. I. Effect of application of gypsum and sodium selenate on sulphur distribution and manganese, iron, and copper contents of lucerne. L. H. Johnson, H. V. Lindstrom, and R. A. Gortner [with M. Malm] (*Arch. Biochem.*, 1943, **2**, 435—441).—Application of gypsum to the soil causes pronounced stimulation of growth as well as an increase in total S of lucerne. The increase in total S is due mainly to SO_4''; reduced S is increased only slightly. The Mn content is somewhat increased, but it is not related to the increase of reduced S. Unusually high Mn contents are accompanied by low Fe content. Application of Na_2SeO_4 causes acceleration of growth. Total S uptake is increased, and there is a greater amount of reduced S than after treatment with gypsum. Na_2SeO_4 decreases the content of Mn, Fe, and Cu. The ratios N : reduced S brought about by gypsum and Na_2SeO_4 indicate either that protein in the plant is richer in S or that non-protein S in some reduced form has increased. On some land, application of Na_2SeO_4 causes a great increase in total, SO_4''-, and reduced S, with simultaneous stimulation of growth and reduction in Mn content. The vals. for N × Mn/reduced S are fairly const. for the soils examined regardless of treatment. It is suggested that the amounts of N and reduced S are related to the Mn content, and decrease in uptake of Mn after application of Na_2SeO_4 may be due to pH changes in the soil making Mn less available. Addition of $Na^{\cdot}$ may exert a " mutual replacement " of $Mn^{\cdot\cdot}$. J. N. A.

Plant nutrition and the hydrogen ion. III. Soil-calcium and the oxalate content of spinach. R. A. Schroeder and W. A. Albrecht (*Bull. Torrey Bot. Club*, 1942, **69**, 561—568).—Spinach grown in two soils of pH 5·2 and 6·8 with varying amounts of exchangeable Ca showed a higher oxalate concn. at the higher pH but no consistent relation between oxalate content and exchangeable Ca appeared. The Ca, Mg, Sr, Mn, and K concns. were all higher in the plants grown at the lower pH level. L. G. G. W.

Soil acidity in relation to alkaloid and cyanogenetic glucoside production. J. B. McNair (*Lloydia*, 1942, **5**, 208—221).—The amounts of alkaloids and cyanogenetic glucosides in plants are generally highest when the concn. of electrolytes in the sap is high and the amounts are increased by application of N fertiliser. In 13 plant families, the max. mol. wt. of alkaloids produced decreases as the soil-pH decreases. Of 17 families producing HCN the no. of genera producing HCN decreases as pH of the soil of the natural habitats falls. In the Gramineæ, Leguminosæ, Rosaceæ, and Ranunculaceæ most of the HCN-producing plants occur in soils with a pH of 6 or higher. L. G. G. W.

Cyanogenesis in white clover (*Trifolium repens*, L.). V. Inheritance of cyanogenesis. L. Corkill (*New Zealand J. Sci. Tech.*, 1942, **23**, B, 178—193; cf. A., 1941, III, 944).—The cyanogenetic character of white clover is dependent on the interaction of genes which govern the presence of the enzyme linamarase and the glucoside lotaustralin. Differences in cyanoglucoside content are probably due to the effect of modifying genes. R. H. H.

Atropine transference from stock (*Datura stramonium*) to scion (*Solanum lycopersicum*). S. J. Kraevoi and I. Netschaev (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 69—71).—To prevent the scion from receiving substances other than those transferred from the stock, its leaves were removed immediately they appeared. Fruits which formed and ripened were consumed by human subjects. Typical symptoms of affection by atropine resulted and these were confirmed by c.c.g. R. H. H.

Catalase in vine shoots.—See A., 1944, III, 64.

Synthetic ability of [wheat] plants as affected by vernalisation. I. N. Konovalov and T. M. Popova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 58—60).—The rate of enzyme action is accelerated in the leaves of vernalised wheat plants. This condition favours the development of ear organs and increases grain yields. R. H. H.

Germination and seedling growth. II. Effect of environment during germination on subsequent growth of barley seedling. R. Brown (*Ann. Bot.*, 1943, **7**, 275—296; cf. A., 1943, III, 534).—The different effects of early and late excision of the embryo, and of transference to various artificial media, are recorded. As the time of excision is increased from 2 to 6 hr., subsequent growth of the seedling tends to increase, but as the time is increased from 6 to 10 hr., the rate of growth declines. The levels of nutrient, water availability, and CO_2 to which the excised embryo is exposed have a marked effect on growth. R. H. H.

Changes within the seeds of *Juniperus scopulorum* during the process of after-ripening and of germination. M. Afanasiev and M. Cress (*J. Forestry*, 1942, **40**, 798—801).—During after-ripening at low temp. (5°) the fat and protein content of the seeds remains unaltered, sugar appears in traces in the endosperm, peroxidase activity increases slightly, oxidases appear, there is increased catalase activity, water absorption occurs, and the embryo increases in size. Germinating seed showed reduced contents of fat and protein, increased sugar, the appearance of starch and increased oxidase, peroxidase, and catalase activity. L. G. G. W.

Variations in ascorbic acid and dry matter content of cow peas at different times of day. M. E. Reid (*Bull. Torrey Bot. Club*, 1942, **69**, 522—527).—Ascorbic acid and dry matter contents of cow pea plants both increase throughout the day from the beginning of the daily light period. With high light conditions and low nutrient supply, the plants have high reserves of carbohydrates and a low capacity for carbohydrate synthesis and such plants reach their max. ascorbic acid content early in the day. L. G. G. W.

Larger aquatic vegetation of Trout lake, Vilas county, Wisconsin. L. R. Wilson (*Trans. Wisconsin Acad. Sci.*, 1941, **33**, 135—146).—The light penetration is correlated with the distribution of aquatic vegetation; some species do not occur below the depth at which 70% of total sunlight occurs but others descend to levels where only 2% of total sunlight penetrates. L. G. G. W.

Photosynthesis in plants at high altitudes. O. V. Zalenski (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 61—64).—At an altitude of

3860 m., the rates of assimilation of CO_2 by wheat and barley plants (transported in pots) were, respectively, 57·7 and 19·0 mg. per sq. dm. of leaf area per hr. At 6000 m., photosynthesis in both plants was almost or completely absent. R. H. H.

Device for measuring rate of photosynthesis in plants. A. A. Nitschiporovitsch and N. G. Vasilieva (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 65—68).—An apparatus for making several parallel determinations at the same time is described. R. H. H.

Reduction of carbon dioxide during photosynthesis.—See A., 1944, I, 43.

Chromatophores. IV. Structure of the chromatophores of carrot. W. Straus (*Helv. Chim. Acta*, 1943, **26**, 1370—1383; cf. A., 1942, III, 722, 863).—The microscopic structure of carrot chromoplasts consists of small rings arranged in a straight line or in circles one beside the other. The linear association of the small rings has a fibrillar character. The parallel disposition of several fibrils creates a reticular texture of which the links are of different size according to the size of the rings. The chromoplast may contain several superposed layers of annular systems. All the rings have a granular appearance. The largest rings consist of very small rings the detailed structure of which is not visible under the microscope. After suitable treatment of the carrot chromoplasts, the pigment appears under the ultramicroscope as small pleochroic platelets in a straight line or in a circle, one beside the other; it clings to the little rings and can be transformed into large crystals by acetone of suitable concn. The structure of the chromoplasts is compared to a mol. network the fundamental units of which are the protein mols. The chromoplasts show the same morphological peculiarities as the protein crystals of vegetable tissues. The structure of the chromatophores is considered as a confirmation of Nägeli's micellar theory of the structure of org. bodies. The analogies between the structure of carrot chromoplasts and that of the chloroplasts and virus are discussed. H. W.

Metaphase in colchicinised onion root tips. M. Levine and S. Gelber (*Bull. Torrey Bot. Club*, 1943, **70**, 175—181).—Onion roots exposed to 0·01% aq. colchicine for 6—24 hr. show an increased % of cells in the metaphase state, the increase reaching a max. in 24 hr. The colchicine partly inhibits the development of the prophase after 24 hr. and many of the colchicinised cells degenerate. L. G. G. W.

Colchicine-induced allo- and auto-polyploidy in *Nicotiana*. M. V. Bradley and T. H. Goodspeed (*Proc. Nat. Acad. Sci.*, 1943, **29**, 295—301).—Treatment of seedlings gave more consistent results than any other method. Seeds were sown on moist filter-paper and, when germination had proceeded to shedding of the seed coats, the seeds were transferred to filter-paper saturated with 0·5% colchicine solution for 2—5 days. Of 250 seedlings of 7 F_1 hybrids and 10 species that were treated, 23% survived to maturity and of this no. 5% showed complete or partial chromosome doubling. Treatment for 3—4 days was the most effective and in every case where mature plants were produced one or more had complete chromosome doubling or 4*n* sectors. F. S.

Nutrition of isolated tomato roots. J. Bonner (*Bull. Torrey Bot. Club*, 1943, **70**, 184—189).—Three clones of tomato roots that all grew luxuriantly in nutrient containing thiamin and pyridoxine did not grow so well when the only accessory growth-substances were thiamin and glycine; only one responded to nicotinic acid in addition to thiamin and pyridoxine. This explains the discrepancy between the results of different workers as to the necessity of nicotinic acid for isolated tomato roots. L. G. G. W.

Effect of thiamin and niacin on growth of Jack-pine seedlings. D. W. Bensend (*J. Forestry*, 1942, **40**, 883—884).—Pine seedlings in water culture to which thiamin (0·10 mg. per l.) and niacin (0·5 mg. per l.) had been added did not show any increased growth within a period of 80 days. The treatment did not increase the thiamin content of the seedlings. L. G. G. W.

Inhibiting action of mannose on growing plant. H. K. Wachtel (*Arch. Biochem.*, 1943, **2**, 395—401).—0·005M-Mannose causes inhibition of stem and root growth of cress seedlings growing in tap-water. Higher concns. cause greater inhibition. 0·125M-Mannose also causes inhibition of germination of cress seeds. The effect is connected with the stereochemical structure of mannose, and is not produced by glucose, fructose, galactose, mannitol, sorbitol, or dulcitol. J. N. A.

Variables affecting vegetative propagation of red and sugar maple. A. G. Snow (*J. Forestry*, 1941, **39**, 395—404).—Different red maple clones differ in their ability to produce roots on cuttings. Aq. indolylbutyric acid (50 p.p.m. for sugar maple and 200 p.p.m. for red maple) increases the rooting of soft wood cuttings, short (3 hr.) periods of treatment being more effective than longer ones. Treatment of cuttings with sucrose in addition to growth-substance had no beneficial effect. L. G. G. W.

Effect of indolylbutyric, indolylacetic, and α-naphthylacetic acid on rooting of cuttings of Douglas fir and Sitka spruce. B. G. Griffiths (*J. Forestry*, 1940, **38**, 496—501).—Indolylbutyric, indolylacetic, and α-naphthylacetic acids stimulate root production by dormant cuttings of Douglas fir and Sitka spruce. Indolylbutyric acid is the most effective chemical tried and gives 80—100% of rooted cuttings. The "optimum treatment" is to stand the cuttings with their basal ends in an aq. solution (25—50 p.p.m.) for 24 hr. before planting. L. G. G. W.

Propagation of black locust clones by treating hardwood cuttings with growth-substances. V. T. Stoutemeyer, J. R. Rester, and F. L. O'Rourke (*J. Forestry*, 1940, **38**, 558—563).—Black locust cuttings root readily if planted after treatment with aq. indolyl- or α-naphthyl-acetic acid (100 p.p.m.) for 24 hr. Storage of treated cuttings at 21° before planting is beneficial as it encourages the rapid production of root primordia. L. G. G. W.

Vegetative propagation of Norway spruce. C. G. Denber and J. L. Farrar (*J. Forestry*, 1940, **38**, 578—585).—Norway spruce can be propagated from dormant cuttings. Treatment of the cuttings by standing them in aq. indolylbutyric acid (2·5—100 p.p.m.) for 24 hr. did not increase root production. L. G. G. W.

XXVII.—PLANT CONSTITUENTS.

Occurrence of rare earths in plants and soils.—See B., 1944, III, 2.

Ash skeleton method for diagnosis of magnesium and potassium deficiencies in apple leaves and for determining their distribution in the leaf. E. B. Kidson (*New Zealand J. Sci. Tech.*, 1943, **24**, B, 140—145).—A method of ashing which produces a skeleton leaf is described. For the detection of Mg, the ash is sprayed with 0·5N-NaOH and then with 0·05% aq. Titan-yellow, which produces a transient pink colour with Mg. K is detected by spraying the ash with cobaltinitrite reagent. G. H.

Volatile plant substances. XXIV. Composition of essential oil and resin of lovage (*Levisticum officinale*, Koch). Y. R. Naves (*Helv. Chim. Acta*, 1943, **26**, 1281—1295).—The essential oil of the roots of lovage contains a high proportion (approx. 70%) of derivatives of phthalides amongst which *n*-butylidenephthalide, *n*-butylphthalide, and sedanonic anhydride have been identified. The presence of *n*-butyl-di- and -tetra-hydrophthalides is probable. *n*-Butyric acid, carvacrol, coumarin, a sesquiterpene, and, probably, eugenol are also present. The non-volatile fraction of the benzene extract contains free palmitic acid, the acids corresponding to the phthalides, and bergaptene. The presence of phthalide derivatives closely connects the oil of lovage to that of other umbelliferæ (*Cnidium officinale*, Makino; *Ligusticum acutilobum*, Sieb. and Zucc.). (See also A., 1943, II, 367.) H. W.

[Constituents of] oil of pennyroyal.—See A., 1944, II, 31.

Isolation of hexenal from leaves. W. Nye and H. A. Spoehr (*Arch. Biochem.*, 1943, **2**, 23—35).—The highest yields of hexenal from *Ailanthus glandulosa* leaves (by steam-distillation) were obtained after fine grinding in air, and lower yields after rough grinding. No hexenal was obtained after first killing the leaves by heat, or after grinding and distilling in N_2 or CO_2, or when the leaves were not ground. Hexenal is formed by enzymic action in the presence of air. 0·1% of pyrogallol inhibits and peroxides promote formation of hexenal. E. R. S.

Leaf alcohol. IV. *trans-cis* Problem of the leaf alcohol, Δ$^{\gamma}$-*n*-hexen-α-ol. See A., 1944, II, 30.

Limit dextrins and starch. VI—VIII.—See A., 1944, II, 8.

Chemical composition of pods and seeds of *Medicago*: apparent digestibility of cluster clover (*Trifolium glomeratum*, L.) seed.—See B., 1944, III, 13.

Chemistry of allergens. VIII. Isolation and properties of an active protein-polysaccharide fraction *CB*—1A, from castor beans.—See A., 1944, III, 81.

Alkaloids of *Coscinium fenestratum* (Colebr). N. S. Varier and P. P. Pillai (*Current Sci.*, 1943, **12**, 228—229).—The presence of berberine as the only alkaloid in *C. fenestratum* has been demonstrated. The stems were extracted with alcohol, and the total alkaloids dissolved out by water followed by dil. acetic acid. They were completely pptd. as nitrate by KNO_3. The nitrate was identical with that of berberine. Free berberine was prepared from the salt. J. F. M.

***cis–trans*-Isomerisation and spectral characteristics of gazaniaxanthin. Its structure.**—See A., 1944, II, 9.

Optically active phytol.—See A., 1944, II, 31.

Constituents of red sandalwood. II. Constitution of pterostilbene.—See A., 1944, II, 45.

New hamameli tannin.—See A., 1944, II, 38.

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	A.	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, Assignee } in patent titles only	Assr., Assee.	gallon(s)	gal.	preparation	prep.
		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·]	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	*tert.*
critical	crit.	millilitre(s)	ml.	vacuum	vac.
crystalline, crystallised (adjective only)	cryst.	millimetre(s)	mm.	value	val.
		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^{α}; *iso*propyl, Pr^{β}; *n*-butyl, Bu^{α}; *iso*butyl, Bu^{β}; *tert.*-butyl, Bu^{γ}; phenyl, Ph; acetyl ($CH_3 \cdot CO$), Ac; benzoyl ($C_6H_5 \cdot CO$), 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 $\mu\mu$.) 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; $\gg$, much greater than; $\not>$, not greater than (and $<$, $\ll$, $\not<$ conversely); $\propto$, (is) proportional to; $\sim$, 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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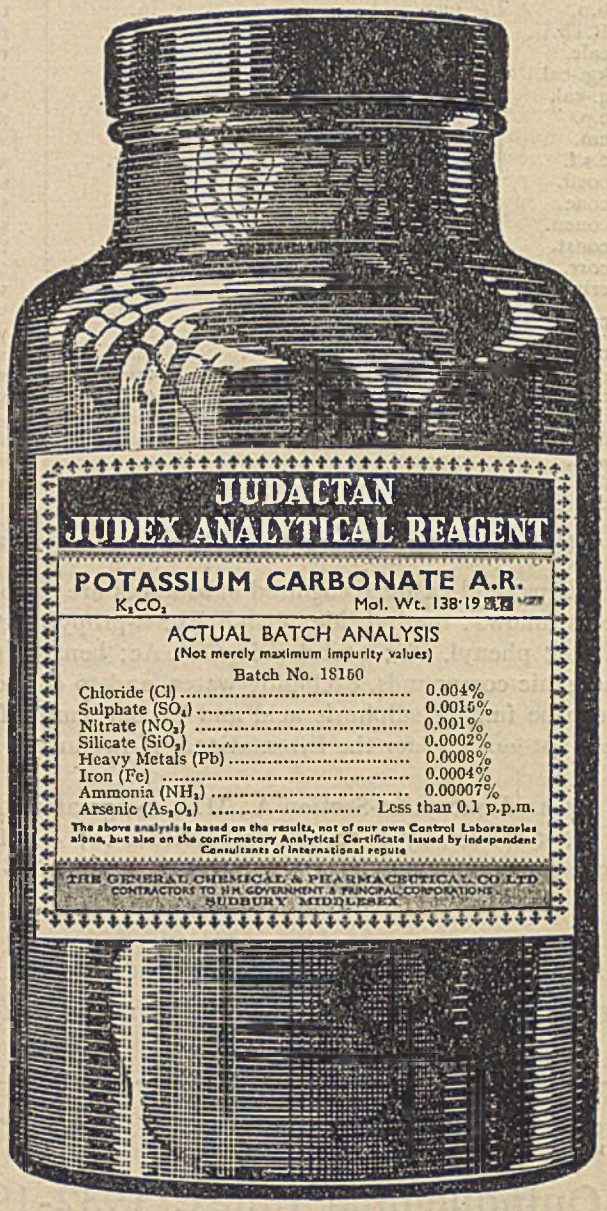
JUDACTAN

ANALYTICAL REAGENTS WITH ACTUAL BATCH ANALYSIS

ACTUAL

BATCH

ANALYSIS



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