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APRIL, 1944

A III—PHYSIOLOGY. BIOCHEMISTRY. ANATOMY

CONTENTS

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A III—Physiology. Biochemistry. Anatomy.

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BIBLIOTEKA POLITECHNIKI ŚLĄSKIEJ

I.—GENERAL ANATOMY AND MORPHOLOGY.

Ageing of human skin. I. Influence of dermal shrinkage on appearance of epidermis in young and old fixed tissues. R. Evans, E. V. Cowdry, and P. E. Nielson (*Anat. Rec.*, 1943, **86**, 545—565).—Old epidermis is generally thinner than young by 6·5 μ.; in it, there is a tendency to lose a layer of granular cells and the corium becomes thinner, but these changes are too minute to account for the striking differences between old and young skin as seen in stained sections. Serial reconstructions of the young and old epidermis following removal of the dermis show that the differences observed are for the most part illusory due to distortion and crowding of cells by shrinkage of subjacent tissue in young specimens. Apart from a difference in reaction of their connective tissue beds, young and old epidermis show little difference in thickness or conformity. W. F. H.

Biology of skin and fleece of sheep. I. Development and general histology of follicle group in skin of merino. II. Use of tanned sheep skin in study of follicle population density. III. Arrangement, nomenclature, and variation of skin folds and wrinkles in merino. H. B. Carter (*Counc. Sci. Ind. Res. Australia, Bull.* 164, 1943, 59 pp.; 12 plates). J. D. B.

Morphology of male urogenital system of frilled shark, *Chlamydoselachus anguineus*. P. W. Gilbert (*J. Morph.*, 1943, **73**, 507—528).—Macroscopic appearances are described. The urogenital system is of a very generalised and primitive type. H. L. H. G.

Origin of primitive tetrapod limb. T. S. Westoll (*Proc. Roy. Soc.*, 1943, **B**, **131**, 373—393).—A rhipidistian paired fin, made to assume the position of a primitive tetrapod limb, would suffer certain modifications which throw light on the origin of the latter and on the homology of its elements. The proto-tetrapod pectoral and pelvic fins were of similar structure. Each consisted of five axial mesomeres, each bearing distally a simple preaxial radial and an actual or potential postaxial process; a rudimentary 6th mesomere may have been present. The downward flexure of the extended fin between 1st and 2nd mesomeres, and forward torsion of the part distal to the 2nd mesomere, lead to conditions closely comparable with part of the limbs of primitive tetrapods. The digits (including their proximal podialia) are new formations and the terms archepodium and neopodium are proposed for those parts of the tetrapod limb derived directly from the rhipidistian paddle skeleton and for new formations respectively. The prepollex (prehallux) is a digit, but postminimal and pisiform elements are less certainly so. The main axis of the rhipidistian paddle is directed between the "first" and "second" fingers. Several variants of this scheme are discussed. The structure of the stegocephalian limb is discussed; it corresponds well to this theoretical pattern, but there is some reduction of the distal part of the archepodium. The limb structure of urodeles and other tetrapods can easily be derived from this common ancestral pattern. The development of limbs of living tetrapods is in general agreement with this new theory, which alone explains the relationships of the radiale (tibiale) in many forms. Many peculiarities of the tetrapod limb seem to be relics of characters of the rhipidistian fin. Each mesomere and preaxial radial of the rhipidistian paddle was probably related to one myotome. Relics of this condition seem to be found in the segmental motor innervation of the muscles of human extremities. C. J. C. B.

Gross structural and quantitative aspects of developmental anatomy of human embryonic, fœtal, and circumnatal skeleton. C. R. Noback (*Anat. Rec.*, 1943, **87**, 29—51).—A technique whereby over-maceration and over-staining of human embryos can be prevented is described. Structures associated with developing bones, including primary and secondary trabeculæ, open reticular zone, free bony islands, bony nodules, and marginal zone, are defined according to the differential staining affinity of alizarin-red S to bone. Four morphological types of bone are described: open reticular bordered plate bones, smooth-bordered plate bones, peripheral band bones, and tubular bones. Three developmental periods in the morphogenesis of the bones during prenatal life are postulated, viz., differentiation (appearance of ossification centres), proliferation (relatively rapid growth), and construction (relatively slow growth). W. F. H.

Mechanism of rotation at first carpo-metacarpal joint. R. W. Haines (*J. Anat., Lond.*, 1944, **78**, 44—46).—The movements at the first carpo-metacarpal joint are discussed. It is suggested that the function of certain ligaments, hitherto unrecognised, of this joint is mainly to guide the axial rotation of the first metacarpal at the end of the movements of flexion and extension. W. J. H.

Effect of illness and other factors on appearance pattern of skeletal epiphyses. L. W. Sontag and J. Lipford (*J. Pediat.*, 1943, **23**, 391—409).—Acute or subacute illness did not delay the centres which were about to appear at the time of illness or cause a greater incidence of centres "out of line" with the group or the child's own pattern. There is a greater likeness in ossification patterns among siblings than among non-siblings and among like-sexed siblings as compared with unlike-sexed siblings. Monozygotic twins show even more clearly this genetic factor in ossification pattern. C. J. C. B.

Hereditary multiple exostosis. H. I. Jaffe (*Arch. Path.*, 1943, **36**, 335–357).—A crit. review based on 28 cases. (16 photomicrographs.) C. J. C. B.

March fracture of metatarsal bones. H. H. F. Barns (*Brit. Med. J.*, 1943, II, 608—609).—20 cases of march fracture of the metatarsal bones are recorded and clinically analysed. It is suggested that the exciting force responsible for the fracture is supplied by the repeated muscular action of the plantar flexors of the toes and foot during the springy movements of walking. I. C.

Multiple spontaneous idiopathic symmetrical fractures. L. Edeiken and N. G. Schneeberg (*J. Amer. Med. Assoc.*, 1943, **122**, 865—870).—Case report and review of 19 cases in the literature. The ætiology and pathogenesis of the disease are unknown but high-Ca diet and large doses of vitamin-*D* were helpful in this case. C. A. K.

Value of shoulder–hip ratio as index of masculinity and relation to dynamic physical fitness. C. C. Seltzer (*Rev. Canad. Biol.*, 1943, **2**, 329—331).—The shoulder–hip ratio (bi-iliac × 100/biacromial) with a range of 60—80 (mean 70·90) was found in people with a strong masculine component; in the group with weakness in the masculine component the range was 65—84 (mean 73·62). The average fitness index in the former group was 80·8, and in the latter group 50·9. A. S.

Implications of weight-gain during pregnancy. G. S. Beardsley (*West. J. Surg. Obstet. Gynec.*, 1941, **49**, 350—353).—An analysis was made of the infant wt. and gain of maternal wt. in 200 cases. A gain of 25 lb. over a normal based on a width-wt. scale for Stanford University allows for the usual wt.-loss during the first 6 post-partum weeks with a 5-lb. reserve during the nursing period. Greater gains in wt. had little effect on the infant wt. and had disadvantages for the mother. According to the normal scale used the under-wt. mothers gained an average of 5 lb. more than the over-wt. ones. P. C. W.

Congenital absence of vagina treated successfully by Baldwin technique. T. O'Neill (*Brit. Med. J.*, 1943, II, 746—747).—Case report. I. C.

Anal glands in anorectal disease. M. R. Hill, E. H. Shryock, and E. G. ReBell (*J. Amer. Med. Assoc.*, 1943, **121**, 742—746).—Serial sections of the anorectal region in newborn infants and adults showed anal glands extending between the anorectal and anocutaneous line. The relation to perirectal abscess, fistula *in ano*, etc. is discussed. C. A. K.

Congenital defects in children following infectious diseases during pregnancy. C. Swan, A. L. Tosteuin, B. Moore, H. Mayo, and G. H. B. Black (*Med. J. Austral.*, 1943, II, 201—210).—Discussion of congenital defects with special reference to the relation between German measles and cataract, deaf-mutism, heart disease, and microcephaly, and to the period of pregnancy in which the occurrence of rubella is followed by congenital abnormalities. F. S.

Structure and function of proboscis in common oyster drill (*Urosalpinx cinerea*). M. R. Carriker (*J. Morph.*, 1943, **73**, 441—506).—A detailed account is given of the gross anatomy and function of the drilling and feeding organs contained in the proboscis. Drilling and rasping of flesh by the radula is entirely mechanical; the accessory proboscis appears to secrete a substance which softens the shell and facilitates penetration. (8 plates.) H. L. H. G.

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Reproduction in chimpanzee : report on 49 births. H. W. Nissen and R. M. Yerks (*Anat. Rec.*, 1943, **86**, 567—578).—A revised estimate gives the gestation period as 248 days. Behaviour modifications of the mother during pregnancy and the indications of approaching parturition are described. An analysis of the diurnal and seasonal distribution of births is given. The duration of labour ranged from 40 min. to 8 hr. The placenta is usually expelled within 1 hr. after birth. In 13 cases the placenta was eaten. Initial responses of the mother to the infant are described. Post-parturitional bleeding from the vagina occurred between 10 and 28 days in 17 cases, and lasted about 3 days. In 5 cases it occurred only during the first 9 days post-partum. In cases where the infant was separated from the mother shortly after birth, the first menstruation followed in about 3 months. This interval was not appreciably increased when the infant was nursed for 6 weeks or less.
W. F. H.

Conjoined twins in pig. H. O. Hetzer and O. N. Eaton (*Anat. Rec.*, 1943, **87**, 53—65).—The stillborn specimen was of the Cephalothoracopagus type. The twinning process probably first asserted itself towards the later stages of the formation of the amniotic cavity.
W. F. H.

Multiple congenital anomalies in stillborn infant. L. A. Ashley and G. E. Richardson (*Anat. Rec.*, 1943, **86**, 457—471).—The specimen exhibited a complete vertical cleft of the face and mandible, including bifid tongue, a fully developed erupted tooth on a pedicle, bilateral anophthalmia, and 14 other malformations. The placenta was bound to the head by amniotic adhesions and the view that the latter are the result, not the cause, of the fœtal malformations is reiterated. Evidence favouring an endogenous origin for the majority of the malformations is advanced and possible causes of initial germinal defects responsible for monster formation are discussed. Craniofacial anomalies, particularly those associated with amniotic adhesions, may arise as a result of one or more defective cells at the junction between amnion and germ disc in a pre-villous ovum possibly during the second week.
W. F. H.

Experimental studies on development of pronephric duct in anuran embryos. Ti-Chow Tung and Su-Hwei Kü (*J. Anat., Lond.*, 1944, **78**, 52—57).—Experiments were carried out on the embryos of *Bufo bufo gargarizans* and *Rana nigromaculata* to demonstrate the growth of the pronephric duct. The growth capacity of the rudiment is not limited to the caudal end since if the tip is removed the remaining rudiment continues to grow. Evidence derived from rotation experiments shows that the caudal extension of the rudiment is not controlled in relation to the axis of the body. There is a close topographical relationship between the path of the pronephric duct and the ventro-lateral border of the somites.
W. J. H.

Changes in *B*-vitamin content [of chick embryonic tissues] during development.—See A., 1944, III, 199.

Rôle of neural crest in development of dorsal fin in *Urodela*. I. B. Terentiev (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 91—93).—Data presented show that factors contained in the neural crest determine the localisation and shape of the dorsal fin.
R. H. H.

Innervation of supernumerary limbs by heterotopically grafted brachial cords in *Amblystoma punctatum*. E. K. Moyer (*J. Exp. Zool.*, 1943, **94**, 97—114).—After grafting the brachial region of the spinal cord and the fore limb rudiment to the postbrachial region of a host, the resulting supernumerary limb did not exhibit co-ordinated movements unless it received some innervation from the normal brachial plexus of the host, in which case its movements were synchronised with those of the normal fore limb. The grafted brachial segments of the cord, though remaining larger and maintaining a greater cell count than the replaced segments, do not maintain their capacity for effecting normal limb movements.
H. L. H. G.

Choline-esterase and behaviour problem in *Amblystoma*. III. Distribution of choline-esterase in nerve and muscle throughout development. IV. Choline-esterase in nerveless muscle. C. H. Sawyer (*J. Exp. Zool.*, 1943, **94**, 1—32; cf. A., 1943, III, 707).—III. Choline-esterase is already conc. in nerve and muscle in the premotile stage of *Amblystoma* embryos. It increases rapidly during the swimming stage, the muscles and nervous tissues containing practically the whole of the enzyme. A max. concn. is found about 20 days after feeding begins; this is the period when reflexes are most rapid and most easily evoked. Thereafter the concn. falls gradually to the adult level.

IV. By preventing the ingrowth of nerves the esterase content of the muscles was lowered, especially in the later stages. It is concluded that some structure closely connected with nerve endings is responsible for the production of most of the choline-esterase in skeletal muscle; Schwann's cells may be the active agents.
H. L. H. G.

Morphogenesis in axolotl under influence of derivatives of hydrolysed cartilage. D. M. Fedotov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **38**, 47—50).—An account of the morphogenetic effect of various acid and alkaline hydrolysates on 2-year-old axolotls. The results are discussed in relation to Nassonov's views on the organising rôle of chemical substances arising from tissue disintegration.
J. D. B.

Suspension of pole cell formation in *Drosophila* eggs by hydrostatic pressure. I. Cornman (*J. Cell. Comp. Physiol.*, 1943, **22**, 197—198).—Application of pressure of 6000 lb. per sq. in. forced the budding pole cells back into the egg, and if such application was prolonged or several times repeated pole cell formation was permanently inhibited.
V. J. W.

Influence of hatching order on intensity of testis pigmentation in *Ephestia kühniella*. E. Caspari (*J. Exp. Zool.*, 1943, **94**, 241—260).—Late hatching animals have less testis pigmentation than earlier hatching ones. This decrease in intensity of coloration is not directly caused by the increase in time of development; it is shown to be at least partly due to relative starvation of the more slowly developing animals. In *aa* animals (which have reduced or no a^+ substance), while the testes are lighter in the later hatching ones, no change in eye colour is observed; this indicates that the rate of development does not influence the release of a^+ substance.
H. L. H. G.

Maternal and paternal inheritance in plutei of hybrids of sea urchins *Strongylocentrotus purpuratus* and *S. franciscanus*. A. R. Moore (*J. Exp. Zool.*, 1943, **94**, 211—228).—In the hybrid *S. purpuratus* ♀ × *S. franciscanus* ♂, the form of the body and that of the skeleton are influenced by the characters of both parents. A significant difference of the hybrid from either parent is shown in respect of the ratios body width : total length, and length of body-rod : length of postoral rod.
H. L. H. G.

Familial variations in pattern of rib ossification in rabbit. I. M. Baumgartner and P. B. Sawin (*Anat. Rec.*, 1943, **86**, 473—489).—Embryos of a 12-ribbed family of rabbits and a 13-ribbed family taken at 4 developmental stages showed familial patterns of rib ossification differing in time and position of onset and speed of progression. Ossification began earlier, originated more anteriorly, and progressed more rapidly in the 12-ribbed group. It is suggested that the observed differences may be due to separate genes or that they may be determined by the interrelation of growth and differentiation. The fact that acceleration of ossification in the 13-ribbed family occurred simultaneously in ribs and limbs supports the latter hypothesis.
W. F. H.

Meiosis in the striped hamster and the problem of heterochromatin in mammalian chromosomes. J. Pontecorvo (*Proc. Roy. Soc. Edin.*, 1943, **62**, 32—42).—The *X*- and *Y*-chromosomes of *Cricetulus griseus* ($2m = 14$) are heterochromatic, the pairing and differential segments showing nucleic acid cycles different from each other and from the autosomes. As this situation is widespread in mammals it is suggested that, in this group, there has been a progressive specialisation in the evolution of sex-chromosomes such that the differential segment of the *X*-chromosome comes to carry almost exclusively female-determining genes, while the pairing segments of *X* and *Y* carry male-determining genes. It is considered that the only essential difference between heterochromatin and euchromatin lies in the spatial distribution of similar genes : heterochromatin results from the grouping together of similar genes, and euchromatin from the intermingling of dissimilar ones.
J. D. B.

Cytoplasmic modification of genetic trends. W. F. Petersen and A. Mayne (*J. Amer. Med. Assoc.*, 1943, **121**, 929—931).—A lecture.
C. A. K.

III.—PHYSICAL ANTHROPOLOGY.

Genetics and antiquity of man in Americas. M. F. Ahsley-Montagu (*Man*, 1943, **43**, 131—135).—Finds of human skeletal material for which a greater antiquity than 5000 years can be claimed are unknown. An analysis of the skeletal remains of aboriginal American populations supports the conclusion that the first inhabitants were Caucasoids with some Mongoloid admixture. They are probably represented by the extinct inhabitants of Tierra del Fuego and the Navarino islands. Some evidence in support of this is also derived from an analysis of blood groups. *B*, which originated somewhere in Asia, is markedly lacking in America, except among the Yaghans of Tierra del Fuego. North American Indians are predominantly *O*, but there is evidence that they formerly possessed appreciable amounts of *A* and *B*.
W. F. H.

Lacandone Indians of Southern Mexico. J. Soustelle (*Man*, 1943, **43**, 117).—A review.
W. F. H.

Bushman tribes of southern Africa. A. M. D. Cronin and D. F. Bleek (*Man*, 1943, **43**, 120).—A review.
W. F. H.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Cytological study of carotid body of cat. W. H. Hollinshead (*Amer. J. Anat.*, 1943, **73**, 185—213).—The cells do not form a

syncytium and they do not exhibit Nissl substance or neurofibrillar net. Fat, cholesterol, and glycogen are absent. Fuchsinophilic granules are abundant within the cytoplasm but the majority of them are not mitochondria. The granules did not exhibit the peroxidase reaction. It would appear that they play a rôle in the initiation of chemoreceptor reflexes, but their precise nature and function are obscure. W. F. H.

Differentiation and significance of argentaffin granules in hypophysis. A. Popoff (*Anat. Rec.*, 1943, **87**, 1—15).—By selective staining and Ag impregnation granules of typical argentaffin cells, mitochondria, ascorbic acid, and certain lipoid inclusions were clearly differentiated in the cells of the anterior part of the hypophyses of man and of rabbits. Cellular metamorphosis leading to the formation of argentaffin cells from chromophil cells and the transformation of argentaffin cells into chromophobe cells is described. It is considered that the argentaffin cell represents a phase of rest or recuperation in the life cycle of the chromophil cell. In their mode of formation and in their response to certain chemical and physical agents argentaffin cells in this situation are analogous to those of the gastrointestinal tract. In the rabbit hypophysis there is a marked decrease in the no. of these cells in mid-winter. W. F. H.

Histological study of testes of sockeye salmon (*Oncorhynchus nerka*). G. F. Weisel (*J. Morph.*, 1943, **73**, 207—230).—The Pacific salmon dies soon after its single spawning season. In the season the testes show vacuolation and early pyknotic changes in the epithelial cells of the ducts, in the spermatogonia, and in the follicle cells. After spawning the vacuoles increase in size and pyknosis becomes more marked. Such changes are not observed in the rainbow trout. They indicate the approaching death of the fish. H. L. H. G.

Relation between centriole and centromere in atypical spermatogenesis of viviparid snails. A. W. Pollister and P. F. Pollister (*Ann. New York Acad. Sci.*, 1943, **45**, 1—48). J. D. B.

Manipulation of nematocysts of *Pennaria tiarella* by *Aeolis pilata*. W. A. Kepner (*J. Morph.*, 1943, **73**, 297—312).—The sea-slug *A. pilata* ingests the 6 types of nematocyst elaborated by *P. tiarella* and transfers them to the cnidosac. The epithelium of the cnidosac digests all the types except the microbasic mastigophores; these, the most effective type of nematocyst, are retained, conc., and oriented. It is inferred that the microbasic mastigophores of the hydroid are of defensive val. to the sea-slug. H. L. H. G.

Nuclear changes in protozoan parasite *Myxidium gasterostei*. E. R. Noble (*J. Morph.*, 1943, **73**, 281—296).—The diagnostic characters and the life cycle of a new myxosporidian parasite from the gall bladder of the common stickleback are described. The last division in sporogony is the reduction division and the two haploid nuclei so formed are the sporoplasm nuclei; the remainder of the life cycle is diploid. H. L. H. G.

Cutaneous melanophore eruptions in young fishes during stages preceding melanotic tumour formation. M. Gordon and W. Lansing (*J. Morph.*, 1943, **73**, 231—245).—The pigmentary patterns of selected surface areas were observed at intervals during stages preceding neoplastic tumour formation in young melanotic hybrid xiphophorin fishes. Changes in melanophore grouping are readily seen through the transparent epidermis; the melanoma-inducing macromelanophores develop initially in the corium. There is a continuous process of degeneration and production of melanophores, the rate of production being much greater than that of degeneration. Melanin particles resulting from degeneration are carried to the surface and sloughed off. H. L. H. G.

Photochemical synthesis of fluorochromes for vital staining. R. Stämpfli (*Helv. Physiol. Pharm. Acta*, 1943, **1**, 265—273).—Cryst. vitachrome was obtained by ultra-violet irradiation for 6—18 hr. of a 1% solution of 4-methyl-5-β-hydroxyethylthiazole at pH 3—4 in the presence of O_2. The crystals were dissolved in alcohol and several times recryst. until they had m.p. 174°. The fluorescence of 1 μg. of vitachrome in 100 c.c. of water is still photoelectrically measurable. The fluorescence intensity of thiochrome and vitachrome is 1 : 16 at pH 7. Both substances can be reduced with Na dithionite to a colourless compound which can be reoxidised with O_2. Vitachrome is photostable. The surface tension of 60·8 dynes per cm. of a 1% solution of 4-methyl-5-β-hydroxethylthiazole was reduced to 46·5 dynes per cm. during 11 hr. irradiation. Pure vitachrome solutions show no surface activity. Vitachrome is recommended for vital staining in fluorescence microscopy; it is non-toxic on frog spawn, frog hearts, paramecia, and planaria. An ultra-violet irradiation product of Na 2-thiol-4-methyl-5-thiazolecarboxylate can also be used for vital staining. A. S.

Combined elastica-trichrome stain for tissues. J. Mendeloff and H. Blechman (*Amer. J. clin. Path. Tech. Sect.*, 1943, **7**, 65).—The tissue is deparaffinised in the usual manner, washed thoroughly in water, stained in resorcinol–fuchsin mixture for 60 min., washed rapidly in acid alcohol, dehydrated and differentiated in abs. alcohol until the section is faintly red, washed rapidly with 70% alcohol into water, stained in Harris hæmatoxylin for 8 min., differentiated in water for 5 min., stained in ponceau–acid fuchsin–orange G staining solution for 5 min., washed thoroughly, placed in 3% phosphotungstic acid for 10 min., again washed and placed in light-green for 5 min., then without washing placed in 1% acetic acid for 3 min., dehydrated, cleared, and mounted in gum dammar. With this stain, the elastic tissue stains blue-black, smooth muscle is red, and collagen green. C. J. C. B.

Use of manganese in histochemical demonstration of acid phosphatase. F. Moog (*J. Cell. Comp. Physiol.*, 1943, **22**, 95—97).—Presence of 0·01M-$MnSO_4$ in the incubating solution used in Gomori's method makes the method much more sensitive, and gives black granules which are not dissolved out in xylol. Incubation time should be halved. V. J. W.

Use of tertiary butyl alcohol in bacteriologic staining procedures. D. Slaughter, C. R. Treadwell, and J. W. Gales (*J. Lab. clin. Med.*, 1943, **28**, 1599—1602).—*tert.*-Butyl alcohol is satisfactory as a decolorising agent in modifications of the Gram and Ziehl–Neelsen staining procedures. C. J. C. B.

Dioxan: dehydration, purification, and clarification for continued use in tissue technique. W. E. B. Hall (*Amer. J. clin. Path. Tech. Sect.*, 1943, **7**, 98—100).—A method is detailed whereby hydrated dioxan is frozen. This, when placed in a refrigerator at 2—5°, liberates the watery contaminants, which are drained away, leaving cryst. dioxan which, after melting, is recovered as actively dehydrating dioxan. C. J. C. B.

Handling of small biopsy material. A. C. Lendrum (*Brit. Med. J.*, 1943, II, 644—645).—Technical note. I. C.

Restoration of dried biopsy tissue. K. D. Graves (*Amer. J. clin. Path. Tech. Sect.*, 1943, **7**, 111).—When dried tissue is placed in physiological saline solution for 1 hr. or more, it absorbs water, and softens so that useful sections can be obtained. C. J. C. B.

V.—BLOOD AND LYMPH.

Bone marrow of normal dogs. L. M. Meyer (*Amer. J. med. Sci.*, 1943, **206**, 637—641).—A simple method suitable for repeated biopsies in obtaining bone marrow from the crest of the ilium in living dogs is described. Data are given for 10 normal dogs about the total no. of nucleated cells and megakaryocytes, and the % distribution of marrow cells in the ilial bone marrow. C. J. C. B.

Species differences in mouse erythrocytes. H. P. Levine (*Biol. Bull.*, 1943, **85**, 52—59).—Four species of *Peromyscus* differ consistently from each other with regard to the rate of osmotic hæmolysis in ethylene glycol, glycerol, erythritol, and thiourea. Hæmolysis rate decreases progressively during refrigeration storage, in *Peromyscus* but not in *Cavia*. G. P. W.

Blood value of English breeds of sheep in relation to their constitutional characters. A. S. Karpov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 827—830).—Hampshire and Shropshire breeds possess advantages over Lincoln and Romney Marsh breeds in hæmoglobin val., hæmoglobin concn., no. and total surface area of red cell, and the functional capacity of hæmoglobin surface. C. J. C. B.

Effect of sex hormones on erythrocyte number in blood of domestic fowl. E. Taber, D. E. Davis, and L. V. Domm (*Amer. J. Physiol.*, 1943, **138**, 479—487).—The red cell counts in capons and bilaterally and unilaterally ovariectomised poulards treated with testosterone were above those of uninjected controls for up to 45 days. Young female and male birds treated with pregnant mare serum had raised counts. The counts were lowered in normal males, capons, and bilaterally ovariectomised poulards by treatment with œstradiol or stilbœstrol; clotting time was prolonged. Adult intersexual males, feminised with œstrogens during incubation, had lowered counts resembling those of normal hens; immature intersexual males (feminised) had the same counts as controls in spite of some feminisation of plumage. There was no change in the counts before and during moult. A. S.

Removal of red cells from active circulation by sodium pentobarbital [rôle of spleen; action of adrenaline]. P. F. Hahn, W. F. Bale, and J. F. Bonner, jun. (*Amer. J. Physiol.*, 1943, **138**, 415—420).—Nembutal anæsthesia was induced in dogs after labelling circulating erythrocytes by injecting blood with the radioactive Fe isotope; the spleen was 5 times as heavy as when removed under ether anæsthesia and contained up to 30% of the circulating red cells. Intravenous injection of 0·5 mg. of adrenaline increased the no. of circulating red cells by as much as 37% of the total cell mass. If adrenaline was injected into splenectomised dogs the increase in circulating cells was half as great as that in the intact animal. A. S.

Effect of nembutal–ether anæsthesia on blood concentration [rôle of spleen]. L. W. Jarcho (*Amer. J. Physiol.*, 1943, **138**, 458—461).—Nembutal anæsthesia in cats and dogs produces a decrease in the hæmatocrit (by 26·5 and 22·9%) and plasma-protein concns. (by 16

and 9·3%); after splenectomy nembutal no longer decreases the hæmatocrit more than the plasma-protein concn. and the magnitude of both changes is decreased. In intact and splenectomised dogs ether, administered after nembutal, raises the previously lowered hæmatocrit and protein concn. above control level. This effect of ether was not observed in nembutalised intact, splenectomised, adrenalectomised, or sympathectomised cats. A. S.

Factors influencing increase of erythrocyte fragility induced by stasis. C. Tsai, C. J. Chen, and K. Y. Chiu (*Amer. J. Physiol.*, 1943, **138**, 519—526).—Increased red cell fragility does not occur if the dog's red cells were previously washed with buffered saline, or if previously, *in vivo*, sufficient glucose or citrate was added to make the plasma hypertonic. The findings are explained by the rapid formation of osmotically active metabolites within the cell, *e.g.*, lactic acid. A. S.

Five cases of jaundice following transfusion of whole blood or human plasma. R. E. Steiner (*Brit. Med. J.*, 1944, I, 110—111).—Five cases of jaundice developing 2—3 months after transfusion are reported. It is suggested that transfusion is the cause of the illness. I. C.

Fate of transfused erythrocytes. H. S. Baar and T. W. Lloyd (*Arch. Dis. Childh.*, 1943, **18**, 124—136).—The fate of transfused red blood corpuscles was followed by decomp. of Price Jones' curves and by estimation of alkali-resistant and alkali-labile oxyhæmoglobin. A method for estimation of the latter with Evelyn's photoelectric step-photometer is described. The life span of transfused cells is usually different from that of the recipient's cells. A diminution in the life span is usual, but prolongation may occur. Transfusion experiments demonstrated the inferior quality of erythrocytes and the increased activity of the destructive mechanism in acholuric jaundice and the presence of an erythronoclastic factor in icterus gravis neonatorum and hæmolytic anæmia of the newborn. C. J. C. B.

Citric acid–sodium citrate–glucose mixtures for blood storage. J. F. Loutit, P. L. Mollison, I. M. Young, and E. J. Lucas (*Quart. J. Exp. Physiol.*, 1943, **32**, 183—202).—8 different citric acid–Na citrate-glucose mixtures were tested and some were satisfactory for use as blood preservatives. The following advantages of these mixtures were noted: the *in vivo* survival of the red cells stored in these solutions after transfusion is better than with any other solution yet tested; the mixture withstands autoclaving with the production of little or no caramel; transfusion of blood stored in these solutions was not followed by any untoward effects; the amount of methæmoglobin formed when blood was stored in these solutions was not greater than with the usual Na_3 citrate–glucose mixture. The rates of release of inorg. P, of K shift, of glycolysis, of hæmolysis, and of fragility of blood stored in these solutions and in the Rous–Turner and standard M.R.C. citrate–glucose solutions were not correlated with the ability of the red cells to survive *in vivo* after transfusion, although delay in hæmolysis was associated with improved survival *in vivo*. A. S.

Advantages of disodium citrate–glucose mixture as blood preservative. J. F. Loutit and P. L. Mollison (*Brit. Med. J.*, 1943, II, 744—745).—The erythrocytes of blood (420—430 c.c.) stored in a mixture of 2% Na_2 citrate (100 c.c.) and 15% glucose (20 c.c.) have a longer survival period *in vivo* than when a mixture of Na_3 citrate and glucose is used; the mixture can be autoclaved without production of caramel. I. C.

Isolation from hog gastric mucin of polysaccharide–amino-acid complex with blood group *A* specificity.—See A., 1944, III, 226.

Despeciated bovine serum: a substitute for human plasma. F. R. Edwards (*Brit. Med. J.*, 1944, I, 73—76).—Despiciated bovine serum (D.B.S.) is prepared by destroying the antibodies by heating at 72°, while rendering the proteins incoagulable by the addition of 0·2% formalin and NH_3. The osmotic pressure of D.B.S. is 120—160 mm. H_2O (human serum 292 mm.; filtered human plasma 151); it can be stored for several months safely. In 26 clinical tests D.B.S. was safely administered rapidly and in large amounts (400—2400 c.c.). I. C.

Acquired hæmolytic anæmia. V. R. Mason (*Arch. intern. Med.*, 1943, **72**, 471—493).—A review of 12 cases. C. J. C. B.

Treatment of anæmia in school-children with iron and ascorbic acid. L. S. P. Davidson and G. M. M. Donaldson (*Brit. Med. J.*, 1944, I, 76—77).—A supplement of Fe (3 g. of $FeSO_4$ once daily for 5 days a week) raises the hæmoglobin levels of municipal-school children. The hypochromic anæmia of these children is due therefore mainly to Fe insufficiency in the diet. A supplement of 25 mg. of ascorbic acid daily had no effect in raising the hæmoglobin levels. I. C.

Effect of myxœdema on hæmopoiesis in leukæmia and related disorders. J. T. Paul, L. R. Limarzi, and L. Seed (*Amer. J. med. Sci.*, 1943, **206**, 625—630).—Erythropoiesis is depressed in polycythæmia vera after total thyroidectomy and development of myxœdema. The anæmia is macrocytic and hyperchromic in type; leukopoiesis is unaffected. In erythroleukæmia, myxœdema induced a moderate to marked depression in erythropoiesis; the anæmia is macrocytic or microcytic in type; there is stimulation of leukopoiesis. In 1 case, after thyroidectomy there was early a "megakaryocytic crisis" followed later by normal platelet counts. Hæmopoiesis in chronic lymphatic and chronic myeloid leukæmia is not altered by an induced myxœdema. C. J. C. B.

Case of myxœdema with macrocytic anæmia treated successfully with thyroid and testosterone. S. J. Glass (*J. clin. Endocrinol.*, 1943, **3**, 421—425).—A case is reported. The associated hyperchromic macrocytic anæmia had not responded to thyroid + liver extract + Fe treatment. P. C. W.

Cold hæmagglutination with symmetric gangrene of tips of extremities. D. State and J. G. M. Bullowa (*Arch. intern. Med.*, 1943, **72**, 506—517).—In the case reported unilateral hæmoglobinæmia following exposure of a forearm to cold, and hæmagglutination in the capillaries of the conjunctiva due to cold, were demonstrated. C. J. C. B.

Practical significance of red cell sedimentation rate in upper respiratory tract infections. G. Becker (*Schweiz. med. Wschr.*, 1943, **73**, 389—390).—A review. A. S.

Leucocytes in aged male and female. B. Newman and S. Gitlow (*Amer. J. med. Sci.*, 1943, **206**, 622—625).—Normal adult vals. are found; old women have a lower total white cell count than old men. C. J. C. B.

Sulphapyridine in malignant leukopenia.—See A., 1944, III, 204.

Plasma-prothrombin of mothers and infants at delivery. R. P. Norris and M. C. Bennett (*Surg. Gynec. Obstet.*, 1941, **72**, 758—763).—The average plasma-prothrombin val. (Quick method) was higher than normal in 85 women at delivery and lower than normal in their infants. The plasma-prothrombin was higher in the umbilical vein than in the artery in 70% of 35 cases, suggesting prothrombin formation in the placenta. P. C. W.

Plasma-proteins and red cell volume following single severe non-fatal hæmorrhage. R. Elman, C. E. Lischer, and H. W. Davey (*Amer. J. Physiol.*, 1943, **138**, 569—576).—Hæmodilution occurred in 45 non-anæsthetised dogs following severe non-fatal hæmorrhage with or without replacement with Ringer's solution or red cell suspensions; the effect was most marked in the first hr. but continued for 72 hr. The fall in plasma-proteins was greatest 1 hr. after the hæmorrhage; the correction of the low-albumin fraction begins within 6 hr., but is still incomplete after 7 days. The globulin fraction continues to fall at 7 hr., but returns to its initial concn. between 24 and 72 hr. A. S.

Reversibility of plasma-amino-acid retention during recovery from dietary hypoproteinæmia in the dog.—See A., 1944, III, 197.

Results of splenectomy in Gaucher's disease. V. W. Logan (*Surg. Gynec. Obstet.*, 1941, **72**, 807—814).—Review of the literature with description of 1 case 7 years after operation. P. C. W.

Hæmoptysis and hæmaturia in sprue; importance of vitamin-*K* metabolism. E. N. Collins and A. D. Hoffmann (*Cleveland Clin. Quart.*, 1943, **10**, 105—111).—There was marked hypoprothrombinæmia in the cases of sprue. Blood transfusion and repeated intravenous injections of Na 2-methyl-1 : 4-naphthaquinol-3-sulphonate stopped the bleeding and restored the prothrombin time of the blood to normal. A. S.

Onyalai [thrombocytopenic purpura]. M. Gelfand (*Clin. Proc.*, 1943, **2**, 281—286).—Description and discussion of the disease—a form of thrombocytopenia chiefly but not entirely confined to S. African natives. P. C. W.

Onyalai and acute thrombocytopenic purpura. H. B. Stein and E. Miller (*Clin. Proc.*, 1943, **2**, 347—354).—The relation between the two complaints is reviewed and a case described in which the hæmorrhagic bullæ of onyalai occurred 4 months after the purpuric manifestations of acute thrombocytopenia. P. C. W.

Effect of sulphonamides on blood platelets. Thrombocytopenic purpura following sulphathiazole and sulphadiazine. Agranulocytosis following succinylsulphathiazole.—See A., 1944, III, 208.

Chronic hypergalactosæmia. F. A. Norman and G. J. Fashena (*Amer. J. Dis. Child.*, 1934, **66**, 531—538).—A 3rd case of chronic hypergalactosæmia associated with galactosuria, albuminuria, nutritional disturbance, hepatosplenomegaly, anæmia, mild azotæmia, and osteoporosis is described. Removal of milk from the diet resulted in the disappearance of all symptoms except the mild azotæmia. It is suggested that the essential disturbance resides in the sp. enzyme system concerned with the conversion of galactose into glycogen and this constitutes an inborn error in metabolism. C. J. C. B.

Independence of serum-cholesterol from exogenous cholesterol in infants and in children. W. Heymann and G. Back (*Amer. J. Dis. Child.*, 1943, **65**, 235—246).—Administration of a single dose (or daily doses for 2—3 weeks) of cholesterol dissolved in oil or suspended in eggnog, with or without bile, to 2 infants, 8 children, and

2 adults in amounts of 0·07—0·67 g. per kg. body wt. produced no increase in serum-total cholesterol or -cholesterol esters. A diet devoid of cholesterol of animal origin was fed to 5 children for 10 weeks with no decrease in serum-cholesterol. C. J. C. B.

Effect of formaldehyde on denaturation of serum by alkali. O. Suolahti and T. Laine (*Biochem. Z.*, 1941, **308**, 216—224).—When 50 c.c. of horse serum are treated with 0·45 g. of NaOH in 20 c.c. of water there is an increase in η. If 5 c.c. of aq. formaldehyde containing 0·21 c.c. of 35% formalin is added 5 min. before the alkali there is practically no increase in η; when added immediately after the alkali the increase in η is unaffected, whilst if added 10 min. after the alkali, there is a very large increase. 45 min. after addition of alkali, without formalin, to the serum, polarographic determination indicates 50% increase in peptide linkings and 150% in cystine linkings. When formalin is added before the alkali the increase due to cystine is not observed and it does not occur after subsequent addition of alkali, but if the alkali is added before the formalin the step in the polarogram due to cystine is quite distinct and it does not disappear when formalin is added afterwards. Diffusion tests through sintered glass show that with the serum alone 4·18% of N diffuses per hr., and only 3·22% of N diffuses after addition of alkali. When formalin is added before the alkali, diffusion after 45 min. is 3·98% of N, whilst only 1·5% of N diffuses if the formalin is added 10 min. after the alkali. It is suggested that reactive S·S linkings on the surface of the spherical native protein mol. are broken by the alkali, thus lengthening the mol. with consequent increase in η and decrease in rate of diffusion. Aggregation probably occurs as well. The subsequent decrease in η in presence of alkali is due to decomp. of the protein mol. Formalin has a double effect on the mol.: (*a*) it reacts with the S·S linking or modifies it so that it is not attacked by alkali and hence there is no increase in η; (*b*) it considerably increases the aggregation caused by alkali, which explains the very great increase in η when formalin is added shortly after the alkali. J. N. A.

Serological factors as possible causes in spontaneous abortions. P. Levine (*J. Heredity*, 1943, **34**, 71—80). L. G. G. W.

Regulation of level of blood-vitamin-*A* of newborn infants. J. M. Lewis, O. Bodansky, and L. M. Shapiro (*Amer. J. Dis. Child.*, 1943, **66**, 503—510).—The concn. of vitamin-*A* in the blood in 106 infants throughout the newborn period falls sharply during the first 48 hr. of life and rises to normal on the 4th day. A low blood-*A* early in the newborn period brings about no pathologic disorders. C. J. C. B.

VI.—VASCULAR SYSTEM.

Phosphate exchange in resting cardiac muscle as indicated by radioactive studies.—See A., 1944, III, 203.

Sympathetic and vagal interaction in emotional responses of heart rate. D. D. Bond (*Amer. J. Physiol.*, 1943, **138**, 468—478).—Sudden unexpected noise raises the heart rate in non-anæsthetised cats and dogs, followed by a fall, a second rise of variable height, and several undulations in rate lasting 2—3 min. Naturally secreted adrenaline becomes effective after 12 sec., more so in cats than in dogs. Pure accelerator changes were seen in dogs after cutting the vagi and depressor nerves and eliminating adrenaline. Vagal tone was promptly inhibited in dogs and cats after exclusion of adrenaline and the sympathetic cardio-accelerators; the acceleration in cats was greater than could be accounted for by loss of vagal tone alone. There was a complex effect of respiration on cardiac rhythm; apnœa may increase or diminish the rate. A. S.

Heart of *Venus* as test object for acetylcholine. R. B. Wait (*Biol. Bull.*, 1943, **85**, 79—85).—The isolated, non-eserinised ventricle of the clam *Venus mercenaria*, perfused with sea-water, can be used as a test object for acetylcholine. The curve relating drug concn. to decrease in amplitude is a hyperbola. The heart is 100 times as responsive at 5—10° as at 25—30°; this is probably due to the greater activity of the choline-esterase in the heart at the higher temp. G. P. W.

Cardiac action of posterior pituitary extract in physiological doses, in normal dog, and after partial and complete denervation of heart.—See A., 1944, III, 188.

Clinical application of phonocardiography. A. A. Luisada (*Arch. Pediat.*, 1943, **80**, 498—510).—A review. C. J. C. B.

Treatment of coronary artery disease. F. A. Le Fevre (*Cleveland Clin. Quart.*, 1943, **10**, 126—132).—A lecture. A. S.

Dupuytren's contracture as sequel to coronary artery disease and myocardial infarction. K. C. Kehl (*Ann. int. Med.*, 1943, **19**, 213—223).—6 patients developed Dupuytren's contracture following coronary occlusion. The contracture may be associated with the syndrome of shoulder disability and painful hands following myocardial infarction. There was pain, stiffness, swelling, livid discoloration, numbness, tingling, and abnormal skin temp. of the hand. A. S.

Cardiovascular syphilis; early clinical recognition and treatment. M. Dressler and M. Silverman (*Ann. int. Med.*, 1943, **19**, 224—240).—24% of 1270 cases of syphilis were diagnosed as uncomplicated aortitis and 30·7% as cardiovascular syphilis; of the latter group 78% were cases of uncomplicated aortitis. The ratios of males to females and of whites to negroes were 2 : 1. The aortic 2nd sound is characteristic, usually of tambour, drum-like, tympanitic, or hollow quality. Hypertension was found in 47·4% of all cases with cardiovascular syphilis. Of 128 cases of cardiovascular syphilis who remembered the infection, uncomplicated aortitis was found in 38 cases within 10 years after the infection. Neurosyphilis was found in 26·6% of the patients with cardiovascular syphilis. A. S.

Incidence of acute and subacute bacterial endocarditis in rheumatic heart disease. R. Gelfman (*Ann. int. Med.*, 1943, **19**, 253—255). A. S.

Combined electrocardiography, stethography, and cardioscopy in early diagnosis of heart disease. W. M. Bartlett and J. B. Carter (*Ann. int. Med.*, 1943, **19**, 271—285).—Chest lead abnormalities were found in 29% of 1108 patients with heart disease; these abnormalities were found in 20% of cases between the ages of 31 and 41 and 47% between 61 and 87. In 88% of all cases clinical findings coincided with graphic records. In 12% the stethogram was essential for the diagnosis of gallop rhythm, of early initial stenosis, or of early aortic disease. 42% of 102 cases of gallop rhythm were misjudged clinically so far as timing of the extra sound was concerned. Serial stethograms are recommended, like serial e.c.g., to follow the course of heart disease. A. S.

Cardiac aneurysm; report of case with correlation of clinical, radiological, and electrocardiographic findings. D. Rowland (*Ann. int. Med.*, 1943, **19**, 349—356). A. S.

Traumatic heart disease; 250 cases of non-penetrating chest injuries and their relation to cardiac disability. H. Arenberg (*Ann. int. Med.*, 1943, **19**, 326—346).—The histories of 28 cases are reported; nearly all cases of cardiac trauma following non-penetrating chest trauma occurred at the age when coronary disease and hypertension are most common. The severity of the trauma and the chances of cardiac damage do not necessarily correspond. The greatest degree of cardiac damage was found in patients who had not suffered fractures of ribs. A. S.

Jugular pressure of anæsthetised dogs during inflation of lungs before and after pneumonectomy. G. H. Humphreys, R. L. Moore, and H. Barkley (*Surgery*, 1941, **10**, 21—26).—The jugular venous pressure of 5 dogs, anæsthetised with Na barbital, markedly increased when the intratracheal pressure was raised above atm. with both thoracic cavities open. After resection of the right lung, the increase in the venous pressure was very small when the left lung was inflated, and negligible if at the same time the displacement of the heart to the right was prevented. G. P.

Rôle of pressoreceptors in regulation of blood pressure in rabbits. T. H. Simister and R. E. Conklin (*Amer. J. Physiol.*, 1943, **138**, 391—395).—There was a compensatory rise in arterial blood pressure when rabbits under urethane anæsthesia were tilted at angles to the horizontal of 60° and 75°, even when both vagi, aortic nerves, and splanchnics were cut, and the common carotid arteries occluded. Some other reflexogenic zone is suspected. A. S.

Capillary permeability to intravenously administered gelatin. J. M. Little and H. S. Wells (*Amer. J. Physiol.*, 1943, **138**, 495—498).—Dogs under nembutal anæsthesia were bled 3—4% of their body wt. and transfused with cells suspended in a saline-gelatin solution. Intestinal capillaries, mechanically injured to allow the partial or complete passage of plasma-proteins through their walls, permitted the passage of 35—60% of plasma-gelatin. A. S.

Cytolytic effect of saponin on walls of vessels. E. Ponder and C. Hyman (*Amer. J. Physiol.*, 1943, **138**, 432—438).—Perfusion of frog's muscle with Ringer's solution containing saponin or bile salts increases the rate of œdema formation; hæmoglobin does not leave the vascular stsyem when the muscle is perfused with a hæmoglobin–Ringer's solution, but it appears in the extra-vascular spaces if saponin or bile salts are added to the perfusion fluid. The lysins are gradually taken up by the walls of the vessels and by other tissue cells. The kinetics of this cytolytic process are similar to those of hæmolysis. A. S.

Localised subcutaneous œdema with weakness of limb muscles: syndrome due to polyarteritis nodosa. R. MacKeith (*Brit. Med. J.*, 1944, I, 139—142).—Three cases with localised soft œdema of the subcutaneous tissues of the limbs with asymmetrical muscular weakness are described. The diagnosis of polyarteritis nodosa was confirmed by biopsy. A large increase of plasma-albumin was found in two cases. One patient recovered completely, one recovered with residual contractures of the hands and weakness of the legs, and one died. I. C.

Fat embolism: clinical and experimental study. C. S. Scuderi (*Surg. Gynec. Obstet.*, 1941, **72**, 732—746).—Blood-fat determinations are of no diagnostic val.; qual. dark field examination of the

blood is useful. In dogs injected with olive oil intravenously changes could be detected radiographically in the lungs. Dilutions of oil in water of 1 : 1600 may be detected by a characteristic popping noise when a drop of the emulsion in a Pt loop is heated in the Bunsen flame; this forms a useful test for fat in urine. The conditions necessary for successful staining of blood droplets in urine and blood with Sudan III are detailed. Gardinol and decholin Na (emulsifying agents) did not protect dogs against the lethal effects of olive oil injections. Fat injected intravenously in dogs is excreted by the renal tubules if the concn. is above 0·75 ml. per kg. body wt. Serum surface tension is too variable to help in the diagnosis of fat embolism. All the bone marrow fat from one femur when injected intravenously does not kill a dog; oleic acid is 7 times more lethal and may be the cause of fat embolism. By intravenous injections of increasing amounts of fat the tolerance of dogs may be increased. P. C. W.

Localised arterial thrombosis of indeterminate origin. J. R. Learmonth, W. Blackwood, and R. L. Richards (*Edinb. Med. J.*, 1944, **51**, 1—20).—4 cases are described in the main arteries of the limbs in males aged 25, 38, 30, and 35. In 2 cases histological findings suggested trauma as the causal factor. In a third case there was a clinical history of injury but its site did not correspond to the affected segment of artery. Diagnosis rests on local manifestations of ischæmia, examination of the peripheral pulses, tests of responses to reflex vasodilatation, and arteriography. Treatment was by preganglionic sympathectomy and/or arteriectomy, but it was felt that a conservative attitude towards the latter was justified. (30 figs.) H. S.

Vascular diseases. T. R. van Dellen, G. de Takats, and G. W. Scupham (*Arch. intern. Med.*, 1943, **72**, 518—561).—A crit. review. C. J. C. B.

Syndrome of rupture of aortic aneurysm into pulmonary artery; review of literature with report of two cases. R. E. Nicholson (*Ann. int. Med.*, 1943, **19**, 286—325).—One patient of 39 years survived the rupture of an aortic aneurysm into the pulmonary artery for 5 months, the other patient (40 years) for 6 days. A. S.

Mesenteric thrombosis. F. L. Shively, jun., and R. J. F. Renshaw (*Cleveland Clin. Quart.*, 1943, **10**, 133—137).—A case is reported. A. S.

Disseminated necrotising vascularitis—toxic origin of periarteritis nodosa. M. M. McCall and J. W. Pennock (*Amer. J. med. Sci.*, 1943, **206**, 652—659).—Report of 10 cases. C. J. C. B.

Periarteritis nodosa diagnosed clinically. C. Murphy (*Brit. Med. J.*, 1944, I, 150—151).—Case report. I. C.

Effect of plaster bandages and local cooling on hæmoconcentration and mortality rate in burns. E. A. Sellers and J. W. Willard (*Canad. Med. Assoc. J.*, 1943, **49**, 461—464).—In burnt dogs, the mortality and hæmoconcn. after early application of plaster were decreased markedly. Cooling the extremities also reduced the mortality rate and hæmoconcn. C. J. C. B.

Effect of replacement therapy in experimental shock. J. E. Dunphy and J. G. Gibson, 2nd (*Surgery*, 1941, **10**, 108—118). G. P.

Hæmoconcentration and shock following severe hæmorrhage. R. E. Weston, M. Janota, S. O. Levinson, and H. Necheles (*Amer. J. Physiol.*, 1943, **138**, 450—457).—Shock, as characterised by a persistent fall in the blood pressure to less than 70 mm. Hg, a progressive increase in circulating time to 20 sec. or more, and a decrease in the arterial CO_2 content to less than 26 c.c. per 100 c.c., was produced in 11 non-dehydrated and in 15 dehydrated non-anæsthetised normal dogs by controlled hæmorrhage. Hæmoconcn. occurred in 2 of the 1st and in 8 of the 2nd group of animals. Plasma-vol. and -protein determinations showed that the animals with hæmoconcn. lost additional plasma-fluid and -protein as shock developed; the main postmortem changes were gastro-intestinal engorgement and hæmorrhage, pulmonary congestion, and marked engorgement of the liver and of the zona fasciculata of the adrenal cortex. The animals with hæmodilution (non-dehydrated) withstood an average withdrawal of nearly 50% of their blood vol., whereas both groups of dehydrated dogs tolerated only an average of 43% of their average initial blood vol. The changes in plasma-protein concn. indicate that the hæmoconcentrating dehydrated dogs hæmodiluted during and after hæmorrhage less than the other 3 groups. There are no grounds for distinguishing between hæmorrhagic shock and shock from other causes. A. S.

Experimental shock with particular reference to plasma-potassium changes. J. F. Manery and D. Y. Solandt (*Amer. J. Physiol.*, 1943, **138**, 499—511).—Dogs subjected to mild trauma of the muscles under ether anæsthesia died after 3—17 hr. in secondary shock, showing considerable swelling in the traumatised area, slight decrease or no change in the red cell concn., and little alteration in the Cl or water content of jugular vein plasma. The plasma-K concn. in the control period varied from 12·2 to 20·0 mg. per 100 c.c. (average in 44 experiments 15·9 ± 1·7 mg.); there was a small but significant rise some time before death and a 100—200% increase just prior to or at death. The K content of the traumatised muscle was diminished. Local fluid loss was the major factor in causing death. A. S.

Reactions of aorta in hæmorrhagic hypotension and shock. C. J. Wiggers, R. Wegria, and N. D. Nickerson (*Amer. J. Physiol.*, 1943, **138**, 491—494).—Aortagraph, circumferometer, and pulse conduction rate determinations in dogs under conditions of hæmorrhagic shock provide no evidence for capacity changes in the aorta being responsible for the initiation of shock. A. S.

Heat in treatment of shock. A. W. Kay (*Brit. Med. J.*, 1944, I, 40—41).—15 young normal males were exposed for 1 hr. to the hot-air cradle. Intravenous saline (200—1200 c.c.) was administered to 10 subjects and intravenous plasma (250—700 c.c.) to 5. In all cases a progressive rise in pulse rate and venous pressure, together with a fall in arterial blood pressure, was observed. Other symptoms were nausea, vomiting, dehydration, headache, perspiration, muscular pain, and exhaustion. These results contraindicate the usual therapeutic procedure in traumatic shock. I. C.

Experimental atherosclerosis in chick. D. V. Dauber and L. N. Karz (*Arch. Path.*, 1943, **36**, 473—492).—43 3-month-old cockerels were divided into 4 groups. 1 group received a liberal diet, a second group the same diet + cottonseed oil, the 3rd group was given restricted feeding, and the 4th group 2% cholesterol in cottonseed oil, added to the basic mash. All the cholesterol-fed chicks developed atherosclerosis of the thoracic and the abdominal aorta and of the major branches. The lesions showed accumulation of lipin-containing foam cells, fibrosis, deposition of cholesterol crystals, calcification, and cartilage formation. (21 photomicrographs.) C. J. C. B.

Hypertension and unilateral renal disease. B. S. Abeshouse (*Surgery*, 1941, **10**, 147—200).—A review of the literature. 16 cases are reported of unilateral kidney disease (chronic pyelonephritis with or without calculi, pyonephrosis, hypernephroma) associated with hypertension; they were treated by nephrectomy. An analysis is given of 167 cases of consecutive nephrectomies in a 10-year period at the Mt. Sinai Hospital; high blood pressure (over 145 mm. Hg systolic) occurred in 29 of these. G. P.

Effects of large doses of a vitamin-*A* concentrate in normal and hypertensive patients. R. D. Taylor, A. C. Corcoran, J. C. Shrader, W. C. Young, and I. H. Page (*Amer. J. med. Sci.*, 1943, **206**, 659—667). —Vitamin-*A* concentrate is useless in the treatment of essential hypertension in doses of 100,000—400,000 units daily for 5—90 days. The concentrate causes renal vasodilatation, increased capacity for secretion of diodrast, and increased cardiac output. C. J. C. B.

Medical use of thiocyanates in treatment of arterial hypertension. R. E. Forster (*Amer. J. med. Sci.*, 1943, **206**, 668—675).—A crit. review. C. J. C. B.

VII.—RESPIRATION AND BLOOD GASES.

"Bohr effect" [change in oxygen affinity] in fish blood. R. W. Root and L. Irving (*Biol. Bull.*, 1943, **84**, 207—212).—The O_2 affinity of the blood of *Tautoga onitis* is depressed by CO_2 or by lactic acid. The effect is due to the pH change, not to the sp. acid employed. Hæmolysed blood and whole blood behave similarly except that a greater pH change must be used to produce a given reduction of O_2 affinity in the case of hæmolysed blood. G. P. W.

Physics of sound with particular relation to general examination of patient. E. M. Chapman and A. Goldstein (*J. Lab. clin. Med.*, 1943, **28**, 1535—1541).—A general discussion. C. J. C. B.

Respiration of sea cucumber, *Thyone briaereus*, as influenced by hydrogen-ion concentration and oxygen tension. W. A. Hiestand (*Proc. Indiana Acad. Sci.*, 1941 [1942], **51**, 262).—A decrease in the O_2 tension of the water to ½ of its normal val. does not affect the respiration rate of *T. briaereus*. Over the pH range 5·4—8·8, pH and O_2 consumption are inversely related. L. G. G. W.

Reflexes from limbs as factor in hyperpnœa of muscular exercise. J. H. Comroe, jun., and C. F. Schmidt (*Amer. J. Physiol.*, 1943, **138**, 536—547).—Ischæmia of the forearm in man did not cause hyperpnœa, while exercise increased the ventilation vol. per min.; a further increase was noted during exercise under ischæmic conditions; this ischæmic potentiation is due to pain. Exercise of the hind limbs in dogs and cats, produced by stimulation of the cut ventral roots, caused hyperpnœa which, in the dog, was not further increased by ischæmia, but was abolished by transection of the spinal cord; in the cat, it was reduced or abolished by ischæmia and was not affected by transection of the spinal cord. The hyperpnœa therefore was mainly due to reflexes in man and in dogs and to central stimulation by muscle metabolites in the cat. There is no evidence of a sp. chemosensitive reflex system in the limbs. The blood pressure responses to exercise in man were insignificant. Passive movements of the limbs produced reflex hyperpnœa (most markedly in man and least markedly in the cat); the hyperpnœa

was abolished by denervation of the limb or spinal cord transection in dogs and cats and diminished during spinal anæsthesia in man. The reflex arises in or around the knee joint, not in the muscles or tendons. These reflexes account, in part, for the hyperpnœa in the course of muscular exercise. A. S.

Should the pleural space [thoracic cavity] be reduced in size after resection of lung tissue? R. A. Rasmussen, W. E. Adams, and L. S. Hrdina (*Surgery*, 1941, **10**, 85—107).—Bilateral resection of 60% of the total lung vol. within 3 weeks was well tolerated by normal dogs. Even after a further reduction to 15% of the original lung vol. the dogs tolerated moderate exercise and reduction of atm. pressure to 272 mm. Hg. Reduction of the thoracic cavity after lobectomy was achieved by crushing or by resection of the phrenic nerves on both sides; both treatments were well tolerated and the compensatory distension of the remaining lung was of the same degree with both methods. However, with crushing the distension was uniform and with resection there was a tendency to formation of bullæ at the periphery of the lung. The temporary paralysis after crushing the phrenics, which lasts for 2—3 months, is the method of choice in man. G. P.

Use of prolonged [local] anæsthetic agents in upper abdominal incisions [effect on vital capacity]. E. Zollinger (*Surgery*, 1941, **10**, 27—36).—When the 6—11th intercostal nerves were blocked with 1·5—5 ml. of a eucupin solution in oil (eucupin 0·005 g., ethyl aminobenzoate 0·15 g., and benzyl alcohol 0·25 g. in 5 ml. of sweet almond oil) at the time of upper abdominal operations, the post-operative decrease in the vital capacity of the lungs was less marked than without this anæsthesia. Infiltration of the abdominal wound alone with eucupin–procaine had no effect on vital capacity. G. P.

Effect of sympathomimetic amines on output of respiratory tract fluid in rabbits. E. M. Boyd, S. Jackson, and A. Ronan (*Amer. J. Physiol.*, 1943, **138**, 565—568).—Stimulation of the cervical sympathetic or subcutaneous injection of adrenaline, ephedrine, neosynephrine, amphetamine, and privine (2-naphthyl-1-methyl-iminazoline hydrochloride) had no effect on the amount of respiratory tract fluid drained from the trachea of rabbits under urethane anæsthesia. A. S.

Bronchiolar lymphoid hyperplasia as cause of emphysema. W. W. Brandes, R. A. Cook, and M. P. Osborne (*Arch. Path.*, 1943, **36**, 465—472).—Report of a case. (5 photomicrographs.) C. J. C. B.

VIII.—MUSCLE.

Mechanochemistry of muscle. V. A. Engelhardt and M. N. Liubimova (*Biochimia*, 1942, **7**, 205—231).—The pH curve of the adenosinetriphosphatase activity of myosin exhibits an optimum at pH 9·0 and another less pronounced at pH 6·2, probably caused by the dependence of the rate of reaction on the ionisation of adenosinetriphosphatase and myosin. $Ca^{..}$ has a strong activating action, the effect of $Ba^{..}$ is slight, and $Mg^{..}$ and $Ag^{.}$ are strong inhibitors. F inhibits only in presence of $Ca^{..}$, probably by removal of $Ca^{..}$; phloridzin inhibits slightly at high concn. in acid solution. Iodoacetate inhibits by more than 30%, CN' is without effect, urea in concn. of 18% completely destroys the activity and decreases the solubility. No indication of any lack of homogeneity in myosin preps. is observed and the activity per unit of sol. protein remains const. The extensibility of myosin threads is reversibly increased by adenosine triphosphate. This effect is also given by substances such as inorg. P_2O_7'''', PO_3', cocarboxylase, cozymase, and adenosinediphosphoric acid. The effect is probably due to transfer of PO_4''' to myosin together with formation of a myosin–adenosine triphosphate complex. A marked parallelism is observed between the enzymic properties and "mechanochemical" reactivity of myosin. H. G. R.

Effect of encircling conducting band on action currents of striated muscle. B. Kisch and M. M. Schwarzschild (*Amer. J. Physiol.*, 1943, **138**, 412—414).—The effects on action potentials of isolated turtle muscle of placing on the muscle a band of conducting material between the stimulating and recording electrodes are described. The method can be applied to measure the velocity of impulse conduction. Action potentials were obtained which closely resemble the *R–T* waves of the e.c.g. A. S.

Glycogen and insect flight. C. M. Williams, L. A. Barness, and W. H. Sawyer (*Biol. Bull.*, 1943, **84**, 263—273).—The glycogen content of *Drosophila funebris* and *Lucilia sericata* steadily decreases during flight. Exhaustion is due to depletion of the glycogen, not to accumulation of lactic acid. In *Drosophila*, the glycogen content and the flight ability (*i.e.*, the total no. of wing-beats in continuous flights to exhaustion) increase during the first week of adult life, and decrease, rapidly at first and then more slowly, after the second. G. P. W.

Creatinuria caused by poisoning with tri-*o*-cresyl phosphate and effect of vitamin-*E*.—See A., 1944, III, 213.

Bromidism after prostigmine bromide for myasthenia gravis.—See A., 1944, III, 214.

Crystalline muscle phosphorylase.—See A., 1944, III, 217.

IX.—NERVOUS SYSTEM.

Removal of acetylcholine by choline-esterase injections and effect thereof on nerve impulse transmission. B. Mendel and R. D. Hawkins (*J. Neurophysiol.*, 1943, **6**, 431—438).—By measuring pupil diameters in rats under const. experimental conditions, it has been shown that the direct light reflex is partly or totally abolished by the injection of choline-esterase preps., indicating that the reflex depends on the presence of acetylcholine at some point or points in the pathway of the nerve impulse. S. Cr.

Influence of interelectrodal distance in electrical stimulation of nerve and of striated and ventricular muscle. A. Rosenblueth and G. H. Acheson (*Amer. J. Physiol.*, 1943, **138**, 583—586).—With short distances between the stimulating electrodes the threshold of the *C* fibres of the cat's saphenous nerve rises, but not as markedly as that of the *A* fibres. The threshold of cat's and frog's sartorius muscle and of turtle's ventricular muscle to electrical stimuli is independent of the interelectrodal distance; that of striated muscle is also independent of the angle between the stimulating current and the muscle fibres. A. S.

Re-innervation of muscle after various periods of atrophy. E. Gutmann and J. Z. Young (*J. Anat., Lond.*, 1944, **78**, 15—43).—Details are given of the structure of normal motor end-plates in rabbits. After the interruption of a nerve the no. of nuclei within the sarcoplasm of the end plate remains the same but the fibrocytes without increase in no. A year after denervation the end-plate may remain intact although the muscle fibre has undergone shrinkage. When a nerve has been crushed close to the muscle one nerve fibre returns to each end-plate. When the crushing has been made at some distance from the muscle some end-plates are not re-innervated but new plates are formed where the nerve fibres contact the sarcoplasm. There is a delay of 11 days between the return of the fibre to the muscle and the onset of reflex activity, when the nerve is crushed close to the muscle. After long periods of denervation this delay is increased. When muscles have been denervated for increasing periods of time, the proportion of old end-plates which become re-innervated is reduced. W. J. H.

Threshold of sensitivity to currents of some Black Sea fishes. I. I. Stas (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 751—752).—Various species of fish were exposed to water currents of various velocity in an apparatus. Their reactions and reaction times varied considerably. The most sensitive fish were anadroms (*Trachurus trachurus, Smaris chryselis*); the least were *Scualus ocanthias* and *Crenilabrus tinca* which drifted with the current without resistance. C. J. C. B.

Influence of motor denervation on activity of proprioceptors of skeletal muscle of frog. S. P. Narikaschvili and G. V. Gerschuni (*Compt. rend. Acad. Sci. U.R.S.S.*, 1942, **36**, 243—246).—Motor denervation of skeletal muscle (10—25 days after the anterior roots have been cut) is accompanied by a considerable increase in the frequency of proprioceptive discharges, the val. of the extending load remaining const. This may be due to a direct change in the intrafusal fibres, or to redistribution of the mechanical forces among various groups of fibres within the muscle. F. S.

Present status of neurone theory. J. F. Nonidez (*Biol. Rev.*, 1944, **19**, 30—40).—A review. J. D. B.

Nerve tumours of female genitals and pelvis. R. Meyer (*Arch. Path.*, 1943, **36**, 437—464).—A general review. (26 photomicrographs.) C. J. C. B.

Late effects of lead poisoning on mental development. R. K. Byers and E. E. Lord (*Amer. J. Dis. Child.*, 1943, **66**, 471—494).—20 school children who had been hospitalised in infancy or early childhood because of Pb poisoning were followed up. None of them had definite encephalopathy during their primary admission, and all were adjudged to have made a complete recovery from Pb poisoning when discharged from hospital. Failure of the normal processes of growth and development of the cortex prevented all but 1 of the 20 children from progressing satisfactorily in school. C. J. C. B.

Importance of sensory perception for relationship of individual and environment. M. Monnier (*Schweiz. med. Wschr.*, 1943, **73**, 351—353).—A lecture. A. S.

Anatomical basis of cortico-striate connexions. P. Glees (*J. Anat., Lond.*, 1944, **78**, 47—51).—Experiments were carried out on cats and rabbits in order to determine the paths of connexion between the caudate nucleus and the cortex. It was found that the areas of suppression, 2S, 3S, and 8S, in the cat brain are connected with the caudate nucleus by non-myelinated cortico-caudate fibres which arise as collaterals from the cortico-fugal system. The fibres entering the caudate nucleus end as pericellular plexuses around the cells of that nucleus. W. J. H.

Treatment of cerebral abscesses. R. V. López (*Schweiz. med. Wschr.*, 1943, **73**, 380—382).—The results of treatment of cerebral abscesses with the method of Sandy or by open drainage are reviewed. 26 out of 36 post-traumatic abscesses treated with the latter method were cured; 10 patients died. A. S.

Present status of contrast myelography. H. M. Weber (*Amer. J. med. Sci.*, 1943, **206**, 687—694).—A crit. review. C. J. C. B.

Epilepsy. H. R. Litchfield (*Arch. Pediat.*, 1943, **60**, 426—437).—A clinical and therapeutic review. C. J. C. B.

Gunshot wounds of head in acute stage. H. Cairns (*Brit. Med. J.*, 1944, I, 33—37).—Three neurosurgical units in the Middle East and North Africa treated 459 non-penetrating head injuries with 3 deaths and 506 penetrating brain injuries with 83 deaths. In penetrating head wounds, when the debridement was incomplete, about 25% of the survivors subsequently developed brain abscess; of 36 head wounds 3—12 days old all but one were found to contain bacteria, especially *Staph. aureus*. The infection develops in the superficial layers and spreads then to deeper layers. Penicillin was tried in a few cases with encouraging results. I. C.

Prisoner-of-war mentality. P. H. Newman (*Brit. Med. J.*, 1944, I, 8—10).—The phases through which the mental attitude of the prisoner-of-war is formed are described and the mental reactions which follow release analysed. Cases with excessive mental reactions and undue persistence of symptoms may need assistance; a scheme for aiding such cases is outlined. I. C.

Nature of concussion. G. Jefferson (*Brit. Med. J.*, 1944, I, 1–5).—A review with reports of three cases. I. C.

Hyperkinetic diseases. E. Moschcowitz (*Amer. J. med. Sci.*, 1943, **206**, 576—599).—A review. C. J. C. B.

Response of nervous apparatus [Auerbach's plexus] of sheep to *Trichocephalus* invasion. V. G. Evranova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **33**, 502—503).—In the appendices of sheep that were heavily infected with *T. ovis* or *T. skrjabini* there were changes in the ganglia of Auerbach's plexus. The first change was vacuolation of the cytoplasm proceeding to displacement of the nucleus and disintegration of the cytoplasm. F. S.

Vitamin-*E* in neurology.—See A., 1944, III, 202.

X.—SENSE ORGANS.

Grafted eyes of young and old adult salamanders (*Amblystoma punctatum*) showing return of vision. L. S. Stone and C. H. Cole (*Yale J. Biol. Med.*, 1943, **15**, 735—754).

Congenital bilateral anophthalmos. R. Hare (*Arch. Ophthal.*, 1943, **30**, 320—330).—Description of two cases of bilateral anophthalmos, one of which was otherwise physically and mentally normal, the other retarded. The psychological benefit of fitting prostheses is emphasised, both for the child and its parents; if the sockets are too shallow to accommodate these, a preliminary plastic operation is advocated. J. H. A.

Water and fat content of orbital tissues of guinea-pigs with experimental exophthalmos produced by extracts of anterior pituitary gland. G. K. Smelser (*Amer. J. Physiol.*, 1944, **140**, 308—315).—Experimental exophthalmia was produced by injecting anterior pituitary extracts into thyroidectomised guinea-pigs. The accompanying increase in wt. of orbital fat is due to an increase in water content and in the amount of connective tissue. Increased water content also accounts largely for the increased wt. of extra-orbital muscles. No change is found in water content of skeletal muscle or in the wt. of peritoneal fat deposits of exophthalmic animals. R. H. K.

Effect of riboflavin on corneal vascularisation and symptoms of eye fatigue in R.C.A.F. personnel. F. F. Tisdall, J. F. McCreary, and H. Pearce (*Canad. Med. Assoc. J.*, 1943, **49**, 5—12).—The incidence of vascularisation of the cornea among healthy young adults in Canada is high (91% in 198 men) and varied with the riboflavin content of the diet. Riboflavin in large doses for 2 months decreased vascularisation of the cornea in 71% of cases and caused marked improvement in symptoms of eye fatigue in men exposed to glare in their flying duties. C. J. C. B.

Abrine [relation to cataract].—See A., 1944, III, 197.

Vitamin *E* (wheat-germ oil) in treatment of interstitial keratitis. S. Stone (*Arch. Ophthal.*, 1943, **30**, 467—475).—In ten patients with interstitial keratitis, all of whom had previously received ample antisyphilitic treatment, the administration of vitamin-*E* over a period of months was found to hasten the absorption of superficial and deep exudates and to reduce corneal vascularisation and photophobia. The addition of riboflavin appeared to enhance the latter effect but had no influence on the rate of absorption of corneal opacities. If the general condition is well under control, antisyphilitic and fever therapy are of little benefit in combating these late visual effects. J. H. A.

Embryology of microphthalmos in *Rattus norvegicus*. L. G. Browman and F. Ramsey (*Arch. Ophthal.*, 1943, **30**, 338—351).—In a series of rat embryos, no difference could be detected between normal and microphthalmic eye primordia until about 12½ days, at which stage the microphthalmic eye showed retarded invagination of the optic vesicle and failure of the normal differentiation in the cells of the posterior wall of the lens. These abnormalities depended on a third, namely absence of the hyaloid artery, though the fœtal fissure was normal. Failure of the blood supply also accounted for failure of the retina to differentiate into layers at a slightly later stage. The ocular adnexa were present in older embryos, but distorted by their abnormal relationship to the developing globe. J. H. A.

Pathologic anatomy of myopic eye with regard to newer theories of ætiology and pathogenesis of myopia. F. W. Stocker (*Arch. Ophthal.*, 1943, **30**, 476—488).—The theory of primary scleral stretching is discarded in favour of Vogt's hypothesis that the increased size of the globe depends on an abnormal tendency to growth on the part of the retina. Retinal atrophy does not make its appearance until the scleral stretching is complete and should be regarded as secondary to atrophy of the choroid which supplies its outer layers. The underlying factor may be failure of co-ordination in the development of the various coats of the eye, each of which has its own independent potential of growth. J. H. A.

Blood-choline-esterase values of patients with glaucoma. A. Rados (*Arch. Ophthal.*, 1943, **30**, 371—375).—Of 61 unselected patients with glaucoma, 59 had blood-choline-esterase vals. towards the upper limit of normal: 10 out of 12 patients with acute glaucoma also had high normal vals. The concn. of this enzyme in the blood is affected by hyperthyroidism, anæmia, cirrhosis of the liver, etc., and such cases were excluded. The results suggest that the tension-reducing acetylcholine is subjected only to normal hydrolysis in glaucoma. J. H. A.

Bilateral uveitis, poliosis, and retinal detachment with recovery. I. Givner (*Arch. Ophthal.*, 1943, **30**, 331—337).—The case of a youth of 20 who showed the characteristic features of Harada's disease, viz., low-grade bilateral iridocyclitis with retinal (macular) detachment, followed by the appearance of poliosis and Koeppe's nodules on the iris and lens capsule. Alopecia and deafness were not present. Culture of the aqueous was negative. The patient developed secondary glaucoma in each eye, which was treated by bilateral iridectomy and sclerectomy. Since he was allergic to atropine and tuberculin, this disease, like sympathetic ophthalmia and the Vogt–Koyanagi syndrome, is regarded as possibly an allergic manifestation. J. H. A.

Changes in optic function and ophthalmoscopic picture observed in four patients of the eunuchoid skeletal type who were being treated with an orchic extract. M. Kutscher (*Arch. intern. Med.*, 1943, **72**, 461—470).—Before treatment all showed decreased visual acuity and diminished amplitude of accommodation. The fundi showed changes varying from hyperæmia and postneuritic signs to complete decoloration of the nerve heads. The visual fields were contracted, especially for colours (red and green) and in 2 cases there was central scotoma for colours. Usually there was diminished dark adaptation. During therapy improvement occurred in the visual acuity for distance and in the amplitude of accommodation. The fundus changes disappeared, and later these showed normal, well coloured and well defined discs with little vascular abnormality. Dark adaptation returned to normal. The size of the visual fields for form and colours increased and in some cases became normal. C. J. C. B.

Lipæmia retinalis: report of a case. H. F. Falls (*Arch. Ophthal.*, 1943, **30**, 358—361).—Description of the 62nd case of lipæmia retinalis to be reported, and the second whose age exceeded 60. The patient, a male, presented a combination of severe systemic diseases, including diabetes, gastric ulcer, pneumonia, renal infarct, severe cachexia, and widespread xanthiomatosis, without which combination it is suggested that lipæmia retinalis would probably not have occurred at so advanced an age. The total plasma-lipin was 6·2 g.-%, but fell to 2·52 g. before death. J. H. A.

New answer to question of macular sparing. F. H. Verhoeff (*Arch. Ophthal.*, 1943, **30**, 421—425).—The sparing of the macula which is found after destruction of one occipital lobe, but not in lesions of the optic tract, is generally attributed to bilateral cortical representation of the macula, although there is no anatomical evidence to support the hypothesis. Certain physiological considerations are put forward suggesting that the sparing is only apparent and is due to loss of integration between the seeing field and the blind field in the visual cortical area in use so that an eccentric retinal point is employed for fixation, and slipping of fixation occurs easily. J. H. A.

Eye and radiology. I. J. F. Browley. **II.** W. D. Wright. **III.** G. Spiegler (*Brit. J. Radiol.*, 1944, **17**, 65—69).—I. Since the brightness of fluorescent screens is only 0·001 to 0·01 millilambert the radiologist must dark adapt his eyes previously and use

parafoveal (10° eccentric) vision. Dim red lighting of the *X*-ray room should produce least loss of dark adaptation.

II. The low brightness of fluorescent screens implies poor perception of contrast—probably 20 to 30% being required instead of the 2% required at high brightnesses—and poor acuity or resolution—a separation of lines by about 10′ of arc instead of 1′. For the same reason stereoscopic fluoroscopy will be unsatisfactory.

III. Besides failing to see contrasts which are there, the eye can sometimes "see" edges which are not; photographs of some illusions are given. K. J. W. C.

Night vision. D. Y. Solandt and C. H. Best (*Canad. Med. Assoc. J.*, 1943, **49**, 17—21).—Red lighting may be employed to protect the night vision of personnel who are dark-adapted and on duty. Adaptometer tests can be used to select personnel with exceptionally good night vision for special training in night duties. C. J. C. B.

Effect of oxygen deprivation on relation between stimulus intensity and latency of visual after-images. R. A. McFarland, L. M. Hurvich, and M. H. Halperin (*Amer. J. Physiol.*, 1944, **140**, 354—366).—The relation between anoxia and the latency of visual after-images was studied in human subjects, using stimuli of short duration and a range of stimulus intensities. The latent time of the after-image is related inversely both to the stimulus intensity with a given degree of anoxia, and to the degree of anoxia at a given stimulus intensity. The increase in latent time during anoxia is inversely related to the stimulus intensity. Complete recovery of the latent time on restoring the O_2 supply to normal may take up to 50 min. depending on the amount and duration of the anoxia. R. H. K.

Magnitude of the threshold of stereoscopic vision as affected by the period of observation. L. N. Gasovski and N. A. Nikolskaja (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **38**, 15—19).—Observations of the threshold of stereoscopic vision on 11 subjects showed little decrease in accuracy when the period was reduced from 3 to 1 sec., about half this accuracy at 0·4 sec., and a rapid drop with shorter exposures (20-fold loss at 0·1 sec.). K. J. W. C.

[Rejection of theory of tubular origin of otitis media.] A. Delrez (*Acta Otolaryngol.*, 1943, **31**, 475—518).—It is claimed that careful radiological examination with a proper understanding of the anatomy and physiology of the middle ear and mastoid shows that chronic otitis media is always due to inflammation of the mastoid cavities and never to infection from the nose and pharynx carried via the Eustachian tube. K. T.

Gradenigo syndrome (otitis media with head pains and paralysis of the 6th nerve on the same side) complicated by pneumococcic meningitis; recovery after intensive treatment with penicillin and sulphadiazine. L. F. Barker (*Amer. J. med. Sci.*, 1943, **206**, 701—703).—A case report. C. J. C. B.

Bone conduction threshold measurements : effects of occlusion, enclosures, and masking derives. N. A. Watson and R. S. Gales (*J. Acoust. Soc. Amer.*, 1943, **14**, 207—215).—For a person with normal hearing, bilateral occlusion of the external meatus causes a shift of the bone conduction threshold at lower intensities. A special device for bone-conduction testing at frequencies down to 100 cycles is described. P. G.

Salicylate and quinine deafness and Mygind–Dederding view of hearing tests. D. Dederding, J. Falbe-Hansen, and S. H. Mygind (*Acta Otolaryngol.*, 1943, **31**, 545—548).—A reply to Foght's criticism of Falbe-Hansen's theory (A., 1943, III, 475). The authors contend that if Falbe-Hansen's results are corr. for the fact that, in testing the difference between air and bone conduction, the intensities of sound from the prongs and foot of the tuning fork are different, they still support the theory that salicylate and quinine deafness is a conduction and not a nerve deafness. K. T.

Experimental studies of vascular symptoms of labyrinth fistulas, with a brief historical survey. G. Ahlén (*Acta Otolaryngol.*, 1943, **31**, 519—544).—The relation of eye movements to vascular changes in a labyrinth with a fistula were studied experimentally in rabbits. It was found that changes in the blood pressure etc. are transmitted to the labyrinth via the vessels and are the cause of fluid movements there. When one labyrinth has a fistula the balance between pressure changes on the two sides is upset and nystagmus and slow eye movements may result. These eye movements may be synchronous with the pulse or respiration and turn into nystagmus, usually towards the operated side, if the pressure is violently altered as by pressure on the vessels of the neck. K. T.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Influence of the endocrine glands on growth and ageing of the skeleton. M. Silberberg and R. Silberberg (*Arch. Path.*, 1943, **36**, 512—527).—A crit. review. C. J. C. B.

Galactose-tolerance test in endocrine disorders in children. R. Wagner (*Amer. J. Dis. Child.*, 1943, **65**, 207—234).—Abnormally flat galactose-tolerance curves were obtained only in patients with hypogonadism and abnormally high curves only in pituitary dwarfs. All the other curves in endocrine disorders in children were between the two extremes. C. J. C. B.

Experimental thyroid abnormalities and appetite. J. Warkentin, L. Warkentin, and A. C. Ivy (*Amer J. Physiol.*, 1943, **139**, 139—146).—The diet eaten by rats in self-selection experiments varies with age. Young rats (up to 4 months) select more fat and salt than older rats (over 4 months), who eat more protein but smaller total amounts of food per 100 g. of body wt. Hyperthyroid rats ate more than normals, who ate more than hypothyroid rats without any qual. differences in food selection. T. F. D.

Radioactive iodine studies in childhood hypothyroidism. J. G. Hamilton, M. H. Soley, and K. B. Eichorn (*Amer. J. Dis. Child.*, 1943, **66**, 495—502).—Labelled (radioactive) I was employed to determine the ability of the thyroids in two groups of hypothyroid children to concentrate I. The thyroids of children with hypothyroidism and without goitres conc. only small amounts of orally administered I, as compared with normal children or adults. In the hypothyroid children, the thyroid conc. a larger % of a dose of 0·1 μg. than of a dose of 14 mg. of I. The thyroids of 2 children with goitres and with severe hypothyroidism took up relatively large amounts of I and produced both thyroxine and di-iodotyrosine in large amounts. The uptake curves of the thyroids as measured *in situ* were similar to those seen in hyperthyroidism in adults. Radioautographs made from sections of the thyroids of both of these children indicate that by the 5th day after the oral administration more of the I was in the cells than in the colloid. C. J. C. B.

Locating iodine in tissues autographically.—See A., 1944, III, 162.

Chemicals depressing the thyroid gland. G. J. Martin (*Arch. Biochem.*, 1943, **3**, 61—69).—Thiourea, sulphanilamide, sulphaguanidine, and *p*-aminobenzoic acid produced pseudo-potentiation (reduced shock-producing dose) of insulin for starved mice, thyroid hypertrophy with hypothyroidism in rats, and protection of dogs against the toxic action of injected thyroxine. These effects are due to a generalised inhibition of tissue metabolism. E. R. S.

Influence of pregnancy, hypervitaminosis-*D*, and partial nephrectomy on volume of parathyroid glands in rats. L. Opper and T. Thale (*Amer. J. Physiol.*, 1943, **139**, 406—409).—Partial nephrectomy or pregnancy produced significant, and hypervitaminosis-*D* statistically unreliable, increases in parathyroid vol. in rats. No summation effects of real damage and pregnancy or of renal damage and hypervitaminosis-*D* were observed. T. F. D.

Hyperparathyroidism : report and analysis of 13 cases in Middle Western States. R. Lage and J. A. Greene (*J. clin. Endocrinol.*, 1943, **3**, 408—412). P. C. W.

Intravascular parathyroid grafts. M. R. Reid and J. Ransohoff (*Amer. J. med. Sci.*, 1943, **206**, 731—735).—A method of producing intravascular pulmonary grafts by injection of minced parathyroid glands into the external jugular veins of the same dog is given. C. J. C. B.

Effects of parathyroid hormone and calcium gluconate on skeletal tissues of mice.—See A., 1944, III, 157.

Effect of thyroid hormone on growth rate, time of sexual differentiation, and oxygen consumption in *Lebistes reticulatus*. D. C. Smith and G. M. Everett (*J. Exp. Zool.*, 1943, **94**, 229—240).—There was no change in normal growth rate of new-born guppies when they were fed on thyroid extract and kept in water to which thyroxine was added for 50—90 days. Male guppies similarly treated showed no change in rate of O_2 consumption, and the time of sexual differentiation was unaffected. H. L. H. G.

Modified protamine zinc insulin : comparison with histone zinc insulin, clear and standard protamine zinc insulins. C. M. MacBryde and H. K. Roberts (*J. clin. Invest.*, 1943, **22**, 791—797).—A new insulin modification containing 3 parts of pptd. insulin to 1 of sol. insulin provided better control in the patients studied than that obtained with other modifications or combinations of insulin. It is made by mixing equal parts of protamine Zn insulin and regular insulin with buffer added to adjust the pH to 7·2. C. J. C. B.

Insulin hypersensitivity with desensitisation. M. A. Weitz (*J. Allergy*, 1943, **14**, 220—226).—Case report and review of literature. The patient showed positive skin tests and passive transfer reactions. C. A. K.

Age and calorigenic response to subcutaneously administered adrenaline in the rat. I. L. Bunnell and F. R. Griffith, jun. (*Amer. J. Physiol.*, 1943, **138**, 669—675).—Subcutaneous adrenaline injections (0·02 mg. per 100 g. body wt.) caused an average max. increase in O_2 consumption of 34·5% within 45 min. in male albino rats 2—28 months old; in older rats the max. increase was less and was delayed until 90 min. after injection. The max. increase in R.Q. (from 0·72 to 0·79 15 min. after injection) is the same and is reached at the same time in all age groups, but the return to normal was delayed in proportion to increasing age, possibly because of the slower absorption. T. F. D.

Inhibition of oxidation of adrenaline by malonic acid. P. Marquardt (*Biochem. Z.*, 1941, **308**, 56—58).—The oxidation of adrenaline

in aq. succinic acid (cf. A., 1940, III, 895) is inhibited by malonic acid. F. O. H.

Influence of sodium bisulphite on toxicity of adrenaline.—See A., 1944, III, 210.

Survival of non-adrenalectomised rats in shock with and without adrenal cortical hormone treatment. D. J. Ingle (*Amer. J. Physiol.*, 1943, **139**, 460—463).—Normal rats, in whom shock was caused to develop by ligation of the two hind limbs for a period of 2½ hr., did not survive for longer periods when treated with adrenal cortical extracts than when given control solutions. T. F. D.

Dietary "self-selection" and appetites of untreated and treated adrenalectomised rats. W. G. Clark and D. F. Clausen (*Amer. J. Physiol.*, 1943, **139**, 70—79).—In self-selection dietary experiments on rats, an increased voluntary selection and beneficial effect of NaCl, reversed by adrenal cortical hormone, was noticed after adrenalectomy. No effect of adrenalectomy was observed on intake of protein, carbohydrate, fat, yeast, or solid salt mixture. T. F. D.

Relation of diabetogenic effect of diethylstilbœstrol to adrenal cortex in the rat. D. J. Ingle (*Amer. J. Physiol.*, 1943, **138**, 577—582).—The glycosuria of partly depancreatised rats disappeared after adrenalectomy and administration of 11-deoxycorticosterone acetate, but reappeared on daily administration of 0·1 mg. of diethylstilbœstrol; 5 partly depancreatised rats without glycosuria became diabetic on daily administration of 0·1 mg. of diethylstilbœstrol, and the glycosuria disappeared on its withdrawal. When the latter animals were adrenalectomised and maintained on adrenal cortical extract, glycosuria developed only on administration of diethylstilbœstrol, but not when maintined on 11-deoxycorticosterone acetate or by drinking isotonic NaCl solution, in which cases the diabetogenic action of diethylstilbœstrol was either slight or absent. T. F. D.

Deoxycorticosterone and sexual function. F. Verzár (*Helv. Physiol. Pharm. Acta*, 1943, **1**, 389—392).—Three adrenalectomised male and two female cats, maintained with deoxycorticosterone acetate, showed completely normal sexual function, with regard to fertility, pregnancy, and lactation. One adrenalectomised male mated an adrenalectomised female with normal results. A. S.

Carbohydrate metabolism following adrenalectomy. I. Decrease of glycogen phosphorylation in adrenalectomised cats and dogs and restoration by deoxycorticosterone and other steroid hormones. II. Glycogen formation under influence of deoxycorticosterone. III. Serum-amylase. C. Montigel and F. Verzár (*Helv. Physiol. Pharm. Acta*, 1943, **1**, 115—135, 137—141, 143—148).—I. Glycogen phosphorylation *in vitro* by skeletal muscle of normal cats and adrenalectomised animals maintained by deoxycorticosterone acetate uses 60—70% of the P originally present within 1 hr. Phosphorylation of adrenal cortex-deficient animals is considerably diminished and retarded but is restored *in vitro* by addition of deoxycorticosterone, which has no effect on normal animals or on the muscle of treated adrenalectomised animals. Increase in temp. accelerates glycogen phosphorylation of muscle of normal and of treated adrenalectomised animals or of cortex-deficient muscle after *in vitro* addition of cortical hormone. Corticosterone is less effective, œstradiol, testosterone, and progesterone are 10—100 times less effective, than deoxycorticosterone. Phosphorylation of glycogen by heart muscle and liver of adrenalectomised cats is also diminished; that by heart muscle can be restored by cortical hormone. The development of muscular weakness in adrenalectomised animals runs parallel, and is due to, the diminution in glycogen phosphorylation.

II. The glycogen storage in liver and muscle of adrenalectomised cats returns to normal following treatment with deoxycorticosterone.

III. Serum-amylase of adrenal cortex-deficient cats is markedly diminished and returns to normal after treatment with deoxycorticosterone. A. S.

Basis of hormonal treatment of pituitary disturbances. W. Berblinger (*Schweiz. med. Wschr.*, 1943, **73**, 382—385).—A review. A. S.

Anterior pituitary gland in women with carcinoma of mammary gland, with report of case of chromophobe adenoma. P. E. Steiner and L. J. Dunham (*Amer. J. Path.*, 1943, **19**, 1031—1041).—Differential cell counts were made on the anterior pituitary from 12 women with carcinoma of the mammary gland; as controls pituitary glands from 15 women with other tumours were used. There were no important differences in the % of chromophobes, acidophils, or basophils in the two groups. C. J. C. B.

Mitotic activity in female mouse pituitary. T. Kerr (*J. exp. Biol.*, 1943, **20**, 74—78).—During the normal œstrous cycle, the no. of mitoses shows a max. in late diœstrus and another in late œstrus. There were also two peaks during a series of six œstrone injections. G. P. W.

Parathyroid function in hypophysectomised rat. W. H. Carnes, J. Osebold, and H. C. Stoerk (*Amer. J. Physiol.*, 1943, **139**, 188—192).—Hypophysectomised rats maintained their serum-$Ca^{..}$ and -$PO_4^{'''}$ concns. within normal limits as well as the non-operated control even when subjected to the stress of a low-Ca diet. In rats hypophysectomised–parathyroidectomised or parathyroidectomised, the serum-$Ca^{..}$ fell and the -$PO_4^{'''}$ rose. Doubt is thus cast on the existence of a direct physiological regulation of the parathyroids by the hypophysis. 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).—The liver-arginase activity is markedly decreased by hypophysectomy and increased by administration of pituitary adrenocorticotrophic hormone in normal and hypophysectomised rats. Administration of growth hormone diminished liver-arginase activity in normal and hypophysectomised animals. A. S.

Therapeutic observations in Cushing's syndrome. W. H. Perloff, E. Rose, and F. W. Sunderman (*Arch. intern. Med.*, 1943, **72**, 494—505).—There was an increase in muscular strength and improvement in the backache following 123 days of treatment with Ca gluconate, vitamin-*D*, and testosterone. At the same time, the voice deepened, the clitoris enlarged, and the facial acne and hirsutism were increased. The diabetes also improved and there was some recalcification of the spine and increase in the urinary excretion of 17-keto-steroids to 25 mg. per 24 hr. Other changes were loss of Ca chiefly through the urine, when the Ca intake was low; ability to retain intravenously administered Ca; retention of Ca and increased retention of P following large doses of -D_2; retention of N during and after the first phase of testosterone therapy, whereas less marked retention of N was noted following its continued use for a period of 123 days; and negative Ca balance, increase in fæcal P, and retention of N after the administration of diethylstilbœstrol. C. J. C. B.

Preparation of sheep pituitary gonadotropin and recovery of lactogenic hormone. W. H. McShan and R. K. Meyer (*J. Biol. Chem.*, 1943, **151**, 259—266).—The gonadotropic hormone is extracted from crude powdered pituitary with water, dialysed against buffer successively at pH 5 and 4, and then against distilled water. The lactogenic hormone can be recovered from the original insol. residue with 75—80% alcohol, and considerable luteinising activity is present in ppts. thrown down during dialysis. R. L. E.

Factors affecting augmentation of pituitary gonadotropic extracts by hæmin. L. E. Casida, R. K. Meyer, and W. H. McShan (*Amer. J. Physiol.*, 1943, **139**, 89—94).—The addition of hæmin to pituitary gonadotropic extracts produced on injection into rats an augmented ovarian wt. increase and a decline in % of ovarian solids. Variations in augmentation of ovarian wt. were caused by dosage, no. of injections, dosage interacting with no. of injections, and dosage interacting with age. Variation in decline of % of ovarian solids were caused by dosage, no. of injections, age, age interacting with dosage, and age interacting with no. of injections. T. F. D.

Intermedin. I. Recovery and purification from waste fractions of sheep pituitary. A. A. Abramowitz, D. N. Papandrea, and F. L. Hisaw (*J. Biol. Chem.*, 1943, **151**, 579—586).—Residual gland tissue, from preps. of gonadotropic hormones etc. by extraction with 2% pyridine (or NH_3) followed by adjustment of pH to 5 with acetic acid, is suspended in water at pH 5 and boiled for 15 min. The extract is evaporated at 40°, and gelatin is removed by leaching with cold water. The residual hygroscopic material is dissolved in water and treated with baryta to pH 8·0—8·5; excess of Ba is quantitatively removed from the supernatant by H_2SO_4. Inert material may also be removed by treatment with basic Pb acetate, but some loss of intermedin occurs. The solution is adjusted to pH 7 with NaOH, and Na phosphotungstate is added followed by N-H_2SO_4 to pH 3. The hormone is quantitatively pptd. and the phosphotungstate is decomposed with baryta in the usual way; a 5-fold concn. results. The activity of the solution can be doubled by fractional pptn. with $AgNO_3$. Fractionation with alcohol at varying pH yields the hormone as a ppt. with an activity 700—1300 times that of the residual tissue. The sp. activity is defined as the no. of frog units per μg. of solids. P. C. M.

XII.—REPRODUCTION.

Phosphate intake by marine eggs. S. C. Brooks (*Biol. Bull.*, 1943, **84**, 213—225, 226—239).—Eggs and larvæ of *Arbacia punctulata* and *Asterias forbesi* and unfertilised eggs of *Fundulus heteroclitus* were immersed in sea-water containing radioactive Na phosphate and their $PO_4^{'''}$ contents were determined at various periods by measuring the β-radiations from samples. The $PO_4^{'''}$ was taken in during two or more periods separated by periods during which it was lost. The permeabilities during early absorption were greater than those during later absorption. Possible mechanisms of ion intake, accumulation, and loss are tentatively discussed. G. P. W.

Environmental factors and fertility in a weevil infesting stored grain. L. E. S. Eastham and S. B. McCully (*J. exp. Biol.*, 1943, **20**, 35—42).—The effects of temp. and humidity on length of life, length of oviposition period, rate of oviposition, and total eggs laid in *Calandra granularis* are described. G. P. W.

Reproductive cycle of a viviparous teleost. G. Mendoza (*Biol. Bull.*, 1943, **84**, 87—98). G. P. W.

Mechanism of pigment formation in *Bombyx* and *Drosophilia*. H. Kikkawa (*Genetics*, 1941, **26**, 587—607).—Hibernating eggs of *B. mori* are generally yellowish-white when laid but gradually acquire a variety of pigments. Kynurenine and its derivatives have been isolated from the eggs and a possible scheme of pigment formation is: tryptophan → hydroxytryptophan → kynurenine → + chromogen → pigment, the conversions being due to enzymes. L. G. G. W.

Effect of artificial light on reproduction in poultry (turkeys). T. T. Milby and R. B. Thompson (*Proc. Oklahoma Acad. Sci.*, 1941 [1942], **22**, 41—43).—All-night illumination induces egg laying in hen turkeys during the winter after 3 weeks' exposure and the treatment increases greatly the no. of eggs produced during the hatching season. Morning illumination was slightly less effective. Egg fertility may be slightly reduced by the all-night light. L. G. G. W.

Light and reproductive activity in a fish. E. J. Robinson and R. Rugh (*Biol. Bull.*, 1943, **84**, 115—125).—In *Oryzias latipes*, ovulation and oviposition (both of which are described in detail) occur just before dawn, in consequence of a diurnal rhythm in general activity which is in turn due to the light cycle. G. P. W.

Gonad development and sex changes in *Teredo* and other molluscs. W. R. Coe (*Biol. Bull.*, 1943, **84**, 178—186). G. P. W.

Puberty and its disturbances. H. Wissler (*Schweiz. med. Wschr.*, 1943, **73**, 409—413).—A lecture. A. S.

Hormonal determination of adult characters and sex behaviour in *Larus argentatus*. W. R. Boss (*J. Exp. Zool.*, 1943, **94**, 181—210).—The herring gull has a juvenal period of 3 years during which time it has a hen plumage, whereas all adults have a cock plumage; in other respects (size, voice, behaviour) sexual dimorphism is apparent. Injection of testosterone induces premature development of the adult plumage (this is the first example of induction of cock plumage by androgens); in immature males it induces aggressiveness, adult voice, and other adult behaviour traits. Discontinuance of injections leads to a reversion of immature males to the juvenal type. Gynogens produce no change in voice, nor do they induce adult female behaviour. Males are 25% heavier than females; this difference is genetically fixed and is uninfluenced by hormones. H. L. H. G.

Morphological changes in fowl following chronic overdosage with various steroids. H. Selye (*J. Morph.*, 1943, **73**, 401—421).—2-day-old white Leghorn chicks were given steroids subcutaneously twice daily in increasing doses and were killed after 20, 45, and 95 days. Deoxycorticosterone caused kidney enlargement with glomerular sclerosis and thickening of vessels, hypertrophy of the heart, and, in the acute stages, general tissue œdema with distension of serous cavities; these changes were less pronounced with progesterone and acetoxypregnenolone. Testoids caused decrease in renal size. Testes showed accelerated development with progesterone and ethinyltestosterone. In the acute stage deoxycorticosterone caused great enlargement of testes due to accumulation of fluid in the tubules, and œdema of the stroma of the ovary; in the chronic stage there was a marked increase in deposition of body-fat, and the adrenal cortex atrophied. Leydig cells atrophied with all steroids. Androstenedione caused greatest enlargement of the comb. Involution of the uropygial gland and of the bursa Fabricii was effected by testoid and folliculoid compounds but in both cases some adaptation occurred after prolonged treatment. Unlike the mammals, œstradiol caused no enlargement of adrenals or pituitary. H. L. H. G.

Relationships between sex hormones and enzymes. V. Cholinesterase and sex function of guinea-pigs. H. von Wattenwyl, A. Bissegger, A. Maritz, and E. A. Zeller (*Helv. Chim. Acta*, 1943, **26**, 2063—2070).—Castration of adult male guinea-pigs causes a diminution in serum-choline-esterase which is restored to its original level by subcutaneous injection of testosterone. In castrated and normal male animals the serum-choline-esterase is lower in July and August than in the other months; no such periodic fluctuations are observed in female guinea-pigs. Further experiments on a larger scale confirm the finding that castration of adult female guinea-pigs causes a diminution of choline-esterase which is only partly if at all counteracted by testosterone. The rational deduction of mean vals. necessitates 9—10 individual vals. H. W.

Nomenclature of hormone-producing tumours of ovary.—See A., 1944, III, 196.

Female sex hormones. T. N. MacGregor (*Edinb. Med. J.*, 1944, **51**, 39—56).—A lecture describing the uses and abuses, on a physiological basis, of anterior pituitary, ovarian, and corpus luteum hormones in gynæcological disorders (before puberty, during active reproductive life, and at, and after, the menopause), in obstetrical conditions, and to suppress lactation. (39 refs.) H. S.

Œstrogen pellet therapy in menopause. R. W. Te Linde and H. G. Bennett, jun. (*J. clin. Endocrinol.*, 1943, **3**, 417—420).—Favourable clinical report on the subcutaneous implantation of œstrone tablets. P. C. W.

Spectrochemical study of œstrogen-induced mammary cancer in mice.—See A., 1944, III, 195.

Dienœstrol for menopausal symptoms. J. Barnes (*Brit. Med. J.*, 1944, I, 79—80).—Dienœstrol was useful and non-toxic in menopausal patients. I. C.

Metabolism of œstrone in surviving rabbit, bovine, and human endometrium. C. M. Szego and L. T. Samuels (*J. Biol. Chem.*, 1943, **151**, 599—605).—Neither pregnant human nor bovine endometrium destroys œstrone or converts it into œstradiol on aërobic incubation. The endometrium of the pregnant rabbit converts œstrone into œstradiol almost quantitatively. P. G. M.

Hexœstrol: clinical study. K. J. Karnaky (*J. clin. Endocrinol.*, 1943, **3**, 413—416).—Hexœstrol was more successful than stilbœstrol in the treatment of menopausal symptoms as it caused less nausea and no uterine bleeding. Dysfunctional uterine bleeding and menorrhagia were controlled by doses of 3 mg. 1—3 times daily. Laboratory tests showed no toxic effects following the administration of doses of 500—15,000 mg. in 1—214 days. P. C. W.

Prostigmin in treatment of delayed period. E. Friedmann (*Brit. Med. J.*, 1944, I, 11—12).—Ninety cases of amenorrhœa were treated with prostigmin (1—3 injections of 1 mg.). The results were favourable (menstruation induced) in 94% of the cases. The drug is safe and it does not interfere with pregnancy. I. C.

Enzymic hydrolysis of urinary sodium pregnanediol glycuronidate. N. B. Talbot, J. Ryan, and J. K. Wolfe (*J. Biol. Chem.*, 1943, **151**, 607—614).—Acetone-dried rat liver powder contains an enzyme that hydrolyses Na pregnanediol glycuronidate. 89% of the theoretical amount of free pregnanediol is recovered after enzymic hydrolysis (at pH 5 for 4 hr.) of the conjugated Na salt added to urine; this compares with 68% after hydrolysis with HCl. P. G. M.

Treatment of mastopathy. G. E. Konjetzny (*Schweiz. med. Wschr.*, 1943, **73**, 377—379).—A review. A. S.

Disintegration of epididymal spermatozoa by cooling. M. C. Chang (*J. exp. Biol.*, 1943, **20**, 16—22).—In the rabbit, application of ice to the scrotum for 10 min. causes deterioration and disintegration of half the spermatozoa in the epididymis, but has no adverse effect on sex drive or spermatogenesis. G. P. W.

Rôle of oxygen in metabolism and motility of human spermatozoa. J. MacLeod (*Amer. J. Physiol.*, 1943, **138**, 512—518).—O_2 is not of primary importance in the metabolism and motility of human spermatozoa; they cannot oxidise glucose, lactate, or pyruvate; they oxidise succinic acid but the energy set free is not used for motility. The motility is depressed by high O_2 pressures, and small amounts of H_2O_2 are formed. A. S.

Effects of castration on feather weight in domestic fowl. K. B. Turner (*Proc. Oklahoma Acad. Sci.*, 1940 [1941], **21**, 93).—Capons reach max. feather development in 29—33 weeks and cockerels in 33—37 weeks. At 40 weeks 7·6% of the body wt. of capons is represented by feathers whilst the corresponding figure for cockerels is 6·3%. L. G. G. W.

Reversible testosterone-induced virilism. H. D. Palmer and M. De Ronde (*J. clin. Endocrinol.*, 1943, **3**, 428).—A woman who had received a total dose of 650 mg. of testosterone during 35 days developed pronounced symptoms of virilism; these disappeared in 3 months after stopping the treatment. P. C. W.

Testosterone therapy of male eunuchoids. Results from methyltestosterone linguets. H. Lisser and L. E. Curtis (*J. clin. Endocrinol.*, 1943, **3**, 389—399).—The linguets were the most economical form of treatment so far adopted. 6 of 12 patients were maintained with a 5-mg. linguet daily. P. C. W.

Castration for carcinoma of prostate. Removal of secreting tissue of testis for malignant melanoma of choroid with extensive metastases.—See A., 1944, III, 196.

Endocrine treatment [androgens] of enuresis. F. W. Schultz and C. E. Anderson (*J. clin. Endocrinol.*, 1943, **3**, 405—407).—Enuresis was completely cured in 54% of 50 children given androgen treatment; the condition was improved in 34%. Androgen therapy was various: 10—20 mg. of methyltestosterone daily by mouth, 10—25 mg. of testosterone propionate intramuscularly, or 8 mg. of testosterone by inunction. P. C. W.

Effects of injections of testosterone propionate on reproductive system of female English sparrow. A. R. Ringoen (*J. Morph.*, 1943, **73**, 423—440).—½—1 mg. of the androgen was injected daily for 2 weeks during the non-breeding season. Precocious development of the gonad and the oviduct occurred and the bill darkened in colour. The histological changes in the oviduct were the same as those induced by œstrogen. It is concluded that the oviduct response was induced by the androgen-stimulated gonad through the pituitary. H. L. H. G.

Vitamin-*E* and its relation to reproduction. J. G. Kehler, jun. (*Amer. J. med. Sci.*, 1943, **206**, 676—686).—A crit. review. C. J. C. B.

Activity of α-tocopherol against sterility and testicular degeneration in rats on vitamin-*E*-poor diets.—See A., 1944, III, 202.

XIII.—DIGESTIVE SYSTEM.

Absence of rennin from adult human gastric juice. L. B. Dotti and I. S. Kleiner (*Amer. J. Physiol.*, 1943, **138**, 557—559).—No rennin was found in the gastric juice of human adults. A. S.

Gastrophotography in natural colours in conjunction with gastroscopy. H. A. Rafsky (*Amer. J. med. Sci.*, 1943, **206**, 618—622).—(3 coloured photographs.) C. J. C. B.

Rôle of epithelisation and contracture in healing of peptic ulcer. E. L. Howes, S. C. Bullock, and B. Syphax (*Surgery*, 1941, **10**, 1—6).—When large areas of the mucosa alone, or muscle and serosa, of the stomach of dogs are removed, the defect is reduced in size by contracture of the muscle and the lesion heals rapidly. When all three layers of the stomach wall are excised in a 1 sq. in. area and the defect is repaired with a patch of omentum, a lesion results which even after 30 days resembles grossly and microscopically a chronic peptic ulcer; the resulting ulcer is smaller than the original defect. G. P.

Late results in acute perforated peptic ulcer treated by simple suture. E. F. Parkes (*Surgery*, 1941, **10**, 49—63). G. P.

Effect of bile in intestine on secretion of pancreatic juice. J. E. Thomas and J. O. Crider (*Amer. J. Physiol.*, 1943, **138**, 548—552).—Injection of ox or dog bile into the small intestines of unanæsthetised dogs does not increase the rate of secretion of pancreatic juice. The presence of soap, peptone, or HCl in the intestine depresses the amount of pancreatic juice secreted. Gastric juice was drained off through a fistula; the pylorus was tied. A. S.

Pancreatic function and disease in early life. Methods of analysing pancreatic enzyme activity. H. Shwachman, S. Farber, and C. L. Maddock (*Amer. J. Dis. Child.*, 1943, **66**, 418—424).—The methods used are given in detail. C. J. C. B.

Cystic fibrosis of the pancreas in siblings, with necropsy reports. J. Felsen, W. Wolarsky, and E. Rosen (*Arch. Pediat.*, 1943, **60**, 488—497).—(4 photomicrographs.) C. J. C. B.

Effect of secretin on pancreatic function of infants and children. C. L. Maddock, S. Farber, and H. Shwachman (*Amer. J. Dis. Child.*, 1943, **66**, 370—375).—Secretin may be safely injected intravenously and repeatedly into infants and children. In normal infants and children and in patients with cœliac disease and chronic nutritional disturbance, the injection was followed by an increase in vol. and pH of the duodenal content. No important change in either vol. or tryptic activity was produced by secretin in 7 patients with pancreatic fibrosis. No change in tryptic activity was demonstrable in a boy with trypsin deficiency, although a decided increase in vol. and lipolytic and amylolytic activity was produced. An increase in lipolytic activity was produced by secretin in all subjects studied except in patients with pancreatic fibrosis, .An increase in amylolytic activity was found in all subjects studied except in patients with pancreatic fibrosis and cœliac disease. C. J. C. B.

Histological studies of pancreas and associated tissues of wild and experimentally fed young Chinook salmon. L. R. Donaldson (*Amer. J. Physiol.*, 1943, **138**, 560—564).—Fish fed a diet of 100% beef liver show excessive fat deposits in the pancreatic tissues; the pancreas degenerated on a diet of 20% salmon viscera, 20% beef liver, and 60% seal meal; it was normal when these 3 substances were fed in equal amounts. The fat content of the pancreas increased on fresh beef pancreas. Degenerative changes were produced by addition of salmon oil, or salmon oil + cholesterol, to synthetic diets; they were prevented by pancreatic extracts or choline. A. S.

Elimination of administered zinc in pancreatic juice, duodenal juice, and bile in dogs as measured by its radioactive isotope (^{65}Zn).—See A., 1944, III, 213.

Neurogenic factor in intestinal obstruction. R. F. Antoncic (*Surg. Gynec. Obstet.*, 1941, **72**, 728—731).—Dogs were prepared with closed jejunal loop obstructions. Denervation of the closed loops did not affect intestinal motility. Denervation of the loops prolonged the life of the operated dogs. P. C. W.

Chronic adrenal deficiency and its effects on responses of isolated rabbit intestine.—See A., 1944, III, 186.

Effect of thiamin, riboflavin, or pyridoxine deficiency on the intestinal absorption of galactose in the rat.—See A., 1944, III, 199.

Vitamin-*C* and its importance in illness of gastro-intestinal tract.—See A., 1944, III, 201.

Intra-abdominal application of sulphanilamide in acute appendicitis. J. E. Thompson, J. A. Brabson, and J. M. Walker (*Surg. Gynec. Obstet.*, 1941, **72**, 722—727).—Complications were reduced and healing was more rapid. P. C. W.

Omental adhesions syndrome. J. C. McCann (*Surg. Gynec. Obstet.*, 1941, **72**, 707—721).—A post-operative syndrome is described in 23 cases where dysfunction of the transverse colon was produced by fibrosed omentum becoming adherent under tension to a low abdominal incision. P. C. W.

Case of congenital microcolon. K. C. McKeown and C. A. Holman (*Brit. Med. J.*, 1944, I, 115—116).—Case report, with post-mortem findings. I. C.

XIV.—LIVER AND BILE.

Liver function tests. J. G. Mateer, J. I. Baltz, D. F. Marion, and J. M. MacMillan (*J. Amer. Med. Assoc.*, 1943, **121**, 723—728).—A review of the kephalin–cholesterol flocculation, intravenous hippuric acid, colloidal Au, and bromsulphalein tests. An improved bromsulphalein test is described. C. A. K.

Liver function tests in clinical medicine. F. Steigmann, H. Popper, and K. A. Meyer (*J. Amer. Med. Assoc.*, 1943, **122**, 279—285).—A review. C. A. K.

Liver function in newborn infant. G. W. Salmon and E. Ehrenfest (*J. Pediat.*, 1943, **23**, 522—533).—There is no relationship between the degree of blood destruction in the newborn child as indicated by changes in the packed cell vol. and the severity of the icterus, as indicated by the icterus index. There is no difference in the ability of the liver to excrete bromsulphalein in newborn infants whose icterus index rises to 20 units or above and those whose icterus index remains below 20. The ability of the liver of newborn infants to excrete bromsulphalein is similar to that of adults. The kephalin–cholesterol flocculation test is positive during the first few days of life and becomes negative towards the end of the first week. C. J. C. B.

Liver function in heart disease. I. Chávez, B. Sepúlveda, and A. Ortega (*J. Amer. Med. Assoc.*, 1943, **121**, 1276—1282).—In heart failure liver function is damaged as shown by blood-bilirubin levels, bromsulphalein test, and urinary urobilinogen. The Takata-Ara and galactose-tolerance tests are of little val. in these cases. C. A. K.

Detoxication of borneol by glycuronic acid in man [test of liver efficiency]. II. Pathological cases. R. Ottenberg, H. Wagreich, A. Bernstein, and B. Harrow (*Arch. Biochem.*, 1943, **2**, 63—66; cf. A., 1941, III, 1056).—Of 14 patients with severe liver damage, 11 showed low excretion of glycuronides; of 6 with mild liver damage, 3 showed low glycuronide excretion. 7 of 8 patients with no diagnosed liver damage showed low glycuronide excretion. 1 g. of borneol was well tolerated and had no unusual effects. E. R. S.

Action of liver extracts in counteracting toxic effects of diethylstilbœstrol and sulphanilamide. I. M. Chamelin and C. Funk (*Arch. Biochem.*, 1943, **2**, 9—14).—Intraperitoneal injection of 650 mg. of stilbœstrol or 400 mg. of sulphanilamide per kg. into rats caused 50% mortality in 1—2 days. Mortality was diminished to 25% by simultaneous administration of total liver extract in doses of 100 mg. per kg. E. R. S.

Prevention and diagnosis of liver dysfunction. S. A. Portis (*J. Amer. Med. Assoc.*, 1943, **121**, 733—736).—Lecture and case report. C. A. K.

Liver deaths. C. G. Heyd (*J. Amer. Med. Assoc.*, 1943, **121**, 736—737).—A lecture. C. A. K.

Kephalin–cholesterol flocculation test in liver disease. K. Y. Yardumian and B. J. Weisband (*Amer. J. clin. Path.*, 1943, **13**, 383—392).—This test is especially valuable in the differentiation of early hepatogenous from obstructive jaundice. False positive reactions are seldom encountered. The degree of flocculation is indicative of the extent of liver damage. C. J. C. B.

Kephalin flocculation test in jaundice. P. A. Kirschner and S. I. Glickman (*J. Lab. clin. Med.*, 1943, **28**, 1721—1724).—Of 75 cases of obstructive jaundice, 62 were " negative." Of 58 cases of hepatitis, 20 were negative and 38 positive. Of 4 cases of postarsenical icterus, all were negative. Of 17 cases of cirrhosis with jaundice, 12 were positive. In 3 cases of hæmolytic jaundice, the reaction was negative in 2, positive in 1. C. J. C. B.

Portal cirrhosis. C. H. Greene (*J. Amer. Med. Assoc.*, 1943, **121**, 715—720).—A review. C. A. K.

Epidemic hepatitis. N. G. Markoff (*Schweiz. med. Wschr.*, 1943, **73**, 349—351).—A lecture. A. S.

Infarction of the liver and hypoprothrombinæmia. L. Kaplan, M. A. Perlstein, and E. R. Hess (*Amer. J. Dis. Child.*, 1943, **65**, 258—264).—A newborn infant is described as an example of a bleeding diathesis occurring at birth that failed to respond to adequate parenterally and orally administered doses of vitamin-*K* preps. At necropsy a massive infarction of the left lobe of the liver was found. C. J. C. B.

Multiple myeloma with liver infiltration and low prothrombin purpura. J. A. Schindler (*Ann. int. Med.*, 1943, **19**, 140—143).—There was a striking invasion of the liver sinusoids by plasma cells. The low blood-prothrombin content was unaffected by large intravenous doses of 2-methyl-1 : 4-naphthaquinone. There were other clinical and laboratory findings of severe liver damage. A. S.

Variations of plasma-vitamin-*A* after administration of large doses of vitamin-*A* in liver disease. H. Popper, F. Steigman, and S. Zevin (*J. clin. Invest.*, 1943, **22**, 775—783).—In liver disease the tolerance curve following injection of 75,000 i.u. of vitamin-*A* was flatter than normal and paralleled the degree of liver damage. Evidence was obtained that the tolerance curves are not related to the liver saturation of -*A* but to the efficiency of -*A* absorption from the intestine. The disturbed intestinal absorption of -*A* in liver disease is not primarily related to the degree of jaundice but rather to the degree of liver damage. The absorption damage could not be corr. by the administration of various bile acid preps.
C. J. C. B.

Visualisation of biliary tract with air and barium following barium meal. D. B. Faust and C. S. Mudgett (*Ann. int. Med.*, 1943, **19**, 356—367).—A case of emphysema of the gall bladder with incompetency of Oddi's sphincter and general atony of the biliary tract, visualised following a Ba-meal, is reported. A. S.

Pheniodol : new contrast medium for cholecystography. F. H. Kemp (*Brit. Med. J.*, 1943, II, 647—676).—Pheniodol perorally in doses of 3—6 g. gives a good shadow of the gall bladder. It is pleasanter to take than tetraiodophenolphthalein and seldom causes vomiting. I. C.

Diverticulum of gall bladder. M. Golob (*Amer. J. digest Dis.*, 1943, **10**, 148—151).—Review of literature and case report.
N. F. M.

Biliary constipation. H. Gauss (*Amer. J. digest. Dis.*, 1943, **10**, 141—143).—Functional disorders of the biliary tract are a common cause of constipation in middle-aged persons and should be treated with bile or bile salts orally. N. F. M.

Postural treatment of biliary colic [in relation to the prevention of acute cholecystitis]. D. Macdonald (*Amer. J. digest. Dis.*, 1943, **10**, 138—141).—The prone position is recommended. N. F. M.

Stricture [resulting from scarring] of the bile ducts treated with vitallium tube. H. E. Pearse (*Surgery*, 1941, **10**, 37—44).—Report of 3 cases in which vitallium tubes were introduced permanently into strictured bile ducts. G. P.

Mechanism of bile flow inhibition on distension of colon or stimulation of its nerve supply. J. Warkentin, J. H. Huston, F. W. Preston, and A. C. Ivy (*Amer. J. Physiol.*, 1943, **138**, 462—464).—Distension of the proximal colon inhibits hepatic bile flow in 70% of anæsthetised dogs, even after decentralisation of the cœliac ganglion, double vagotomy, splanchnicotomy, and excision of the lumbar sympathetics. A. S.

Biliary amylase in fowl. D. S. Farner (*Biol. Bull.*, 1943, **84**, 240—243).—The bile of the domestic fowl contains an amylase secreted by the liver. Its optimum pH is similar to that of pancreatic amylase. The amylolytic activity of pancreatic juice is 10—800 times that of bile. G. P. W.

XV.—KIDNEY AND URINE.

Renal dwarfism. F. S. McConney, J. McGeachy, and A. Gelber (*Canad. Med. Assoc. J.*, 1943, **49**, 415—416).—A case report.
C. J. C. B.

Bilateral cortical necrosis of kidneys following severe burns. C. E. Brown, C. Hill, and G. L. Crane (*J. Amer. Med. Assoc.*, 1943, **122**, 871—872).—Fatal case report. C. A. K.

Cytological study of tubular epithelium in acute and chronic canine Bright's disease with special reference to the mitochondria. F. Bloom (*Amer. J. Path.*, 1943, **19**, 957—967).—The morphological mitochrondrial pattern is closely correlated with the general histological appearance of the tubular epithelium as determined by routine stains. (31 photomicrographs.) C. J. C. B.

Renal function in myxœdema. G. E. Beaumont and J. D. Robertson (*Brit. Med. J.*, 1943, II, 578).—Urea clearance is diminished in myxœdema and rises after thyroid therapy but still remains below normal. Water excretion and urine concn. are normal in myxœdematous patients. I. C.

Effect of injections of testosterone propionate on male subject with nephrotic syndrome. S. H. Bassett, E. H. Keutmann, and C. D. Kochakian (*J. clin. Endocrinol.*, 1943, **3**, 400—404).—Intramuscular injections of testosterone propionate (25—50 mg. daily; total : 1375 mg. in 40 days) increased the rate of protein deposition in the tissues, increased slightly the proteinuria, and caused retention of salt and water with consequently increased tendency to œdema.
P. C. W.

Production of nephrosclerosis in fowls by sodium chloride. H. Selye (*J. Amer. Vet. Med. Assoc.*, 1943, **103**, 140—143).—Barred Rock 2-day-old chicks given 2% NaCl instead of drinking water died within 3 days; they showed diarrhœa, generalised œdema, and accumulation of fluid in the serous cavities. Three of 12 chicks given 0·9% NaCl died within 5 days, the remainder surviving up to 20 days and showing symptoms of nephritis. Water retention and renal changes resembling Bright's disease in man were observed. No abnormalities resulted from giving 0·3% NaCl for a period of 2 weeks. E. G. W.

Relation of pyelonephritis to toxæmias of pregnancy. G. C. Prather and W. Sewall (*Surg. Gynec. Obstet.*, 1941, **72**, 781—786).—An analysis of succeeding pregnancies among 72 patients who had pyelonephritis during one pregnancy does not support the view that pyelonephritis is a cause of pregnancy toxæmia. P. C. W.

Acute glomerulonephritis occurring in three children in the same family. R. B. Tudor (*Amer. J. Dis. Child.*, 1943, **66**, 528—530).—In 4 children in 1 family, aged 3—5 years, infections of the upper respiratory tract developed which were followed in a few days by mild to severe signs of acute glomerulonephritis in 3 of them.
C. J. C. B.

Severe renal irritation from foreign protein fever therapy. R. D. Taylor and I. H. Page (*J. Amer. Med. Assoc.*, 1943, **121**, 754—755).—Intravenous injection of typhoid vaccine produced hæmaturia and marked reduction of urea clearance in 1 case of malignant hypertension and in 1 case of nephrotic stage of hæmorrhagic Bright's disease. C. A. K.

Renal glycosuria in recruits. H. Blotner and R. W. Hyde (*J. Amer. Med. Assoc.*, 1943, **122**, 432—435).—367 cases of glycosuria occurred in 45,650 consecutive recruits, 33 of these being renal glycosuria. Most of the men were under 30, and there was a diabetic family history in 32%, compared with 5% in non-diabetic controls. There were no symptoms. C. A. K.

Pharmacodynamics of urine excreted during migraine headache and its relation to 17-ketosteroid content. C. Torda and H. G. Wolff (*J. clin. Invest.*, 1943, **22**, 853—858).—Urine collected during attacks of migraine headache caused the rectus abdominis muscle of the frog to contract to a greater degree than did specimens collected during the attack-free periods. Specimens collected during the prodromic period induced least contraction. The 17-ketosteroid content of urine increased with an increase in the contraction-producing effect, as demonstrated by chemical and biological assays. The increase in contraction was probably not due to K, acetylcholine, or histamine, and was not related to the sp. gr. of the urine. It is suggested that steroid compounds may participate in the production of an attack of migraine headache by potentiation of the effect of a locally liberated vasodilator neurohumoral substance.
C. J. C. B.

Excretion of urinary antidiuretic principle in renal hypertensive dogs. D. B. Frankel and G. E. Wakerlin (*Amer. J. Physiol.*, 1943, **138**, 465—467).—The excretion of the urinary antidiuretic principle in dogs during normal hydration and during dehydration was not changed by the production of experimental renal (Goldblatt) hypertension. A. S.

Effect of exercise on chloride excretion in man during water diuresis and during tea diuresis. M. G. Eggleton (*J. Physiol.*, 1943, **102**, 140—154).—The urines of tea and water diuresis were similarly affected by a 40—60-sec. sprint in the following ways : PO_4''' and NH_3 excretion and titrable acidity were increased; creatinine, total N, Cl′ excretion, and pH were decreased. Individual variations in duration of inhibition of flow were large, but were similar after tea or water. The diureses were differently affected by exercise, the decreases in total N, Cl′, and water output being only temporary in tea diuresis. (Total output of water after tea was 1·55 times that after water; total Cl′ output after water was only 40% of that after tea.) In the absence of exercise the Cl′ excretion was 30% subnormal during water, and 50% increased during tea, diuresis. The less is the water diuresis, the smaller is the output of Cl′.
W. H. N.

March hæmoglobinuria. R. A. Palmer and H. S. Mitchell (*Canad. Med. Assoc. J.*, 1943, **49**, 465—472).—Report of 2 cases.
C. J. C. B.

"Sulphonamide" crystals in urine. B. L. Della Vida (*Chem. Products*, 1944, **7**, 20—22).—The crystals formed by sulphanilamide, sulphapyridine, sulphathiazole, sulphadiazine, and sulphaguanidine are described. J. E. P.

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

Social medicine : its meaning and its scope. J. A. Ryle (*Brit. Med. J.*, 1943, II, 633—636).—A review. I. C.

Physics and surgeon. H. S. Souttar (*Brit. Med. J.*, 1943, II, 737—740.—A lecture. I. C.

Population problem of India. D. B. Blacklock (*Brit. Med. J.*, 1943, II, 805—807).—A review from the social and medical viewpoints. I. C.

Treatment of gunshot fractures of limbs [shock]. S. S. Yudin (*Brit. Med. J.*, 1943, II,657—572).—From the experience gained in 18 months of war the following method of treatment of gunshot fractures has been evolved: warmth, hot drinks, and blood transfusion are given to shocked patients before operation; spinal anæsthesia is induced and the limbs are put on the extension apparatus and thoroughly washed with soap and water; a large excision of the wound is then made; all necrotic tissues are removed together with foreign bodies and bone fragments separated from the periosteum; the excision is made in such way as to leave a funnel-shaped aperture for drainage which is kept open by suturing the skin to the underlying muscle; sulphanilamide is applied locally or/and given by mouth; the limb is then immobilised in plaster. With this technique 95% of the patients had their limbs saved. Details of the operative procedure in the field are given. I. C.

Adhesions from hot laparotomy pads. F. E. Kredel and H. G. Smithey (*Surgery*, 1941, **10**, 45—48).—Moist laparotomy pads at 45° or above damage the peritoneum and produce abdominal adhesions. G. P.

Rate and periodicity of mitotic activity in regenerating epidermis of healing wounds in rabbits. C. M. Blumenfeld (*Arch. Path.*, 1943, **36**, 493—498).—Wounds were made in the skin of each of 10 young male albino rabbits at 8 a.m., 12 noon, 4 p.m., 8 p.m., midnight, and 4 a.m. Each wound was removed exactly 7 days after it was made. The piece of skin removed to make the wound served as the control. Mitotic acivity in normal epidermis displayed diurnal periodicity, being min. at 8 a.m., 5·96 mitoses per 0·004 cu. mm. of epidermis, and max. at 4 a.m., 9·16 mitoses per 0·004 cu. mm. The difference is statistically significant. In regenerating epidermis, mitotic activity was increased to twice that of normal epidermis. There was periodicity of mitotic activity, with a min. rate of 12·65 per 0·004 cu. mm. at 8 p.m. and a max. rate of 19·62 per 0·004 cu. mm. at 4 a.m. The difference is statistically significant. C. J. C. B.

Tensile strength of sutured skin wounds. T. W. Botsford (*Surg. Gynec. Obstet.*, 1941, **72**, 690—697).—An apparatus is described for testing the tensile strength of wounds in guinea-pigs and dogs. There are wide variations in healing ability in different animals and in different wounds in the same animal. Secondary sutures are valuable. Wounds sutured with silk were stronger than those sutured with catgut. Spleen extracts or embryonic extract ("Epicutan") had no effect on wound healing. P. C. W.

Syndrome of cutaneous fragility and hyperelasticity and articular hyperlaxity. B. Benjamin and H. Weiner (*Amer. J. Dis. Child.*, 1943, **65**, 247—257).—Report of 2 cases and a review. C. J. C. B.

Galvanic skin reflex. O. A. M. Wyss (*Helv. Physiol. Pharm. Acta*, 1943, **1**, C72—74).—The method is described. A. S.

Principles of insecticidal action [permeability of blow-fly larva cuticle].—See A., 1944, III, 214.

Rapid removal of excess joint fluid by acid salts. Experiments with traumatic hydrarthrosis of the knee joint. L. Pelner (*Amer. J. med. Sci.*, 1943, **206**, 498—503).—The use of the low-Na acid or neutral ash diet coupled with adequate dosage of NH_4Cl (90 grains per day) rapidly diminished the effusion in 4 cases of traumatic hydrarthrosis. C. J. C. B.

Experimental paradentosis. T. Gordonoff (*Helv. Physiol. Pharm. Acta*, 1943, **1**, C60—61).—Extirpation of the submaxillary and sublingual salivary glands in rats kept on a mixed diet produced marked paradentosis within 4 months. A. S.

Acclimatisation of marine fishes to temperature. P. Doudoroff (*Biol. Bull.*, 1942, **83**, 219—244).—*Girella nigricans* (a littoral fish from California) is killed by low temp. well above 0°. This is no less important as a possible limiting factor in distribution than heat injury. Acclimatisation to different temp. has a pronounced influence on subsequent resistance to cold as well as to heat. The time relations of acclimatisation, and the effect of time of exposure on the highest and lowest temp. tolerated, are investigated in detail. G. P. W.

Illumination and melanin content of fishes. I. F. B. Sumner and P. Doudoroff. **II.** F. B. Sumner (*Biol. Bull.*, 1943, **84**, 187—194, 195—205).—I. A method for the extraction and colorimetric determination of melanin in fishes is described (see C, 1944, Part 2).

II. *Girella nigricans*, kept for 2—4 months on backgrounds ranging from black through three greys to white, showed differences in (*a*) distribution of pigment within the chromatophores, and (*b*) total amount of melanin pigment, apparently due to loss of pigment in pale-adapted fishes. In *Fundulus parvipinnis*, the effects were less pronounced. G. P. W.

Methods of estimating melanophore responses. G. H. Parker (*Biol. Bull.*, 1943, **84**, 273—284).—A crit. review. G. P. W.

Pigmentation of cave animals. I. E. Baldwin and R. A. Beatty. **II.** R. A. Beatty (*J. Exp. Biol.*, 1941, **18**, 136—143, 144—152).—I. A study of the pigments of 3 *Asellus* species, one of which is cavernicolous. *A. aquaticus* does not lose melanin when kept in the dark.

II. A study of the available carotenoids in org. detritus in caves. G. P. W.

Body temperature of frog. K. Mellanby (*J. Exp. Biol.*, 1941, **18**, 55—61).—In water, *Rana temporaria* is never as much as 0·1° warmer (rectal temp.) than the water. In moderately rapidly moving air, its temp. is the wet-bulb temp. It can survive a loss of about 25% of its wt. by evaporation. G. P. W.

Factors controlling firefly luminescence. R. S. Alexander (*J. Cell. Comp. Physiol.*, 1943, **22**, 51—71).—The flash can be seen microscopically to be located at the periphery of the photogenic cells near the base of a tracheole, and involves the sudden admission of O_2 to these cells. CN' or anæsthetics cause flashing to be replaced by a steady glow, which is attributed to the relaxation of the contractile ring which normally keeps the tracheole closed. Intra-abdominal injection of distilled water does not inhibit flashing, so that the view of Maluf, that activity is due to osmotic effects, is not tenable. V. J. W.

Reactions of a copepod to directional and diffuse light. W. Schallek (*Biol. Bull.*, 1943, **84**, 98—106). G. P. W.

Oxygen consumption of *Thyone briareus* (Holothurioideæ) as a function of oxygen tension and hydrogen-ion concentration of the surrounding medium. W. A. Hiestand (*Trans. Wisconsin Acad. Sci.*, 1940, **32**, 167—175).—The O_2 consumption of *T. briareus* is independent of the O_2 tension of the water unless this falls to below ¼ of saturation. Below this O_2 concn. O_2 consumption falls. In sea-water respiration is inversely proportional to pH between 5·4 and 8·8. L. G. G. W.

Osmotic pressure and marine invertebrates. F. L. Topping and J. L. Fuller (*Biol. Bull.*, 1942, **82**, 372—384).—The distribution of 14 species in a Maine estuary is given, with f.p. vals. for the environment. In experiments, the survival of *Nereis virens* in fresh water is extended as the process of transfer is made more gradual. Down to 16% sea-water, its wt. is const. but its respiration rises with dilution; below 16%, it swells and its respiration falls. Individuals of *N. virens*, *Gammarus*, *Mytilus*, and *Mya* from brackish water survive dilution better than those from the open sea. G. P. W.

Tolerance of the snail *Thais floridana* to waters of low salinity. V. Schechter (*Ecology*, 1943, **24**, 493—499).—At low salinities (1% and below) *T. floridana* is partly or wholly immobilised. 1—2 weeks' exposure to salinities below 0·7% at 20° is fatal but for exposures of less than 1 week salinities below 0·7% are less toxic than 0·7%. Susceptibility to low salinity is most marked with small snails. L. G. G. W.

Feeding reactions in sea anemones. C. F. A. Pantin and A. M. P. Pantin (*J. Exp. Biol.*, 1943, **20**, 6—13).—The initiation of feeding reactions in *Anemonia sulcata* by mechanical and electrical stimulation and by various chemical substances is described, and the range of chemical sensitivity in different coelenterates is discussed. A high sensitivity to proteins and a lack of response to carbohydrates appear to be fairly general in the group, although certain differences occur, both between species and between the parts of the same animal. G. P. W.

Physiology of gastropod mollusc. V. Fretter (*J. Marine Biol. Assoc.*, 1943, **25**, 685—720).—A study of digestion, respiration, reproduction, and development in *Onchidella celtica*. G. P. W.

Sexual cycle in *Toredo navalis*. B. H. Grave (*Proc. Indiana Acad. Sci.*, 1941 (1942), **51**, 265).—Individuals of this species may change their sex more than once during their life. L. G. G. W.

Humidity, moisture, and behaviour of wireworms. A. D. Lees (*J. Exp. Biol.*, 1943, **20**, 43—53, 54—61).—I. *Agriotes* larvæ (the cuticle of which is very permeable to water) avoid dry air. This is due partly to kinesis and partly to klino-taxis. The receptors are on the appendages of the head and their functioning is due to the rate of evaporation of water.

II. The method of burrowing is described. The larvæ rapidly migrate from dry into wet sand. This is due to ortho-kinesis. Feeding activity is reduced when the moisture is high. G. P. W.

Body temperature and energy production of muscles of insects. A. Krogh and E. Zeuthen (*J. Exp. Biol.*, 1941, **18**, 1—10).—*Vanessa*, *Bombus*, and *Geotrupes* warm themselves up before flight, usually to above 30°, by vibrating the wing muscles. They cannot fly unless the muscle temp. exceeds a certain val.; this is probably due to properties of the muscles themselves. G. P. W.

Temperature and beetle activity. D. L. Gunn and H. S. Hopf (*J. Exp. Biol.*, 1942, **18**, 278—289).—In *Ptinus tectus*, there is a stimulating effect of change of temp., the magnitude of which depends on the speed and direction of the change. G. P. W.

Temperature, humidity, and a beetle life cycle. D. W. Ewer and R. F. Ewer (*J. Exp. Biol.*, 1942, **18**, 290—305).—Effects of temp. and humidity on oviposition, feeding, and duration of life in *Ptinus tectus* show that this beetle is adapted to a temperate climate with high humidity. G. P. W.

Temperature preference in a beetle. D. L. Gunn and B. M. Walshe (*J. Exp. Biol.*, 1942, **19**, 133—140).—*Ptinus tectus* chooses temp. around 24°, which are favourable for growth and other activities. G. P. W.

Diurnal rhythm in a beetle pest. E. W. Bentley, D. L. Gunn, and D. W. Ewer (*J. Exp. Biol.*, 1941, **18**, 182—195).—*Ptinus tectus* is active at night. The diurnal rhythm persists either in alternating light and darkness at 25°, or in const. illumination with diurnally fluctuating temp. If both temp. and illumination are held const., the rhythm persists for a few days, then dies out. G. P. W.

Host selection in a beetle. A. C. Crombie (*J. Exp. Biol.*, 1941, **18**, 62—79).—*Rhizopertha dominica*, a pest of stored grain, finds a suitable environment by olfaction and then chooses oviposition sites by touch. The olfactory receptors are on the antennæ and legs. No preference was shown for particular foods on which they had been reared, but after prolonged exposure a repulsive odour (peppermint) was tolerated. G. P. W.

Crowding and fertility in grain-infesting insects. A. C. Crombie (*J. Exp. Biol.*, 1942, **19**, 311—340).—In *Rhizopertha*, *Oryzæphilus*, and *Sitotroga*, crowding depresses oviposition because of competition for suitable sites. Starvation depresses egg production. Media conditioned by previous infestation have a " poisoning " effect on fecundity in *Rhizopertha*. G. P. W.

Honey-bees and light. C. G. Butler and D. J. Finney (*J. Exp. Biol.*, 1942, **18**, 206—212).—The stimulating effect of solar radiation on honeybees is due to visible, not ultra-violet, light. G. P. W.

Foraging behaviour of honey-bees. C. G. Butler, E. P. Jeffree, and H. Kalmus (*J. Exp. Biol.*, 1943, **20**, 65—73).—112 Petri dishes of sugar syrup were arranged at 20-yard intervals in a meadow. Individual bees tended to return repeatedly to one chosen dish. The effects of variation in syrup concn., and of exhaustion of the dish, were observed. Bees also tend to return always to the same patch of willow herb or cultivated thistle, even though many patches are available. Foraging bees spend more time per visit at a flower patch than they do at a dish. G. P. W.

Behaviour of woodlice. N. Waloff (*J. Exp. Biol.*, 1941, **18**, 115—135).—An analysis of the reactions which cause 3 species of woodlice to collect in moist, dark situations. G. P. W.

Narcosis and asphyxiation in *Drosophila*. H. Kalmus (*J. Exp. Biol.*, 1942, **19**, 238—254).—The effect of physiological condition and of genotype on susceptibility to narcosis and on resistance to respiratory poisons is studied. G. P. W.

Histological effects of pyrethrum and an activator on central nervous system of housefly. A. Hartzell and H. I. Scudder (*J. Econ. Entom.*, 1942, **35**, 428—433).—The effect of 0·1% of pyrethrum, 1% of *iso*butylundecenoamide (an activator of pyrethrum), and a mixture of 0·04% of pyrethrins with 0·6% of activator, all in oil (Deobase), on the histopathology of the central nervous system and of the closely associated fat and muscle tissues of the housefly is discussed. A. A. M.

Biochemistry of strontium and barium. A. O. Voinar and L. N. Lazovskaja (*Biochimia*, 1942, **7**, 244—254).—The presence of Sr and Ba in an organ depends on the amount of Ca and is smaller as the amount of Mg increases. The Sr and Ba of the blood serum of parathyroidectomised animals with hypocalcæmia exhibit a corresponding decrease while the Ca, Sr, and Ba contents of the organs of these and of normal animals remain const. Ca and Sr in arterial blood vessels increase with age (Ba exhibits no regular change) while the ratio Sr : Ca in arterial ash is const. H. G. R.

XVII.—TUMOURS.

Carcinogenic hydrocarbons and synthetic œstrogens. R. H. Martin (*Chem. and Ind.*, 1944, 94—95).—Since the C skeleton of the synthetic œstrogen ββ-di-(*p*-hydroxyphenyl)-γ-ethylhexane (Blanchard *et al.*, A., 1943, III, 810) can be arranged so as to coincide with those of the carcinogens 9 : 10-dimethyl-1 : 2-benzanthracene and cholanthrene, it is suggested that examination of ββ-diphenyl-γ-ethylhexane for carcinogenic (and growth-inhibitory) activity might be of interest. Similar considerations pointed to a possible relationship (in structure and biological action) between the hitherto unknown 4′ : 9 : 10-trimethyl-1 : 2-benzanthracene and the carcinogenic hydrocarbon 20-methylcholanthrene. A. H.

Odorants and carcinogens. R. W. Moncrieff (*Manufg. Chem.*, 1944, **15**, 44—47, 50).—A speculative discussion of possible relationships.

Production of malignancy *in vitro*. I. Method of cleaning glassware. II. Photomicrographic equipment. III. Microcinematographic equipment. IV. Mouse fibroblast cultures and changes seen in living cells. W. R. Earle. **V. Results of injection of cultures into mice.** W. R. Earle and A. Nettleship. **VI. Pathology of tumours produced.** A. Nettleship and W. R. Earle (*J. Nat. Cancer Inst.*, 1943, **4**, 131—133, 135—145, 147—164, 165—212, 213—227, 229—248).—I. The glassware was cleaned with hot aq. 80% H_2SO_4 containing a little HNO_3 for 1 day. The acid was steam-heated in an acid-resistant metal kettle. This treatment removed all traces of carcinogens. The acid was washed away by rinsing in distilled water.

II. The camera and inverted microscope were set on the 54-in. bed of a 10-in. lathe set on reinforced concrete standing on cork. The camera had bellows extending to 50 in. and holds a rotating 8 × 10-in. plateholder. The microscope was housed in an air-bath at 38°.

III. A 35-mm. cinema camera and microscope were set on a lathe bed. An arrangement to take an image of a watch was incorporated.

IV. A strain of fibroblasts from subcutaneous and adipose tissue of a male *C3H* mouse was grown in Carrel flasks in horse serum–chick embryo extract saline solution for 291 days before adding methylcholanthrene (1 μg. per c.c.). Cells were grown in presence of the carcinogen for 6, 32, 111, 184, and 406 days. The methylcholanthrene decreased the rate of increase in width of the cultures after a few days, and this decrease continued for 400 days. After 40 days' exposure the terminal cell processes became shorter and amœboid in appearance. The cells became more coherent and produced sheets similar to epithelial sheets in tissue culture. The cell cytoplasm became granular. The induced characters remained when the carcinogen was removed. Control cultures (*H* and *D*) showed similar changes after cultivation for much longer periods and these changes may have been due to contamination with methylcholanthrene.

V. Cultures from 5 treated and 2 control strains of cultures were injected into male *C3H* mice with a trochar. The strains gave rise to the following % of tumours : *H* (control) 7·7, *D* (control) 86, *H* (treated with carcinogen for 6 days) 72, *J* (treated for 32 days) 20, *L* (treated for 111 days) 46, *N* (treated 184 days) 7·6, *O* (treated 406 days) 7·6. The tumours were sarcomas which grew to cause death, and could be transplanted. With a concn. of 1 μg. of methylcholanthrene max. tumour production probably occurs with exposure to the carcinogen for less than 6 days.

VI. The sarcomas were similar to those induced by injection of carcinogens into mice. Tumours from cells exposed for the longer periods (*N*) showed increased invasiveness and variation in cell pattern. Giant cells and abnormal mitoses were more common in tumours from strain *N* than in tumours from strains *J* and *L*. Metastases were most common from the tumours derived from strain *L*. E. B.

Carcinogenesis with ultra-violet radiation of wave-length 2800—3400 A. J. A. Bain and H. P. Rusch (*Cancer Res.*, 1943, **3**, 425—430).—Tumours were produced in mice by exposure to the wave band 2800—3400 A. More energy of these λλ was needed than when the whole Hg arc spectrum was used. Small amounts of energy applied over a long time were more efficient than large doses given for short periods. F. L. W.

Effect of methylcholanthrene on epidermal sodium and calcium. V. Suntzeff and C. Carruthers (*Cancer Res.*, 1943, **3**, 431—433).—One application of methylcholanthrene reduced the Ca content of mouse epidermis within a few days to approx. 50% of the normal content. Multiple applications of the carcinogen on alternate days induced only slight further lowering. Epidermal Na was not affected by similar treatment. F. L. W.

Occurrence and transplantation of embryonal nephromas in the rabbit. H. S. N. Greene (*Cancer Res.*, 1943, **3**, 434—440).—Four embryonal nephromas occurred in a large colony of rabbits during a period of 14 years. The growths were morphologically identical with similar human neoplasms. Because of the extreme variation in biological behaviour in the two species it is concluded that the rabbit tumours are not analogous to the well-defined Wilms tumour in man. F. L. W.

Mammary cancer in fostered and unfostered *C3H* breeding females and their hybrids. J. J. Bittner (*Cancer Res.*, 1943, **3**, 441—447).—Foster nursing does not alter the inherited susceptibility to the spontaneous development of mammary carcinoma in mice. The active milk influence may appear at any time in the life of a mouse. If it occurs in animals whose mammary glands have developed in the absence of the active agent mammary cancer usually does not result. Females having the active milk influence and not developing cancer may transfer this influence to their progeny by nursing. The average age for development of mammary cancer in inbred mice may change with continued inbreeding. The incidence of mammary cancer may be influenced by the average cancer age. F. L. W.

Effect of hypothermia. I. Acute physical and physiological changes induced by the prolonged hypothermic state in the rabbit. I. Ariel, F. W. Bishop, and S. L. Warren. **II. Active rôle of thyroid gland in hypothermic states in the rabbit. III. Effect of a**

single short period of hypothermia on the Brown–Pearce rabbit epithelioma. I. Ariel and S. L. Warren. **IV. Rise of serum-magnesium in rabbits during the hypothermic states as shown by the spectrochemical method.** L. T. Steadman, I. Ariel, and S. L. Warren (*Cancer Res.*, 1943, **3**, 448—453, 454—463, 464—470, 471—474).—I. A rectal temp. of 20° or higher can be maintained in the rabbit for periods up to 48 hr. with spontaneous recovery. Temp. of 20° down to 10° are possible but recovery is less. A pseudohibernation can be produced by maintaining a rectal temp. of 23—28°. After the initial effort of the body to compensate for heat loss the vital signs diminish as the body temp. falls until at low temp. (10—15°) an inanimate state is produced. The presence of a 2-weeks-old Brown–Pearce epithelioma did not change the reaction of the rabbit to the hypothermia.

II. In hypothermic rabbits (body temp. 27—10°) the thyroid is engorged and enlarged and there is microscopic evidence of hyperactivity of the follicular epithelium. Metabolism is greatly increased, particularly during recovery from temp. near 25°. As the temp. falls the metabolism diminishes rapidly and is nearly zero at 19°. Prolonged maintenance of hypothermia (30—48 hr.) at 25—28° results in thyroid hypoactivity. The ability of the rabbit to withstand hypothermic states depends in part on the state of activity of the thyroid and its capacity to function over a prolonged period at low temp.

III. Short periods of hypothermia (6 hr. at 18°, 8 hr. at 20°, 24 hr. at 30°) changed the growth curve of the Brown–Pearce rabbit epithelioma. Growth was retarded during the week following treatment. After the second week growth was normal. The no. of animals succumbing from metastases was increased. No cures were obtained.

IV. Serum-Mg and -Na levels were determined in 8 normal and 4 tumour-bearing rabbits before and after 2—5 hr. of the hypothermic state. Initial serum-Mg was 2·63 mg. per 100 ml. A rise of 24% occurred after the hypothermic state. There was no relation with the duration or level of the state. Serum-Na showed wide fluctuation (−20% to +19%). F. L. W.

***B* vitamins in human, rat, and mouse neoplasms.** M. A. Pollack, A. Taylor, and R. J. Williams (*Univ. Texas Publ.*, 1942, No. 4237, 56—71).—Extensive analytical data are given for *B* vitamins in human malignant tumours, and in rat and mouse tumours of both the transplanted and chemically induced types. The *-B* content of tumour material is highly uniform and independent of species, site, or manner of induction. Levels are in general lower than in normal tissues; the vitamin present at the highest relative level is folic acid. E. C. W.

Diethylstilbœstrol excretion in tumour-bearing rabbits. A. D. Bass and W. T. Salter (*Yale J. Biol. Med.*, **15**, 729—733).—There were no differences in the urinary excretion curves of normal rabbits and rabbits bearing intraocular transplantations of an adenocarcinoma of rabbit uterus. F. S.

Experimental brain tumours produced with benzpyrene. H. M. Zimmerman and H. Arnold (*Amer. J. Path.*, 1943, **19**, 939—950).—Pellets of 3 : 4-benzpyrene were implanted in the right cerebral hemispheres of 47 *C3H* mice of both sexes. 28 tumours developed, of which 14 were gliomas, 9 were intracranial fibrosarcomas, 2 were extracranial fibrosarcomas, 2 were extracranial rhabdomyosarcomas, and 1 was a mixed glioma and sarcoma. The appearance of ependymoblastomas around pellets implanted in the ventricular system suggests that the type of glioma depends on the site of its development. No difference in the survival time of mice with gliomas and intracranial sarcomas induced with benzpyrene was found. (9 photomicrographs.) C. J. C. B.

Enzyme deficiency in human and experimental cancer. R. C. Roskelley, N. Mayer, B. N. Horwitt, and W. T. Salter (*J. clin. Invest.*, 1943, **22**, 743—751).—Most neoplasms are deficient in cytochrome-oxidase system or succinoxidase activities, but only frank cancers exhibit characteristic changes involving also aërobic glycolysis. In animals developing neoplasia under the influence of a chemical carcinogenic agent or of a virus, loss of cytochrome system activity precedes the histological appearance of aërobic glycolysis. Neoplastic tissue which is obviously not malignant may show striking diminution in this capacity for oxidative activity. C. J. C. B.

Carcinoma of duodenum. J. W. Howard (*Amer. J. med. Sci.*, 1943, **206**, 735—745).—3 cases of carcinoma of the duodenum are reported including one associated with erosion of the superior mesenteric artery; the literature is reviewed. (4 photomicrographs.) C. J. C. B.

Diagnosis of cancer of colon and rectum. A. Trasoff and D. H. Goodman (*Amer. J. digest. Dis.*, 1943, **10**, 132—133).—A statistical analysis of 120 cases with special reference to symptoms and signs. The need for complete investigation including radiology and proctoscopy is stressed. N. F. M.

Metastatic melanotic sarcoma of ileum causing intussusception. J. R. Phillips (*Amer. J. digest. Dis.*, 1943, **10**, 147—148).—A case report. N. F. M.

Malignant lesions of cæcum and ascending colon. C. W. Mayo and W. R. Lovelace (*Surg. Gynec. Obstet.*, 1941, **72**, 698—706).—A statistical analysis of 885 cases. P. C. W.

Mixed intracranial gliomas. D. Munro, J. E. Edwards, and W. O. Russell (*Surg. Gynec. Obstet.*, 1941, **72**, 787—797).—Review and discussion with illustrative cases. P. C. W.

Inhibition in enzyme systems.—See A., 1944, III, 217.

XVIII.—ANIMAL NUTRITION.

Evaluation of nutrition experience in industry. F. C. Bing (*J. Amer. Med. Assoc.*, 1943, **121**, 813—816).—A lecture. C. A. K.

Current nutritional activity in industry. G. R. Cowgill (*J. Amer. Med. Assoc.*, 1943, **121**, 817—820).—A lecture. C. A. K.

National nutrition programme for industry. R. S. Goodhart (*J. Amer. Med. Assoc.*, 1943, **121**, 823—825).—A lecture. C. A. K.

Nutritional diseases as post-war problem. J. B. Youmans (*J. Amer. Med. Assoc.*, 1943, **122**, 11—15).—A review. C. A. K.

Principles of diet in treatment of disease. T. D. Spies (*J. Amer. Med. Assoc.*, 1943, **122**, 497—502).—A special article. C. A. K.

Nutritional principles of mass feeding. G. H. Berryman and P. E. Howe (*J. Amer. Med. Assoc.*, 1943, **122**, 212—216). C. A. K.

Conditioned malnutrition. N. Jolliffe (*J. Amer. Med. Assoc.*, 1943, **122**, 299—306).—A review. C. A. K.

Nutritional deficiency in pathogenesis of disease. J. Yudkin (*Brit. Med. J.*, 1944, I, 5—7).—Description of the principles which may help in evaluating the part played by vitamins in the causation of disease. I. C.

Nutrition in the tropics. D. H. K. Lee (*Austral. J. Sci.*, 1943, **6**, 6—9).—A review of food requirements and production, distribution, and storage of food. H. G. R.

Effects on rats of prolonged feeding with staple African diet. J. Gillman (*Brit. Med. J.*, 1944, I, 149—150).—Gross pathological changes of the liver, frequency of lung lesions, enlarged heart, abundance of adipose tissue, thickened skull, and dental affections, without manifestations of acute vitamin deficiency, resulted from feeding rats for 14 months with mealie-meal porridge and sour milk. Implications of this experiment in human pathology are discussed. I. C.

Adequacy of American diets. H. K. Stiebeling (*J. Amer. Med. Assoc.*, 1943, **121**, 831—838).—A review. C. A. K.

Nutrition in relation to pregnancy and lactation. J. E. Becker, H. J. Bickerstaff, and N. J. Eastman (*Amer. J. Publ. Health*, 1941, **31**, 1263—1270).—A lecture. C. J. C. B.

Nutrition of infants with lactic acid milk. J. Mégevand and V. von Riederer (*Schweiz. med. Wschr.*, 1943, **73**, 334—338).—Good results were obtained with a milk prep. containing 10% of lactic acid and 11·8% of carbohydrates. Normal infants received 130 cal. per kg. body wt. The food was particularly successful in infants maintained on breast and artificial food, in dystrophy, eczema, infantile vomiting, dyspepsia, and premature infants. A. S.

Infant feeding in relation to mortality in Belfast. J. Deeny and E. T. Murdock (*Brit. Med. J.*, 1944, I, 146—148).—Facts concerning infant feeding were obtained in a study of 554 deaths occurring in one year in Belfast and in a control group of 447 living infants. The extent of breast feeding was much less in the infants who died than in the control group. Income, housing, domestic hygiene, order of birth, and cause of death have no appreciable influence on the extent of breast feeding in Belfast. I. C.

Nutritional requirements of the dog. L. Michaud and C. A. Elvehjem (*Nutr. Abs. Rev.*, 1944, **13**, 323—331).—A review and discussion.

Basic food requirements of insects. G. Fraenkel and M. Blewett (*J. Exp. Biol.*, 1943, **20**, 28—34).—Six insects infesting flour (*Tribolium confusum, Silvanus surinamensis, Sitodrepa panicea, Lasioderma serricorne, Ptinus tectus, Ephestia kuehniella*) were reared on diets of casein, carbohydrate, cholesterol, yeast, salts, and water, and the relative importance of the various constituents was analysed. Some species require carbohydrates and others not; this is a factor determining their distribution on different foods. G. P. W.

Improved quality of staple foods. G. R. Cowgill (*J. Amer. Med. Assoc.*, 1943, **122**, 437—440).—A review of enriched and fortified foods. C. A. K.

Nutritive values of fishery products. B. E. Bailey (*Progr. Repts. Fish Res. Bd. Canada, Pacific Sta.*, 1943, No. 57, 11).—Analyses of representative samples of the edible portion of smoked black cod, kippered herring, ling cod fillets, blueback salmon (fresh), and clam nectar show that the vitamin-*A* vals. range from 0 to 7200 U.S.P. units per lb., Ca from 250 to 800 mg. per lb., and P from 20 to 1150 mg. per lb. J. M. S.

Feeding of raw and cooked potatoes and sugar beet to laying pullets. H. Temperton and F. J. Dudley (*J. Agric. Sci.*, 1943, **33**, 204—206).—Feeding raw potatoes with the mash causes a reduction in egg production though cooked potatoes and raw or cooked sugar beet have little effect. Little difference is observed in final body wt. between groups fed on raw potatoes, raw sugar beet, or mash only, but cooking of both potatoes and sugar beet results in an increase of about ½ lb. H. G. R.

Foods of animal origin. H. C. Sherman (*J. Amer. Med. Assoc.*, 1943, **122**, 228—231).—A review. C. A. K.

A high-protein beverage. L. Bauman and H. Gage (*J. Amer. Med. Assoc.*, 1943, **121**, 1283).—Egg white and powdered milk are added to milk so that 100 c.c. of the mixture contains 10 g. of protein and provides 120 cal. It is useful in helping to raise lowered serum-proteins. C. A. K.

Relation of protein content of mother's diet during pregnancy to birth length, birth weight, and conditions of infant at birth. B. S. Burke, V. V. Harding, and H. C. Stuart (*J. Pediat.*, 1943, **23**, 606—615).—Of 216 women whose diets were studied during pregnancy, only 10% consumed 85 g. of proteins; 68% of the diets contained less than 70 g. and 38% less than 55 g. daily. A significant relationship existed between the protein content of the mother's diet during pregnancy and the birth length and wt. of her infant. This increase in birth length and wt. can be demonstrated with each additional increment of protein in the prenatal diet irrespective of the mother's height. C. J. C. B.

Minimum maintenance requirement of enzymic casein hydrolysate. A. J. Mueller, D. Fickes, and W. M. Cox., jun. (*Johns Hopkins Hosp. Bull.*, 1943, **72**, 110—115).—Two dietary levels of a casein hydrolysate of 0·4 and 0·7 g. per kg. were fed to 4 healthy men, who showed on the lower level, a negative N balance and on the higher level, a just adequate N balance. The hydrolysate is thus approx. equiv. to intact protein, maintenance vals. of which are between 0·5 and 0·7 g. per kg. T. F. D.

Essential amino-acid requirements of man. R. J. Block (*Yale J. Biol. Med.*, **15**, 723—728).—It was calc. from the estimated average annual per capita consumption of food in the U.S.A. in 1937—1941 and from other available data that, for optimal nutrition, the average man should ingest daily cystine + methionine 3·5—4 g., arginine 4—5 g., lysine 5—6 g., tryptophan 1—1·25 g., phenylalanine 4—4·5 g., threonine 3·5 g., leucine 10 g., valine 4—4·5 g., and *iso*leucine 3—3·5 g. F. S.

Utilisation of casein and amide-nitrogen by chickens. V. G. Heller and R. Penquite (*Proc. Oklahoma Acad. Sci.*, 1940 (1941), **21**, 85—86).—Casein is a good source of protein for chicken rations whereas urea is of no val. L. G. G. W.

Digestion of whole wheat and white breads in the human stomach. H. H. Rostorfer, C. D. Kochakian, and J. R. Murlin (*J. Nutrition*, 1943, **26**, 123—138).—" Peeled wheat " bread (from flour containing the whole of the grain except the outer epidermis) baked with high-vitamin yeast undergoes gastric proteolytic digestion and salival amylolysis more quickly than does that prepared with ordinary baker's yeast. Meals made with the former bread provide only 0·45 mg. of additional pantothenic acid, the effect produced being similar to that resulting from 2 doses of 16 mg. of Ca pantothenate each taken 8—10 hr. and 1 hr. before the meal. Bread made with high-vitamin yeast from high-extraction flour and containing milk solids (3·5% of wt. of flour) showed digestion rates for protein and carbohydrates 36 and 3% respectively greater than those for " the peeled wheat " bread. The corresponding vals. for a white bread from straight grade (72% extraction) flour and containing non-fat milk solids (2·5% of wt. of flour) were 61 and 11% respectively. Digestion of white bread was only 39% more rapid with respect to protein than that from " peeled wheat " if the latter was prepared with high-vitamin yeast but no faster as regards carbohydrate. The pepsin content of the gastric digest was 40% higher with a whole wheat than with a white bread diet. A. G. P.

Value of complex carbohydrates [cellulose] in diets of normal children. I. G. Macy, F. C. Hummel, and M. L. Shepherd (*Amer. J. Dis. Child.*, 1943, **65**, 195—206).—The daily intake of roughage of the children 4—12 years old from fruit, vegetables, and cereals was 6·3 g. Of the total intake of fibre 4—6 g. was cellulose + hemicellulose, of which 2·3—4·8 g. disappeared during passage through the alimentary canal. The ability to decompose fibre varied widely, less so in the older children. C. J. C. B.

Effect of purified diet deficient in carbohydrate on rat. R. H. Follis, jun., and W. M. Straight (*Johns Hopkins Hosp. Bull.*, 1943, **72**, 39—41).—Rats grew normally without change in the ratios of adrenals or thymus : body wt. on a completely carbohydrate-free diet. T. F. D.

Effects of ingestion of methylcellulose and ethylcellulose by rats. W. Deichmann and S. Witherup (*J. Lab. clin. Med.*, 1943, **28**, 1725—1727).—80 rats were given methylcellulose (0·44 g. daily) in their food and drinking-water over 8 months, and the same no. were given ethylcellulose (0·18 g. daily) in their food for a corresponding period. The consumption of food and water as well as the gain in wt. by these animals were normal; no tissue changes occurred. C. J. C. B.

Mineral metabolism of pullets. VII. Calcium requirement of the laying bird. R. H. Common (*J. Agric. Sci.*, 1943, **33**, 213—220).—The average daily retention of Ca from the food of the laying fowl is of the order of 50% of the daily intake of 1—3·5 g. The optimum daily Ca requirement for sustained heavy laying is 4 g. H. G. R.

Effect of severe calcium deficiency on pregnancy and lactation in rat. M. D. D. Boelter and D. M. Greenberg (*J. Nutrition*, 1943, **26**, 105—121).—Rats maintained from weaning on a diet containing 10 mg. of Ca per 100 g. failed to mate. Change from a normal to a Ca-deficient diet diminished the fertility of females which had produced normal litters previously. Pregnancy did not greatly reduce Ca reserves but lactation lowered skeletal Ca, serum-Ca, % ash in bone, % Ca in the ash, and total body wt. Surviving Ca-deficient young were almost normal at birth except for low bone-ash and -Ca. Ca-deficient mothers produced inadequate supplies of milk and insufficient Ca for normal growth of young. A. G. P.

Magnesium metabolism in man. K. P. Basu and M. C. Malakar (*Indian J. Med. Res.*, 1940, **28**, 333—343).—The maintenance requirement of Mg, calc. from metabolism experiments on 3 healthy adults living on an Indian cereal diet, was 0·4 g. for an adult per day. Whole wheat diet satisfied the Mg requirement better than a rice diet. Addition of milk did not raise Mg retention. S. E. M.

Availability of iron in enriched bread. H. R. Street (*J. Nutrition*, 1943, **26**, 187—195).—The availability of Fe in $Fe_4(P_2O_7)_3$, $2Na_4P_2O_7$, $6H_2O$ to rats is approx. half that of $FeSO_4$ or $Fe_2(SO_4)_3$ when used in a whole-milk diet or as enriched bread. A. G. P.

Long-term prevention of tooth decay among diabetic children. J. D. Boyd (*Amer. J. Dis. Child.*, 1943, **66**, 349—361).—Prolonged observations of the teeth of 111 children with diabetes mellitus showed that although most had little or no extension of caries for years, a high rate of progression was noted among a few who failed to observe the dietary regimen consistently in whole or in part. It is concluded that the incidence of caries during childhood can be lessened impressively through dietary means. C. J. C. B.

Ingestion of fluoride and dental caries. F. J. McClure (*Amer. J. Dis. Child.*, 1943, **66**, 362—396).—Water-borne F equal to 0·5—1 mg. of F daily present in the diet from the first to the 8th year of life reduces dental caries. Calculations of the quantity of supplemental F required must take into account F present naturally in the local water supply. C. J. C. B.

Vitamins.

Protective diet. R. Pybus (*Edinb. Med. J.*, 1944, **51**, 21—38).—A lecture. H. S.

Problem of the increase in vitamin content of agricultural products in view of improving the diet of the people. E. Lelesz (*Int. Rev. Agric.*, 1942, **33**, 265—285T).—Factors which influence the vitamin content of agricultural products and the artificial enrichment of foodstuffs are reviewed. H. G. R.

Dietary survey of some families and institutions in Calcutta. II. Vitamin content. B. Ahmad and D. N. Mullick (*Indian J. Med. Res.*, 1940, **28**, 397—403; cf. Wilson *et al.*, *ibid.*, 1936, **24**, 161).—The diets of 10 middle-class families and 4 institutions at Calcutta were low in vitamin-*A*, but high in carotene and adequate in -*B* and -*C*. They contained 0·5—2 mg. of riboflavin and 0·8—2·7 mg. of -B_6 per person per day. S. E. M.

Treatment of scrotal eczema, stomatitis, and allied conditions caused by vitamin deficiency. C. O. Karunakaran and P. Krishnan Nair (*Indian J. Med. Res.*, 1940, **28**, 371—383).—92 inmates of an institution who had lived on a diet deficient in Ca, vitamin-*A* and -B_2 were treated for deficiency diseases with cod-liver oil, marmite, or buttermilk or combinations of them, and by S. Xerophthalmia and phrynoderma, due to -*A* deficiency, were cured by cod-liver oil or buttermilk, but not by marmite. Scrotal eczema responded badly to cod-liver oil and moderately to marmite, but was cured by a combination of cod-liver oil and marmite or by buttermilk alone. The disease appears, therefore, to be caused by deficiency of one of the -B_2 factors and of -*A*. Stomatitis, cured by marmite or buttermilk, is caused by deficiency of a -B_2 factor. S (2 cases) was without effect. S. E. M.

Influence of supplements of vitamins-*A*, -B_1, -B_2, -*C*, and -*D* on growth, health, and physical fitness. E. R. Bransby, J. W. Hunter, H. E. Magee, E. H. M. Milligan, and T. S. Rodgers (*Brit. Med. J.*, 1944, I, 77—78).—The tests on 214 adult men showed that the vitamin capsules had no significant effect on wt., hæmoglobin, blood pressure, absence from illness, or output. In children both controls and vitamin-treated improved in endurance, but the improvement shown by the vitamin children was greater. I. C.

Relation between hepatic and plasma concentrations of vitamin-*A* in man. H. Popper, F. Steigmann, K. A. Meyer, and S. S. Zevin (*Arch. intern. Med.*, 1943, **72**, 439—460).—The plasma-vitamin-*A* level was affected by -*A* intake and by disease. It is moderately reduced in gastrointestinal carcinoma and greatly reduced in hepatic damage and in jaundice; it is unaffected by anæsthesia. Comparison between the plasma level and the -*A* concn. in biopsy specimens of liver over a wide range of the plasma-*A* level shows a parallelism only if the average of many cases is taken; in individual cases no relationship is found. The plasma-*A* level is thus no index of the liver stores of the vitamin, except that a high plasma level indicates normal or high stores; low plasma-*A* levels may be associated with high or low liver-*A*. The fluorescence microscopic picture shows great variations of the -*A* fluorescence pattern. The amount of -*A* fluorescence as seen under the microscope and the chemical assay for -*A* (the method of which is discussed) run parallel in the human liver. If high amounts of -*A* are present, they are chiefly found in Kupffer cells. (13 photomicrographs.) C. J. C. B.

Absorption, storage, and utilisation of vitamin-*A* in the presence of disease. S. Spector, C. F. McKhann, and E. R. Meserve (*Amer. J. Dis. Child.*, 1943, **66**, 376—403).—A general review with a few small-scale personal observations. C. J. C. B.

Vitamin-*A* activity of lean meat and fat from cattle fed various levels of carotene. C. A. Cabell, N. R. Ellis, and L. L. Madsen (*Food Res.*, 1943, **8**, 496—501).—The vitamin-*A* activity of the tissues, including both fat and lean portions, is dependent on the carotene intake of cattle, the val. for beef fat varying from 660 i.u. per 100 g. for pasture-fed cattle to 33 for cattle fed a relatively low carotene level. Some of the potential -*A* activity of beef fat is destroyed by roasting. H. G. R.

Carotene content of the blood plasma of dairy cattle in relation to vitamin-*A* deficiency. W. D. Gallup and A. H. Kuhlman (*Proc. Oklahoma Acad. Sci.*, 1940 [1941], **21**, 89—92).—Plasma-carotene of cows usually falls after calving but there is no consistent change during lactation. Cows with plasma-carotene below 150 μg. per 100 ml. 90 days before calving produce calves of low vitality. This level of carotene apparently represents a borderline deficiency of vitamin-*A*. L. G. G. W.

Spectroscopic investigation of the colour reaction given by vitamin-*A* and related substances with antimony pentachloride. G. V. Troitzki (*Biochimia*, 1941, **6**, 3—17).—The λλ of the adsorption max. given by $SbCl_3$ with vitamin-*A*, -A_2, α- and β-carotene, xanthophyll, -D_3, and organ extracts from various species were measured. The positions of these max. change markedly after treatment of the test solutions with $KMnO_4$ and after ageing, thus limiting the quant. val. of this method for extracts of natural products. A. H. G.

Vitamin-*B* complex and work output. C. J. Baborka, E. E. Foltz, and A. C. Ivy (*J. Amer. Med. Assoc.*, 1943, **122**, 717—720).—4 healthy subjects were given a diet adequate except that the thiamin and riboflavin intakes were 0·65 mg. and 0·94 mg. daily respectively. The daily urinary excretion of thiamin fell to 5—35 μg. and that of riboflavin to 100—200 μg. During the 82 days on the deficient diet the subjects became irritable, easily fatigued, and developed anorexia and increased leg pain during work periods, but there were no objective changes of -*B* deficiency. There was a diminished capacity for work done on an electrodynamic brake bicycle ergometer, and this was rapidly restored to normal and all symptoms were removed by addition of -*B*-complex to the diet. The ratio of blood-pyruvic acid to total work output increases proportionately as diet deficiency progresses. C. A. K.

***B* vitamin content of organisms of different biological phyla.** A. M. Woods, J. Taylor, M. J. Hofer, G. A. Johnson, R. L. Lane, and J. R. McMahan (*Univ. Texas Publ.*, 1942, No. 4237, 84—86).—The content of 8 vitamins of the *B* group is given for 34 organisms drawn from the animal and vegetable kingdom. All organisms tested contained all the vitamins studied. In the animal kingdom the level of *B* vitamins tends to vary inversely with the size of the organism. The richest source of any given vitamin seldom contains more than 10 times as much as the poorest. Insects and bacteria are fairly rich in *B* vitamins. Nicotinic acid is in general richer in animal than in vegetable material, but with inositol, folic acid, and pyridoxine, the reverse is true. E. C. W.

Nutrition of mosquito larvæ. A. R. Buddington (*J. Econ. Entom.*, 1941, **34**, 275—281).—Mosquito larvæ require under aseptic conditions at least three factors, vitamin-B_1 and -B_2 and a heat-stable substance in yeast and liver extract, for development to maturity. A. A. M.

***B* vitamins in normal human tissues.** A. Taylor, M. A. Pollack, and R. J. Williams (*Univ. Texas Publ.*, 1942, No. 4237, 41—55).—Data are given for *B* vitamins in human muscle, skin, and various viscera, and are compared with corresponding data for rat and mouse tissues. Human tissues are in general poorer in *B* vitamins, but the human body is relatively rich in pantothenic acid, just as the pig is rich in thiamin. The liver is the best source of *B* vitamins as a whole. E. C. W.

***B* vitamin content of normal rat tissues.** H. K. Mitchell and E. R. Isbell (*Univ. Texas Publ.*, 1942, No. 4237, 37—40).—Data are given for *B* vitamins in rat muscle and various viscera, the tissue extracts being made after enzymic hydrolysis (cf. C, 1944, Part 2). In general, higher vals. are thereby obtained than after autolysis (cf. C., 1944, 34). E. C. W.

Vitamin requirements of cæcectomised rats. A, Taylor, D. Pennington, and J. Thacker (*Univ. Texas Publ.*, 1942, No. 4237, 135—144).—The cæcum and its contents represent over 30% of the wt. of the total digestive tract in mature rats. On an adequate diet, cæcectomised rats grew normally and showed no deterioration in 7 weeks. On a pyridoxine-deficient diet, cæcectomised and normal rats grew at approx. the same rate. On a diet partially deficient in several of the *B* vitamins, cæcectomised rats were severely affected, losing wt. and showing abnormalities of skin and hair, while controls, though their growth rate was retarded, remained in good health. The use of cæcectomised rats in studies on *B* avitaminoses is advocated. E. C. W.

Intestinal bacterial synthesis as a source of *B* vitamins for the rat. H. K. Mitchell and E. R. Isbell (*Univ. Texas Publ.*, 1942, No. 4237, 125—134).—Rats were kept on a diet of either 100% lean beef or 75% beef and 25% lactose, the former producing a predominantly coliform intestinal flora while the latter encourages acidophilic bacteria. The urine and fæces were collected and assayed for *B* vitamins. After 30 days, the rats were killed and the cæcal contents and intestinal tract assayed. The body tissues absorb *B* vitamins originating in the intestinal bacteria, the contribution of which to the dietary intake of these vitamins varies widely (from 8—18% for thiamin to 200—400% for biotin). The contribution is markedly influenced by both the quantity and kind of intestinal flora, which in turn may be greatly altered by changes in the diet. E. C. W.

Effect of composition of diet on vitamin content of rat tissues. B. S. Schweigert, J. M. McIntire, and C. A. Elvehjem (*Arch. Biochem.*, 1943, **3**, 113—120).—The thiamin content of rat muscle and liver was 3—4 times as high at 25—30 μg. as at 8 μg. per day intake. The riboflavin content of muscle was 40% higher at 30—60 μg. than at 8 μg. per day intake. The thiamin and riboflavin contents were not appreciably affected by increasing carbohydrate, protein, or fat intake. E. R. S.

Effect of *B* vitamins in the diet on tumour transplants. A. Taylor, M. A. Pollack, and C. L. Sortomme (*Univ. Texas Publ.*, 1942, No. 4237, 72—80).—A mammary carcinoma suspension was inoculated into mice receiving diets of different vitamin-*B* levels. In groups whose -*B* intake was several times that of the control group on the basic diet, 10—15% of non-"takes" occurred, whereas the controls showed 100% "takes." A group on a rice-casein-carrot diet, of low -*B* content, also gave 20% of non-"takes," but other factors may have been responsible for this result. E. C. W.

Effects of vitamin-*B* deprivation on spontaneous activity of rat. A. L. Bloomfield and M. L. Tainter (*J. Lab. clin. Med.*, 1943, **28**, 1680—1690).—Vitamin-*B* lack in white rats is followed by an increase in activity with, after a few days to 2 weeks, a sharp decrease. This decrease is not to be explained by inanition. When rats deficient in either -*B* or total calories are given unlimited food and adequate vitamins, there follows, not an increase, but a sudden sharp fall in activity, which persists during the period of increased food intake. C. J. C. B.

***B* vitamins in cell nuclei.** E. R. Isbell, H. K. Mitchell, A. Taylor, and R. J. Williams (*Univ. Texas Publ.*, 1942, No. 4237, 81—83).—Cell nuclei were separated from very finely ground beef heart and mouse carcinoma tissues by fractional centrifuging in org. solvents at various sp. gr. The *B* vitamins are 2—4 times as rich in normal nuclei as in whole tissue, but nuclei from cancer tissue are somewhat less rich than the tissue itself. E. C. W.

Vitamin-*B* in sweat. T. Cornbleet, E. R. Kirch, O. Bergeim, and J. D. Solomon (*J. Amer. Med. Assoc.*, 1943, **122**, 426—429).—Sweat induced by heat contained 150 μg. of thiamin, 120 μg. of riboflavin, 300 μg. of pantothenic acid, and 200 μg. of nicotinic acid per c.c. For average American diets this amounted to 10% of thiamin, 5% of riboflavin, and 1% of nicotinic acid intakes. C. A. K.

Studies on enriched white flour (vitamin-*B*). R. D. Williams, H. L. Mason, and R. M. Wilder (*J. Amer. Med. Assoc.*, 1943, **121**, 943—945).—Subjects were maintained on a diet which contained 170 g. of white flour daily and a total of 0·2 mg. of thiamin and 0·35 mg. of riboflavin per 1000 cal. Signs of thiamin deficiency, low excretion of thiamin, and abnormal rises of blood-pyruvic acid after oral administration of glucose, developed. Subjects who took the same diet but with white flour enriched with 2·5 mg. of thiamin, 18 mg. of nicotinic acid, and 27 g. of non-fat milk solids per lb. showed practically no signs of thiamin deficiency and after 9 months were in as good physical condition as other subjects who had whole grain flour in place of enriched white flour. C. A. K.

***B* vitamin content of milk from animals of different species.** R. J. Williams, V. H. Cheldelin, and H. K. Mitchell (*Univ. Texas Publ.*, 1942, No. 4237, 97—104).—Human milk, and that of the mare, cow,

goat, dog, and mouse, were assayed for vitamins of the *B* group. In general, the levels tend to vary inversely as the size of the animal. Bitches' milk, however, is very low in thiamin. Folic acid is much higher in human and bitches' milk than in that of the herbivores. Samples of milk from 16 cows of two breeds showed fair uniformity in their content of thiamin, riboflavin, and pantothenic acid, but other vitamins were very variable. 9 samples from 5 human individuals showed considerable uniformity for all the vitamins assayed; biotin and thiamin were appreciably lower, and folic acid much higher, than in cows' milk. E. C. W.

B vitamin content of foods. V. H. Cheldelin and R. J. Williams (*Univ. Texas Publ.*, 1942, No. 4237, 105—124).—Analytical data are given for thiamin, riboflavin, nicotinic acid, pantothenic acid, pyridoxine, biotin, inositol, and folic acid in 53 representative foods. All were assayed microbiologically. Pork is the richest source of thiamin, and liver of pantothenic acid and biotin, while fresh vegetables and fruits are in general good sources, and processed cereals poor sources, of the vitamin *B* complex. Inositol is present in far greater abs. amounts than any of the other vitamins assayed; in oranges, its richest source, it constitutes 1·6% of the dry wt. E. C. W.

Balance of vitamin-B_1 in rats. L. Wildemann (*Biochem. Z.*, 1941, **308**, 10—14).—The vitamin-B_1 content of the fæces is independent of the -B_1 intake and can be neglected in balance experiments; the effect is probably due to bacterial metabolism. With normal diets 5%, and with -B_1-rich diets 25%, of the ingested -B_1 is excreted in the urine. Thus the urinary -B_1 level reflects the intake of -B_1. F. O. H.

Vitamin-B_1 in diabetic neuritis. W. Needles (*J. Amer. Med. Assoc.*, 1943, **121**, 914—916).—7 patients with diabetic neuritis were given 10—15 mg. of thiamin daily for 5½ months. In 4 there was improvement in muscular strength and disappearance of paræsthesiæ but neurological examination showed no improvement in any of the 7 cases and in fact 2 cases showed progression. C. A. K.

Occurrence of cocarboxylase in urine. H. Kraut, A. Weischer, and G. Stumpff (*Biochem. Z.*, 1941, **308**, 309—320).—Besides free aneurin, cocarboxylase is regularly present in human urine. The daily excretions of aneurin and cocarboxylase vary between 10 and 210 and 0 and 180 μg., respectively. The ratio of free to bound aneurin varies from 1 : 9 to 9 : 1 and the average of 38 determinations gives 100 μg. of free and 40 μg. of bound aneurin. Administration of aneurin increases not only the amount of aneurin but also that of cocarboxylase excreted in the urine, so that the proportion of each excreted is not essentially altered. J. N. A.

Effect of aneurin on urea synthesis. F. Leuthardt and B. Glasson (*Helv. Physiol. Pharm. Acta*, 1943, **1**, 221—227).—Aneurin augments the urea synthesis of liver tissue slices of vitamin-B_1-deficient rats. A. S.

Aneurin in wheat. L. H. Pulkki and K. Puutula (*Biochem. Z.*, 1941, **308**, 122—127).—The aneurin content of wheat grains is lowest in the shell and central part and highest in the embryo. In wheat flour, the content increases parallel with the ash and fat contents. W. McC.

Vitamin-B_1 content of potatoes. S. M. Prokoschev (*Biochimia*, 1942, **7**, 278—282).—The vitamin-B_1 content of wild and cultivated potatoes is 44—100 μg. per 100 g. crude wt. or 160—480 μg. per 100 g. dry wt. No correlation exists between the -B_1 and cocarboxylase contents or between the -B_1 and biological peculiarities of different species and varieties. The concn. is higher in peripheral than in the central layers. The -B_1 in cocarboxylase amounts to ¼—½ of the total -B_1. H. G. R.

Differential diagnosis of infantile beriberi. L. Fohily (*Trans. R. Soc. trop. Med. Hyg.*, 1943, **37**, 111—123).—A review. C. J. C. B.

Urinary pigments in pellagra and other pathological states. I. Clinical observations. II. Excretion of porphyrins and urorosein reaction in dogs with experimental blacktongue. C. J. Watson and J. A. Layne. **III. Certain toluene-soluble pigments of human and canine urine.** S. Schwartz, J. F. Marvin, J. A. Layne, and C. J. Watson (*Ann. int. Med.*, 1943, **19**, 183—199, 200—205, 206—212).—I. The chromogen of the urorosein reaction is a normal constituent of urine in many subjects without clinical evidence of nicotinic acid deficiency; it is identical with indolylacetic acid. The development of the reaction (Nencki and Sieber, Beckh, Ellinger, and Spies methods) requires the presence of nitrite or similar oxidising agents, which can be found in urines with positive urorosein reaction. There was no correlation between the presence and disappearance of either chromogen or oxidising agent and the deficiency or administration of nicotinic acid. The Ellinger–Dojmi colour reaction is not sp. for porphyrin but is due to urorosein. There was no correlation between the development of a red colour in toluene preservatives of urines of pellagra or other malnutrition states and other evidence of nicotinic acid deficiency; the pigment was not observed in normal urines.

II. The spontaneous urorosein reaction was negative in urines of dogs suffering from experimental blacktongue disease. The appearance of red pigment in toluene urine preservatives was not related to nicotinic and deficiency. There was no increase in coproporphyrin excretion in dogs with blacktongue disease over that of control periods.

III. The red pigment in toluene urine preservatives consists of several similar pigments (chromatography). 2 pigments were very similar to, but not identical with, synthetic indirubin. The latter also consists of a mixture of related pigments, none of which was identical with those from the urines. A. S.

Acceleration of co-ordinated muscular effort by nicotinamide. I. M. Frankau (*Brit. Med. J.*, 1943, II, 601—603).—Addition of nicotinamide alone, or of nicotinamide and other vitamins (aneurin, ascorbic acid, riboflavin), to the diet of fit young men results in increased efficiency in carrying out a severe test involving physical effort and co-ordination. I. C.

Chemical composition of bones during starvation. J. Ruiz-Gijon (*Biochem. Z.*, 1941, **308**, 59—63).—Determination of org. substance, ash, Ca, P, Mg, and CO_2 contents of rib and tibia bones of 7 cases of severe pellagra shows a general decrease in ash and, in 3 cases, a decrease in P content. These changes are probably to be associated with nutritional deficiency. F. O. H.

Biochemical defect in nicotinic acid deficiency. II. Nature of the anæmia. P. Handler and W. P. Featherston (*J. Biol. Chem.*, 1943, **151**, 395—404; cf. A., 1943, III, 42).—The severe macrocytic anæmia produced in dogs by diets deficient in nicotinic acid is specifically due to this deficiency. The anæmia is not affected by administration of Fe, protein, glucose, hæmoglobin, xanthopterin, anti-pernicious anæmia factor, or large amounts of $Co^{..}$. The reticulocyte content of the blood, however, is very rapidly increased by administration to the anæmic dogs of nicotinic acid or nicotinamide, which also cause subsequent increase, to the normal levels, in the erythrocyte and hæmoglobin contents. Probably, the anæmia is caused by lack of cozymase required for the respiration of immature erythrocytes. W. McC.

Influence of nicotinic acid on blood-sugar level and its relation to adrenaline hyperglycæmia. L. A. Tscherkes and E. L. Rozenfeld (*Biochimia*, 1941, **6**, 58—66).—Nicotinic acid in large amounts (1 g.) administered parenterally to rats causes hypoglycæmia; small quantities (0·1 g.) have no effect. When nicotinic acid (1 g.) and adrenaline (0·1 mg.) are given at the same time, hyperglycæmia does not occur as it does in controls receiving only the adrenaline. A. H. G.

Synthesis of co-enzyme and factor *V* in erythrocytes and urinary excretion of nicotinic acid derivatives after ingestion of nicotinic acid and nicotinamide. C. L. Hoagland, S. M. Ward, and R. E. Shank (*J. Biol. Chem.*, 1943, **151**, 369—375; cf. A., 1943, III, 63).—In man, the concn. of factor *V* in the blood and, in parallel, the rate at which the erythrocytes oxidise lactate and malate increase when nicotinic acid is administered and decrease when it is withdrawn. Administration of nicotinamide does not cause increase in this rate. In children on a diet low in trigonelline, the contents of acid- and alkali-hydrolysable fractions of nicotinic acid derivatives in the urine increase when nicotinic acid is administered. Urinary excretion of trigonelline increases after administration of nicotinamide, but the content of acid-hydrolysable nicotinic acid derivatives is not affected. W. McC.

Nicotinamide riboside. F. Schlenk (*Arch. Biochem.*, 1943, **3**, 93—103; cf. A., 1940, III, 536).—Nicotinamide riboside was prepared from codehydrogenase I (from yeast) by hydrolysis with an enzyme prep. from almond press cake. Procedures for purification are described. It has an absorption max. at 260 mμ., and its reduced form has a max. at 340 mμ. E. R. S.

Nicotinamide-like substance from amino-acids etc.—See A., 1944, II, 116.

Pyridoxine deficiency in swine, with particular reference to anæmia, epileptiform convulsions, and fatty liver. M. M. Wintrobe, R. H. Follis, jun., M. H. Miller, H. J. Stein, R. Alcayaga, S. Humphreys, and G. E. Cartwright (*Johns Hopkins Hosp. Bull.*, 1943, **72**, 1—25).—Pyridoxine deficiency in pigs leads to severe anæmia, seizures resembling the "petit mal" and "grand mal" of human epilepsy, and fatty infiltration of the liver. The anæmia is characterised by microcytosis, an increase of polychromatophilia, reticulocytes, and nucleated red cells in the blood, a rise in serum-Fe, bone marrow hyperplasia, and hæmosiderosis in the spleen, liver, and bone marrow. Pyridoxine administration gives a sharp reticulocyte response and rapid regeneration of blood with restoration of the normal size of the red blood corpuscles; mobilisation of Fe from the tissues and its utilisation in blood formation is indicated by the disappearance of hæmosiderosis and fall in serum-Fe. Pyridoxine deficiency thus leads to the development of a metabolic disorder which is related to the utilisation of Fe. T. F. D.

Effects of pantothenic acid and inositol added to whole wheat bread on evacuation time, digestion and absorption in the upper gastro-intestinal tract of dogs. C. G. Bly, F. W. Heggeness, and

E. S. Nasset (*J. Nutrition*, 1943, **26**, 161—173).—In enterostomised dogs receiving an exclusive peeled whole wheat diet, severe deficiency symptoms (50% decrease in gastrointestinal motility, 40—60% decrease in rates of digestion and absorption of protein and carbohydrate) appeared in 2—3 months. Supplements of 220 μg. of Ca pantothenate per kg. body wt. caused an almost immediate return to normal functions. Pyridoxine had no such effect. Inositol acted as a cathartic, causing temporarily improved motility but a further marked decrease in digestion and absorption. No evidence was obtained of a synergism between pantothenic acid and inositol; the latter acted more as a cathartic, its effect being superimposed on the deficiency. Prolonged use (5—6 months) of the bread diet induced a secondary deficiency characterised by diminished response to supplementary pantothenate in respect of motility, digestion, and absorption. Addition of a mineral salt mixture with pantothenate to the diet restored normal motility but only slightly improved rates of digestion and absorption. A. G. P.

Prevention of perosis and dermatitis in turkey poults. H. Patrick, R. V. Boucher, R. A. Dutcher, and H. C. Knandel (*J. Nutrition*, 1943, **26**, 197—204).—Incidence of dermatitis was diminished by biotin supplements and that of perosis by choline, biotin, and by an unrecognised factor obtained from aq. extracts of dried brewers' yeast by adsorption on C or fuller's earth and elution by aq. NH_3. A. G. P.

Egg white and avidin concentrates in cancer patients. C. P. Rhoads and J. C. Abels (*J. Amer. Med. Assoc.*, 1943, **121**, 1261—1263).—One patient with mammary cancer and 1 with lymphatic leukæmia were fed for 30 weeks 16—40 times the amounts of avidin (egg-white protein) required to bind *in vitro* their restricted biotin intake. No clinical signs of biotin deficiency or much reduction of urinary excretion of biotin were observed and there were no apparent effects on the clinical course of the 2 cases. C. A. K.

Nutritional requirements of the rhesus monkey. H. A. Waisman A. F. Rasmussen, jun., C. A. Elvehjem, and P. F. Clark (*J. Nutrition*, 1943, **26**, 205—218).—The monkeys failed to survive on a purified diet containing sucrose, casein, salts, maize oil, vitamin-*C*, and the 8 readily-available constituents of the -*B* complex. Deficient animals showed anorexia, loss of wt., leucopenia, anæmia, cachexia, and intercurrent infections especially bacillary dysentery. Supplements of whole liver, liver extract, and solubilised liver residue restored normal growth and tended to prevent dysentery and secondary infections. A. G. P.

Relationship between choline-esterase and ascorbic acid. E. Frommel, A. D. Herschberg, and J. Piquet (*Helv. Physiol. Pharm. Acta*, 1943, **1**, 229—239).—Experimental *C*-hypovitaminosis or diminution of the serum-*C* content by various drugs lowers the serum-choline-esterase content in guinea-pigs, whereas inhibition of serum-choline-esterase by administration of eserine does not affect the -*C* content of liver, kidney, lung, or spinal cord. Ascorbic acid has no effect *in vitro* on choline-esterase of horse and guinea-pig serum, of the dorsal muscle of the leech, or the hæmolymph sac of snails. A. S.

Effect of physiological disturbances on synthesis of ascorbic acid in rats. B. Ghosh (*Ann. Biochem. Exp. Med.*, 1943, **3**, 15—22).—Vitamin-B_1 deficiency caused decreased ascorbic acid in brain and liver, with no change in that in the kidneys or urine. Anoxia produced by deficient O_2 did not affect the urinary excretion but increased the renal ascorbic acid. Ether anoxia increased the ascorbic acid content of all tissues, particularly the kidney. $CHCl_3$ and coal gas decreased tissue-ascorbic acid. Blood-ascorbic acid was little affected by these procedures. The urinary excretion of ascorbic acid showed a slight decrease or no change following injections of insulin, CN', or malonate. P. C. W.

Adsorption of vitamin-*C*.—See A., 1944, I, 58.

Paprika and vitamin-*C*. T. Jachimowicz (*Biochem. Z.*, 1941, **307**, 387—399).—The seasoning and small-fruiting varieties have in general a higher vitamin-*C* content than the vegetable varieties. There is no apparent destruction of -*C* after boiling for 10 min. but after boiling for 1 hr. the total apparent -*C* content of the cooked fruit + aq. extract exceeds that of the original fresh substance by 25%, as determined by titration methods. This is due to either the presence of bound ascorbic acid in the fresh fruit or the production of other reducing substances by boiling. The stability of -*C* is greater in 2% acetic acid solution, which inhibits oxidase action, and is independent of the duration of boiling. There is no appreciable loss of -*C* on storage at 4° for 2 months under sterile conditions, but freezing at −15° leads to a considerable loss after 1 month either with or without blanching. P. G. M.

Effect of vitamin-*D* on calcium retention. H. McKay, M. B. Patton, M. S. Pittman, G. Stearns, and N. Edelblute (*J. Nutrition*, 1943, **26**, 153—159).—In young college women receiving a well-selected diet, supplements of vitamin-*D* did not increase Ca retention when the level of Ca intake was below 0·8 g. With an intake of 0·8 g. some evidence of slight improvement in Ca retention was apparent. A. G. P.

Calcium and phosphorus metabolism. III. Calcium content of soft tissues of albino rats in rickets and hypervitaminosis-*D*. IV. Absorption of calcium from the intestine. V. N. Patwardhan and R. G. Chitre (*Indian J. Med. Res.*, 1940, **28**, 353—360, 361—369; A., 1939, III, 291).—III. The average Ca content of brain and liver of rachitic rats was lower than normal (32 against 44—50 mg. and 29 against 48 mg. per 100 g. dry wt.), whereas the Ca content of rachitic lungs was higher than normal (80 against 54 mg. per 100 g. dry wt.). Other organs showed no difference from the normal. In induced hypervitaminosis-*D* the Ca content of muscle, brain, spleen, testes, liver, and heart was raised, whereas lungs and kidney were unchanged histologically. The tissues showed no calcification.

IV. Ca lactate or $CaCl_2$ introduced into the duodenum of anæsthetised dogs caused an equal rise in the Ca content of the portal blood serum and the mesenteric lymph. Ca is, therefore, absorbed from the intestine into the portal venous system and the mesenteric lymphatics. The rise in serum-Ca was not proportional to the dose or concn. of Ca salt nor related to the pH of the ingested solution. S. E. M.

Sunlight in Oklahoma as an important factor in the prevention of rickets and the maintenance of normal calcium and phosphorus metabolism. W. D. Gallup and A. H. Kuhlman (*Proc. Oklahoma Acad. Sci.*, 1941 [1942], **22**, 11—15).—Calves receiving a diet containing adequate Ca and P but deficient in vitamin-*D* develop rickets when housed in barns. This is accompanied by decreased plasma-Ca and by irregular changes in blood-P. Exposure to sun ensures recovery from rickets and return of the blood-Ca and -P to normal. L. G. G. W.

Relationship between rates of growth and rickets in sheep on diets deficient in vitamin-*D*. J. Duckworth, W. Godden, and W. Thomson (*J. Agric. Sci.*, 1943, **33**, 190—196).—The characteristic change in blood composition of vitamin-*D*-deficient lambs receiving a diet containing adequate and balanced amounts of Ca and P is a reduction in serum-Ca. The wide normal variations in blood-inorg. P mask any sp. effect of -*D* deficiency in its early stages. Sheep are resistant to hypocalcæmic tetany and the incidence of the attack depends on the rate at which blood-Ca is reduced rather than on the final level attained. Rachitic animals have large amounts of the parathyroid hormone in circulation and a relationship between the quantity present and the severity of the rickets is observed. Plasma-phosphatase is increased proportionally with the interference in bone growth. Lambs have sufficient reserves of -*D* to protect them for about 6 weeks and rickets does not develop unless there is a moderate degree of growth and the serum-Ca falls below 7 mg. per 100 ml. H. G. R.

Metabolism of bone salts in resistant rickets. L. Gunther, E. T. Cohn, W. E. Cohn, and D. M. Greenberg (*Amer. J. Dis. Child.*, 1943, **66**, 517—527).—A case is reported of resistant rickets in a boy who suffered from rickets from infancy until 14 years of age in spite of treatment with vitamin-*D* and Ca salts. The disorder was corr. by the daily administration of fish-liver oil high in -*D* (122,000 U.S.P. units per day, later reduced to 50,000). A positive Ca and P balance could be maintained only when the intake of these elements was high. The changes in the balances corresponded to changes in the amounts of the minerals excreted in the fæces. The urinary excretion of both Ca and P remained unchanged with either high- or low-Ca diets. Tracer experiments with radioactive P showed that phosphate was readily absorbed from the intestinal tract by the patient. C. J. C. B.

Effect of maternal rachitogenic diet on skeletal development of young rat. J. Warkany (*Amer. J. Dis. Child.*, 1943, **66**, 511—516).—Congenital skeletal malformations were present in 45% of the offspring of female rats fed on a rachitogenic diet. Pronounced curving of the radius, ulna, tibia, and fibula as well as angulation of the ribs occurred in the offspring. Addition of vitamin-*D* to the maternal diet prevented these malformations. C. J. C. B.

Case of vitamin-*D* deficiency associated with cirrhosis of liver and a dyscrasia of calcium and phosphorus metabolism. H. F. Fraser (*J. Pediat.*, 1943, **23**, 410—420). C. J. C. B.

Effect of sunshine on the antirachitic potency of butter. G. B. Berry (*Proc. Oklahoma Acad. Sci.*, 1941 [1942], **22**, 27—30).—Butter fat from regions of high sunshine has a higher antirachitic val. than that from a region where the sunshine is less. L. G. G. W.

Effect of tocopherols on phosphorus metabolism. L. H. Weissberger and P. L. Harris (*J. Biol. Chem.*, 1943, **151**, 543—551).—Groups of rats on diets of low, normal, or high vitamin-*E* content were given Na_2HPO_4 containing radioactive P. They were killed 17 hr. later, and the P turnover in the blood, bone, kidneys, and genitals was compared. Both a deficiency and an excessive (100 mg. per day) intake of tocopherol increased P metabolism in bone and (though not always with excessive intake) in soft tissues. A moderately high (10 mg. per day) intake caused no change in P metabolism. The total P content of the tissues was not affected by -*E* intake, nor was there any differential sex response. E. C. W.

Chemical determination of tocopherol (vitamin-*E*) content of foods. A. Emmerie and C. Engel (*Z. Vitaminforsch.*, 1943, **13**, 259—266).—The vitamin-*E* content of various cereals, vegetables, dairy products, and fats has been determined by the authors' $FeCl_3$-dipyridyl method (cf. A., 1939, II, 123). Among cereals, maize (10·0) and barley (3·2—5·2 mg. per 100 g.) show the highest vals. Of vegetables kale (8·0) and green peas (5·4—6·4 mg. per 100 g.) are richest, of dairy products eggs (boiled, 3·0 mg. per 100 g.) are richest, and of fats maize oil and wheat-germ oil have a tocopherol content of 150—250 mg. per 100 c.c. (see also C, 1944, Part 2). P. G. M.

Vitamin-*K* group. I. Synthesis of potassium 2-methyl-1 : 4-naphthaquinone-3-sulphonate. II. Mechanism of biological action of vitamin-*K* and of its synthetic analogues.—See A., 1944, II, 103.

See also Section XIX.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Cellular respiration after inhibition of succinic dehydrogenase. I. I. Ivanov (*Biochimia*, 1942, **7**, 163—170).—Succinic dehydrogenase occurs in mammalian spermatozoa. Their respiration is very resistant towards malonate, and their mobility persists for several hr. in malonate but very quickly ceases if CN′ is added. It is probable that in the living, undamaged cell, oxidation of various substrates, especially of carbohydrates, occurs in various ways, and is not necessarily confined to the succinate system. This is borne out by the fact that isolated cat and frog hearts continue to beat in presence of that amount of malonate which causes 70% inhibition of respiration of minced muscle. J. N. A.

Enzymic synthesis of flavin-adenine nucleotide. A. V. Trufanov (*Biochimia*, 1942, **7**, 188—200).—Slices of rat brain, kidney, and intestine synthesise flavin-adenine nucleotide from its components. The dinucleotide content is higher in the grey and lower in the white matter of the brain. Synthesis proceeds at approx. the same rate in slices of intestine and in isolated mucous membrane. An extract of mucous membrane is also active. In organs of animals with riboflavin deficiency the amount of dinucleotide is decreased considerably, especially in the liver. The extent of synthesis is higher than in normal animals. The enzyme responsible for the synthesis was isolated in sol. form. Presence of glycogen accelerates, whilst iodoacetate, AsO_3''', and F′ inhibit, synthesis, and phloridzin has no effect. The most pronounced effect is observed with adenosine diphosphate. It is concluded that during synthesis adenosine diphosphate is condensed with riboflavin. Riboflavinphosphoric acid is formed by hydrolysis of the dinucleotide. J. N. A.

Effect of hydrogen peroxide on rate of oxygen consumption of frog skin. L. D. Carlson and G. Marsh (*J. Cell. Comp. Physiol.*, 1943, **22**, 99—114).—H_2O_2 concn. of 10^{-7}—10^{-4}M. increases uptake of atm. O_2. From 1 to 5 × 10^{-4}M. uptake of atm. O_2 declines but total O_2 uptake increases by consumption of H_2O_2. At 8 × 10^{-4}M. total uptake decreases, but up to this point rate of consumption of H_2O_2 is linear with concn. Below 10^{-4}M. the effect is perfectly reversible. There is considerable correlation between H_2O_2 effects on skin respiration and e.m.f. (A., 1942, III, 611). V. J. W.

Metabolic rate of rat fœtuses *in vitro*. M. Kleiber, H. H. Cole, and A. H. Smith (*J. Cell. Comp. Physiol.*, 1943, **22**, 167—176).—The 13-day-old fœtus without membranes weighs 77 mg. and consumes 55 cu. mm. of O_2 per hr. The membranes consume 18 cu. mm. The intact fœtus with the membranes consumes 67 cu. mm., and it is calc. that O_2 diffusion is inadequate for the fœtus *in vitro* when the membranes are intact. Consumption is increased by cutting them open. Change from 100% to 60% O_2 causes a decrease of consumption less than half the decrease to be expected if diffusion rate were the limiting factor. Heart puncture did not alter consumption, but forcing the fœtus through a syringe to abolish tissue structure reduced it by 60%. Consumption is only $\frac{1}{10}$ of that expected from an independent homœothermic animal, calc. from wt., and is approx. the same as that of the mother. V. J. W.

Oxygen consumption of skin during hair cycle in white rat. E. O. Butcher (*Amer. J. Physiol.*, 1943, **138**, 408—411).—Rat's skin consumes 0·92 c.c. of O_2 per mg. of dry tissue at the end of activity in the hair bulb (22 days old); skin of 31-day-old rats, prior to hair follicle activity, consumes 1·31 c.c. A. S.

Respiration of echinoderm eggs and larvæ. M. M. Brooks (*Biol. Bull.*, 1943, **84**, 164—177).—Various developmental stages of *Asterias forbesi* and *Arbacia punctulata* were used, up to the pluteus larva. Methylene-blue (0·002%) increased O_2 consumption most in unfertilised eggs, not at all in gastrulæ, and slightly in other stages. KCN (5 × 10^{-4}M.) decreased O_2 consumption most in gastrulæ, and least in unfertilised eggs. CO (99·5%) prevented O_2 consumption and fertilisation and caused cytolysis. Methylene-blue antagonised the actions of KCN and CO. The results are discussed on the basis of the relation between the redox potentials and the rate of O_2 consumption of the cells. G. P. W.

Effects of temperature, pH, and salts on metabolism of a nematode. T. von Brand (*Biol. Bull.*, 1943, **84**, 148—156).—A larval *Eustrongylides* was used. The worms were unharmed from 5° to 45°, O_2 consumption rising with temp. O_2 consumption is const. from pH 3·4 to 8·3; it rises in the extreme acid range due to increased muscular activity, and this may be the stimulus determining their boring into the stomach wall. Effects of various isotonic salts on O_2 consumption are also described. G. P. W.

Respiration of mite infesting stored food. T. E. Hughes (*J. Exp. Biol.*, 1943, **20**, 1—5).—*Tyroglyphus farinæ* is not viable except in humid atm. The R.Q. is normally near 0·9. The O_2 absorption is in part CN′-sensitive. The mite has a high resistance to CO_2 accumulation and to O_2 lack, and is thus adapted to the special atm. in the masses of grain and flour in which it lives. G. P. W.

Oxygen consumption at various temperatures by nymphs and adults of the grasshopper, *Melanophus differentialis* (Thomas). L. A Riehl (*Iowa State Coll. J. Sci.*, 1943, **18**, 80—83).—The O_2 uptake increases with increasing temp. The results are to some extent in agreement with Rubner's surface law. F. R. G.

Basal metabolism in Bombay. II. Boys. S. P. Niyogi, V. N. Patwardhan, P. L. Powar, and M. V. Sirsat (*Indian J. Med. Res.*, 1940, **28**, 345—351; cf. A., 1940, III, 147).—The basal metabolic rate of 35 boys aged 11—16 years was studied. The average heat production was 37·1 cal. per sq. m. per hr. at the age of 11, 40·0 at 14, and 36 at 16. This is lower than the Mayo Clinic and the DuBois standards by 16·8 and 15·9%, and 5% lower than the Harris and Benedict standards. The low basal metabolic rate was not due to malnutrition. S. E. M.

Effect of altitude on basal metabolism. R. C. Lewis, A. Iliff, and A. M. Duval (*J. Nutrition*, 1943, **26**, 175—185).—The basal metabolism of 43 young women at altitude 5280 ft. was equal to or slightly less than that recorded for women of similar ages at altitudes below 1000 ft. No relationship was apparent between altitude and basal metabolic rate. A. G. P.

Effect of work on the nitrogen, calcium, and phosphorus balance of draft geldings. A. L. Harvey (*Iowa State Coll. J. Sci.*, 1943, **18**, 45—47).—2 Percheron geldings working at 0·56, 0·93, and 1·27 h.p. and fed on oats, timothy hay, sugar, and dextrinised maize starch were in positive N and negative Ca and P balances. F. R. G.

Metabolism of trichinosed rats during the intermediate phases of disease. W. P. Rogers (*J. Helminthol.*, 1943, **20**, 139—158).—During the first 12 days of *Trichinella spiralis* infection in rats protein digestion was lowered 1% for each 100 infective larvæ fed. The degree of digestive disorder was unrelated to the no. of larvæ finally recovered from the host's tissues. Inorg. P excretion fell to a low level 4—8 days after infection; 24 days later the rate of excretion rose, the max. being 2—3 times the normal level. Ca assimilation fell to a low level at 4—8 days, falling again after a further 36 days. As indicated by wt. losses the most severe period of infection occurred at 24—48 days. F. S.

Relationship between food proteins, their oxidation, and content of liver-glycogen. T. Huchtemann (*Biochem. Z.*, 1941, **308**, 40—55).—Rats were fed on adequate diets in which protein was supplied either entirely as potato-protein or partly as potato-protein and partly as lactalbumin. Data for changes in body wt. and contents of C, N, and vacate-O in the urine and, at the end of the experimental period, for the liver-glycogen indicate that the metabolic derivatives of dietary proteins regulate liver-glycogen, not by an effect on oxidative processes in intermediate metabolism, but by a direct effect on glycogenesis. F. O. H.

Influence of histidine on urinary excretion of nitrogen in dogs given pure amino-acid mixtures intravenously. R. Elman, H. W. Davey, and Y. Loo (*Arch. Biochem.*, 1943, **3**, 45—52).—When histidine is omitted from intravenously administered mixtures containing all of the other essential amino-acids, positive N balance is maintained for 3 days in the dog. After 3 days urinary excretion of N increases markedly, leading to a negative balance. This contrasts with the immediate rise of urinary N when tryptophan is omitted from the mixture. E. R. S.

Totally asymmetric synthesis of amino-acids *in vivo*. D. Shemin and D. Rittenberg (*J. Biol. Chem.*, 1943, **151**, 507—510).—When *dl*-tyrosine or *dl*-glutamic acid containing ^{15}N was fed to rats (on a vitamin-B_2-deficient diet to diminish their *d*-amino-acid oxidase) the *d*-amino-acid isolated from the urine had the same ^{15}N content as that fed. Again, when heavy NH_3 was fed with *dl*-tyrosine, the excreted tyrosine contained no ^{15}N. Thus there is no evidence of asymmetric amino-acid synthesis by -B_2-deficient (and therefore presumably by normal) rats. E. C. W.

Chloride metabolism and plasma-amino-acid levels in primary atypical pneumonia. K. Emerson, jun., E. C. Curnen, G. S. Mirick, and J. E. Ziegler, jun. (*J. clin. Invest.*, 1943, **22**, 695—697).—In primary atypical pneumonia, unlike pneumococcus pneumonia, hypoaminoacidæmia does not occur and there is no tendency to retain salt and water in the acute stage or to excrete an excess in convalescence. C. J. C. B.

Lipin metabolism in relation to xanthoma diabeticorum : recommendation for new nomenclature. J. Garb (*Ann. int. Med.*, 1943, **19**, 241—252).—A xanthoma eruptivum diabeticum, occurring with diabetic hyperlipæmia, and a xanthoma eruptivum pancreaticum, resulting from hyperlipæmia with chronic pancreatitis, are distinguished. The term extracellular cholesterosis or papulo-pustular xanthoma eruptivum is used for all xanthomas with xanthomatous biliary cirrhosis, which are inflammatory, very pruritic, and consist of solid material. A. S.

Effect of sodium chloride on disposition of injected glucose in a strain of rats. G. Sayers, M. Sayers, and J. M. Orten (*J. Nutrition*, 1943, **26**, 139—151).—In rats of low glucose tolerance administration of aq. NaCl (0·85%) with glucose increases the tolerance without affecting peritoneal absorption or renal excretion of glucose, favours deposition of glycogen, and decreases the free sugar content or blood and tissues. Glucose transformation (oxidation, conversion into fat, etc.) is also decreased to a normal level. The increased glucose tolerance probably results from the greater storage of glycogen. A. G. P.

Gluconeogenesis and cellular injury. Mechanism involved in diabetes enhanced by inflammation. V. Menkin, M. A. Kadish, and A. A. Warren (*Amer. J. Physiol.*, 1943, **138**, 396—407).—Local inflammation in non-diabetic and pancreatectomised dogs was produced by intrapleural injection of 1·5 c.c. of turpentine. The exudate-sugar concn. in non-diabetic animals is higher than the blood concn. for 24 hr. and then falls due to an increase in local glycolysis; the rise in exudate-sugar concns. is due to proteolytic gluconeogenesis at the site of inflammation. In diabetic dogs the exudate-sugar concn. is consistently increased and after 24 hr. the blood-sugar level has increased, approaching the exudate-sugar concn. The extent of local proteolysis is more marked in a diabetic than in a non-diabetic animal and is greater than local glycolysis. A similar but not so marked concn. gradient between exudate and blood exists with regard to urea. A. S.

Thiamin and specific dynamic action of carbohydrate and fat. G. C. Ring (*Amer. J. Physiol.*, 1943, **138**, 488—490).—The sp. dynamic action, in rats, of glucose was 4·2%, that of glucose and thiamin (50 μg.) 8%. Thiamin given in water has no effect on basal metabolism. The R.Q. after glucose and thiamin is higher than after glucose alone. Addition of oleic acid to glucose and thiamin does not further increase the sp. dynamic action of the latter. The sp. dynamic action of oleic acid is not affected by thiamin. A. S.

Treatment of diabetes mellitus without regard to hyperglycæmia and glycosuria. H. J. John (*Amer. J. digest. Dis.*, 1943, **10**, 129—131).—Hyperglycæmia should be adequately controlled and it is not sufficient to keep the patent symptom-free. N. F. M.

Von Gierke's disease (glycogen disease of hepatomegalic type). W. B. Manter and R. O. Bowman (*Amer. J. Dis. Child.*, 1943, **66**, 404—412).—In this case (a boy aged 14 months) glycogen metabolism was deranged, as shown by deficient storage of ingested glucose, inability to mobilise glucose from the large amounts of glycogen in the liver when adrenaline was injected, ketonuria, and failure of hepatic glycogenolysis after death. C. J. C. B.

Influence of diphtheria toxin on phosphorylation of glycogen and hydrolysis of adenosine triphosphate. A. D. Braun and M. J. Ratner (*Biochimia*, 1942, **7**, 171—179).—There is a decrease in the amounts of hexose phosphate and adenosine triphosphate in the adynamic muscles of mice poisoned with diphtheria toxin; directly determined PO_4''' is unaltered. The decrease in inorg. PO_4''' in minced muscle caused by presence of glycogen and NaF is almost completely inhibited in the muscles of poisoned animals. Phosphorylation proceeds more actively in muscle extract than in minced muscle and poisoning with diphtheria toxin has no detectable effect on phosphorolysis. The toxin has no effect on phosphorolysis *in vitro* in minced muscle or muscle extract. There is 5—40% increase in the activity of adenosine triphosphatase in muscles of poisoned animals. J. N. A.

Observations on starvation diets and hunger ketosis. G. F. Dick, M. C. Goldner, and T. P. Singer (*Amer. J. digest. Dis.*, 1943, **10**, 124—129).—3 obese patients placed on starvation diets showed no marked ketosis in accordance with Stadie's theory, but there is a qual. difference between starvation and diabetic ketosis not at present explained. N. F. M.

Ketosis in health and disease. J. H. Barach (*Amer. J. digest. Dis.*, 1943, **10**, 134—138).—A review. N. F. M.

Skeleton as source of endogenous citric acid. R. N. Class and A. H. Smith (*J. Biol. Chem.*, 1943, **151**, 363—368; cf. A., 1940, III, 58; Dickens, A., 1942, III, 34).—In rats on a protein-rich diet, the changes produced by supplements of $NaHCO_3$ or Na malate show that there is no correlation between the balance of citric acid and the citric acid content of the bones and suggest that the excess of citric acid excreted by the kidney after these salts are consumed is not of skeletal origin but is a product of intermediary metabolism. W. McC.

Metabolism of butyric and related acids in animal tissue. A. Kleinzeller (*Biochem. J.*, 1943, **37**, 678—682).—Both guinea-pig and rat kidney slices rapidly oxidise butyric, crotonic, vinylacetic, β- and γ-hydroxybutyric, and *dl*-αγ-dihydroxybutyric acids, as measured by HCO_3' formation. Only rat kidney oxidises *trans*-γ-hydroxycrotonic acid, whilst α-hydroxybutyric, *dl*-βγ-dihydroxybutyric, tetrolic, and tetronic acids are not appreciably oxidised, and vinylglycollic acid inhibits tissue respiration. Vinylacetic acid, which is oxidised more rapidly than butyric acid, shows similar physiological properties to the latter and may be an intermediate in its metabolism. The β-ketonic acid formed by oxidation of *dl*-βγ-dihydroxybutyric acid is probably not acetoacetic and certainly not *cis*-tetronic acid, but it may be the *trans*-isomeride of the enolic form of tetronic acid. The oxidation by both rat and guinea-pig kidney slices of all the butyric acid derivatives tested is inhibited by 0·031M-malonate. The evidence supports the theory of γ-oxidation of butyric acid. P. G. M.

Mercapturic acids. III. Conversion of benzene into phenylmercapturic acid in the rat. S. H. Zbarsky and L. Young (*J. Biol. Chem.*, 1943, **151**, 487—492).—The urine of rats to which benzene had been administered by stomach tube contained small amounts of phenylmercapturic acid. (Cf. A., 1944, III, 202.) E. C. W.

Oxidation of acetic acid in animal tissue. A. Kleinzeller (*Biochem. J.*, 1943, **37**, 674—677).—Neither glycine nor glycollic and glyoxylic acids can be an intermediate in the oxidation of acetic acid by guinea-pig kidney cortex. This oxidation is almost completely inhibited by 0·031M-malonate, and is more rapid in guinea-pig kidney cortex than in other tisues. P. G. M.

Determination of ethyl alcohol in blood and tissues, its absorption and distribution, and its effect on some of the blood constituents of the rat. V. B. Fish (*Iowa State Coll. J. Sci.*, 1943, **18**, 30—32; cf. C., 1944, Part 2).—The ratio of blood- to tissue-alcohol is const. for a period 1·5—3 hr. after oral administration to fasted rats. Habituation has no effect, whilst whole milk and cream have an inhibitory action on the absorption of alcohol from the digestive tract. Ingestion and intraperitoneal injection of alcohol were also studied. F. R. G.

Calcium and phosphorus metabolism in rheumatoid arthritis and degenerative joint disease. M. W. Ropes, E. C. Rossmeisl, and W. Bauer (*J. clin. Invest.*, 1943, **22**, 785—789).—Ca and P metabolism are not changed. C. J. C. B.

XX.—PHARMACOLOGY AND TOXICOLOGY.

Penicillin in treatment of hæmolytic staphylococcal septicæmia. N. Silverthorne (*Canad. Med. Assoc. J.*, 1943, **49**, 516—517).—2 children suffering from hæmolytic *Staph. aureus* septicæmia were given adequate doses of sulphonamides without improvement. Penicillin (dosage not stated) was also administered and there was prompt recovery of both patients with sterilisation of the blood. C. J. C. B.

Toxicity of penicillin as prepared for clinical use. D. M. Hamre, G. Rake, H. B. MacPhillamy, and C. M. McKee (*Amer. J. med. Sci.*, 1943, **206**, 642—652).—The acute toxicity of penicillin for mice, guinea-pigs, and rabbits was low; 100,000 Florey units (1 g.) per kg. given intravenously, caused a severe reaction and death. 7000—12,000 units per kg. per day of penicillin, as prepared for clinical use, given subcutaneously over a period of several days, caused death of guinea-pigs, but not of mice or rabbits. However, the clinical dose (1000 units per kg.) given subcutaneously for 20 days did not kill guinea-pigs. All animals given penicillin subcutaneously showed a severe reaction at the site of injection. Large doses of Na ascorbate did not protect guinea-pigs from the toxicity of repeated subcutaneous doses of penicillin. (5 photomicrographs.) C. J. C. B.

2'-Aminodiphenyl-4-sulphonamide and derivatives.—See A., 1944, II, 95.

Relation of structure to activity of sulphanilamide type compounds. R. O. Roblin, jun., and P. H. Bell (*Ann. New York Acad. Sci.*, 1943, **44**, 449—454).—See A., 1943, III, 415. V. J. W.

Relationship between chemical structure and physiological disposition of a series of substances allied to sulphanilamide. J. A. Shannon (*Ann. New York Acad. Sci.*, 1943, **44**, 455—476).—Sulphanilic acid, sulphanilamide, sulphanilylethanolamide, sulphanilylglycine, sulphanilylsulphanilic acid, and sulphanilylsulphanilamide were compared in respect of their distribution in the cat and excretion in the dog. N^1-Heterocyclic and N^1-acyclic sulphanilamide derivatives were also examined and all results are tabulated and discussed. No large generalisations are attempted. V. J. W.

Antagonists (excluding *p*-aminobenzoic acid), dynamists, and synergists of sulphonamides. H. I. Kohn (*Ann. New York Acad. Sci.*, 1943, **44**, 503—524).—A review. V. J. W.

Actoin of sulphonamides in the body. J. S. Lockwood (*Ann. New York Acad. Sci.*, 1943, **44**, 525—538).—A review. V. J. W.

Binding of sulphonamide drugs by plasma-proteins, a factor in determining distribution of drugs in body. B. D. Davis (*J. clin. Invest.*, 1943, **22**, 753—761).—Equilibria of sulphonamide drugs, dialysed between plasma or plasma-protein fractions and buffer, show considerable binding of drug to albumin, the extent of which accounts for the distribution of the drugs in the body fluids and the increased solubility in plasma. The order of increasing binding tendency is sulphanilamide, sulphapyridine, sulphadiazine, sulphathiazole. The binding increases with increasing alkalinity over the pH range 6·0—8·5, suggesting that anionic dissociation of the sulphonamide is a factor in the binding. Probably only the unbound drug is bacteriostatically active. The effective level of any of the sulphonamides in the c.s.f. would then be as great as that in the blood stream, suggesting that the ratio of the concns. in c.s.f. and blood should not be used as a guide to the choice of a drug in the treatment of meningitis. C. J. C. B.

Mode of action of prontosil. K. Ganapathi and R. Sanjiva Rao (*Indian J. Med. Res.*, 1940, **28**, 327—332; cf. A., 1940, III, 822).—The concns. of free sulphanilamide in the blood of mice 4—5 hr. after the ingestion of dyes of the prontosil series were high in dyes with strong anti-streptococcal activity, low in weakly active dyes. Six dyes were examined. Sulphanilamide is, therefore, considered the active principle in prontosil. S. E. M.

Penetration of sulphonamides into skin. Sulphathiazole, sulphadiazine, and sodium sulphacetimide. E. A. Strakosch and W. G. Clark (*Amer. J. med. Sci.*, 1943, **206**, 610—617).—Sulphanilamide, sulphathiazole, and sulphadiazine similarly applied to the skin gave similar tissue concns., indicating similar penetration into intact skin. Na sulphacetimide (" Albucid sol.") penetrated more rapidly. An increase of drug concn. did not increase the absorption rate in any case. Increasing the time of application did increase absorption. The type of emulsion had no effect. Injured skin absorbs much greater amounts of sulphonamides from ointments than intact skin, especially Na sulphacetimide. Injured skin absorbs sulphonamides from wet packs to a much greater extent than from ointments. C. J. C. B.

Treatment of acute appendicitis with sulphathiazole. O. Schürch (*Schweiz. med. Wschr.*, 1943, **73**, 262—264).—The sulphathiazole treatment of acute appendicitis is rejected; caution is recommended in the intraperitoneal administration of a sulphathiazole–boric acid prep. in cases of peritonitis because of the danger of adhesion formation. A. S.

Sulphapyridine in typhoid fever. M. Rachmilewitz and K. Braun (*Trans. R. Soc. trop. Med. Hyd.*, 1943, **37**, 157—162).—18 cases of typhoid fever benefited from sulphapyridine. C. J. C. B.

Use of sulphapyrazine in infants and children. H. L. Barnett, A. M. Perley, G. B. Forbes, and D. Goldring (*Amer. J. med. Sci.*, 1943, **206**, 599).—Low (4 mg.-%) but uniform blood levels of free sulphapyrazine follow the oral administration of 0·1 g. of the drug per kg. High blood levels can be rapidly attained and maintained by the subcutaneous administration of Na sulphapyrazine. The concn. in the c.s.f. is 64% of the plasma concn. and 76% of the whole blood concn. With comparable blood levels, sulphapyrazine is as effective as other sulphonamides. It causes few toxic effects, and the renal complications are less common than with other sulphonamides except sulphanilamide. C. J. C. B.

Selective action of sulphaguanidine on avian coccidia. P. P. Levine (*J. Parasit.*, 1943, **29**, 362—363).—When sporulating oöcysts of *Eimeria acervulia*, *E. praecox*, *E. mitis*, *E. hagani*, *E. brunetti*, and *E. maxima* were ingested by chickens being fed sulphaguanidine in concns. of 0·5% of the ration, infection was completely prevented. *E. tenella* and *E. necatrix* infections were unaffected. F. S.

Effect of oral administration of succinylsulphapyrazine on coliform flora of intestine of mice. F. T. Callomon and G. W. Raiziss (*J. Pharm. Exp. Ther.*, 1943, **79**, 200—207).—Succinylsulphapyrazine has the same bactericidal effect on the intestinal coliform flora of mice as sulphaguanidine. Malylsulphathiazole, also recently synthesised, is less effective in this respect; its activity equals that of succinylsulphathiazole. G. P.

Histological effects of sulphonamide–proflavine mixtures in rabbit. D. S. Russell and D. J. K. Beck (*Brit. Med. J.*, 1944, I, 112—113).—Powders consisting of 1 part of proflavine to 100 parts of sulphathiazole caused considerable damage to neighbouring muscle and connective tissues when applied between the panniculus carnosus and skeletal muscle of the rabbit. Similar effects are obtained by applying the powder to the brain of the rabbit. Mixtures containing 0·5% of proflavine are not so damaging and 0·1% proflavine and sulphonamide powder are preferable from the histological viewpoint. I. C.

Urinary chloride excretion in pneumonia after chemotherapy. M. Naville and P. Alphonse (*Schweiz. med. Wschr.*, 1943, **73**, 353—356).—The body temp. of 41 patients suffering from pneumonia returned to normal on the 6th day of the disease following chemotherapy; the main increase in urinary Cl′ excretion, however, occurred in 33 cases on the 12th day, as in untreated cases. A. S.

Toxic effects of sulphonamides. H. B. van Dyke (*Ann. New York Acad. Sci.*, 1943, **44**, 477—502).—A review of toxic effects on blood, kidney, nervous system, skin, body temp., and liver, with photographs. V. J. W.

Prevention of renal precipitation of sulphadiazine in dogs. O. J. Jensen (*Amer. J. med. Sci.*, 1943, **206**, 746—755).—Experiments in dogs showed that when the pH of the urine exceeds 7, crystalluria is min., higher urinary concns. of drug are obtained, and the total quantity of drug excreted is also higher. Conversely, during acid therapy, when the urinary pH was below 7, crystalluria was marked, urinary levels were low, and the total quantity of drug excreted was less. A comparison of the pH and sulphadiazine levels in the urine of dogs under therapy gave a curve that closely simulates the *in-vitro* solubility curve. C. J. C. B.

Urinary excretion of sulphadiazine. O. L. Peterson, R. A. Goodwin, jun., and M. Finland (*J. clin. Invest.*, 1943, **22**, 659—672).—The greatest and most prolonged increase in excretion of sulphadiazine resulted from the administration of sufficient $NaHCO_3$ to insure a highly alkaline urine. A decrease in the drug concn. in the urine was obtained most rapidly by the intravenous injection of a large vol. of 5—10% glucose solution. The ingestion of water in large amounts produced a similar result less rapidly, and intravenous physiological saline gave a less marked reduction in the concn. of drug in the urine and the effect was more delayed. Only the first procedure was accompanied by a large increase in drug output. C. J. C. B.

Anti-hæmolytic action of soluseptasine. A. C. Roy, D. C. Mazumdar, and P. Mukherjee (*Indian J. Med. Res.*, 1940, **28**, 235—240).—Soluseptasine retarded, roughly in proportion to its concn., hæmolysis *in vitro* caused by cobra venom. It also retarded hæmolysis by Na glycocholate, Na taurocholate, saponin, and cyclamine. Cholera and streptococcal hæmolysins were neutralised. S. E. M.

Modern drugs in prevention and treatment of tropical diseases. S. P. James and F. Hawking (*Trans. R. Soc. trop. Med. Hyg.*, 1943, **37**, 71—88).—A general discussion. C. J. C. B.

Biological properties and chemotherapeutic effects of irgafen (Geigy 867, N^1-3 : 4-dimethylbenzoylsulphanilamide), especially in pneumococcal infections of mice. P. Läuger, H. Martin, R. Pulver, and R. Suter (*Schweiz. med. Wschr.*, 1943, **73**, 399—408).—A 5% aq. solution of the Na salt of this substance has pH 8·2. The free acid is almost insol. in water. The max. single dose which is tolerated by mice or rabbits on subcutaneous, intravenous, or intraperitoneal administration is 0·5 g. of the Na salt per kg. A single oral dose of 5 g. per kg. produces a blood concn. of 140 mg.-%. The blood concn. after injection of equal doses of prep. 867 is higher than following sulphapyridine. Intestinal absorption in rabbits and in man is rapid and the amount of acetylated substance excreted in urine was never more than 20% of the total concn.; the acetyl derivative showed a high solubility in urine, especially at pH 7—8. There was no formation of methæmoglobin after prolonged administration. The substance was very active against pneumococcal infections in mice, including types I, II, VI, and XIII infections, even after administration of a single dose, against hæmolytic streptococci and *B. coli*, less active against Friedländer's *Diplobacillus pneumoniæ*, and inactive against *Trypanosoma equiperdum*. Good results were obtained by prophylactic administration of a single dose against 10 lethal doses of type I pneumococcus in mice; *p*-aminobenzoic acid has a complete antagonistic effect to prep. 867 in pneumococcal infections in mice. Addition of 2 mg.-% of prep. 867 to a synthetic medium inoculated with *Staph. pyogenes aureus* produces an 89% inhibition of O_2 consumption in 3½ hr.; 10 mg.-% have a complete bacteriostatic effect in 5 hr.; this effect is annulled by *p*-aminobenzoic acid. A. S.

***cyclo*Hexylgeranylacetic [α-*cyclo*hexyl-δθ-dimethyl-Δ$^{\nu\eta}$-decadienoic] acid.**—See A., 1944, II, 99.

Blocking of brain capillaries by parasitised red blood cells in *Babesiella berbera* infections in cattle [parasites unaffected by stilbamidine, pentamidine, or acaprin]. I. Tchernomoretz (*Ann. trop. Med. Parasit.*, 1943, **37**, 77—79).—*B. berbera* infections in calves were not influenced by injections of stilbamidine (4 : 4′-diamidinostilbene) in doses up to 10 mg. per kg., of pentamidine (4 : 4′-diamidinodiphenoxypentane) in doses up to 10 mg. per kg., or of acaprin in doses up to 2·8 mg. per kg. Blocking of the brain capillaries was an important contributary cause of death. (3 photomicrographs.) F. S.

Comparison of results obtained by different methods of administration of drugs in trypanosomal infections in mice. J. D. Fulton and W. Yorke (*Ann. trop. Med. Parasit.*, 1943, **37**, 80—95).—The best therapeutic indices were obtained by subcutaneous inoculation of the drug, because the mice tolerated greater doses by this route than by the intraperitoneal or intravenous routes, while the min. effective and curative doses were the same. The highest doses were tolerated by mouth but the results were the least satisfactory. With reduced tryparsamide the trypanocidal effect of a relatively high concn. in the blood for a short period was the same as that of a relatively low concn. for a longer period. F. S.

Case of Indian kala-azar treated with propamidine (4 : 4'-diamidinodiphenoxypropane). A. R. D. Adams (*Ann. trop. Med. Parasit.*, 1943, **37**, 96—97).—The case was apparently cured by 9 daily doses of 2 mg. of the drug per kg. of body wt. F. S.

Activity of drugs in malaria of man, monkeys, and birds. F. H. S. Curd (*Ann. trop. Med. Parasit.*, 1943, **37**, 115—143).—The activity of many antimalarial drugs is tabulated. (277 references.) F. S.

Hæmoglobinuria following administration of plasmoquine. W. N. Mann (*Trans. R. Soc. trop. Med. Hyg.*, 1943, **37**, 151—155).—A case is described of severe hæmoglobinuria after 0·01 g. thrice daily of plasmoquine in a Bantu patient suffering from sub-tertian malaria. The presence and subsequent disappearance of hæmagglutinins was observed. C. J. C. B.

Clinical features and treatment of malaria in British troops in West Africa. S. B. Hughes and R. R. Bomford (*Brit. Med. J.*, 1944, I, 69—73).—846 cases of malaria are reported and classified into febrile, gastric, diarrhœic, dysenteric, respiratory, myalgic, and cerebral types. Only two patients died, both from blackwater fever. The most useful type of treatment was found to be quinine 10 grains thrice daily by mouth for 2—3 days and 0·1 g. thrice daily of mepacrine for 6 days, the two drugs being allowed to overlap for 24 hr. I. C.

Unusual case of cerebral malaria [quinine therapy]. C. S. D. Don and P. F. Meyer (*Brit. Med. J.*, 1944, I, 149).—Case report. 35% of the red cells were infected; after a large dose of quinine pronounced cerebral symptoms developed; transient hæmoglobinuria followed 30 g. of quinine intravenously and two blood transfusions; hyperpyrexia developed after three days' intensive quinine therapy. I. C.

Bacteriostatic action of euflavine and proflavine dressings on pathogenic organisms in blood. Mechanism of disinfection of bacteria by water-soluble bactericides.—See A., 1944, III, 221.

[Anti-]protozoal activity of phenols.—See A., 1944, III, 220.

Treatment of pediculosis capitis. E. Blackstock (*Brit. Med. J.*, 1944, I, 114—115).—The following treatment is recommended: first day: head coated with a modified ascabiol applied with brush; second day: hair washed with soap and water; one week later: inspection of the head for possible re-infestation. I. C.

Treatment of pyogenic infections with emetine. E. Melchior (*Schweiz. med. Wschr.*, 1943, **73**, 385—389).—Dramatic improvement in gravely ill patients with a variety of pyogenic conditions which did not respond to surgery was obtained by subcutaneous injections of 0·03—0·06 g. per day of emetine hydrochloride up to total doses of 0·6 g. The treatment can be repeated after 1—2 weeks' interval. There were no untoward effects. 16 case histories are reported. A. S.

Furfuryltrimethylammonium iodide (furmethide) in the treatment of urinary retention due to bladder atony. S. H. Beaser, J. H. Lipton, and M. D. Altschule (*Amer. J. med. Sci.*, 1943, **206**, 490—497).—Furmethide (furfuryltrimethylammonium iodide), a parasympathomimetic substance with a strong action on the bladder, was used in the treatment of bladder atony caused by a variety of factors in 31 patients. Urinary retention was relieved in most patients, the vol. of residual urine being reduced. Side reactions, consisting of perspiration and salivation, were occasionally troublesome but never dangerous. Obstruction of the vesical neck constitutes a contraindication for the use of furmethide. C. J. C. B.

Pharmacology of *dl*-β-phenyl-*n*-propylmethylamine, a volatile amine. M. R. Warren, D. G. Marsh, C. R. Thompson, R. S. Shelton, and T. J. Becker (*J. Pharm. Exp. Ther.*, 1943, **79**, 187—199).—Out of a series of synthesised arylethyl-, arylpropyl-, and arylbutylamines, dl-*β-phenyl*-n-*propylmethylamine*, b.p. 211° (*hydrochloride*, m.p. 144°), injected intravenously has similar qual. and quant. effects on the cardiovascular system and bronchioles to *l*-ephedrine. Its toxicity is also the same as that of *l*-ephedrine but it has no central stimulating effect. Inhalation of the vapours produces similar effects to injection of the drug. It decreases the tonus of isolated intestinal muscle and causes a spasm of isolated uterine muscle. The vasopressor action of a phenylethylamine compound with a side-chain (other than OH) on the β carbon is not affected, but its toxicity is reduced when the compound is converted into a methylated *sec.* amine. G. P.

Chemotherapeutic study of *p*-nitrobenzoyl and related compounds.—See A., 1944, II, 99.

Peripheral circulatory [vasodilating] action of *Veratrum viride*. J. R. Willson and R. G. Smith (*J. Pharm. Exp. Ther.*, 1943, **79**, 208—214).—A peripheral vasodilating action of *V. viride* was demonstrated in perfusion experiments with isolated organs, and in anæsthetised dogs after vagal section. G. P.

Sites of heart-rate-lowering action of veratridine. O. Krayer, E. H. Wood, and G. Montes (*J. Pharm. Exp. Ther.*, 1943, **79**, 215—224).—The sites of the heart-rate-lowering action of veratridine were determined in heart–lung–head preps. and cross-circulation experiments in dogs. In the latter case the heart was connected with the head by nervous pathways only and the head was perfused from another dog. It was found that the heart-rate-lowering action of veratridine is due partly to a reflex mechanism mediated through the vagi, which originates in the heart–lung system, and partly to central stimulation of the vagi. It is probable that afferent stimuli, originating in the carotid sinus area, also play a part in the action of veratridine. G. P.

Inhibitory agents of uterine mobility. B. T. Krishnan (*Indian J. Med. Res.*, 1940, **28**, 241—247).—Adrenaline inhibited mobility of pregnant and non-pregnant uterus of rat and guinea-pig. Antuitrin excited mobility; insulin increased this effect. Thyroxine and vitamin-*E* had no effect. Thymol and acetone inhibited strongly, ether and alcohol moderately. S. E. M.

Phenothiazine in the treatment of human intestinal helminthic infestations. M. Elliott (*Trans. R. Soc. trop. Med. Hyg.*, 1943, **37**, 163—164).—Phenothiazine 2 g. thrice daily for 5 days was well tolerated by the adult native and has an antiparasitic action against *A. duodenale* and other common intestinal parasites. C. J. C. B.

Antibodies to histamine induced by histamine conjugates [azoprotein] in man. M. B. Cohen and H. J. Friedman (*J. Allergy*, 1943, **14**, 195—202).—Patients with urticaria, atopic dermatitis, contact dermatitis, and vasomotor rhinitis were given injections of histamine-azoprotein once or twice weekly for 3—12 months. Precipitins to the injected complex were found in the serum; prior incubation of the serum with histamine inhibited the precipitin reaction with the complex, showing the presence of precipitins sp. for histamine. The patients' sera were mixed with varying amounts of histamine and applied by iontophoresis to the skin of a normal subject. There was some evidence of histamine neutralisation by the serum. Introduction of histamine by iontophoresis into the skin of the patients also showed some histamine neutralisation *in vivo*. C. A. K.

Thiourea and thiouracil in hyperthyroidism.—See A., 1944, III, 185.

Reactions to local anæsthetic agents [procaine]. H. B. Shumacker, jun. (*Surgery*, 1941, **10**, 119—133).—The median lethal doses [LD_{50}] of 10% procaine for guinea-pigs, using various routes of injection, were: intravenous 41, intrapleural 42, paravertebral (thoracic) 115, paravertebral (lumbar) 250, intramuscular 330, subcutaneous 410, and intraperitoneal 750 mg. per kg. The blood free-procaine level at death was 11—16 mg.-% irrespective of the route of administration of a toxic dose. Death from a toxic dose is preceded by convulsions, except when a large dose is given intravenously, and the heart beat and respirations often stop simultaneously. Nembutal anæsthesia increased the subcutaneous LD_{50} to 700 and the intramuscular to 610 mg. per kg., but slightly decreased the intravenous and intrapleural LD_{50}. Coramine, metrazol, or artificial respiration did not save the animals from procaine death. G. P.

Reactions to local anæsthetic agents [in man]. H. B. Shumacker, jun. (*Surgery*, 1941, **10**, 134—144).—Report of 9 cases of toxic reactions to cocaine or its substitutes in man. G. P.

Effect of pentobarbital sodium and pentothal sodium on the fœtus. R. Dreisbach and F. F. Snyder (*J. Pharm. Exp. Ther.*, 1943, **79**, 250—257).—Pentobarbital Na or pentothal Na, given intravenously to pregnant rabbits at full term, decreased or completely abolished the respiratory movements of their fœtuses *in utero*. This effect occurred with doses which did not produce complete analgesia in the maternal animal. The effect of pentobarbital is more prolonged than that of pentothal. The O_2 and CO_2 content of the fœtal blood remained normal during the suppression of the respiratory movements of the fœtus. G. P.

Effect of hæmorrhage on anæsthetic dosage. D. R. Wood and N. T. Jaco (*J. Pharm. Exp. Ther.*, 1943, **79**, 259—265).—The intravenous dose of pentobarbitone required to produce a defined level of anæsthesia in rabbits was reduced by 18%, and the dose producing respiratory failure by 24%, after the loss of 20 ml. of blood per kg. The induction time of ether anæsthesia in rats deprived of more than 25% of their blood vol. was shortened to 60—75% of the normal. Anæsthesia could be maintained in bled rats by 3—4% ether concn., while 5—6% ether was required to maintain anæsthesia in normal rats. G. P.

Analgesic effects of low concentrations of nitrous oxide compared in man with morphine sulphate. W. P. Chapman, J. G. Arrowood, and H. K. Beecher (*J. clin. Invest.*, 1943, **22**, 871—875).—N_2O in 20% concn. in O_2 is as effective an analgesic agent as morphine in 15-mg. dose, judged from the 2 types of pain (cutaneous or muscle ischæmia) considered. N_2O at this concn. does not impair consciousness and is effective as long as it is not allowed to escape from the "closed" respiratory system; the morphine effect passes through a max. and, as it is metabolised, the effect disappears. C. J. C. B.

Withdrawal syndrome in opium addicts and the rationale of treatment with lecithin and glucose. R. N. Chopra and G. S.

Chopra (*Indian J. Med. Res.*, 1940, **28**, 225—233):—Withdrawal symptoms, disturbance of central nervous and digestive systems, cause general dehydration of the body, but the withdrawal treatment restores the fluid equilibrium of the body in the end. Treatment with lecithin decreased the intensity and duration of symptoms, probably by restoring lost P to the nerve cells. Intravenous injection of 25% glucose further decreased symptoms by improving the fluid-retaining power of the blood. S. E. M.

Fate of heroin [*in vitro* **and** *in vivo*]. F. W. Oberst (*J. Pharm. Exp. Ther.*, 1943, **79**, 266—270).—88% of heroin hydrolyses in 10 min. in 0·5M-Na_2CO_3 at 26°. In the human body heroin is completely hydrolysed and is excreted as morphine, 7% in free and 50% in bound form. Half as much heroin hydrochloride (calc. as morphine base) as morphine sulphate satisfied physical dependence in morphine addicts. G. P.

Tissue action of theophylline and other xanthines. E. R. Zak (*Exp. Med. and Surg.*, 1943, **1**, 181—187).—Frogs, rabbits, mice, and rats were given subcutaneous theophylline injections on 3 successive days and one intravenous injection of $Na_4Fe(CN)_6$. Treatment of the specimen with $FeCl_3$ showed a stronger Prussian-blue reaction, as sign of marked vasodilatation, than in untreated animals. Similar results were obtained with Na theobromine acetate. The vasodilator effect of the xanthines was also demonstrated using acid fuchsin and $Na_4Fe(CN)_6$ and the Spalteholz technique. A. S.

Gold therapy in rheumatoid arthritis. J. W. Graham and A. A. Fletcher (*Canad. Med. Assoc. J.*, 1943, **49**, 487).—Of 100 cases of rheumatoid arthritis in which treatment with Au salt was undertaken, 95 received at least 1·06 g.; 67% underwent remission or were much improved; 20% showed moderate improvement. 54 of the 100 patients showed 1 or more toxic manifestations, the majority of which were mild and cleared up with temporary cessation of treatment. The most severe were 4 cases of skin reactions with exfoliating dermatitis. C. J. C. B.

Gold therapy in rheumatoid arthritis. A. E. Price and B. Leichtentritt (*Ann. int. Med.*, 1943, **19**, 70—80).—Au Na thiomalate was used in 91 and Au thioglucose in 10 patients, given intramuscularly. The total dose of drug given varied from 0·5 to 9·0 g. Toxic reactions occurred in 38% of all patients. Dermatitis, from simple erythema to extensive papulo-squamous eruptions involving the whole body, was observed in 30 patients; pruritus was frequent. The erythematous skin showed dilatation of capillaries in the papillary layer with œdema and infiltration by lymphocytes, plasma cells, and histiocytes. Superficial ulceration of the buccal mucosa occurred in 4 patients, conjunctivitis in 3, " Au bronchitis " in 2. Traces of albumin in the urine were found in 50% of the patients at some time, marked albuminuria only in 4 patients. Eosinophilia exceeding 5% was found in 11 cases; agranulocytosis occurred in 1 patient after administration of 300 mg. of Au, thrombocytopenia in 3, one of whom died. 93% of the mild cases improved under treatment, 80% of the moderately advanced, and 40% of the severe advanced cases. There was definite improvement in 60% of all cases. Relapses occurred in 55% of all cases showing initial improvement, most of them 2—3 months after cessation of treatment. A. S.

Treatment of early and latent syphilis. J. H. Stokes and H. Beerman (*Amer. J. med. Sci.*, 1943, **206**, 521—545).—A crit. review. C. J. C. B.

Fatal methyl bromide poisoning. J. W. Miller (*Arch. Path.*, 1943, **36**, 505—507).—A man was accidentally exposed to methyl bromide in a refrigerator car filled with hay. The concn. of methyl bromide in air was 8160 p.p.m. 14 hr. before his entrance into the car. The duration of exposure was 5½—7½ hr. He was unconscious when found but was revived by administration of O_2 and other medication not specified. Muscular control was impaired throughout the entire survival time (80 hr. after the end of exposure). The most significant changes were extensive pulmonary œdema, seropurulent pneumonia (small foci), acute bronchitis, and early fatty degeneration of the liver. (1 photomicrograph.) C. J. C. B.

Histopathological changes in retina and late changes in visual field in acute methyl alcohol poisoning.—See A., 1944, III, 183.

Skin absorption of tri-*o*-cresyl phosphate as shown by radioactive phosphorus. H. C. Hodge and J. H. Sterner (*J. Pharm. Exp. Ther.*, 1943, **79**, 225—234).—Tri-*o*-cresyl phosphate, containing ^{32}P, was absorbed through the palmar skin of man and through the skin of abdomen of a dog. 0·1—0·4% of the dose applied to the skin was excreted in the urine in 24 hr. The various tissues of the dog retained the compound in the following order: viscera, muscle, brain, bone. The intraperitoneal LD_{50} for mice was 0·28 ml. per kg. There is a danger of cumulative toxic effects from absorption of tri-*o*-cresyl phosphate if it is handled without necessary precautions. G. P.

Toxicity of rotenone to animals. L. K. Cutkamp (*Soap*, 1943, **19**, No. 10, 107, 109, 111, 113, 115, 123).—Data in the literature are summarised and compared with those for other insecticides. R. S. C.

Cantharidin poisoning in S. Africa. I. Gordon (*Clin. Proc.*, 1943, **2**, 293—298).—A review. P. C. W.

Case of aspirin poisoning. A. D. Charters (*Brit. Med. J.*, 1944, I, 10—11).—Case report, with acidosis, acetonuria, hepatitis, and damage to the kidneys. I. C.

Standardisation of cobra antivenene. J. Taylor (*Indian J. Med. Res.*, 1940, **28**, 279—290).—The toxicity of dried cobra venom decreases slightly on storage. The assay of potency of antivenene should be based not on wt. of cobra venom, but on the no. of " certain lethal doses " (*d.c.l.*) neutralised by a given quantity of serum. Tests were carried out on white mice. Intramuscular injection of the venom gave more reliable results than intravenous injection. When multiples of 1 *d.c.l.* of cobra venom were injected, for every additional *d.c.l.* 5 times the quantity of serum neutralising 1 *d.c.l.* was required to obtain neutralisation. The calculation of the neutralising val. of an antivenene should, therefore, not be based on the amount required to neutralise 1 *d.c.l.*, but on the amount neutralising additional lethal doses. S. E. M.

Fluorescent alkaloid in rye-grass (*Lolium perenne*, L.). V. Toxicity, photodynamic action, and metabolism of perloline. I. J. Cuningham and E. M. Clare (*New Zealand J. Sci. Tech.*, 1943, **24**, B, 167—178; cf. A., 1944, II, 113).—Perloline is toxic to paramecia in solution, and to mice, rabbits, and sheep when injected intravenously or intraperitoneally; the toxic doses required are, however, much larger than those of strychnine or nicotine. There is no cumulative effect on repeated injection of sub-toxic doses. Toxic symptoms are not similar to those of any known disease, and are not accompanied by any macroscopic or microscopic change of any tissue or organ. Toxic effects are not induced in sheep by oral administration of amounts larger than would be normally ingested from pasture; photosensitisation is not induced in this way, and only slightly by intravenous injection of large quantities. Perloline is rapidly destroyed in the body, mainly by the liver, less than 4% being excreted. When ingested with pasture it is unlikely to be the cause of disease or of photosensitisation, but its effect on growth rate or production of stock has not been studied. S. A. M.

Epidemiology of epidemic dropsy. IX. Quantitative aspects of the problem of toxicity of mustard oil. R. B. Lal, S. P. Mukherji, A. C. Das Gupta, and S. R. Chatterji (*Indian J. Med. Res.*, 1940, **28**, 163—196; cf. A., 1940, III, 103).—Mustard seed contains *Argemone* seeds as admixture in quantities of 0·5—5%. The argemone oil is responsible for the toxic effects producing dropsy. The amount of toxic principle present was determined by the colour reaction of the oil with conc. HNO_3 (equal vols., 2 min.). Exposure of the oils, but not of the cryst. active substance, to visible or ultra-violet light and air reduces the strength of the colour reaction. Toxicity of the oils, roughly estimated from epidemiological data, corresponded approx. with the strength of the colour reaction. Mustard oil containing less than 1% of argemone oil is without toxic effect. S. E. M.

Modern treatment of burns. R. H. Aldrich (*J. Chem. Educ.*, 1943, **20**, 566—570). L. S. T.

Protection from [war] gases. G. Ljunggren (5 *Nordiske Kemikermøde*, 1939, 62—73).—A review. M. H. M. A.

Action of war gases. C. D. Leake and D. F. Marsh (*J. Chem. Educ.*, 1943, **20**, 339—343, 357).—A review of economic, psychological, and biological actions of war gases. L. S. T.

Invert soaps. I—VI.—See A., 1944, II, 90, 95, 98, 111, 112, 115.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Dynamic physical fitness in adolescents. I. Absolute physical fitness. II. Evaluation of athletic programmes by means of fitness tests. J. R. Gallagher and L. Brouha. **III. Practical bicycle ergometer test of fitness for adolescents. IV. Evaluation of a body-building programme utilising a bicycle ergometer test.** J. R. Gallagher, C. D. Gallagher, and L. Brouha (*Yale J. Biol. Med.*, 1943, **15**, 659—670, 671—677, 679—688, 689—692).—I. The efficiency for hard muscular work of boys 13—19 years of age was measured by getting them to ride a bicycle ergometer at 20 miles an hr. against a friction load of 5 lb. for 5 min. Max. heart rates were more influenced by fitness than by age, but fitness could not be predicted from the max. rate alone. Initial heart rate had little correlation with fitness and was of val. only in estimating the degree of tenseness or apprehension of the subject. With work kept const., the fitness index was more affected by the size than by the age of the subject. Blood-lactate levels did not correlate closely with max. heart rates, but the lower fitness indices tended to be accompanied by higher max. heart rates. There was a relation between work indices, based on max. heart rate and lactate level, and recovery indices, based on the heart rate deceleration after exercise.

II. In a sport requiring almost continuous running (lacrosse) the improvement in fitness index and work index was greatest after 6 weeks' participation.

III. Dynamic physical fitness was tested on a bicycle ergometer with adjustments of the work load to compensate for the variations in size within the members of the group. F. S.

Dermatological therapy in general practice. W. Lutz (*Schweiz. med. Wschr.*, 1943, **73**, 390—393).—A lecture. A. S.

Recent advances in pharmacology. H. Staub (*Schweiz. med. Wschr.*, 1943, **73**, 369—374). A. S.

Influence of muscular work and fatigue on the state of the central nervous system [fusion frequency of flicker]. E. Simonson, N. Enzer, and R. W. Benton (*J. Lab. clin. Med.*, 1943, **28**, 1555—1567).—The reactions of the fusion frequency of flicker of 54 normal subjects after exercise of increasing severity were studied. 80—90% of normal people respond with an increase of the fusion frequency after static exercise and 30 genuflexions, and with a decrease of the fusion frequency after running. After pulley exercise, 40% of the subjects respond with both increase and decrease. The magnitude and the duration of the depression correspond to the severity of exercise. The endurance of women in static and pulley exercise and in running is lower than that of men, but there is no difference of the reaction of the fusion frequency of flicker. The response of the fusion frequency of women after an equal amount of work (30 genuflexions) is inferior to that of men. C. J. C. B.

"Oxygen pulse index" of work capacity in horses. H. H. Kibler and S. Brody (*Univ. Missouri Agric. Expt. Stat., Res. Bull.* 367, 20 pp.).—The rate of O_2 consumption in small and large work horses at rest and during work on a horizontal treadmill was related to pulse rate and body wt. The O_2 consumption is directly proportional to body wt. in mature work horses of different size. "O_2 pulse" (O_2 consumption per min./pulse rate per min.) is proportional to body wt. in mature animals of different species; O_2 pulse per kg. body wt. is const. for all body wts. but varies with training and muscular work capacity. O_2 pulse per kg. body wt. is an index of work capacity. A low index during rest and work indicates a low work capacity. The index vals. for horses are compared with figures obtained in athletes and subjects of sedentary habits. A. S.

Supervision of pregnant women in factory employment. J. V. O'Sullivan and L. B. Bourne (*Brit. Med. J.*, 1944, I, 108—110).—A review. I. C.

Industrial dermatitis. C. C. Dennie, J. G. Downing, J. R. Driver, H. R. Foerster, J. Klander, C. G. Lane, H. E. Miller, E. A. Oliver, E. Osborne, L. Schwartz, and M. Sulzberger (*J. Amer. Med. Assoc.*, 1943, **122**, 370—375).—A review. C. A. K.

Contact dermatitis from olive oil. R. L. Sutton (*J. Amer. Med. Assoc.*, 1943, **122**, 34—35).—Case report. C. A. K.

Nail polish dermatitis. W. H. Guy and F. M. Jacob (*J. Amer. Med. Assoc.*, 1943, **122**, 436).—Case reports. C. A. K.

Halowax acne among electricians. L. Schwartz (*J. Amer. Med. Assoc.*, 1943, **122**, 158—161).—Electricians working with cables coated with chlordiphenyls (halowax) developed an acne-like eruption on face, ears, neck, shoulders, abdomen, and thighs. Methods of protection suggested include local application of a cream containing alcoholic solution of shellac mixed with $NaBO_2$ and ZnO. C. A. K.

Experimental thermal burns, especially moderate-temperature burn. E. H. Leach, R. A. Peters, and R. J. Rossiter (*Quart. J. Exp. Physiol.*, 1943, **32**, 67—86).—Temp. of 45—80° have been applied with a burning-iron to the shaved skin of anæsthetised guinea-pigs and rats for periods varying from 10 sec. to 10 min. Application of 47° up to 6 min. produced no visible change. At 50—55° applied for 1 min. and over there is development of irreversible damage and scab formation. At 60—65° the epidermis can be peeled off, leaving a punched-out exposed surface like the exposed human blister. Severe scabbing is produced by temp. of 70—80° for 10—20 sec. Œdema formation begins at 55° and is definite at 60°. With milder burns there is cellular disintegration; with more intense burns, heat-coagulation, and a peripheral zone with changes characteristic of burns of lower temp. The epithelium of burnt skin loses basophil granules from the cytoplasm and nucleoprotein from the nuclei; both substances were identified in the intercellular blister spaces. The structure and staining properties of collagen fibres change in the more intense burns. A. S.

Burns and scalds in children. A. W. Wilkinson (*Brit. Med. J.*, 1944, I, 37—40).—The circumstances of the accident, time of day, causal agent, age of the patient, and extent of injury have been analysed in 366 children up to 12 years of age suffering from burns and scalds. The results show that the problem is a social one and passible of educational propaganda. I. C.

XXII.—RADIATIONS.

Roentgen therapy of interstitial pneumonia. A. Oppenheimer (*J. Pediat.*, 1943, **23**, 534—538).—Following roentgen irradiation with small doses, rapid and consistent improvement of the clinical condition took place in 33 of 36 patients with interstitial pneumonia. Treatment with doses exceeding 100 r. during acute stages resulted in severe constitutional reactions. C. J. C. B.

Roentgen therapy of non-specific inflammatory conditions. A. Rosselet and R. Humbert (*Schweiz. med. Wschr.*, 1943, **73**, 393—The results of *X*-ray therapy of 291 cases suffering from a variety of inflammatory conditions are reviewed. A. S.

Surgical management of post-radiation scars and ulcers. H. Conway (*Surgery*, 1941, **10**, 64—84).—Report of 10 cases in which extensive scarring, indolent ulceration, or carcinoma of the skin developed after *X*-ray or Ra therapy. Treatment is described. G. P.

Effects of various intensities of light on certain laboratory animals. M. E. Maun and L. H. Domeier (*J. Lab. clin. Med.*, 1943, **28**, 1696—1713).—Groups of rats, rabbits, guinea-pigs, and chickens were exposed to different intensities of light in 3 experimental rooms. The animals received unlimited quantities of similar food in each room, and all were exposed to light for an equal length of time daily. The health of the animals, in the 3, the 100, and the 1000 ft.-candle rooms was the same. No differences in behaviour or wt. increase of the animals were noted in the different experimental rooms. There was increased rate of hair growth in animals exposed to higher intensities of light. C. J. C. B.

Ultra-violet radiation in respiratory cross infections. E. C. Robertson, M. E. Doyle, and F. F. Tisdall (*J. Amer. Med. Assoc.*, 1943, **121**, 908—914).—Ultra-violet irradiation of the entrances to cubicles reduced the frequency of respiratory tract infections, and diminished the no. of bacteria in the air. C. A. K.

Effect of *X*-rays on the structural viscosity of the protoplasm. H. T. Northen and R. MacVicar (*Biodynamica*, 1940, **3**, 28—32).—*Spirogyra* filaments subjected to *X*-rays (250—5000 r.) showed a decrease followed by an increase in the viscosity of the protoplasm. L. G. G. W.

Quantitative effect of *X*-rays on ascorbic acid in simple solution and in mixtures of naturally occurring compounds. R. S. Anderson and B. Harrison (*J. Gen. Physiol.*, 1943, **27**, 69—75).—When 0·36—0·42 mg.-% of ascorbic acid in 0·025M-PO_4''' buffer and approx. 0·5M-$NaPO_3$ is irradiated with *X*-rays approx. 50% and 70—80% of the ascorbic acid reacts when the intensities are approx. 5500 and 11,000 r. per min. respectively. Most of the reaction occurs during or soon after the irradiation. It is assumed that the ascorbic acid reaction represents a substantial fraction of the available totally ionised or activated water. 0·2—2·5% of serum-albumin or 7% of dried or fresh human plasma has no effect on the reaction, but in presence of excised rat muscle the induced reaction occurs to only a small extent. J. N. A.

Photosynthesis of a fluorescent substance of the thiazole series (vitachrome).—See A., 1944, II, 86.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Osmosis and osmotic pressure. H. C. Eyster (*Bot. Rev.*, 1943, **9**, 311—324).—A review. L. G. G. W.

Changes in an osmotic system during freezing.—See A., 1944, I, 56.

Effect of temperature on rate of hydrolysis of triglycerides by pancreatic lipase. B. Schwartz (*J. Gen. Physiol.*, 1943, **27**, 113—118).—The temp. characteristic (μ) for the hydrolysis of all concns. (except very dil.) of tributyrin by pancreatic lipase is 8500±1000, whilst for hydrolysis of trivalerin, trihexoin, triheptoin, and trioctoin, μ varies from approx. 8500±1000 for high concn. to 12,400, 20,000, 22,400, and 23,700 respectively for the lowest concn. of each. J. N. A.

Kinetics of enzyme–substrate compound of peroxidase. B. Chance (*J. Biol. Chem.*, 1943, **151**, 553—577).—The equilibrium const. of the peroxidase–substrate reaction (2×10^{-8}) is of the same order as that of CO-hæmoglobin, but the system dissociates less readily than the peroxidase–H_2O_2 system of cytochrome *c*. Determinations of the Michaelis const. ($0{\cdot}41—0{\cdot}5 \times 10^{-6}$), using ascorbic acid and leucomalachite-green as acceptors, indicate that a chain mechanism plays little part in the reaction. The mechanism of oxidation of the acceptor is obscure, but the reaction involves bimol. combination. The enzyme–substrate complex is decomposed according to a first-order reaction. P. G. M.

Model of the potassium effect. W. J. V. Osterhout (*J. Gen. Physiol.*, 1943, **27**, 91—100).—The protoplasm of certain cells is able to distinguish electrically between K^+ and Na^+ and this is called the K effect. When *Nitella* cells which have been in contact with 0·01M-KCl are placed in 0·01M-NaCl the p.d. changes in a positive direction, by 30—95 mv. This ability to distinguish between K^+ and Na^+

disappears when an org. substance of unknown constitution, and which is sol. in light petroleum, is removed from the cell. When M-KCl in contact with nitrobenzene (previously shaken with M-KCl) is replaced by M-NaCl the p.d. changes by +67 mv., which compares favourably with the val. found in *Nitella*. This effect is not due to greater mobility of $K^{\cdot}$ than of $Na^{\cdot}$ in nitrobenzene; it might be produced if KCl in nitrobenzene forms a sufficiently large no. of simple or complex ions as compared with NaCl. This is unknown, but nitrobenzene when shaken with M-KCl has a higher conductivity than when shaken with M-NaCl. K salicylate has a partition coeff. approx. 11.7 times that of Na salicylate. When M-K salicylate in contact with nitrobenzene (previously shaken with M-K salicylate) is replaced by M-Na salicylate there is an increase in potential of 56 mv. It is unknown to what extent phase boundary potentials enter into these vals. The model resembles the *Nitella* cell in that RbCl and KCl are negative to NH_4Cl which in turn is negative to NaCl and still more so to LiCl. In the model CsCl is negative to KCl but it is positive in *Nitella*. The model also resembles *Nitella* in that the K effect is decreased in presence of guaiacol. J. N. A.

Effect of protein dissociating agents on the structural viscosity of the protoplasm. H. T. Northen (*Biodynamica*, 1940, **3**, 10—27).—Filaments of *Spirogyra* immersed in 0·1M. solution of various amides and centrifuged show during 90 min. immersion first a decrease, then an increase, then a decrease, and then further fluctuations in structural viscosity as determined by the proportion of cells with displaced chloroplasts. When the filaments were replaced in water recovery to the normal viscosity did not occur. L. G. G. W.

XXIV.—ENZYMES.

Quantitative theory of synergism and antagonism among diverse inhibitors, with special reference to sulphanilamide and urethane. F. H. Johnson, H. Eyring, and W. Kearns (*Arch. Biochem.*, 1943, **3**, 1—31).—Expressions are derived for the effects of inhibitors which combine reversibly with an enzyme to give two products (type I), and for those giving one product (type II). Sulphanilamide belongs to type I in its effect on bacterial luminescence, and urethane to type II, but urethane is antagonistic to sulphanilamide at low temp., synergistic at higher temp., due to its increasing inhibitory power with temp. Ethyl and butyl alcohols, ether, acetone, and $CHCl_3$ behave like urethane. The adsorption of sulphanilamide by various materials was measured by determining the residual concn. by means of its inhibitory effect on bacterial luminescence. The % inhibition due to sulphanilamide is increased by metabolites which themselves increase the luminescence. The results are discussed in relation to the theory. E. R. S.

Dehydrogenases of wheat embryos. V. L. Kretovitsch [with A. I. Sokolova] (*Biochimia*, 1942, **7**, 232—237).—The optimum activity of the dehydrogenases occurs at pH 7·2—7·5 in McIlvain's buffer and at pH 7·3—9·2 in Sörensen's PO_4''' buffer and at 50°. The reaction of the medium influences the temp. coeff. val. (Q_{10}). Hexose phosphate and phosphogluconic and glutamic acid dehydrogenases are present and boiled yeast extract increases the activity of the hexose diphosphate dehydrogenase. H. G. R.

Glucose-dehydrogenase from germinated seeds of green and black grams (*Phaseolus radiatus* and *P. mungo*, L.). K. P. Basu and J. N. Karkun (*J. Indian Chem. Soc.*, 1943, **20**, 229—238).—An oxidising enzyme, not purified, is isolated from germinating green or black gram (cf. Harrison, A., 1933, 747); it requires no co-enzyme, and it is not inactivated by dialysis. It acts on glucose (yields probably gluconic acid) both aërobically and anaërobically, and is a perfect dehydrogenase. Its activity remains intact up to 40°, but it is inactivated at 52°. Methylene-blue inhibits the activity by approx. 25%; 2 : 6-dichlorophenol-indophenol-blue can act as an acceptor. Galactose and mannose, but not fructose, xylose, and arabinose, are oxidised by the enzyme. Narcotics inhibit the dehydrogenase, whilst KCN and H_2S inhibit the oxidase factor. Flavin, adrenaline, and ascorbic acid cannot act as carriers, but glutathione can (acceleration of approx. 8%). The enzyme probably contains an aldehyde group; it is inhibited by xanthine oxidase. The physiological significance of the presence of the enzyme in plants is discussed. A. T. P.

Characteristics of tyrosinase system in potatoes which blacken after boiling. A. F. Ross, W. E. Tottingham, and R. Nagy (*Plant Physiol.*, 1939, **14**, 549—557).—Greater differentiation in the determination of the tyrosinase activity of potato saps is obtained in either BO_3''' or unbuffered solutions than in PO_4''' buffers. An activator of tyrosinase was found in the boiled sap of the potatoes which blacken, but this is not the sole factor contributing to high tyrosinase activity. R. H. H.

Substrate specificity of tobacco polyphenoloxidase. A. I. Smirnov and K. V. Pschenova (*Biochimia*, 1941, **6**, 29—36).—Quinol, caffeic acid, and chlorogenic acid added to a suspension of tobacco leaves in PO_4''' buffer at pH 6·6 bring about a marked increase in the O_2 uptake of the system. Monophenols, *o*- and *m*-diphenols lower the O_2 uptake. Pyrogallol and tannic acid inhibit the enzyme completely. Thus for oxidation of phenol the *o*- and *m*-positions must not be substituted by OH. Caffeic acid, however, is attacked, perhaps because of its unsaturated side-chain. A. H. G.

Effect of cyanide on kinetics of enzyme–substrate compound and overall reaction of peroxidase. B. Chance (*J. Cell. Comp. Physiol.*, 1943, **22**, 33—41).—Activity was determined in a special photoelectric colorimeter (A., 1942, I, 250) and indicates that the equilibrium const. for peroxidase–CN' is $4 \times 10^{-6} M/L$. The formation of enzyme–CN' compound is of second order, and rate const. is $9{\cdot}6 \times 10^4 L/MS$. The velocity coeff. of the reverse reaction is 0·4 sec.$^{-1}$ V. J. W.

Enzymic formation of vanillin, heliotropin, and aubepin. S. Manskaja and M. Emelianova (*Biochimia*, 1942, **7**, 109—116).—Several phenolic substances with an unsaturated side-chain, such as *iso*eugenol, *iso*safrole, and anethole, are oxidised by peroxidase + H_2O_2 and yield aromatic aldehydes. It is assumed that vanillin is formed in cognac from eugenol or coniferyl alcohol by enzyme action. J. N. A.

[Preparation and stability of] fumarase. F. Wille (*Biochem. Z.*, 1941, **308**, 64—68).—Ox liver or calf's heart is minced, frozen in liquid air, allowed to thaw, and then extracted with acetone at −15° and finally with ether to give brown powders of fumarase activity 14·7 and 21·4, respectively [the activity is the no. of mg. (?) of *l*-malic acid produced by 1 mg. of enzyme acting on M./6-Na fumarate in M./45-PO_4''' buffer at pH 7·1 and 38°]. The crude liver prep., on aq. extraction and fractional pptn. of the extract by $(NH_4)_2SO_4$ and Na_2HPO_4 at 0°, yields preps. of activity 96. The preps. are not stable in borate or veronal–acetate buffer, are stable when dissolved in, or dialysed against, saturated aq. $NaHCO_3$, but are rapidly inactivated by dialysis against water. F. O. H.

Decomposition of nicotine by animal tissue. II. E. Werle and R. Müller (*Biochem. Z.*, 1941, **308**, 355—358; cf. A., 1938, III, 1036).—Fresh slices of rabbit lung, liver, and kidney contain an enzyme that decomposes nicotine. The enzyme has max. activity in neutral solution and requires presence of O_2 for its action. When boiled for a short time in Tyrode's solution, all the activity of lung tissue and approx. 70% of that of liver tissue is destroyed. The ability of rabbit, sheep, pigeon, guinea-pig, dog, rat, pig, and ox liver, lung, and kidney to decompose nicotine decreases in the above species order, and no decomp. occurs with ox and pig organs. Liver is always the most active, lung is only approx. 50% as active, whilst kidney has the least effect. Brain, spleen, and intestinal mucosa from all these species are inactive. The ability of an organ to decompose nicotine does not appear to be related to its sensitivity towards nicotine, for rabbit and pigeon liver both decompose nicotine to approx. the same extent, but pigeon liver is very sensitive, whilst rabbit liver is only slightly sensitive, to nicotine. Organs that have been kept for 24 hr. at 15° show little or no activity. This may be the reason why organs from human corpses are inactive. The activity of the enzyme is destroyed by grinding or repeated mincing of the organ. 0·002M-$CuSO_4$ has little effect on the activity; 0·001M- and 0·01M-NaN_3 cause 35 and 70% inhibition, respectively, whilst 0·0001M- and 0·001M-methylene-blue produce 25—50 and 50—90% inhibition, respectively. 0·1M-Semicarbazide and NH_2OH are inactive. The ability of the liver to decompose nicotine is not increased by repeated parenteral injection of nicotine. J. N. A.

Kinetics of carbonic anhydrase. I. M. Kiese (*Biochem. Z.*, 1941, **307**, 400—413).—The velocity of CO_2 hydration at low pressures is not proportional to CO_2 pressure, and approaches a limiting val. The dissociation const. (K_M) of the CO_2–enzyme combination at 1° is $1{\cdot}2 \times 10^{-3}$ at pH 7·4 and $2{\cdot}2 \times 10^{-3}$ at pH 9·3; the heat of reaction is 2×10^1 g.-cal. per mol. The enzyme also catalyses the reaction $CO_2 + H_2O \rightarrow H_2CO_3$, the energy of activation of which is $2{\cdot}31 \times 10^1$ g.-cal. Cysteine, histamine, histidine, skim milk, and boiled muscle extract do not increase the activity of the enzyme. At 0·1° and under optimal conditions, 45,000 mols. of CO_2 are hydrated per sec. per atom of Zn. The unit of carbonic anhydrase activity is defined. P. G. M.

Two types of choline-esterases. A. Bissegger and E. A. Zeller (*Helv. Physiol. Pharm. Acta.*, 1943, **1**, C86—87).—Percaine, irgamid, and *iso*propylantipyrine inhibit the serum-choline-esterase more than the brain and red cell enzyme; caffeine inhibits exclusively the serum-, morphine both types of choline-esterase. The activity of red cell- and brain-choline-esterases but not that of serum-esterase is diminished in the presence of excessive amounts of acetylcholine. A. S.

Formation of acetylcholine. A new enzyme: "choline acetylase." D. Nachmansohn and A. L. Machado (*J. Neurophysiol.*, 1943, **6**, 397—403).—An enzyme called choline acetylase has been extracted from brain and nervous tissue (electric organ) which forms acetylcholine in the presence of adenosine triphosphate. The formation is enhanced by F, unaffected by K, and inhibited by Cu, iodoacetic acid, and I. S. Cr.

Determination of mechanism of transamination by means of deuterium. A. S. Konikova, M. G. Kritzman, and R. V. Teis (*Biochimia*, 1942, **7**, 86—92).—During transamination of *a*-deutero-*dl*-

alanine with α-ketoglutaric acid in presence of glutamic-aminopherase most of the D passes into the water and the newly formed glutamic acid contains practically no D. In absence of the enzyme there is no removal of D from the alanine and in a control without ketoglutaric acid there is only insignificant exchange of D for H. It is concluded that there is no direct transference of α-H during transamination, but only through an intermediate removal and exchange for the H of the water. J. N. A.

Peptidases. I. Activation of dipeptidases by manganese and cobalt. E. Bamann and O. Schimke (*Biochem. Z.*, 1941, **308**, 130—140; cf. Maschmann, A., 1941, III, 1062).—Experiments with leucylglycine and the dipeptidase of liver, spleen, kidney, intestine, pituitary gland, healthy and diseased serum, leucocytes, c.s.f., saliva, and urine of man and animals show that Mn^{++}, Mg^{++}, Co^{++}, and, to a smaller extent, other metallic ions (*e.g.*, Fe^{++}, Cu^{++}, Ni^{++}) usually activate the enzyme, sometimes very greatly (*e.g.*, 200%). The degree of activation varies with the origin of the enzyme and the ion used and, in some cases, inhibition occurs. The action of the dipeptidase of yeast and *Aspergillus oryzæ* is inhibited by Mn^{++} and Co^{++}. W. McC.

Peptidases. II. Activation of aminopolypeptidase. III. Preparation of yeast dipeptidase. F. Schneider (*Biochem. Z.*, 1941, **307**, 414—426, 427—430).—II. Aminopolypeptidase is pptd. from dialysed solutions with 1 vol. of acetone at −10° to −15°, washed with ice-cold acetone and ether, and dried in a vac. Such preps. can be kept for several months without loss of activity, but are inactive towards *dl*-leucylglycine in the absence of Cl' or boiled yeast juice; the max. activity is attained in the presence of both these activators. The optimal pH for the enzyme activated by Cl' alone is 7·0, and by Cl' + boiled yeast juice is approx. 7·8. High concns. of PO_4''' inhibit hydrolysis of the dipeptide, but low concns. exhibit a small additional activation.

III. Dried brewer's yeast is macerated with water at 40° for 3 hr. and centrifuged. The supernatant fluid is adjusted with aq. $Ba(OH)_2$ to pH 7·8—8·0, and the ppt. is collected and washed with 0·033M-PO_4''' buffer. The combined supernatant fluids, adjusted to pH 7·0 with acetic acid and cooled to 0°, are treated with 0·5 vol. of acetone at −10° to −15° and sufficient alcoholic KOH to maintain the pH at 7·0 at a temp. below 3°. The ppt. is discarded and the supernatant fluid treated with 1 vol. of acetone. The ppt. is washed with acetone and ether. Such dried preps. of dipeptidase have an activity of 0·7—1·2 units per 10 mg. and are free from aminopolypeptidase. P. G. M.

Peptidases. IV. Aminopolypeptidase and apodipeptidase. F. Schneider (*Biochem. Z.*, 1941, **308**, 247—254).—Aminopolypeptidase, which is inactive towards dipeptides, hydrolyses dipeptides in presence of Cl' and boiled yeast juice. This is not due to presence of an apodipeptidase in the aminopolypeptidase, but probably to a combination of the latter with the unknown yeast factor and activation of the product by Cl' with formation of a complex capable of hydrolysing dipeptides. Attempts to separate an apodipeptidase from aminopolypeptidase by prolonged dialysis, electrodialysis, and dialysis against acid, as well as by the action of enzyme poisons, *e.g.*, H_2S, cysteine, and KCN, that inhibit aminopolypeptidase always lead to disappearance of activity towards leucylglycine in presence of Cl' and yeast juice. The optimum pH for Cl'-activated hydrolysis is very close to that of leucylglycylglycine by aminopolypeptidase, and the behaviour of the system, which is much less stable towards H_2S and cysteine than is the normal dipeptidase, is very similar to that of aminopolypeptidase. Hydrolysis of tripeptides by aminopolypeptidase is also activated by Cl'; 0·004N-KCl causes almost complete, and 0·01N-KCl complete, activation. PO_4''' has practically no effect, whilst cations are inactive. Amino-acids have no effect on hydrolysis of tripeptides by aminopolypeptidase. In presence of 0·01N-KCl, yeast juice has no activating action on hydrolysis of leucylglycylglycine, but in absence of KCl it activates the hydrolysis by aminopolypeptidase. J. N. A.

Occurrence of *d*-peptidases. V. *d*-Peptidase activity in serum of Brown–Pearce rabbits in different stages of tumour development. Do *d*-peptides inhibit development of tumour implants? H. Bayerle, G. Borger, and F. H. Podloucky (*Biochem. Z.*, 1941, **307**, 341—351).—Serum of rabbits with Brown–Pearce tumour implants does not hydrolyse *d*-leucylglycylglycine, nor does the injection of *d*-leucylglycine cause the production of a tripeptidase. The hydrolysis of *dl*-leucylglycine is unaffected by injection of the same dipeptide. There is no relationship between malignant growth and enzymic hydrolysis of *d*-peptides. P. G. M.

Preparation and properties of a crystalline protein-disaggregating enzyme. M. S. Reznitschenko, N. P. Kozmina, and P. I. Staroselski (*Biochimia*, 1941, **6**, 18—28).—The proteolytic activities of various samples of pancreatin and trypsin towards gelatin were compared in respect of N not pptd. by trichloroacetic acid (disaggregation) and liberation of amino-N, measured by titration with HCl in presence of acetone, according to Linderstrøm-Lang (hydrolysis). From the pancreatin which showed the highest disaggregation/hydrolysis ratio a cryst. enzyme prep. has been obtained by a method similar to that used by Northrop for crystallising trypsin. This enzyme causes disaggregation of gelatin without any significant increase in amino-N. When the disaggregating enzyme acted on a 5% gelatin solution for 1 hr. at pH 9·1, 35% of the N not pptd. by trichloroacetic acid was dialysable. Disaggregation is a process independent from, and preceding, hydrolysis of peptide bonds. A. H. G.

Activity of proteolytic enzymes from different morphogenic regions of axolotl body. V. E. Sokolova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1942, **36**, 247—250).—Cathepsin was extracted from tissues by grinding and suspending in 50% glycerol with 0·15% acetic acid, adding thymol, keeping at room temp. for 18 hr., and incubating at 37° for 8 hr. Catheptic activity was determined by adding 0·5 c.c. of the extract to 2 c.c. of a citrate buffer solution (pH 4·4) and 2 c.c. of 8% gelatin with thymol, and incubating at 37° for 24 hr., when its extent was measured by titration of carboxyl groups. The cathepsin activity of tissues was in the following descending order: liver, skin of fore legs, skin of hind legs, skin of tail, muscles of fore leg, muscles of hind leg, skin of back, muscles of tail and back. There was thus a relation between the formative ability of a region and the enzymic activity of its tissues. F. S.

Mechanism of wheat injury by *Eurygaster integriceps*. V. L. Kretovitsch, A. A. Bundel, and K. V. Pschenova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **39**, 31—33).—In addition to amylase, which is always present, the salivary glands of *E. integriceps* contain a very active proteolytic enzyme when the wheat ripens. This proteinase is most active at pH 8 and is therefore a tryptase. In the anterior intestine there is a heat-stable activator of the proteolytic enzymes present in a normal flour. This activator contains SH groups and facilitates the digestion of proteins by reduction. F. S.

Influence of colchicine and 3-indolylacetic acid on some enzymic reactions. D. F. Smith (*Proc. Oklahoma Acad. Sci.*, 1940 [1941], **21**, 105—108).—Colchicine (1—1000 p.p.m.) accelerates the hydrolysis of starch by diastase but is without effect on the inversion of sucrose by invertase. Indolylacetic acid retards the diastatic hydrolysis of starch but accelerates the hydrolysis of sucrose by invertase. L. G. G. W.

Alcoholic fermentation with intact enzyme system of the yeast cell and with disorganised zymase system. IV. R. Nilsson and J. Westerberg (*Biochem. Z.*, 1941, **308**, 255—265).—Addition of glycerol to the fermentation system quickly causes inhibition, but not disorganisation, of the enzyme system. The rate of fermentation is decreased by the same amount in presence and absence of PO_4'''. Na lactate and NaCl also inhibit. Na lactate increases the induction period; there is no pronounced accumulation of difficultly hydrolysable phosphoric esters, and in absence of sugar there is no phosphorylation of the lactic acid. Alcohol and acetone cause marked disorganisation of the zymase system in intact dried yeast. H acceptors, *e.g.*, methylene-blue, formaldehyde, and acetaldehyde, also have a disorganising effect that is complicated by the fact that these substances are also toxic. There is no increased accumulation of phosphoglyceric acid in presence of methylene-blue. It is suggested that the H acceptor reacts with the unsaturated fatty acid radicals in the regulatory yeast-lipins and thus disorganises the intact enzyme system. Addition of salts of heavy metals has no typical disorganising effect, but the results are not conclusive owing to the toxicity of the salts and pptn. of the heavy-metal phosphate. J. N. A.

Mechanism of activation of alkaline phosphatase II by metal ions. R. Cloetens (*Biochem. Z.*, 1941, **307**, 352—365).—Alkaline phosphatase II consists of a nearly inactive complex (protein + metal-binding group) with a metal. The protein portion has an activity less than 2% of that of its Mg complex at the optimal pH (9·4). β-Glycerophosphate is hydrolysed by the Mg, Ca, Mn, Co, and Ni complexes. The dissociation consts. of the enzyme–substrate complex increase rapidly with pH val., and are unaffected by the nature of the metal. The nature and properties of alkaline phosphatase II are discussed and compared with those of phosphatase I. P. G. M.

Reversible removal of the second [activating] metal from alkaline phosphatase II. R. Cloetens (*Biochem. Z.*, 1941, **308**, 37—39; cf. preceding abstract).—The mol. of alkaline phosphatase II (kidney phosphatase) has two centres, G_1 and G_2, activated by metals. G_1 is activated by Ca, Mg, Mn, Co, or Ni. Dialysis of the enzyme against 0·01M-KCN at pH 9·0 removes the metal activating G_2 and reactivation is then achieved by addition of Zn and, to a smaller extent, Co or Hg to the enzyme prep. F. O. H.

Phosphorolysis of sucrose. M. Doudoroff (*J. Biol. Chem.*, 1943, **151**, 351—361; cf. A., 1943, III, 599).—When dry cells of *Pseudomonas saccharophila* are extracted with PO_4''' buffer and the extract is treated with aq. $(NH_4)_2SO_4$, sucrose phosphorylase containing but little invertase or phosphatase is obtained. At 55°, approx. 55% of the enzyme is inactivated in 10 min. It specifically catalyses the reaction glucose 1-phosphate + fructose ⇌ sucrose, so that no reaction occurs when sucrose is replaced by raffinose, trehalose, maltose, glycogen, or starch and no synthesis of sucrose occurs when fructose is replaced by other sugars or sugar phosphates. No co-enzyme

is required for the reaction, for which the optimum pH is 6·4—7·0, and, for the synthesis of sucrose, catalytic amounts of sucrose need not be added. The phosphorolysis of sucrose is not affected by F, but is inhibited by glucose, probably because of competition for the enzyme. Phloridzin inhibits the synthesis of sucrose but not the reverse reaction. W. McC.

Efficiency of aërobic phosphorylation in cell-free heart extracts. S. Ochoa (*J. Biol. Chem.*, 1943, **151**, 493—505).—When pyruvic acid is oxidised by heart extracts, adenylic acid is simultaneously phosphorylated; the product was identified as diphosphate. Heart extracts contain a very active adenosine triphosphatase, and even in presence of F′ (which partly inhibits its activity) this enzyme interferes with the phosphorylation of glucose by adenosine triphosphate and with the transfer of PO_4''' from phosphocreatine to glucose via adenylic acid. Because of this type of interference, the previously obtained ratio of 2 atoms of P esterified : 1 atom of O consumed in pyruvate oxidation is too low. A more accurate val. of 3 : 1 is obtained by comparing the respective phosphorylations caused by pyruvate oxidation and by anaërobic dismutation between pyruvate and phosphoglyceraldehyde. This finding is discussed in the light of energy considerations. E. C. W.

Phosphorylase of waxy maize. L. Bliss (*Iowa State Coll. J. Sci.*, 1943, **18**, 16—18).—Phosphorylase pptd. by $(NH_4)_2SO_4$ converts glucose 1-phosphate first into amylose and then amylopectin. Two forms of phosphorylase producing straight- and branched-chain linkages must be present. F. R. G.

Enzymes of healing wounds. I. Distribution of alkaline phosphomonoesterase in experimental wounds and burns in the rat. H. B. Fell and J. F. Denielli (*Brit. J. exp. Path.*, 1943, **24**, 196—203).—Changes in phosphatase were determined by Gömöri's histochemical method (A., 1943, III, 544) and by direct measurement of phosphatase in the whole wound. During the early stages of repair only the invading polymorphonuclear leucocytes gave an intense staining reaction for phosphatase. The regenerating connective tissue reacted more strongly than the normal dermis, the intensity increasing to a max. when the formation of collagen fibres began. Skin phosphatase was activated by oxidised glutathione, Mg, and iodoacetate. It was inactivated by reduced glutathione, thioglycollate, $(NH_4)_2S$, and ascorbic acid, but not by glycine. (5 photomicrographs.) F. S.

Limit dextrins and starch. XII.—See A., 1944, II, 93.

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

Effect of certain sugars and amino-acids on respiration of *Allomyces*. F. T. Wolf and C. S. Shoup (*Mycologia*, 1943, **35**, 192—200).—Four species of *Allomyces* were all able to utilise for respiration peptone, dextrin, aspartic and glutamic acids but not mannitol, *d*- or *l*-arabinose, glucose, fructose, galactose, lactose, cellobiose, sol. starch, glycine, or tyrosine. Only *A. arbuscula* utilised sucrose, maltose, asparagine, and leucine. *A. arbuscula* and *A. javanicus* both utilised cystine and arginine hydrochloride whilst *A. arbuscula*, *A. moniliformis*, and *A. cystogenus* utilised alanine. L. G. G. W.

Rôle of nitrogen in fungous thermogenesis. J. O. Gaskill and J. C. Gilman (*Plant Physiol.*, 1939, **14**, 31—53).—The influence of addition of 5 forms of N [asparagine, NH_4Cl, $NH_4H_2PO_4$, $(NH_4)_2SO_4$, $Ca(NO_3)_2$] on thermogenesis and loss in dry wt. of corncob-meal cultures of *Aspergillus flavus*, *A. terreus*, *Penicillium oxalicum*, and *Rhizopus tritici* is investigated. Asparagine was the most generally suitable for all four organisms in both respects. R. H. H.

Mutations in *Aspergillus niger* bombarded by low-voltage cathode rays. R. W. Wheldon (*Mycologia*, 1940, **32**, 630—643).—Irradiation of *A. niger* spores with cathode rays (about 12 e.kv.) apparently causes the electrons to penetrate into the spores where they release most of their energy in the nuclear region of the spore. Several mutants were produced in which the colour of the fruiting mycelium was altered; only one mutant showed increased vigour and in this mutant there was a visible change in the nucleus. The chromosome no. was doubled. The induced changes persisted in later asexually-produced generations. L. G. G. W.

Changes in respiratory activity of *Bursaria truncatella* under influence of hunger and potassium cyanide. V. V. Barbarin and L. M. Soloviev (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 94—96).—Under conditions of hunger, the rate of respiration was decreased after 24 hr., but increased to a val. above the normal after 40 hr. In 0·001N-KCN solution, respiration was reduced in 2½ hr. to about 20% of that of the control. R. H. H.

Specificity of pyridoxine for *Ceratostomella ulmi*. W. J. Robbins and R. Ma (*Bull. Torrey Bot. Club*, 1942, **69**, 342—352).—*C. ulmi* in culture requires a supply of pyridoxine but the diacetate and triacetate are equally effective. Of the other 10 analogues of pyridoxine tested two were inactive, four caused some reduction in growth, and four stimulated growth but the effect was less than 5% of that of pyridoxine. L. G. G. W.

Carbohydrate requirements of *Diplodia macrospora*. A. S. Margolin (*Proc. W. Virginian Acad. Sci.*, 1940, **14**, 56—59).—*D. macrospora* utilises glucose, sucrose, and maltose equally well if supplied with biotin. Brown sugar contains sufficient biotin and similar substances to support growth of the fungus. L. G. G. W.

Rôle of malic acid in metabolism of the vegetable cell. V. O. Tauson (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 373—376).—When supplied as sole source of C for *Aspergillus niger*, *A. oryzæ*, and *Penicillium* sp. *Ad* 1, malic acid gives a higher ratio of energy stored in the organism to energy consumed than does lactic acid or ethyl alcohol. Succinic, fumaric, and tartaric acids and glucose give similar high energy storage ratios. The C_4 dicarboxylic acids probably have a special function in carbohydrate metabolism and in protein and fat synthesis. R. L. E.

Development of fungi in the soil. A. Verner, P. Malischkin, and N. Kvint (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 812—814).—In sterilised soil the growth of *Fusarium lini* is very rapid and intensive, but reaches a max. and then decreases. This may be due to lysis. In normal soil the fungus gradually disappears. This is due to the presence of antagonistic bacteria, as borne out by the fact that saprophytic fungi remain alive for long periods in normal soils. A. J. M.

Physiological studies on fungus *Ophiobolus graminis*, Sacc. II. Carbon and nitrogen requirements. N. H. White (*J. Counc. Sci. Ind. Res. Australia*, 1943, **16**, 234—244).—When N is supplied as a mixture of amino-acids or as peptone, the optimum concns. for growth of the fungus are 0·02% of N and 1% of glucose. The C-utilisation factor for glucose varies with the source of N. The optimum concn. of N remains 0·02% when it is supplied as KNO_3, NH_4NO_3, glycine, or asparagine, but that of glucose is 2%. (Cf. A., 1941, III, 1064.) R. H. H.

Biochemistry of micro-organisms. LXXII. Gentisyl alcohol, a metabolic product of *Penicillium patulum*, Bainier. J. H. Birkinshaw, A. Bracken, and H. Raistrick (*Biochem. J.*, 1943, **37**, 726—728).—The ethereal mother-liquors from which patulin has been isolated contain 2 : 5-*dihydroxybenzyl alcohol* (gentisyl alcohol), m.p. 100° (*dimethyl ether*, b.p. 140°/3·3 mm.) (yield 0·6 g. per l. of culture filtrate). The alcohol at concn. 1 : 500 inhibits completely the growth of *Staphylococcus aureus*. In alcohol, it is reduced (Pd–norite–H_2) to toluquinol. Alkaline $KMnO_4$ oxidises the dimethyl ether to 2 : 5-dimethoxybenzoic acid, which yields gentisic acid with HI at 130—140°. Gentisaldehyde, treated with Pd–norite–H_2 until 1 mol. of H_2 is taken up, yields gentisyl alcohol. W. McC.

Chemistry of ketonic rancidity. III. Production of methyl ketones from αβ-unsaturated acids by *Penicillium glaucum*. H. Thaler and W. Eisenlohr (*Biochem. Z.*, 1941, **308**, 88—102; cf. A., 1940, III, 166).—The micro-organism produces ketone from NH_4 crotonate, hexenoate, decenoate, and tetradecenoate, added as sole C source to an inorg. medium. The rate and extent of production of ketone vary with the acid used and, particularly, with pH, max. yields being usually attained at pH approx. 7 within approx. 10 days. Curves showing the relation between time and yield of ketone are irregular in form. Variations in extent of growth of the mould are also observed. The results provide support for Wieland's theory of oxidation. W. McC.

Thiamin content of agar. D. Day (*Bull. Torrey Bot. Club*, 1942, **69**, 11—20).—*Phycomyces blakesleeanus* grew better in a medium containing agar in addition to minerals, sugar, and asparagine but no added thiamin. This is interpreted as showing that the agar contains thiamin, which is removed from the agar by leaching with pyridine. Cheesecloth, tobacco cloth, and filter-paper all contain appreciable amounts of thiamin, some of which is removed by washing with distilled water. L. G. G. W.

Growth rate of some fungi in the presence of cocarboxylase and the moieties of thiamin. V. G. Lilly and L. H. Leonian (*Proc. W. Virginia Acad. Sci.*, 1940, **14**, 44—49).—The growth rate of *Rhizopus suinus* was depressed by thiamin for the first 5 days but increased by cocarboxylase. *Mucor ramannianus* grew more rapidly in the presence of thiamin than in that of cocarboxylase, thiazole, or thiazole plus pyrimidine. Thiazole alone gave the slowest growth rate but the final yield was not affected greatly. None of the chemicals tested had a great effect on *Pythiomorpha gonapodioides* but with *Phycomyces blakesleeanus* cocarboxylase produced in two days twice as much growth as did thiamin. After the second day the effect of thiamin exceeded that of cocarboxylase. For all the growth-substances the final yields of *Phytophthora erythroseptica* were the same. L. G. G. W.

Cultural and pathogenic habits of *Thielaviopsis basicola* (Berk and Br.), Ferraris. R. E. Rawlings (*Ann. Missouri Bot. Gardens*, 1940, **27**, 561—598).—Three isolants of *T. basicola* from tobacco, from *Primula obconica*, and cotton all of different geographical origin differed in their behaviour (colour, type of growth, etc.) in culture.

They reacted differently to changes in media composition so that the order of vigour varied with the medium used. Changes in pH affected the growth rate of primula type considerably but of tobacco type only slightly; the pH affected chlamydospore production materially in tobacco type but only slightly in the other two. The three types differed in their ability to infect plants, and cotton type proved a very weak parasite whilst primula type infected all the plants tested except tobacco. L. G. G. W.

Vitamin deficiencies of *Cetratostomella*. W. J. Robbins and R. Ma (*Bull. Torrey Bot. Club*, 1942, **69**, 184—203).—Ten species or strains of *Cetratostomella* were grown in media containing minerals, glucose, and asparagine, supplemented with biotin, pyridoxine, or thiamin either singly or together. All the fungi suffered from vitamin deficiencies, some from complete deficiencies. *C. ulmi* suffered from complete pyridoxine deficiency only and might be used for assay of this vitamin. With *C. fimbriata* the addition of thiamin not only increases growth directly but permits synthesis of biotin and pyridoxine. L. G. G. W.

Effect of *Actinomyces albus* and of thiamin on the growth of *Trichophyton discoides*. J. E. Mackinnon (*Bull. Torrey Bot. Club*, 1942, **69**, 21—26).—*A. albus* is autotrophic for thiamin and its mycelium allows luxuriant growth of *Phycomyces blakesleeanus* in media with no added thiamin. Strains of *A. albus* have a stimulating effect on the growth of *T. discoides* when grown on glucose bacto-peptone agar. The addition of thiamin to the media has the same effect as the presence of *A. albus*. L. G. G. W.

Vitamin deficiencies of *Trichophyton discoides*. W. J. Robbins, J. E. Mackinnon, and R. Ma (*Bull. Torrey Bot. Club*, 1942, **69**, 509—521).—*T. discoides* is unable to synthesise pyridoxine, *i*-inositol, and thiamin and so suffers from complete deficiency of these vitamins and partial deficiencies for other unidentified substances present in peptone and many other natural products. These partial deficiencies were not corr. by biotin, lactoflavin, pimelic, pantothenic, and *p*-aminobenzoic acids, hypoxanthine, guanine, nicotinamide, 2-methyl-1 : 4-naphthaquinol diacetate, 7 pyridine and purine bases, and 43 amino-acids. Max. growth occurred in a 4-week period in a culture with 0·1—0·5 mg. of inositol and 1—10 mμ-mol. of pyridoxine and thiamin. L. G. G. W.

Genetic control of biochemical reactions in *Neurospora* : a mutant strain requiring *iso*leucine and valine. D. Bonner, E. L. Tatum, and G. W. Beadle (*Arch. Biochem.*, 1943, **3**, 71—91).—An *X*-ray-induced mutant strain of *N. crassa*, differing by a single gene from the normal, grew on hydrolysed casein or yeast extract but not on a mixture of 23 amino-acids. The material in hydrolysed casein supporting growth was isolated and was a mixture of *l*(+)-*iso*leucine (60%), *l*(−)-leucine (25%), and *l*(+)-valine (15%). *iso*Leucine and valine (optimal ratio 78—80 : 30—20) only are necessary for growth, but leucine is required when the valine supply is inadequate. Phenylalanine, norleucine, and norvaline inhibit the activity of valine and *iso*leucine. The hydroxy- and keto-acid analogues of leucine can replace leucine, but those of *iso*leucine and valine cannot replace them; either keto-acid with the other amino-acid is active. The mutant strain can adapt to grow on media containing no addition of valine or *iso*leucine. E. R. S.

Unilateral stimulation of *Microsporum audouinii* by a new species of bacillus. T. Benedick (*Mycologia*, 1943, **35**, 222—242).—*M. audouinii* in contrast with other members of the genus does not normally grow on rice media but in the presence of the newly discovered *Bacillus weidmaniensis* (described), *M. audouinii* will grow and may produce perfect perithecia on a rice medium. L. G. G. W.

Distribution of antagonistic fungi in nature and their antibiotic action. S. A. Waksman and E. S. Horning (*Mycologia*, 1943, **35**, 47—65).—Methods for isolating from soil, manure, etc. fungi antagonistic to bacteria are described. The antibiotic substance produced may be conc. by adsorbing it from a culture filtrate on moist C and eluting with $CHCl_3$. The substance is sol. in $CHCl_3$ and alcohol, partly sol. in ether and water, and is thermostable, but only when removed from the filtrate and conc. L. G. G. W.

Antibiosis between bacteria and fungi. III. Inhibitory action of some actinomycetes on various species of fungi in culture. C. J. Alexopoulus and J. A. Herrick (*Bull. Torrey Bot. Club*, 1942, **69**, 257—261).—Actinomycetes differ in their ability to inhibit fungal growth and fungi differ in their susceptibility to *Actinomyces* inhibition. L. G. G. W.

Production of penicillin in surface cultures of *Penicillium notatum*. J. W. Foster, H. B. Woodruff, and L. E. McDaniel (*J. Bact.*, 1943, **46**, 421—433).—Different strains of *P. notatum* differed greatly in their penicillin-producing ability. Active strains tended to degenerate or lose their capacity to produce penicillin, especially after repeated subculture. This was reduced by avoiding vegetative transfers. By plating, cultures of varying degrees of penicillin activity were obtained. Under conditions where the medium reached and maintained a pH of 3—4 notatin was formed; this was encouraged by extreme purity of the ingredients of the medium. The presence of trace elements (Mn, Fe, Cu, and Zn) and org. supplements favoured a rapid rise in pH and the formation of penicillin. Zn acts by catalysing the complete oxidation of glucose, thus preventing the accumulation of gluconic acid. F. S.

Technique of penicillin production. Anon. (*Manufg. Chem.*, 1944, **15**, 51—52).—Details are given for the laboratory production of penicillin. J. H. B.

Gliotoxin, the antibiotic principle of *Gliocladium fimbriatum*. I. Production, physical and biological properties. J. R. Johnson, W. F. Bruce, and J. D. Dutcher (*J. Amer. Chem. Soc.*, 1943, **65**, 2005—2009).—Prep. of gliotoxin (3·0 g.), $C_{13}H_{14}O_4N_2S_2$, by shaking sucrose (900 g.), salts, and *G. fimbriatum* in water (60 l.) is described (for physical properties see A., 1944, II, 116). Its bacteriostatic and fungicidal action on many organisms is described. Growth of most pathogenic organisms is stopped by 10 μg. per ml., but that of type III pneumococcus and a strain of hæmolytic *Streptococcus* by 0·2—0·3 μg. per ml. It is toxic to aphis, but much less so than is rotenone, and has no biotin action on yeast. The min. lethal dose for rabbits, rats, and mice is 45—65 mg. per kg. body wt., but smaller doses cause kidney lesions (hæmaturia). R. S. C.

Selecting, inbreeding, recombining, and hybridising commercial yeasts. C. C. Lindegren and G. Lindegren (*J. Bact.*, 1943, **46**, 405—419).—The breeding of strains of *Saccharomyces cerevisiæ* must be based on the maintenance, under laboratory conditions, of strains producing viable ascospores, since the ascospores produce the gametes. Each generation must be cross-bred, for the ability to produce viable ascospores depends on the maintenance of heterozygosis of the mating-type alleles, or self-sterility genes. Selection and inbreeding eliminate undesirable recessive genes and provide strains that can be used for hybridisation. F. S.

Effect of culture history on metabolic activities of *Zygosaccharomyces*. W. J. Nickerson and W. B. Carroll (*J. Cell. Comp. Physiol.*, 1943, **22**, 21—32).—O_2 uptake is less in older cultures, and is greater in aërobic than in anaërobic growth. Anaërobic storage in PO_4''' buffer at 5° does not affect the subsequent O_2 uptake of the cells. V. J. W.

Effects of metal salts on yeast dehydrogenase. C. W. Hock (*Plant Physiol.*, 1939, **14**, 797—807).—Cations inhibit the dehydrogenase activity of yeast cells in the order : Hg > Cu > Au > Th > La > Ba > Mn > K, and of yeast extract in the order : Hg > Cu > Au > Th > La > Ba. R. H. H.

***Zygosaccharomyces acidifaciens* : a new acetifying yeast.** W. J. Nickerson, jun. (*Mycologia*, 1943, **35**, 66—78).—*Z. acidifaciens nov. sp.* (described) will ferment 60% but not 80% aq. glucose. It also ferments fructose and mannose but not galactose, sucrose, lactose, raffinose, arabinose, or dextrin. Moderate growth occurs when the only source of C is ethyl alcohol and the only source of N is NO_3 (with bios added). Respiration is at the same rate whether glucose, ethyl alcohol, or acetic acid forms the substrate but fumarate, lactate, glutarate, and saccharic acid are not respired. L. G. G. W.

Lactic acid formation in alcoholic fermentation by yeast. L. A. Hohl and M. A. Joslyn (*Plant Physiol.*, 1941, **16**, 343—360).—Lactic acid formation was closely related to sugar utilisation. The amount formed varied with difference in the composition of the medium and in the strain of yeast used. R. H. H.

Alkali-hydrolysable phosphorus compound in yeasts. M. M. Levitov (*Biochimia*, 1942, **7**, 255—266).—The alkali-labile PO_4''' in yeast represents the fraction of P pptd. by trichloroacetic acid and rendered acid-sol. on hydrolysis of the ppt. with alkali. 50% of the alkali-labile PO_4''' is split off on 10 min. hydrolysis with aq. N-HCl. Fermentation increases the amount of alkali-labile P in yeast and destruction of the cells is accompanied by rapid breakdown of alkali-labile P, which is transformed into acid-sol. products containing no labile P. The breakdown of alkali-labile PO_4''' is increased by incubating dried yeast with water and glucose but in presence of NaF addition of glucose or hexose diphosphate inhibits this. If NaF and hexose diphosphate are added to dried yeast that has been incubated with water an increase in the alkali-labile PO_4''' occurs. H. G. R.

Variations in the cytochrome-*c* content of top yeast with cultural conditions. H. Borei and A. Sjödén (*Arkiv Kemi, Min., Geol.*, 1943, **16**, **A**, No. 19, 17 pp.).—Various methods of extraction of cytochrome-*c* are discussed. A method for determination of cytochrome-*c* in top yeast is described. The yeast is first exposed to a temp. of −80° for at least 3 hr. and then allowed to rise to 4° overnight. Cytolysis is effected at 4° with 40% trichloroacetic acid and the cytochrome-*c* is extracted at 4° with 5N. aq. NH_3. The amount of -*c* in the extract is determined by means of the objective spectrophotometer. Growth of pressed yeast is at first completely anaërobic under crowded conditions; then follows cultivation under conditions of moderate aëration, and the final cultivation is carried out under vigorous aërobic conditions. There is a considerable increase in the total amount of the 3 cytochromes during the cultivation cycle. The first culture yeast contains 6·2 mg.-% whilst the last culture contains 24·1 mg.-% of cytochrome-*c*. The

yeast is always of the respiration type, and no fermenting yeast type is observed. J. N. A.

New mode of formation of β-alanine.—See A., 1944, II, 91.

Yeast growth-promoting substance from sugars by action of ammonia. V. Hartelius and N. Nielsen (*Biochem. Z.*, 1941, **307**, 333—340).—Yeast growth-promoting substances are formed more rapidly by heating glucose solutions with aq. NH_3 than with aq. NH_4 tartrate. Optimum conditions are heating 0·1M-glucose–NH_3 to 134° for approx. 50 min., when growth substances are produced equiv. to 1·0 μg. of β-alanine per c.c. Adjustment of the solution to the same pH with NaOH before heating does not give rise to any growth substance. Heating 0·05M. solutions of various sugars with 0·1M. aq. NH_3 produces growth substances with the following β-alanine equivs.: glucose 0·6, fructose 0·8, galactose 1·0 μg. per c.c. etc. Sucrose yields growth substances only when heated with aq. NH_4 tartrate. In the process of heating with aq. NH_3, by-products are also produced which, in higher concns., inhibit growth, whilst no such compounds are produced by heating with aq. NH_4 tartrate. P. G. M.

Vitamin-B_1 content of various yeasts and factors affecting it. H. Fink and F. Just (*Biochem. Z.*, 1941, **308**, 15—28).—Disturbance of the normal metabolism of brewer's yeast, growing in vitamin-B_1-containing media, by aëration lowers the -B_1 content of the yeast. The level is increased in *Torula utilis* (in -B_1-free media) by fermentation, to a greater extent at pH 7 than at pH 3. With *T. utilis*, only 30—50% of added -B_1 is utilised, the extent of utilisation diminishing with decrease in ratio of added -B_1 to wt. of yeast. The yeast cells store -B_1 in a combined form, which is not removed by washing the cells with solutions of normal pH. F. O. H.

Influence of some environmental factors on production of riboflavin by a yeast. P. R. Burkholder (*Arch. Biochem.*, 1943, **3**, 121—129).—The accumulation of vitamin-B_2 by the yeast *Candida guilliermondia* followed a sigmoid curve. The crop of yeast (determined turbidimetrically) obtained in 1 week was unaffected by the ratio of inoculum to medium, but the final vitamin-B_2 yield was diminished when the inoculum exceeded 12 mg. of moist yeast per 100 ml. of medium. Mechanical agitation promoted growth and synthesis of -B_2. The yields of -B_2 were poor in media containing certain carbohydrates, although there was good growth, whilst good yields and growth were obtained in media containing glucose, mannose, fructose, or sucrose as source of C. Galactose increased the growth on glucose but decreased the yield of -B_2. Asparagine and glycine, as sources of N, gave good growth and yields of -B_2. E. R. S.

Nicotinic acid requirements of certain yeasts. M. Rogosa (*J. Bact.*, 1943, **46**, 435—440).—Yeasts which do not ferment lactose do not require an exogenous source of nicotinic acid for growth. Lactose-fermenting yeasts require an exogenous source of nicotinic acid for growth. F. S.

Constitution of yeast-ribonucleic acid.—See A., 1944, II, 85.

Cellulose digestion by rumen protozoa. R. E. Hungate (*Biol. Bull.*, 1943, **84**, 157—163).—Culture studies and experiments with extracts of the protozoa show that *Diplodinium* ingests and digests large quantities of cellulose while *Entodinium* ingests very little cellulose and cannot digest it. *Isotricha*, *Dasytricha*, and *Butschlia* ingest very little cellulose; their digestion was not studied, but they probably resemble *Entodinium*. G. P. W.

Anaërobiosis and cholesterol as growth requirements of *Endamœba histolytica*. T. L. Snyder and H. E. Meleney (*J. Parasitol.*, 1943, **29**, 278—284).—The probable growth requirements are inorg. salts, amino-acids, carbohydrate, cholesterol, anaërobiosis, a reducing factor, a heat-labile factor present in serum, other essential factors present in bacteria, and supplementary factors present in liver extract, casein, etc. F. S.

Influence of phytoncides on protozoa. B. Tokin (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **38**, 215—217).—*Paramecium caudatum* suspended in water was killed in 1—5 min. by exposure of a hanging drop on a slide to a freshly-prepared paste of onion, garlic, or of some other plants. F. S.

Mechanism of action of phytoncides on protozoa. A. Kovalenok (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **38**, 218—220).——The protoplasmic and other changes produced by lethal doses of onion vapour on various protozoa are described. F. S.

Rapid diagnosis of malaria by the use of Wratten light filter. R. Cares (*J. Lab. clin. Med.*, 1943, **28**, 1750—1751).—The E light red filter (series 23A) has a spectral transmission range parallel to that of eosin. Moreover, this filter transmits a higher % of incident light in the red part of the spectrum than does eosin; consequently the red cells actually appear lighter. The absorption of all blue (and green) light by the E filter renders the blue-stained elements distinctly darker. This contrasts sharply with the pale shadow or "ghost" rendition of the red cells. In a specified examination period 3—4 times as many parasites can be located as with normal lighting. C. J. C. B.

Method of counting plasmodia in avian malaria infections. H. Beckman and J. Smith (*J. Lab. clin. Med.*, 1943, **28**, 1735—1740).—The no. of plasmodia in a 3-min. search of a film are recorded. C. J. C. B.

Viability of various species of *Trypanosoma* and *Leishmania* cultures. A. Packchanian (*J. Parasitol.*, 1943, **29**, 275—277).—Of 124 subcultures of *T. cruzi* kept at 18—31° for 6 years, 13 contained actively motile trypanosomes; of 291 kept for 7 months to 5 years, 11 were positive, and 68 of 110 were positive after 6 months. The viability of *T. avium* on blood agar was 1—3 months, of *T. rotatorium* 4 months, and of *T. americanum*, *T. duttoni*, *T. lewesi*, *T. melophagium*, *L. donovani*, and *L. tropica*, 2—3 months. F. S.

Morphology of *Treponema pallidum* in electron microscope. U. J. Wile and E. B. Kearney (*J. Amer. Med. Assoc.*, 1943, **122**, 167—168).—Under the electron microscope, with a magnification of 9000 diameters with 10-fold enlargement of photographic reproductions, *T. pallidum* from human infection showed flagellæ. C. A. K.

Syphilis. Review of recent literature. F. W. Reynolds, C. F. Mohr, and J. E. Moore (*Arch. intern. Med.*, 1943, **72**, 635—706).—The review deals with publications which appeared from July, 1942, to June, 1943. A. S.

Inhibition phenomenon in precipitation tests for serodiagnosis of syphilis. R. Brown (*J. Lab. clin. Med.*, 1943, **28**, 1758—1760).—This phenomenon was observed in 4 cases undergoing malarial therapy for syphilis. C. J. C. B.

Preparation and properties of bacterial peptones. I. Enzymic hydrolysates of casein. E. Leifson (*Johns Hopkins Hosp. Bull.*, 1943, **72**, 179—199).—Methods of preparing salt- and carbohydrate-free peptone from casein hydrolysates are described. Comparative growth tests show pancreatic digests to be in general superior to papaic or peptic digests. T. F. D.

Yeast extract as a culture medium. F. W. Brauss (*Zentr. Bakt.*, 1943, I, **150**, 220—224).—2% of a commercial yeast extract and 0·5% of peptone was a satisfactory substitute for meat extract and 1% peptone in the prep. of culture media. F. S.

New sterilisable blood medium. H. Zeuner (*Zentr. Bakt.*, 1943, I, **150**, 217—220).—To 3·0 c.c. of washed sheep erythrocytes are added 2·0 c.c. of H_2O_2, 8·0 c.c. of distilled water, and 0·2 c.c. of olive oil. This is then mixed with 90 c.c. of nutrient agar (pH 7·5) at 50—60° containing 1·5 c.c. of serum. The medium is sterilised by steaming for 10 min. on two successive days. The medium supports the growth of most pathogenic organisms as well as fresh blood agar. F. S.

Extracts from Irish moss as a substitute for agar in bacteriological culture media. A. W. Walker and A. A. Day (*Food Res.*, 1943, **8**, 435—443).—The Irish moss gel is not so firm as agar gel and its m.p. is much lower but it is firm enough for most purposes and where a firmer gel is necessary 0·5—0·75% of agar may be added. The latter also raises the m.p. and allows incubation at higher temp. Irish moss is more readily hydrolysed by hot acids and alkalis and the medium should be neutralised before heating. The growth and viability of organisms is as good as, if not better than, on agar. No change in biochemical, antigenic, or morphological properties (except a slight one in the meningococcus) has been observed. H. G. R.

Effect of selective poisons on utilisation of glucose and intermediate compounds by micro-organisms. M. J. Pickett and C. E. Clifton (*J. Cell. Comp. Physiol.*, 1943, **22**, 147—165).—Oxidative assimilation of glucose by a no. of bacteria is inhibited by NaN_3 or 2 : 4-dinitrophenol. Oxidation and fermentation by yeast is little affected by NaF but is inhibited by monoiodoacetate, especially if this is added 1 hr. before the glucose, and by KH_2AsO_3. Synthesis of carbohydrate from glucose by yeast is blocked by NaN_3 or dinitrophenol. V. J. W.

Action of iodine–potassium iodide solution on the spores of some bacilli. C. Nyberg and O. Kivinen (*Zentr. Bakt.*, 1943, I, **150**, 200—203).—Cotton threads impregnated with spores were kept in aq. solutions containing 1·2% of KI and 1·0, 0·75, 0·50, and 0·25% of I for varying intervals, washed in 1% $Na_2S_2O_3$ for 10 min. and water for 5 min., and then cultured. A no. of strains of *B. vulgatus*, *B. subtilis*, and *B. cereus* were killed by 1% I in 11—13 hr. and by 0·25% I in 17—22 hr., whereas most strains of *B. mesentericus* were killed in 5—8 and 11—14 hr. respectively. F. S.

Invert soaps.—See A., 1944, II, 90, 95, 98, 111, 112, 115.

Relation between chemical structure and bacteriostatic activity of sulphanilamide-type compounds. W. D. Kumler and T. C. Daniels (*J. Amer. Chem. Soc.*, 1943, **65**, 2190—2196).—The bacteriostatic properties of sulphanilamide-type compounds (*i.e.*, those antagonised by *p*-aminobenzoic acid) is correlated with the contribution to the mol. made by the resonance form, $N^+H_2{:}C_6H_4$ (cf. A., 1941, I, 448). The importance of the NH_2 follows from the work of Bradbury *et al.* (A., 1942, II, 639). The negative character of a SO_2 group increases the amount of this form and in the group $SO_2{\cdot}NHR$ separation of the charge to give *p*-$N^+H_2{:}C_6H_4{:}SO(O^-){\cdot}N{-}HR$ increases the effect. The effect of R noted by Bell and Roblin (A., 1943, III, 415) is thus

accounted for. *m*-Aminobenzenesulphonamide is not bacteriostatic as no quinonoid form is possible; the *o*-acid is ineffective because of steric interaction, and similar interaction accounts for inactivity caused by nuclear substitution of sulphanilamide. Exceptions to Bell and Roblin's generalisation are explained by effects on the resonance; *e.g.*, sulphanilylcarbamide has a form p-$NH_2 \cdot C_6H_4 \cdot SO_2 \cdot N{:}C(NH_2) \cdot O^-$ and is thus less active than anticipated. Similar considerations are detailed for sulphanilyl-guanidine, -triazines, and -hydrazine and for the *N*-methyl derivatives of sulphapyridine and -thiazine. Further, *p*-nitroaniline, which resembles *p*-aminobenzoic acid sterically more than do sulphanilyl compounds, is bacteriostatic to *B. coli* at 1 : 4000 and is antagonised by *p*-aminobenzoic acid at 1 : 10,000. Analogous considerations explain variations amongst amino- and chloroamino-acridines. The optimum relation between p*Ka* and activity is due to the biological action being dual in nature. It is suggested that neutral mols. are concerned in migration of the drug to the site of action and that the ion, once in place, is then the active agent. R. S. C.

Azo-dyes. I. Preparation and bacteriostatic properties of azo-derivatives of 2 : 6-diaminopyridine. R. N. Shreve, M. W. Swaney, and E. H. Riechers. **II. Preparation and bacteriostatic properties of azo-derivatives of 8-hydroxyquinoline.** R. N. Shreve and R. B. Bennett (*J. Amer. Chem. Soc.*, 1943, **65**, 2241—2243, 2243—2245).—I. Bacteriostatic indices are recorded for 30 2 : 6-diamino-3-aryl-azopyridine monohydrochlorides (A., 1944, II, 111) against *Staph. aureus* and *E. coli*. *E. coli* is usually the more susceptible. Indices against *Staph. aureus* and *E. coli*, respectively, of the most potent dyes are aryl = 2-*m*-xylyl 12,000 and 24,000, 3-nitro-*p*- and 5-nitro-*o*-tolyl 15,000 and 10,000, 4-nitro-*o*-tolyl 10,000 and 10,000, and *p*-iodophenyl 1000 and 60,000.

II. Bacteriostatic properties are recorded for 28 5-arylazo-8-hydroxyquinolines (A., 1944, II, May) against *E. coli* and *Staph. aureus*. The following are the most potent dyes and dilutions thereof in which the two organisms fail to grow: aryl = phenyl 12,000 and 150,000, *m*-42,000 and 52,000, and *p*-chlorophenyl 42,000 and 48,000. R. S. C.

Antibacterial action of pyridine analogue of thiamin. O. Wyss (*J. Bact.*, 1943, **46**, 483—484).—Pyrithiamine, 4-amino-5-(2'-methyl-3'-β-hydroxyethyl)pyrimidylmethyl-2-methylpyridinium bromide, competes with the utilisation of thiamin by *Staph. aureus*. The inhibitor–growth factor ratio is 666—750, roughly comparable to that of sulphapyridine in *p*-aminobenzoic acid inhibition under similar conditions. With *Bact. coli* this ratio is 20,000. F. S.

Analogues of pantothenic acid. III. Preparation of growth-inhibiting analogues related to *N*-pantoyltaurine.—See A., 1944, II, 92.

Nutritional studies of bacterial variation. I. Resistance to pantoyltaurine in naturally-occurring and experimentally prepared strains. II. Derivation of drug-resistant strains in absence of any inhibitor. H. McIlwain (*Brit. J. exp. Path.*, 1943, **24**, 203—212, 212—217).—I. Sulphonamide-resistant streptococci were of normal sensitivity to pantoyltaurine, and pantoyltaurine-fast organisms were as susceptible to sulphanilamide as were normal strains. The varying resistance to pantoyltaurine of different natural and experimentally prepared strains of *C. diphtheriæ* was correlated with their ability to grow with β-alanine in place of pantothenate. Resistant strains synthesised pantothenate, and as pantothenate antagonises pantoyltaurine, this synthesis explained their resistance. Resistance of *Strep. hæmolyticus* to pantoyltaurine was not by this process since many of the natural and all the experimental strains required pantothenate for growth. These strains, and other organisms insensitive to pantoyltaurine alone, were made susceptible to it by the addition of salicylate. Pantoyltaurine-resistant streptococci therefore possess metabolic processes alternative to those susceptible to pantoyltaurine, and these are susceptible to salicylate.

II. Pantoyltaurine-resistant strains of *C. diphtheriæ* were prepared by repeated subculture (*a*) in the presence of much β-alanine and absence of pantothenate, and (*b*) in the presence of little β-alanine, but falling concn. of pantothenate. The presence of the drug was thus not essential to the development of drug-resistant strains, and the natural variation in resistance of organisms not known to have been in contact with a drug may be explained in nutritional terms. F. S.

Air-borne cross-infection and the common cold. Use of glycol vapours for air sterilisation. T. N. Harris and J. Stokes, jun. (*Amer. J. med. Sci.*, 1943, **206**, 631—636).—Propylene glycol was vaporised in wards of a children's convalescent home in bactericidal concn. The incidence of upper respiratory infection was reduced. C. J. C. B.

Effects of colchicine on bacteria. G. E. Pottz (*Proc. Oklahoma Acad. Sci.*, 1941 [1942], **22**, 139).—*Bacillus mesentericus* (?) was grown in a colchicine-containing medium. At a colchicine concn. of 1000 p.p.m. the no. of cells produced is limited but the size of those that do grow is somewhat increased. At lower concn. length and breadth of the bacterial cell are increased and with 10 p.p.m. of colchicine cell length is increased by 110% and cell width by 40%. L. G. G. W.

Synthesis of *B* vitamins by bacteria in pure culture. R. C. Thompson (*Univ. Texas Publ.*, 1942, No. 4237, 87—96).—5 species of bacteria were grown on a synthetic medium and the bacteria and the medium were separately assayed for vitamin-*B* content. All organisms tested synthesised significant quantities of all the vitamins. The amount of each vitamin retained by the cell was fairly const. as between different species, but the amount found in the medium varied widely; it is probably derived from excretion, not from autolysis of dead cells. This was established in the case of biotin, since the amount in the medium was closely proportional to growth. The cells were, in general, 2—5 times as rich in *B* vitamins as the rat carcase, except for biotin (10—20 times) and nicotinic acid (1—1·5 times). Supplementing the culture medium with a single vitamin did not affect the synthesis of the other vitamins. E. C. W.

Rôle of niacin and thiamin in metabolism of glucose by *Staphylococcus aureus*. I. J. Kligler, N. Grossowicz, and S. Bergner (*J. Bact.*, 1943, **46**, 399—403).—Without nicotinic acid there was no growth and no fermentation of glucose in a synthetic medium. With niacin and without thiamin there was active growth under aërobic conditions but the glucose metabolised was 40% of that used with both vitamins present. About 40% of the glucose consumed was converted into pyruvic acid and 60% into lactic acid, indicating a glycolytic reaction. When both vitamins were present the end products were acetic acid 40%, lactic acid 20%, and only small amounts of pyruvic acid. Thiamin therefore acts as a catalyst in the oxidation of pyruvic acid and can do so only when nicotinic acid is available for the primary glycolysis. Under anaërobic conditions, thiamin had no effect on the reaction, which is glycolytic. When pyruvate was used in place of glucose, the absence of thiamin resulted in dismutation according to the reaction of Krebs. Lactate was used only under aërobic conditions and in the presence of both vitamins was oxidised to acetic acid and CO_2. In the absence of thiamin oxidation was incomplete with an accumulation of pyruvic acid (about 25% of the lactic acid used). With resting cells thiamin accelerated oxidation of glucose 4 times, of pyruvic acid 2·5 times, and of lactic acid twice. F. S.

Inactivation of œstrone and diethylstilbœstrol by micro-organisms. B. Zondek and F. Sulman (*Endocrinol.*, 1943, **33**, 204—208).—The effects of 32 non-pathogenic and 29 pathogenic strains of micro-organisms on aq. solutions of œstrone and diethylstilbœstrol were studied. Both were inactivated by *Proteus X* Kingsbury and by a randomly isolated strain of *B. mesentericus sp.* 10^{10} bacteria inactivated 0·8 mg. of œstrone. The activity of œstrone solutions was tripled by contact with bottom yeast, top yeast, Willia yeast, or Pombé yeast. Biological activity of œstrone was not affected by any of the pathogenic bacteria. P. C. W.

Hydrogenase and nitrogen fixation by *Azotobacter*. S. B. Lee and P. W. Wilson (*J. Biol. Chem.*, 1943, **151**, 377—385; cf. A., 1943, III, 602).—When *Azotobacter* is grown in media containing low concns. of combined N, there is rough parallelism between hydrogenase activity and N fixation. The activity increases sharply when depletion of combined N results in increased N fixation. The extent to which certain sources of combined N inhibit N fixation by various species of *Azotobacter* is paralleled by the extent to which these sources inhibit hydrogenase activity, inhibition of N fixation by combined N being accompanied by decrease in hydrogenase production even in presence of H_2. When *Azotobacter* is adapted to utilise N sources (*e.g.*, NO_3') not otherwise readily utilisable, such sources inhibit N fixation more effectively than before adaptation and diminish hydrogenase activity. These findings, and the fact that hydrogenase appears to respond more to the presence of N_2 than to that of H_2, suggest that hydrogenase activity is closely associated with the N-fixing system of *Azotobacter*. W. McC.

Isolation of aërobic cellulose-decomposing organisms and their actions on cellulose and associated plant constituents. W. H. Fuller (*Iowa State Coll. J. Sci.*, 1943, **18**, 39—41).—Hydrolysis of xylan in cellulose by cultures of aërobic mesophilic bacteria is similar to the action of dilute acids. Cellulose decomp. is retarded by large amounts of lignin. F. R. G.

Fermentation of sugar by choleriform vibrios. M. M. Levitov and M. A. Davidovitsch (*Biochimia*, 1941, **6**, 76—87).—Glucose is metabolised both aërobically and anaërobically by choleriform vibrios, strain *b* 44. Max. activity occurs at pH 8—9. The breakdown of glucose is almost completely inhibited by 0·001N-monobromoacetic acid, is little sensitive to NaF, and is unaffected by glyceraldehyde. Inorg. PO_4''' disappears from the medium during the metabolism of glucose, and the addition of PO_4''' causes an increase in rate of glucose utilisation of 40—70%. Hexose diphosphate also stimulates glucose utilisation but is itself only slightly metabolised. A. H. G.

Flavin fermentation of acetone–butyl alcohol bacteria. IV. I. Yamasaki (*Biochem. Z.*, 1941, **307**, 431—441).—The stimulating effect of $CaCO_3$ on flavin formation by acetone–butyl alcohol bacteria depends on the moment of the addition; it is greatest when added at the moment of inoculation, and falls off progressively when added later. It also inhibits acetone formation. Whey and yeast

extract are equally effective nutrient media for flavin fermentation. Besides $CaCO_3$, some salts, *e.g.*, Ba and Ca acetate, stimulate lactoflavin formation, whilst others, *e.g.*, Zn acetate, $CaCl_2$, $MnSO_4$, are ineffective. $FeSO_4$ inhibits flavin formation but has no effect on acetone production. Lactoflavin stimulates growth in young dogs. P. G. M.

Growth requirements of *Leuconostoc mesenteroides*; its use as assay agent for members of vitamin-*B* complex. S. Gaines and G. L. Stahly (*J. Bact.*, 1943, **46**, 441—449).—In a medium in which all constituents were chemically defined except acid hydrolysate of casein, thiamin, Ca pantothenate, and nicotinic acid were essential for growth and pyridoxine exerted a stimulatory effect. There was growth in the absence of added biotin, but the avidin activation technique (Landy *et al.*, A., 1942, III, 718) demonstrated the biotin requirement of this organism. With *L. mesenteroides* as the assay agent standard assay curves were established for the vitamins essential to this organism. F. S.

Phosphorolysis of sucrose by *Leuconostoc mesenteroides*. B. O. Kagan, S. N. Liatker, and E. M. Tzfasman (*Biochimia*, 1942, **7**, 93—108).—In presence of sucrose, but not of glucose or fructose, inorg. PO_4''' is esterified by *L. mesenteroides*. In absence of inorg. PO_4''' only very small amounts of reducing sugars are formed from sucrose. Cori ester is formed as a result of the esterification, which indicates that sucrose is phosphorylated. During this phosphorylation there is a large decrease in the amount of fructose. Fructose disappears when *L. mesenteroides* acts on free fructose, whilst glucose is only slightly attacked. Adenylic acid and NaF have no pronounced effect on phosphorylation of sucrose. The prep. of Cori ester, based on phosphorolysis of sucrose, is described. J. N. A.

Urease activity of *Proteus* and *Salmonella* organisms. W. W. Ferguson and A. E. Hook (*J. Lab. clin. Med.*, 1943, **28**, 1715—1720).—Of 30 strains of *Proteus*, *P. ichthyosmius* alone failed to decompose urea. None of 75 strains of *Salmonella* attacked urea. C. J. C. B.

Cytological and microchemical study of *Thiobacillus thio-oxidans*. G. Knaysi (*J. Bact.*, 1943, **46**, 451—461).—This organism has a Gram-negative protoplasm (pH of isoelectric point above 4) containing one or more large vacuoles. When the medium contains elementary S, the vacuolar content gives the reactions of both volutin and S; on Waksman's $Na_2S_2O_3$ medium only volutin is formed. (10 photomicrographs.) F. S.

Some therapeutic fallacies. J. W. Linnel and W. A. R. Thomson (*Brit. Med. J.*, 1943, II, 572—575).—A review and criticism of the treatment commonly used in some diseases. I. C.

Veneral diseases in Sweden, 1913 to 1937. G. Dahlberg (*Amer. J. Hyg.*, 1941, **33**, A51—63).—Figures are given for the incidence of syphilis, gonorrhœa, and ulcus molle during the years 1913—1937. Gonorrhœa increased markedly towards the end of the World War with a max. in 1918 (20,000 cases); subsequently the frequency fell to the pre-war level of 12,000 cases per year, remaining const. except for a slight rise in 1925—1930. Syphilis showed a max. in 1918 (6000 cases) and a subsequent fall, except from 1925 to 1930, which continued to well below the pre-war figure; there were 308 cases in 1937. The figures for ulcus molle followed those for syphilis at a lower level. The sex proportion of the diseases in relation to incidence and the reasons for the fall in the incidence of syphilis and ulcus molle are discussed. B. C. H.

***Aërobacter aërogenes* associated with acute toxæmic mastitis in cows.** S. Burkhardt, B. A. Beach, and G. R. Spencer (*J. Amer. Vet. Med. Assoc.*, 1943, **103**, 381—383).—*A. aërogenes* was isolated from the milk in 10 of 11 cases of acute mastitis in a herd of 33 cows. Recovery occurred in 3—30 days, treatment including oral administration of sulphanilamide (1 g. per lb. of body wt. daily). E. G. W.

***Bacillus alkaligenes* bacteræmia complicating diabetes mellitus.** D. H. Weintraub and E. R. Neter (*Amer. J. Dis. Child.*, 1943, **66**, 413—417).—A case report. C. J. C. B.

Intermediary carbohydrate metabolism of *Escherichia coli*. M. F. Utter (*Iowa State Coll. J. Sci.*, 1943, **18**, 95—97).—Glucose is dissimilated by bacteria in the cell-free system obtained from *E. coli* by the method of Wiggert *et al.* (A., 1940, III, 768). This is in accordance with the Embden–Meyerhof–Parnas scheme, and points to the similarity of the bacterial, yeast, and muscle enzymes. F. R. G.

Effect of acids and sugar on viability of *Escherichia coli* and *Eberthella typhosa*. C. A. Shillinglaw and M. Levine (*Food Res.*, 1943, **8**, 464—476).—The order of effectiveness of edible acids as germicides against *Esch. coli* at 30° in 0·02N. solution is tartaric > glycollic > phosphoric > lactic > acetic > citric. The temp. coeffs. of the rates of death vary considerably and the ratio of the killing time at 30° to that at 0·6° is citric 2 : 3, lactic 3 : 9, H_3PO_4 5 : 4, tartaric acid 15 : 8. The activity of lactic acid at 30° is increased by 20—25% by the addition of 2·5 vols. of CO_2 or 10% of sucrose, the effect of the former being due not to a simple additive effect but rather to an associative action affecting the permeability of the cell. *E. typhosa* is more susceptible to the effect of CO_2 and acids than *Esch. coli*, the ratio of the times required to give a stipulated reduction being for 2·5 vols. of CO_2 5 : 1, for citric acid 4 : 1, for lactic acid 8 : 1. H. G. R.

Imperfect sterilisation of nursing nipples and formula as possible factor in transmission of epidemic diarrhœa of the newborn. P. A. Lembcke (*Amer. J. Hyg.*, 1941, **33**, A42—50).—2 outbreaks of diarrhœa occurred in a nursery for newborn infants within a period of 6 months. The first comprised 44 cases and was characterised by non-toxicity and blood or mucus in the stools; there were no deaths and the outbreak subsided spontaneously. The second closely followed on the first and was characterised by dehydration, toxicity, frequent loose stools without blood or mucus, and reddening of the buttocks; there were 105 cases with 5 deaths. 144 fæcal specimens from 16 sick infants were negative for pathogens, although intraperitoneal injections of ether-treated suspensions of fæces taken early in the course of illness killed 17 of 34 mice in 48 hr. The ætiological agent and mode of transmission could not be determined for either outbreak; contaminated nursing nipples and feeding solutions (formula) may have been responsible factors. The second outbreak subsided after segregation and isolation of cases together with sterilisation of nipples and feeds. Bacteriological examination of rubber nipples and feeding solutions from this and other hospitals showed many organisms including staphylococci, coliform and aërobic spore-bearing bacilli. Recommendations are given for sterilisation of rubber nipples, bottles, and solutions. B. C. H.

Eijkman test and modifications as given by coliform organisms isolated from human fæces. R. Banerjea and A. K. Sen (*Indian J. Med. Res.*, 1940, **28**, 315—319).—48% of citrate-negative lactose-fermenting coliforms from normal human fæces gave positive tests with single-strength Eijkman's medium, 72% with double-strength Eijkman's medium, and 88% with double-strength McConkey broth at 44°. S. E. M.

Dilution method for isolation of pathogenic bacteria from fæces. C. L. Pasricha, G. Panja, and B. M. Paul (*Indian J. Med. Res.*, 1940, **28**, 323—325).—The fæces are diluted with sterile broth or tap-water and then plated out. S. E. M.

Cultivation of *Brucella* from blood. B. Wise and G. P. Kerby (*J. Bact.*, 1943, **46**, 333—336).—2—5 ml. of the patient's or animal's citrated blood are inoculated in 10 ml. of Bacto-tryptose broth and incubated at 37°. Growth is favoured at the blood–broth interface. F. S.

Bacteriological observations on experimental brucellosis in dogs and swine. G. P. Kerby, I. W. Brown, jun., G. Margolis, and W. D. Forbus (*Amer. J. Path.*, 1943, **19**, 1009—1019).—Brucella usually disappears from the blood stream of dogs and pigs within 1—3 weeks of inoculation of the organisms; it can be recovered sometimes from the tissues 3—7 months later though the animals may show no clinical evidence of disease. The brucella agglutination titre of dogs and pigs rises early in the course of experimental inoculation with brucella and remains high. The route of inoculation, the strain of *Br. suis* employed, or the use of heat-killed live organisms does not affect the litre. The brucella opsonocytophagic indices were variable. No difference in virulence between the 2 strains of *Br. suis* employed was observed although in guinea-pigs the animal strain *A* was highly virulent and the human strain *B* only slightly so. C. J. C. B.

Immune serum therapy for Oroya fever. C. Howe (*Arch. intern. Med.*, 1943, **72**, 429—438).—Immune serum of high agglutinin titre was produced in rabbits by the intravenous administration of large amounts of *B. bacilliformis*, both in the fresh and in the formaldehyde-treated state. There was no change in the clinical picture in 3 cases treated with immune serum therapy, but the serum diminished the no. of colonies of organisms obtained in serial blood cultures taken during the period of treatment. C. J. C. B.

Antitoxic immunity in *perfringens* infections. S. E. Stewart (*U.S. Publ. Health Repts.*, 1943, **58**, 1277—1280).—In guinea-pigs a purely antitoxic immunity affords effective protection against infection with an invasive toxicogenic strain of *Cl. perfringens*. This protection is made possible by the action of the antitoxin which renders the toxicogenic bacteria non-toxic and susceptible to the action of phagocytic cells. C. G. W.

Therapeutic value of gas gangrene antitoxin. M. G. Macfarlane (*Brit. Med. J.*, 1943, II, 636—640).—The death rate in cases of gas gangrene was lower in cases treated with antitoxin and antitoxin + major surgical intervention than in untreated cases. The effect of antitoxin was more pronounced in those cases who received an adequate dose (50,000 units or more) of antitoxin in early stages. I. C.

Fibrinolysins from gas gangrene anaërobes. G. B. Reed, J. H. Orr, and H. J. Brown (*J. Bact.*, 1943, **46**, 475—480).—All pathogenic species of the gas gangrene group and some non-pathogenic anaërobes produce active fibrinolytic enzymes. *Cl. tetani* does not produce fibrinolysis. The clostridial, like the streptococcal, fibrinolysin is thermostable and therefore independent of the clostridial proteolytic

enzymes. Anti-fibrinolytic factors are not demonstrable in sp. antitoxins. Plasma clotting is not a characteristic of the gas gangrene organisms. The presence of fibrinolytic enzyme in gas gangrene wounds may be a factor in the spread of the infection. F. S.

Composition of polysaccharide from diphtheria bacilli. E. M. Gubarev (*Biochimia*, 1942, **7**, 180—187).—The polysaccharide obtained by pptn. from an acid solution with 5 vols. of alcohol contains ash 5·11%, total N 2·48%, and no free amino-N. An amino-sugar is obtained on hydrolysis, and hydrolysis with 5% H_2SO_4 yields 78% of reducing sugar (as glucose). A 1·247% solution has α —0·40°. The biuret reaction is negative. The pentose content, determined by the furfuraldehyde method, is 35·8%. Aldobionic acid is present in the products of hydrolysis. Oxidation with 25% HNO_3 yields mucic acid, which indicates the presence of galactose. The optical rotation of the hydrolysis products corresponds to that amount of *d*-arabonic acid which could be formed from the total amount of pentose originally present. It is concluded that the polysaccharide contains galactose, aldobionic acid, *d*-arabinose, and chondrosamine. J. N. A.

Attenuation and toxin production of diphtheria bacillus. VII. Separation and analysis of products of synthesis in diphtheria culture filtrates. A. B. Wadsworth and M. W. Wheeler (*J. Infect. Dis.*, 1943, **73**, 95—105).—Unaltered toxin was recovered without loss from culture filtrates and in a highly purified form by ultrafiltration through nitrocellulose membranes or by pptn. with 25% Na citrate. The toxin was associated with synthesised protein precipitable by 50—66% saturation of $(NH_4)_2SO_4$. Another fraction contained synthesised non-toxic protein precipitable by 33% saturation of $(NH_4)_2SO_4$. In toxigenic cultures the amount of toxic protein synthesised varied with the toxicity of the culture, but the amount of non-toxic protein varied little. In non-toxigenic cultures the amounts of both types of protein were much less. F. S.

Ultra-violet spectra and fluorescence of synthetic products in toxigenic and non-toxigenic diphtheria cultures. A. B. Wadsworth and M. O'L. Crowe (*J. Infect. Dis.*, 1943, **73**, 106—123; cf. preceding abstract).—The positions of the band max. for the non-toxic synthesised protein changed appreciably with time whereas those for the highly purified toxic protein remained practically const. The band max. for pure diphtheria toxin, purified by ultra-filtration, was about λ 2740 A. F. S.

Active diphtheria immunisation. A. Kappert (*Schweiz. med. Wschr.*, 1943, **73**, 257—262).—Experiences during 2 diphtheria epidemics in an institution are reported. The disease took a mild course in children who had previously been immunised. Immunisation has no influence on the incidence of bacilli carriers. A. S.

Frequency of inadequate antidiphtheria immunisation. J. G. M. Bullowa and M. Scannel (*J. Amer. Med. Assoc.*, 1943, **122**, 595—596).—24% of 200 patients previously immunised against diphtheria were Schick-positive when tested on admission to a fever hospital for diseases other than diphtheria. C. A. K.

Duration of artificial active immunity against diphtheria. H. L. Duke and W. B. Stott (*Brit. Med. J.*, 1943, II, 710—711).—In a country area with a child population of 9600, 95% of whom had been immunised artificially against diphtheria, the Schick test showed that 3—6 months after completion of the course 2% of the inoculated children were primary failures and that the immunity to diphtheria decreases steadily with the passing of time, being present in 96% of children after 2 years and 82% after 6 years. I. C.

Leprosy. V. Pardo-Castello and F. R. Tiant (*J. Amer. Med. Assoc.*, 1943, **121**, 1264).—A review of clinical, pathological, immunological, and bacteriological aspects. C. A. K.

Concurrent meningococcal meningitis and salmonella bacteræmia. E. R. Neter (*J. Pediat.*, 1943, **23**, 562—564).—A case of meningococcal meningitis and *S. choleræ suis* bactæremia is described. Sp. agglutinins in high titre against the paratyphoid bacillus developed in the course of the illness. Recovery followed the use of sulphathiazole. C. J. C. B.

Meningococcæmia. E. P. Campbell (*Amer. J. med. Sci.*, 1943, **206**, 566—576).—The analysis of 88 cases showed that meningococcæmia is characterised by the following signs and symptoms in order of frequency: long-standing intermittent fever, polymorphous rash, arthralgia, chills, and headache. C. J. C. B.

Recognition of meningococcic infections. P. S. Strong (*Amer. J. med. Sci.*, 1943, **206**, 561—566).—A general review. C. J. C. B.

Laboratory methods used in determining the value of sulphadiazine as a mass prophylactic against meningococcal infections. D. M. Kuhns and H. A. Feldman (*Amer. J. Publ. Health*, 1943, **33**, 1461—1465).—The technique is detailed. C. J. C. B.

Estimation of glycerol in johnin. R. E. Glover (*J. comp. Path.*, 1943, **53**, 256—267).—Loss of potency of certain batches of heat-conc. johnin grown on Henley's synthetic medium was associated with a low sp. gr. and low glycerol content. Using the Malaprade reaction, it was found that the glycerol content of cultures of *Mycobacterium johnei* on this medium fell from an initial level of 7 to 2·23% after 11—16 weeks' incubation. It is suggested that glycerol should be added to conc. johnins in order to prevent loss of potency during storage. E. G. W.

Avirulent strains of *Pasteurella pestis*. E. Jawetz and K. F. Meyer (*J. Infect. Dis.*, 1943, **73**, 124—143).—Stable and completely avirulent plague strains were obtained from all isolated variants by using the offspring of single cell isolations, adequately tested on experimental animals. All strains immunised guinea-pigs but only one strain immunised mice effectively. All killed plague preps. immunised mice quite well but failed to immunise guinea-pigs. F. S.

Effectiveness of pertussis vaccine: application of Sargent and Merrell's method of measurement. E. S. Weiss and P. L. Kendrick (*Amer. J. Hyg.*, 1943, **38**, 306—309).—During a 6-year period of immunisation in the city of Grand Rapids 66 cases of pertussis were reported among infected children representing 18% of the 370 theoretically expected cases. The true expectancy was estimated as 416 cases and the proportion of cases thus prevented was calc. to be 84%. This conclusion obtained by Sargent and Merrell's method was verified by observation of the cases and individuals in each field series; there were 589 attacks among 5011 controls and 102 attacks among 4789 inoculated children. The incidences were, therefore, 11·8% and 2·1% respectively and the proportion of prevented cases was calc. to be 82%. B. C. H.

Rapid method of preparing pneumococcal specific carbohydrates with aid of electric current. M. Burger (*J. Lab. clin. Med.*, 1943, **28**, 1624—1628).—A suspension of the organisms in NaCl solution (or in $NaNO_3$, acetate, or Na_2SO_4 solution) is subjected to an electric current. Most of the protein is pptd. during electrolysis. The type-sp. capsular polysaccharide is then isolated from the solution of the electrolysate. C. J. C. B.

Endocarditis due to *Pseudomonas aeruginosa*. V. Moragues and W. A. D. Anderson (*Ann. int. Med.*, 1943, **19**, 146—154).—The organisms were cultured from the blood, initial vegetations, and meninges. Clinically, there was meningitis, widespread infection of other organs, and focal glomerular nephritis. A. S.

Causes of infantile summer diarrhœa. E. Hormaeche, N. L. Surraco, C. A. Peluffo, and P. L. Aleppo (*Amer. J. Dis. Child.*, 1943, **66**, 539—551).—668 infections were classified as enteritis (dysenteriform, choleriform, or mixed); of them 260 were due to shigella, 152 to salmonella, and 256 were of unknown origin. During the last 2 years the cases of enteritis due to shigella and salmonella constituted 57% of all cases of enteritis in infants under 1 year of age, 78% in those under 2 years, and 94% in those between 2 and 12 years. Association of shigella and salmonella was often found, as well as association of several types of salmonella. Extraintestinal localisations were more frequent in salmonella than in shigella infections. Among extraintestinal infections angina, otitis, and septicæmia were most common. Salmonella was observed more frequently in patients with mild infections and in intestinal carriers than was shigella. The carrier state was always transitory. C. J. C. B.

Anaërogenic and indole-forming *Salmonella* variants. E. Seligmann and I. Saphra (*Amer. J. Hyg.*, 1943, **38**, 223—225).—Eight variants were found amongst 1200 specimens of salmonella isolated from human stools or rats. 4 *Bact. typhimurium* and 2 *Bact. enteritidis* cultures fermented glucose, mannitol, maltose, and sorbitol without gas formation and one culture each of *Bact. enteritidis* and *Bact. panama* formed indole. Indole-forming variants so far observed have belonged to group *D* and possess the antigen IX. The necessity of combining biochemical and serological methods in the diagnosis of salmonella is emphasised. B. C. H.

Combining power of staphylococcus toxoid as identity test. L. P. Strean (*J. Lab. clin. Med.*, 1943, **28**, 1607—1608).—This method for identifying staphylococcus toxoid depends on its ability to combine with staphylococcus antitoxin in the presence of rabbit erythrocytes as an indicator. It is necessary to have staphylococcus α-toxin of suitable hæmolytic power for rabbit red cells. C. J. C. B.

Biochemistry of hæmolytic streptococci propagated on raw milk. J. Fonyó (*Biochem. Z.*, 1941, **308**, 78—82).—Examination by Lancefield's method (B., 1935, 1021) showed that of 66 strains, 31, 19, 10, and 6 belonged to the groups *A*, *B*, *C*, and *G*, respectively. The serological properties of the strains, which can be used to determine their origin, were also determined. W. McC.

Penicillin: its antibacterial effect in whole blood and serum for the hæmolytic streptococcus and *Staphylococcus aureus*. C. H. Rammelkamp and C. S. Keefer (*J. clin. Invest.*, 1943, **22**, 649—657).—The addition of penicillin to whole blood *in vitro* increased its antistreptococcal and antistaphylococcal activity; this effect was not due to phagocytosis. The antibacterial action of whole blood is directly related to the serum-penicillin concn. Max. bactericidal effects against the hæmolytic streptococcus were produced by concns. of 0·019—0·156 Florey unit per c.c. of serum. At least 0·156 Florey unit per c.c. was required for max. bacteriostatic action

against *Staph. aureus*. The antistaphylococcal and antistreptococcal effect produced by adding sulphathiazole or sulphadiazine to whole blood *in vitro* was less marked than when penicillin was added to a homologous sample of blood. Similar results were obtained when the antibacterial action of blood was tested after the administration of sulphadiazine and penicillin to normal subjects. C. J. C. B.

Significance of joint pains caused by sterile streptococcus toxin. P. S. Rhoads and M. L. Afremow (*Ann. int. Med.*, 1943, **19**, 60—63).—Subjects who have had rheumatic infections or suffer from chronic streptococcal infections show sensitiveness to hæmolytic streptococcus toxin, manifested by development of joint pains when streptococcus toxin is introduced into the tissues. Heart disease, polyarthritis, and erythema nodosum are found more frequently in these subjects than in others not similarly sensitised. A. S.

Epidemic rheumatic fever. P. L. Boisvert, M. H. Dawson, F. F. Schwentker, and J. D. Trask. **Comparison of pathology of rheumatic fever and rheumatoid arthritis.** G. A. Bennett. **Rheumatic heart disease in autopsied cases of rheumatoid arthritis.** T. B. Bayles. **Cause of death in 30 cases of rheumatoid arthritis.** E. F. Rosenberg, A. H. Baggenstoss, and P. S. Hench. **Food allergy as possible factor in subacute recurrent arthritis.** W. T. Vaughan. **Rheumatoid spondylitis as cause of increased cerebrospinal fluid protein, based on 101 patients with rheumatoid arthritis.** A. O. Ludwig, C. L. Short, and W. Bauer. **Treatment of 200 cases of chronic arthritis with massive doses of vitamin-*D* prepared by the Whittier method.** R. G. Snyder, W. H. Squires, J. W. Forster, and C. H. Traeger. **Evaluation of arthritic cases treated by vitamin-*D*.** L. C. Wagner. **Treatment of arthritic contractures of knee.** J. G. Kuhns. **Tocopherols (vitamin-*E*) in treatment of primary fibrositis.** C. LeR. Steinberg (*Ann. int. Med.*, 1943, **19**, 107—139).—Papers given at a meeting of the American Rheumatism Association. A. S.

Tetanus immunisation: dosage of alum-precipitated toxoid and use of fluid toxoid after trauma. J. J. Miller, jun., and J. B. Humber (*J. Pediat.*, 1943, **23**, 516—521).—3 injections of alum-pptd. tetanus toxoid at 3 monthly intervals initiate and maintain for 1 year high antitoxin titres (0·1—1·0 unit). This level is protective even if reinjection is impossible or was omitted at the time of trauma. 2 injections of alum-pptd. toxoid are less effective. When laceration occurs in any individual previously injected with alum-pptd. or fluid tetanus toxoid, a stimulating reinjection with fluid tetanus toxoid is to be preferred to one with alum-pptd. toxoid because the desired rise in antitoxin is more rapid. C. J. C. B.

Duration of passive tetanus immunity. J. V. Cooke and F. G. Jones (*J. Amer. Med. Assoc.*, 1943, **121**, 1201—1209).—Antitoxin titrations were performed in 39 children after passive immunisation against tetanus. Immunity lasted about 3 weeks after 1500 units, but after 100,000 units there was 0·01 unit of antitoxin per c.c. After 8—11 weeks very small amounts of antitoxin were detected in the c.s.f. In 4 children with clinical tetanus antitoxin immunity did not follow recovery and there was no "sensitisation" to later active tetanus immunisation. Repeated subcutaneous or intracutaneous injections of toxoid did not produce an antitoxic immunity within several weeks unless a previous "sensitising" toxoid inoculation had been given. The presence of much heterologous antitoxin prevents the usual "sensitisation" by toxoid. Passive immunity (10,000 units) can be converted into active immunity by toxoid injections and the latter takes 8—12 weeks to develop whether the first toxoid injection was given simultaneously with the antitoxin or delayed for up to 6 weeks. Active tetanus immunity is best induced by toxoid injections 2—4 weeks after antitoxin injection. C. A. K.

Tuberculosis in London. W. A. Daley and N. Benjamin (*Brit. Med. J.*, 1943, II, 712—713).—Statistics of new cases of tuberculosis and mortality from tuberculosis in London (Administrative County) from 1938 to 1942. I. C.

Comprehensive attack on pulmonary tuberculosis. A. S. MacNalty (*Brit. Med. J.*, 1943, II, 599—601).—A lecture. I. C.

Effect of pregnancy and parturition on pulmonary tuberculosis. R. C. Cohen (*Brit. Med. J.*, 1943, II, 775—776).—Of 46 cases of arrested and recovered tuberculosis, 3 showed retrogression during pregnancy; of 29 cases of quiescent tuberculosis, in 2 the disease was accelerated; of 25 cases of progressive tuberculosis, 7 showed increased pulmonary disease during pregnancy. ⅔ of the patients showing retrogression were under 30, and ⅔ were primiparæ. It is concluded that pregnancy and labour *per se* rarely exert any harmful effect on a tuberculous woman; therapeutic abortion is not a procedure to be resorted to simply on the basis of the pulmonary disease. I. C.

Virulence of tubercle bacilli and fallacy of assuming grade of virulence from arbitrary designations. H. J. Corper and M. L. Cohn (*Amer. J. clin. Path.*, 1943, **13**, 352—361).—The human strain *H*37 (Baldwin) obtained from various sources in the U.S.A. varied from avirulence to fairly high virulence in "dissociated strains." Slight decrease in virulence occurred during 6 years of artificial cultivation on egg mediums in 6 strains of tubercle bacilli studied. A human strain (Gluckson) isolated in 1920 showed a gradual decrease in virulence over the 23 years of artificial cultivation, but still showed a low virulence for guinea-pigs; a bovine strain, artificially cultivated for the same period, was still highly virulent for guinea-pigs and rabbits. Virulence can be preserved by storing desiccated bacilli in sealed glass tubes at 3° for years, thus obviating the influence of repeated culturing and detrimental effects of preservation on media. C. J. C. B.

Influence of phytoncides on *Bacillus tuberculosis*, strain *BCG*. G. Neboliubova and B. Tokin (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **39**, 36—37).—Exposure for 5—8 min. to the vapour of freshly minced onion or garlic was bactericidal to this organism. F. S.

Strain of *Bact. typhosum* inhibited on bismuth sulphite agar. M. B. Coleman (*J. Lab. clin. Med.*, 1943, **28**, 1490—1491).—The isolation of this organism shows the importance of using more than one plating medium in any attempt to isolate *Bact. typhosum* from fæces. C. J. C. B.

Somatic antigen of *B. typhosum*. I. Isolation and tests. D. K. Roy (*Ann. Biochem. Exp. Med.*, 1943, **3**, 43—46).—A toxic antigen of typhoid bacillus identical with *O*-antigen has been isolated. It is free from S, tryptophan, and pentose residues. P. C. W.

Preparation of polyvalent dysentery bacteriophage in dry and stable form. I. Preliminary investigations and general procedures. A. L. Schade and L. Caroline (*J. Bact.*, 1943, **46**, 463—473).—Concn. of mixed phage lysates by distillation under vac. to 1/10—1/20 of their initial vol. was obtained without loss of titre of the constituent phage races. By drying from the frozen state conc., stable, and fully active preps. were made, only the Shiga phage showing sensitivity to lyophilisation. F. S.

Cataphoretic purification of bacteriophage. D. K. Roy (*Ann. Biochem. Exp. Med.*, 1943, **3**, 39—42).—Filtrates of bacteriophages adjusted to pH 7·2—7·4 were placed in a multiple-chamber cataphoresis apparatus. All the bacteriophages migrate to the anode and their purity is increased. P. C. W.

Control of common respiratory infections. C. S. Keefer (*J. Amer. Med. Assoc.*, 1943, **121**, 802—806).—A review. C. A. K.

Laboratory diagnosis of virus diseases. S. E. Sulkin and C. G. Harford (*J. Amer. Med. Assoc.*, 1943, **122**, 643—648).—A review. C. A. K.

Recent virus work and its practical import. S. P. Bedson (*Arch. Childh.*, 1943, **18**, 113—123).—A general review. (10 photomicrographs.) C. J. C. B.

Transmission of virus diseases by water. E. R. Krumbiegel (*J. Amer. Water Works Assoc.*, 1944, **36**, 81—85).—A review.

Effects of inorganic salts on multiplication of bacterial viruses. H. Gest (*J. Infect. Dis.*, 1943, **73**, 158—166).—With rising concn. (0·009—0·36M.) of univalent cation salts plaques of a salt-sensitive anti-*Bact. coli* phage on nutrient agar became increasingly turbid. Bivalent cation salts diminished the plaque size, and concns. greater than 0·01M. prevented the appearance of visible plaques. 0·01M-$MgCl_2$ had no effect on the virus alone, on division time of the host, absorption of virus by the host, or on virus growth, but caused the host cells to become resistant to the virus, thus masking the growth of the virus. The action of the univalent salts can be explained on the same basis. F. S.

Epidemic diarrhœa of the new-born: isolation of a filterable agent causing diarrhœa in calves. J. S. Light and H. L. Hodes (*Amer. J. Publ. Health*, 1943, **33**, 1451—1454).—Filtrates from stools of cases of new-born diarrhœa given nasally to healthy calves caused a bloody mucoid diarrhœa. Filtrates of normal new-born children's stools caused no effect in the calf. C. J. C. B.

Diagnosis of epidemic encephalitis by complement fixation tests. J. Casals (*Amer. J. Publ. Health*, 1941, **31**, 1281—1284).—From cases with epidemic encephalitis, 44 of 83 sera gave a positive complement fixation test against Western equine encephalitis. They did not react with Eastern equine encephalitis or lymphocytic choriomeningitis antigens. C. J. C. B.

Vaccines for St. Louis and Japanese *B* types of epidemic encephalitis. A. B. Sabin, C. E. Duffy, J. Warren, R. Ward, J. L. Peck, and I. Ruchman (*J. Amer. Med. Assoc.*, 1943, **122**, 477—486).—Strains of St. Louis and Japanese *B* types of epidemic encephalitis viruses were grown in the brains of 2—3-week-old mice and high-titre yields of satisfactory antigens were obtained. The vaccines consisted of uncentrifuged 10% mouse brain suspensions in isotonic NaCl solution rendered non-infective by 0·2% formaldehyde solution at 2—3°. Removal of the brain tissue reduced the potency. Lyophilised vaccines were then prepared after adding $NaHSO_3$ to produce a negative Schryver test for formaldehyde, neutralisation with NaOH to pH 7·3, and addition of phenyl Hg borate to final concn. of 1/50,000. The resulting product is readily rehydrated, and produces little local reaction on injection in man. Large, multiple doses were required to protect mice against intranasal or intracerebral inoculation of 10—100 m.l.d. of the viruses. The vaccines were assayed by determining the m.l.d. required to produce significant

resistance to infection by intraperitoneal injection in 1 week; 2 doses at 3-day intervals were best, and 0·01—0·003 c.c. of St. Louis or 0·003—0·001 c.c. of Japanese *B* vaccine was effective. Injections of 2 c.c. into human volunteers were well tolerated and antibodies were produced in 50%. C. A. K.

Infection of birds with virus of equine encephalomyelitis. A. W. Sellards, E. E. Tyzzer, and B. L. Bennett (*Amer. J. Hyg.*, 1941, **33**, B63—68).—The virus of equine encephalomyelitis recovered from pheasants dying in Connecticut was identified with that of the eastern equine type by means of cross protection tests. A fatal paralysis developed in several adult pheasants after intramuscular injection. Very young chicks died within 48 hr. after subcutaneous injection; young hens remained free from symptoms after intracerebral inoculation but their sera showed protective properties. B. C. H.

Encephalitis complicating measles. A. M. Litvak, I. J. Sands, and H. Gibel (*Amer. J. Dis. Child.*, 1943, **65**, 265—295).—A review of 56 cases. C. J. C. B.

Poliomyelitis. C. E. van Rooyen and A. D. Morgan (*Edinb. Med. J.*, 1943, **50**, 705—720).—A description of the morbid histological appearances in 7 cases and references to 31 others in the Middle East Force between Dec., 1940, and May, 1943. Severe pathological changes were found throughout the cord corresponding closely to clinical paralysis but observed in advance of the latter. From 6 out of 7 fatal cases intra-cerebral injection of human cord into *C. æthiops* and/or *P. hamadryas* (Abyssinian baboon) reproduced the disease in fatal form 5—12 days later. The latter species is very susceptible to infection but all attempts to infect Egyptian rodents failed. The disease was not arrested by large doses of sulphadiazine given to infected animals before or after the onset of paralysis. H. S.

Association of virus of lymphocytic choriomeningitis with erythrocytes in infected animals. G. Schartzman (*J. Bact.*, 1943, **46**, 482—483).—There was a firm association of the virus with the erythrocytes of infected mice and guinea-pigs, the degree of association being proportional to the virulence of the strain for the animal species infected. F. S.

Epidemiology of influenza. T. Francis (*J. Amer. Med. Assoc.*, 1943, **122**, 4—8).—A review. C. A. K.

Immunisation against influenza *A*. R. Hare, J. Morgan, J. Jackson, and D. M. Stamatis (*Canad. J. Publ. Health*, 1943, **34**, 353—359).—The immunisation of normal adults with conc. influenza *A* vaccine is described. The response, judged by serological methods, was greater than with unconc. vaccine. The response was greater than after a clinical attack of influenza *A*. C. G. W.

Influenza "*A*": a minor epidemic. T. H. Donnelly, H. P. Hughes, D. Robertson, and E. Philipp (*Brit. Med. J.*, 1944, I, 42—43).—A clinical description. I. C.

Lymphomatosis. U.S.D.A. Regional Research Laboratory, East Lansing, Mich. (*U.S. Egg & Poultry Mag.*, 1943, **49**, 546—548).—This form of the avian leukosis complex appears to be transmitted through the egg. Chicks from stock free from the disease can be so maintained in isolated quarters and under quarantine, but remain susceptible to infection by contact. J. H. Bu.

Cold agglutinins in primary atypical pneumonia. D. M. Horstmann and H. Tatlock (*J. Amer. Med. Assoc.*, 1943, **122**, 369—370).—Cold agglutinins were found in the sera of 27 of 40 cases of primary atypical pneumonia. The titre fell markedly after a few months' storage, which probably accounts for some of the negative responses. The test may be of diagnostic val. C. A. K.

Clinical and epidemiological features of outbreak of primary atypical pneumonia of unknown ætiology among hospital and medical school personnel. L. E. Young, M. Storey, and A. J. Redmond (*Amer. J. med. Sci.*, 1943, **206**, 756—769).—The diagnosis was finally established when *X*-ray examination revealed typical chest findings; bacteriologic studies were negative. Primary atypical pneumonia is not highly communicable like the common cold or influenza. Treatment is symptomatic only; sulphonamide therapy is ineffective against the primary (probably virus) infection. The use of sulphonamide therapy later in the disease depends on the nature of complications. C. J. C. B.

Infectivity of saliva in human rabies. S. E. Sulkin and C. G. Harford (*Ann. int. Med.*, 1943, **19**, 256—262).—Rabies virus was found in the saliva of a rabid patient during a convulsive seizure with profuse salivation. Mice inoculated with the saliva developed rabies. A. S.

Immunological reactions in rickettsial diseases: time of appearance of antibodies. F. Fitzpatrick and B. Hampil (*Amer. J. Publ. Health*, 1941, **31**, 1301—1305).—The rickettsial agglutinins appeared in inoculated rabbits 5—7 days after inoculation, the proteus agglutinins at 7—14 days. The Weil–Felix reaction dropped to 0 in 1—5 weeks even in animals which continued to receive injections. The rickettsial agglutinins and protective antibodies persisted for as long as 7 months. C. J. C. B.

Chick membrane as differential culture medium with suspected cases of smallpox and varicella. J. V. Irons, S. W. Bohls, E. B. M. Cook, and J. N. Murphy, jun. (*Amer. J. Hyg.*, 1941, **33**, B50—55).—Pustular contents or crusts from 4 cases of suspected smallpox when inoculated on chorio-allantoic membranes of 10—14-day-old chick embryos produced characteristic pocks within 48—72 hr. Stained smears prepared from membranal lesions showed moderate nos. of elementary bodies. The histo- and cyto-pathological changes occurring in infected membranes were characteristic of smallpox lesions. Passages could be carried on indefinitely. Inoculation of membranes with material from cases of probable varicella failed to produce lesions. Chorio-allantoic inoculation may be of val. in differentiating between smallpox and varicella. B. C. H.

Study and control of yellow fever in Africa, particularly the Anglo-Egyptian Sudan. R. Kirk (*Trans. R. Soc. trop. Med. Hyg.*, 1943, **37**, 125—150).—A review. C. J. C. B.

Fever of the dengue group occurring in West Africa. G. M. Findlay and R. W. Brookfield (*Trans. R. Soc. trop. Med. Hyg.*, 1943, **37**, 95—109).—The symptoms of the disease are fever of 2—10 days' duration, often of the saddleback type, vague muscular, bone, and joint pains, enlargement of the regional lymph nodes, and a measles-like rash coming out from the 2nd to the 6th day of illness. The infection has not been transmitted to several species of monkey or to mice, rabbits, guinea-pigs, or bush rats (*Cricetomys gambianus*). The disease was reproduced in 2 of 6 volunteers by subcutaneous injection of serum after an incubation period of 5—6 days. No organisms were cultivated from the blood; it is suggested that the disease is due to a virus. The serum of convalescent patients contains no virucidal antibodies against the viruses of Rift Valley fever, Bwamba forest fever, and West Nile fever. C. J. C. B.

Inapparent, latent sylvatic plague in ground squirrels in Central California. K. F. Meyer, R. Holdenried, A. L. Burroughs, and E. Jawetz (*J. Infect. Dis.*, 1943, **73**, 144—157). F. S.

Inhibition of increase and activity of tobacco mosaic virus under nitrogen-deficient conditions. E. L. Spencer (*Plant Physiol.*, 1941, **16**, 227—239).—During a 24-day period the virus-protein content of N-deficient plants remained almost const., but decreased in biological activity by more than 40%. Possible reasons for this partial inactivation of the virus are discussed. Similarly infected plants receiving sufficient N grew in 24 days to about 5 times the size of the N-deficient plants. R. H. H.

Denaturation of tobacco mosaic virus by urea. II. Kinetic aspects. M. A. Lauffer (*J. Amer. Chem. Soc.*, 1943, **65**, 1793—1802; cf. A., 1939, III, 729).—Denaturation of the virus by urea is a first-order reaction, but k is a linear function of 1/(initial concn.). k is increased by small amounts of NaCl, $K_2H_2PO_4$, or Na_3 citrate, but is decreased by larger amounts. Between 0° and 45° k is a max. at 23°, which is explained by assuming that reactions with negative and positive temp. coeffs. are involved, both types consisting of two stages, formation and denaturation of a virus–urea complex; negative temp. coeffs. are produced if ΔH of the formation exceeds that of the denaturation of the complex; for positive temp. coeffs. the reverse is true. This view accords with k being proportional to $[\text{urea}]^{8\cdot1}$ at 0° and $[\text{urea}]^{5\cdot7}$ at 45°. k is $1/(H^+ \text{ activity})^{5\cdot1}$, explained as due to 1·5 (average) H^+ being dissociated from the virus particle before denaturation. R. S. C.

Biological activity of acyl derivatives of the virus of tobacco mosaic. V. L. Rishkov and A. M. Vovk (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **38**, 221—222).—Infection of tobacco and tomato plants with benzoylated and acetylated tobacco mosaic virus produced symptoms typical of the unaltered virus. Passage of the virus from these plants to normal plants was successful. F. S.

Sedimentation rate of infectious principle of tobacco mosaic virus. M. A. Lauffer (*J. Biol. Chem.*, 1943, **151**, 627—634).—The sedimentation const. of the infectious principle of the virus is the same as that of the virus protein, indicating that infectivity is probably a property of the nucleoprotein particles predominating in a virus prep. and eliminating entirely the possibility that the sole carriers of virus infectivity are particles smaller than half the size of the predominating particles. H. G. K.

Contribution of chemistry to immunology. C. R. Harington (*Chem. and Ind.*, 1944, 87—91).—Jubilee Memorial lecture.

Quantitative investigations on antigens, antibodies, and complements. F. Haurowitz (*Schweiz. med. Wschr.*, 1943, **73**, 264—267).—The experimental findings of the author and his co-workers are reviewed. A. S.

Preparation of synthetic immune serum and nature of immunity. D. K. Bacon (*Arch. int. Med.*, 1943, **72**, 581—593).—Citrated beef plasma during dehydration with the cold–vac. method of Flossdorf and Mudd shows a progressive rise in pH (up to 9·10 at near dryness). Staphylococcus toxin was added to the plasma during the dehydration process; the original plasma vol. and a pH of 7·4 (with Br–N-acetic acid) were restored. 5 c.c. of the filtrate and 0·5 c.c. of staphylococcus or diphtheria toxin were mixed and incubated for

12 hr.; a copious antigen–antibody ppt. appeared whereas unprocessed plasma did not show any or only slight pptn. A. S.

Proteolysis of protein fractions from normal and antitoxin sera by pepsin in weakly acidic medium. II. Enzymic protein analysis. H. E. Schultze (*Biochem. Z.*, 1941, **308**, 266—294).—The effect of pepsin at pH 4·5 on normal and antitoxin whole sera depends on the ease of hydrolysis of the albumins. With horse, ox, and sheep sera, hydrolysis by pepsin at pH 4·5 is 10—30 times as rapid as with euglobulin or pseudoglobulin. The differences in the rates of hydrolysis in the final stage of proteolysis of horse serum fractions are even greater because the albumins of horse serum inhibit more than do those of ox and sheep sera. The antitoxin content of diphtheria, tetanus, and gas gangrene sera from ox and sheep has no effect on the rate of hydrolysis compared with whole sera, but the rate of hydrolysis of antitoxin-globulin fractions from horse serum is significantly less than that of the normal globulin. This decrease is not due solely to the antitoxin content. Besides the antitoxin-protein, proteolytically purified diphtheria antitoxin contains also other antibodies and thermostable bacterial proteins, and the amount of these is proportional to the amount of antitoxin. A third inactive protein is also present and the amount of this varies inversely as the amount of antitoxin. This protein is probably identical with that present in very small amount in normal horse serum, the amount of which decreases considerably during immunisation. These three proteins in diphtheria serum differ from the normal serum-proteins by their resistance to pepsin in weakly acid medium. Although not attacked by pepsin at pH 4·5, the antitoxin serum fractions are hydrolysed at pH vals. less than 3·5 just as easily as are the normal serum-globulins. When the concns. of pepsin and protein, within the range 0·04—1·28% of protein, are simultaneously increased, hydrolysis of the globulins is considerably more inhibited than is that of the albumins. Diptheria antitoxin formation in sheep and ox sera is accompanied by a large increase in the euglobulin fraction, whilst with horse serum it is the pseudoglobulin fraction which is increased. With the isolated globulin fractions of horse serum and high concn. of protein, hydrolysis of the immune globulin at pH 3·0 is more marked than that of the normal serum-globulin. J. N. A.

Preparation and antigenic properties of a crystalline labelled antigen. B. K. Shahrokh (*J. Biol. Chem.*, 1943, **151**, 659—664).—Horse serum iodoalbumin is prepared by treatment of the recryst. albumin in PO_4''' buffer at 5° with I in aq. KI. After pptn. with saturated aq. $(NH_4)_2SO_4$ and acetic acid, the prep. is cryst. from aq. Na acetate, $(NH_4)_2SO_4$, and acetic acid, the quantity of acid used depending on the I content of the protein, which can be as high as 4·4%. The cryst. iodoprotein (preferably containing 2% of I) can be used as labelled antigen if the species specificity is not of importance. H. G. R.

Mazzini slide flocculation test: sensitivity of its antigen. M. Costing and V. Watson (*Amer. J. med. Sci.*, 1943, **206**, 486—489).—Mazzini antigen for routine use should be ripened for 3—4 hr. at room temp. Antigen which has been kept at room temp. for 28 hr. in the winter or even in summer heat up to 94° F. is more sensitive for emergency use than that ripened in the refrigerator for 15 min. C. J. C. B.

Immunity induced in dogs by repeated infections with hookworm, *Ancylostoma caninum*. G. F. Otto (*Amer. J. Hyg.*, 1941, **33**, D39—57).—Experiments with 21 puppies showed that graded *per os* infections with hookworms induced immunity as rapidly as subcutaneous injections of larvæ, the rate depending on no. of larvæ rather than route of administration. Neither the periodic removal of worms nor anæmia from initial infections retarded the development of immunity. As immunity developed worms were thrown out but the animal never became free and those worms remaining may prevent sufficiently rapid recovery from anæmia to save the host. B. C. H.

Systemic allergic reaction induced by yellow fever vaccine. H. Schwartz (*J. Lab. clin. Med.*, 1943, **28**, 1663—1667).—The subject, who was sensitive to eggs and chicken, had a severe constitutional reaction immediately following injection of yellow fever vaccine. C. J. C. B.

Allergenic properties of vegetable gums. H. H. Gelfand (*J. Allergy*, 1943, **14**, 203—219).—A case of bronchial asthma induced by prolonged exposure to tragacanth in a gum factory is described, and the allergenic properties of vegetable gums are reviewed. C. A. K.

Thermostable antibody to ragweed pollen. S. Hampton, M. C. Johnson, H. L. Alexander, and K. S. Wilson (*J. Allergy*, 1943, **14**, 227—230).—A simple precipitin method for detection of thermostable antibody to ragweed pollen is described. The method compares favourably with that of passive transfer. C. A. K.

Mould fungi in respiratory allergic diseases. W. H. Browning (*J. Allergy*, 1943, **14**, 231—243).—Asthma and hay fever patients and controls were skin-tested with 1/5000 dilutions of extracts of various mould fungi. Statistical analysis showed that 14 of the 38 extracts were primary irritants, and that only 3 of the remaining 24 non-irritant extracts gave a diagnostic efficiency of 70%. C. A. K.

Source of allergic activity of house dust. M. T. Davidson (*J. Allergy*, 1943, **14**, 244—255).—Skin tests in 100 patients who gave definite reactions to house dust showed that many reacted to the constituents of house dust, *i.e.*, cotton, flax, jute, wool, silk, animal hairs, feathers, glue, kapok, orris root, pyrethrum, and tobacco. C. A. K.

Deer fly desensitisation. J. A. Mease (*J. Amer. Med. Assoc.*, 1943, **122**, 227).—Case report. C. A. K.

Treatment of allergic conditions, especially of skin, with peptones and lactic acid. F. Wyss-Chodat (*Schweiz. med. Wschr.*, 1943, **73**, 417—420).—Good results were obtained. A. S.

Host–parasite relations between laboratory mice and *Nematospiroides dubius*, Baylis. G. M. Spurlock (*J. Parasit.*, 1943, **29**, 303—311).—The *A–W* strain was highly susceptible to the infection on the basis of mortality, whereas the *C*-57 strain was resistant on this basis but was a favourable host on the basis of the rate at which the parasite passed through its encysted stage in the intestine of the mouse. F. S.

XXVI.—PLANT PHYSIOLOGY.

Polarity in plants. R. Bloch (*Bot. Rev.*, 1943, **9**, 261—310).—A review. L. G. G. W.

Protoplasmic streaming. W. Seifriz (*Bot. Rev.*, 1943, **9**, 49—123).—A review. L. G. G. W.

Inner and outer protoplasmic surfaces of large plant cells. I. Plasmolysis due to salts. W. J. V. Osterhout (*J. Gen. Physiol.*, 1943, **27**, 139—142).—The inner and outer non-aq. protoplasmic surface layers in *Nitella flexilis*, *Chara braunii*, *Hydrodictyon reticulatum*, and *Valonia macrophysa* are separated by certain plasmolytic agents which penetrate the outer more rapidly than the inner surface and hence increase the osmotic pressure of the protoplasm lying between them and cause it to increase in thickness by taking up water from the central vacuole. It is concluded that the two surfaces are different and this is confirmed by the fact that when sap is placed outside the cell, the system external sap|protoplasm|sap in vacuole produces an e.m.f. of approx. 65 mv. J. N. A.

Determination of protoplasmic permeability from plasmolytic tests. G. W. Scarth (*Plant Physiol.*, 1939, **14**, 129—143).—The principles of the method are considered, and formulæ applicable to cylindrical and spherical cells are derived. R. H. H.

Time and temperature of protoplasmic coagulation. H. T. Northen and R. T. Northen (*Plant Physiol.*, 1939, **14**, 175—176).—At 43·5° and above there was a marked increase in protoplasmic consistency (coagulation) in cells of maize, oat, rye, and wheat coleoptiles, whilst protoplasmic firmness in *Spirogyra* and *Zignema* increased at a lower temp. Coagulation at 43·5° and 47·5° was more rapid in wheat, rye, and oats than in maize. R. H. H.

Mechanism of phloem transport. T. G. Mason and E. Phillis (*Plant Physiol.*, 1941, **16**, 399—404).—Recent work is critically discussed. R. H. H.

Conditions necessary for activity of chloroplasts outside the cell. E. A. Boitschenko (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **38**, 181—184).—Absorption of CO_2, with evolution of O_2, occurred when isolated chloroplasts were placed in CO_2-saturated 5M-sucrose containing $Ca(OH)_2$ 0·1 and fructose 0·1%. The pH of the solution was 8·2—8·5, and the rH <5·2. With increase in rH (*e.g.*, by using salts of Na or K in place of Ca) no absorption of CO_2 took place. The bearing of the results on the mechanism of photosynthesis is discussed. R. H. H.

Physiology of pollen tubes in the style. F. Rinehart (*Proc. Oklahoma Acad. Sci.*, 1940 [1941], **21**, 65).—At const. temp. over a range 18·4—24° the growth rate of the pollen tubes of *Nicotiana tabacum* was const. for 48 hr. The rate of pollen tube growth was not affected by the source of the stylar plant and crowding on the style was without effect on pollen tube growth unless over 1000 pollen tubes were present in the style. Colchicine when absorbed by the style decreased pollen tube growth and the pollen tubes in the treated style showed enlargements and breakages. L. G. G. W.

Diurnal fluctuation in root pressure. K. A. Grossenbacher (*Plant Physiol.*, 1938, **13**, 669—676).—Sunflower plants, under const. conditions of light, temp., and aëration, exhibited a marked diurnal variation in root pressure which could not be correlated with any change in the environment. The variation may be controlled by a physiological cycle set up during previous growth in the greenhouse. R. H. H.

Temperature effects on growth of excised root tips. G. C. Galligar (*Plant Physiol.*, 1938, **13**, 835—844).—The effects of different temp. on the growth behaviour of excised root tips of dent maize, cotton, sunflower, and Burpee's Extra Early pea are recorded. R. H. H.

Ice formation and death of plant cells by freezing. I. H. Stuckey and O. F. Curtis (*Plant Physiol.*, 1938, **13**, 815—833).—Technique for direct microscopical observation of the freezing of living cells is

described. The method is applied to some of the problems concerned with the resistance of plants to low temp. R. H. H.

Cuticle in angiosperms. J. H. Priestley (*Bot. Rev.*, 1943, **9**, 593—616).—A review. L. G. G. W.

Osmotic quantities of the cells in the hypocotyl of *Helianthus annuus* seedlings. W. A. Beck and B. Andrus (*Bull. Torrey Bot. Club*, 1943, **70**, 563—598).—In etiolated *H. annuus* seedlings about 45 mm. high the uppermost zone (immediately below the cotyledon) has the smallest diameter. This zone, which contained carotenoids in the cells, is the region of cell division and the protoplasm of the cells shows max. viscosity, swelling power, and electrical charge. Plasmolysis of the cells is difficult and slow, and the forces causing water intake are largely non-osmotic. In the second zone (6·5 mm. from the cotyledon) cell enlargement occurs and the cells contain a small amount of carotenoids. The osmotic pressure is less than in the upper zone. The wall elasticity is still considerable. Osmotic pressure and difference between osmotic pressure of epidermis and cortex decrease progressively towards the base of the hypocotyl where the cells are mature. Cell wall plasticity likewise decreases but wall rigidity increases and in the basal zone wall pressure, turgor pressure, and wall rigidity are all max. and suction pressure min. L. G. G. W.

Nature of bound water in colloidal systems. R. C. Chandler (*Plant Physiol.*, 1941, **16**, 273—291).—The thermodynamic behaviour of true and colloidal solutions is considered, following determinations of v.p. lowering and f.p. depression. A new interpretation of some bound-water phenomena is presented. R. H. H.

Relation of cabbage hardiness to bound water, unfrozen water, and cell contraction when frozen. J. Levitt (*Plant Physiol.*, 1939, **14**, 93—112).—Calorimetric determinations of ice formation in frozen cabbage petioles, together with determinations of the f.p. and total moisture, gave a measure both of frozen and unfrozen water and of osmotically and non-osmotically bound water. Hardened and unhardened plants were compared at their crit. freezing temp. (−5·6° and −2·1°, respectively). R. H. H.

Atmospheric humidity and temperature in relation to water system of plants and soils. C. A. Shull (*Plant Physiol.*, 1939, **14**, 401—422). —A lecture. The relation of the water-vapour phase of the atm. to the water economy of plants in general is clarified. R. H. H.

Effect of aëration on growth of tomato in nutrient solution. W. D. Durell (*Plant Physiol.*, 1941, **16**, 327—341).—Aëration had a decidedly beneficial effect on the vegetative growth of roots, stems, and leaves, as well as on fruit production. Optimum production of roots and fruit was obtained by supplying the nutrient solution with 2·5 ml. and that of stems and leaves with at least 250 ml. of air per plant per min. R. H. H.

Absorption and transpiration. III. Effects of hypertonic solutions on leaf turgidity. T. Ekambarum and V. K. Kamalam. **IV. Effect of oxygen concentrations on absorption of water and transpiration.** K. V. Kamalam (*J. Indian Bot. Soc.*, 1941, **20**, 11—18, 19—36).—III. When young cut shoots of *Tecoma stans* and *Barlaria cristata* stand with their lower ends in hypertonic solutions of NaCl or KBr, there is a rapid loss of leaf turgidity. The response with older shoots is slower and is much delayed with shoots of *Artemisia* sp. unless their water content is reduced previous to the experiment.

IV. With a variety of plants with their roots immersed in water, water absorption and transpiration were not affected by changes in the O_2 content of the water between 1·5 and 2·3 mg. per l. L. G. G. W.

Transpiration and physico-chemical properties of leaves as related to drought-resistance in loblolly pine and shortleaf pine. C. S. Schopmeyer (*Plant Physiol.*, 1939, **14**, 447—462).—Determinations of transpiration, bound water, total water, and osmotic pressure were made. The drought-resistance of shortleaf pine was greater than that of loblolly pine. R. H. H.

Pressure-composition relations of gas in marine brown alga, *Nereocystis leutkeana*. G. B. Rigg and L. A. Swain (*Plant Physiol.*, 1941, **16**, 361—371).—The change of pressure in normal plants from a max. in the afternoon to a min. in the morning corresponds with the change in O_2 content. In plants kept in the dark, decrease in pressure and in O_2 content is continuous. R. H. H.

Translocation in plants. A. S. Crafts (*Plant Physiol.*, 1938, **13**, 791—814).—The literature on the subject is reviewed. The case for mass flow is presented, attention being drawn to certain quant. evidence and to cytological studies on the activity of sieve-tube protoplasm. R. H. H.

Transpiration and absorption of mineral salts. K. E. Wright (*Plant Physiol.*, 1939, **14**, 171—174).—Analysis of culture solutions in which bean plants had been growing under conditions of high and low transpiration indicated that increase in the rate of transpiration is correlated with increase in the absorption of N, P, K, and Ca. R. H. H.

Respiration of germinating white-oak acorns. R. E. Girton and E. R. Park (*Proc. Indiana Acad. Sci.*, 1941 [1942], **51**, 83—86).—Dormant seeds of *Quercus alba* have a high (35—45%) water content and a correspondingly high respiration rate which falls for the first 3 days of germination, during which time the lipin content of the acorns increases. Increased primary root elongation is accompanied by an increased rate of O_2 absorption. L. G. G. W.

Respiration of acorns as related to temperature and after-ripening. J. W. Brown (*Plant Physiol.*, 1939, **14**, 621—645).—The R.Q. of white-oak and northern red-oak acorns decreased from about 0·50 to 0·09 and 0·16, respectively, during winter storage at 2·5°. Removal to higher temp. increased the R.Q. Measurements of catalase activity gave no information on after-ripening progress or germinating power. The highest % of germinations of northern red-oak acorns followed storage at 10—12·5° for 2 months, during which time the R.Q. was less than 0·3. R. H. H.

Plum pollen, its appearance and germination. W. S. Flory, jun., and M. L. Tomes (*J. Agric. Res.*, 1943, **67**, 337—358).—The % of normal pollen (determined by microscopical appearance) and the % of germinations on nutrient agar are recorded for different varieties over a period of three seasons. The effects of environment (type of soil, temp., and humidity) on the appearance and viability of pollen, and of hybridisation on pollen abortion, are also considered. R. H. H.

Metabolism of cereal grains. II. Effect of age and kernel size on the course of respiration of wheat during early germination stages. W. Leach (*Canad. J. Res.*, 1943, **21**, C, 289—296; cf. A., 1942, III, 562).—The respiratory activity of wheat kernels in contact with either water or water-saturated air is independent of period of storage prior to testing. Output of CO_2 per unit wt. of grain is higher for small kernels. G. H.

Assimilation of apple leaves. J. G. Waugh (*Plant Physiol.*, 1939, **14**, 463—477).—Under fairly uniform external conditions, the rate of assimilation is irregular. Responses to changes in light-intensity, rate of air flow, and temp. are recorded. R. H. H.

Energy expenditure of (tomato) fruits as independent of rate of ripening. S. V. Soldatenkov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 380—382).—The total O_2 consumption and CO_2 production per kg. of tomatoes ripened are independent of the time or temp. of ripening. Respiration and rate of ripening are accelerated by increasing the partial pressure of O_2, by adding ethylene (1 : 2000), and by increasing temp. (up to 25°). R. L. E.

Rooting of flowers in sterile culture. C. D. La Rue (*Bull. Torrey Bot. Club*, 1942, **68**, 332—341).—The flowers of 14 species were able to root on nutrient agar containing no hormone; root production was accelerated when indolylacetic acid was added to the agar medium. Callus rarely formed on the flowers. L. G. G. W.

Growth behaviour of one-millimetre excised root tips. G. C. Galligar (*Plant Physiol.*, 1939, **14**, 163—169).—Early growth was irregular and was much slower than that of root tips cut at 10 mm. In the first 10 days the rate of elongation of sunflower and maize was more than that of sweet maize, whilst growth of cotton and two pea varieties was very slight. The presence of vascular tissue was not necessary for growth of the tips. R. H. H.

Culture of isolated roots of *Acacia melanoxylon*. J. Bonner (*Bull. Torrey Bot. Club*, 1942, **69**, 130—133).—Isolated roots of *A. melanoxylon* were grown satisfactorily in liquid media containing salts and sucrose, plus thiamin, pyridoxine, and nicotinic acid, all of which appear to be essential, but the absence of pyridoxine had only a small effect on growth. Root elongation averaged 8 mm. per week, which is much less than that found with typical herbaceous plants (*e.g.*, tomato, lucerne, and clover 40—150 mm. per week). Continued growth of the roots of twelve other woody species could not be consistently obtained. L. G. G. W.

Embryo of *Hordeum sativum*. II. Growth in culture. J. Merry (*Bull. Torrey Bot. Club*, 1942, **69**, 360—372).—Young (7—8 days old) excised barley embryos grown in 0·8% agar with 2% sucrose and Shive's solution R5S2 showed no growth, even when vitamin-B_1 was added, after 2 months. Older embryos underwent some development. 12-day-old embryos placed in culture showed development of primary root and shoot meristems and in the latter cell divisions were occurring after a month in culture. With still older embryos, leaf primordia formed more rapidly, coleoptiles were larger, lignification of vascular bundles was more marked and occurred sooner, but the greatest primary root length occurred in the plants from 14-day embryos. New roots formed in culture were all adventitious. L. G. G. W.

Mineral nutrition of wheat as influenced by fertiliser combinations. F. T. Donaldson (*Plant Physiol.*, 1938, **13**, 737—766).—Irrespective of fertiliser treatment, the amounts of dry matter, P, S, and N in the plants increased progressively through the growing season. K and Ca reached max. vals. one month before harvest, K then decreasing and Ca remaining fairly const. The effect of drought and subsequent irrigation on the movement of plant nutrients is recorded. The plant at maturity contained approx. equal amounts

of Ca, P, and S, but their distribution between heads and straw varied markedly. R. H. H.

Salt tolerance of plants at various temperatures. S. M. Ahi and W. L. Powers (*Plant Physiol.*, 1938, **13**, 767—789).—The % germination decreases with increase in temp. or salt concn. The decrease is marked at high temp. (32·2°). Resistance to salinity was shown by legumes in the descending order: strawberry clover, sweet clover, lucerne. Increased yields were obtained by the application of S and manure to the soil accompanied by leaching. The S-oxidising power of reclaimed soil greatly exceeded that of virgin alkali soil. R. H. H.

Antagonistic action of chlorides on toxicity of iodides to maize. J. C. Lewis and W. L. Powers (*Plant Physiol.*, 1941, **16**, 393—398).—Addition of 20 p.p.m. of chlorides to the culture solution partly prevented the toxic action of 2 p.p.m. of iodides. The I′–Cl′ antagonism was independent of Fe deficiency. R. H. H.

Tolerance of shortleaf pine seedlings for some variations in soluble calcium and hydrogen-ion concentration. A. G. Chapman (*Plant Physiol.*, 1941, **16**, 313—326).—For survival of germinating seed and young seedlings, the sol. Ca content of the culture media should be below 500 p.p.m. and the pH below 6·5. The pH of expressed root sap was lower than that of the soil medium in which the roots developed. Application of P to soils low in P increased the buffering power of the cell sap of roots. R. H. H.

Effects of cations and anions on protoplasmic elasticity. H. T. Northen and R. T. Northen (*Plant Physiol.*, 1939, **14**, 539—547).—The elasticity of protoplasm in *Spirogyra* was increased by $Na^{\cdot}$, $K^{\cdot}$, $Be^{\cdot\cdot}$, $Mg^{\cdot\cdot}$, $Zn^{\cdot\cdot}$, $Cd^{\cdot\cdot}$, $Hg^{\cdot\cdot}$, F', SO_4'', CrO_4'', and PO_4''', decreased by $Li^{\cdot}$, $Cs^{\cdot}$, $Ca^{\cdot\cdot}$, $Sr^{\cdot\cdot}$, $Ba^{\cdot\cdot}$, NO_3', and AsO_4''', and unaffected by Br', Cl', and I'. In mixtures of bivalent cations, $Mg^{\cdot\cdot}$ was decidedly antagonised by $Ba^{\cdot\cdot}$, $Cd^{\cdot\cdot}$, and $Ca^{\cdot\cdot}$. R. H. H.

Antagonistic phenomena and cation absorption in tobacco in presence and absence of manganese and boron. T. R. Swanback (*Plant Physiol.*, 1939, **14**, 423—446).—The interrelated antagonistic effects of K, Ca, and Mg have been observed. Distinction is made between antagonism (due to variation in mobility, size, and hydration of the ions) and pseudo-antagonism (due to difference in ion concn.). In general, B aids absorption and utilisation of Ca. Mn retards the absorption and utilisation of Ca in conditions where K is dominating, but is beneficial where Ca is dominating. R. H. H.

Foliar diagnosis: influence of soil on action of fertilisers. W. Thomas and W. B. Mack (*Plant Physiol.*, 1939, **14**, 75—92).—The foliar diagnoses of similarly fertilised duplicate plots are compared. Soil heterogeneity is indicated by relatively large differences in the yield of potatoes from duplicate plots. The differences in the course of nutrition with respect to N, P, and K following various fertiliser treatments are shown graphically. R. H. H.

Effect of potassium manuring on production of organic matter. O. Eckstein (*Plant Physiol.*, 1939, **14**, 113—128).—In wheat plants receiving sufficient N, both transpiration and assimilation increase with increasing applications of K, whilst in N-deficient plants, both tend to be markedly reduced by heavy dressings. The effect of increasing K manuring on the relative protein val. (protein-N/sol. N) and chlorophyll content of the leaf is recorded and discussed. R. H. H.

Antagonism of certain elements essential to plants toward chemically related toxic elements. A. M. Hurd-Karrer (*Plant Physiol.*, 1939, **14**, 9—29).—As-injury is related to the concn. of available P_2O_5, Rb-injury to K, and Sr-injury to Ca. The protective ratio of As/P in nutrient solutions is about 1 : 5, of Rb/K about 1 : 2, and of Sr/Ca about 1 : 1. A possible explanation of these effects is advanced. R. H. H.

Effects of a limiting element on absorption of individual elements and on anion : cation balance in wheat. A. G. McCalla and E. K. Woodford (*Plant Physiol.*, 1938, **13**, 695—712).—Limitation of the N supply led to increased absorption of P and, to a smaller extent, of S. Limitation of K increased absorption of Ca and Mg, whilst limitation of Ca increased K and Mg and slightly decreased the absorption of anions. A balance between total anions and cations, in favour of the anions, was maintained. R. H. H.

Physiological action of ammonia- and nitrate-nitrogen [on plants]. B. Arenz (*Biochem. Z.*, 1941, **308**, 196—212).—Excess of NH_3 which is harmful to plant tissues is removed by formation of amides such as asparagine and glutamine or by formation of salts with the acidic juices of the plants. Ammono-plants are those which have plant juice with pH below 5, whilst amide plants are those with alkaline cell juices. Data are given for the pH of the press juices of various plants growing in nutrient media containing either NH_3-N or NO_3'-N. When barley grows in water culture containing PO_4''', $K^{\cdot}$, and 0·1% of N either as $NH_4^{\cdot}$ or NO_3' the pH of the press juice of the shoots in the NO_3' group varies from 6·29 to 6·38, and of the roots 6·38 to 6·49, compared with the corresponding vals. of 6·45—6·61 and 6·63—6·78 for the $NH_4^{\cdot}$ medium. The yield of shoots and roots on the NO_3' medium is 2—4 times as great as on the $NH_4^{\cdot}$ medium and the harmful effect of the NH_3 is most pronounced on growth of the shoots. When barley and oats are grown in water culture containing 0·025% of N supplied as $NaNO_3$ the plants exhibit a healthy green colour, whilst with NH_4NO_3 the colour is distinctly darker, and with $(NH_4)_2SO_4$ the plants are a dark bluish-green. Growth of barley is adversely affected only on the $(NH_4)_2SO_4$ medium, but with oats both $NH_4^{\cdot}$ media affect the growth. In water culture containing 0·25% of N, the pH vals. of press juice of barley shoots and roots on the NO_3' medium are 6·21 and 6·60 respectively, and on the $NH_4^{\cdot}$ medium 5·70 and 6·30 respectively. The corresponding pH vals. for oats under the same conditions are 6·30 and 7·0, and 5·99 and 6·86. With barley seedlings in a single salt solution with N content varying from 0·02 to 0·2% the pH of the press juice of the shoots on NO_3' medium increases from 5·87 to 6·35 and decreases on the $NH_4^{\cdot}$ medium from 6·10 to 5·90. The difference between the pH vals. of the press juice of shoots and roots of lupin seedlings is not so marked. With N content varying from 0·02 to 0·20%, the pH vals. of the juice of shoots on NO_3' and $NH_4^{\cdot}$ media vary from 5·69 to 5·73 and 5·50 to 5·66 respectively. Without illumination and N content 0·1%, lupin seedlings press juice shows higher pH on NO_3' and $NH_4^{\cdot}$ media than when the seedlings are illuminated. The uptake of N by lupin seedlings in an $NH_4^{\cdot}$ medium containing 0·1% of N is greater in light than in darkness. With sunflower seedlings and 0·1% of N in the medium the pH vals. of the press juice from shoots in the light on NO_3' and $NH_4^{\cdot}$ media are 5·79—6·05 and 5·25—5·53, and in the dark 5·85—6·19 and 5·83—6·02, respectively. The vals. for press juice from roots under the same conditions are 5·79—6·00, 4·83—4·98; 5·89—6·00, and 4·88—5·52 respectively. J. N. A.

Transamination in green plants. A. I. Virtanen and T. Laine (*Biochem. Z.*, 1941, **308**, 213—215).—When a mixture of 15 g. of crushed pea plants, 50 c.c. of 0·066M-PO_4''' buffer at pH 7·5, 10 c.c. of 0·14M-glutamic or aspartic acid (or glutamine or asparagine), and 10 c.c. of 0·14M. neutralised pyruvic acid, is diluted to 100 c.c. and incubated for 4 hr. at 40°, 31·1% of transamination occurs with glutamic acid, 10·7% with aspartic acid, 6·9% with glutamine, and 1·5% with asparagine. In the case of the amides, 4·5% of asparagine-N and 22·6% of glutamine-N was hydrolysed at the same time, which suggests that transamination with the amides occurs probably via the dicarboxylic acids. J. N. A.

Distribution of nitrogenous fractions, sugars, and other substances in ananas grown in darkness versus daylight. C. P. Sideris, B. H. Krauss, and H. Y. Young (*Plant Physiol.*, 1939, **14**, 647—676).—The fruits of pineapple plants grown in the light had much higher total wt., and contents of titratable acidity and sol. solids, than had those of plants grown in the dark. The distribution of different fractions of inorg., sol. org., and protein-N, and of reducing sugars and sucrose, in different sections of the leaf, stem, and fruit of the plants exposed to light and those kept in darkness is recorded and discussed. R. H. H.

Nitrogen and carotene partition in lucerne plant. V. G. Heller and D. Hood (*Proc. Oklahoma Acad. Sci.*, 1941 [1942], **22**, 65—67).—Juice expressed from lucerne ground to a pulp under a pressure of 15,000 lb. per sq. in. and then conc. in a vac. below 65° showed little loss of carotene, although the bulk of the carotene and a little over half the N of the plant is retained in the press-cake residue. L. G. G. W.

Changes in chemical composition of twigs and buds of yellow poplar during dormant period. J. J. McDermott (*Plant Physiol.*, 1941, **16**, 415—418).—During the period Jan.–Mar., much of the insol. N was converted into sol. forms, whilst in Mar.–Apr. the reverse process took place. All carbohydrate fractions (except total reserve polysaccharides) were used in respiration. R. H. H.

Glycine in nutrition of excised tomato roots. P. R. White (*Plant Physiol.*, 1939, **14**, 527—538).—Glycine alone is capable of supplying all the amino-N required for growth of excised tomato roots. A nutrient solution which supports continued and probably unlimited growth of the roots consists of: sucrose 20 g., $Ca(NO_3)_2$ 100 mg., $MgSO_4$ 35, KNO_3 80, KCl 65, KH_2PO_4 12·5, KI 0·75, $Fe_2(SO_4)_3$ 2·5, $MnSO_4$ 4·4, $ZnSO_4$ 1·5, H_3BO_3 1·6, glycine 3, and thiamin 0·5 mg. per l. R. H. H.

Influence of certain amino-acids and of nicotinic acid on nicotine content of tobacco leaves. R. F. Dawson (*Plant Physiol.*, 1939, **14**, 479—491).—The nicotine content of the leaves was increased in varying degree by addition of proline, pyrrolidonecarboxylic, glutamic, and nicotinic acids to the culture solution, but was unaffected by addition of Na-Mg-chlorophyllin, glycine, *d*-arginine, *d*-glucose, citric and *dl*-α-amino-*n*-valeric acids. R. H. H.

Lucerne nectar and the honeybee. G. H. Vansell (*J. Econ. Entom.*, 1941, **34**, 21—23).—Nectar secretion and sugar concn. are increased by a longer light day, warmth, and lowering of soil-moisture and atm. R.H. Turkestan lucerne yields more and richer nectar than the common variety. A. A. M.

Fat metabolism in mature and germinating leguminous seeds. P. Neumann (*Biochem. Z.*, 1941, **308**, 141—174).—The fat content of over-mature white lupin seeds at 20° increases from 3·46 to

5·55% during the first 3—4 days and then decreases slightly to a const. val. The acid val. of half-mature seeds decreases during the first 4 days from 39 to 22 and then remains const. The sap. val. and I val. gradually increase during maturing. Seeds mature more rapidly at 30° and the max. fat content, 7·35—7·40%, is attained within 2—3 days. When the seeds mature in water instead of in air the fat content increases rather more slowly to a lower max. whilst the acid val. is greater. When immature seeds are left in water there is inhibition of the subsequent maturing in air, but inhibition is less if the seeds are immersed in 0·1M-KCl or -K_2SO_4. The maturing process is only slightly quicker in O_2 than in air and the max. amount of fat is formed after 3—4 days, whilst in N_2, and especially in CO_2, the process is much slower and the max. fat content, 7·62%, is not formed until the 9th day. In presence of HCN the increase in fat content and decrease in the acid val. are almost completely inhibited whilst the sap. val. is scarcely affected. When maturing takes place normally on the plant there is a continual increase in the fat content from 2·49 to 11·17% (on dry wt.) and a decrease in acid val. from 50·1 to 0. The amount of unsaponifiable matter in the fat decreases from 18·16 to 1·74%. The I val. increases from 106 to 114·5, whilst the sap. val. increases from 146 to a max. of 200 when the fat content is 7·55% and then decreases to 181·5. The amount of fat in mature seeds and the sap. and acid vals. vary directly and the I val. and amount of unsaponifiable matter inversely with the size of the seed. In germinating soya-bean seeds at 20° the fat content increases during 4 days from 18·2 to 20·3% (on dry wt.), the acid val. from 1·8 to 3·5. At 30° the fat content increases from 18·4 to 22·3% in the first 3 days and then decreases to 16·7% by the 6th day. The I val. decreases from 146·6 to 134·4 whilst the acid val. increases from 1·28 to 6·70. The sap. val. is practically unaltered. Germinating lupin seeds behave in almost the same way except that the I val. increases during the first 4 days from 114·4 to 117·0. When the seeds are soaked in water prior to germination changes in the fat begin immediately whilst soaking in 0·1M-KCl causes a delay in germination. The R.Q. of the germinating soya-bean seed is less than unity.

J. N. A.

Biochemical changes during conditioning of wheat. N. I. Sosedov, A. B. Vakar, V. A. Schvetzova, and Z. B. Drozdova (*Biochimia*, 1942, **7**, 130—141).—During conditioning of wheat the amount of reducing sugar increases whilst that of the disaccharides decreases, and the content of N compounds is unaltered. The physical properties of the gluten are changed and the " swelling no." is max. at 50°. Cold conditioning is accompanied by a slight increase in the activities of catalase and of proteolytic and diastatic enzymes. Hot conditioning causes a marked increase in proteolytic and diastatic activity, which is most pronounced when conditioning is carried out at 50°. The stability of the gluten-proteins is decreased by cold and hot conditioning.

J. N. A.

Physiological and biochemical premises for early harvesting of cereals. A. P. Schtscherbakov and Z. S. Bronovitzkaja (*Biochimia*, 1942, **7**, 117—129).—During post-harvesting ripening in sheaves much more starch is accumulated in the grain than in ears at the stage of waxy or complete ripeness. Activity of catalase and of α- and β-amylases is decreased considerably, whilst that of phenolase is increased. Lying in sheaves and post-harvesting ripening are accompanied by marked decrease in acidity, with less change in the I-reducing substances. During lying and post-harvesting ripening the grain if still connected to the ear or straw can effect additional mobilisation of substances from the cellular walls of the straw or chaff. If adverse conditions render premature harvesting necessary, then the sowing and baking properties of the grain are improved by allowing it to lie for 7—10 days in sheaves or ears.

J. N. A.

Translocation of carbohydrates in sugar beet. O. A. Leonard (*Plant Physiol.*, 1939, **14**, 55—74).—The level of fructose was low in the young leaves and high in leaves from older or mature plants. Fructose, glucose, sucrose, and sometimes dextrin showed marked diurnal variation within the blades. In detached mature leaves, whether placed in the sun or in the dark, the sugars migrated from the blade mesophyll in a polar direction, and accumulated fairly evenly throughout the petioles. Factors which may determine the relative amounts of different carbohydrates within the tissues are considered. The composition of blades and midribs before and after being fed sugar (by dipping the cut surfaces of petioles into solutions of fructose, glucose, or sucrose) is recorded.

R. H. H.

Changes in composition and rate of growth along developing stem of asparagus. C. W. Culpepper and H. H. Moon (*Plant Physiol.*, 1939, **14**, 677—698).—The rate of elongation of the stem of plants maintained at 18·3—21·1° varied in different zones with the height of the stalk. Total sugar content was highest at the base and decreased rapidly to a low val. near the tip, whilst total N was lowest in the basal region, increasing rapidly near the tip. Changes in astringency were closely related to those in total N content.

R. H. H.

Developmental changes in composition of *Macadamia*. W. W. Jones (*Plant Physiol.*, 1939, **14**, 755—768).—During the period from 90 days after flowering to maturity of the fruit (about 125 days later), the major expansion of the embryo occurs and is accompanied by oil formation, protein synthesis, and increase followed by a decline in total sugar content.

R. H. H.

The Mirsky–Pauling theory of structure of native, denatured, and coagulated proteins, and some theoretical aspects of evolution of oxygen from irradiated green plant. O. L. Inman (*Plant Physiol.*, 1938, **13**, 859—862).—Possible relations between the sensitisation and denaturation of proteins and one phase of the mechanism of photosynthesis are dealt with.

R. H. H.

Comparative transmission spectrograms of different concentrations of leaf extract. L. W. Webb, jun., and F. F. Ferguson (*Plant Physiol.*, 1941, **16**, 425—427).—Increase in transmission is related to decrease in concn. of the alcoholic leaf extract.

R. H. H.

Influence of aluminium on flower colour of *Hydrangea macrophylla*, DC. R. C. Allen (*Contr. Boyce Thompson Inst.*, 1943, 13, 221—242).—Blue flowers from the plants grown in sand culture contained more than 250 p.p.m. of Al, mauve flowers approx. 150—250, and pink flowers less than 150. Al compounds induced a change from pink to blue when allowed to infiltrate the tissue of mature flowers.

R. H. H.

Biogenesis of anthoxanthins. P. S. Rao and T. R. Seshadri (*Proc. Indian Acad. Sci.*, 1943, **18**, **A**, 222—235).—The occurrence of anthoxanthins (flavones and flavonols) in plants is discussed and a scheme of their evolution is developed. The scheme involves oxidation and reduction reactions in both the side-chain phenyl and the benzopyrone nucleus.

D. G.

Heritable variations in chlorophyll. J. C. Ireland (*Plant Physiol.*, 1938, **13**, 863—865).—Spectrographic variations in chlorophyll extracts of grain sorghums are continuous throughout a season and in two generations. Chlorophyll and sugar concns. are not correlated with the widths of spectrographic bands.

R. H. H.

Synthesis of hyoscyamine in *Atropa belladonna*, L., and *Datura stramonium*, L. B. T. Cromwell (*Biochem. J.*, 1943, **37**, 717—722; cf. A., 1937, III, 238).—In the leaves, stems, and roots of *A. belladonna*, hyoscyamine attains max. concn. in July, the min. concn. being reached in the leaves in May and in the roots in March. There is only little downward movement of hyoscyamine from the leaves in autumn. The roots and etiolated shoots of *A. belladonna* plants sprouting in darkness give high yields of hyoscyamine and of volatile bases. Grafting experiments and examination of exudate from cut stems indicate that the chief site of hyoscyamine synthesis is the root, from which the alkaloid moves, as such, to stems, leaves, fruits, and seeds. Synthesis of hyoscyamine in the plant is stimulated by injection of putrescine, which is regarded as an intermediate product in the synthesis, and of other amines (*e.g.*, arginine, hexamine). Approx. determinations of the seasonal distribution of carbohydrates in *A. belladonna* plants grown normally and in darkness suggest that accumulation of carbohydrate derivatives favours synthesis of bases.

W. McC.

Rôle of putrescine in synthesis of hyoscyamine. B. T. Cromwell (*Biochem. J.*, 1943, **37**, 722—726).—Press-juice from the leaves, etiolated shoots, and, especially, roots of *Atropa belladonna* contains an enzyme which oxidises putrescine with production of NH_3 and aldehyde and the leaves and upper stems of this plant and of *Datura stramonium* yield small proportions of putrescine. These results support the view that putrescine is an intermediate in the synthesis of hyoscyamine and related alkaloids in plants.

W. McC.

Changes in carbohydrase activity of potato. K. V. Saposhnikova and A. A. Semlianuchin (*Biochimia*, 1942, **7**, 142—150).—There is a direct relationship between the amount of carbohydrate and the extent of enzyme activity in the potato. Synthetic processes are most marked when there is a max. content of monoses and a min. content of disaccharides. Max. synthetic activity occurs in the leaves at midday and in the evening, when the content of monosaccharides is highest.

J. N. A.

Action of enzymes in different parts of leaf. N. Sisakjan and A. Kobjakova (*Biochimia*, 1941, **6**, 50—57).—Synthesis in the sunflower leaf is most pronounced at the base, weaker at the apex, and very weak in the middle. In the conducting system, hydrolysis predominates. The rates of enzyme activity vary at different ages of the leaf.

R. H. H.

Deliberate alteration of prevailing direction of enzyme action in living plant cells. N. Sisakjan and A. Kobjakova (*Biochimia*, 1941, **6**, 41—49).—Removal of the inflorescence of chrysanthemum or sunflower plants promoted synthesis, whilst preservation of the inflorescence and reduction in the no. of leaves favoured hydrolysis.

R. H. H.

Effect of sun and shade on pigment development. W. A. Beck (*Plant Physiol.*, 1938, **13**, 871—872).—*Plantago major* grown in shade contained much more chlorophyll, less xanthophyll, and slightly more carotene per sq. cm. of leaf area than did those grown in sunlight.

A. G. P.

Effect of variations in light intensity, length of photo-period, and availability of nitrogen on accumulation of ascorbic acid in cow pea

plants. M. A. Reid (*Bull. Torrey Bot. Club*, 1942, **69**, 204—220).—High light intensity and medium or long days increase the concn. of ascorbic acid in the leaves and the total amount in the plant. Seasonal variations in ascorbic acid content are correlated with changes in conditions of illumination. L. G. G. W.

Response of seedlings to various wavebands of low light intensity. R. B. Withrow (*Plant Physiol.*, 1941, **16**, 241—256).—The influence of spectrally controlled radiant energy on the growth and development of red kidney bean, pea, maize, soya bean, tomato, and cocklebur and sprouts of potato is investigated. R. H. H.

Absorption and utilisation of radioactive carbon dioxide by sunflower leaves. J. H. C. Smith and D. B. Cowie (*Plant Physiol.*, 1941, **16**, 257—271).—CO_2 is absorbed by dissolution in the sap-water and by reaction both with sol. buffer substances and with insol. carbonates. Absorption of CO_2 by leaves for photosynthetic use is independent of the photochemical reaction. The photosynthate formed is rapidly used up in respiration. R. H. H.

***X*-Ray effects on growth and reproduction of wheat.** D. J. Wort (*Plant Physiol.*, 1941, **16**, 373—383).—The max. increases in fresh and dry wt. were obtained by irradiating plants grown from old seed with 76 r., and those from fresh seed with 57 r. *X*-Radiation of 76—114 r. accelerated heading and flowering of plants grown from old seed and retarded with those from fresh seed. The height and wt. of Fulhio winter wheat seedlings were greatly increased by all doses used, both being max. with 114 r. R. H. H.

Floral development of certain species as influenced by *X*-irradiation of buds. E. L. Johnson (*Plant Physiol.*, 1939, **14**, 783—795).—Irradiation of *Salpiglossis sinuata*, *Phlox drummondii*, and *Nicotiana tabacum* during the reproductive stage with one medium dose of *X*-rays led to the development of blossoms showing approx. 10 types of floral anomalies: white stippling, spotting, and streaking of corolla lobes, colour changes, increased and decreased no. of corolla lobes, dwarf blossoms, etc. The size of the buds at the time of irradiation was correlated with the occurrence and character of the anomaly produced in the flower. R. H. H.

Physiology of diploid and related tetraploid plants. H. Taylor (*Proc. Oklahoma Acad. Sci.*, 1941 [1942], **22**, 137—138).—In *Vinca rosea* and *Petunia violaceæ* tetraploids have larger stomata than diploids but the stomatal frequency is reduced. The osmotic pressure of the cell sap is lower in the tetraploid *Vinca* but unchanged in *Petunia*. The diffusion pressure deficit in *Vinca* leaves is lower in the tetraploids except when transpiration is max. Total transpiration of the tetraploids seems to be less than that of the diploids. L. G. G. W.

Induction of polyploidy in *Vinca rosea*, L. L. Schnell (*Proc. Oklahoma Acad. Sci.*, 1940 [1941], **21**, 67).—*Vinca rosea* seeds treated with aq. colchicine (0·0—0·1%) for 24 and 48 hr. showed a reduction in germination. Seedlings produced showed thickened hypocotyls, distorted leaves, and delayed root production, and some were polyploid. Treatment of apical meristems of shoots with colchicine in lanoline paste or in oil emulsion produced about 50% of polyploids which were larger than normal diploid plants. L. G. G. W.

Induction of polyploidy in *Phlox* by colchicine. O. J. Eigsti and H. Taylor (*Proc. Oklahoma Acad. Sci.*, 1941 [1942], **22**, 120—122).—Immersion of the growing tips of seedlings of *P. drummondii* in 0·2% aq. colchicine for 24 hr. resulted in more than half producing polyploid tissue with stomata and pollen grains larger than normal. Some chimeral plants were produced. Spraying the shoot apices of diploid plants with 0·4% colchicine emulsion was toxic in most cases but two plants that survived were tetraploid. L. G. G. W.

Colchicine-induced tetraploidy in *Oenothera*. A. Hecht (*Proc. Indiana Acad. Sci.*, 1941 [1942], **51**, 87—93).—Colchicine treatment of diploid seedlings produced tetraploids in 14 races and hybrids of *Oenothera* and these were generally larger than the corresponding diploids. L. G. G. W.

Structural features of the shoot apices of diploid and colchicine-induced tetraploid strains of *Vinca rosea*, L. G. L. Cross and T. J. Johnson (*Bull. Torrey Bot. Club*, 1941, **68**, 618—634).—The shoot apices of a colchicine-induced tetraploid of *V. rosea* are similar to those of the diploid, but the meristem in the former is wider, the colchicine treatment having resulted in increased lateral dimensions of the cells, but no increase in vertical cell dimension. L. G. G. W.

Physiological aspects of tetraploidy in cabbage. C. G. Barr and E. H. Newcomer (*J. Agric. Res.*, 1943, **67**, 329—336).—Autotetraploid cabbage, compared with the diploid plant, contained a higher % of ascorbic acid, sugar, starch, acid-hydrolysable substances, and colloidal N, and a lower % of sol. N and ash. R. H. H.

Effects of certain hormones, drugs, amino-acids, and vitamins on mitosis in the pollen tube of *Tradescantia occidentalis*. O. J. Eigsti (*Proc. Oklahoma Acad. Sci.*, 1940 [1941], **21**, 101).—Colchicine, tryptophan, sulphanilamide, sulphapyridine, adrenaline, and prolactin all induced irregularities in mitosis of *Tradescantia* pollen. Anterior pituitary extract, œstrogenic hormone, gonadotropic hormone, thyroid, thymus, heteroauxin, riboflavin, ascorbic acid, nicotinic acid, thiamin, tyrosine, alanine, cystine, and atropine were all without effect at concn. of 1—10,000 p.p.m. L. G. G. W.

Nicotinic acid and growth of isolated pea embryos. J. Bonner (*Plant Physiol.*, 1938, **13**, 865—868).—Data obtained with isolated embryos and roots indicate that nicotinic acid is indispensable to the growth of pea seedlings. A. G. P.

Rôle of ascorbic acid in plant nutrition. G. H. Carroll (*Bot. Rev.*, 1943, **9**, 41—48).—A review. L. G. G. W.

Ascorbic acid and energy of oxidising processes in potatoes. S. M. Prokoschev (*Biochimia*, 1942, **7**, 267—277).—Only a few types of cultivated and wild potatoes exhibit stability of vitamin-*C* during storage, which is related to the oxidative processes of the tuber Stability of -*C* is enhanced by a high content of peroxidase and a low content of phenolase. The stability is determined by the physiological requirements of the tuber in ascorbic acid as a respiratory catalyst. H. G. R.

Carbohydrates of bean plants after treatment with indolyl-3-acetic acid. T. R. Alexander (*Plant Physiol.*, 1938, **13**, 845—858).—Removal of the stem ends of bean plants and treatment with heteroauxin in lanoline led to the production of tumours and roots. Carbohydrates were translocated to the point of treatment, simple carbohydrates being condensed to complex polysaccharides. Reducing sugars, sucrose, starch and dextrin, water-sol. and -insol. acid-hydrolysable substances were determined in controls and treated plants. The loss in dry wt. of treated plants indicated respiratory increase. Reduction of sol. carbohydrates at the point of treatment was mainly due to increases in acid-hydrolysable materials. R. H. H.

Effect of ethylene on certain chemical changes associated with ripening of pears. E. Hansen (*Plant Physiol.*, 1939, **14**, 145—161).—Treatment with ethylene at certain periods in the life of the fruit increased the rate of starch digestion, concn. of total and reducing sugars, and transformation of protopectin into pectin; titratable acidity was unchanged. Increase in the rate of softening was correlated with that of pectic changes. The magnitude of the response to treatment was determined by the maturity of the fruit, and by the length of storage prior to treatment. R. H. H.

Production and consumption of ethylene by ethylene-treated bananas. R. C. Nelson (*Plant Physiol.*, 1939, **14**, 817—822). Ethylene is consumed by bananas during the ripening process, probably in connexion with hydrolysis of starch. The treatment of fruits already producing ethylene accelerates ripening. R. H. H.

Metabolic phenomena associated with virus infection in plants. F. L. Wynd (*Bot. Rev.*, 1943, **9**, 395—465).—A review. L. G. G. W.

Effect of host nutrition on concentration of tobacco mosaic-virus. E. L. Spencer (*Plant Physiol.*, 1939, **14**, 769—782).—The virus activity of expressed juice was directly related to the amount of N supplied to the plants, but was not correlated with growth. R. H. H.

Phosphate distribution in leaves of healthy and mosaic-diseased tobacco plants. V. L. Rishkov and M. N. Vorobeeva (*Biochimia*, 1942, **7**, 79—85).—There is an increase in protein-N but no increase in PO_4''' in diseased leaves. In general there is a decrease in total and in several combined forms of PO_4'''; at the same time the PO_4''' content of water-sol. nucleoproteins is increased. These differences disappear under conditions of PO_4''' deficiency because in healthy plants the PO_4''' level decreases more rapidly than in diseased leaves. When there is a shortage of PO_4''' and N the protein-N in diseased plants decreases considerably less than that in healthy plants. J. N. A.

Comparison of protein from normal tomatoes and from those diseased with tobacco mosaic virus. P. Agatov (*Biochimia*, 1941, **6**, 37—40).—The P content of fractions from normal and diseased plants is the same and only small differences occur in amino-acid composition. A. H. G.

Biochemical changes in the case of antholysis. V. L. Rishkov and E. P. Gromiko (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 385—386).—Oat leaves affected by virus diseases which cause antholysis are high in reducing sugar, sucrose, and starch, giving high C/N ratios; these are all low in the spikelets. R. L. E.

XXVII.—PLANT CONSTITUENTS.

Copper, zinc, and manganese in some plants of agricultural interest. C. S. Piper and A. Walkley (*J. Counc. Sci. Ind. Res. Australia*, 1943, **16**, 217—234).—The amounts of Cu and Zn were significantly correlated in all samples. The Cu and Zn contents of Algerian oats declined as the plants approached maturity, whilst Mn, following an initial decline, increased. At maturity, the Zn was found conc. in the grain, Mn in the straw, and Cu equally distributed between grain and straw. Legumes were richer than cereals and grasses in both Cu and Zn, variation due to species being more than that due to soil type. R. H. H.

Composition of pollens. F. E. Todd and O. Bretherick (*J. Econ. Entom.*, 1942, **35**, 312—317).—Of 27 bee-collected samples of pollen, the mean % composition was: crude protein 21·6, ether extract 4·96, water 11·2, ash 2·7, reducing sugar 25·7, non-reducing sugar 2·7, starch 2·55, undetermined 28·55%. Pollen ash gave the following mean vals.: K 20·7, P 13·6, Ca 10·5, Mg 6·7, Fe 0·07%. A. A. M.

Orange nectar and pollen in relation to bee activity. G. H. Vansell, W. G. Watkins, and R. K. Bishop (*J. Econ. Entom.*, 1942, **35**, 321—323).—Orange nectar showed a total sugar content varying from 19·8 to 25·75% in 2 seasons. Sucrose content was approx. twice that of either glucose or fructose. A. A. M.

New constituent in wheat-germ oil. H. H. Bunzel (*Bull. Torrey Bot. Club*, 1943, **70**, 599—601).—A wheat-germ oil constituent stimulates oxidation of *p*-cresol by tyrosinase, forming a quinonoid compound. The identity of the effective constituent has not been determined but it may be β- or γ-tocopherol. L. G. G. W.

Unequal distribution of soluble solids in pulp of citrus fruits. E. T. Bartholomew and W. B. Sinclair (*Plant Physiol.*, 1941, **16**, 293—312).—The concn. of sol. solids in the stylar half of the mature orange or grapefruit is much greater than that in the stem half. The f.p. of expressed juice is correlated with the sol. solids content. R. H. H.

Occurrence of citric and *iso*citric acid in blackberries and in dewberry hybrids. A. L. Curl and E. K. Nelson (*J. Agric. Res.*, 1943, **67**, 301—303).—The non-volatile acids were determined by the ester distillation method. *iso*Citric acid predominated in the blackberries, and citric acid in the dewberries. R. H. H.

Carbohydrates of wheat leaves. G. Krotkov (*Plant Physiol.*, 1939, **14**, 559—565).—Following extraction of the leaves with alcohol, hydrolysis of the residue with Na_2HPO_4 yielded a larger amount of invert than of reducing sugars, whilst tryptic digestion liberated a preponderance of reducing sugars. The carbohydrate–protein complex is not broken down by 1% H_2SO_4, and sugars are liberated from it only after tryptic digestion of the protein fraction. R. H. H.

Polysaccharides of vegetative tissues of maize. C. G. Barr (*Plant Physiol.*, 1939, **14**, 737—753).—Following extraction of sol. carbohydrates with 80% alcohol, the polysaccharides were separated into four fractions. The first two, sol. in cold 10% alcohol and boiling water, respectively, were probably mixtures of dextrin and other water-sol. gums. The third was rapidly hydrolysed by boiling HCl; tests for fructose were negative. The fourth, resistant to hot acid, consisted mainly of cellulose. R. H. H.

Constituents of the fruit of *Rhus typhina*, L. I. Fats and their decolorisation. J. Tischer, E. Illner, and R. Seidl. **II. Isolation of malic acid.** J. Tischer (*Biochem. Z.*, 1941, **307**, 366—377, 378—386).—I. Crude fat constitutes 3·1—3·5% of the seeds and 12·2—12·3% of the dried casing. With light petroleum as solvent, the proportion of true fat is 89%, with 11% of a non-saponifiable fraction. The I val. of the seed fat (96·4) is higher than that of the casing (50·3). The corresponding ester vals. are 176·9 and 179·4. The fatty acids have a high content of OH-acids, and the mean mol. wt. is 311. Distillation at 0·2—0·3 mm. increases the proportion of unsaturated fatty acids (I val. 64·8). The effect of climatic factors is investigated. Decolorisation by filtration of a light petroleum solution through various adsorbing agents is described; Al_2O_3 is the best adsorbent.

II. Malic acid is extracted with ether from the defatted material; the casing contains 6—10% and the seeds only 1%. The acid occurs both in the free form and as its Ca salts. P. G. M.

Constituents of fruits of *Rhus typhina*, L. III. Tannins in fruits and leaves. J. Tischer and R. Seidl. **IV. Crystals of calcium malate in seed epidermis.** J. Tischer (*Biochem. Z.*, 1941, **308**, 295—300, 225—229).—III. The defatted fruits, fruit pods, and seeds of the Sudeten variety contain 14·43, 16·28, and 10·75% of gallotannins, respectively. The content of tannins in the leaves of *R. typhina* indigenous to the Sudetenland differs from that of other varieties least at flowering time, but amounts to 21% at the beginning of October. The leaves that fall in autumn contain approx. as much gallotannin, but less than 50% of the sol. non-tannin substances.

IV. The epidermis of the seed contains crystals of Ca malate, which occupy 33% of the seed surface and constitute approx. 1·7% of the wt. of the seed. J. N. A.

Nuclein complex of germ and proteins of endosperm of cedar seeds (*Pinus sibirica*, Rupr.). A. N. Belozerski and M. S. Uspenskaja (*Biochimia*, 1942, **7**, 155—162).—The endosperm of cedar nuts contains a globulin, glutelin, and a small amount of albumin; the glutelin and especially the globulin contain a large amount of arginine. Extraction of cedar nut germs with water and alkali yields nucleoproteins with varying ratio protein : nucleic acid. The free nucleic acids belong to the thymo- and yeast-nucleic acid type. A nucleoprotein in which the thymonucleic acid is firmly bound to the protein is also present. This is probably related to the nuclear substance of the cedar germ cells. Determination of the amino-acids in this nucleoprotein show the presence of a basic protein. J. N. A.

Secondary vascular tissues of the oaks indigenous to the United States. II. Types of tyloses and their distribution in *Erythrobalanus* and *Leucobalanus*. S. Williams (*Bull. Torrey Bot. Club*, 1942, **69**, 1—10).—Two distinct types of tylose walls in *Quercus* can be recognised on the basis of chemical composition. In one the tyloses have thin to moderately thick walls with a central cellulose layer, and thin layers of lignin. In the other the walls are thick and stratified, often pitted and with a lignified middle lamella and then a layer of cellulose. L. G. G. W.

Pectin content of plant materials. W. E. Elwell and W. M. Dehn (*Plant Physiol.*, 1939, **14**, 809—816).—Quant. data on the pectic content of a large no. of plant materials are recorded, as well as data indicating the enzyme processes involved in the degradation of pectin. R. H. H.

Amorphin, glycoside in *Amorpha fruticosa*, L.—See A., 1944, II, 93.

Glucosidases of tobacco leaf. G. P. Volgunov, A. S. Komel, and I. N. Puschkareva (*Biochimia*, 1941, **6**, 67—75).—An active maltase was found in tobacco leaves when freshly harvested, but not after curing. β-Glucosidase was absent from freshly harvested leaves, and was either absent or present in insignificant amount after curing. R. H. H.

Thiamin in some common American trees. P. R. Burkholder and A. G. Snow, jun. (*Bull. Torrey Bot. Club*, 1942, **69**, 421—427).—The thiamin content of some trees measured by the stimulating effect of tissue extracts on *Phycomyces* varied in different individuals of white pine. The buds and leaves of various deciduous trees showed varying stimulating effects whilst buds and leaves of sugar maple and white oak inhibited *Phycomyces* growth even when thiamin was added to the culture. In ringed white pine and red maple trees thiamin activity was greater below than above the ring after 4 weeks but was the same after about 4 months. Vitamin starvation of the roots may occur in ringed trees as downward translocation is prevented. L. G. G. W.

Rotenone in the yam bean (*Pachyrrhizus erosus*). L. B. Norton (*J. Amer. Chem. Soc.*, 1943, **65**, 2259—2260).—Yam bean seeds from Mexico yield 26·7% of fatty oil and 1·4% of an insecticidal resin, which gives a Meyer colour test equiv. to 0·15% of rotenone and yields rotenone (about 0·1% calc. on the wt. of seeds) and other crystals. R. S. C.

Preparation of carotene from fresh or preserved carrots. S. D. Balachovski and N. I. Bulgakov (*Biochimia*, 1942, **7**, 151—154).—A small amount of ovalbumin is added to the pressed juice from carrots and the mixture is heated to 80°, when the coagulated protein carries down nearly all the carotene. The ppt. is collected and extracted with ether. The residue from the ethereal extract is hydrolysed and extracted with ether. The extract is then washed with water and conc. until it has a deep red colour. Addition of ethyl alcohol followed by cooling causes crystallisation of the carotene. J. N. A.

Constituents of carotene extracts of plants. A. R. Kemmerer and G. S. Fraps (*Ind. Eng. Chem. [Anal.]*, 1943, **15**, 714—716).—The crude carotene extracts of a no. of materials, analysed by adsorption on $Ca(OH)_2$, contain 2·8—39·5% of an impurity (containing several pigments), 26·4—95·4% of β-carotene, 0—18·1% of neo-β-carotene, 0—26·7% of a new pigment, carotenoid *X*, and in a few cases α- and neo-α-carotene. *X* has no vitamin-*A* activity, and neo-β-carotene has only half the potency of β-carotene. The carotene solutions, prepared by several methods, contain appreciable and variable amounts of impurity, especially *X*, and all methods previously proposed give only approx. results for the carotene content. (See also C., 1944, Part 2.) J. D. R.

"Carpasemine" [benzylthiocarbamide] isolated from *Carica papaya* seeds.—See A., 1944, II, 95.

Constituents of Argentine plants. V. Deulofeu (*Bol. Soc. Quim. Peru*, 1943, **9**, 109—116).—A survey of the distribution of alkaloids in Argentine flora. F. R. G.

Chemical investigation of Indian fruits. IV. Bitter principle of a variety of *Citrus limetta*. T. R. Seshadri (*Proc. Indian Acad. Sci.*, 1943, **18**, A, 201—203).—The bitter principle contained only limonin, $C_{28}H_{30}O_8$ (?), m.p. 292—294° (decomp.), $[\alpha]_D^{30}$ −115·1° in acetone. Naringin and naringenin were absent. D. G.

Fluorescent alkaloid in rye-grass.—See A., 1944, II, 113; III, 282.

Plants, including fungi, poisonous or otherwise injurious to man in Australia. J. B. Cleland (*Med. J. Austral.*, 1943, II, 161—164).—A review. F. S.

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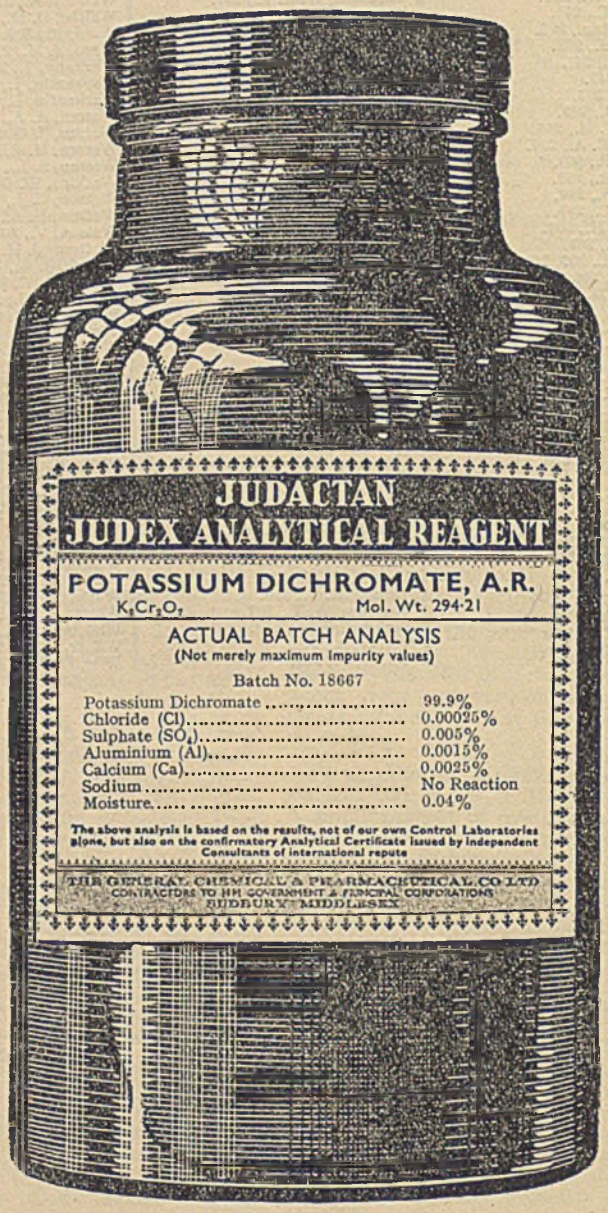

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