

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

JULY, 1944



A III—PHYSIOLOGY. BIOCHEMISTRY. ANATOMY

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BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A III—Physiology. Biochemistry. Anatomy.

JULY, 1944.

I.—GENERAL ANATOMY AND MORPHOLOGY.

Development of tetrapod limb musculature. Shoulder region of *Lacerta*. A. S. Romer (*J. Morph.*, 1944, 74, 1—41).—The differentiation of the muscles and associated structures in the shoulder region of *L. agilis* is described, the main differentiation occurring in embryos of 6–9 mm. crown-rump length. Two primary muscle masses, dorsal and ventral, are formed and these are distinct from each other and for the most part distinct from the axial musculature. The derivatives of these two masses are traced; it is found that the deltoid group of muscles arises from the dorsal mass; levator scapulae and the serrati are axial, not appendicular, muscles. The fenestrae in the girdle develop after the muscles are established and it is probable that they allow "release" of the concerned muscles when these are contracted. The musculature of the adult lizard is considered in the light of the ontogenetic findings and a comparison is made with *Sphenodon*, crocodiles, birds, and urodeles. A table of muscle homologies in these forms is given. H. L. H. G.

Morphological status of modern Amphibia among Tetrapoda. F. G. Evans (*J. Morph.*, 1944, 74, 43—100).—A comparison is made of the osteology of recent Amphibia, *Iguana*, and primitive fossil tetrapods. It is emphasised that recent Amphibia are specialised and are not primitive tetrapods, and many features are pointed out in which they have departed more widely from the primitive condition than has a modern reptile such as *Iguana*. H. L. H. G.

Human sternochondral joints. D. J. Gray and E. D. Gardner (*Anat. Rec.*, 1943, 87, 235—253).—Cavities in the sternochondral joints were present in some in the 3½-month foetus, but the time of their appearance varies. One foetus at term showed no cavities. Cavities appeared first in the second joint, followed shortly afterwards (at the fourth month) by the third joint. Adult articulations showed a decreasing % having complete cavities in passing from the second to the seventh joint. The incidence of strands passing across cavities is given. All the joints contained fibrocartilage between the sternal articular facets and the costal cartilages. Age is not a factor in determining the presence or absence of joint cavities in subjects from 33 to 92 years. W. F. H.

Suboccipital-bregmatic circumference. H. Thomas and M. S. Godfried (*Amer. J. Obstet. Gynec.*, 1940, 39, 841—843).—This circumference was charted in 70 new-born infants by an apparatus consisting chiefly of a flexible lead band. In all but one case the circumference was ovate with narrowing of the occipital half and broadening of the bregmatic half. P. C. W.

Volume, viscosity, and nitrogen content of synovial fluid: histological appearance of synovial membrane. D. V. Davies (*J. Anat.*, London, 1944, 78, 68—78).—The vol., viscosity (η), and N content of the synovial fluid was investigated in normal cattle. The tibio-tarsal joint contains a large vol. of colourless or pale straw-coloured fluid of low η and low total N content. The colour and viscosity of fluid in the knee joint are very variable. The fluid in the hip has a η similar to that of the tibio-tarsal joint. The most viscous fluid was found in the atlanto-occipital joint. Histological examination of the synovial membranes of the different joints revealed no special distinguishing features to account for the differences in η . W. J. H.

Thyroid gland. I. Structure, extent, and drainage of "lymph sac" of the thyroid gland (*Felis domestica*). A. J. Ramsay and G. A. Bennett (*Anat. Rec.*, 1943, 87, 321—339).—Injection methods for demonstrating the gross and microscopic structure of the thyroid lymph sac in the cat are described. The main lymphatic channels draining the sac pass to deep lymph glands of the neck. More than 50% of the animals injected showed lymph vessels from the sac passing directly into veins. Other efferent lymphatics passed directly into cervical lymph trunks. Ramifications of the lymph sac permeate the gland parenchyma, providing broad contact between the lymph channels and the follicles. It is suggested that the sac and its drainage vessels are concerned in the transport of a considerable proportion of thyroid secretion. W. F. H.

Arterial blood supply of breast. J. W. Maliniac (*Arch. Surg.*, Chicago, 1943, 47, 329—343).—The blood supply of the female breast is derived from at least two and often three of the following main sources: (a) the internal mammary artery, (b) the thoracic

lateral artery, and (c) the intercostal arteries. The most frequent combination is (a) and (b) (50%). (a) is always present. In approx. 55% of cases (b) has an equal share with (a) and in 13% a predominant part in vascularisation of the gland, areola, and nipple. F. S.

Main arteries in region of heart. Aves. VIII. Anseriformes. I. F. H. Glenny (*Canad. J. Res.*, 1944, 22, D, 17—35). J. D. B.

Physicomathematical theory of organic form. N. Rashevsky (*Bull. Math. Biophysics*, 1944, 6, 1—59).—Locomotion and form in snakes, shape and locomotion of quadrupeds, flight of birds and insects in relation to their form, and the internal structure of animals are discussed from a physicomathematical viewpoint. There are included a discussion on the loss of energy due to impact of an extremity against the ground and suggestions for an approximation method for solving the equations of motion of a chain of linked levers. J. D. B.

Abscess of lung [relation to subdivision of bronchi]. A. Glass (*Surgery*, 1941, 10, 465—475).—Abscesses of the lung always lie in direct line with certain large bronchi (subdivisions of lobar bronchi), which are const. in no. and position. These bronchi with the corresponding lung parenchyma are designated as bronchopulmonary segments; a description of these is given. An analysis of 100 cases of acute pulmonary abscesses according to their localisation in the various segments is given. G. P.

Combined anterior and posterior spina bifida in living neonatal human. R. L. de C. H. Saunders (*Anat. Rec.*, 1943, 87, 265—278).—In a 5-month-old female the colon communicated by a fistula through a vertebral cleft extending from the first lumbar to the second sacral, and through a corresponding spinal cord cleft. Two sets of nerves arose from the left hemicord and one set from the right. The embryological theories of causation are discussed and it is suggested that the condition followed on an ento-ectodermal adhesion rather than a primitive knot cell rest. The degree of alimentary involvement, sex, longevity, and extent of vertebral cleft in 37 cases of combined spina bifida are summarised. W. F. H.

Pseudo-monoventricular heart terminating in brain abscesses. H. M. Vann and R. E. Miller (*Anat. Rec.*, 1944, 88, 155—160).—The heart was that of an 8-year-old male in which all components of the interventricular septum were present but the septum was incomplete and perforated in the region normally occupied by the pars membranacea. The terminal illness was brain abscess. There was no indication of endocarditis and no lung abscesses. W. F. H.

Pseudouterus arcuatus and functional malformations of uterus. L. Rudolph (*Amer. J. Obstet. Gynec.*, 1940, 39, 975—982).—The condition is due to inco-ordination of the 2 halves of the uterus such as often happens during pregnancy. True anatomic uterus arcuatus can only be diagnosed post-partum. Other forms of functional malformation of the uterus during pregnancy are described. P. C. W.

Amyoplasia congenita causing malpresentation of foetus. M. I. Ealing (*J. Obstet. Gynaec.*, 1944, 51, 144—146).—A case is reported. P. C. W.

Injection method to demonstrate the blood supply of nerves. C. E. Tobin (*Anat. Rec.*, 1943, 87, 341—344).—Studies were made on the peripheral nerves of human subjects, in which the arterial system was injected with red liquid latex. Each peripheral division of the facial nerve receives branches from arteries adjacent to its exit from the parotid gland, as well as along its course and at its termination in the facial musculature. These arteries pierce and run in the epineurium and perineurium and anastomose with other arteries to the nerve. The source of the arteries varied with the arterial pattern of the face. W. F. H.

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Phases of maturation and fertilisation in human ova. W. J. Hamilton (*J. Anat.*, London, 1944, 78, 1—4).—Two human tubal ova are described. Ovum no. 1 examined in the living condition showed several layers of cumulus cells attached to the zona pellucida. The latter was homogeneous in appearance and closely applied to



the vitellus. The granular vitellus filled the zonal cavity. No subdivisions of yolk material were observed. The second maturation spindle was at metaphase and the first polar body showed scattered chromosomes in its cytoplasm. Ovum no. 2 was free from cumulus cells. Many complete sperms were seen in the homogeneous zona pellucida. A coarsely granular degenerating vitellus did not completely fill the zonal cavity. Between vitellus and zona a no. of globules thought to be the remains of degenerating polar bodies were observed. The time of ovulation in women is discussed.

W. F. H.

Histology and cytology of human and monkey placenta, with special reference to trophoblast. G. B. Wislocki and H. S. Bennett (*Amer. J. Anat.*, 1943, 73, 335—449).—Variability of the outer surface of the syncytium is regarded as normal and attributable to plasticity of its surface. The variability probably indicates that active transfer of fluid occurs across the surface of the trophoblast. A variety of vacuoles are described in the syncytium and their genesis and possible functions are discussed. Phagocytosis is not a general property of the trophoblast and it does not play an important rôle in placental transfer. Lipoid droplets are present in the syncytium from early stages until full term. The cytology of the cellular trophoblast is described and discussed. It is suggested that the cytotrophoblast may be the site of formation of chorionic gonadotropin. The possible sites of formation of the several placental hormones and the nature of the placental barrier are discussed.

W. F. H.

Duration of pregnancy in certain mustelids. O. P. Pearson and R. K. Enders (*J. Exp. Zool.*, 1944, 95, 21—36).—With the exception of the second litter of ferrets, the young of Mustelidae are born in the spring despite the great differences in gestation period due to delayed implantation. The gestation period of the marten was shortened by 3—4 months by artificially increasing the length of day. The mink has a very variable period of gestation which is probably due to variation in the delay of implantation; blastocysts were found unimplanted 20 days after mating. Artificial illumination begun before or immediately after mating shortened the period in the mink by about 3 days. It is suggested that the stimulus to implantation is the increasing length of the early spring days.

H. L. H. G.

Transuterine ("internal") migration of the ovum in sheep and other mammals. J. D. Boyd, W. J. Hamilton, and J. Hammond, jun. (*J. Anat., Lond.*, 1944, 78, 5—14).—Transuterine migration of the ovum is of frequent occurrence in the sheep in double pregnancies resulting from two ovulations in a single ovary. It is rare in single pregnancies, being found only once in all sheep (95) on which data are given. The histological appearances of the uterine cornua and body in the sheep are described. The probable mechanism and the significance of intra-uterine migration are discussed. A review shows that transuterine migration is of widespread occurrence in Eutheria.

W. F. H.

Development of innervation pattern in limb bud of the frog. A. C. Taylor (*Anat. Rec.*, 1943, 87, 379—413).—The establishment of nerve pattern occurs before tissue differentiation in the mesenchyme and is essentially completed at the 40-mm. stage of body length. It is concluded that the determination of the various branches of the nerve pattern occurs prior to the time of visible appearance of the branches. Factors directing the growth of early fibres and determining the branches of the nerve pattern are found in the pre-existing pattern in the mesostroma. The presence of a neuroplasmic reticulum within the early limb bud mesenchyme, giving rise later to individual nerve fibres, is suggested. The establishment of the innervation proceeds from base to tip and the pattern thus determined is shaped by mechanical forces accompanying differential growth of the limb.

W. F. H.

Form-producing capacity of muscle tissues after implantation. N. A. Kuzmina (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 507—509).—Adult muscle tissue of axolotl transplanted heterotopically under the epidermis does not possess the ability to organise the development of an appendage (limb-like or tail-like). Such transplantations with muscle from young animals, however, resulted in the production of more or less well differentiated extremities. It is concluded that the morphogenetic effect varies with the age of the donor of the graft. Details are given for the results of transplanting muscle from different parts of the body. Well developed extremities, with differentiated skeleton and muscle, were obtained as the result of implantation of heart muscle.

J. D. B.

Distribution of dry constituents of yolk and albumin in developing avian egg. A. L. Romanoff (*Anat. Rec.*, 1943, 87, 303—306).—The % of dry matter in dense yolk falls initially and then rises at the end of incubation. Liquefied yolk is almost unaltered except for a sharp rise at the time of its disappearance from the egg. The content of dry matter in albumin rises sharply during the first third of the developmental period; then it remains inactive and decreases only slightly at the time of merging with the yolk.

W. F. H.

Osmotic pressure effects on cleavage rate of sea-urchin eggs. I. Cornmann (*Biol. Bull.*, 1943, 84, 244—251).—Hypotonic sea-water

has antagonistic accelerating and retarding effects on the first cleavage of *Arbacia* eggs. Slight dilution accelerates, greater dilution retards, and in the boundary range (92—88% of sea-water) either effect may be produced. Acceleration is apparently due to an action on some phase of mitosis. It is not produced by sea-water diluted with isotonic electrolyte or non-electrolyte.

G. P. W.

Cytochrome oxidase in early chick embryo. F. Moog (*J. Cell. Comp. Physiol.*, 1943, 22, 223—231).—Indophenol oxidase was found in chick embryos as early as the head process stage, after about 16 hr. incubation, and it increases up to the 2nd day. Its action is inhibited by NaN_3 . The opposite results reported by Albaum and Worley (A., 1942, III, 934) may be due to the use of insufficient tissue and a less sensitive method.

V. J. W.

Hormones in *Drosophila* development. D. Bodenstern (*Biol. Bull.*, 1943, 84, 13—33, 34—58).—Larval organ discs fail to develop when transplanted into the adult body cavity unless the larval "ring gland" is transplanted too. If this is done, they grow and differentiate to imaginal completion. The properties of organ discs and ring glands from larvae of different ages were studied. The reaction is controlled by two variables, hormone concn. and organ responsiveness. The ring gland hormone appears to act indirectly through unidentified factors in the host.

G. P. W.

Oval blood cells in human subjects tested for linkage with taste for phenylthiocarbamide, mid-digital hair, hair colour, A-B agglutinogens, and sex.—See A., 1944, III, 321.

Spermatogenesis and fertility in *Mus musculus* as affected by factors at the locus. V. Bryson (*J. Morph.*, 1944, 74, 131—187).—Testes of animals of different genotypes formed by combination of $+$, T , t^o , and t' were examined 5—35 days after birth. Two types of cell are present at 5 days (spermatogonia and r -cells) and all others are derived from them; times of appearance of different cell types are tabulated. Five types of degeneration occur in the testes of all genotypes; some t^o/t' males (prospectively sterile) showed an excessive amount of degeneration but the genetically induced change was variable. In adults the frequency with which different morphological types of abnormal spermatozoa are produced may be correlated with genetic or environmental sterility; t^o/t' males can thus be identified. The abnormal ratios transmitted by males heterozygous for t^o or t' cannot be explained by extra spermatid divisions, differential sperm motility, differential fertilisation, viability, twinning, mutation, or somatic segregation. It is suggested that t^o or t' has a dominant effect on the transformation of spermatids into spermatozoa; defined as partial fertility, this effect is selective, resulting in fewer normal sperm of normal genotype being produced. If t^o and t' are both present there is a summation of effect producing complete sterility. The action of t^o and t' is not local but a general somatic effect is produced which includes the process of spermatogenesis.

H. L. H. G.

Chromosomal aberrations, lethal mutations, and X-ray dosage. N. P. Dubinin, V. V. Chvostova, and V. V. Mansurova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 413—416).—A study of the effects of six different dosages of X-rays (250, 500, 1000, 2000, 4000, and 6000 r.) on the frequency of chromosomal aberrations and on sex-linked lethal mutations in *Drosophila melanogaster*. A linear relation was found between frequency of lethal mutations and dosage but the chromosomal mutations showed departures from direct proportionality to X-ray dosage. The results are discussed in relation to those of other workers.

J. D. B.

Invalidation of cytological evidence for reciprocal chiasmata in sex chromosome bivalent of male *Drosophila*. K. W. Cooper (*Proc. Nat. Acad. Sci.*, 1944, 30, 50—54).—A criticism of Darlington's view that, in meiosis, the sex chromosomes conjoin solely by chiasmata. It is suggested that the problems of bivalent formation and modes of conjunction require reanalysis as the chiasma hypothesis of metaphase pairing is incapable of generalising all of the known facts.

J. D. B.

Law of expansion and extinction of genic action. J. A. Rapoport (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 393—396).—Results are described of crossing *Drosophila Met* (dominant mutation which results in transformation of wing into mesonotum) with a no. of other varieties (80—6000 individuals per combination). The experiments are believed to show that complexes and systems of mutations exist the nos. of which are functionally and causally connected with one another. Unlike the system of genes within a chromosome, these genetic systems affect whole parts or organs which constitute the object of classical morphology and physiology. The theoretical implications of this interpretation are discussed in relation to Goldschmidt's conception of macro-evolution.

J. D. B.

Nature of changes caused by structural chromosome mutations. B. N. Sidorov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 390—392).—Analysis of *Drosophila* material from the point of view of position effect of gene for cubitus interruptus. It is concluded that the phenomenon of position effect is much more frequent than is generally supposed. An experiment is described which is interpreted as

demonstrating the difference between changes of the normal allelomorph of the *c.i.* gene caused by position effect and the point mutation of this locus. J. D. B.

Genetics of species development in old world cottons. R. A. Silow (*J. Genet.*, 1944, 46, 62—77). W. F. H.

Cytological studies in Cucurbitaceæ and their evolutionary significance. A. Afify (*J. Genet.*, 1944, 46, 116—124).—The cytology of three genera of the Cucurbitaceæ found in Egypt is described. The chromosome complements of all of them are similar in every respect. Meiosis is described in two species. Possible evolutionary changes in the family are discussed. W. F. H.

III.—PHYSICAL ANTHROPOLOGY.

Fissural pattern in brain of negroes and whites. Occipital lobe. C. J. Connolly (*Amer. J. phys. Anthropol.*, 1943, [ii], 1, 363—403).—Opercularisation of the posterior lip of the lunate sulcus is considerable in some cases. A transulate gyrus frequently divides this sulcus. The lateral calcarine is a distinct sulcus from that separated off from the retrocalcarine by the emergence of the posterior cuneo-lingual gyrus. The basal aspect of the occipital lobe showed variation in detail and is more fissured in whites than in negroes. The series of negroes and whites is divided into 5 groups according to the form of the lunate and the degree of extension of the operculum, its separation into 2 parts, its dissolving into fragments, or finally its being non-identifiable. No particular morphological feature was found to be characteristic of the negro brain as distinguished from the white. W. F. H.

Physical development of negroes. III. Cephalic index. N. Michelson (*Amer. J. phys. Anthropol.*, 1943, [ii], 1, 417—424; cf. A., 1943, III, 860; 1944, III, 159).—A decrease in the cephalic index occurs from birth to adult age. The higher index observed in females as compared with males is approx. the same as for whites. For the general population of the American negro the head was found to be stable. W. F. H.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Senile changes in pancreas of rats and of man with special regard to similarity of locale and cavity formation. W. Andrew (*Amer. J. Anat.*, 1944, 74, 97—127).—The first indication of a senile process is a proliferation of cells of inter- and intra-lobular ducts. Lumen formation and expansion follow. Expansion of ducts induces flattening of epithelium and produces locales some of which contain a material resembling keratin. Large, irregular cavities form as a result of rupture of locales into each other. Alveolar cells lose their basophilic material, their nuclei hypertrophy or atrophy, and nucleoli increase in no. or hypertrophy. Atrophy of the islets of Langerhans is always secondary to cavity formation. Adipose tissue invasion occurs as a replacement phenomenon. W. F. H.

Effects of hypotonic solutions on living thyroid gland. J. C. Plagge (*Anat. Rec.*, 1943, 87, 345—353).—The thyroid of the living salamander exhibits striking changes in its cytology following exposure to hypotonic Ringer solutions. Hypotonic solutions increase the sensitivity of the gland to mechanical injury. In 30% Ringer solution the gland cells show increased permeability, swelling, and excessive Brownian movement of cytoplasmic granules. If 100% Ringer solution is employed and then replaced by a hypotonic solution the cells remain unaffected. Both factors—a hypotonic medium and the mechanical effect of the operation—must operate simultaneously to induce the cellular changes. W. F. H.

Number and distribution of macrophages and fibroblasts in kidneys of albino rats. H. Kirkman (*Amer. J. Anat.*, 1943, 73, 451—482).—The average no. and relative distribution of macrophages and fibroblasts per sq. mm. of median sagittal section through basalis, intermedia, and cortex is given. Comparison between 18-month- and 26-day-old animals is made. In terms of nephron differentiation the greatest concn. of these cells was found at the level of that portion of the thick ascending limb in the intermediate zone of the medulla. W. F. H.

Corpus luteum in *Rhinobatus granulosus*. M. Samuel (*Proc. Indian Acad. Sci.*, 1943, 18, B, 133—157).—A detailed description of the histology and development of the corpus luteum in this elasmobranch. The luteal cells are shown to arise by the hypertrophy of the cells of both follicular epithelium and theca interna. There are close resemblances between the formation of the corpus luteum in elasmobranchs and in mammals. J. D. B.

Nuclear reorganisation in ciliate. F. R. Evans (*J. Morph.*, 1944, 74, 101—130).—The behaviour of the macro- and micro-nuclei in binary fission and in protective cyst formation is described in *Woodruffia metabolica*. No visible mass of chromatin is eliminated at any stage of the life cycle though evidence suggests that during encystment a chromatin-like substance may diffuse from the macro-

nucleus into the cytoplasm. During fission the 2 chromatin bands of the macronucleus form 4 chromatin bodies, one half of each band going to a daughter macronucleus; the micronucleus has 4 chromosomes. During cyst formation the identity of the chromatin bands tends to be lost; if division is prevented and successive encystment and excystment allowed the disorganisation of the bands increases: one division only is required for complete reorganisation. Diet deficiency does not induce any nuclear reorganisation. H. L. H. G.

Action of amines on cells cultured *in vitro*. H. Lettré and M. Albrecht (*Z. physiol. Chem.*, 1943, 279, 206—208; cf. A., 1944, III, 92).—NH₃ and the stronger org. bases or their salts cause vacuole formation in tissue cultures of fowl heart fibroblasts. Weak bases, amphoteric substances, and quaternary NH₄ compounds do not show the effect. J. H. B.

Storage of trypan-blue in internal ear of rat. B. Spector (*Anat. Rec.*, 1944, 88, 83—89).—The dye was found in the histiocytes lining the periotic spaces, the basilar membrane, and the tympanic membrane. Storage of blue granules was also observed in histiocytes about the stapes, modiolus, the semicircular ducts, and the nerve fibres. W. F. H.

Intra-vitam staining and toxicity of chlorazol-fast-pink in mice and rats. W. L. Williams and H. C. Hodge (*Anat. Rec.*, 1943, 87, 181—209).—Morphologically normal cells showed cytoplasmic storage of the dye in granular form, adhesion of dye granules at the external surface of macrophages, and cytoplasmic suffusion of the dye. Lining cells of the renal proximal convoluted tubules contained dye in granular form. In adipose tissue, dye was stored in the peripheral cytoplasmic ring of larger fat cells and in the cytoplasm proper of smaller fat cells. No difference in toxicity was observed between purified and unpurified samples of the dye. Lethal doses caused petechial hæmorrhages in the intestinal mucosa and meninges. The proximal convoluted tubules of the kidneys showed the greatest degree of damage. The dye was excreted by the kidneys and in the bile. Injections of the dye inhibited *in vitro* coagulation of blood and extended the bleeding time. W. F. H.

V.—BLOOD AND LYMPH.

Blood volume of normal animals. F. C. Courtice (*J. Physiol.*, 1943, 102, 290—305).—60 rabbits, 29 dogs, 30 goats, and 2 horses were used, giving respectively 50, 54, 53, and 51 c.c. per kg. of plasma and 70, 79, 70, and 72 c.c. per kg. of whole blood. 4 greyhounds in training had a higher cell and therefore blood vol. The estimation was based on the intravenous administration of an indiffusible blue dye, T-1824, and the subsequent determination of its plasma concn. by a photoelectric colorimeter. The rate of disappearance of dye and the amount (negligible) re-entering circulation by the thoracic duct were controlled. Blood vol. is proportional to body wt., and not to surface area. Variations from day to day and animal to animal (of the same species) were of the order of 10%. The method is also reliable in certain conditions of abnormal capillary permeability. W. H. N.

Study of effects of vitamin-D on capillary permeability by the use of the dye T-1824.—See A., 1944, III, 397.

Stromatin. R. Ballentine (*J. Cell. Comp. Physiol.*, 1944, 23, 21—26).—Analysis shows that stromatin from various animals contains 3-6% of glycine and 10—11% of leucine, thus differing widely from collagen. Since it contains less than 0-8% of S it cannot be a keratin, and forms a separate protein group. (Cf. Jorpes, *Physiol. Abs.*, 1933, 18, 98.) V. J. W.

So-called "azurophilic granulation" of proerythroblasts. E. M. Schleicher (*Anat. Rec.*, 1943, 87, 355—363).—Granulation in the cytoplasm of proerythroblasts is regarded as pptd. amphoteric colloidal protein. Demonstration of the protein depends on the time allowed for a smear or bone marrow imprint to "air-dry." The granules are derived from a colloidal system different from the azure granules of the myeloblast. Azurophilic granulation has no cytogenetic significance other than that the cells have reached a certain physico-chemical phase in their development. W. F. H.

Osmotic behaviour of crenated erythrocytes. E. Ponder (*J. Gen. Physiol.*, 1944, 27, 273—285).—The anomalously small swelling that erythrocytes of human oxalated blood undergo in hypotonic plasma depends on the extent to which the cells are crenated. Such cells swell as if they are elastic bodies with a bulk modulus of the same order as that for gelatin gels. Reasons are given for regarding a crenation as corresponding to gelation. A very stable form of gelation is observed when rat erythrocytes are suspended in 3% Ng citrate, the resulting cells being extremely resistant to hæmolysis by water. Rabbit erythrocytes resemble those of man rather than those of the rat. J. N. A.

Giant orthochromatic erythroblasts. E. M. Schleicher (*J. Lab. clin. Med.*, 1944, 29, 127—133).—2 cases are reported which showed in the aspirated bone marrow numerous giant orthochromatic

erythroblasts. These are not diagnostic of any sp. disease. Their morphology is described and illustrated. C. J. C. B.

Incidence of hæmolytic disease of fœtus (erythroblastosis fœtal) in different families. K. E. Boorman, B. E. Dodd, and P. L. Mollison (*J. Obstet. Gynaec.*, 1944, 51, 1—23).—Of 100 mothers whose infants had hæmolytic disease of the fœtus 97 were *Rh*-negative; of these 97 women 93 had anti-*Rh* agglutinins in their serum. 79 of the affected infants and 45 of their fathers were tested and all were *Rh*-positive. The sera of the 3 *Rh*-positive mothers contained immune agglutinins incompatible with the fœtal erythrocytes: anti-*Rh*₂ agglutinins in 1 case and anti-*B* agglutinins in the other 2 cases. Serological examination of the mothers in 70 cases of stillbirth or neonatal death established hæmolytic disease of the fœtus as the cause of death in at least 11 cases. In 60 mothers of normal infants or of infants with "physiological jaundice" 3 had anti-*Rh* agglutinins in their serum associated with *Rh*-positive sera in the infants; one of the infants may have had slight hæmolytic disease but the blood picture in the other 2 infants was normal. In the remaining 57 cases incompatibility between mother and infant in respect of anti-*A* or anti-*B* agglutinins was not related to the incidence of "physiological jaundice." P. C. W.

An irregular agglutinin and erythroblastosis fœtal. B. C. McIvor and S. P. Lucia (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 99—100).—A woman of type *A*, *B**N**R**h*⁺ and a man of type *O**N**R**h*⁺ had a child which died on the 2nd day of erythroblastosis. The mother had received a transfusion of unknown blood 2 years before. Her blood contained an agglutinin of high titre against both *Rh*⁺ and *Rh*⁻ cells and not identifiable by the *A*, *B*, *O*, *M*, *N*, *P*, or *Rh* agglutinogens. V. J. W.

Erythroblastosis fœtal and *Rh* factor. A. S. Rubnitz (*Nebraska Sta. Med. J.*, 1943, 28, 372—375).—Report of a fatal case with post-mortem findings. E. M. J.

Distribution and heredity of variants of the *Rh* type. A. S. Wiener (*Science*, 1943, 98, 182—184; cf. A., 1944, III, 322).—Blood samples from 280 white individuals in New York City were tested with a special anti-rhesus serum (anti-*Rh*₂) from the mother of an erythroblastotic infant. From the results, the main types *Rh*₁ and *Rh*₂ (as identified by reaction with human anti-*Rh*₁ and anti-*Rh*₂) are further subdivided into *Rh*₁*Rh*₂, reacting positive with anti-*Rh*₂ serum, *Rh*₁, proper reacting negative with anti-*Rh*₂ serum, *Rh*₂, reacting positive with anti-*Rh*₂ serum, and *Rh* reacting negative with anti-*Rh*₂ serum. The hypothesis that the agglutinogens detected by anti-*Rh*₁ and anti-*Rh*₂ sera are determined by genes allelic to *rh* is tested by calculating the frequencies of the genes *rh*, *Rh*₁, and *Rh*₂ from the distribution of the main sub-types. It is found that *rh* + *Rh*₁ + *Rh*₂ = 95.5; the discrepancy (from 100) may arise from experimental difficulties in making tests, or from the small nos. The existence of variants of *Rh* is of considerable importance in transfusions. E. R. R.

Rôle of subtypes of *Rh* in hæmolytic transfusion reactions and in erythroblastosis. A. S. Wiener (*Amer. J. Clin. Path.*, 1944, 14, 52—59).—An instance of icterus gravis in an *Rh*-positive infant with *Rh*-positive parents was explained by the demonstration of anti-*Rh* isoantibodies in the maternal serum; the mother belonged to subtype *Rh*₁, father and infant to subtype *Rh*₁*Rh*₂. Despite the apparently minor difference in the reactions of the bloods of mother and infant and the weakness of the anti-*Rh* isoantibodies in the maternal serum, the disease in the infant was fulminating. Recovery ensued following transfusions of the mother's washed blood cells suspended in the father's plasma. In hæmolytic disease of the newborn, the mother's washed cells are always suitable for transfusion therapy, and *Rh*-negative blood is almost always suitable, even though mother and infant are both *Rh*-positive, excluding cases where isoantibodies of specificity different from anti-*Rh* are demonstrable in the maternal serum. Similarly, in patients having unexplained hæmolytic reactions to repeated transfusions, it is worth while to try a transfusion or biological tests with *Rh*-negative blood even though the patient is *Rh*-positive. In general, in such problem cases, the use of *Rh*-negative donors is comparable to the use of group *O* individuals as universal donors in ordinary transfusions. The existence of subtypes of *Rh* in human blood accounts for the difference in specificities among human anti-*Rh* sera, in contrast to the uniformity of the animal immune anti-rhesus serum. The specificity of the maternal serum in cases of erythroblastosis can be predicted from tests for the subtypes of *Rh* on the infant and/or father. A case of hæmolytic disease of the newborn is described in which the hæmolysis was caused principally by *Rh* isoantibodies acquired by the infant through ingestion of the maternal milk. C. J. C. B.

Erythroblastosis fœtal. S. A. Wolfe and I. Neigus (*Amer. J. Obstet. Gynec.*, 1940, 40, 31—47).—27 cases are reported and discussed. P. C. W.

Red cell transfusion in treatment of anæmia. H. L. Alt, S. G. Taylor, D. L. Custis, and F. D. Bernard (*Surg. Gynec. Obstet.*, 1944, 78, 191—194; cf. A., 1944, III, 166).—227 red cell transfusions have been given to 100 patients with different forms of anæmia. The

erythrocyte count and hæmoglobin level were improved as much as with whole blood transfusions but the incidence of reactions was lower. P. C. W.

Effect of trauma on release of histamine from blood cells *in vitro*. G. Ungar (*J. Physiol.*, 1943, 102, 19p).—Histamine is released *in vitro* from the blood of normal guinea-pigs when mixed with peptone. The amount is reduced (a) in the refractory phase following the injection of peptone and (b) after trauma administered under ether anaesthesia. A normal rate of release returns with healing. Hæmorrhage without tissue injury has no effect on histamine release. W. H. N.

Uptake of lead by blood cells measured with radioactive isotope. R. A. Mortensen and K. E. Kellogg (*J. Cell. Comp. Physiol.*, 1944, 23, 11—20).—Pb acetate containing Ra-D was given orally to guinea-pigs and intravenously to dogs. With blood concns. up to 1 mg.-%, 90% of the Pb was found in the cells after 1 min., and 97—99% after 10—15 min. At greater concns. the cells may be saturated, and, at the max. dose, may contain only 35% of the Pb present. From the sp. reaction rate *in vitro* at 20° it is calc. that at 38° 50% of the Pb is taken up by the cells in 0.17 min. and 85% in 0.5 min. V. J. W.

Diagnostic physico-chemical blood tests in sickle-cell anæmia. T. Winsor and G. E. Burch (*Amer. J. med. Sci.*, 1944, 207, 152—159).—The marked retarding of the sedimentation rate of the erythrocytes of patients with sickle-cell anæmia by CO₂ and the marked acceleration by O₂ were used as a basis for a simple rapid macroscopic test which is 98% reliable for active sickle-cell anæmia. The method is as follows. Venous stasis is produced in the arm for 6 min., 5 c.c. of blood are drawn from a vein and placed in a small vial containing an anticoagulant, stoppered, and rotated gently in order to avoid mixing the blood with air. A sample of the blood is set up for a sedimentation measurement immediately. The remainder of the blood is rotated in air in a small beaker, to saturate it thoroughly. A sedimentation rate is then determined on this aerated blood. Within 15—60 min. the diagnostic parameter (Δ_2) should be greater than 20 mm. per hr. if the patient has sickle-cell anæmia. As soon as this parameter is reached, it is not necessary to continue the sedimentation rate to a full hr. C. J. C. B.

Elliptocytosis. M. K. Helz and M. L. Menten (*J. Lab. clin. Med.*, 1944, 29, 185—187).—Report of 2 cases. C. J. C. B.

Vitamin-B and phenothiazine anæmia in dogs. H. B. Collier and G. E. Mack, jun. (*Canad. J. Res.*, 1944, 22, E, 1—11).—Phenothiazine (5 g. per kg. daily) caused a hæmolytic anæmia in 3 dogs. In one a diet deficient in vitamin-B intensified the anæmia and jaundice. Addition of -B complex to normal diets did not prevent the anæmia, but suppressed Heinz body formation and stimulated reticulocytosis. -B complex is necessary for erythropoiesis, but has no direct effect on the anæmia. One animal died after 4 courses of the drug totalling 340 g.; the liver revealed portal cirrhosis. C. J. C. B.

Definition of the National Physical Laboratory Haldane hæmoglobin standard. C. G. Douglas, E. M. Jope, H. M. Jope, R. G. Macfarlane, and J. R. P. O'Brien (*J. Physiol.*, 1943, 102, 15p).—49 blood samples from normal adults were compared by Haldane's colorimetric method, and 6 by the N.P.L. visual colorimeter, with the N.P.L. hæmoglobin standard. Calculating from the former group, blood containing 100% hæmoglobin has the following mean vals.: O₂ 19.88 c.c.-%; Fe 49.83 mg.-%; 5.17 red cells per cu. mm., 44.3% by vol.; spectrographic extinction coeff., oxyhæmoglobin, $E_{1\text{cm.}}^{1:1000}$ ($\lambda = 414 \text{ m}\mu$) 1.200. Calculating from the latter group, blood containing 100% hæmoglobin has the following mean vals.: O₂ 19.67 c.c.-%; Fe 48.20 mg.-%; oxyhæmoglobin, $E_{1\text{cm.}}^{1:1000}$ ($\lambda = 414 \text{ m}\mu$) 1.180; carboxyhæmoglobin, $E_{1\text{cm.}}^{1:100}$ ($\lambda = 540 \text{ m}\mu$) 1.271. W. H. N.

Hæmoglobin equivalent of N.P.L. Haldane standard. E. J. King, M. Gilchrist, and A. Matheson (*J. Physiol.*, 1943, 102, 21—22p).—The colour of the National Physical Laboratory Haldane standard is equal to that given by blood of 19.8 ml. O₂ capacity (14.8 g. of hæmoglobin) per 100 c.c., not to that given by blood of 18.5 ml. O₂ capacity per 100 c.c. as it is stated to be. W. H. N.

Phytic acid and iron absorption.—See A., 1944, III, 346.

Platelet count and coagulation time of plasma and whole blood following operation. W. J. Potts and E. Pearl (*Surg. Gynec. Obstet.*, 1941, 73, 492—494).—There is a 6% drop in platelet count 1—3 days after operation, with a recovery and rise to 9% above normal 10 days after operation. There is no change in coagulation time of serum or whole blood. P. C. W.

Effects of caecectomy, succinylsulphathiazole, and *p*-aminobenzoic acid on vitamin-K synthesis in the intestinal tract of rats [low plasma-prothrombin].—See A., 1944, III, 425.

Intravenous use of synthetic vitamin-K. A. M. Seligman, A. Hurwitz, H. A. Frank, and W. A. Davis (*Surg. Gynec. Obstet.*, 1941, 73, 686—701).—10 mg. of vitamin-K₁ given intravenously as a colloidal suspension in glucose solution produce a rapid and prolonged

effect in case of obstructive jaundice and biliary fistula; single doses of 0.25 mg. rapidly cured cases of hæmorrhagic disease of the newborn, as did 5 mg. of the Na salt of a sulphuric ester of 2-methyl-1:4-naphthaquinol. 2-Methyl-1:4-naphthaquinone is also effective when given intravenously in colloidal solutions. A water-sol. sulphuric ester of 2-methyl-1:4-naphthaquinol in doses of 10–20 mg. causes a drop in prothrombin time, but was not as effective as the quinones. Prothrombin deficiency in liver failure did not respond to -K. P. C. W.

Intrauterine onset of hæmorrhagic disease of newborn. C. T. Javert (*Amer. J. Obstet. Gynec.*, 1940, 40, 453–456).—In 3 cases of hæmorrhagic disease of the newborn the condition developed in utero as shown by bloody amniotic fluid in two cases and retroplacental hæmatomas in the 3rd. The prothrombin concn. in the last case was 13% of normal. P. C. W.

Effect of vitamin-K administered in labour. J. E. Fitzgerald and A. Webster (*Amer. J. Obstet. Gynec.*, 1940, 40, 413–420).—Prothrombin level was unaffected by labour in 25 normal cases. There was a rise in prothrombin level in 50 mothers given 4000 Almqvist units of vitamin-K by mouth and in 19 mothers given 2-methyl-1:4-naphthaquinone (2 mg.) intravenously during labour; the prothrombin level of the cord blood was also raised by these procedures. Administration of Na pentobarbital as an analgesic caused a depression of prothrombin level which could be prevented by simultaneous administration of -K. P. C. W.

Heparin and dicumarol. D. B. Pfeiffer and F. D. Sain (*Int. Abst. Surg.*, 1944, Feb., 109–119).—A review. P. C. W.

Nervous regulation of clotting mechanism. G. de Takáts (*Arch. Surg.*, Chicago, 1944, 48, 105–108).—The clotting mechanism of patients, as tested by their response to heparin, is under neurogenic influence. Adrenergic stimuli increase, cholinergic stimuli decrease, the tendency to thrombosis. Fear, nervous strain, and hæmorrhage increase, and prostigmine by its cholinergic action lessens, the tendency to thrombosis. F. S.

Effect of stirring on blood-clotting. E. Wöhlisch (*Biochem. Z.*, 1941, 309, 238–245).—The greatly reduced thrombin content of serum as a result of mechanical agitation depends, not on increased metathrombin formation as is the case with static clotting, but on increased thrombin fixation by the resulting fibrin, which is appreciably raised by increased temp. Shaking somewhat reduces the clotting activity of fresh serum and thrombin solutions. P. G. M.

Magnesium-calcium antagonism in blood clotting. G. D. Greville and H. Lehmann (*J. Physiol.*, 1943, 102, 14–15p).—Mg⁺⁺ inhibits clotting by competing with Ca⁺⁺, the function of which presumably involves the formation of one stage of a complex with thrombokinase and prothrombin. A final concn. of 0.045M-MgCl₂ is effective and does not damage human red cells. W. H. N.

Coagulant substances of cells. F. Widenbauer and C. Reichel (*Biochem. Z.*, 1941, 309, 100–107).—The fraction of the kephalin of human and rabbit brain that is sol. in alcohol and consists chiefly of lipid material has great coagulating power *in vitro* and *in vivo* (healthy and hæmophilic blood), whilst the insol. fraction is inactive. The active material spontaneously loses its activity, becoming finally anti-coagulant. Protein-like substances extracted by water from human and rabbit organs (*e.g.*, heart, lung, thyroid gland) also have great coagulating power even when freed from lipin. The activity of these extracts is lost on denaturation. All the active materials are stable towards heat. W. McC.

Plasma clot tensile strength. Effect of physical factors, anti-coagulants, and coagulants. A. Shapiro, I. M. Tarlov, R. Oliver, A. I. Goldfarb, S. Bojar, R. Kaslow, and M. Rockenmacher (*J. Lab. Clin. Med.*, 1944, 29, 283–295).—The mean tensile strength of plasma clots is proportional to the cross-sectional area of the tubes in which they are formed; it is lower when formed at 10–20° than at 37°. Plasma clots incubated aseptically at 37° weaken during a test period of 8 days. Clots prepared from unmodified plasma diluted with saline solution are weakened in proportion to the amount of dilution. Clots prepared from unmodified plasma to which muscle and lung extract are added coagulate more rapidly than controls, but are weakened by more than the dilution factor. Lung extract reduces the tensile strength more than muscle extract. Clots prepared by recalcifying plasma obtained from citrated blood are weakened to an extent proportional to the dilution of the plasma. Clots prepared by adding suitable amounts of the citrate and CaCl₂ in dry form to unmodified plasma are unimpaired. Plasma to which oxalate and CaCl₂ were added in dry form yields weakened clots. Clots prepared by adding rabbit "globulin" to the plasma obtained from heparinised blood are weakened. Clots prepared by adding protamine sulphate solution to the plasma obtained from heparinised blood are not weakened. C. J. C. B.

Prothrombin in disorders of the blood. E. A. Sharp, J. G. Wolter, and E. C. von der Heide (*Amer. J. Clin. Path.*, 1944, 14, 44–51).—Prothrombin concn., bleeding and coagulation time of skin blood for the following blood disorders are detailed, viz.: 82 severely relapsed

pernicious anæmias, 61 miscellaneous anæmias, 28 purpuras, 20 leukæmias, 14 lymphoblastomas, 10 erythræmias, and 6 hæmophilias. Details are set out. C. J. C. B.

Use of dried plasma obtained from fresh cadaver blood. L. A. Erf (*Amer. J. med. Sci.*, 1944, 207, 314–316).—The collection, prep., and administration of dried plasma from cadaver blood is described and a practical procedure is recommended for use during the present war-time emergency. C. J. C. B.

Preservation of placental blood. J. Scudder, C. R. Drew, and V. G. Danton (*Amer. J. Obstet. Gynec.*, 1940, 40, 461–463).—The cell vol. of placental blood is 50% higher than that of the mother and 22% higher than that in the blood of normal men. The concn. of total proteins is subnormal. There is an increased concn. of plasma-K, though the rate of diffusion of K from the placental blood cells is normal. 0.35% Na citrate solution is a more efficient preservative than Moscow I.H.T. solution. P. C. W.

Inactivation of group-specific isoagglutinins [of plasma and of ascitic fluid]. H. A. Davis (*Surgery*, 1941, 10, 592–603).—When equal vols of group A and group B plasma are incubated at 37° for 10–60 min., the isoagglutinins of both plasmas are inactivated. Similarly A plasma and O ascitic fluid (1:1, v/v) mixed with an equal vol. of B plasma and O ascitic fluid (1:1, v/v), both previously incubated at 37° for 10–60 min., lose their agglutinating activity. Bled dogs tolerated well the transfusion of large vols. of human group O ascitic fluid. 2 out of 6 human patients after transfusion of 200–400 ml. of incompatible group O ascitic fluid developed a brief rigor. G. P.

Cold hæmagglutination. D. Stats and L. R. Wasserman (*Medicine*, 1943, 22, 363–424).—A review. E. M. J.

Development of blood transfusion technique since 1907. R. Lewisohn (*J. Mt. Sinai Hosp.*, 1944, 10, 605–622).—A review. E. M. J.

Protein of low density prepared from human serum. G. S. Adair and M. E. Adair (*J. Physiol.*, 1943, 102, 17p).—Euglobulin having been pptd. by 33% and pseudoglobulin by 50% saturation with (NH₄)₂SO₄, a small ppt. of unusually low density formed when the (NH₄)₂SO₄ saturation of human serum was raised to 60%. A purified fraction of this ppt. appears (by cataphoresis) to be homogeneous and to contain N 6.44, org. P 0.67, phospholipin 8.5, cholesterol 16.5, fatty acids 20.4%. The mol. wt. (by osmotic pressure) was 370,000. Serological tests differentiate between this protein and both serum-albumin and total serum-globulin. W. H. N.

Enzymic cleaning of Berkefeld candles used in filtration of human blood plasma. B. Witlin (*Science*, 1943, 98, 160).—The candles are incubated in 0.5% pepsin solution in 1% HCl, rinsed with water, dried, and sterilised. E. R. R.

Effect of fasting on blood-lipins of mice. P. L. MacLachlan (*J. Biol. Chem.*, 1944, 152, 391–394; cf. A., 1942, III, 371).—Acetone-sol. lipins and total lipins of the blood of fasting mice showed significant increases, but changes in phospholipin level depended on the pre-fasting level. Absence of changes from the normal in amount and degree of unsaturation of blood-lipins confirmed the non-selective utilisation of fat during fasting. G. D.

Effect of drying from frozen state on physico-chemical properties of citrated human plasma. L. E. Krejci (*J. Franklin Inst.*, 1942, 234, 596–604).—The reconstituted plasma was turbid and the photographic record of the electrophoretic pattern was thus incomplete. The turbidity coincided with the leading portion of the globulin boundary; it obscured all boundaries in advance of it in the cathode (descending) arm of the U-tube and all boundaries which followed it in the anode arm. The appearance of the descending globulin boundary was changed; the sharp peak adjacent to the fibrinogen boundary was reduced in height and sharpness. In all other details the plasma pattern appeared to be the same as before drying. The complete absence of turbidity from lipin-impooverished plasma after freezing to low temp. suggests that the cloudiness usually observed after this treatment is caused by lipins liberated from the lipin-protein complex by removal of liquid water. When water is added to dried plasma the temp. rises so that some of the more permanent turbidity of lyophile plasma may be the result of slight protein denaturation or to lipin-protein interaction due to this cause. C. J. C. B.

Genetic and certain non-genetic factors with reference to leukæmia in F strain mice. A. Kirschbaum (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 147–149).—In hybrids between F and normal strains, incidence of leukæmia was the same as in pure F but onset was later. Life expectancy was greater in these hybrids than in crosses between them and pure F. There were no sex differences and no evidence for a "milk influence." V. J. W.

Preparation and preservation of plasma. L. H. Sophian (*Amer. J. Clin. Path. Tech. Sect.*, 1943, 7, 116–122).—The methods used in the U.S. Marine Hospital, Staten Island, are outlined. C. J. C. B.

Total osmotic activity of human plasma or serum. N. Lifson (*J. Biol. Chem.*, 1944, 152, 659–663).—The total osmotic activity of

the plasma and serum of healthy white males was measured by the thermoelectric vapour tension method of Hill and Baldes (A., 1934, 986). Plasma and serum were found to be equiv., with a normal mean of 155.5 m-equiv. of NaCl per kg. of water. Variations per day were less than 2.0 m-equiv. and from day to day ranged from 1.6 to 5.2 m-equiv. Deprivation of food and water for 24 hr. produced no significant change, whilst fasting for 48 hr. led to a rise of 2.5 m-equiv. J. F. M.

Production and treatment of granulocytopenia and anaemia in rats fed sulphonamides in purified diets. A. Kornberg, F. S. Daft, and W. H. Sebrell (*Science*, 1943, 98, 20—22).—Two purified diets, both supplemented with thiamin hydrochloride, riboflavin, pyridoxine hydrochloride, Ca pantothenate, niacin, and choline, and 1% of sulphathiazole, sulphadiazine, or sulphanilamide, were fed to rats weaned at 21—27 days. Blood counts indicated that blood dyscrasia (severe granulocytopenia or severe anaemia or both) developed in all groups, but less markedly in the sulphanilamide group. The condition was corr. by oral treatment with solubilised liver, and also certain liver extracts and brewer's yeast, in spite of continued ingestion of the sulphonamide diet. E. R. R.

Osteosclerosis, myelofibrosis, and leukaemia. J. Churg and M. Wachstein (*Amer. J. Med. Sci.*, 1944, 207, 141—152).—Among 97 cases of leukaemia, 6 showed a varying degree of myelofibrosis without osteosclerosis. Four of these cases were of the chronic myeloid type and were treated with Roentgen rays; the other 2 were diagnosed as subacute myeloid leukaemia and did not receive any ray therapy. Myelofibrosis, not associated with osteosclerosis, is not uncommon in the leukaemias. A case of osteosclerosis and leukaemoid blood picture is described and interpreted as an instance of non-leukaemic myelosis. A review of the literature showed that osteosclerosis is often associated with non-leukaemic myelosis and only very rarely, if at all, with true leukaemia. C. J. C. B.

Higher centres [insulin] and blood-sugar curve. C. Reid (*J. Physiol.*, 1943, 102, 20r).—The blood-sugar response of a trained bitch to sugar by stomach tube was established. Sniffing and tasting of meat reduced the response (observations with and without olfactory and gustatory stimulation alternated). Secretion of insulin as a result of stimulus to the corresponding higher centres is postulated. W. H. N.

VI.—VASCULAR SYSTEM.

Infusion of blood and other fluids into general circulation via bone marrow. L. M. Tocantins and J. F. O'Neill (*Surg. Gynec. Obstet.*, 1941, 73, 281—287; cf. A., 1942, III, 663).—In patients where intravenous injection is impossible for any reason, blood or other fluids may be infused via the bone marrow in the sternum, tibia, or femur. 40 patients have been so treated (33 adults and 7 infants) without ill effects. 50—2000 ml. have been infused by gravity at rates of 0.4—25 ml. per min. P. C. W.

Responses in size, output, and efficiency of human heart to acute alteration in composition of inspired air.—See A., 1944, III, 398.

Recording of right heart pressures in man. A. Cournaud, H. D. Lauson, R. A. Bloomfield, E. S. Breed, and E. de F. Baldwin (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 34—36).—A catheter is passed into the right heart (A., 1941, III, 650) and auricular or ventricular pressure recorded by manometer, simultaneously with e.c.g. and pulse, in normal and pathological conditions. V. J. W.

Compression of heart produced experimentally. A. Yodice (*Surg. Gynec. Obstet.*, 1941, 73, 277—280).—Chronic compression of the heart was produced by the injection of Dakin's solution into the pericardium of dogs. Ascites appeared when the venous pressure exceeded 15 cm. H₂O. The pressure in the lymphatics is increased but not the lymph flow. Removal of the ascitic fluid lowers the venous pressure and if the lowering is excessive the dog dies. Venous pressure may be further increased by distension of the lungs. Removal of the compression scar cures the condition. P. C. W.

Method for recording and reproducing foetal heart sounds. A. L. Smith and W. J. Hervert (*Amer. J. Obstet. Gynec.*, 1940, 40, 102—110; cf. A., 1942, III, 201).—The heart sounds were reproduced and recorded by stethograph and cardiophonograph. The recordings were made with fetuses aged 6 months to term; only 6 out of 58 attempts were unsuccessful. In 49 cases the diastole was of greater duration than the systole: diastole 0.17—0.53 sec., systole 0.16—0.23 sec. The heart rates varied from 92 to 163 per min. without apparent diagnostic significance. The intensity of the second sound was the greater in most cases. P. C. W.

Normal variations in foetal heart rate during pregnancy. L. W. Sontag and H. Newbery (*Amer. J. Obstet. Gynec.*, 1940, 40, 449—452).—18,517 records were made on 63 fetuses during the last 5 months of pregnancy. Rates above 160 per min. were common; rates below 120 per min. were rare. No rates below 100 per min. were recorded. P. C. W.

Tonus and venopressor mechanism [and mode of death]. Y. Henderson (*Medicine*, 1943, 22, 223—249).—A review. E. M. J.

Chronic pericardial disease. A. Blalock and C. S. Burwell (*Surg. Gynec. Obstet.*, 1941, 73, 433—461).—Diagnosis and treatment are described in 28 cases. Chief findings are distension of the veins, high venous pressure, engorged liver, ascites, and oedema of the extremities. P. C. W.

[Prognosis of] electrical [pulsus] alternans. H. H. Kalter and A. Grishman (*J. Mt. Sinai Hosp.*, 1943, 10, 459—470).—Report of 16 cases. E. M. J.

Electrocardiographic patterns in cardiovascular syphilis. S. L. Cole and A. Bohning (*Amer. J. med. Sci.*, 1944, 207, 317—330).—The e.c.g. and postmortem findings of 30 cases of cardiovascular syphilis are described. C. J. C. B.

Electrocardiographic features associated with hyperthyroidism. G. Gordan, M. H. Soley, and F. L. Chamberlain (*Arch. intern. Med.*, 1944, 73, 148—153).—In 168 cases of hyperthyroidism the e.c.g. findings in order of frequency were: sinus tachycardia; abnormalities of the T waves, chiefly low amplitude and notching; auricular fibrillation; partial auriculoventricular block, and rarely auricular flutter. After treatment of hyperthyroidism, the abnormalities tend to disappear. C. J. C. B.

Effect of low-potassium diet and deoxycorticosterone on rat heart. D. C. Darrow (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 13—14).—A low-K diet combined with 2 mg. daily of deoxycorticosterone acetate caused in 4 days a loss of K and gain of Na in heart muscle, together with myocardial necrosis and cellular infiltration. Either treatment by itself had little effect in 30 days. V. J. W.

Momentary atrial electrical axes in paroxysmal tachycardia. G. Decherd, A. Ruskin, and G. Herrmann (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 17—20).—Analysis of e.c.g. in 6 patients with paroxysmal tachycardia, and in others with auricular fibrillation, shows a circular movement of electrical axes in the latter cases but not in the former. It is suggested that the condition is due to an ectopic pacemaker and not to a circus movement. V. J. W.

Development of pulmonary tuberculosis in congenital heart disease. O. Auerbach and M. G. Stemmerman (*Amer. J. med. Sci.*, 1944, 207, 219—230).—The most common congenital defect was pulmonary stenosis, which was present in all cases which came to autopsy. The pulmonary tuberculosis runs a course typical of that disease irrespective of the cardiac lesion. C. J. C. B.

Heart disease in Selective Service examinees. M. Wilburne and E. M. Cuccolini (*Amer. J. med. Sci.*, 1944, 207, 204—209).—A study of 20,000 consecutive Selective Service examinees, representing a cross-section of male population 20—45 years of age in the Pacific Northwest, revealed the existence of heart disease in 288 men (1.44%). This figure constituted 6% of rejections for all physical and mental defects. Rheumatic heart disease was observed in 63.5% of cardiac rejections. Congenital heart disease followed in frequency, occurring in 12.2% of rejections for heart diseases. There were 9 instances of arteriosclerotic heart disease, 6 of hypertensive heart disease, 3 each of hyperthyroid heart disease and effort syndrome (neurocirculatory asthenia), 2 of paroxysmal tachycardia, and 1 of chronic constrictive pericarditis. There were 46 cases of organic heart disease of unknown aetiology in 16% of total cardiac rejections. In the 183 examinees rejected for rheumatic heart disease, the mitral valve was involved alone in 152 cases (83.1%), the aortic valve was involved alone in 8 examinees (4.4%), and combined mitral and aortic valve defects were observed in 23 cases (12.5%). Functional murmurs were noted in 1.48% of all the men examined. C. J. C. B.

Fluid dynamics in chronic congestive heart failure. J. V. Warren and E. A. Stead, jun. (*Arch. intern. Med.*, 1944, 73, 138—147).—Oedema develops in chronic congestive failure because the kidneys do not excrete salt and water normally. This disturbance in renal function is related to the decreased cardiac output and not to engorgement of the kidneys from an increased venous pressure, because the salt and water retention may occur before the venous pressure rises. The increased plasma vol. is a result of retention of salt and water. The resulting decrease in plasma-protein concn. stimulates production of plasma-protein so that the total amount of circulating protein increases. The plasma vol. is thus increased without a marked lowering of the osmotic pressure of the plasma-proteins. Later the increase in blood vol. causes a rise in venous and capillary pressures. The osmotic pressure of the plasma-proteins and the increased pressure of the extracellular fluid enable the large plasma vol. to be maintained in spite of raised capillary pressure. Local differences in venous pressure may determine the site of oedema formation. The rise in venous pressure is also partly the result of heart failure. C. J. C. B.

The goitre heart.—See A., 1944, III, 406.

Calibre changes in minute blood-vessels observed in living mammal.—See A., 1944, III, 389.

Cerebral angiography. J. M. Sanchez-Perez (*Surgery*, 1941, 10, 535—552).—The discovery and the technique of cerebral angiography and the appearances of normal and pathological angiograms

(arteriograms and phlebograms) in various cerebral tumours are described. The anatomy of cerebral arteries, as observed in angiograms, and circulation times in cerebral blood vessels are also given. G. P.

Method of obtaining blood samples directly from the hepatic vein in man. J. V. Warren and E. S. Beannon (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 144—146).—An oiled catheter is introduced by an incision into the basilic vein and passed by fluoroscopic observation through the right auricle into the inferior vena cava and hepatic vein. V. J. W.

Influence of respiration on blood pressure in man. A. Battro, R. G. Segura, C. A. Elicade, and E. Araya (*Arch. intern. Med.*, 1944, 73, 29—40).—The influence of breathing, inspiratory and expiratory apnoea, Valsalva test, and coughing on the intra-arterial pressure in man was studied. Two types of waves were found: vasomotor waves which are independent of the respiratory movements (Traube-Hering waves) and blood pressure waves depending on the respiratory movements (respiratory waves). The intra-arterial pressure may rise or fall in accordance with the type of breathing—thoracic or abdominal—or with the frequency or depth of respiration. During ordinary respiration the most const. change is a fall of blood pressure during inspiration and a rise during expiration. With deep, slow thoracic breathing there is usually an inspiratory fall and an expiratory rise of blood pressure. The opposite, as a rule, is true of abdominal breathing of the same type. Curves of intra-arterial pressure registered during inspiratory apnoea and the Valsalva test show a fall of blood pressure at the beginning, while those taken during expiratory apnoea are characterised by a slight initial fall and a terminal rise. Coughing causes great increase in the blood pressure. C. J. C. B.

Capillary fragility in relation to diabetes mellitus, hypertension, and age. S. B. Beaser, A. Rudy, and A. M. Seligman (*Arch. intern. Med.*, 1944, 73, 18—22).—54 adult patients (15 with hypertension) and 67 non-diabetic patients (21 with hypertension) were tested by Wright's method for capillary fragility. The incidence of increased capillary fragility was greatest in the 5th and 6th decades. The diabetic patients showed a greater incidence of increased capillary fragility at each age decade than the non-diabetic subjects. In diabetic hypertensive patients, the test showed a greater incidence of increased capillary fragility at the higher pressure levels (midway between systolic and diastolic pressure), as used by Wright, than at a lower arbitrary level (100 mm. Hg) when performed simultaneously on the two arms. C. J. C. B.

Vitamin therapy in increased capillary fragility of diabetes mellitus. A. Rudy, S. B. Beaser, and A. M. Seligman (*Arch. intern. Med.*, 1944, 73, 23—38).—Vitamins-C and -B complex, hesperidin, and the eriodictyol fraction of -P did not affect the capillary fragility in diabetic patients. -P therapy had also no effect on the increased capillary fragility of thrombopenic purpura and rheumatoid arthritis. C. J. C. B.

Pathologist looks at ischaemia. W. Blackwood (*Edinb. Med. J.*, 1944, 51, 131—143).—A description of the causes, effects, and factors modifying the latter, of ischaemia illustrated by reference to 9 clinical cases and 11 photomicrographs. H. S.

Suggested change in designation of "renin-activator" (hypertensinogen) to renin-substrate (α_2 globulin). I. H. Page, O. M. Helmer, A. A. Plentl, K. G. Kohlstaedt, and A. C. Corcoran (*Science*, 1943, 98, 153—154). E. R. R.

Hypertension after removal of renal calculus. A. MacKay, L. D. Proctor, and N. W. Roome (*Canad. Med. Assoc. J.*, 1944, 50, 328—331).—A case is described in which malignant hypertension complicated the convalescence from a conservative kidney operation for calculus and was relieved by nephrectomy. C. J. C. B.

Mechanism of shock. A. R. McIntyre (*Nebraska Sta. Med. J.*, 1944, 29, 69—72).—A review. E. M. J.

Symptoms of impending shock. A. C. Johnson (*Nebraska Sta. Med. J.*, 1944, 29, 73—76). E. M. J.

Substitutes for human blood and plasma in treatment of shock. H. F. Gerald (*Nebraska Sta. Med. J.*, 1944, 29, 77—80).—A review. E. M. J.

Treatment of shock. J. D. Bisgard (*Nebraska Sta. Med. J.*, 1944, 29, 80—83). E. M. J.

Beneficial effects of oxygen therapy in experimental traumatic shock.—See A., 1944, III, 398.

Influence of sympathetic nervous system on capillary permeability in traumatic shock. D. Engel (*J. Physiol.*, 1943, 102, 281—289).—"Permeability" is assessed by infusing dye into the jugular vein of the cat and measuring its rate of appearance in fluid perfused through the knee-joints. After crushing both limbs, the rate of appearance of the dye is less on the sympathetomised side. Crushing of the sympathetomised side only yields no increase of dye over the control side. Blocking of the regional sympathetic during the phase of increased capillary filtration in traumatic shock may be beneficial (cf. A., 1944, III, 173). W. H. N.

Oxygen therapy in shock due to haemorrhage. J. G. Schnedorf and T. G. Orr (*Surg. Gynec. Obstet.*, 1941, 73, 495—497).—Inhalation of 100% O₂ had a beneficial effect on dogs shocked by repeated small haemorrhages; they tolerated a 15% greater blood loss and lived 17% longer than control dogs. They had a slower pulse and faster respiration. P. C. W.

Beneficial effect of oxygen therapy in experimental shock. J. G. Schnedorf and T. G. Orr (*Surg. Gynec. Obstet.*, 1941, 73, 301—304).—Dogs anaesthetised with Na pentobarbital were shocked by the continuous intravenous infusion of histamine. The blood pressure was reduced to 40 mm. Hg and there was a 16% rise in haematocrit val. The average survival time was 5.7 hr. When the air breathed was replaced by 100% O₂ the survival time was 9.8 hr. In nembutalised dogs given single intravenous injections of 0.15 mg. of histamine the recovery of normal blood pressure was normal when the dogs breathed 100% O₂ but was delayed with O₂ of less than 20%. With 10% O₂ the normal fall in blood pressure was prolonged and succeeded by secondary anoxic shock; recovery could be produced by artificial respiration with 95% O₂. P. C. W.

VII.—RESPIRATION AND BLOOD GASES.

Mechanism of lung clearance. J. G. M. Bullowa (*J. Mt. Sinai Hosp.*, 1944, 10, 508—511). E. M. J.

Obliteration of chronic empyema cavity with free fat transplant. A. H. Aufses (*J. Mt. Sinai Hosp.*, 1943, 10, 283—286).—Case report. E. M. J.

Oxygen absorption in some damselfly naiads. R. W. Pennak and C. M. McColl (*J. Cell. Comp. Physiol.*, 1944, 23, 1—10).—O₂ absorption by the rectal lining is of small importance. Larvæ from which the gills had been removed survived up to 14 days in well-aerated water. When kept in closed vessels they could not withstand an O₂ concn. below 14.5% saturation, but normal larvæ absorbed O₂ down to 2.4% concn. V. J. W.

Resuscitation and oxygen therapy. A. R. Behnke (*Anesthesiology*, 1941, 2, 245—260).—Physiological principles and practical considerations are discussed. G. P.

Effect of anoxia on sense organs.—See A., 1944, III, 403.

Physiological effects of carbon dioxide on activity of central nervous system in man [and high-altitude flying]. A. Brazier (*Medicine*, 1943, 22, 205—221).—A review. E. M. J.

Growth and reproduction during chronic exposure to carbon monoxide. V. Suhrie and A. T. Miller, jun. (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 85—86).—In newly weaned rats kept for 8 hr. daily in 0.04% CO, growth and fertility were impaired, but no. and wt. of offspring were decreased, abortions were increased, and lactation always failed. V. J. W.

VIII.—MUSCLE.

Effect of testosterone propionate and methyltestosterone on creatinuria in progressive muscular dystrophy. C. L. Hoagland, R. E. Shank, and H. Gilder (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 49—51).—Daily injection of 20 mg. of testosterone caused in normal children a fall in creatine excretion within 72 hr. and this decrease persisted as long as the hormone was given. In dystrophic children no fall occurred, but there was a marked increase on withdrawal. Oral administration of 20 mg. of methyltestosterone caused an immediate increase of creatinine in all cases, with a return to normal on withdrawal. V. J. W.

Prophylactic requirement of the rat for α -tocopherol [effect on muscle].—See A., 1944, III, 425.

Effects of different intakes of B-complex vitamins on neuromuscular regeneration. H. M. Hines, B. Lazere, and J. D. Thomson (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 97—98).—Regeneration was not affected by vitamin-B deprivation or excess intake. The weakness of regenerating or control muscles on a -B-deficient diet resembled that found in inanition or in inanition + -B supplements. V. J. W.

Delayed contraction of denervated muscle with intravenous bartitrates. M. B. Bender (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 146—147).—Injection of Na pentobarbital (25 mg. per kg.) caused contraction of the denervated facial muscles of monkeys after a latent period of 16—60 sec. The contraction lasted for 40—75 sec.; it was slightly enhanced by eserine but not affected by atropine. V. J. W.

Adenosine triphosphate in muscles of rats studied with radioactive phosphorus. E. V. Flock and J. L. Bollman (*J. Biol. Chem.*, 1944, 152, 371—383).—The uptake was measured of ³²P by each of the three PO₄ groups in adenosine triphosphate of rat muscles resting, working, and recovering from work. In resting muscle, ³²P was distributed in a proportion of 100 for the first PO₄ group (i.e., hydrolysable with myosin), 75 for the second (i.e., hydrolysed from adenosine diphos-

phate with acid), and 5 for the third (i.e., ribose phosphate). ^{32}P of labile PO_4 of adenosine triphosphate of muscle working continuously for 1 hr. was increased only slightly more than that of resting muscle, but when a turnover of 35% of labile PO_4 was produced three times in 1 hr., a greater increase in uptake of ^{32}P was found. Limitations of isotope technique are discussed. G. D.

Muscle-glycogen as influenced by castration, adrenalectomy, and treatment with testosterone and deoxycorticosterone acetate. C. A. Winter and J. D. Thomson (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 95—97).—Glycogen of the rat's gastrocnemius was not affected by castration or by testosterone implanted or injected. The low muscle-glycogen found after adrenalectomy is not raised by testosterone or deoxycorticosterone administration. The max. tension of the muscle was not affected in any of these treatments.

V. J. W.

Experimental histopathology of motor end-plates produced by quinine, curare, prostigmine, acetylcholine, strychnine, lead tetraethyl, and heat. E. J. Carey (*Amer. J. Path.*, 1944, 20, 341—355).—The experimental pleomorphism of the hypolemmal axons of the motor end-plates in the chameleon is a result of normal and abnormal functional amoeboid motion. There is a correlation between amoeboid motion and the secretion of granules (so-called granular sole plate of Kuehne). These aurophilic granules are increased in nos. by curare and quinine, which inhibit their dispersal and dissolution into the protoplasm of the muscle fibre. Neuromuscular transmission is blocked by curare and quinine by amoeboid retraction of hypolemmal axons and the formation of a dense and circumscribed pptn. membrane composed of the granules of Kuehne. The aurophilic epilemmal and hypolemmal axons undergo acute dilatations through the sudden formation of retention cysts produced by the chemical action of curare and quinine followed by that of aq. NH_3 , which increases transmission to the end-plates. The secreted granules of Kuehne may be depleted by prolonged chemical stimulation with strychnine, NaCN, or CO_2 , or by exhausting muscular exercise. In exhaustion, in addition to absence of the granules of Kuehne, there is a decrease in size of the epilemmal and hypolemmal axons. Heat produces a sudden expansion of the end-plate and a dispersal of the granules of Kuehne that together produce perturbations in the pattern of the cross striations of the muscle fibre. Pb tetraethyl produces a sudden and explosive transmission of an abnormal quantity of aggregates of aurophilic granules which results in massive radiations, distortion, and increased staining capacity of the end-plates for Au. There are also abnormal distortions of the related cross striations of the muscle fibre to these abnormal end-plates. (87 photomicrographs.) C. J. C. B.

Acetylation in patients with myasthenia gravis. Elimination of p-aminobenzoic acid. C. Torda and H. G. Wolff (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 86—90).—Doses of 0.3—2 g. of p-aminobenzoic acid, given orally to such patients and to controls, were excreted similarly by both groups, with respect to both time of elimination and proportions of free and acetylated compound. V. J. W.

Nature of myasthenia gravis. C. Torda and H. G. Wolff (*Science*, 1943, 98, 224—225).—Mixtures containing frog brain and serum from control patients and from patients with myasthenia gravis were incubated, and acetylcholine was determined by means of the frog rectus abdominis muscle, and compared with corresponding unincubated samples. In myasthenia gravis there was a decrease in acetylcholine synthesis, the magnitude of which was parallel to the severity of the disease. Some of the agents which modify the synthesis are dialysable. E. R. R.

IX.—NERVOUS SYSTEM.

Chromatolysis and recovery of efferent neurones. R. S. Turner (*J. Comp. Neurol.*, 1943, 79, 73—78).—15 days after section of the sciatic nerve on one side in guinea-pigs an average of 38% of the anterior motor horn cells on the operated side showed marked chromatolysis. Guinea-pigs kept for 7 months—2 years after such an operation possessed, on the average, 16% fewer anterior motor horn cells on the operated side. It is concluded that following section of the sciatic nerve approx. two thirds of the motor horn cells which underwent definite chromatolysis recovered.

J. D. B.

Impairment of growth and myelinisation in regenerating nerve fibres subject to constriction. P. Weiss and A. C. Taylor (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 77—80).—Regenerating nerves were subjected to constriction by a segment of artery slipped over one branch of a regenerating nerve. The regenerating fibres were reduced in diameter and delayed in myelinisation as compared with those in another unconstricted branch of the same nerve.

V. J. W.

Effect of nerve compression on Wallerian degeneration *in vitro*. P. Weiss and A. S. Burt (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 109—111).—Excised rat nerves kept in Ringer's solution show the usual sequence of degenerative changes. These are delayed if the nerve is compressed by a glass slide or by an arterial sleeve. V. J. W.

Growth of Schwann cells of peripheral nerves *in vitro*.—See A., 1944, III, 389.

Effects of retrograde degeneration on reflex activity of ventral horn neurones. B. Campbell (*Anat. Rec.*, 1944, 88, 25—37).—Section of peripheral nerves or of ventral roots in the cat and monkey produced loss of the proprioceptive component of the segmental spinal reflex during the period of chromatolysis. Conduction occurred from peripheral to central fibres of the dorsal root ganglion cells after retrograde degeneration induced by nerve section. It is concluded that the physiological state of the chromatolysed motor cell is such that it can still react to incoming stimuli though unable to respond normally to the proprioceptive component. It is suggested that some difference, either quant. or qual., between the excitatory processes set up at the locus of the motor neurone must occur.

W. F. H.

Sensory reception in hysterical anaesthesia as measured by cold pressure response.—See A., 1944, III, 406.

Peripheral unit for pain.—See A., 1944, III, 339.

Vitamin-E deficiency in chicks [changes in nervous system].—See A., 1944, III, 425.

Studies of cerebral function in learning. XII. Loss of maze habit after occipital lesions in blind rats. Noise-induced seizures in rat and their modification by cerebral injury. Absence of audiogenic seizures in wild Norway and Alexandrine rats.—See A., 1944, III, 337.

Convulsive seizures associated with pyridoxine deficiency.—See A., 1944, III, 354.

Cellular structure of marsupial cortex. W. Riese (*Natural. Canad.*, 1943, 70, 139—144).—A comparison of the structure of the cortex in the opossum with that in the kangaroo. It is concluded that the polyprotodont cortex is much more primitive than that of the diprotodonts.

J. D. B.

Postoperative neurological [and psychological] complications. H. W. Woltman (*Nebraska Sta. Med. J.*, 1944, 29, 4—8). E. M. J.

Electric shock therapy [in private practice]. N. K. Rickles (*Northw. Med.*, 1944, 43, 44—46).—Report of 100 cases. E. M. J.

Type of choline-esterase present in brain tissue. B. Mendel and H. Rudney (*Science*, 1943, 98, 201—202).—Acetyl- β -methylcholine is hydrolysed only by the true choline-esterase, and benzoylcholine only by the pseudocholine-esterase. Using this fact, the type of choline-esterase in the brain tissue of rats, mice, guinea-pigs, rabbits, dogs, cats, cows, pigs, chickens, turtles, frogs, and carp was shown to be true choline-esterase. In the parotid glands and the pancreas, the type varies with the same organ in different species. E. R. R.

Effect of anoxia on pressure of cerebrospinal fluid and on rate of absorption of normal saline solution from subarachnoid space of dogs under ether anaesthesia. T. H. Bedford (*J. Physiol.*, 1943, 102, 334—340).—Anoxia does not affect pressure of c.s.f. in dogs. The rate of absorption (10 experiments out of 12), and change of rate of absorption with pressure, are also unaffected. Swelling of the brain induced by anoxia is probably moderate in degree and usually insufficient to obstruct circulation of c.s.f.

W. H. N.

Carotene requirements for the maintenance of normal spinal fluid pressure in dairy calves.—See A., 1944, III, 422.

X.—SENSE ORGANS.

Eye pigments of *Drosophila*. I. Methods of extraction and estimation of the pigment components. B. Ephrussi and J. L. Herold (*Genetics*, 1944, 29, 148—177).—30% ethyl alcohol acidified to pH 2.0 extracts the red eye pigments when *Drosophila* heads are placed in it. In 48 hr. extraction is almost complete. The solution of the red pigment obeys Beer's law between the concns. tested and so the concns. of pigment in the extract can be determined photometrically. Acid methyl alcohol (0.270N-HCl) extracts brown eye pigment and this solution obeys Beer's law, and its concn. therefore may be determined with a photometer.

L. G. G. W.

Nature of Graves' disease with special reference to its ophthalmic component. J. H. Means (*Amer. J. med. Sci.*, 1944, 207, 1—18).—A lecture.

C. J. C. B.

Nominal duction and true duction power. J. I. Pascal (*Amer. J. Ophthalm.*, 1944, 27, 179—180).—Nominal ductions refer to the amount of prism power, base out or in, overcome without reference to an existing phoria. True ductions take into consideration any phoria present, and the ratio of true duction is practically 2 : 1 of adduction to abduction in the majority of cases.

A. J. B. G.

Binocular refraction with cross cylinder technique. H. S. Sugar (*Arch. Ophthalm.*, 1944, 31, 34—42).—The axis of the cylinder in cases of astigmatism may shift when the eye is tested monocularly with and without cycloplegia, and may change again when both eyes are used for distance, and yet again with convergence to the usual reading distance. The theories as to the causes of these shifts are briefly discussed and it is suggested that the final prescription for

correction should be based on testing with cross cylinders under binocular fixation. In determining the manifest refraction with the cross cylinder the principles of spherical equivs. must be followed or the results will be fallacious.

A. J. B. G.

Torsion without known eye defect. T. G. Hermans (*Amer. J. Ophthalm.*, 1944, 27, 153—158).—104 students passed as normal in naval eye examinations were examined, using figures of the Volkman disc type, for cyclophoria. This was measured in 99 positions, from 0° to 10° or convergence, and from 40° above to 40° below the horizontal. The tabulated results show that torsion is a normal phenomenon of vision, and that ex-torsion is to be expected except in extreme positions of elevation below the horizontal. The amount of variation that may still be regarded as normal is expressed by standard deviations from the average vals.

A. J. B. G.

Congenital paralysis of both external recti treated by transplantation of eye muscles. J. A. Magnus (*Brit. J. Ophthalm.*, 1944, 28, 241—245).—A case of spina bifida occulta with paralysis of both external recti. The operation for transplanting segments of these muscles is described with a diagram. Cosmetically the results were good although there was no abduction. Photographs illustrate the results of the many operations performed. The external recti were found to be abnormally thick and one was in an abnormal anatomical position. No explanation for this or the lack of abduction after operation is offered.

M. G. M.

Pupillographic studies. V. Periodic sympathetic spasm and relaxation and rôle of sympathetic nervous system in pupillary innervation. O. Lowenstein and A. S. Levine (*Arch. Ophthalm.*, 1944, 31, 74—94).—A girl of 22 suffering from intramedullary disease of the cord presented a syndrome of periodic sympathetic spasm and subsequent relaxation affecting the left side. The pupillary changes during these attacks are analysed as also are the reactions to light, drugs, fatigue, and psychosensory stimuli, and conclusions are drawn as to the rôle of the sympathetic in pupillary movements. The parasympathetic light reflex of the pupil contains some factors determined by the functional state of the sympathetic system.

A. J. B. G.

Distribution of oxidative enzymes in ciliary body. J. S. Friedenwald, H. Herrmann, and R. Moses (*Johns Hopkins Hosp. Bull.*, 1943, 73, 421—434).—Epithelium was separated from the stroma of the ciliary body of slaughterhouse beef eyes by controlled mechanical stirring in saline solution. O₂ uptakes in the presence of various substrates in the Warburg apparatus showed high cytochrome oxidase in epithelium and low in stroma. Succinoxidase did not parallel cytochrome oxidase in the tissue fractions examined.

T. F. D.

Present limits of gonioscopy. P. C. Kronfeld and H. I. McGarry (*Amer. J. Ophthalm.*, 1944, 27, 147—153).—Gonioscopy gives satisfactory explanations for most of the phenomena of narrow-angle glaucoma. The recognition of impaired permeability of the trabeculae in wide-angle glaucoma is difficult and the findings are not conclusively in favour of the pigment block theory. Gonioscopy is of great interest in the examination of the site of anti-glaucomatous operations, usually affording a simple explanation of failure or success. It may, however, be conducive to the development of an over-mechanical concept of glaucoma as a whole.

A. J. B. G.

Ætiology of so-called chronic simple glaucoma. C. Berens and E. L. Nilson (*Trans. Amer. Acad. Ophthalm. Otolaryngol.*, 1944, 121—152).—After the chance observation of the occurrence of unilateral glaucoma with ipsilateral sinusitis, 53 cases of chronic simple glaucoma were investigated for sinus infection. The tabulated results show that sinus infection was present in all cases, and that in 70% the greater ocular and nasal involvement occurred on the same side. This, the effects of exacerbation of the nasal condition, and the results of treatment of the nose in some cases, indicate that a relationship exists. The possible mechanism of connexion is discussed, and this and the authors' criteria of the pathogenicity of the nasal infection are criticised in the ensuing discussion.

A. J. B. G.

Dinitrophenol cataract; production in an experimental animal. B. H. Robbins (*J. Pharm. Exp. Ther.*, 1944, 80, 264—271).—The production of cataract in ducks and chickens by dinitrophenol is described. Changes in the lens are similar to those reported in the human lens following the use of dinitrophenol in treatment of obesity.

R. H. K.

Principles of retinoscopy. M. Klein (*Brit. J. Ophthalm.*, 1944, 28, 157—177).—An explanation of the phenomena of retinoscopy based on the projection of images, and a discussion of some of the factors involved.

A. J. B. G.

Exudative and hæmorrhagic retinitis with increased intra-ocular tension treated by pilocarpine and thyroid. A. Landau and J. Ruskowski (*Brit. J. Ophthalm.*, 1944, 28, 184—187).—A retinopathy of the type usually associated with hypertension occurred in a woman of 40 with normal blood pressure. As the blood-cholesterol was at the upper normal figure and the basal metabolic rate was —10 she

was treated with thyroid extract and showed marked improvement. The blood-cholesterol was not estimated during treatment.

A. J. B. G.

Case of angeoid streaks of retina. T. H. Butler (*Brit. J. Ophthalm.*, 1944, 28, 220—224).—The fundus, as seen in the photographs, showed a white mass at the macula suggesting a soft exudate, also a few angeoid streaks and diffuse choroiditis. The condition developed within 6 months but deterioration of sight occurred in a fortnight. The condition may be the result of a subsiding exudative retino-choroiditis and consequent folding of the retina with deposits of pigmentary debris between rods and cones and pigment layer. It is suggested that the cause is a rapid mechanical act and not a slow pathological process such as the formation of new vessels.

M. G. M.

Senile changes in choroid and retina. H. P. Wagener (*Amer. J. med. Sci.*, 1944, 207, 258—266).—A general review.

C. J. C. B.

Physiological grey filters. F. Weidert (*Anal. Fis. Quim.*, 1942, 38, 203—235).—50% Neophan glass contains Nd₂O₃ and, due to the absorption bands, a reduced amount of yellow light is transmitted. The effect of this on day and night vision has been investigated. This glass is suitable as a physiological grey filter which should absorb certain wave-lengths without changing the colour of white light. Artificial light is perceived as white, 51.8% being transmitted. From red, green, and amber signal lamps, 75, 60, and 51% respectively is transmitted.

F. R. G.

Concept of colour. Committee on Colorimetry (*J. Opt. Soc. Amer.*, 1943, 33, 544—554).—A discussion on the meaning, use, and suitability of terms descriptive of colour phenomena from physical, psychological, and psychophysical points of view.

E. N. W.

Factors and implications of colour constancy. H. Helson (*J. Opt. Soc. Amer.*, 1943, 33, 555—569).—The relative importance of different factors involved in the recognition of the actual colour of an object under varying conditions of illumination and background is discussed. It is shown that there are rapid processes of adaptation which tend to compensate for changes in conditions of illumination. It is suggested that in every viewing situation there is established an adaptation level such that samples having reflectances above adaptation reflectance take the hue of the illuminant, those below take the hue of the after-image complementary to the illuminant; samples near adaptation reflectance are either achromatic or very low in saturation. The parts played by contrast and the nature of the boundary between an object and its surroundings are also discussed in relation to the apparent colour and brightness of an object.

E. N. W.

Visual processes and colour photography. R. M. Evans (*J. Opt. Soc. Amer.*, 1943, 33, 579—618).—A discussion and analysis of the various factors which have to be considered in order that the reproduction of a scene may produce as nearly as possible the same visual sensations as the scene itself. The importance of the adaptive processes in the visual mechanisms by which "constancy" of brightness and colour is maintained is stressed. The adaptation of the eye to different levels of illumination, both general and local, is considered in relation to certain contrast effects on colour and brightness and to the perception of grey. Since contrast effects extend only for limited distances laterally, the visual angle subtended by the reproduction must be closely related to the visual angle subtended by the original scene.

E. N. W.

Farnsworth-Munsell 100-hue and dichotomous tests for colour vision. D. Farnsworth (*J. Opt. Soc. Amer.*, 1943, 33, 568—578).—85 Munsell colour papers of approx. the same saturation are selected so as to form a continuous series capable of being arranged in a circle. The papers are mounted in suitable holders and subjects are required to arrange them in sequence, for which purpose the colours are grouped into four divisions. The colours are numbered in sequence and the errors made in arranging the colours are recorded by noting the sum of the differences between each no. and those placed on either side of it. The scores are then plotted on circular diagrams in which the radii represent the colour nos. and concentric circles represent the ordinates for recording the extent of the error. For normal subjects the "profile" so obtained is almost circular with a few random errors. For colour-abnormal subjects the "profile" becomes markedly distorted at opposite ends of certain diameters. The position of the diameter of distortion is significantly different for each type of anomaly, e.g., deuteranomaly, protanomaly, or tritanomaly. The dichotomous test is a modification of the same principle. The subject is required to arrange a series of only twenty numbered colours in a circle. For a normal subject the lines joining consecutive nos. will naturally form a circle. For abnormal subjects these lines cross the circle repeatedly as a series of almost parallel chords. The angle which these chords make with a pre-determined axis of the circle are again characteristic of each type of abnormality. The results show that there is also a class of people with low general discrimination but without pronounced anomaly in any particular direction.

E. N. W.

Theoretical colour-blindness frequencies. J. R. Platt (*J. Opt. Soc. Amer.*, 1943, 33, 679).—The distribution of colour-blindness in the

population can be compared with the frequency ratios predicted for sex-linked recessive genes by simple genetic theory. It is deduced that if 8% of the male population are colour-blind, then 14.96% of the females are likely to be carriers of the defect. E. N. W.

Effect of hue on dark adaptation. E. M. Lowry (*J. Opt. Soc. Amer.*, 1943, 33, 619—620).—After 15 min. in total darkness observers' eyes were exposed for 1 min. to either neutral or red fields of the same brightness (3.15 ft.-lamberts). After these exposures and return to darkness there was no significant difference in the time taken to reach a threshold of 0.035 microlambert (white light). It is concluded that brightness is the important factor in determining the time necessary for dark adaptation and not the spectral region involved. E. N. W.

Myopia nocturna. II, III. J. M. Otero and A. Durán (*Anal. Fis. Quím.*, 1942, 38, 236—248; cf. A., 1942, I, 377).—The pupil-size of the dark-adapted eye was measured by infra-red photography and gave a mean diameter of 8 mm. Myopia nocturna cannot be due solely to spherical aberration of the eye, but is considered to be caused by a state of accommodation in which the spherical aberration nearly disappears. F. R. G.

Myopia and presbyopia of night vision. J. Palacios (*Portugaliae Physica*, 1944, 1, 47—58).—On looking at an object at infinity with an illumination so low that it can only just be seen, the eye behaves as if it had 2D of myopia relative to its seeing the same object with perfect lighting. The theories to account for this phenomenon are discussed, and it is concluded that it is due largely to the spherical aberration introduced by the dilated pupil, and to a smaller extent to chromatic aberration associated with the Purkinje spectrum brightness shift in scotopic vision. With lowering of illumination there is a progressive paralysis of accommodation leading eventually to the coincidence of the near and far points of vision at a distance of 50 cm. from the emmetropic or corr. eye. A. J. B. G.

Reappearance of flicker at high flash frequency in patients with brain pathology and in normal subjects. N. Enzer, E. Simonson, and S. S. Blankstein (*J. Lab. clin. Med.*, 1944, 29, 63—73).—When using a.c. and increasing the frequency of light flashes in a rotator arrangement beyond the fusion frequency of the first flicker, a second flicker appears at a higher frequency and, after its disappearance, a third flicker appears at a yet higher frequency. It is an objective phenomenon, for it can be photographed. It is due to the interference of light flashes with fluctuations of luminosity. In 31 of 33 patients with cerebral lesions, the recognition of the second and third flickers was abolished or greatly reduced as compared with the lowest limit of 25 normal subjects. In 2 patients the reduction of the second and third flickers was noted before other neurological changes occurred; in another patient there was a marked reduction 8 weeks after head injury when the neurological findings were otherwise normal. Clinical improvement in 5 patients was accompanied with improved recognition of the 2nd and 3rd flickers. C. J. C. B.

Amblyopia due to vitamin deficiency. P. B. Wilkinson, (*Lancet*, 1944, 246, 528—531).—A group of 14 cases of amblyopia associated with dietetic deficiency are described and illustrated with diagrams of visual fields and two tables, one showing signs, symptoms, and results of treatment and the other giving details of Chinese diets used in Hong Kong hospital. The patients interviewed had lacked high-class protein owing to scarcity of meat; all, save one, showed visual field defects, mostly contraction, all save two showed some pupillary defects, and three showed temporal pallor. Most showed such symptoms as weakness of extremities, giddiness, etc., usually associated with pellagra, although glossitis and perlèche were not constant accompaniments to the syndrome. Treatment with special diets, or deficiency diets with addition of riboflavin or nicotinic acid, produced slow improvement in visual acuity but addition of nicotinic acid was more effective. It is concluded that a disturbance in the second link of the co-enzyme-oxidase may cause amblyopia as well as pellagra. M. G. M.

Early diagnosis and treatment of primary optic atrophy. F. Cooper (*Eye, Ear, Throat*, 1944, 23, 68—71).—The routine ophthalmological tests for a suspected case of early optic atrophy are described, and emphasis is laid on the importance of perimetry. Aetiology and treatment are briefly discussed. A. J. B. G.

Infantilism with goitre, diabetes mellitus, mental defect, and bilateral primary optic atrophy. J. Tyrer (*Med. J. Austral.*, 1943, II, 398—401).—The condition is attributed to degeneracy produced by a cousin marriage in a neuropathic stock. F. S.

Problem of split macula. J. N. Evans and J. Browder (*Arch. Ophthalmol.*, 1944, 31, 43—53).—Functional studies of the visual pathway in man present difficulties as they can only rarely be supported by anatomical evidence. In the case here recorded the optic chiasma was cleanly divided in the median line in an operation for craniopharyngeoma. The resulting field changes are described in detail and the authors conclude that the whole macular area must be supplied by both crossed and uncrossed fibres. A. J. B. G.

Vitamins in otolaryngology. H. B. Perlman (*J. Laryngol. Otol.*, 1943, 58, 391—396).—A general review of the diseases produced in man by vitamin deficiencies. It is concluded that, so far as present knowledge goes, vitamin therapy is unlikely to be helpful in otolaryngological practice. K. T.

Damping and selectivity of inner ear. R. S. Hunt (*J. Acoust. Soc. Amer.*, 1942, 14, 50—57).—Evidence is produced to show how the ear can have the effective selectivity equiv. to about five cascaded resonators. The amplitude of the basilar membrane has a val. equal to the fifth root of the val. to be expected from a simple stretched string resonator. It is shown how the anatomy of the inner ear is consistent with this interpretation. R. H. K.

Cochlear potentials elicited from bats by supersonic sounds. R. Galambos (*J. Acoust. Soc. Amer.*, 1942, 14, 41—49).—Cochlear potentials have been recorded from 4 species of bat under nembutal anaesthesia with stimulus frequencies between 30 and 98,000 c.p.s. The magnitude of the potential at a given frequency increases with increase of stimulus intensity to a max. and then decreases. On subsequently lowering the intensity the previous potentials are not attained. Contraction of the intra-aural muscles is given as an explanation of this hysteresis effect, which is not found in curarised or deeply anaesthetised animals. R. H. K.

Independent differentiation of avian ear.—See A., 1944, III, 387.

New laryngoscope. R. A. Miller (*Anesthesiology*, 1941, 2, 317—320).—A new laryngoscope blade is described which has a shallow base, round bottom, narrow end, and a curvative starting 2 in. from its end. One size can be used for all patients except infants. G. P.

Relative sweetness of sucrose, glucose, and fructose. A. T. Cameron (*Trans. Roy. Soc. Canada*, 1943, [iii], 37, V, 11—27).—Review and confirmation of the work of Dahlberg and Penczek (A., 1941, III, 740). The relative sweetness of the three sugars is in the order: fructose > sucrose > glucose (α -D-glucose > β -D-glucose). The relative sweetness of sucrose and glucose tends to become equal with increasing concns., but the sweetness of fructose (impure) relative to sucrose increases with increasing concn. The sweetness of one sugar is enhanced by the presence of another. G. P.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Newer knowledge of biochemistry of thyroid gland. C. R. Harington (*J. C.S.*, 1944, 193—201).—The facts relating to the biosynthesis of thyroxine and of the *in vitro* iodination of proteins to produce biologically active compounds are reviewed. The production of a 3.4% net yield of thyroxine by the oxidation of di-iodotyrosine with H_2O_2 at pH 10 at 100° for 5—6 hr. (the thyroxine formed being removed from the reacting mixture by dissolution in butyl alcohol) is described. Theoretical consideration of the Pummerer oxidation of phenols leads to a postulated method for the biosynthesis of thyroxine from di-iodotyrosine. P. C. W.

Three cases of congenital goitre. A. H. Parmelee, E. Allen, I. F. Stein, and H. Buxbaum (*Amer. J. Obstet. Gynec.*, 1940, 40, 145—147). P. C. W.

Effect of thyroid on sterility in normal and hypothyroid females. L. B. Winkelstein (*Amer. J. Obstet. Gynec.*, 1940, 40, 93—102).—16 sterile women were given tolerance doses of thyroid; 9 became pregnant, 7 did not. All the women who became pregnant had some degree of hypothyroidism while the others gave no evidence of hypothyroidism. P. C. W.

Inhibition of metamorphosis in tadpoles by thiouracil. A. M. Hughes and E. B. Astwood (*Endocrinol.*, 1944, 34, 138—139).—Thiouracil in concn. of 1:2000 inhibits the metamorphosis of *Rana clamitans* normally produced by thyrotropin, but not that produced by thyroxine. P. C. W.

Role of thyroid in cytologic responses of pituitary to low intake of iodine. A. Chapman and G. E. Higgins (*Endocrinol.*, 1944, 34, 83—89).—Intact rats fed on a diet with a low I content had an increased no. of pituitary basophil cells; these cells were larger than normal, their Golgi apparatus and nuclei were enlarged, and there was increased deposition of colloid by the basophil cells. In thyroidectomised rats on a high I intake there was an increase in the eosinophil cells which deposited large amounts of colloid, and a degranulation of the chromophil cells. Such rats on a low I intake showed a generalised degranulation of all chromophil cells and deposition of colloid. P. C. W.

Five cases (three in siblings) of idiopathic hypoparathyroidism associated with moniliasis. A. Sutphin, F. Albright, and D. J. McCane (*J. clin. Endocrinol.*, 1943, 3, 625—634).—The moniliasis appeared to precede the hypoparathyroidism in onset. The nail changes of moniliasis did not improve when the blood-Ca was restored to normal in 1 case by dihydrotachysterol. P. C. W.

Parathyroid tetany treated with massive doses of vitamin-D. E. L. Sevringhaus and R. S. John (*J. clin. Endocrinol.*, 1943, 3,

635—637).—6 women with severe hypoparathyroidism were maintained free from symptoms by daily doses of 150,000—400,000 U.S.P. units of vitamin-D for 2 years or more. There was no evidence of hypercalcaemia or renal disturbance. The therapy is cheaper than dihydrotachysterol therapy. P. C. W.

Parathyroid glands in trichinosis. L. Garrick (*Amer. J. clin. Path.*, 1944, 14, 24—27).—The parathyroid glands of the guinea-pigs whose skeletal muscles contained encysted *Trichinella spiralis* were moderately enlarged. Serum-Ca, inorg. P, and phosphatase activity were unchanged. Calcified larvae of *T. spiralis* without cysts occurred in the myocardium of the guinea-pig. C. J. C. B.

Mechanism of diabetogenic action of alloxan. M. G. Goldner and G. Gomori (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 73—75).—Alloxan diabetes is not prevented in rabbits or dogs by insulin sufficient to abolish the initial hyperglycaemia. V. J. W.

Simplification of treatment of diabetes. L. L. Pennock (*J. Lab. clin. Med.*, 1944, 29, 168—176).—A general review of principles with illustrative cases. C. J. C. B.

Gonad and related endocrine response of female rats to experimental hyperadrenalism. J. C. Perry (*Anat. Rec.*, 1943, 87, 415—427).—Subcutaneous injections of adrenaline produced repeated periods of diestrus for 5—40 days. Interstitial cells and luteal cells exhibited "beaded" nuclei and there was reduction in abs. and relative ovarian wt. Uterus and vagina showed atrophic histological changes and commonly a reduction in wt. Pituitary basophils decreased in no. The thyroid in maximally responding animals was hyperplastic. Insulin-producing cells were increased in no. The metabolic rate was increased for 3 weeks following cessation of injections. W. F. H.

Treatment of Addison's disease with pellets of deoxycorticosterone acetate. R. A. Shipley (*Amer. J. med. Sci.*, 1944, 207, 19—28).—5 of 7 patients with Addison's disease were well maintained for 7—40 months by pellets of deoxycorticosterone acetate and were able to carry on work involving moderate physical activity. The other 2 patients were not satisfactorily controlled either by pellets or by the compound administered by injection. Patients under therapy with pellets of deoxycorticosterone acetate may easily be thrown into hypoglycaemia by fasting. They are particularly vulnerable in the presence of an infection. The effective life of the 75-mg. pellet is 9 to 10 months, the average daily absorption is 0.21 mg. per pellet, and the average no. of pellets required is 4—6. The rate of absorption is reasonably const. from patient to patient and pellet to pellet. C. J. C. B.

Adrenal rest tumour of ovary. H. J. Greene and W. A. Lapp (*Amer. J. Obstet. Gynec.*, 1944, 47, 63—69).—A case is described with masculine symptoms. P. C. W.

Adrenal-like ovarian tumour associated with Cushing's syndrome. E. J. Kepler, M. B. Dockerty, and J. T. Priestley (*Amer. J. Obstet. Gynec.*, 1944, 47, 43—62).—A case is described and discussed with relation to 13 other cases collected in the literature. It is concluded that the tumours develop from adrenal-cortical rests present in the ovary. P. C. W.

Surgical removal of adrenal adenoma with relief of Cushing syndrome. S. F. Wilhelm and S. Gross (*Amer. J. Med. Sci.*, 1944, 207, 196—204).—A 46-year-old man presenting a classical Cushing syndrome had a large adenoma of the right adrenal gland. He was completely relieved of his symptoms following extirpation of the tumour and has remained well for over 16 months. Laminography and perirenal insufflation proved valuable in delineating the neoplasm. The urinary androgens (17-ketosteroids) were greatly elevated. The normal excretion of urinary oestrogens suggested the likelihood of a benign neoplasm. C. J. C. B.

Relation of thyroid and adrenals to pregnancy toxæmia. E. C. Hughes (*Amer. J. Obstet. Gynec.*, 1940, 40, 48—60).—In 400 pregnant women the average basal metabolic rate was lowered during the first 3 months and raised during the last 3 months. When the basal metabolic rate was kept const. during the first 3 months in 558 pregnant women by thyroid administration the incidence of pre-eclampsia was 2.5% compared with 5.2% in 550 control cases. During normal pregnancy serum-Na remains const. but is lowered in early or late toxæmia. The urinary excretion of Na is increased in early toxæmia more than it is in late toxæmia. Injection of the urine from cases of early and late toxæmia into virgin rabbits produced lesions in the adrenals and thyroids and pathological changes in the liver and kidneys characteristic of those of early and late toxæmia respectively. P. C. W.

Reaction of the pituitary gland and related hypothalamic centres in hamster to prolonged treatment with oestrogens. E. Vazquez-Lopez (*J. Path. Bact.*, 1944, 56, 1—13).—In the hamster (*Cricetus auratus*) prolonged treatment with oestrogens, natural and artificial, produced reactions in the pituitary gland and related hypothalamic nuclei; carcinoma of the head of the epididymis was also found in some cases. The pituitary reaction consists in a proliferation of cells of the intermediate lobe which invade the pars nervosa and reach the brain, invading in some cases the walls of the third

ventricle. The anterior lobe remains intact and is only later invaded by intermedial cells. The cells of the supraoptic nucleus show vacuolation and decrease in no., and sometimes disappear almost completely. The para-ventricular nucleus shows less marked changes. (21 photomicrographs.) C. J. C. B.

Corticotropin obtained by ultra-filtration of pituitary extracts. R. Tyslowitz (*Science*, 1943, 98, 225—226).—Hog pituitary extracts, ultra-filtered through Cellophane under a pressure of 6 ft. of water, yielded ultra-filtrates from which a corticotropic substance was isolated by adding NaCl or Na₂SO₄, or by the freezing-drying technique. E. R. R.

Effect of adrenotropic hormone on insulin content of rat's pancreas. H. Fraenkel-Conrat, V. V. Herring, M. E. Simpson, and H. M. Evans (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 62—63).—Pancreatic insulin of hypophysectomised rats is increased by purified adrenotropic hormone; hence the effect of the crude hormone previously described (A., 1942, III, 598) is not due, as supposed, to lactogenic contamination. V. J. W.

Influence of thyroid gland on pituitary gonadotrophic activity in the rabbit. J. P. Chu (*Endocrinol.*, 1944, 34, 90—102).—The ovaries of thyroidectomised rabbits contain more large follicles than those of normal rabbits. These follicles do not ovulate after coitus or the injection of Cu acetate but do so after injection of chorionic gonadotropin. Fresh saline extracts of the hypophysis from thyroidectomised rabbits caused no ovulation but only follicle stimulation when injected into oestrous rabbits; similar extracts from normal rabbit hypophyses caused ovulation in 60% of oestrous rabbits. The ovaries of thyroidectomised rabbits were very sensitive to the ovulating activity of normal hypophyseal extracts but did not ovulate when injected with extracts from thyroidectomised rabbits. P. C. W.

XII.—REPRODUCTION.

Study of motility of intact uterus at term [secretion of oxytocin]. J. K. W. Ferguson (*Surg. Gynec. Obstet.*, 1941, 71, 359—366).—In anaesthetised cats and rabbits 48 hr. post partum stimulation of the pituitary by electrodes placed over the middle of the pituitary fossa enhances uterine contractions for 1—2 hr.; the result is similar to that produced by the intravenous injection of 0.5 unit of oxytocin. This effect on the uterus is more pronounced when all connexions between head and trunk have been severed apart from the carotid arteries and jugular veins. The contractions are followed by small rises in blood pressure but are not caused by them nor are similar changes produced by injections of acetylcholine, histamine, or adrenaline. Pituitrin causes a greater rise in blood pressure than does oxytocin but has an inhibitory effect on uterine activity. In rabbits 8—48 hr. after parturition the uterus is flabby and inactive when exposed but slowly develops fairly regular contractions during the 30 min. following exposure. This is due to secretion of oxytocin stimulated by stretching of the uterus by the application of a Cushny myograph; when one horn of the uterus is distended the other horn shows increased contractions but only if the hypophysis is intact. Stretching of the cervix also stimulates oxytocin secretion; vaginal dilation may cause oxytocin secretion but also causes reflex nerve effects on the uterus through a spinal reflex stimulating adrenergic nerves. The contractions caused by oxytocin are expulsive; those caused by adrenaline are not. P. C. W.

Embryonic differentiation of Cowper's and Bartholin's glands of opossum following castration and ovariectomy. D. Rubin (*J. Exp. Zool.*, 1943, 94, 463—476).—Growth and differentiation of Cowper's and Bartholin's glands proceed normally (at least up to 100 days old) after removal of the gonads in 20—40-day-old pouch-young opossums. H. L. H. G.

Sexual differentiation in opossum after early gonadectomy. C. R. Moore (*J. Exp. Zool.*, 1943, 94, 415—462).—The gonads were removed surgically from young opossums while still in the pouch 20—40 days after birth. Differentiation of the prostate in the male and of the reproductive tract in the female proceeds normally until the animal is about 100 days old; subsequently, retardation of prostate development and of uterine gland differentiation indicates a lack of gonadal hormone secretions. Up to the prepubertal stage therefore the reproductive system develops normally in the absence of the gonads. H. L. H. G.

Endometrium-like mucosa lining Fallopian tube. A. A. Marchetti (*Amer. J. Obstet. Gynec.*, 1940, 40, 69—79).—Two cases are described in which the endometrium-like mucosa when removed proved to be in the same phase of the menstrual cycle as the uterus. Theories of the origin and development of such structures are discussed. P. C. W.

Degeneration of corpora lutea in pregnant vitamin-E-deficient rat. B. H. Ershoff (*Anat. Rec.*, 1943, 87, 297—301).—The corpora lutea exhibited no significant difference in size for the first 16 days of pregnancy. Subsequently the corpora regressed in vitamin-E-deficient rats in contrast with their continued growth in animals

maintained on natural diet or -E-deficient food supplemented with α -tocopherol. The degeneration of the corpora invariably occurred subsequent to the death of the foetus and placenta. W. F. H.

Results of surgical castration in women under forty. W. Filler and N. Drezner (*Amer. J. Obstet. Gynec.*, 1944, 47, 122—124).—Menopausal symptoms developed in 85% of 40 cases but were not severe enough to require oestrogen therapy, being controlled by barbiturates. Libido was diminished in none of the women. P. C. W.

Comparative value of endometrial biopsies and vaginal smears. T. Neustaedter and L. L. MacKenzie (*Amer. J. Obstet. Gynec.*, 1944, 47, 81—92).—Vaginal smears are an adequate index of ovarian function during the proliferative phase of the menstrual cycle; endometrial biopsies are essential for study of the progestational phase and ovulation. P. C. W.

Constitutional type of precocious female puberty with report of 9 cases. E. Novak (*Amer. J. Obstet. Gynec.*, 1944, 47, 20—42).—Puberty may occur as early as the 15th month without any detectable endocrine tumour. P. C. W.

Sex hormone excretion of adult female and pregnant monkeys. R. I. Dorfman and G. Van Wagenen (*Surg. Gynec. Obstet.*, 1941, 73, 545—548).—The urinary excretion of oestrogens and androgens is increased in rhesus monkeys during pregnancy. Following parturition or operative removal of the placenta there is an immediate reversion to normal oestrogen excretion, though androgen excretion remains raised for 1 month. The results show that oestrogens may be produced by ovary, placenta, and adrenal cortex, and that this last organ is the main source of androgens produced during pregnancy. The excretion of oestrogenic and androgenic substances is compared in immature and pregnant monkeys. P. C. W.

Nutritional deficiency in aetiology of menorrhagia, metrorrhagia, cystitis mastitis, and premenstrual tension. II. Treatment with vitamin-B complex. M. S. Biskind, G. R. Biskind, and L. H. Biskind (*Surg. Gynec. Obstet.*, 1944, 78, 49—57; cf. A., 1943, III, 648).—37 of 39 patients under treatment for nutritional deficiency showed one or more of the above symptoms of endocrine disorder. All of 52 patients with one or more of the endocrine disorders also had some evidence of vitamin-B deficiency and all showed clinical recovery when given massive -B therapy (9—24 mg. of thiamin, 9 mg. of riboflavin, 60—210 mg. of niacinamide plus liver, yeast, and/or rice bran extract daily by mouth with additional parenteral administration of the above substances and 5—8 mg. of pyridoxine and Ca pantothenate 2—3 times weekly). The endocrine disturbance is attributed to excess of oestrogen in the presence of normal amounts of androgen due to the lack of hepatic inactivation of oestrogen known to occur in -B deficiency. During the -B therapy there was a decrease in the size of 2 enlarged thyroids, an improvement in the complexion, hypersensitivity (bruiseability) of the skin, and a reduction in the subcutaneous fat that has feminine distribution. P. C. W.

Dysfunctional uterine bleeding. K. J. Karnaky (*J. clin. Endocrinol.*, 1943, 3, 648—654).—A clinical review; massive stilboestrol therapy + thyroid medication is the most effective treatment. P. C. W.

Uterine bleeding induced by progesterone. B. Zondek, S. Rozin, and M. Vesell (*Amer. J. Obstet. Gynec.*, 1940, 40, 391—399).—If 5 mg. of progesterone are given to normal women daily throughout the entire menstrual cycle bleeding occurs at the expected time. Bleeding was produced in 17 of 19 women with secondary amenorrhoea injected with 10 mg. of progesterone daily for 5 days and in all of 3 women injected with 25 mg. daily for 2 days, but not in 2 women given a single injection of 50 mg. Bleeding occurred 60—72 hr. after the last of the 5 injections or 70—72 hr. after the last of the 2 injections. In 6 cases successive bleedings were produced by giving similar progesterone treatments starting 1—2 days after the cessation of the previous bleeding; this shows that proliferation of the endometrium is not essential for the action of progesterone to occur. Progesterone will not produce bleeding in cases of primary amenorrhoea but if 20,000 i.b.u. of oestradiol benzoate are given before or at the same time as the progesterone then bleeding occurs. P. C. W.

Preparation, biological assay, and properties of relaxin. A. A. Abramowitz, W. L. Money, M. X. Zarrow, R. V. N. Talmage, L. H. Kleinholz, and F. L. Hisaw (*Endocrinol.*, 1944, 34, 103—114).—A guinea-pig unit of relaxin is defined as that amount which when given as a single subcutaneous injection 24 hr. after the last of 4 daily injections of 0.83 μ g. of oestradiol produces relaxation of the pelvic ligaments in $\frac{2}{3}$ of a group of female guinea-pigs. Relaxin is extracted from defatted sow corpora lutea with 2% HCl, and inert material is removed by addition of NaCl to M. concn. and neutralisation. Relaxin is pptd. by saturation with $(\text{NH}_4)_2\text{SO}_4$. 1 guinea-pig unit is contained in 1 mg. of this extract which contains 15% of N. 120 mg. contained no oestrogenic activity and 500 mg. no progestational activity; these quantities represent 0.12 and 0.5 kg. of fresh tissue. P. C. W.

Concentration of relaxin in serum of pregnant and post-partum rabbits. S. N. Marder and W. L. Money (*Endocrinol.*, 1944, 34, 115—121).—Relaxin was found in the blood 3 days after mating, and rose rapidly between the 12th and 24th days, when it reached a plateau which was maintained for the remainder of pregnancy. There was a sharp decline in relaxin content after parturition and none was found after 3 days. Max. amount present was 10 guinea-pig units per ml. which is equiv. to the amount contained in 10 g. of fresh sow corpora lutea. Relaxin was also present in the urine on the 5th day of pregnancy and the amount excreted increased during the course of gestation. P. C. W.

Importance of female reproductive tract in formation of relaxin. F. L. Hisaw, M. X. Zarrow, W. L. Money, R. V. N. Talmage, and A. A. Abramowitz (*Endocrinol.*, 1944, 34, 122—134).—Relaxin is not sol. in fat solvents and does not produce oestrogenic or progestational reactions. Progesterone does not cause relaxation of the pelvic ligaments in the female guinea-pig in the absence of the ovaries and uterus; relaxin does. In castrated female guinea-pigs progesterone causes relaxation 72—96 hr. after the injection. The latent period with relaxin is 6 hr. Progesterone injections cause relaxin to appear in the blood of female rabbits (max. concn. 1 guinea-pig unit per 5 ml. of serum) in amounts equiv. to those present in pseudo-pregnancy and 2% of the max. amounts present in pregnancy. The amounts of relaxin formed were not related to the dose of progesterone, and relaxin was not produced by progesterone injections in the absence of the ovaries and uterus or in castrated male rabbits, indicating that the female reproductive tract is essential for the formation of relaxin. About the same length of time was required for a given dose of progesterone to give rise to relaxin in the blood of ovariectomised rabbits pre-treated with oestrogen as to cause relaxation of pelvic ligaments in female guinea-pigs. Oestradiol stimulated the formation of relaxin in the absence of the ovary but not in the absence of the ovary and uterus. Oestrogens facilitate the action of relaxin on the pelvic ligaments of ovariectomised guinea-pigs, probably by the resorption of cartilage and bone which they produce. P. C. W.

Laboratory and clinical experience with oral pregnenolone. M. R. Cohen and I. F. Stein (*Amer. J. Obstet. Gynec.*, 1940, 40, 713—724).—2 oral administrations of 10 mg. of pregnenolone caused oestrus in castrated rats. Castration changes in young male rats were prevented by 10 daily doses of 2.5—5 mg. 5 oral doses of 10 mg. produced progestational changes in castrated rats. Adult rats fed 0.25—5 mg. daily for 20 or 60 days showed symptoms of gonadotropin depression though the highest dose caused an increase in uterine wt. Rats 5 days pregnant were fed 6—200 mg. of pregnenolone during 6—40 days; abortion occurred in 3, and stillbirths in 2, of 14 treated animals. Lactation was impaired in all animals. Cloudy swelling of the kidney was produced in most of the rats and necrosis of the kidneys was common. 37 patients with menometrorrhagia, dysmenorrhoea, premenstrual tension, or amenorrhoea were given 15—30 mg. of pregnenolone daily by mouth (total dose 300 mg. or less); 48% of the menometrorrhagia cases were improved but the treatment had little effect in the other complaints. 31% of cases complained of nausea. P. C. W.

Endocrine therapy in gynaecology and obstetrics. P. M. F. Bishop (*J. Obstet. Gynaec.*, 1944, 51, 51—63).—A review. P. C. W.

Effects of stilboestrol in parturient women. H. T. Connally, D. I. Dann, J. M. Reese, and L. H. Douglass (*Amer. J. Obstet. Gynec.*, 1940, 40, 445—448).—200 parturient women (all operative cases) were given 5 mg. of stilboestrol intramuscularly 6—12 hr. after parturition and 5 mg. daily by mouth for the next 10 days or 10 mg. intramuscularly and 10 mg. orally daily for 3 days and 5 mg. orally for the remaining 7 days. The morbidity of the series was 4% as against a morbidity rate of 12.8% for the whole no. of cases (operative and non-operative) for 1939. There was no apparent effect on the early involution of the uterus but the involution of the uteri by the 20th day post-partum had been hastened. Lactation was suppressed in 70% of cases. On clinical evidence there appeared to be a sensitisation of the uterus to the action of oxytocics. P. C. W.

Use of desiccated blood pellets in assay of blood-oestrogen. S. J. Meyer and E. L. Sevringhaus (*J. clin. Endocrinol.*, 1943, 3, 545—547).—5 blood samples from 4 normal women, taken at different stages of the menstrual cycle, were dried and compressed into pellets. Application of these pellets into the vagina of ovariectomised rats did not produce oestrus. The failure is attributed to the smallness of the max. quantity of blood which can be so applied (0.5 ml.). P. C. W.

Treatment of vulvovaginitis [in children] with oestrogens. W. E. Brown (*Nebraska Sta. Med. J.*, 1943, 28, 354—358).—Report of 13 gonorrhoeal and 6 non-sp. cases treated successfully, with individual dosages. E. M. J.

Stilboestrol in treatment of menopausal symptoms. F. L. Payne and C. W. Muckle (*Amer. J. Obstet. Gynec.*, 1940, 40, 135—139).—Favourable clinical report. P. C. W.

Suppression of lactation by stilboestrol. C. W. Mucklé (*Amer. J. Obstet. Gynec.*, 1940, 40, 133—135).—Favourable clinical report.

P. C. W.

Differential behaviour of liver towards natural and artificial oestrogens. A. Lipschütz, U. Quintana, and S. Bruzzone (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 43—45).—Natural oestrogens, implanted in the spleen, failed to cause fibroids in spayed guinea-pigs, but such pellets of diethylstilboestrol or hexoestrol were able to induce them. There was a similar difference with other toxic oestrogen reactions.

V. J. W.

Evaluation of stilboestrol as therapeutic oestrogen. U. J. Salmon, S. H. Geist, and R. I. Walter (*Amer. J. Obstet. Gynec.*, 1940, 40, 243—250).—45 patients were given 0.3—6 mg. daily by mouth or 1—5 mg. intramuscularly 1—3 times weekly. The effects on the vaginal mucosa and endometrium were like those of the natural oestrogens; the hot flushes of the menopausal patients were relieved; the excess gonadotropin excretion in the urine of menopausal patients was reduced. Nausea and vomiting were common.

P. C. W.

Changes in vascular pattern of ovary of albino rat during oestrous cycle.—See A., 1944, III, 320.

Endosteal bone deposition in femurs of vitamin-D-deficient mice treated with oestrogen.—See A., 1944, III, 386.

Effect of administration of oestrogen on mechanism of [renal] ascorbic acid excretion.—See A., 1944, III, 414.

Quantitative study of effects of oestradiol benzoate and progesterone in modifying incidence of binucleated cells in rabbit liver.—See A., 1944, III, 412.

Postpartum pyelo-ureteral changes following hormone administration. S. Lubin, L. S. Drexler, and W. A. Bilotta (*Surg. Gynec. Obstet.*, 1941, 71, 391—395).—30 normal post-partum women were divided into 5 groups of 6 and pyelograms were recorded on the 1st and 7th days after parturition. The groups received no treatment, or daily injections of 10 i.u. of pituitrin, 1 i.u. of progesterin, or 1000 i.u. of chorionic gonadotropin, or received 5 mg. of stilboestrol by mouth daily. Pyelo-ureteral dilatation had reverted to normal in more of the patients treated with pituitrin or chorionic gonadotropin than in those untreated; the no. was less than normal in those treated with progesterin.

P. C. W.

Relation of obstetric complications to sterility. R. B. Nicholls (*Amer. J. Obstet. Gynec.*, 1940, 40, 276—278).—Of 118 women complaining of sterility 57 became pregnant during treatment. Of these 9 aborted and there were obstetric complications in 19.

P. C. W.

Uterine contractions in late pregnancy and their relation to length of labour. D. P. Murphy (*Surg. Gynec. Obstet.*, 1941, 73, 681—685).—Records were made in 129 patients during the 9th and 10th lunar months of pregnancy with the Lorand tocograph. There were wide individual variations in the character of the uterine contractions recorded. During the 37th and 38th weeks contractions tended to be small or absent, but were unusually long and strong during the 39th and 40th weeks; there was a progressive increase in tension throughout. Multigravidae women and others with labour shorter than the average had contractions that were longer and stronger, more rhythmic, and less frequent than the average.

P. C. W.

Uterine contractions of early pregnancy and their relation to duration of labour. D. P. Murphy (*Surg. Gynec. Obstet.*, 1941, 73, 498—501).—The uterine contractions of 250 women were recorded by the Lorand tocograph at intervals during the 110th—279th days of pregnancy. Foetal movements were detected on the 130th day, but no spontaneous uterine contraction was recorded before the 160th day, after which there was a progressive increase in uterine activity which was most marked about the 32nd week. Patients experiencing uterine contractions before the 33rd week had shorter labours than those who did not.

P. C. W.

Uterine contractions associated with prolonged labours. D. P. Murphy (*Surg. Gynec. Obstet.*, 1944, 78, 207—210).—Among 100 patients whose uterine contractions were recorded at 1½—2-hourly intervals during labour there were 3 cases of prolonged labour. In the normal cases the uterine contractions were rhythmic and the pattern of the contractions varied little throughout labour in any one case. In the 3 cases of prolonged labour the contractions appeared normal in 1 case which proved to have disproportion; the other 2 cases were of primary, and primary + secondary, inertia. In the latter 2 cases the contractions were small or absent, varied greatly in form, and showed no rhythmicity.

P. C. W.

Pressure theory of eclampsia. J. A. Davis and L. O. Snook (*Int. Abst. Surg.*, 1941, Oct., 336—342).—A review.

P. C. W.

Placenta in eclampsia and nephritic toxæmia. N. M. Falkiner and J. O. E. Thorp (*J. Obstet. Gynaec.*, 1944, 51, 30—37).—9 cases are described and plates of their placenta published as representative of the findings in 100 cases of toxæmia. Eclampsia is associated with an acute placental lesion characterised by engorgement of the

foetal circulation, gradual disappearance of the intervillous space with disappearance of the maternal circulation, and necrosis of the villous tree. Nephrotic toxæmia is associated with a chronic lesion of the same type. In some cases the whole placenta only becomes involved gradually; in others there is partial placental separation with consequent degeneration of the involved cotyledon. The early stages of the eclamptic lesion permit oxygenation of the foetus to continue.

P. C. W.

Effect of salt-poor diet on duration of labour. W. Pomerance and I. Daichman (*Amer. J. Obstet. Gynec.*, 1940, 40, 463—466).—78 pregnant women maintained on a salt-poor diet showed an average duration of labour about 50% of normal.

P. C. W.

Oxytocin-destroying principle of blood. E. Werle, A. Hevelke, and K. Buthmann (*Biochem. Z.*, 1941, 309, 270—287).—An oxytocin-inactivating principle can be detected in the blood of pregnant women from the second month. It remains at a fairly const. level from the third to the eighth month, is highest at birth, and can no longer be detected one month afterwards. It can also be detected in colostrum. It is thermolabile and has an optimum pH of 6.5—7.5, but it is not sensitive to ultra-violet light. Cysteine and glutathione have a strong activating effect. Acetone-ether desiccation of pregnancy serum inactivates the principle, but treatment with cysteine or glutathione reactivates it. The principle can often be detected in the urine of both pregnant and non-pregnant women. No sp. inhibiting substance has been found.

P. G. M.

Calcium, phosphorus, and nitrogen metabolism in second half of pregnancy and during lactation. F. W. Oberst and E. D. Plass (*Amer. J. Obstet. Gynec.*, 1940, 40, 399—413).—10-day Ca, P, and N balances were carried out on 5 pregnant women at intervals between the 21st and 40th weeks of pregnancy and on 3 of the women during lactation. The Ca intake during pregnancy was 1.63—2.64 g. daily and during lactation 1.92—2.18 g. daily; Ca retention was 0.23—0.88 g. and 0.02—0.51 g. daily respectively. The lowest retention during lactation was found in the woman with the highest milk output. P intake during pregnancy and lactation was 1.44—2.0 g. daily and 1.59—1.95 g. daily and the retention was 0.02—0.68 g. and —0.18—0.21 g. daily; the negative balances occurred in 2 women shortly after parturition. The N intakes were 9.99—15.15 g. daily in pregnancy with retentions of —0.77—3.65 g. daily; the negative balance occurred in 1 woman during illness. During lactation the daily N intake was 11.6—16.8 g. and the retention was negative in all cases during the first and second weeks of the puerperium but became positive later.

P. C. W.

Two- and six-hour pregnancy test. H. S. Kipperman, R. B. Greenblatt, and C. R. Noback (*J. clin. Endocrinol.*, 1943, 3, 548—550).—Correct diagnoses were obtained in 48 pregnant women and 38 non-pregnant women by the methods in which two simultaneous intraperitoneal injections of 0.75 ml. of urine are made in the left and right flank of immature rats killed 2 hr. after the injection, or where 2 ml. of urine are injected subcutaneously and the animal is killed 6 hr. later. In both cases pregnancy is indicated by the hyperæmia produced in the uterus and ovaries. When 5 ml. of pregnancy urine are injected into metæstrous or di-œstrous adult rats the recent corpora lutea are hyperæmic 6 hr. later.

P. C. W.

Positive pregnancy test without endometrial decidua in ectopic pregnancy. H. I. Kantor and S. Wimpfheimer (*J. Mt. Sinai Hosp.*, 1944, 10, 601—604).—Report of 2 cases.

E. M. J.

Quantitative pregnancy tests in [diagnosis of] hydatid mole and chorionepithelioma. R. T. Frank (*J. Mt. Sinai Hosp.*, 1943, 10, 112—118).—Report of 27 cases.

E. M. J.

Calcium gluconate and vitamin-D in neuro-muscular dystrophy during pregnancy and labour. J. R. Goodall (*J. Mt. Sinai Hosp.*, 1943, 10, 119—131).

E. M. J.

Potential fertility of ova from ewes treated with gonadotropins. R. L. Murphree, E. J. Warwick, L. E. Casida, and W. H. McShan (*J. Animal Sci.*, 1944, 3, 12—21).—Ewes in the "follicular" (12 days after beginning of œstrus), the "luteal" (3 days after), or the "anœstrous" reproductive stage were injected with a follicle-stimulating extract on 4 consecutive days followed on the 6th day by either a luteinising extract or unfractionated pituitary extract. All ewes were artificially inseminated on this and the following day. 24 "follicular" ewes had a total of 576 corpora lutea and yielded 357 eggs; 7 of these animals had no fertilised eggs, while the other 17 had 153. 5 "luteal" ewes had 57 corpora lutea but only 25 eggs, all unfertilised. 9 "anœstrous" ewes had 84 corpora lutea and 25 unfertilised eggs. 4 other "anœstrous" ewes were treated with pregnant mare's serum, either alone or with unfractionated pituitary extract; they had 8 corpora lutea and 8 eggs (1 fertilised). There were unexplained differences, both between similarly treated ewes and between batches of follicle-stimulating extract, in the ability to produce potentially fertile eggs.

E. C. W.

Vascular changes in rabbit uterus and in intraocular endometrial transplants during pregnancy. B. Krichesky (*Anat. Rec.*, 1943, 87, 221—234).—Marked hyperæmia occurs in the superficial region of

the mucosa during the first 4 days of pregnancy. The area of the vascular bed increases gradually from the 7th to 23rd day. Reduction in this area takes place until the 28th day and is followed by an increase continuing until delivery. The non-pregnant condition of the mucosa is attained by the 12th day post-partum. Tissue spaces are described in the stroma 2 days prior to delivery and their origin is related to the appearance of extensive oedema. The changes in the vascular pattern in intraocular endometrial transplants are similar to those in the uterus *in situ*. W. F. H.

Heredity and length of gestation. E. R. Bryant (*J. Heredity*, 1943, 34, 339).—In pure-bred Aberdeen Angus cattle the calves are carried for 16 days less than in pure-bred Herefords, whilst cross-bred calves are carried for an intermediate period. In humans also, the length of gestation may depend on the genotype of the foetus rather than on that of the female parent alone. L. G. G. W.

Pregnanediol determination as diagnostic aid. C. L. Buxton (*Amer. J. Obstet. Gynec.*, 1940, 40, 202—211).—Pregnanediol was excreted in the urine of two women with total or subtotal hysterectomy after the injection of 30 mg. of progesterone for 3 days; 2 other women showed no such excretion. It is concluded that the uterus is not essential for the conversion of progesterone into pregnanediol. Determinations in pregnant and amenorrhoeic women show that the absence of pregnanediol is indicative of non-pregnancy while the presence of pregnanediol does not indicate pregnancy since the amounts present may not be more than are present in the luteal phase of the normal menstrual cycle. One of five cases of habitual abortion (more than 3 previous abortions) treated with progesterone had abnormally low pregnanediol output and subsequently aborted again. Simultaneous pregnanediol determinations and endometrial biopsies were made in 78 women. Pregnanediol was excreted when the endometrium was in the secretory phase and only during that time. P. C. W.

Correlation of Friedman test and endometrial phase in ectopic pregnancy. M. E. Goldblatt and H. A. Schwartz (*Amer. J. Obstet. Gynec.*, 1940, 40, 233—242).—32 cases are analysed. There was an inverse correlation between the incidence of endometrial decidual and vaginal blood loss. The positive Friedman test depended on the presence of endometrial decidual or of placental tissue in the Fallopian tubes; in the latter case there is profuse bleeding from the vagina. P. C. W.

Blood-phosphatase in pregnancy an indication of twins.—See A., 1944, III, 394.

Serum-gonadotrophin. II. Purification. C. Rimington and I. W. Rowlands (*Biochem. J.*, 1944, 38, 54—60).—The authors' previous method for preparing a gonadotrophic extract from pregnant mares' serum (cf. A., 1941, III, 764) has been improved to give concentrates having a potency of 200—1000 i.u. per mg. and containing 70% of the total activity of the original serum. By (a) extraction with alcohol at pH 4.8 and pptn. with 86% alcohol, (b) removal of inactive material insol. in 56% alcohol at pH 6.5, and (c) fractionation with alcohol at pH 1.5 and 0°, preps. have been obtained assaying 12,500 i.u. per mg. The action of acid, as in stage (c), is not a hydrolytic fission, since the potency of the product is independent of the time of contact with acid. 85% of the activity of solutions at pH 5.9 is lost in 96 hr. at 60°, whether in presence of O₂ or not, and inactivation also gradually occurs at 37°; the rate is more rapid in presence of either acid or alkaline buffers than in water alone. The inactivated material could not be reactivated by treatment with quinol. The hexose content of the active fraction was unrelated to the gonadotrophic activity; the hexose-hexosamine ratio was 2 : 1, as in similar fractions from normal horse serum. E. C. W.

Clinical experiences with equine gonadotropic hormone. H. W. Erving, C. Sears, and J. Rock (*Amer. J. Obstet. Gynec.*, 1940, 40, 695—713).—48 cases of sterility, dysfunctional bleeding, or amenorrhoea were treated with injections of equine gonadotropin (1—5 doses of 200—2000 r.u. intramuscularly or intravenously) alone or in combination with stilboestrol or chorionic gonadotropin. There was no change in 81% of cases and there was no definite evidence of ovulation in any patient. Allergic reactions occurred in 3 patients and 3 patients developed cystic ovaries. P. C. W.

Maintenance of pregnancy induced in female rabbit following treatment with pituitary gonadotropins. E. J. Warwick, R. L. Murphree, L. E. Casida, and R. K. Meyer (*Anat. Rec.*, 1943, 87, 279—296).—Superovulation was induced in juvenile rabbits by gonadotropic extracts of sheep pituitary powder. The animals were artificially inseminated following treatment. A high % of the ova produced were fertilisable but this was followed by heavy embryonic mortality during the first 9 days of gestation, and virtually no embryos lived longer than 10 days. The evidence suggests that embryonic death is due to either a primary or secondary uterine deficiency rather than to defects induced in the ova by the rapid maturation of the follicles. W. F. H.

Survival of multiple pregnancies induced in ewes following treatment with pituitary gonadotropins. L. E. Casida, E. J. Warwick, and R. K. Meyer (*J. Animal Sci.*, 1944, 3, 22—28).—Superovulation

was induced in 25 ewes by injections of follicle-stimulating extract on the 12th day of the oestrous cycle and on the next 3 days, followed on the 17th day of the cycle by luteinising extract. The ewes were either mated or artificially inseminated. 6 of 7 ewes were pregnant at 2—5 days (average embryos per ewe, 9.2), 8 of 10 at 14—27 days (3.4 embryos per ewe), and 5 of 8 at 30—37 days (0.8 embryo per ewe). The nos. of corpora lutea were approx. equal, and the progressive death of the embryos was probably due to either abnormalities in the ova induced by rapid maturation of the follicles or inability of the uterus to support many embryos. Of 26 fertilised ova transplanted to normal ewes, there were only 3 "takes," but the transplantation technique may have been faulty and the results are inconclusive. E. C. W.

Chorioepithelioma of male treated with pregnancy serum. G. H. Twombly and A. F. Hocker (*Surg. Gynec. Obstet.*, 1941, 73, 733—739).—A case is described of chorioepithelioma of the testis. At death the pituitary gland showed an increased no. of basophil cells and degeneration of eosinophil cells similar to that seen in pregnancy. No gonadotropic activity could be detected in the gland. The daily excretion of chorionic gonadotropin was 40,000—130,000 m.u. Following the injection of 250 ml. of the serum from cord blood or from the blood of parturient women the daily excretion rose to 440,000 m.u. The increase cannot be accounted for by the gonadotropin content of the injected serum and is probably due to non-sp. protein shock. Similar though not so great rises in gonadotropin excretion were recorded in 3 cases of teratoma testis injected with the antiserum of goats injected with pregnancy urine or with normal male human serum. The chorioepithelioma patient excreted amounts of oestrogen higher than those in normal women, which probably explains his gynecomastia; his androgen excretion was normal. Extraction of 2 8-hr. specimens of urine produced 10—16 mg. of cryst. hormone, probably pregnanediol. P. C. W.

Effect of cystine on human milk production. R. G. Dagg (*Amer. J. Obstet. Gynec.*, 1940, 40, 457—460).—The daily addition of 5 g. of cystine, glycine, and glutamic acid to the normal diet in 4 multiparous women with previous histories of deficient or absent lactation caused a stimulation of milk secretion. P. C. W.

Cyclic changes in mammary gland of rhesus monkey. H. Speert (*Surg. Gynec. Obstet.*, 1941, 71, 388—390).—Weekly biopsy specimens were examined from the mammary glands of 9 regularly menstruating rhesus monkeys. There was an enlargement of the lobules with an increase in vascularity and a dilatation of the acini during the premenstrual and menstrual periods. These changes did not occur in those monkeys that had anovulatory cycles. P. C. W.

Alterations in mammary structure following adrenalectomy in immature male rat. C. F. Reeder and S. L. Leonard (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 61—62).—Adrenalectomy with NaCl maintenance caused an increase in lateral buds on the mammary duct system, and often increased growth of end buds. Oestrogen treatment caused dilatation or further increase in the lateral buds. V. J. W.

Care of human sperm. R. L. Brown (*J. Lab. clin. Med.*, 1944, 29, 211—213).—A review of the author's previous work. C. J. C. B.

Benign and malignant testicular tubular adenoma in female [and existence of true ovotestis]. J. Novak (*J. Mt. Sinai Hosp.*, 1943, 10, 250—268).—A review and report of 3 cases. E. M. J.

Postnatal history and function of interstitial cells of testes of bull. C. W. Hooker (*Amer. J. Anat.*, 1944, 74, 1—37).—At 1 month the tubules are small, devoid of lumina, and widely separated. Inter-tubular spaces contain only mesenchyme. Up to 2 years growth of the testis is mainly tubular. Leydig cells differentiate from interlobular mesenchyme and nuclear and cytoplasmic changes during their formation are described. At 3½ months a few cells have granular cytoplasm. Up to 2 years there is a gradual increase in the no. of cells with Leydig cell nuclei and granular protoplasm. After 2 years Leydig cells become extensively vacuolated. From 5 to 15 years there is progressive loss of vacuolation and diminution in the size of the cells. Disintegration of Leydig cells was observed at 15 years. Androgen content increases uniformly through the first 2 years; from 2 to 5 years it increases sharply to a high level and decreases from 5 to 15 years. No striking change in Leydig cells or androgen content occurs at puberty, which is during the second 6 months of life. W. F. H.

Hermaphroditism. H. F. Bettinger (*Surg. Gynec. Obstet.*, 1944, 78, 91—97).—A review of the literature with detailed description of 1 case. P. C. W.

Evaluation of androgenic therapy in gynaecological practice. J. W. Huffman (*Amer. J. Obstet. Gynec.*, 1940, 40, 675—694).—The experimental work on the depression of pituitary gonadotropin secretion, inhibition of sex cycles, inhibition of lactation, and temporary masculinisation is reviewed and confirmed. Testosterone propionate therapy was successfully used in the treatment of functional uterine bleeding in 22 women. Doses of 25 mg. were given every 2 days until bleeding stopped—usually within 14—20 days. Treatment had to be repeated every 4—6 months in most

cases. Temporary masculinising symptoms, particularly hypertrophy of the clitoris, appeared in women who received the largest doses. Other uses of androgen therapy are discussed. P. C. W.

Sublingual use of testosterone in 7 cases of hypogonadism. Report of three congenital eunuchoids in one family. L. M. Huxthal (*J. clin. Endocrinol.*, 1943, 3, 551—556).—Sublingual administration of testosterone in propylene glycol-alcohol is effective but needs more testosterone than tablet implantation. In some cases it is more efficacious than intramuscular testosterone propionate for maintenance therapy. In a case of hypopituitarism due to chromophobe tumour, hair growth followed local application of testosterone to the pubic and axillary regions. The growth of face hair and distribution of pubic hair are abnormal in eunuchoids treated with testosterone. P. C. W.

Excretion in dog of androgens and oestrogens in bile following injections of androgens. K. E. Paschkis, A. Cantarow, A. E. Rakoff, L. Hansen, and A. A. Walking (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 127—130).—In female dogs with biliary fistulae, intravenous injection of androsterone, testosterone, or methyltestosterone caused excretion of varying amounts of androgen, and sometimes of oestrogen, in the bile, which may continue for 72 hr. Urinary androgen was not increased. Introduction of testosterone into the duodenum also produced an increase in biliary androgen and oestrogen. V. J. W.

Androgen assay on three-day-old male chicks. A. E. Rakoff, K. E. Paschkis, and A. Cantarow (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 124—127).—The unknown androgen is compared with a standard androsterone by application in ether solution to the comb surface daily for 7 days. The ratio comb wt./body wt. is determined and compared with an ether control. V. J. W.

XIII.—DIGESTIVE SYSTEM.

Gastroenterology. C. M. Jones (*Arch. intern. Med.*, 1944, 73, 53—108, 154—197).—A review of the literature from July, 1942, to July, 1943. C. J. C. B.

Idiopathic muscular hypertrophy of oesophagus. J. Bühler (*Schweiz. Z. Path. Bakt.*, 1943, 6, 249—264).—5 cases are reported and the aetiology especially in relation to vagal irritation is discussed. E. M. J.

Biology of achlorhydria in relation to anaemia. E. Moschowitz (*J. Mt. Sinai Hosp.*, 1944, 10, 796—803).—A review. E. M. J.

Effects of histamine and insulin on gastric secretion, with gastroscopic observations of the secreting stomach. M. Gill (*J. Physiol.*, 1943, 102, 13—14p).—The reflex gastric secretion of hypoglycaemia was summed with a chemically produced secretion by carefully timed doses of histamine and insulin (7 units). The combined response was always greater than that after either stimulus singly. Secretion was observed gastroscopically and found to precede vasodilatation; this sequence was also seen after giving conc. meat extract. 13 out of 161 subjects were normal controls, the rest having gastroduodenal lesions. W. H. N.

Abdominal pain in cyclic vomiting. S. Karelitz and S. Blumenthal (*Surgery*, 1941, 10, 613—623). G. P.

Effect of silk [and catgut sutures] on intestinal anastomoses. C. L. Hoag, J. B. Saunders, H. H. Lindner, and J. M. Moore (*Surgery*, 1941, 10, 604—612).—When silk was used for sutures of the mucosa and serosa in entero-anastomoses in dogs, the stoma became inflamed, but not when catgut was used. G. P.

Treatment of [direct] inguinal hernia by injections under operative visualisation. E. E. Arnheim and H. Neuhoof (*Surgery*, 1941, 10, 624—632).—Synlasol, an extract of psyllium seeds, injected into tissues produces inflammation with resulting fibrosis. 17 patients with direct inguinal hernia were treated by injection of 20—50 ml. of synlasol into the preperitoneal tissues over the sac of the hernia. 9 were cured and in 7 the hernia recurred. The injections caused fever which lasted for 4 days. The method is not recommended. G. P.

Mucocoele of appendix and pseudomyxoma peritonei. M. Grodin-sky and A. S. Rubnitz (*Surg. Gynec. Obstet.*, 1941, 73, 345—354).—A case is reported and the literature reviewed. In rabbits, ligation of the appendix produced acute appendicitis and gangrene. If the lumen of the appendix was washed before the ligation then mucocoeles developed and if left long enough resulted in pseudomyxoma peritonei by rupture of the mucocoele or extension through its wall. It was possible to produce pseudomyxoma peritonei by intraperitoneal injection into rabbits of the contents of mucocoeles or of emulsions of the walls and contents of the secondary deposits. When the contents or emulsions were passed through a Seitz filter they became innocuous. P. C. W.

Differentiation in absorption of olive oil and oleic acid [from intestine] in rat. A. C. Frazer (*J. Physiol.*, 1943, 102, 306—312).—Olive oil and equiv. amounts of oleic acid and glycerol are equally well absorbed by rats; Sudan IV enables olive oil or oleic acid to

be identified after absorption. Neutral fat appears as large globules in the intestinal cell and as chyle in the lacteals and its absorption leads to systemic but not portal lipaemia. Fatty acid appears as a granular deposit in the intestinal cells, is absent from lacteals, and leads to portal but not systemic lipaemia. Neutral fat is directed to the fat depôts; fatty acid leads to a deposit in the liver. It is postulated that normally lipolysis in the lumen of the intestine is only partial, its degree determining the fate of the absorbed fatty material. W. H. N.

Lipolysis and fat absorption. A. C. Frazer (*J. Physiol.*, 1943, 102, 329—333).—Absorption of fat in rats is determined by analysis of intestinal residues and confirmed by the appearance of the cells. The pathway is shown by systemic and portal chylomicrographs and inspection of lacteals. The destination is traced by using Sudan-stained fat. The picture after feeding neutral fat is characteristically different from that after fatty acid (cf. preceding abstract). Neutral fat + active lipase yields a fatty acid picture. Neutral fat + boiled lipase (or lipase inhibited by Na cetyl sulphate) yields a neutral fat picture. The inhibitory action of Na cetyl sulphate was confirmed by incubating intestinal contents of this group *in vitro*. The peak of the human systemic chylomicrogram following 30 g. of neutral fat is reduced by 75% by adding lipase. W. H. N.

Diagnostic value of pancreatic function tests in 47 surgically treated cases. L. Bauman and A. O. Whipple (*Amer. J. med. Sci.*, 1944, 207, 281—290).—The pH and enzyme concn. of pancreatic juice were determined in 150 patients after mecholyl injection. Painless obstructive jaundice with normal pancreatic ferments favours the diagnosis of carcinoma of the bile duct. In tumour of the ampulla, normal ferments may be obtained if the pancreatic duct enters the duodenum separately or if there is an accessory duct of Santorini. Painless obstructive jaundice with diminished or absent ferments favours the diagnosis of carcinoma of the pancreas. C. J. C. B.

Alkali in pancreatic secretion. G. O. Oldfelt (*J. Physiol.*, 1943, 102, 362—366).—The alkali reserve and the content of K, Na, and Ca of the pancreas of urethanised cats are not altered by profuse secretion of pancreatic juice caused by repeated injections of secretin. The alkali of the juice is therefore obtained directly from the blood and not from a store in the gland. W. H. N.

XIV.—LIVER AND BILE.

Serum colloidal gold reaction as liver function test. N. F. Mac-lagan (*Brit. J. exp. Path.*, 1944, 25, 15—20).—This reaction is greatly influenced by the pH and ionic strength of the medium. To 0.05 ml. of serum is added 0.5 ml. of a barbitone buffer, pH 7.8, and then 2.5 ml. of Au sol. The final ionic strength is 0.01 including serum-electrolytes and Au. The result is read after keeping at room temp. overnight. The test is a valuable indicator of liver damage and of particular val. in distinguishing obstructive jaundice from infective hepatitis or hepatic cirrhosis. F. S.

Fat metabolism in liver on diets free from choline; relation to vitamin-K. C. R. Honorato and H. Molina (*Rev. Soc. argent. Biol.*, 1942, 18, 431—437).—Rats were kept on a diet free from choline (Griffith and Mulford); one group received 250 µg. per g. of choline and another 10 µg. of vitamin-K. The controls had 19.92 ± 1.42% of fat in the liver; in the choline- and -K-treated groups liver-fat amounted to 8.44 ± 1.72 and 9.67 ± 0.84% respectively. There was fatty infiltration and degeneration of the liver cells and haemorrhage in the kidney in non-treated animals; these alterations were absent or slight in the treated animals. Thus -K replaces choline in choline-free diets. J. T. L.

Production of hydroxyphenyl compound from L-phenylalanine incubated with liver slices. M. L. C. Bernheim and F. Bernheim (*J. Biol. Chem.*, 1944, 152, 481).—An unidentified hydroxyphenyl compound, possibly tyrosine, is formed when L-phenylalanine is incubated with rat liver slices. D-Phenylalanine gives a lower yield, and acetylphenylalanine, phenylethylamine, and phenylacetic acid none at all. p-Hydroxyphenylpyruvic and lactic acids and tyramine are not formed. R. L. E.

Production of folic acid by rat liver *in vitro*. L. D. Wright and A. D. Welch (*Science*, 1943, 98, 179—182).—The low folic acid content of human urine could not be increased by autoclaving with or without acid or alkali, or by digestion with takadiastase, but folic acid is produced by incubation of urine with fresh rat liver. Certain liver extracts, acid-autoclaved grass, and synthetic xanthopterin also produce folic acid on incubation with rat liver. Xanthopterin or a derivative probably acts as a substrate for the enzymic synthesis of folic acid. E. R. R.

Iron-protein complex from liver. B. Libet and K. A. C. Elliott (*J. Biol. Chem.*, 1944, 152, 613—615).—The complex, "ferrin," which is obtained, possibly in denatured state, by extraction with hot water and pptn. with 3N-HCl (pH adjusted to about 2.5), is partly purified [Fe (probably Fe^{III}) content 15.7%] by pptn. from

solution in aq. NaOH with $(\text{NH}_4)_2\text{SO}_4$ and dialysis against running distilled water. It does not occur in appreciable proportions in brain or spleen. It is sol. in neutral and alkaline solution. Conc. alkali has no effect on it but its Fe is irreversibly removed by conc. HCl. W. McC.

Presence of choline-like substance in several injectable solutions of liver. J. E. Davis and M. J. C. Allinson (*Proc. Soc. Exp. Biol. Med.*, 1944, 54, 266—268).—6 out of 7 commercial liver extracts, treated with acetic anhydride, thereafter contained a substance which lowered blood pressure in dogs and the effect of which was abolished by atropine. V. J. W.

Oxygen consumption of normal rat liver slices in serum and in lymph taken from legs before and after severe burns.—See A., 1944, III, 356.

Specific stimulators of hæmatopoiesis from beef liver.—See A., 1944, III, 321.

Inactivation of œstradiol in liver. Inactivation of stilbœstrol by liver *in vitro*.—See A., 1944, III, 343.

Effect of dietary urea on kidneys and liver of steers.—See A., 1944, III, 352.

Production of glycogen from C_4 -dicarboxylic acids of liver.—See A., 1944, III, 357.

Inhibition of experimental liver cancer in rats by addition of adsorbent to diet.—See A., 1944, III, 350.

Morphology and pathogenesis of hepatic cirrhosis. H. T. Karsner (*Amer. J. clin. Path.*, 1943, 13, 569—606).—An exhaustive review. C. J. C. B.

Reaction following ingestion of sodium benzoate in a patient with severe liver damage. R. E. Kinsey and D. O. Wright (*J. Lab. clin. Med.*, 1944, 29, 188—195).—A coloured male with marked yellow atrophy of the liver had a severe reaction on 2 occasions, 4 hr. after ingesting Na benzoate, with substernal pain, raised blood pressure, and dyspnœa, followed by shock. 3 days after ingesting the second dose of Na benzoate, the patient developed signs of systemic infection and the white blood count showed an absence of the neutrophilic granulocytes, but normal or increased eosinophils and basophils. The bone marrow showed arrest of maturation of the neutrophils, but normal maturation of eosinophils and basophils. There was later a marked leucocytic response to a generalised septicæmia, showing complete recovery of the bone marrow. The icteric index increased from 220 to 275 after the first reaction, and to 285 after the second reaction. The cause of the increase in icteric index after the reactions was not determined. C. J. C. B.

Normal appearing gall-bladder. Report of 32 operated cases with long follow up. J. R. Verbryke, jun. (*Amer. J. digest. Dis.*, 1943, 10, 190—193).—27 cases were much improved. It is justifiable to remove an apparently normal gall-bladder if other signs point to disease of this organ. N. F. M.

Excretion of penicillin in bile.—See A., 1944, III, 358.

XV.—KIDNEY AND URINE.

Laboratory investigation of renal function. V. I. Krieger (*Med. J. Austral.*, 1944, I, 101—104).—No single test is completely satisfactory for the determination of renal function in all types of patients. Several tests and the correlation of all data are necessary. F. S.

Renal pathology of nutritional hypertension in rats. R. M. Calder (*J. Exp. Med.*, 1944, 79, 215—220).—Rats were made hypertensive by being kept on a diet partly deficient in the heat-stable fractions of the vitamin-B complex. The surface of the kidneys became finely granular; the afferent renal arterioles showed irregular subendothelial hyaline deposits encroaching on the lumen. The interlobular arteries showed similar changes plus degeneration of the media. Small areas of ischæmic atrophy occurred in the cortex and medulla, with necrosis of the epithelial lining of the uriniferous tubules. The glomeruli were small with a decreased no. of capillary loops and thickened basement membrane. Cortical and subcapsular hæmorrhagic infiltrations were found in the kidneys of animals maintained on a more profoundly deficient diet. (Illustr.) A. S.

Pregnancy pyelonephritis in relation to renal damage and hypertension. E. G. Crabtree and D. E. Reid (*Amer. J. Obstet. Gynec.*, 1940, 40, 17—30).—A study of 45 patients for 5—10 years following the infection. Intravenous pyelography, phenolsulphonethylamine excretion, urinary N retention, or urine concn. tests indicated that kidney damage could still be demonstrated in a high proportion of the cases though the kidney function was in most cases adequate. All of 3 cases in which there was both pyelonephritis and toxæmia developed hypertension and 2 of these were dead within 5 years. P. C. W.

Intravenous amino-acids in nephrotic toxæmia of pregnancy. J. E. Corr, W. Wagner, and M. Hetzer (*Amer. J. Obstet. Gynec.*, 1944, 47, 70—80).—A case is described. In spite of a high-protein diet

and frequent infusions of whole blood or plasma the patient had low plasma-protein, low hæmoglobin concn., and anæmia. Daily intravenous infusion of 45 g. of amino-acids caused a rapid rise in hæmoglobin and a slight but definite rise in plasma-protein. P. C. W.

Malakoplakia of urinary bladder. J. E. Morison (*J. Path. Bact.*, 1944, 56, 67—71).—An autopsy on a 6-year-old female child with chronic pyelonephritis, numerous malakoplakic nodules in the urinary bladder, and one in a left hydro-ureter is reported. Left ventricular hypertrophy and widespread arteriolosclerosis were also present. (4 photomicrographs.) C. J. C. B.

Effect of dietary urea on kidneys and liver of steers.—See A., 1944, III, 352.

Water metabolism [polyuria] in hypertensive rats.—See A., 1944, III, 328.

Effect of subcutaneous injection of urine and urinary extracts from rheumatoid patients into rats. H. Waite, W. Bauer, and G. A. Bennett (*J. Lab. clin. Med.*, 1944, 29, 19—20).—12 rats injected subcutaneously with unprocessed urine and alcohol and CHCl_3 extracts of urine from patients with active rheumatoid arthritis developed no significant lesions. C. J. C. B.

Excretion of sodium chloride and other substances in urine in phloridzin diabetes. K. Krzyk (*Biochem. Z.*, 1941, 309, 42—50; cf. Lundsgaard, A., 1933, 1076).—In dogs, urinary excretion of NaCl is decreased by large doses of phloridzin, but is sometimes increased by small doses. Excretion of PO_4''' is also decreased, whilst blood-NaCl and $-\text{PO}_4'''$ are increased. Excretion of sugar during phloridzin diabetes is not affected by administration of lactoflavin. The profound detrimental action of phloridzin on cellular metabolism in the kidney is non-sp. W. McC.

Dehydroisoandrosterone sulphate from normal male urine.—See A., 1944, III, 344.

Urinary excretion products of atebirin. Effect of atebirin on urinary porphyrin output in rat.—See A., 1944, III, 359.

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

New theory of origin and nature of life. A. L. Herrera (*Science*, 1942, 96, 14).—Experiments on the behaviour of mixtures of olive oil, gasoline, and NaOH and of NH_4CNS and formaldehyde (which give rise to "colpoids" and "sulphobes" respectively) are summarised. Structures resembling cell, amoeba, and tissue forms are obtained. Micro-organisms might result from S-containing sublimation from volcanoes. E. R. R.

Effect of controlled temperatures on spontaneous activity rhythms of albino rat [influence of light]. L. G. Browman (*J. Exp. Zool.*, 1943, 94, 477—489).—Observations were made on normal female rats of an inbred stock, and on rats of the same stock which had been blinded at birth. Alternating daily temp. elicit an activity pattern in blind rats, the peak of activity occurring during the cool period with the onset of proœstrum at the end of this period. Blind animals do not respond to daily alternations in light. Normal animals always respond to light alternation rather than to temp. changes, though if kept in const. light or const. dark they respond to temp. in the same way as the blind animals. With const. temp. and const. dark, normal females tend to persist in earlier rhythms; with const. temp. and const. light they go into a state of const. reversals of their spontaneous pattern. H. L. H. G.

Morgagni-Stewart-Morel syndrome. M. T. Moore (*Arch. intern. Med.*, 1944, 73, 7—12).—A woman presented the syndrome of calvarial hyperostosis with metabolic, endocrine, and neuropsychiatric disturbances (Morgagni-Stewart-Morel syndrome). Pneumoencephalographic studies showed frontoparietal cortical atrophy, atrophy of the islands of Reil, asymmetry of the lateral ventricles, and moderate internal hydrocephalus. C. J. C. B.

Clinical use of oral thermometers. N. de Nosaquo, I. Kerlan, L. F. Knudsen, and T. G. Klumpp (*J. Lab. clin. Med.*, 1944, 29, 179—184).—3 min. should be the min. time interval allotted for an oral thermometer to reach equilibrium under ordinary conditions of use. C. J. C. B.

How to use catgut. E. L. Howes (*Surg. Gynec. Obstet.*, 1941, 73, 319—323). P. C. W.

Tissue-nucleic acids. I. Ribonucleic acids and nucleotides in embryonic and adult tissue. J. N. Davidson and C. Waymouth (*Biochem. J.*, 1944, 38, 39—50).—The total nucleic acid content of embryo sheep tissues is in most cases higher than in the same adult organ. Ribonucleic and deoxyribonucleic acids are present in both embryonic and adult tissues, their relative proportions being similar for the same tissue but widely variable from organ to organ; the first is located in the nucleus and the second in the cytoplasm. Rapidly growing (e.g., embryonic) tissues tend to have

a higher concn. of both acids, and a lower concn. of acid-sol. purine nucleotides, than have adult tissues. E. C. W.

Hair keratin. II. Dicarboxylic and basic amino-acids of human hair. III. Proline from human hair. J. M. R. Beveridge and C. C. Lucas (*Biochem. J.*, 1944, **38**, 88–95, 95–97; cf. A., 1941, III, 110).—II. Preliminary removal of cystine is necessary for accurate determination of dicarboxylic acids and simplifies the separation of basic amino-acids. Glutamic acid (10.6%) is significantly higher than previously found, and aspartic acid (3.5%) is reported for the first time in human hair. Arginine is removed as its flavianate prior to separation of the dicarboxylic acids. Methionine (1%) is also present; vals. for other amino-acids agree with earlier results. A suitable order of isolation of all acids is indicated.

III. Proline is obtained in max. yield (4.3%) by Town's Cu salt method, after removal of cystine, arginine, tyrosine, dicarboxylic acids, histidine, lysine, and some leucine. Hydroxyproline is absent. P. G. M.

Organ extracts. III. Unsaponifiable lipids from arteriosclerotic aortas. IV. Unsaponifiable lipids from swine spleen.—See A., 1944, II, 104.

Human milk fat. I. Component fatty acids. T. P. Hilditch and M. L. Meara (*Biochem. J.*, 1944, **38**, 29–34).—The chief component acids of human milk fat are oleic (30–37) and palmitic acid (22–24%). Of the unsaturated acids, diethenoid C_{18} acids (approx. 7%) include a considerable amount of linoleic acid, whilst unsaturated C_{20-22} acids amount to 3–4%, and there are smaller amounts of tetra- and hexa-decenoic acids. Stearic (approx. 8–9), myristic (approx. 8–9), lauric (5–7), and decolic (2–3%) acids are also present. The acids of human milk fat differ from those of cow milk fat in that no butyric or acids lower than decolic are present; there is also a larger content of C_{18} diethenoid acids and unsaturated C_{20-22} acids. The fat in regard to its component acids resembles a typical margarine fat blend rather than butter fat. J. N. A.

Ascorbic acid in sweat. E. R. Kirch, T. Cornbleet, and O. Bergeim (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 307–308).—Human sweat is practically free from ascorbic acid. The vals. previously reported are due to reducing substances from the rubber bags used for collection. V. J. W.

XVII.—TUMOURS.

Experimental brain tumours. III. Tumours produced with dibenzanthracene. H. Arnold and H. M. Zimmerman (*Cancer Res.*, 1943, **3**, 682–685; cf. A., 1942, III, 533).—Pellets of 1:2:5:6-dibenzanthracene were implanted in the right cerebral hemispheres of 21 female C3H mice. 13 tumours developed, of which 2 were gliomas. 1 was an intracranial meningeal sarcoma. One sarcoma was both intra- and extra-cranial. One neoplasm was a squamous-cell carcinoma of the scalp. 8 animals did not develop tumours. Of the 2 gliomas, 1 was a glioblastoma multiforme while the other was an ependymoblastoma. F. L. W.

Quantitative evaluation of experimental skin carcinogenesis by methylcholanthrene. Factors of dosage, time, spacing of applications, and the multiplicity of the carcinogenic response. W. Cramer and R. E. Stowell (*Cancer Res.*, 1943, **668**–681).—Continuous exposure of the mouse skin to methylcholanthrene in order to induce cancer is not essential. Skin cancer is induced by much smaller doses if the applications are made at long intervals (e.g., 1 month). Increasing the dosage applied to a large skin area increases the no. of multiple skin cancers. Min. dosages induce single cancers even in the most susceptible individuals of a strain. Increasing the dose shortens the time at which cancer develops in the resistant animals; it does not shorten the induction time in the most susceptible ones. The quant. evaluation of carcinogenic potency should be based on the use of min. doses of the carcinogen. It can be determined by the % of cancerous tumours and the dose rather than by % of cancerous animals and time of induction. High susceptibility to skin cancer does not extend over the whole skin but may be restricted to one small area. The aetiology of multiple skin cancer in man is discussed in the light of these findings. F. L. W.

Skin carcinogenesis by a single application of 20-methylcholanthrene. W. L. Simpson and W. Cramer (*Cancer Res.*, 1943, **3**, 604–605; cf. A., 1943, III, 747).—A single application of methylcholanthrene (0.6% in benzene) induced malignant tumours in mice of the New Buffalo strain. Of 12 effective mice 2 developed carcinomas and 1 a sarcoma. One of the carcinomas had a period of induction of 9 months. F. L. W.

Chemical studies on the mode of action of methylcholanthrene on mouse epidermis. C. Carruthers and V. Sontzeff (*Cancer Res.*, 1943, **3**, 744–748).—Methylcholanthrene was applied to the skin of mice. One application reduced the Fe and Ca content of the epidermis to approx. 50% of normal in 10 days. Na, K, and ascorbic acid were not altered but Mg was increased. Nucleo-

protein-P was used as a basis of reference for the amount of tissue involved. The mineral analysis of mouse epidermis is also given. F. L. W.

Carcinogenic activity of some new derivatives of aromatic hydrocarbons. I. Compounds related to chrysene. C. E. Dunlap and S. Warren (*Cancer Res.*, 1943, **3**, 606–607).—Five derivatives of chrysene were tested for carcinogenic activity by injection of 1–4 mg. dissolved in 0.2 ml. of tricaprilyn subcutaneously into young male mice of the Swiss and C3H strains. 7-Methylchrysene showed high activity; 6:7-methylenechrysene and 7:8-dimethylchrysene were moderately active, and 6-methylchrysene and 6:7-dimethylchrysene weakly or questionably active. F. L. W.

Reported production of tumours by normal liver cells of mice bearing tumours produced by methylcholanthrene. L. Dmochowski (*Cancer Res.*, 1943, **3**, 608–609).—Mice of the Strong A, C3H, RIII, and Bagg high-cancer strains, S and C57 low-cancer strains, and C57 × RIII low-cancer strain hybrids were injected with liver suspensions from mice of RIII, C3H, Strong A, and Bagg strains bearing sarcomas induced by methylcholanthrene. No tumours were produced in this way during a period of several months. F. L. W.

Effect of temperature on ultra-violet carcinogenesis with wave-lengths 2800–3400 Å. J. A. Bain, H. P. Rusch, and B. E. Kline (*Cancer Res.*, 1943, **3**, 610–612).—The effect of temp. on ultra-violet carcinogenesis in young adult white ABC mice of both sexes with wave-lengths of 2800–3400 Å. was investigated. Production of tumours is more efficient at 35–38° than at room temp. (23°). There is little difference in the rate of carcinogenesis at 3–5° and at 23°. F. L. W.

Growth and regression of frog kidney carcinoma transplanted into the tails of permanent and normal tadpoles. R. Briggs and R. Grant (*Cancer Res.*, 1943, **3**, 613–620; cf. A., 1942, III, 903).—Kidney carcinoma from adult frogs transplanted into the dorsal mesenchyme of the anterior third of the tails of normal young tadpoles grows well and maintains its characteristic structure during early larval development but rapidly regresses as the hosts approach metamorphosis. Carcinoma implants in the tails of non-metamorphosing, thyroidectomised or hypophysectomised tadpoles follows the same sequence. The proportion of takes (53–60%) and of regressions after growth (95–100%), rate of growth, max. size attained, and rate of regression are not significantly different in non-metamorphosing tadpoles compared with normals. Regression is associated with accumulation of spindle-shaped mesenchyme cells, and occasionally of numerous small round cells around the implant. F. L. W.

Spontaneous primary hepatomas in mice of strain C3H. II. Influence of breeding on their incidence. E. L. Burns and J. R. Schenken. **III. Effect of oestrogens and testosterone propionate on their incidence.** J. R. Schenken and E. L. Burns. **IV. Intracytoplasmic inclusion bodies and mitochondria.** E. L. Burns and J. R. Schenken (*Cancer Res.*, 1943, **3**, 691–692, 693–696, 697–701; cf. A., 1940, III, 670).—II. The incidence of hepatomas was observed in 153 untreated breeding and non-breeding strain C3H mice. In breeding males the incidence was 27% as compared with 6% in non-breeding males. No tumours were found in 47 breeding females while 10% of the 10 non-breeding females developed them.

III. 48 non-breeding C3H mice were treated with testosterone propionate, 69 non-breeding C3H mice with α -estradiol benzoate, and 39 non-breeding C3H mice with α -estrone. None of the 24 males and 4% of the 24 females injected with testosterone propionate developed hepatomas. 25% of the 59 males and none of the 10 females injected with α -estradiol benzoate developed hepatomas. 17% of the 25 males and none of the 9 females injected with α -estrone developed hepatomas.

IV. Intracytoplasmic inclusion bodies and mitochondria were studied in the liver and hepatoma cells of C3H mice. Two types of intracytoplasmic inclusion bodies occurred. One was a large hyaline body found almost exclusively in the cytoplasm of tumour cells, the other was a smaller lipoprotein body. Staining reactions and modes of origin of these bodies are discussed. There were few mitochondria in hepatoma cells as compared with non-neoplastic liver cells. Administration of testosterone propionate did not alter the no. of mitochondria while α -estradiol benzoate reduced the no. in non-neoplastic liver cells. F. L. W.

Tumour-promoting action of fat. P. S. Lavik and C. A. Baumann (*Cancer Res.*, 1943, **3**, 749–756; cf. A., 1940, III, 853).—Fatty acids of hydrogenated vegetable oil free from unsaponifiable matter and resynthesised into triglycerides have the same tumour-promoting activity as natural fat. Prolonged heating of natural fats did not alter this activity. Application of oil to the skin increased the total no. of tumours induced by biweekly painting with 0.2% methylcholanthrene in dioxan. Fat fed in emulsion in water was only half as effectual as fat incorporated in the diet. Acetone, ethyl acetate, and butyric acid did not increase no. of tumours in rats or mice. Increased riboflavin or protein intake did not diminish the tumour-promoting action of the fat. Increased dietary fat did not increase the incidence of sarcomas in mice injected subcutaneously with methylcholanthrene, or of spontaneous breast

tumours of rats, or of tumours induced by injection of methylcholanthrene subcutaneously or into the submaxillary gland in rats. Mice painted with methylcholanthrene consumed 12–30% more calories on high-fat diets than on low. On an equiv. caloric intake the incidence of tumours on both diets was more nearly equal. It is suggested that part of the tumour-promoting action of fat is due to increased calorie consumption. F. L. W.

Spontaneous testicular tumours in mice. W. U. Gardner (*Cancer Res.*, 1943, 3, 757–761).—Testicular tumours arose in 3 of 61 hybrid mice obtained by mating animals of the A strain with those of the C3H and C57 strains. Two of these were interstitial cell tumours resembling those arising in oestrogen-treated mice of similar origin. The third, composed of fibroblastic cells and small round cells, was probably an interstitial cell tumour but resembled a seminoma. No tumours were observed in strain A mice but these animals survived 200–300 days less than the hybrids. In mice of certain strains oestrogens may reveal or augment tendencies to acquire testicular interstitial cell tumours which otherwise would not occur during the normal life span. F. L. W.

Testicular changes resembling early stages in development of interstitial cell tumours in mice of the A strain after long-continued injections of pregnant mare serum. C. A. Pfeiffer and C. W. Hooker (*Cancer Res.*, 1943, 3, 762–766).—15 male mice of the A strain were injected daily with 50 i.u. of pregnant mare serum for periods ranging from 30 to 550 days. During the first 100 days the testes enlarged slightly; this was followed by a slow reduction in size. After one year the testes were of approx. normal size. The testes did not acquire the characteristic yellow or brown colour of oestrogen-treated mice. Accessory reproductive glands hypertrophied greatly. In the testes of 9 mice the interstitial cells formed nodules ranging in area from $\frac{1}{2}$ to twice the cross-sectional area of a tubule. The nodules were localised and most frequently found in the region of the mediastinum testis. The nodules resembled those found during development of testicular tumours in oestrogen-treated mice. There was no local invasion and lymph nodes were not involved. F. L. W.

Attempts to abrogate immunity to the Brown-Pearce carcinoma. O. Saphir and M. Appel (*Cancer Res.*, 1943, 3, 767–769).—Prolonged intravenous administration of trypan-blue to rabbits which had been rendered immune to the Brown-Pearce carcinoma by intracutaneous transplantation resulted in some animals in abrogation of immunity. In 7 of 9 rabbits so treated tumour growth followed intravenous injection with a suspension of tumour cells. F. L. W.

Importance of dosage in the intradermal immunisation against transplantable neoplasms. L. Gross (*Cancer Res.*, 1943, 3, 770–778).—195 C3H mice were inoculated intradermally with a standard vol. (0.02 ml.) of a tumour cell suspension varying in concn. from 0.1 to 20%. The suspensions were derived from a methylcholanthrene-induced tumour in C3H mice. The min. tumour dose (MTD) capable of inducing a sarcoma in the majority of the inoculated animals was 0.02 ml. of 0.5% suspension. The incidence of spontaneous regression of the intradermal tumours was inversely proportional to the inoculated dose. 1–1.25 MTD gave 66% regression while 20–40 MTD showed only 26%. Of 47 animals which recovered from intradermal tumours 45 survived a second intradermal inoculation. These 45 mice were tested with subcutaneous inoculation of the same tumour. None of 5 males resisted 5000 MTD; 6 of 19 males developed tumours following 2–250 MTD. Two of 5 immunised females resisted 5000 MTD and 16 females were refractory to doses varying from 2 to 800 MTD. It is suggested that accurate dosage is of great importance in studies of tumour immunity and that resistance against neoplasm can be overwhelmed by massive doses of tumour suspensions. F. L. W.

Polytene chromosomes in two mammary carcinomas of the human subject. J. J. Biesele and H. Poyner (*Cancer Res.*, 1943, 3, 779–783).—Two mammary carcinomas of the human subject contained chromosomes of 2 and 4 times the vol. of those in human granulation tissue and in a healing skin wound as well as chromosomes indistinguishable from those of normal tissues. There were three classes of nuclei. Different nuclear classes in normal tissue can be explained on the basis of polyploidy but no polyploidy was found in the cancers although there was considerable aneuploidy ranging about the diploid no. Since there was an increase in the max. nucleolar no. with increase in size of resting nucleus in the cancers the enlarged chromosomes must have been many-stranded. There was a higher frequency of polytene chromosomes in the carcinoma with the higher grade of malignancy. F. L. W.

Tissue metabolism studies on bone marrow. Consideration in relation to tumour metabolism. C. O. Warren (*Cancer Res.*, 1943, 3, 621–625).—Bone marrow metabolism in the femur of the rabbit is reviewed with special reference to criteria of a tumour type of metabolism. Myeloid, but not erythroid, cells fulfil seven of the eight criteria. Only the relatively high R.Q. (about 0.96) distinguishes these cells metabolically from malignant cells. Succinate and *p*-phenylenediamine tests are of no val. in this connexion and their general applicability is questioned. Evidence is presented

to support the view that growth and glycolysis are not necessarily related. F. L. W.

Tumour inhibitor studies. II. Effect of plant hormones on tumour growth. B. E. Kline and H. P. Rusch (*Cancer Res.*, 1943, 3, 702–705; cf. A., 1943, III, 331).—23 plant hormones were tested for their effect on the takes and subsequent growth of the Flexner-Jobling rat carcinoma, the Walker rat carcino-sarcoma 256, and on a transplantable fibrosarcoma of the mouse. When tumour mice were kept before inoculation in direct contact with the plant hormones a decrease in the no. of takes and subsequent growth rates was observed. Subcutaneous injection of the same substances had no effect on established neoplasms. F. L. W.

Chemotherapeutic studies on transmitted mouse leukaemia. C. M. Flory, J. Furth, J. A. Saxton, and L. Reiner (*Cancer Res.*, 1943, 3, 729–743).—The effects of underfeeding, of X-rays, and of the administration of K arsenite, 4 org. arsenicals (neocarsphenamine, mapharsen, tryparsamide, and soamine), of benzene, toluene, xylenes, mesitylene, ψ -cumene, ethylbenzene, and cymene, and stilbæstrol, suphadiazine, and sulphaguanidine were studied in transmitted myeloid and lymphoid leukaemias in mice. Each strain of myeloid leukaemia responded differently to the therapeutic agents but the prolongation of life of the leukaemic mice caused by a given chemical or other agent was const. for each strain. Benzene, K arsenite, and underfeeding retarded the development of one strain of myeloid leukaemia. All three were ineffectual against another strain, while only benzene was effectual against a myeloid chloroleukaemia. X-Rays had some effect on the last two strains. They best results were obtained with benzene. Benzene, underfeeding, and X-rays prolonged the lives of mice with some strains of lymphoid leukaemia. No org. arsenical or benzene derivative was as effectual as arsenite or benzene. Underfeeding retarded the development of most strains of leukaemia. Sulphadiazine and sulphaguanidine did not prolong the life of leukaemic mice but they did not harm the animals and may be of use in treatment of infections complicating leukaemias. F. L. W.

Chemically induced chicken tumour containing an antigen related to that of a leukosis sarcoma agent. R. G. Gottschalk (*Cancer Res.*, 1943, 3, 649–667).—The non-filterable chicken sarcoma 16 originally induced by methylcholanthrene was transmitted for 27 generations in chickens. In young chicks the tumour was invasive and often metastasised but frequently regressed in older birds. All attempts to isolate a filterable agent from this tumour failed. The regression of sarcoma 16 rendered chickens resistant to a subsequent injection of a filterable agent of leukosis and sarcoma (agent 13). Their sera contained neutralising antibodies to this agent in much larger amounts than those of normal birds of the same age. Sera of chickens bearing non-metastasising sarcoma also neutralised the agent; in birds with metastases no antibodies were found. Neutralising antibodies to agent 13 were also produced by injecting rabbits with high-speed sediments from sarcoma 16. These antibodies could not be absorbed by cells from normal chicken spleen. Injection of rabbits with material from normal chicken spleen did not produce neutralising antibodies to agent 13. Thus the non-filterable chemically induced chicken sarcoma contains an antigen not found in normal fowl cells. This antigen is related to an antigen contained in a filterable agent of leukosis and sarcoma. F. L. W.

Infection of turkeys and guinea-fowls by the Rous sarcoma virus and the accompanying variations of the virus. F. Duran-Reynals (*Cancer Res.*, 1943, 3, 569–577; cf. A., 1942, III, 903).—80% of turkeys and guinea-fowl were susceptible to Rous virus during the first 10 and 5 weeks of life respectively. With cell suspensions the tumour incidence rose to 100% and 88% respectively. Adult pheasants are highly susceptible but pigeons are refractory. Tumours were maintained through 4 passages in turkeys and 6 in guinea-fowls. Original and transplanted tumours were but slightly viscid, very collagenous, and resembled duck variants of Rous tumours. Periosteal and endosteal tumours developed frequently in turkeys and occasionally in guinea-fowls and in the latter hosts spleen and liver were always involved. The species affinities of the virus were not modified by the adaptation to the new species. Virus from the turkey or guinea-fowl tumour regularly infected adult chickens but the resulting growths showed the same tissue affinities as in the homologous host and could be differentiated from those induced by the original Rous virus. It is concluded that the virus of the Rous sarcoma of chickens undergoes variations in turkeys and in guinea-fowls. F. L. W.

Growth of a chicken sarcoma virus in the chick embryo in the absence of neoplasia. J. J. Milford and F. Duran-Reynals (*Cancer Res.*, 1943, 3, 578–584).—The Rous virus injected intracelomically or intravenously into 132 3-, 6-, and 13-day chick embryos multiplied in 64 of these hosts without eliciting tumours but produced hæmorrhagic lesions. These lesions were transmitted to other embryos through 6 serial passages without inducing neoplasia. Injection of extracts of these lesions into chicks or pullets resulted in tumours of the normal type, but embryos in which no lesions developed contained no transmissible virus. Chorioallantoic tumours developed in only 2 of the 64 embryos which developed lesions.

Section of the hæmorrhagic lesions showed destructive changes in the vessel wall and adjacent connective tissue and confirmed the absence of neoplasia. F. L. W.

Rous sarcoma cells cultivated in vitro. II. Morphologic properties of Rous sarcoma cells. E. Tenenbaum and L. Doljanski (*Cancer Res.*, 1943, 3, 585—603; cf. A., 1942, III, 150).—The alterations undergone by cells of the Rous sarcoma growing *in vitro* are described and illustrated. The nature and significance of these changes are discussed. F. L. W.

Size of the Shope rabbit papilloma virus. R. Markham, K. M. Smith, and D. Lea (*Parasitol.*, 1944, 35, 178—179).—Data on the diffusion, sedimentation, density, viscosity, and electron microscopy of the Shope rabbit papilloma virus, given by Sharp *et al.* (A., 1942, III, 903) and by Neurath *et al.* (A., 1941, III, 808), are treated according to the appropriate formulæ of Markham, Smith, and Lea (*Parasitol.*, 1942, 34, 315) to give conclusions as to the size, shape, and degree of hydration of the agent, which are summarised as follows. The virus is spherical or nearly spherical. Unhydrated it has a diameter of 48 μ . and mol. wt. of 47×10^6 . In solution it hydrates to the extent of 1.8 g. of water per g. of unhydrated virus, causing its diameter to increase to 73 μ ., its mol. wt. to 136×10^6 , and its partial sp. vol. to 0.916. A. H.

Enhancement of leukæmogenic action of methylcholanthrene by pre-irradiation with X-rays. J. Furth and M. C. Boon (*Science*, 1943, 98, 138—139).—Subjection of mice to the mildly leukæmogenic action of X-rays, followed by painting with methylcholanthrene, resulted in much more marked leukæmia than was produced by either agent alone. The effect of X-rays alone is milder and exhibits a longer period of latency than that of methylcholanthrene alone. E. R. R.

Mammary and testicular tumours in male mice of various strains following oestrogen treatment. G. M. Bonser (*J. Path. Bact.*, 1944, 56, 15—26).—The five strains of mice tested can be arranged in ascending order of susceptibility to the development of testicular tumours as follows: CBA (no tumours), "White label" and IFS (a few tumours), RIII (a moderate no. of tumours if the mice survive long enough), and Strong A (all the mice with tumours). Foster-nursing does not influence the appearance of these tumours except in so far as it prolongs life. Castration of Strong A males does not increase the incidence of breast cancers. An interstitial-cell carcinoma in a Strong A male was successfully grafted into a normal female and into oestrogen-treated males. In subsequent generations it was grafted into a normal female and into oestrogen-treated males. In subsequent generations it was grafted from normal females into normal females and males. (14 photomicrographs.) C. J. C. B.

Antifibromatogenic steroids: Δ^4 -androstene-3:17-dione and cholestenone. R. Iglesias and A. Lipschütz (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 41—43).—Abdominal fibroids produced in spayed guinea-pigs by oestradiol implants were not prevented by implants of these steroids of 40 times the effective dose of progesterone or testosterone. V. J. W.

Cancer and chronic disease. J. Eason (*Edinb. Med. J.*, 1944, 51, 113—123).—A lecture. H. S.

Primary sarcoma of heart. C. Tedeschi (*Arch. Path.*, 1944, 37, 70—77).—A case report and review of the literature. (3 photomicrographs.) C. J. C. B.

Extragenital chorioma: its relation to teratoid vestiges in testicles. A. Rottino and H. DeBellis (*Arch. Path.*, 1944, 37, 78—80).—Description of a case and review of the literature. (2 photomicrographs.) C. J. C. B.

Monocytic (histiocytic) leukæmia in relation to previously existing sarcoma of skin. B. Gueft and P. D. Rosahn (*Amer. J. Clin. Path.*, 1943, 13, 516—526). (5 photomicrographs.) C. J. C. B.

Cancerous mixed tumour of urinary bladder. E. F. Hirsch and G. W. Gasser (*Arch. Path.*, 1944, 37, 24—26).—A case report. (2 photomicrographs.) C. J. C. B.

Treatment of cancer of prostate. C. Huggins (*Canad. Med. Assoc. J.*, 1944, 50, 301—306).—A lecture. C. J. C. B.

Metaplasia of the prostatic epithelium: lesion sometimes mistaken for carcinoma. E. B. Sutton (*Amer. J. Clin. Path.*, 1943, 13, 607—615).—Islands of metaplastic epithelium were seen in the depths of 16% of 302 prostate glands removed by routine transurethral resection. They are more common in and about infarcts and in a prostate which has been the site of a previous transurethral resection. This change is benign and should not be mistaken for carcinoma. (7 photomicrographs.) C. J. C. B.

Papillary adenocarcinoma of kidney. W. C. Sterlin and J. E. Ash (*Surg. Gynec. Obstet.*, 1941, 73, 305—311).—Clinical and pathological study. P. C. W.

Luteinised granulosa cell tumour of ovary (luteoma). A. S. Giordano and J. L. Haymond (*Amer. J. Clin. Path.*, 1944, 14, 28—33).—A completely luteinised ovarian tumour, probably of granulosa cell origin, produced symptoms of uterine bleeding in a 69-year-old

woman. Endometrial biopsy showed progesterone effect (secretory endometrium) instead of the oestrogenic effect (proliferative endometrium) usually associated with granulosa cell tumour. Masculinising symptoms exhibited by the patient may be explained on a basis of hyperfunctioning reticular zone of the adrenal gland. (6 photomicrographs.) C. J. C. B.

Intraligamentous granulosa cell tumour. A. B. Ragins and L. Frankel (*Amer. J. Obstet. Gynec.*, 1940, 40, 302—306).—A case report. P. C. W.

Extraovarian granulosa cell tumour. C. Powell and W. C. Black (*Amer. J. Obstet. Gynec.*, 1940, 40, 318—323).—A case report. P. C. W.

Granulosa cell tumour of ovary with hæmoperitoneum and hæmothorax. C. J. Vogt (*Amer. J. Obstet. Gynec.*, 1940, 40, 285—289).—A case report. P. C. W.

Fibroma of ovary with ascites and hydrothorax. E. J. Bomze and J. D. Kirschbaum (*Amer. J. Obstet. Gynec.*, 1940, 40, 281—285).—Clinical and pathological review with descriptions of 2 cases. P. C. W.

Carcinosarcoma of uterus. B. J. Hoffman (*Amer. J. Obstet. Gynec.*, 1940, 40, 289—293).—A case report. P. C. W.

Mixed adenocarcinoma and squamous-cell carcinoma of uterus. I. C. Skinner and J. R. McDonald (*Amer. J. Obstet. Gynec.*, 1940, 40, 258—266).—28 cases are described. P. C. W.

Dermoid tumour of sclera.—See A., 1944, III, 403.

Masculinising tumour of the ovary.—See A., 1944, III, 408.

Effects of feeding heated lard to rats.—See A., 1944, III, 420.

XVIII.—ANIMAL NUTRITION.

Rôle of nutrition in preoperative and postoperative care. H. A. Zintel (*Amer. J. med. Sci.*, 1944, 207, 253—258).—A general review. C. J. C. B.

Assessment of level of nutrition in man. L. J. Harris (*Proc. Nutrition Soc.*, 1944, 1, 7—10).—The following subjects are discussed: the val. of vitamin-deficiency tests; the inadequacy of clinical observations when unsupported by such tests; the disclosure of vitamin-A deficiency by dark-adaptation tests; and, in discussion by J. Yudkin and G. W. Robertson, disclosure of anæmia by determination of hæmoglobin level. W. McC.

Clinical signs of dietary deficiency. B. S. Platt. R. H. Dobbs. W. C. W. Nixon (*Proc. Nutrition Soc.*, 1944, 1, 11—13).—Reviews. W. McC.

Nutrition of farm animals. C. Crowther (*Proc. Nutrition Soc.*, 1944, 1, 13—16).—A general review is followed by discussions of vitamins, minerals, and trace elements in animal nutrition (H. H. Green) and of the effect of changed plane of nutrition on growth and body formation (J. Hammond). W. McC.

Agricultural implications of food policy based on nutritional needs. J. Orr (*Proc. Nutrition Soc.*, 1944, 1, 19—23).—A review with discussion. W. McC.

Rival claims of animals and man for food. N. C. Wright (*Proc. Nutrition Soc.*, 1944, 1, 23—31).—A review with discussion. W. McC.

Animals as food converters. E. T. Halnan (*Proc. Nutrition Soc.*, 1944, 1, 32—36).—Consideration of the efficiency of conversion of feeding-stuffs into human food by cattle, poultry, sheep, and pigs suggests that, when account is taken of protein and energy requirements, the available feeding-stuffs in Britain at present are most efficiently used by concn. on production of milk, with veal as by-product, and eggs, with young cockerels as by-product. In the discussion it is pointed out that efficiency of conversion varies with stage of life and that total duration of life, area of land required to produce a unit of food, and type of feeding-stuff consumed by the animal must be taken into account. W. McC.

[Food] standards and their implications. J. Orr (*Proc. Nutrition Soc.*, 1944, 1, 43—46). W. McC.

Translation of standards into terms of foods. I. Leitch (*Proc. Nutrition Soc.*, 1944, 1, 60—66). W. McC.

Short method of calculating the nutritive value of diets. G. H. Berryman and P. E. Howe (*J. Nutrition*, 1944, 27, 231—240; cf. A., 1943, III, 494).—Seasonal variations in the nutritive val. of U.S. Army diets have been calc. by the method previously described. H. G. R.

Industrial canteens. I. M. Clift (*Proc. Nutrition Soc.*, 1944, 1, 108—110). W. McC.

Collective feeding and the housewife. W. Parsons (*Proc. Nutrition Soc.*, 1944, 1, 111—112). W. McC.

Organisation of catering in the Royal Air Force. J. Salmon (*Proc. Nutrition Soc.*, 1944, 1, 87—91).—A review with discussion. W. McC.

Food supplies for collective feeding. M. Pyke (*Proc. Nutrition Soc.*, 1944, 1, 92—98).—Analyses of typical samples showed that the meal provided at British Restaurants, which is intended to provide 33% of the daily calorie and protein requirement and 66% of the vitamin and mineral requirement, account being taken of the classes of workers served, actually provides approx. 14—50% of the vitamin-C requirement if green vegetable, especially properly cooked cabbage, is included. Loss of -C on cooking, shredding, and storing, after cooking, in insulated containers is discussed and the val. of raw vegetables and school gardens indicated.

W. McC.

Effects of large-scale preparation on nutritional values. T. F. Macrae (*Proc. Nutrition Soc.*, 1944, 1, 99—103).—In large-scale catering 90% of the vitamin-C content of cabbage is usually lost during storage before cooking, during cooking because ascorbic acid oxidase is not destroyed rapidly enough at the initial temp. (approx. 65°) employed, and during prolonged periods of heating after cooking. Loss due to oxidase action is greatly diminished if the initial cooking temp. is not below 85°. Large-scale cooking has advantages over small-scale in that fat recovery is increased, the keeping of stock is facilitated, and destruction of -B₁ and riboflavin is prevented and more than counterbalanced by replacing baking powder by yeast.

W. McC.

Role of the dietician. M. Abrahams (*Proc. Nutrition Soc.*, 1944, 1, 103—106).

W. McC.

School canteens. M. C. Broatch (*Proc. Nutrition Soc.*, 1944, 1, 106—108).

W. McC.

Fried food for children. F. H. Richardson (*J. Pediat.*, 1944, 24, 199—205).—A review.

C. J. C. B.

Potential contribution of milk, meat, and eggs to British diet. N. C. Wright (*Proc. Nutrition Soc.*, 1944, 1, 67—75).—Modifications in Stiebeling's standards and allocations (*U.S. Dept. Agric., Misc. Publ.* 183, 1933) as applied to the United Kingdom seem necessary in order that the requirements of British dietary habits and international economic policy may be met. Butter should not be converted into "milk equiv." since the protein and minerals of the milk are not in the butter and not consumed in other forms. Bacon, ham, and pork should be placed in the single category of pig meat. The possibility of using margarine in place of a large part of the butter requirement should be kept in mind. Pre-war milk, cheese, and egg consumption should be doubled but consumption of home-produced, and imported meat should be reduced equally by 25%, the proportions of beef, mutton, and pig meat remaining unchanged. Home production of feeding-stuffs will have to be greatly increased.

W. McC.

Potential contribution of fish to British diet. J. A. Lovern (*Proc. Nutrition Soc.*, 1944, 1, 76—80).—In 1938, the consumption of British-caught fish in Gt. Britain was about 22.6 lb. per head of the population, the amounts of protein and fat derived from sea-food (chiefly fish and whale oil) being 3.6 and 7.0 lb. per head, respectively. These sea-foods provided vitamin-A and -D sufficient to supply 1862 and 265 i.u. per head daily. It is suggested that consumption of pelagic fish (chiefly herring) might be very greatly increased, although consumption of demersal fish and of whale oil must probably remain at or below the 1938 level.

W. McC.

Use of evaporated milk without added sugar for feeding of infants. H. McCulloch (*Amer. J. Dis. Child.*, 1944, 67, 52—55).—When a sufficient supply of breast milk is not available, infants may be fed by choice, and will do well, with various dilutions of irradiated, homogenised, unsweetened evaporated cows' milk. Criteria such as gain in wt., rate of growth, general nutritional status, satisfactory sleeping habits, normal stool formation, and absence of indigestion indicate that such feeding is adequate and satisfactory.

C. J. C. B.

Determinations of metabolisable energy of feeding stuffs for cattle.—See A., 1944, III, 356.

Distillers' by-products in pig rations. I. Creep-feeding and growing-fattening rations. B. W. Fairbanks, J. L. Krider, and W. E. Carroll (*J. Animal Sci.*, 1944, 3, 29—40).—18 litters of pigs were given one of (a) a basal ration of yellow maize, middlings, soya and fish meals, minerals, and cod-liver oil, (b) the basal ration + 6% of dried distillers' solubles, and (c) the basal ration + 12% of dried grains with solubles. No significant differences were observed up to weaning, but the pigs on the ration (a) after weaning failed to thrive compared with those on (b) or (c). The ration (a) was not obviously deficient in known nutritional factors. The growth rate of pigs on the ration (a) after weaning and which had previously been on rations (b) and (c) indicated that they had to some extent stored whatever it was that the supplements had supplied. There was a high death rate in all groups, but no connexion between death rate and nutritional status was apparent.

E. C. W.

Nutritional requirements of the Syrian hamster. J. W. Hamilton and A. G. Hogan (*J. Nutrition*, 1944, 27, 213—224).—Hamsters require vitamin-A, -D, -E, and -K, thiamin, riboflavin, pyridoxine, and pantothenic acid. In the absence of -E the animals collapse and die after 14—18 weeks but administration of -E shortly after

collapse will prevent death. Omission of -K causes a period of arrested growth with development of small hæmorrhagic areas, but maturity is reached in nearly normal time. Omission of both -E and -K from the diet causes death probably from -E deficiency but the animals are severely hæmorrhagic. Females may bear at least one litter on diets containing nicotinic acid, choline, and inositol in addition to the above but few bear a second litter; at least one unrecognised vitamin is required for reproduction.

H. G. R.

Protein in human nutrition, with particular reference to the rôle of essential amino-acids. D. Melnick (*Wallerstein Lab. Comm.*, 1943, 6, 167—181).—A crit. review, covering a very extensive bibliography.

I. A. P.

Standards for proximate principles. D. P. Cuthbertson (*Proc. Nutrition Soc.*, 1944, 1, 46—49).—In temperate countries, protein consumption by all workers other than specially trained athletes usually supplies 10—14% of the total calorie val. of the diet. Where economic circumstances permit, 60% of the protein is of animal origin. Since accurate knowledge of the optimum protein and fat requirements is lacking, long-established precedent is a better guide to dietary allowances than are short-period experiments. A table showing the vals. for protein and calories laid down by the National Research Council, U.S.A., with suggested revisions to suit dietary habits in the United Kingdom is given.

W. M. C.

Biological value of food-proteins. IV. Significance of cystine for metabolism. Improvement of yeast-protein. A. Hock and H. Fink (*Z. physiol. Chem.*, 1943, 279, 187—206; cf. A., 1944, III, 41).—The relatively low biological val. of yeast-protein for white rats can be improved by addition of cystine to the ration to the extent of 2% of the total protein. Growth on brewery yeast is thus raised to the same level as on milk-protein. The metabolic disturbances and death from liver damage due to a diet of 80% of yeast-protein or of other proteins low in S, such as casein and mould-protein, are prevented by cystine. Ascorbic acid cannot replace cystine as a protective agent.

J. H. B.

Nutritive value of proteins of edible fungi. W. Lintzel (*Biochem. Z.*, 1941, 308, 413—419).—Mushroom, chantarelle, edible boletus, and common morel contain approx. 90% of water and 2.6—5.4% of protein, most of which is of fairly good nutritional val. As a source of total protein, a 70-kg. man would require 100—200 g. of the dried fungi daily.

F. O. H.

Practicability of increasing calcium absorption with protein derivatives. T. C. Hall and H. Lehmann (*Biochem. J.*, 1944, 38, 117—119).—The inclusion of peptone and glutamic acid in powders containing CaHPO₄·2H₂O was shown to increase urinary Ca (and therefore Ca absorption) in mental subjects with otherwise normal Ca excretion. Serum-Ca is unaffected.

P. G. M.

Protein hydrolysates in intravenous alimentation. W. E. Gaunt (*Nutr. Abs. Rev.*, 1944, 13, 501—507).—A review.

Interrelation of methionine, choline, betaine, and arsenocholine in the chick. H. J. Almquist and C. R. Grau (*J. Nutrition*, 1944, 27, 263—269).—The increased growth in choline-deficient chicks produced by betaine (A., 1943, III, 900) is augmented by methionine and further increased by arsenocholine. The effects of betaine or methionine and arsenocholine are additive and together these substances are practically a complete substitute for choline.

H. G. R.

Amino-acids in hæmoglobin formation.—See A., 1944, III, 323.

Diet in diabetes mellitus. W. C. Cutting and G. B. Robson (*Amer. J. digest. Dis.*, 1943, 10, 177—179).—A description of the diets used in the Stanford Metabolic Clinic.

N. F. M.

Galactose-poisoning in chicks. H. Dam (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 57—59).—Chicks on a diet containing 54.6% of galactose develop severe muscular spasms and die in a few days. Their blood-galactose is high, but blood-glucose normal. Muscle-glycogen is normal but liver-glycogen almost nil.

V. J. W.

Effect of fat on digestion of nutrients by dairy cows. H. L. Lucas and J. K. Loosli (*J. Animal Sci.*, 1944, 3, 3—11).—When rations containing 1.6% and 2.6% of ether-sol. matter were fed to dairy cows (the difference being due solely to the use of solvent-extracted oil meals in the low-fat ration), no difference in digestibility was found. When rations containing 1% and 7% of ether-sol. matter, in which soya products were the only concentrates, were fed, the crude fibre and N-free extract in the low-fat rations were more digestible than in the high-fat rations, whether the latter contained raw unextracted soya-bean meal or toasted solvent-extracted meal + soya-bean oil or maize oil, but a ration containing extracted meal + soya fatty acids (6.6% of ether-sol. matter) was as digestible as the low-fat ration. Differences in protein digestibility were probably not significant. The production of milk fat and of milk bore no relation to intakes, but the ration containing unextracted soya meal gave a higher % of fat with no effect on total flow, whilst those containing extracted meal + oil or fatty acids gave a lowered production with no effect on % of fat, as compared with results on the low-fat ration.

E. C. W.

Essential fatty acid deficiency in mouse. E. A. White, J. R. Foy, and L. R. Cerecedo (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 301—302).—The condition produced by a fat-free diet in rats (Burr and Burr, *Physiol. Abs.*, 1929, **14**, 438) can be produced equally well in mice. V. J. W.

Adequacy of recommended calcium and iron allowances. J. Duckworth (*Proc. Nutrition Soc.*, 1944, **1**, 50—51; cf. A., 1943, **III**, 129).—A review of recent work suggests that the allowances of the National Research Council, U.S.A., are adequate or more than adequate. W. McC.

Phytic acid and iron absorption.—See A., 1944, **III**, 346.

Phosphorus requirement for fattening lambs. W. M. Beeson, R. F. Johnson, D. W. Bolin, and C. W. Hickman (*J. Animal Sci.*, 1944, **3**, 63—70).—Lambs fed on a diet containing 0.07—0.12% of P (providing 1.2—1.67 g. per 100 lb. of body wt.) showed a depressed growth rate and sp. symptoms of aphosphorosis. 0.15—0.32% of P (2.17—3.38 g. per 100 lb. of body wt.) appeared sufficient for good growth and health, and it is suggested that the optimum requirement is 2.4 g. per 100 lb. of body wt., or 0.17% in the diet. P deficiency affects the utilisation of the diet more than it does the appetite. E. C. W.

Iodine-fluorine relationships in sheep nutrition. J. D. Hatfield, C. L. Shrewsbury, F. N. Andrews, and L. P. Doyle (*J. Animal Sci.*, 1944, **3**, 71—77).—The growth of lambs receiving 6 mg. of F (from rock phosphate) per kg. of body wt. was markedly depressed, whilst lower intakes of F had a similar but smaller effect. I did not counteract the effect of F. The addition of F to the basal ration, which was deficient in I, increased the % of I in the thyroids, whether the ration was supplemented with I or not, but the effect of F on the total I in the thyroids was variable. Disagreement in the literature as to the relation between F intake and thyroid size may be due to lack of control of I intake. E. C. W.

Endemic fluorosis in South India. I. Fluorides in drinking-water supplies, and attempts at their removal. T. N. S. Raghavachari and K. Venkataraman. **II. Factors involved in the production of mottled enamel in children and severe bone manifestations in adults.** C. G. Pandit, T. N. S. Raghavachari, D. Subba Rao, and V. Krishnamurti. **III. Experimental production of chronic fluoride intoxication in monkeys (*Macaca radiata*).** C. G. Pandit and D. Narayana Rao (*Indian J. Med. Res.*, 1940, **28**, 517—532, 533—558, 559—574).—I. Fluorides in toxic concn. occurred in the drinking water of a more extensive area in Southern India than described by Shortt *et al.* (*Indian Med. Gaz.*, 1937, **72**, 396). Out of 1700 samples taken 90 contained over 3 p.p.m. of F, and 800 contained 1—3 p.p.m. Wells with water rich in F always occur in rocky strata rich in fluorite and fluorapatite. F was determined in the samples by a slight modification of Sanchis' method (B., 1937, 193; cf. C., 1944, Part 3). In laboratory experiments to remove F from drinking water, filtration of the water through a product consisting mainly of Al_2O_3 reduced the F content to a non-toxic level.

II. In the districts with the highest F content in drinking water, the incidence and severity of chronic F intoxication (mottled dental enamel in children and bone affections in adults involving spine, joints, and ligaments) were proportional to the F content of the water, but were influenced by the state of nutrition. Deficiency in vitamin-C caused severe incidence of the disease even at lower F content of the water. Chronic intoxication in adults occurred only after 15 years' residence in the endemic area.

III. Administration of NaF, mixed in the food, to 8 monkeys for 5 months resulted in typical symptoms of chronic F intoxication (bone lesions). In absence of -C from the diet, more F was absorbed into the system and excreted in urine, and radiological changes were more marked than on a diet rich in -C. S. E. M.

Use of a germicidal quaternary ammonium salt in nutritional studies. L. J. Teply and C. A. Elvehjem (*Proc. Soc. Exp. Biol. Med.*, 1944, **55**, 59—61).—Replacement of drinking water by 1:1500 Phemerol retarded growth of young rats. Its effects were neutralised by giving whole liver powder as 5% of the diet, but not by administration of a mixture of folic acid, inositol, and *p*-aminobenzoic acid. V. J. W.

Vitamins.

Standards for vitamins. C. C. Ungley (*Proc. Nutrition Soc.*, 1944, **1**, 51—59).—A review of existing knowledge shows that it is not possible to say whether the National Research Council, U.S.A., allowances of riboflavin, vitamin- B_1 , and nicotinic acid are adequate. The allowances of -A and ascorbic acid are probably adequate. W. McC.

Relationship between the structure and physiological action of the vitamins. A. Santos Ruiz and M. Rotilant de Franch (*Anal. Fis. Quim.*, 1942, **38**, A, 11—51).—A survey of the structure and activity of the vitamins and related substances. F. R. G.

Vitamins in edible soya beans. P. R. Burkholder (*Science*, 1943, **98**, 188—190).—Analyses for thiamin, riboflavin, pyridoxine,

biotin, niacin, pantothenic and ascorbic acid were carried out for six varieties of soya bean, both green and mature, and the results compared with similar vals. for beef, pork, and Tenmarq wheat. E. R. R.

Growth-substances in a hybrid corn and its parents.—See A., 1944, **III**, 384.

Correlation between dietary content of vitamin-A and dark-adaptation time in pregnancy. P. F. Williams, B. Hark, and F. G. Fralin (*Amer. J. Obstet. Gynec.*, 1940, **40**, 1—11).—There was marked vitamin-A deficiency in the diet of 62% of 123 pregnant women and abnormally high dark-adaptation time in 38%, though the two factors were not closely related. P. C. W.

Vitamin-A in pregnancy. I. Average capacity by Feldman adaptometer. J. C. Hirst and R. E. Shoemaker (*Amer. J. Obstet. Gynec.*, 1940, **40**, 12—16).—Of 200 pregnant women attending a pre-natal clinic only 3% were judged as vitamin-A-deficient by the Feldman adaptometer. There was a tendency for the -A status to improve during pregnancy. P. C. W.

Hypervitaminosis-A and carotenæmia. H. W. Josephs (*Amer. J. Dis. Child.*, 1944, **67**, 33—43).—Severe hypervitaminosis-A occurred in a boy of 3 years who had received 240,000 U.S.P. units of vitamin-A daily since he was 3 months of age. The condition was characterised by hepatomegaly, splenomegaly, hypoplastic anæmia, leukopenia, increased serum-A, increased serum-lipins, advanced skeletal development, clubbing of the fingers, and sparse, coarse hair; it was accompanied with an abnormal appetite for halibut-liver oil, the source of the -A. Most of the symptoms cleared promptly when the excess of -A was removed from the diet. C. J. C. B.

Effect of a vitamin-A-rich diet on the vitamin-A content of the colostrum of dairy cows. J. Stewart and J. W. McCallum (*J. Dairy Res.*, 1942, **13**, 1—4).—Feeding 3 lb. of carrots daily to each of 69 cows during late lactation and the dry period did not increase the vitamin-A content of the colostrum of the following lactation over that of the 67 controls on an -A-poor diet. A similar experiment with cod-liver oil (70,000 i.u. of -A per cow per day) gave a similar result. N. J. B.

Action of montmorillonite clays on vitamin-A.—See A., 1944, **II**, 192.

Blood-pyruvate and lactate/pyruvate ratio following ingestion of glucose in experimental [vitamin-B₁] deficiency. D. Klein and K. O. Elsom (*Amer. J. med. Sci.*, 1944, **207**, 247—251).—Blood-pyruvic acid vals. as well as the blood-lactate/pyruvate ratio, fasting and following the administration of glucose, did not differ from the normal in 5 subjects living under carefully controlled conditions and ingesting a diet deficient only in the B vitamins, even though manifestations of "sub-clinical" deficiency became evident in 2 of them. C. J. C. B.

Vitamin-B₁ deficiency as cause of pregnancy toxæmia. A. C. Siddall (*Amer. J. Obstet. Gynec.*, 1940, **39**, 818—821).—Daily injections of 6.7 mg. of thiamin chloride for 10 days had no effect on the symptoms of pre-eclampsia. The geographic distribution of eclampsia in the U.S.A. corresponds largely with the distribution of pellagra and beri-beri. P. C. W.

Correlation between vitamin-B₁ content of diet and electrocardiographic findings in 91 pregnant women. P. F. Williams, G. C. Griffith, and F. G. Fralin (*Amer. J. Obstet. Gynec.*, 1940, **40**, 181—193).—The literature is reviewed. 60 of 91 pregnant women were receiving less than 500 i.u. of vitamin-B₁ and 30 less than 15 i.u. per 100 cal. Excessive nausea and vomiting, fatigue, and paræsthesia were more prevalent among the women with the deficient diet. 8 of the women had e.c.g. with abnormalities characteristic of -B₁ deficiency but there was no correlation between these symptoms and the -B₁ content of the diet. P. C. W.

Subclinical vitamin deficiency. Thiamin in skeletal muscle of infants and children. M. C. Hulse, N. Weissman, V. Rowland, R. Gross, and J. W. Ferrebee (*Amer. J. Dis. Child.*, 1944, **67**, 30—32).—The thiamin content of skeletal muscle was determined in a group of infants and children by the yeast fermentation method of assay for thiamin. Correction was made for yeast-stimulating material other than thiamin by destroying the thiamin in the muscle with Na_2SO_3 and repeating the fermentation measurement. The "true" thiamin content of the samples of muscle was then calc. by difference. In 12 subjects, ranging in age from a premature foetus to a 7-year-old child, the concn. of thiamin varied between 0.21 and 1.47 mg. per g. of fresh muscle. In general, the higher vals. were found in the younger children and the foetus. Only three vals. were below 0.6 mg. per g.; two of these low vals. were explainable on nutritional or technical grounds. C. J. C. B.

Heightened thiamin and choline requirements in tropical heat. C. A. Mills (*Proc. Soc. Exp. Biol. Med.*, 1943, **54**, 265—266).—Young rats kept at 90° show max. growth when 1 kg. of their diet contains 2 mg. of thiamin and 5 g. of choline. When they are kept at 68°

these optimal vals. are 1 mg. and 0.75 g. respectively. Differences do not appear until the diets have been given for 2 weeks.

V. J. W.

Prevention of oral lesions in B_1 -avitaminotic dogs. W. M. Govier and M. E. Greig (*Science*, 1943, 98, 216—217).—The necrotic lesions appear to be caused by the inability of dogs to synthesise vitamin-C when B_1 and certain other members of the B -complex are omitted from the diet. 10 mg. of ascorbic acid administered twice weekly by stomach tube healed and prevented the lesions. E. R. R.

Thiamin requirements of pigs as related to the fat content of the diet. N. R. Ellis and L. L. Madsen (*J. Nutrition*, 1944, 27, 253—262).—Young pigs fed on thiamin-deficient diets containing 2, 11, and 28% of fat exhibit signs of thiamin depletion (failure of appetite and cessation of growth accompanied by weakening of the heart, decrease in body temp., and emaciation) in 25, 28, and 33 days, respectively. Administration of thiamin produces rapid responses in appetite, growth, and general health, intermediate levels producing the greatest response in animals on the high-fat and the least in those on the low-fat diet. Pigs require 125—141 μ g. of thiamin per 100 g. of carbohydrate and protein to produce the max. rate of growth and maintain good health, but this is insufficient to promote storage of the normal amounts found in the meat.

H. G. R.

Alcohol metabolism in thiamin deficiency.—See A., 1944, III, 357.

Electrocardiographic changes associated with thiamin deficiency in pigs.—See A., 1944, III, 326.

Manner of inactivation of thiamin by fish tissue.—See A., 1944, III, 366.

Selective reversible inhibition of microbial growth with pyrithiamine.—See A., 1944, III, 370.

Stimulatory effect of aneurin and its derivatives on the assay of vitamin- B_1 by yeast fermentation. H. F. Deutsch (*J. Biol. Chem.*, 1944, 152, 431—443).—The pyrimidine fraction of aneurin is more active than aneurin itself at low, but less active at high, concns. Pyrimidine and thiazole together are almost as active as aneurin. Thiazole, alone or with pyrimidinesulphonic acid, and oxychloro-aneurin are less active. Adenosine triphosphate, hexose diphosphate, glycerophosphate, and adenylic acid are slightly active. R. L. E.

Production of riboflavin deficiency in monkey. H. A. Waisman (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 69—71).—Rhesus monkeys on a riboflavin-deficient diet developed dermatitis, anaemia, and muscular inco-ordination. Symptoms were relieved in mild cases by 50 μ g. of riboflavin daily for 2—3 weeks, but severe cases required 100—500 μ g.

V. J. W.

Destruction of riboflavin by light. R. R. Williams and V. H. Chedelín (*Science*, 1942, 96, 22—23).—The rate of destruction of aq. riboflavin (0.1 μ g. per c.c.) exposed to about 60 ft.-candles is rapidly increased by rise in temp. or pH. The loss in foods (milk and eggs) during cooking is less marked, owing to the opacity of the materials.

E. R. R.

Influence of crystalline vitamin- B_2 on hæmatopoiesis in the chick. C. J. Campbell, R. A. Brown, and A. D. Emmett (*J. Biol. Chem.*, 1944, 152, 483—484).—Symptoms appear in the following order as the vitamin- B_2 content of a synthetic diet is reduced: leucopenia and retarded growth, hæmoglobin deficiency, reduced hæmatocrit, erythrocyte, and thrombocyte count.

R. L. E.

Pantothenic acid deficiency in swine. Effect on growth and alimentary tract. M. M. Wintrobe, R. H. Follis, jun., R. Alcayaga, M. Paulson, and S. Humphreys (*Johns Hopkins Hosp. Bull.*, 1943, 73, 313—341).—Pantothenic acid deficiency in the young pig was characterised by diarrhoea, dysentery, loss of appetite, impairment of growth, loss of hair, red and scaly skin, cough and excessive nasal secretion, changes in the tongue, and abnormal gait. Extensive colitis characterised by hyperæmia, œdema, and ready bowel bleeding was apparent on rectosigmoidoscopic examination. At autopsy, changes ranged from diffuse hyperæmia, increase in size of lymphoid follicles, and formation of small ulcers to extensive inflammatory changes involving the large intestine. Atrophy of mucosa lining cells, abscess formation, and ulceration were observed histologically. Deficiency was accompanied by moderate normocytic anaemia, fall in serum-Cl, increase in CO_2 -combining power of blood, a terminal rise in non-protein-N, and sometimes hypoglycaemia. Administration of 600 μ g. or more of Ca pantothenate per kg. body wt. per day was accompanied by cessation of diarrhoea, improvement in bowel condition, restoration of normal blood vals., growth of hair, and gain in wt. The abnormal gait which was associated with well-defined histological changes in the nervous system improved following administration of Ca pantothenate without, however, complete restoration of function.

T. F. D.

Hydrolysis of pantothenate: a first-order reaction. Relation to thiamin stability.—See A., 1944, I, 157.

Plant growth substances. XXXIV. β -Biotin. F. Kögl and E. J. ten Ham (*Z. physiol. Chem.*, 1943, 279, 140—152; cf. A., 1944, II, 182).—Details are given of the prep. of β -biotin from a liver concentrate by Tswett adsorption on norit, elution with acetone- NH_3 ,

esterification, chromatographic adsorption from CHCl_3 on Al_2O_3 , elution with acetone-methanol (90:10), re-adsorption from acetone on Al_2O_3 , elution with acetone-methanol, and hydrolysis (for physical properties see A., 1944, III, 354). Physiologically (yeast test) β - is twice as active as α -biotin. The mol. structure of β -biotin is discussed in the light of α -biotin and of the work of du Vigneaud *et al.* (A., 1942, II, 211) on β -biotin. J. H. B.

Biotin and p -aminobenzoic acid content of crystalline enzymes.—See A., 1944, III, 364.

Minimum ascorbic acid need of adults. E. D. Kyhos, E. S. Gordon, M. S. Kimble, and E. L. Sevringhaus (*J. Nutrition*, 1944, 27, 271—285).—The minimal daily requirement of vitamin-C for normal healthy male adults is 75 mg. as estimated by plasma-C vals. and the health of gum tissues, though cases of low-grade chronic infections, such as nose and throat infections or deeply diseased gums, require at least 100 mg. The severity of oral disease is correlated with the duration of -C deficiency. H. G. R.

Plasma-fibrinogen in guinea-pig scurvy. W. R. Sullivan, E. O. Gangstad, and K. P. Link (*J. Biol. Chem.*, 1944, 152, 367—369).—The fibrinogen content of the plasma increased with the onset of scurvy. Normal fibrinogen levels were restored by adding raw cabbage or l -ascorbic acid to the basal diet. G. D.

Correlation between capillary resistance and ascorbic acid. H. Scarborough and E. Gilchrist (*Proc. Biochem. Soc.*, 1944, 38, xxvii).—No such correlation exists and, in general, lower levels of capillary resistance are found to accompany higher plasma-ascorbic acid levels. P. G. M.

Influence of ascorbic acid on contractions and incidence of fatigue of different types of muscles.—See A., 1944, III, 330.

Vitamin-C and tumour growth.—See A., 1944, III, 350.

Raman spectra of vitamin-C and its oxidation products.—See A., 1944, I, 142.

Kinetics of the antioxygenic synergism of quinones with ascorbic acid in fat systems.—See A., 1944, I, 157.

Preparation and properties of highly purified ascorbic acid oxidase. Inactivation of ascorbic acid oxidase. Enzymic reduction of dehydro-ascorbic acid.—See A., 1944, III, 365.

Synthesis of vitamin-C in stored apples. C. West and S. S. Zilva (*Biochem. J.*, 1944, 38, 105—108).—Synthesis of vitamin-C takes place on storage of Bramley's Seedling apples at 3°, and this synthesis decreases with age. The proportion of l -ascorbic acid to dehydro-ascorbic acid also increases on storage, but it has not been possible to determine in which form the primary synthesis occurs. The vitamin formed during maturation on the tree probably arises in the same manner as during storage of immature fruit. P. G. M.

Sources of vitamin-C. I. Rose hips.—See B., 1944, III, 100.

Vitamin-C content of cultivated and wild plants growing in high regions of Pamir.—See A., 1944, III, 383.

Colour reaction of ascorbic acid with nicotinamide and nicotinic acid. T. H. Milhorat (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 52).—When ascorbic acid is moistened and stirred into a thick paste with nicotinamide or nicotinic acid a yellow colour is produced.

V. J. W.

Colour reaction of ascorbic acid with derivatives of pyridine, piperidine, quinoline, and isoquinoline. A. T. Milhorat (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 52—55).—Most of these derivatives which have a methyl group in the α -position give the reaction described in the preceding abstract. Substances with an acid radical in this position do not give the reaction until this radical is neutralised. The properties of the ascorbic acid are not modified by the colour change. V. J. W.

Use of single massive doses of vitamin-D in prevention of rickets. I. J. Wolf (*J. Pediat.*, 1944, 24, 167—175).—21 infants were given 50,000 units of vitamin-D at 1 month, 50,000 units at 2 months, and 60,000 units at 3 months of age. They remained protected on this dosage for 4—9 months. C. J. C. B.

Effect of vitamin-D from cod-liver oil and tuna-liver oil on serum-phosphatase concentrations in rachitic infants. D. J. Barnes, B. Munks, and M. Kaucher (*J. Pediat.*, 1944, 24, 159—166).—48 infants with clinical rickets, shown by raised serum-phosphatase concns., were divided into groups and treated with vitamin-D from cod-liver oil and tuna-liver oil (62% as effective as cod-liver oil on chicks) at 3 dosage levels (600, 900, and 2400 i.u. daily). No difference was found in the magnitude of serum-phosphatase reduction by either oil at any level. Both oils at all levels lowered serum-phosphatase by the 6th week. C. J. C. B.

Case of osteomalacia in pregnancy. H. R. MacLennan (*J. Obstet. Gynaec.*, 1944, 51, 127—129).

P. C. W.

Vitamin-E and length of life of rats fed a diet with fatally low protein content. H. Dam (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 55—56).—Addition to diet of 10% of dl - α -tocopherol acetate prolonged life of newly weaned rats on a protein-deficient diet. The

prolongation was greatest when the low-protein diet began not less than 14 days after weaning.

V. J. W.

Effect of tocopherols and soya-bean phosphatides on utilisation of carotene. J. L. Jensen, K. C. D. Hickman, and P. L. Harris (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 294—296).—The enhancing action of soya-bean phosphatides on utilisation of vitamin-A, described by Slanetz and Scharf (A., 1944, III, 43), is due to the tocopherols contained in the prep. used and not to the pure phosphatides.

V. J. W.

Rôle of oxidised part of vitamin-K in experimental -K avitaminosis. C. R. Honorato, R. Oliveri, and A. Illanes (*Rev. Soc. argent. Biol.*, 1942, 18, 438—440).—Leyhorn chickens were fed Almquist and Klose's diet; on the 9th day when the prothrombin time (Quick) was considerably increased different groups were injected with 3 µg. of naphthoquinone, 5 µg. of quinol, 3 µg. of quinhydrone, 3 µg. of thyroxine, or 3 mg. of oxalic acid. Prothrombin time continued to increase; on the 20th day a few animals received vitamin-K and prothrombin rapidly decreased. The oxidised part of the -K mol. has little to do with its activity.

J. T. L.

Factors involved in blood coagulation and vitamin-K.—See A., 1944, III, 324.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Metabolism of oestrogens.—See A., 1944, III, 344.

Metabolism of human placenta. I. Oxygen consumption in relation to ageing.—See A., 1944, III, 344.

Inhibition of brain respiration by picrotoxin.—See A., 1944, III, 331.

Depression of basal metabolism by the brown fatty tissue of hibernating hedgehogs and by prolactin. C. F. Wendt (*Z. physiol. Chem.*, 1943, 279, 153—168).—An extract of the brown fat of hibernating hedgehogs injected into the peritoneum of rats depresses the basal metabolic rate (B.M.R.), particularly in animals with a high B.M.R. The R.Q. is also lowered. The action of thyroxine or thyrotropic hormone in raising the B.M.R. is counteracted. The extract also lowers body temp. and increases the blood-sugar and serum-Mg. Mg salts do not affect the B.M.R. of normal white rats or of those treated with thyroxine. The thyroxine effect is neutralised by administration of the prolactin fraction of anterior pituitary.

J. H. B.

Change in respiration of blood vessels with age. L. N. Lazovskaja (*Biochimia*, 1943, 8, 171—176).—The decreased respiration of the blood vessels with age is probably largely due to decreasing activity of succinoxidase and cytochrome oxidase. It is unaffected by the presence of cytochrome-c, *p*-phenylenediamine, etc.

P. G. M.

Effect of carbon dioxide tension on metabolism of cerebral cortex and medulla oblongata. F. N. Craig (*J. Gen. Physiol.*, 1944, 27, 325—338; cf. A., 1943, III, 553).—The O₂ uptake and output of lactic acid under aerobic conditions by slices of cerebral cortex and medulla oblongata (cat) in presence of O₂ containing 1, 5, and 20 vol.-% of CO₂ are determined. The amounts of NaHCO₃ and NaCl in the medium are varied so as to maintain pH and [Na⁺] const. With 0.0002M-Ca⁺⁺ at pH 7.5 under the above conditions, the lactic acid output of both types of tissue is increased 100% when the CO₂ is increased from 1 to 5 vol.-%, but the O₂ uptake is unaffected. When CO₂ is increased from 5 to 20%, there is no further effect on lactic acid formation in both tissues or on O₂ uptake of cortex but the O₂ uptake of medulla is decreased. At pH 8.1, increase of CO₂ from 1 to 5% causes approx. 60% increase in lactic acid formation and O₂ uptake in the cortex. When O₂ in the mixed gas is decreased from 95 to 3 vol.-%, lactic acid output is increased by 114 and 8 mg. per g. in cortex and medulla, respectively, whilst total CO₂ output (in cu. mm. per hr. per mg. of dry tissue) increases from 12.3 to 13.5 in cortex and decreases from 5.1 to 3.8 in medulla.

J. N. A.

Effect of reduction of accompanying nutrient protein with high liver-glycogen content and lower state of oxidation on these two functions. K. Hanisch (*Biochem. Z.*, 1941, 309, 246—253).—Reduction (even to one third of its original val.) of the nutrient-N of the potato-protein providing it does not affect the liver-glycogen content in rats. Still further reduction of the protein-N produces a rise in glycogen content to a limiting point at which the state of oxidation becomes a more sensitive indicator of the reaction.

P. G. M.

Metabolism of 1:2-benzanthracene in mice and rats. I. Berenblum and R. Schoental (*Cancer Res.*, 1943, 3, 686—688).—A fluorescent phenolic derivative was isolated from the faeces of mice and rats injected intraperitoneally with a saturated solution of 1:2-benzanthracene in arachis oil. Methylation of the metabolite gave a product having chromatographic behaviour, fluorescence spectrum, and absorption spectrum (in the range longer than 3000 Å.) identical with those of synthetic 4'-methoxy-1:2-benzanthracene. It is

suggested that the metabolite is, therefore, 4'-hydroxy-1:2-benzanthracene.

F. L. W.

Metabolism of lysine. A. Neuberger and F. Sanger (*Biochem. J.*, 1944, 38, 119—125).—Ingestion of *l*-lysine by rats causes 67—78% of the expected increase in N in urine, as urea or NH₃; no intermediate product is isolable. *dl*-Lysine gives a smaller increase in urine-N, and *d*-lysine can be isolated in the urine of rats fed with *d*-lysine. Neither *dl*-α- nor -ε-methyl-lysine is attacked by lysine decarboxylase. Disappearance of *l*-lysine in tissue slices is measured by the decarboxylase method, but decomp. of *l*-lysine *in vitro* is not shown with certainty. Kidney, and to a small extent liver slices, demethylate *dl*-methyl-lysine to give *l*-lysine. *dl*-Lysine is not attacked, or only very slowly, by *d*-amino-acid oxidase but some oxidation occurs with ε-acetyl- or -benzoyl-lysine. This suggests that the free external NH₂ inhibits the enzyme; NH₂ in the δ-position inhibits less than ε-NH₂. *dl*-Pipicolinic acid is oxidised fairly rapidly by *d*-amino-acid oxidase, and *dl*-ornithine is slightly more rapidly oxidised than the δ-acetyl derivative. ε-Acetyl-lysine is slowly oxidised by an animal *l*-amino-acid oxidase, whereas *l*-lysine, *dl*-ornithine, and its acetyl derivative are not attacked. It is possible that in metabolism, oxidation of lysine is preceded by acetylation of terminal NH₂, and initial oxidation may yield δ-amino-valeric or glutaric acid.

A. T. P.

Availability of ε-acetyl-*l*-lysine and ε-methyl-*dl*-lysine for growth. A. Neuberger and F. Sanger (*Biochem. J.*, 1944, 38, 125—129; cf. preceding abstract).—*d*-Lysine is prepared by making use of the stereochemical specificity for *l*-lysine of lysine decarboxylase found in coliform organism. An enzyme-Al₂O₃ suspension is added to *dl*-lysine at 37° and pH 6.0, and derived *d*-lysine is benzoylated to separate dibenzoylcadaverine, and the dibenzoyl-*d*-lysine, m.p. 145°, is hydrolysed by boiling 20% HCl to *d*-lysine. Walden inversion of ε-benzoyl-*l*-lysine also gives *d*-lysine; ε-benzoyl-*l*-lysine and NaNO₂ in 2.5N-H₂SO₄-KBr at 0° afford *d*-α-bromo-ε-benzamido-hexoic acid, m.p. 132°, [α]_D -32.9° in EtOH, converted by NH₃ (d 0.88) into ε-benzoyl-*d*-lysine, [α]_D -19.6° in 5% HCl, and thence (20% HCl) the hydrochloride, [α]_D -15.7° in 5% HCl, of *d*-lysine. *dl*-N-Methyl-lysine is prepared by a modified method of Enger *et al.* (A., 1930, 1419), and isolated as the hydrochloride, +H₂O. Unlike the *l*-isomeride, *d*-ε-N-acetyl-lysine does not replace *l*-lysine on a deficient diet. *dl*-ε-N-Methyl-lysine replaces it well, equal to 0.5 of the equiv. amount of *l*-lysine; as only *l*-methyl-lysine is used for growth, *dl*-ε-N-methyl-lysine is as effective as *l*-lysine.

A. T. P.

Metabolism of *dl*-methionine and *l*-cystine in dogs on very low protein diet. L. L. Miller (*J. Biol. Chem.*, 1944, 152, 603—611; cf. A., 1943, III, 374).—*dl*-Methionine and *l*-cystine have marked protein-sparing action when administered to dogs on a diet very low in protein. The effect, which is also observed in dogs with undepleted protein stores, becomes less pronounced as depletion proceeds. Choline also has slight protein-sparing action. A large proportion of the S requirement of the dogs is met by small (0.5—1.25 g.) daily supplements of these amino-acids, especially *dl*-methionine, with which total urinary S excretion does not exceed the total S of the supplement. Sometimes with *l*-cystine and always with *dl*-methionine the proportion of urinary S which is in org. combination increases until it constitutes 15—40% of the amino-acid-S administered.

W. McC.

Synthesis of *p*-fluorophenyl-*l*-cysteine and its conversion into *p*-fluorophenylmercapturic acid *in vitro* and *in vivo*.—See A., 1944, II, 193.

Oxidation, catalysed by iron compounds, of phospholipin by ascorbic acid. K. A. C. Elliott and B. Libet (*J. Biol. Chem.*, 1944, 152, 617—626).—Small proportions of Fe and Fe-protein complex (e.g., ferrin) stimulate O₂ uptake by suspensions of brain or liver; the effect is greatly increased by addition of ascorbic acid, which, alone, has no effect on the respiration of isotonic suspensions although it maintains that of hypotonic suspensions and at neutral pH causes O₂ uptake by mixed phospholipin of brain and liver. The initial O₂ uptake of phospholipin + ascorbic acid becomes very rapid if Fe compound is also added. Of the brain phospholipins the cephalin fraction only is affected. In the system, other compounds (e.g., cysteine, glutathione) do not replace ascorbic acid. The effects of Fe-protein compounds are not proportional to their Fe content. Ferritin is less active than ferrin. Hæmin and cytochrome-c are inactive. Hæmoglobin is destroyed by phospholipin + ascorbic acid with production of an active catalyst of the oxidation. The oxidation is inhibited by adrenaline, tyramine, and other phenolic compounds and by serum, which probably acts in virtue of its Ca and protein. Certain amino-acids, especially histidine, have first stimulatory and then inhibitory effects.

W. McC.

Similarity of the acid-fast pigment ceroid and oxidised unsaturated fat. K. M. Endicott (*Arch. Pathol.*, 1944, 37, 49—53).—An insol. acid-fast basophilic lipid substance was produced in rats by injection of cod-liver oil and linseed oil. A similar substance is produced by prolonged oxidation of solidified agar emulsions of cod-liver oil and linseed oil with K₂Cr₂O₇. A similar substance was found in a

human case of pneumonia due to aspiration of cod-liver oil. All of these substances resemble one another and ceroid, the pigment of rats with dietary cirrhosis. C. J. C. B.

Heredity obesity of yellow mice. D. A. Rytand (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 340—341).—In obese individuals of this strain, on unlimited diet, replacement of drinking water by olive oil or solutions of sugars caused an immediate increase of wt. which returned to normal when water was resumed. This increase did not occur in normal mice, but was present to a slight degree in non-obese individuals of the obese strain. V. J. W.

Relation of post-mortem interval to synthesis of glycogen from glucose by surviving liver. J. A. Saxton, jun., and M. L. Miller (*Arch. Pathol.*, 1944, 37, 34—38).—The ability of surviving slices of rabbit liver to synthesise glycogen from glucose when incubated in a medium comparable with intracellular fluid decreased rapidly after death. Glycogenesis was not demonstrated if 15 or more min. had elapsed post mortem before the tissues were removed from the animal. A relatively high initial level of glycogen in the liver seemed to inhibit glycogenesis *in vitro*. C. J. C. B.

New technique for measurement of glycogenesis: study of glycogen metabolism in liver under fasting conditions. E. W. Cohn and J. H. Roe (*J. Lab. clin. Med.*, 1944, 29, 106—112).—The method consists of a double laparotomy under nembutal anaesthesia. A sample of liver is obtained from a fasted animal to serve as a control; and a second sample of liver after the test substance has been given. Surgery with nembutal anaesthesia causes a mild increase in liver-glycogen in rabbits fasted 24—60 hr. In the rabbit, marked glycogenolysis occurs during the 12- to 18-hr. period of fasting; during the 24- to 36-hr. period after food withdrawal the glycogen content of the liver is fairly const.; at the 48- and 60-hr. periods of fast the liver-glycogen is higher than during the preceding 24 hr. C. J. C. B.

Human respiratory quotients in relation to alveolar carbon dioxide and blood-lactic acid after ingestion of glucose, fructose, or galactose. H. T. Edwards, E. H. Bensley, D. B. Dill, and T. M. Carpenter (*J. Nutrition*, 1944, 27, 241—251).—Ingestion of 50—100 g. of glucose, fructose, or galactose produces an increase in blood-lactic acid (most marked and prolonged with fructose) and a significant decrease in alveolar CO_2 only in the case of galactose. The greatest net increase in the R.Q. , after correction for changes in blood-lactic acid and alveolar CO_2 , occurs after ingestion of fructose. With glucose the max. increase in R.Q. occurs within 90—135 min., there being no return to the normal level after 4 hr.; the increase due to galactose is of the same order. Differences in the increases in R.Q. are attributed to variations in the rate of combustion of the sugar or in the rate of conversion of the sugar into fat. H. G. R.

Ketosis. XXII. Metabolism of cellobiose. C. E. Vaniman and H. J. Deuel, jun. (*J. Biol. Chem.*, 1944, 152, 565—570).—Rats absorb cellobiose at the rate of 5.3—5.6 mg. per 100 sq. cm. per hr. with consequent deposition of glycogen in liver and muscle in approx. the same proportion as after absorption of an equiv. quantity of glucose. Experiments with rats to which Na butyrate is administered show that the two sugars have equal ability to diminish exogenous ketonuria and to spare protein. Cellobiose is probably converted into 2 mols. of glucose before absorption. W. McC.

Metabolism of ascorbic acid in the horse.—See A., 1944, III, 355.

Action of sodium iodide and sodium thiocyanate on the phosphate metabolism of muscle. A. Effing (*Z. physiol. Chem.*, 1943, 279, 169—174).—Hydrolysis curves of the P compounds of muscle show that NaI hydrolyses almost exclusively the $\text{P}_2\text{O}_5^{''''}$ fraction, whereas with CNS' an increase, no change, or a decrease in the directly determined P may occur. The type of change depends on the lactic acid production, which in turn gives rise to rearrangement of phosphoric acid esterification. Evidence of this is the production of P compounds hydrolysed only with difficulty. J. H. B.

Effect of work on calcium and phosphorus retention by Percheron geldings.—See A., 1944, III, 363.

Transfers of intracellular potassium in experimental dehydration.—See A., 1944, III, 325.

[Use of thiourea as measure of changes in body-water.]—See A., 1944, III, 349.

Urinary excretion products of atebirin.—See A., 1944, III, 359.

XX.—PHARMACOLOGY AND TOXICOLOGY.

Toxicity of calcium salt of penicillin. P. György and P. C. Elmes (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 76—77).—The Ca salt, if properly purified by freeze-drying, is no more toxic to mice or man than is the Na salt. V. J. W.

Medicinal sulphanilamides. J. Amargos Anoro (*Anal. Fis. Quím.*, 1942, 38, A, 191—199).—A lecture dealing with the sulphanilamides used in medicine. F. R. G.

Binding of sulphonamides in plasma. D. R. Gilligan (*J. Pharm. Exp. Ther.*, 1943, 79, 320—328).—Only 40—46% of sulphadiazine, 23—30% of sulphamerazine, and 25—29% of sulphamethazine in human plasma is dialysable; the rest is bound to protein. The binding of the acetyl derivatives of these sulphonamides is even greater. Calculations based on data of the literature on absorption, excretion, and blood levels of these drugs suggest that these sulphonamides are bound to plasma-proteins *in vivo* to the same extent as was found in the dialysis experiments. G. P.

Relation between chemical structure and distribution [and excretion] of substances allied to sulphanilamide. S. H. Fisher, L. Troast, A. Waterhouse, and J. A. Shannon (*J. Pharm. Exp. Ther.*, 1943, 79, 373—391).—The distribution of sulphanilamide and 30 related compounds in various tissues, c.s.f., and plasma was studied in cats after ligation of the renal pedicles; the compounds were injected intravenously. The distribution of the compounds reached an equilibrium usually 1—2 hr. after the injections. Sulphanilamide attains a higher concn. in tissue cells than in the plasma and passes freely the blood-brain barrier. The distribution of N^1 -methyl and -ethyl derivatives of sulphanilamide was similar to that of the parent compound. N^1 -OH, -NH_2 , β -hydroxyethyl, and -guanidino-substitution impaired the ability of the compounds to pass the blood-brain barrier. Introduction of acidic groups in N^1 position, or into the N^1 -isocyclic derivatives, resulted in almost complete exclusion of these compounds from the c.s.f. and their concn. in tissue cells was lower than in plasma. Sulphanilic acid behaved similarly, but *p*-aminobenzoic acid passed the blood-brain barrier almost as freely as sulphanilamide. N^1 -phenyl, -aminophenyl, and -sulphonamidophenyl derivatives reach high concns. in tissue cells but their ability to pass into the c.s.f. is poor. The distribution of the N^1 -heterocyclic derivatives (sulpha-pyridine, -thiazole, -methyl-thiazole, -diazine, -merazine) is markedly influenced by their binding to plasma-proteins. The mechanism of renal excretion of the 30 compounds was studied in normal female dogs with simultaneous creatinine-clearance determinations; detailed data of these are presented. G. P.

Effect of sulphonamides on conversion *in vitro* of inorganic iodide into thyroxine and di-iodotyrosine by thyroid tissue with radioactive iodine as indicator.—See A., 1944, III, 407.

Effectiveness of sulphonamide drugs and neoarsphenamine against pneumococci in bone marrow cultures. E. E. Osgood, J. G. M. Bullock, and I. E. Brownlee (*Arch. intern. Med.*, 1944, 73, 13—17).—Sulphathiazole and sulphapyridine in a concn. of 5 mg.-% are equally active in destroying pneumococci. Sulphathiazole is more active against pneumococci than sulphadiazine, sulphathiazoline, sulphanilamide, or Na sulphanilylsulphanilate. Neoarsphenamine is ineffective against pneumococci. The concn. of organisms, as measured by the inoculum, and the concn. of the drug achieved and maintained are important factors influencing the therapeutic activity of the sulphonamide compounds. Very large inocula were not sterilised by the concns. usually employed clinically. Strains of pneumococci of the same type differed in their resistance to the same sulphonamide drugs in identical concns. *in vitro*. C. J. C. B.

Effect of sulphonamides on co-enzyme I-linked enzyme systems. E. G. Anderson, F. J. Pilgrim, and C. A. Elvehjem (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 39—41).—Neither fermentation by yeast (A., 1940, III, 73) nor O_2 uptake by rat liver is depressed by presence of sulphonamides. It is suggested that they interfere with the synthesis of the co-enzyme rather than with its functioning. V. J. W.

Prophylactic implantation of sulphanilamide in clean operative wounds for reduction of post-operative infections. J. A. Key and T. H. Burford (*Surg. Gynec. Obstet.*, 1941, 73, 324—332).—Favourable clinical report based on 150 cases. P. C. W.

Sulphonamide treatment of wounds. W. Magner (*Canad. Med. Assoc. J.*, 1944, 50, 118—123).—The rate of absorption of sulphathiazole from the muscles of guinea-pigs is greatly accelerated when it is injected in saline solution, in oil, or in an oil-in-water emulsion. Absorption is more rapid from oil than from saline solution and is more rapid from an oil-in-water emulsion than from oil. The rate of absorption of sulphathiazole from an oily suspension in the muscles is influenced by the size of its particles and by the addition of a wetting agent to the suspension. There was no difference in the mortality rates in groups of animals infected with *Cl. welchii* treated with sulphathiazole powder and with oily suspensions of sulphathiazole. C. J. C. B.

Use of sulphonamides for suppression of bacterial growths in stored blood.—See A., 1944, III, 391.

[Acute and chronic toxicity, and therapeutic efficacy of] sulphyprazine. H. J. Robinson, H. Siegel, and O. E. Graessle (*J. Pharm. Exp. Ther.*, 1943, 79, 354—363).—No toxic effects were observed in mice, rats, or dogs after a single oral dose of 10 g. per kg., or after 4 g. per kg. per day of sulphyprazine for 10 days. 1 g. per kg. of sulphyprazine-Na intravenously was lethal to mice. When sulphyprazine powder was given with food in 0.5—1% concn. to

mice and rats, or to dogs in daily doses of 0.5–1 g. per kg. for several months, the animals developed urolithiasis and died of hydronephrosis, pyonephrosis, or pyelonephritis. The formation of uroliths could be prevented by simultaneous administration of NaHCO_3 . The prolonged administration of the drug also produced hyperplasia of the thyroid. Sulphapyrazine is as effective as sulphadiazine against experimental pneumococcal, streptococcal, and staphylococcal infections when compared on the basis of equal blood concns. G. P.

Role of inositol in alopecia of rats fed sulphasuxidine. E. Nielsen and A. Black (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 14–16).—Addition of 1% of sulphasuxidine to diet of 19-day-old rats on a synthetic diet results in a symmetrical alopecia in 6–8 weeks. This is prevented by administration of 5 mg. daily of inositol. V. J. W.

Toxicity of sulphadiazine. N. Plummer and C. Wheeler (*Amer. J. med. Sci.*, 1944, 207, 175–184).—The toxic reactions that occurred in 1367 hospital patients treated with sulphadiazine orally, or with Na sulphadiazine intravenously alone or in combination with sulphadiazine orally, are tabulated and analysed. There was 1 death, a case of thrombocytopenic purpura which was attributed to sulphadiazine. 8% of 705 patients who received 6 g. of sulphadiazine daily for 2–14 days showed evidence of toxicity, most commonly renal. With intravenous Na sulphadiazine the incidence of renal reactions was doubled. The previous use of sulphonamide (87 patients) slightly increased the incidence of reactions. The renal complications comprised more than half the toxic reactions following sulphadiazine in the entire series. As this reaction can be prevented by proper fluid intake and alkali therapy, the total incidence of toxic reactions from sulphadiazine can be reduced to 4%. C. J. C. B.

Comparative toxicities of sulphadiazine and sulphathiazole in children. J. O. Dowdrie and M. H. Abramson (*J. Pediat.*, 1944, 24, 176–181).—Granulocytopenia occurred in 44 of 54 cases treated with sulphadiazine and in 38% of 53 treated with sulphathiazole. There were no cases of agranulocytosis, even when the drug was continued after granulocytopenia appeared. Simultaneous administration of alkali was generally employed. The only case of gross hæmaturia occurred in a child who had not received alkali. No instances of anuria were observed. Drug rashes occurred 4 times, all in children receiving sulphathiazole. 3 of them resembled erythema nodosum. The administration of ascorbic acid in massive dosage had no detoxifying effect for the two sulphonamides studied and there was then no striking difference in toxicity between sulphadiazine and sulphathiazole with the exception of the greater incidence of rashes with the latter. C. J. C. B.

Advances in chemotherapy of influenzal meningitis. M. L. Blumberg, E. Tannenbaum, and M. Gleich (*J. Pediat.*, 1944, 24, 182–185).—Of 11 patients, only 6 died when treated with sulphonamide and serum. C. J. C. B.

Treatment of 134 cases of meningococcal infection with massive doses of sulphadiazine. B. A. Marangoni and V. C. D'Agati (*Amer. J. med. Sci.*, 1944, 207, 67–77).—In the treated cases there were 4 deaths. Sulphadiazine was responsible for toxic reactions in 36 cases of which 31 had some form of renal complication, exclusive of renal colic. C. J. C. B.

Sulphathiazole in glycerin. E. H. Wood (*Canad. Med. Assoc. J.*, 1944, 50, 251–253).—Glycerin is recommended as a vehicle. C. J. C. B.

Apparent advantage of frequently administered quinine in avian malaria infections. H. Beckman and J. Smith (*J. Lab. clin. Med.*, 1944, 29, 43–47).—In canaries infected with a very virulent strain of malarial plasmodium, the "continuous" is markedly superior to the "traditional" type of quinine therapy. C. J. C. B.

Syntheses by means of sodamide.—See A., 1944, II, 201.

Invert soaps. VII, IX.—See A., 1944, II, 184, 204.

Increased efficiency of phenolic germicides by addition of inorganic salts to produce oxidation-reduction systems. A. J. Salle and H. L. Guest (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 26–28).—Addition to solutions of phenol or cresol of 0.65% of $\text{Fe}_2(\text{SO}_4)_3 \cdot 5\text{H}_2\text{O}$, or of 0.72% of $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$, or of 2.16% of $\text{FeCl}_3 \cdot 6\text{H}_2\text{O} + 0.34\%$ of FeCl_2 increases 15–45 times their germicidal efficiency against *Staph. aureus*. Efficiency of hexylresorcinol was similarly increased 4 times. Max. effect depends on definite proportions of salts and germicide. V. J. W.

Antibacterial effects of various acridine compounds. G. R. Goetchius and C. A. Lawrence (*J. Lab. clin. Med.*, 1944, 29, 134–138).—Two acridine compounds, rivanol lactate and rivanolazosulphanilamide, compare favourably in their antibacterial actions *in vitro* with acriflavine and proflavine. Several atabrine salts and other acridine derivatives exert bacteriostatic and bactericidal effects on several of the organisms studied. The acridines produce bacterial destruction, not merely inhibition of growth. C. J. C. B.

Effect of repeated application of sublethal concentrations of germicides on living embryonic tissue fragments [in culture]. A. J. Salle

(*J. Pharm. Exp. Ther.*, 1943, 79, 271–280).—The application of I (1:30,000) or hexylresorcinol (1:60,000) twice daily for 10–12 days to cultures of embryonic chick-heart fragments was without ill effects. HgCl_2 (1:150,000), applied twice daily, killed the tissue cultures in 3 days. The org. Hg compounds, metaphen (1:350,000) and merthiolate (1:440,000), similarly applied, produced degeneration of fibroblasts and stopped growth beyond 96 hr., but the heart fragments remained pulsating for 12 days. Transplants prepared from these fragments after 10 days' treatment grew in a normal manner. AgNO_3 (1:15,000) caused degeneration of fibroblasts in 72 hr., but the heart fragments pulsed for 10 days; fresh transplants from these made after 10 days' treatment grew more slowly than controls. Silver-protein strong (U.S.P.), 1:3000, had similar but milder effects. G. P.

Physostigmine [eserine] and related substances. III. Break-down products of eserine; their inhibitory effect on choline-esterase and their pharmacological action. S. Ellis, O. Krayner, and F. L. Plachte (*J. Pharm. Exp. Ther.*, 1943, 79, 309–319; cf. C., 1944, Part 3).—Rubreserine and eserine-blue are inhibitors of choline-esterase. Their potency *in vitro* on a mol. basis is 1/100th that of eserine. Eseroline and eserine-brown have no such actions. The pharmacological actions of rubreserine and eserine-blue are similar to that of eserine. The L.D.₅₀ intravenously for mice were: eserine sulphate 0.25, rubreserine 2.0, and eserine-blue 2.0 mg. per kg. G. P.

Pressor action of optical isomerides of sympathicomimetic amines. E. E. Swanson, C. C. Scott, H. M. Lee, and K. K. Chen (*J. Pharm. Exp. Ther.*, 1943, 79, 329–333).—The *l*-isomerides of sympathicomimetic amines have stronger pressor action than the *d*-isomerides. G. P.

Pharmacological action of *N*-methylecystisine. C. C. Scott and K. K. Chen (*J. Pharm. Exp. Ther.*, 1943, 79, 334–339).—The pharmacological actions of *N*-methylecystisine are similar to those of nicotine but with 0.025–0.1 of its activity. G. P.

Pharmacological action of β -methylaminoheptane (EA-1). D. E. Jackson (*J. Lab. clin. Med.*, 1944, 29, 150–167).—3 c.c. of a 10% EA-1 hydrochloride solution given by a stomach tube to a dog produced salivation, erection of hair on the back, dilatation of the pupils, lachrymation, rapid breathing, depression, weakness, incoordination, and cardiac irregularity. Almost complete recovery occurred in 2½ hr. When given intravenously (1 c.c. of a 10% solution) similar symptoms were produced more promptly. The action on the circulation is peripheral. The blood pressure rises promptly; the rise is more persistent and stable than that which follows adrenaline. EA-1 potentiates the action of ergotamine in producing adrenaline reversal. EA-1 has a double action on the heart: first a stimulation of the sympathetic nerve endings, and second, a direct muscular action which is, with proper dosage, almost entirely stimulating and augmentative, but rapidly changes to depression with the second or later doses. EA-1 dilates the bronchioles by a peripheral action. Relaxation and inhibition of stomach tone were produced. C. J. C. B.

Naturally occurring blood thiocyanates and their relation to blood pressure. A. Trasoff and N. G. Schneeberg (*Amer. J. med. Sci.*, 1944, 207, 63–67).—CNS' occurs normally in human blood in concns. averaging 1.31 mg.-%. Habitual tobacco smokers showed CNS' concns. well above the normal average. No const. relationship of blood pressure to blood-CNS' concn. was found. C. J. C. B.

Internal treatment of animals with phenothiazine to prevent development of horn-fly larvae in the manure. E. F. Knippling (*J. Econ. Entom.*, 1938, 31, 315–316).—0.1 g. or less of phenothiazine per kg. body wt. given orally to cattle gave 100% control of horn-fly larvae in the faeces. A. A. M.

Influence of certain amino-acids on histamine reactions and anaphylactic reactions in intestinal strips of guinea-pigs and in intact guinea-pigs. S. W. Landau and L. N. Gay (*Johns Hopkins Hosp. Bull.*, 1944, 74, 55–76).—Arginine and histidine *in vitro* prevent or stop the contracting effect of histamine or an antigen, and sometimes weaken the effect of acetylcholine, on a strip of guinea-pig's intestine. The ileum of a sensitised animal is desensitised by adding the sp. antigen even if contraction of the strip is prevented by arginine or histidine. Arginine injections (intracardiac more effective than intra-abdominal) protected guinea-pigs against death from histamine injection but not from anaphylactic shock. Arginine in 2% solution had no effect on intradermal skin reactions from histamine or pollen extracts in man. From these experiments and from those of authors, who prevented the effects of histamine and of anaphylaxis by using the French ethylenediamine preps. 929 F and 1571 F, it seems that higher doses of the protecting substances are needed for preventing anaphylactic than histamine effects. T. F. D.

Expectorant action of paregoric. E. M. Boyd and M. L. MacLachlan (*Canad. Med. Assoc. J.*, 1944, 50, 338–344).—Paregoric increased the output of respiratory tract fluid (R.T.F.) in rats, cats, rabbits, guinea-pigs, and hens. All the components of paregoric

individually increased the output of R.T.F. and when combined their actions were potentiated, but only in preps. of paregoric which had aged well over one year and were of a dark brown colour, in contrast to the pale and light brown colour of non-aged preps. Section of the afferent vagal nerves from the stomach annuls the action of paregoric, which probably acts reflexly. Morphine, alone or following eserine, had no effect on the output of R.T.F.

C. J. C. B.

Ether anaesthesia and secretion from respiratory tract. E. M. Boyd and J. S. Munro (*J. Pharm. Exp. Ther.*, 1943, 79, 346—353).—The vol. of secretion from the respiratory tract, collected through a tracheal cannula, did not increase during inhalation of ether in rabbits, cats, or guinea-pigs anaesthetised with urethane, but the secretion increased threefold in dogs. Atropine did not influence the secretion from the respiratory tract in any of the animals, but decreased the excessive salivation caused by ether (cf. A., 1942, III, 50; 1944, III, 245).

G. P.

[Anaesthesia in myxomycetes.] Theory of anaesthesia based on protoplasmic behaviour. W. Seifriz (*Anesthesiology*, 1941, 2, 300—309).—The effect of various anaesthetic agents on the myxomycete *Physarium polycephalum* was studied. Cessation of protoplasmic flow served as indication of anaesthesia. CO₂, cyclopropane, and CHCl₃ produced rapid anaesthesia with rapid recovery. During anaesthesia the protoplasm underwent gelation ("thixotropic setting"). Acetone vapour (1:5—1:10) causes anaesthesia, but higher concns. damage or kill the mould. Ether does not stop protoplasmic flow, except in lethal concns. N₂O or ethylene had no anaesthetic effect. A theory of anaesthesia, based on the "thixotropic setting" of the protoplasm, is advanced.

G. P.

Effects of respiratory stimulants in animals under pentothal sodium anaesthesia. L. H. Mousel and H. E. Essex (*Anesthesiology*, 1941, 2, 272—280).—Coramine, metrazol, picrotoxin, neospiran, and α -lobeline produce respiratory stimulation in normal and lightly anaesthetised dogs and cats. They have no stimulating effect in deeply anaesthetised animals. Often, when the respiration was depressed by the anaesthetic, these stimulants produced a further depression of respiration.

G. P.

Laboratory and clinical evaluation of vinethene [divinyl ether]. S. J. Martin and E. A. Roventine (*Anesthesiology*, 1941, 2, 285—299).—Review of literature since 1936.

G. P.

Effect of cyclopropane on blood pressure, stroke volume, and heart size of dog. D. E. Brace, D. Scherf, and L. J. Spire (*Anesthesiology*, 1941, 2, 261—271).—The circulatory effects of cyclopropane inhalation for 4—5 min. were studied in dogs under nembutal anaesthesia. The blood pressure fell slowly during the first 2 min. and rose above the original level during the 3rd and 4th min. and during the 1st min. after discontinuation of cyclopropane, and then fell to the original level. The heart showed a marked diastolic and less marked systolic dilatation and increased output during cyclopropane inhalation. 20 sec. after the cyclopropane was stopped systole became more forcible and the cardiac vol. smaller in systole and in diastole.

G. P.

Nitrous oxide anaesthesia for thoracoplasty. S. C. Cullen, W. O. McQuiston, and V. W. Petersen (*Anesthesiology*, 1941, 2, 310—316).—After premedication of patients with barbiturates, morphine, and scopalamine, N₂O + O₂ can be used as the anaesthetic for thoracoplasty. 73 cases are reported.

G. P.

Adaptation of continuous nitrous oxide [administration] to "to and fro" carbon dioxide absorption technique. S. S. Lyons (*Anesthesiology*, 1941, 2, 321—325).—An apparatus is described which permits the continuous flow of N₂O in the "to and fro" CO₂ absorption technique with simultaneous ether vaporisation.

G. P.

Nausea and vomiting during [abdominal operations under] spinal anaesthesia; influence of preoperative narcotics. P. Sellman (*Anesthesiology*, 1941, 2, 333—338).—An analysis of 400 cases. It is suggested that pantopon might be more suitable for premedication than morphine to avoid nausea and vomiting.

G. P.

Effect of local anaesthetics on regeneration of corneal epithelium.—See A., 1944, III, 403.

Sulphonamide-inhibiting action of procaine. O. L. Peterson and M. Finland (*Amer. J. Med. Sci.*, 1944, 207, 166—175).—Procaine, in amounts ordinarily employed for local anaesthesia, may be absorbed into the circulation in sufficient concn. to inhibit the action of sulphonamides in the blood. Infection introduced into an area which has been infiltrated with procaine may become established locally in spite of the continuous presence in the body of bacteriostatic concns. of sulphonamides.

C. J. C. B.

Duration of sleep produced by pentobarbital sodium in normal and castrate female rats. C. Gaylord and H. C. Hodge (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 46—48).—Normal rats slept longer than castrates.

V. J. W.

Use of curare in anaesthesia and for other clinical purposes. H. G. Griffith (*Canad. Med. Assoc. J.*, 1944, 50, 144—146).—A lecture.

C. J. C. B.

Demerol (S140) and scopalamine in labour. W. R. Schumann (*Amer. J. Obstet. Gynec.*, 1944, 47, 93—104).—A favourable clinical report based on 1000 cases.

P. C. W.

Metabolism of paraldehyde. II. P. Hitchcock and E. E. Nelson (*J. Pharm. Exp. Ther.*, 1943, 79, 286—294; cf. C., 1944, Part 3).—The excretion of paraldehyde, after oral or intraperitoneal administration, through the lungs was studied in normal mice and in mice poisoned with CCl₄. The smallest doses after which excretion could be measured were 100 mg. per kg. orally and 50 mg. per kg. intraperitoneally in normal mice, and 50 mg. per kg. orally and 25 mg. per kg. intraperitoneally in poisoned mice. The rate of pulmonary excretion (total amount excreted/hr. of excretion) was proportional to the dose in all mice. Excretion ceased in normal mice 2 hr. after administration and in poisoned mice only after 6 hr. The latter excreted more paraldehyde than the controls. The rate of destruction of paraldehyde in the body [(dose administered—total amount excreted)/hr. of excretion] was proportional to the dose in normal mice, but it was const. in poisoned mice and much lower than in the controls. In both normal and poisoned mice more paraldehyde is destroyed than excreted. It is suggested that paraldehyde is depolymerised in the body to acetaldehyde which is then oxidised. Only small quantities of administered acetaldehyde are excreted through the lungs and most of it is rapidly destroyed; the rates of destruction and excretion are not influenced by CCl₄ poisoning. Paraldehyde increases acetylation of sulphamylamide by mice.

G. P.

Repeated administration of paraldehyde to guinea-pigs. E. B. Carmichael, F. A. Kay, and G. W. Phillips (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 22—23).—3 injections weekly of 10 c.c. per kg. of 10% paraldehyde for 4 weeks caused some loss of wt. in guinea-pigs, but they developed tolerance, as shown by a decrease in sleeping time and in the time necessary for recovery of full motor co-ordination.

V. J. W.

Reduction of post-partum morbidity by prophylactic use of ergonovine. J. B. Lounsbury (*Amer. J. Obstet. Gynec.*, 1940, 40, 111—117).—Ergonovine given in doses of 0.2 mg. thrice daily for the first 3 post-partum days in 100 women hastened the involution of the uterus, lessened the lochia, and reduced morbidity compared with 100 women who received no such treatment.

P. C. W.

Flaking paint is dangerous to calves. E. G. White and E. Cutchin (*J. Min. Agric.*, 1944, 51, 85—86).—Cases of Pb poisoning in calves due to licking paint flaking off stall partitions and doors occurring on nine different farms are reported. A 7-day-old calf was given 10 g. of paint scraped from a door used in a calf pen in which deaths had occurred. The calf died 8 days later with symptoms lasting less than 1 hr.; Pb was found in the stomach contents, liver, and kidneys in amounts similar to those in the previous cases.

E. G. W.

Acute toxicity of mercurial diuretics. W. Modell and S. Krop (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 80—82).—The lethal dose of Hg for cats is 15 mg. per kg. whether it is given as HgCl₂, HgCl₂ + theophylline, or Salyrgan. When given as Salyrgan + theophylline, Mercupurin, or Mercurin the lethal dose is 30 mg. per kg. The Salyrgan-theophylline mixture has to be kept for 1 hr. at room temp. for the fall in toxicity to take place.

V. J. W.

Acute nitroglycerin poisoning. I. M. Rabinowitch (*Canad. Med. Assoc. J.*, 1944, 50, 199—202).—A general review.

C. J. C. B.

Statistical treatment of toxicological data relating to more than one dosage factor. D. J. Finney (*Ann. Appl. Biol.*, 1943, 30, 71—79).—Mathematical.

A. G. P.

Toxicity studies on insecticides. H. A. Shelanski (*Soap*, 1944, 20, No. 2, 107—109, 133).—Prior to use, an insecticide should be tested for acute and chronic oral toxicity on rats and guinea-pigs, for irritation to skin and eyes on guinea-pigs and rabbits, chronic toxicity to rats and guinea-pigs on exposure to vapour, sprays, and aerosols, for skin irritation and sensitisation in man, and finally in conditions encountered in actual use. Brief general directions are given for each type of test.

R. S. C.

Mode of action of pyrethrum on the cockroach (*Periplaneta americana*, L.). D. N. Ray, S. M. Ghosh, and R. N. Chopra (*Ann. Appl. Biol.*, 1943, 30, 42—47).—Pyrethrin dissolves in the body fluid of the cockroach and its sp. destructive action on cells of nerve ganglia causes the death of the insect. When introduced into the body cavity in the form of powder or of kerosene extract pyrethrin is carried by the blood to the ganglia. When introduced via the spiracles pyrethrin diffuses into the hæmocoel, and thence to the ganglia.

A. G. P.

Circa 42, a new itch remedy. J. F. Yeager and C. S. Wilson (*J. Lab. clin. Med.*, 1944, 29, 177—178).—The composition of Circa 42 is: *n*-butyl *p*-aminobenzoate 100 g., benzyl alcohol 170 c.c., anhyd. lanolin (melted) 20 c.c., corn starch 640 g., Na laurylsulphonate 64 g. Circa 42 shows considerable promise as a remedy for the relief of itching skin.

C. J. C. B.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Regional relationship of rate of water loss in normal adults in sub-tropical climate. G. E. Burch and W. A. Sodeman (*Amer. J. Physiol.*, 1943, 138, 603—609).—The measurements were made in a room at $105 \pm 2^\circ \text{F}$. and R.H. $75 \pm 2\%$, with a flow of air of less than 20 ft. per min. The most rapid rates of insensible perspiration are from the hands, feet, forehead, and cheeks in normal adults; slow rates were found from the skin of the trunk, arms, and legs. There were marked individual variations from subject to subject and from time to time in the same subject. With sensible perspiration the rate of water loss was often greater over areas which showed little insensible perspiration. Under const. laboratory conditions there was no difference in the rate of insensible or sensible water loss during winter or summer. The rate of water loss of a subject resting is not materially increased when temp. and R.H. are increased from 75°F . and 50% to 95° and 75%. Sweat is poured out when the temp. is further increased to 100°F . A. S.

Mineral content of lungs of workers in South Wales coalfield. E. J. King and G. Nagelschmidt (*Proc. Biochem. Soc.*, 1944, 38, xxxii).—There is no correlation between severity of pathological lesions of the lungs and concn. of coal or kaolin, whilst concns. of mica and quartz parallel degree of fibrosis. P. G. M.

XXII.—RADIATIONS.

Effect of hard roentgen rays on intestines of normal dogs fed inorganic iron compounds. Y. K. K'O, C. L. Tu, and B. C. Chan (*Surg. Gynec. Obstet.*, 1941, 73, 333—340).—A total depth dose of 2400 r. given to the abdomen in dogs over 10—20 days produced clinical signs of intoxication with varying degrees of necrosis, hæmorrhage, and ulceration of the intestinal mucosa. The same dose given during 24 days produced slight œdema and anæmia but no other symptoms. 30 ml. of FeSO_4 (2.5%) administered daily during the irradiation abolished or diminished the anæmia and caused only slight œdema of the intestinal mucosa, which was quite normal 8 weeks later. A similar vol. of 20% $\text{Fe}^{III} \text{NH}_4$ citrate had less effect on the anæmia and produced hæmorrhages and sloughing of the intestinal mucosa which persisted for at least 8 weeks after stopping treatment. The doses of irradiation and Fe compounds were comparable to those given to patients with cervical carcinoma and anæmia. The use of the Fe^{II} salt is preferable. P. C. W.

Sensitivity of new-born mice in a state of asphyxia to X-rays. A. Lacassagne (*Compt. rend.*, 1942, 215, 231—232).—A decreased sensitivity to X-rays is observed in mice in a state of asphyxia due to exposure to cold and CO_2 . H. G. R.

X-Ray therapy of inflammatory and neoplastic diseases of eye.—See A., 1944, III, 335.

Cytological effect of different seed treatments on X-rayed barley. Germination and sprouting ability of oats and wheat following different X-ray dosages. Failure of root tips of tomato seedlings germinated from X-rayed seeds to grow in vitro.—See A., 1944, III, 380.

Effect of X-rays on yeasts. J. Reboul (*Compt. rend.*, 1942, 215, 261—263).—The curve obtained by plotting the X-ray dose against the % of surviving yeast is a flat sigmoid with asymptote in the neighbourhood of 45%. H. G. R.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Non-osmotic force in water relations of potato tubers during storage.—See A., 1944, III, 377.

"Degree of saturation" in kinetics of respiration. O. Klein and J. Runnström (*J. Cell. Comp. Physiol.*, 1943, 54, 273—276).—A mathematical analysis of reactions between O_2 and substrate, with a rejoinder to Fisher's criticism (A., 1940, III, 432) of Warburg's use of the ϵ factor. V. J. W.

Critical graphical methods for calculating isotonic concentrations and freezing points of aqueous solutions. F. M. Goyan, J. M. Enright, and J. M. Wells (*J. Amer. Pharm. Assoc.*, 1944, 33, 74—80).—It is shown that substances of the same ionic type have nearly the same val. of Δ and hence approx. isotonic concns. of substances for which data for Δ are lacking may be calc. Methods are also described for calculating, from either ionic type and mol. wt. or cryoscopic data, the wt. of a substance isotonically equiv. to 1 g. of NaCl. Practical applications of the methods are exemplified. F. O. H.

Longitudinal scattering of infra-red rays, Tyndall effect, and mol. wt. of proteins. W. W. Lepeschkin (*Biochem. Z.*, 1941, 309, 254—260).—The Tyndall effect in protein solutions, which manifests itself with white light, is no longer observed with dark red rays. At low concns., the effect varies with concn. but with high concns.,

e.g., 9% for ovalbumin and 2% for hæmoglobin, the scattering attains a max. val. and then remains const. In no case is it related to the mol. wt. of the protein. By contrast the longitudinal scattering of infra-red or dark red rays (Plotnikov effect) increases with mol. wt. Ovalbumin (mol. wt. 34,000) produces a scattering effect of 1, and tobacco mosaic virus (mol. wt. 17×10^6) a scattering effect of 6.91. A rise in pH from the isoelectric point (4.8) to 5.9 produces a slight reduction in the Plotnikov effect, which thereafter remains const. to pH 8.5. The change in the Tyndall effect over the same pH range is less. Treatment of the albumin solution with glycerol or NaCl increases the Plotnikov effect and lowers the Tyndall effect. P. G. M.

Anomalous viscosity and flow-birefringence of protein solutions.
III. Changes in these properties of myosin solutions in relation to adenosine triphosphate and muscular contraction. M. Dainty, A. Kleinzeller, A. S. C. Lawrence, M. Miall, J. Needham, D. M. Needham, and S. Shen (*J. Gen. Physiol.*, 1944, 27, 355—399; cf. A., 1944, I, 103).—When myosin is prepared under standard conditions, the ratio of flow-birefringence to concn. of protein is uniform. 0.5M-LiCl, -NaCl, -KCl, -RbCl, -CsCl, and - NH_4Cl have no appreciable effect on flow-birefringence and relative η is affected only very slightly. With increased concn. of these salts, the flow-birefringence is decreased. Br^- and SO_4^{2-} have no appreciable effect on, whilst I^- and SCN^- abolish or considerably decrease, the flow-birefringence. Br^- and SO_4^{2-} have no effect, whilst CNS^- generally increases relative η . Within the pH range 6.0—8.5, there is no appreciable effect on flow-birefringence, whilst below 6.0 there is a sudden increase, and above 8.5 a gradual decrease. Relative η is very high at pH vals. below 6.0; it is const. at pH 6.0—8.5 and increases considerably at higher pH vals. In presence of urea, flow-birefringence is decreased and becomes zero at approx. 2.5M-urea. Relative η is unaffected by this concn. of urea but is decreased at higher concn. Decrease or abolition of flow-birefringence does not always imply pronounced denaturation because the effects are annulled by various means. When a solution of myosin is treated with 0.004M-adenosine triphosphate, its flow-birefringence is decreased by approx. 48%, anomalous η is unaffected, whilst relative η is decreased by 14%. The changes are spontaneously reversible and are connected with the enzymic action of the protein as adenosine-triphosphatase. Effects similar to those obtained with adenosine triphosphate are observed only with inosine triphosphate. Inorg. PO_4^{3-} is removed by myosin from adenosine and inosine triphosphate. Inorg. triphosphate is hydrolysed by 1—2% solution of thrice-pptd. myosin. Adenosine diphosphate and inorg. triphosphate are competitive inhibitors with adenosine triphosphate and inhibit the decrease in flow-birefringence. The bearing of the results and the conception of active enzymic groups attached to proteins participating in cell structure, whether contractile or non-contractile, are discussed in relation to present views on muscle physiology and other biological problems. J. N. A.

XXIV.—ENZYMES.

Respiration and enzymic activity of wheat kernel during ripening.—See A., 1944, III, 376.

Enzymes and their mode of action. J. H. Quastel (*Endeavour*, July, 1943; *Wallerstein Lab. Comm.*, 1943, 6, 182—190).—A review of the nature of enzymes and enzyme systems, with particular reference to prosthetic groups and co-enzymes, and of enzyme-substrate relationships. I. A. P.

Inhibition of enzyme systems by metabolic products of carcinogenic compounds. Urease and succinoxidase. L. A. Elson and C. Hoch-Ligeti (*Proc. Biochem. Soc.*, 1944, 38, xxxvi).—Both urease and succinoxidase systems are strongly inhibited by "benzidine rearrangement" products of the metabolism of *p*-dimethylamino-azobenzene. In the succinoxidase system the rate of oxidation of diamines is related to cytochrome present, and inhibition is sometimes observed only after addition of cytochrome-*c*. Addition to diamines to complete systems produces initial increase in O_2 uptake, followed by inhibition, whilst when they are added before the substrate no initial increase occurs. P. G. M.

Lipoxidase, a dehydrogenase. J. P. Hummel and H. A. Matill (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 31—33).—Lipoxidase from soya bean catalyses both primary and secondary phases of auto-oxidation of ethyl esters of lard fats. In the primary phase, carotene acts as a pro-oxidant. The fact that it is almost uninhibited by CN^- shows that it is an aerobic dehydrogenase rather than an oxidase. V. J. W.

Separation of cytochrome-oxidase into two components. E. Haas (*J. Biol. Chem.*, 1944, 152, 695—696).—Centrifuging the oxidase led to the separation of two components, one insol. and the other sol. and thermostable. Both components appeared to be proteins. On recombining, most of the original activity, lost on separation, was recovered. J. F. M.

Reduction of dehydroascorbic acid in plant extracts. E. M. Crook and E. J. Morgan (*Biochem. J.*, 1944, 38, 10—15).—30 species of

plants are examined for presence of the enzyme which catalyses reduction of dehydroascorbic acid by reduced glutathione. The enzyme is absent from 8, whilst addition of the juice from 9 other species causes at least 100% increase in rate of reduction of dehydroascorbic acid by reduced glutathione alone without added enzyme. The most active species are cabbage, cauliflower, and broad bean. In general, the Gramineae, Cruciferae, and Leguminosae appear to contain more of the enzyme than do other genera. In cauliflower and broad bean glutathione protects ascorbic acid from oxidation by atm. O_2 . The physiological rôle of the enzyme is discussed.

J. N. A.

Occurrence of diamino-oxidase and histidine-decarboxylase in micro-organisms. E. Werle (*Biochem. Z.*, 1941, 309, 61–76; cf. A., 1943, III, 848).—Production of histidine-decarboxylase by *B. coli* is much greater in glucose-agar medium than in an agar medium containing no glucose. *B. pyocyaneum* and some other pathogenic bacteria also produce the decarboxylase, which decarboxylates both *D*- and *L*-histidine. Fungi (e.g., yeast, *Torula utilis*, *Aspergillus niger*, *A. oryzae*) produce no histidine-decarboxylase but all (except yeast) produce histaminase (which usually accompanies the decarboxylase in bacteria), the yield being generally greater in an agar than in an agar-glucose medium. Diamines (putrescine, cadaverine) compete with histaminase and inhibit it but are not attacked by it since no consumption of O_2 occurs. The decarboxylase, but not histaminase, is destroyed by treatment with acetone-ether mixture.

W. McC.

Mechanism of enzyme action. XXII. Elementary sulphur as hydrogen acceptor in dehydrogenations by living fusaria.—See A., 1944, III, 368.

In-vitro hydrolysis and synthesis of cocarboxylase by [mechanically damaged] liver tissue.—See A., 1944, III, 347.

Choline-esterase. IV. Purification of pseudo-choline-esterase from horse serum. F. Strelitz (*Biochem. J.*, 1944, 38, 86–88).—The method described involves fractional pptn. by $(NH_4)_2SO_4$ at pH 2.8, followed by dissolution of the active fraction in 0.1N-acetate buffer at pH 3.5 and further fractional pptn. at this pH. The active ppt. is then dialysed against tap water, the solution is clarified with with Lloyd's reagent, pptd. by $(NH_4)_2SO_4$ (0.66-saturated), again dialysed, and dried in vac. A 2400-fold purification is thus effected. The potency can be increased to 5000 times that of the original serum by further dissolution in N-acetate buffer at pH 5.2, fractionally pptg. at -10° with 33% acetone, dialysing against distilled water, and drying in vac. The best yield is obtained in autumn and early winter. The purified enzyme hydrolyses tributyrin at 30% of the rate of acetylcholine.

P. G. M.

Lowering of blood-uric acid by uricase injections.—See A., 1944, III, 325.

Serum-peptidases. E. Maschmann (*Biochem. Z.*, 1941, 308, 359–390).—The peptidase, especially the dipeptidase (leucyl-, alanyl-, and glycyl-glycine as substrates), activity of serum (sheep, rabbit, guinea-pig) is increased by Mg, Mn, Co, and Fe; other metals (Ni and, to a greater extent, Hg) inhibit, whilst the effect of Zn depends on concn., 0.001M. slightly inhibiting and 0.0001M. activating the dipeptidase action. The peptidases are inhibited by CN^- , cysteine, and $P_2O_7^{4-}$; the inhibition is reversible, e.g., cysteine inactivation is reversed by Mn. The activity appears to be dependent on a $-CO-$ group. With $(NH_4)_2SO_4$ fractionation, the peptidases of guinea-pig and rabbit sera are pptd. with the albumins and those of sheep plasma or serum with the globulins; removal of these proteins from the enzymes has no effect on their activation or inhibition. Pptn. of the serum-proteins by alcohol or acetone results in variable losses in peptidase activity. The action of serum-peptidases is discussed with reference to activation and inhibition phenomena and to specificity.

F. O. H.

Peptidases. V. Separation of co-enzymic factors from yeast-dipeptidase. F. Schneider (*Biochem. Z.*, 1941, 308, 399–404; cf. A., 1944, III, 287).—Normal dried preps. of dipeptidase are not activated by boiled yeast juice + Cl^- ; high concns. of Cl^- have an inhibitory effect. After prolonged dialysis, during which activity decreases, boiled yeast juice, but not Cl^- , has an activating effect. Dipeptidase prepared by methods that include pptn. by acetone at pH 5.0 behave like dialysed preps. The nature of the thermostable, co-enzyme-like substances present in the yeast juice is discussed.

F. O. H.

Peptidases. E. Abderhalden (*Biochem. Z.*, 1941, 308, 439–440).—A comment on the work of Schneider and Graef (A., 1944, III, 66). The results of several workers confirm that a thermostable and dialysable factor is necessary for the activity of erepsin and dipeptidase. The claim that the "synthesis" of a peptide-splitting enzyme from two inactive constituents has been achieved for the first time is true for yeast but not for animal peptidases.

F. O. H.

Animal peptidases. IV. E. Maschmann (*Biochem. Z.*, 1941, 309, 179–189).—Glycerol extracts of rabbit tissues and serum, and mouse carcinoma, have higher di- and tri-peptidase activity than have aq. extracts. Kidney has the highest, and serum the lowest,

activity. The dipeptidases show considerable substrate specificity, and the enzymes that split alanyl- and glycyl-glycine are more labile than that which attacks leucylglycine. Tripeptidases are more stable. Mn exhibits a greater activation of tissue enzymes that split leucyl- and leucylglycyl-glycine than Mg, whilst Co has either no effect or an inhibiting action. Mn, Mg, and Co do not affect the activity of serum tripeptidase. Mg increases the activity of alanyl-glycine peptidase; Mn and Co often inhibit it. Most other metals either have little effect on, or inhibit, enzymes that hydrolyse leucine-containing di- or tri-peptides. Co effects the greatest activation of glycyl- and glycylglycyl-glycine peptidases.

P. G. M.

Partial hydrolysis products from the action of proteolytic enzymes on casein. T. Winnick (*J. Biol. Chem.*, 1944, 152, 465–473).—Digestion of casein by pepsin, trypsin, chymotrypsin, ficin, and papain yielded peptides with an average of 5–7 amino-acid residues; 1.5–4.5% of the total N was left in the form of free amino-acids. Electrolytes were removed by electrodialysis. Carboxypeptidase splits off single amino-acids from peptides. All the proteinases probably attack a small no. of protein mols. quickly and continue to hydrolyse the resulting polypeptides.

R. L. E.

Digestion of living tissues by proteolytic enzymes. C. A. Dragstedt (*Science*, 1943, 98, 131–132).—Trypsin liberates histamine from living mammalian tissues; the amount of local digestion by trypsin was increased by injecting histamine, although the same amounts of histamine produced no necrosis. Free living cells are not injured by histamine, and trypsin digestion does not occur. It is suggested that histamine affects the vascular system in organised tissue rather than that there is any fundamental difference in the protoplasm of free living cells and tissue.

E. R. R.

Classification of carbohydrases. W. W. Pigman (*J. Res. Nat. Bur. Stand.*, 1943, 30, 257–265).—Weidenhagen's classification of carbohydrases has been modified by the suggestion that individual enzymes may be regarded as classes of enzymes with properties that vary according to the source, particularly as applied to glucosidases and polysaccharidases. The source of an enzyme prep. should therefore always be stated.

P. G. M.

Reversible heat-inactivation of invertase. A. M. Chase, E. H. Reppert, jun., and R. M. Ruch (*J. Cell. Comp. Physiol.*, 1944, 23, 27–30).—Rate of inversion of sucrose by invertase at pH 4.8 is much less at 50° than at 21° , but invertase solution which has been kept at 50° for 30 min. and then cooled has the same activity as before heating.

V. J. W.

Effect of acid hydrolysis on activity of polysaccharides in enzyme synthesis of starch. P. H. Hidy and H. G. Day (*J. Biol. Chem.*, 1944, 152, 477–478).—Synthetic starch lacks the activating effect of natural starch on phosphorylase, but acquires activating power on hydrolysis with acid. The activating effect of maize starch and of its amylose fraction is increased by acid hydrolysis. The increase is greatest just before the colour reaction with I disappears.

R. L. E.

Mechanism of polysaccharide production from sucrose. S. Hestrin and S. Avineri-Shapiro (*Biochem. J.*, 1944, 38, 2–10; cf. A., 1943, II, 294).—Levan sucrose catalyses the conversion of sucrose into glucose, fructose, and levan, and the conversion of raffinose into melibiose, fructose, and levan. PO_4^{3-} , adenylic acid, levan itself, and the dialysable fractions of the enzyme prep. are non-essential components of the levan-forming enzyme system. Although not observed, the enzymic reaction which leads to synthesis of levan may be reversible. Levan sucrose has a high substrate-specificity and has no action on glucose, fructose, trehalose, maltose, lactose, methylfructofuranoside, inulin, or phosphoric esters. The enzyme is inhibited by various sugars which, with one exception (sorbitol), are similar in configuration at $C_{(2)}$, whilst those which differ from glucose at $C_{(2)}$ are non-inhibitory. The susceptibility of levan sucrose to inhibition by different sugars is distinct from that of yeast fructo-saccharase and also from that of phosphorylase. Inhibition of levan sucrose by glucose is due to competition for the enzyme. Possible reaction paths leading from sucrose and raffinose to levan, and the bearing of the results on the theory of direct sucrose fermentation, are discussed.

J. N. A.

Influence of dextrin on the synthetic action of plant phosphorylase. J. B. Sumner, G. F. Somers, and E. Sisler (*J. Biol. Chem.*, 1944, 152, 479–480).—Synthesis of polysaccharides by jack bean and potato phosphorylases can be activated by maize-starch amylose or amylopectin, glycogen, erythro-dextrin, achroo-dextrin, or either of two water-sol. polysaccharides from sweet corn. Maltose is inactive. The product varies with the kind and amount of activator present. The enzyme probably adds anhydro-*D*-glucose units to the polysaccharides available.

R. L. E.

Alcoholic fermentation with intact enzyme system of the yeast cell and with disorganised zymase systems. V. R. Nilsson and M. Elander (*Biochem. Z.*, 1941, 309, 51–60; cf. A., 1944, III, 288).—The rate of fermentation in a mixture containing intact dried yeast is decreased by dilution if no PO_4^{3-} is added and the course of fermentation is altered, the effects resembling those caused by

disorganisation. Dilution also lengthens the period of induction. Since a high degree of restitution occurs when $\text{PO}_4^{'''}$ or, especially, $\text{PO}_4^{'''}$ + cozymase is added, the effects of dilution are probably due to the concn. of water-sol. constituents being rendered sub-optimal. When yeast maceration juice replaces intact yeast, the effects of dilution are different. W. McC.

Influence of sodium salicylate on enzyme systems. H. von Euler and L. Ahlström (*Z. physiol. Chem.*, 1943, 279, 175—186; cf. A., 1944, III, 217).—On the assumption that the inhibition of fermentation by salicylate is due to replacement of the cozymase combined with the apozymase by salicylate, the redetermined *K* val. for 50% inhibition (salicylate concn./cozymase concn.) is 0.78. The % inhibition by salicylate depends on glucose concn. but not on apozymase concn. Partial inactivation of the apozymase by heat greatly increases the % inhibition, possibly by changing the affinity of the apo- for the cozymase. The reaction between cocarboxylase and actiozymase, i.e., formation of holocarboxylase, is inhibited by salicylate. Nicotinic acid and amide inhibit the apozymase fermentation only when present in relatively large amounts, nicotinyl-salicylamide is a much stronger inhibitor, and trigonelline inhibition increases with decrease in cozymase concn. In rats salicylic acid *per os* increases the blood-pyruvic acid and affects the colour of the hair, probably by opposing the action of pantothenic acid. It is unlikely that salicylate inhibition is due to replacement of cozymase, but rather to a weakening of the affinity of apo- for cozymase. J. H. B.

"Activation" of phosphatase. G. E. Delory and E. J. King (*Biochem. J.*, 1944, 38, 50—53).—Carefully controlled experiments fail to demonstrate the existence of a phosphatase activator, and the high serum-phosphatase vals. found in, e.g., jaundice must be due to an actual increase in the amount of enzyme in the serum (cf. Thannhauser *et al.*, A., 1938, III, 784). E. C. W.

Biological degradation of acetic acid. II. Action of malonic acid on the degradation of acetic acid by yeast.—See A., 1944, III, 369.

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

Marine fungi. Taxonomy and biology. E. S. Barghoorn and D. H. Linder (*Farlowia*, 1944, 1, 395—468).—Seven marine fungi grown from ascospore isolations all tolerated a salinity three times that of normal sea-water. In sea-water-agar growth was better when cellulose, pectin, or starch than when maltose, galactose, xylose, asparagine, or wood flour was supplied, although the latter was not much inferior to starch and cellulose as a nutrient. Optimum temp. for growth was generally 22.5—27.5° but all forms showed appreciable growth at 5°. Growth was generally best with an initial pH above 7.6; acid media affected growth adversely. The fungi were all obtained from wood or rope partly submerged in salt water and they all penetrated into and caused decay of the wood or rope. L. G. G. W.

Chemistry of lipins in ergot. A. Santos Ruiz (*Anal. Fis. Quím.*, 1940, 36, 345—353).—The constituents of Spanish ergot and their physical consts. are comparable with those of ergot from other sources. The unsaponifiable fraction contains 960 i.u. of vitamin-D per g. and 26.4% of sterols including ergosterol, two isomerides of α. (cf. Heyl, A., 1932, 511) and 22 : 23-dihydroergosterol. F. R. G.

Routine procedures for isolation and identification of certain pathogenic fungi. H. J. Peppler (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 123—127).—A routine method of mycological examination of diverse pathological specimens from human sources is described. Primary isolation of a variety of fungi is achieved through the use of a liquid medium buffered at pH 4.0, Brewer's thioglycollate medium, honey agar, nutrient agar, and chocolate agar. C. J. C. B.

Effect of trace elements in tap-water on acid formation by *Aspergillus niger*. H. Knobloch and R. Sellmann (*Biochem. Z.*, 1941, 309, 145—150).—With the majority of strains of *A. niger*, the substitution of tap- for distilled water in the nutrient solution decreases citric acid formation, although the actual level depends on the composition of the solution. Mg salts generally stimulate acid formation but the effect varies according to the previous culture of the mould. Decrease in acid formation accompanies inhibition of growth of the mycelium. P. G. M.

Acid formation from sugar by *Aspergillus niger*. XI. Accumulation of citric acid. K. Bernhauer and H. Knobloch [with A. Iglaue] (*Biochem. Z.*, 1941, 309, 151—178).—Addition of MgCl_2 to nutrient solutions increases citric acid formation, whilst CaCl_2 , ZnSO_4 , etc. decrease it and many other salts have no effect. The optimum pH depends on the composition of the medium : the val. is 1.8 for solutions in which NH_4NO_3 is the source of N, 2.3 if MgCl_2 is added, and 3.3 where $\text{Mg}(\text{NO}_3)_2$ is the source of N. Variation of temp. between 28° and 35° does not influence acid formation, but it is almost completely inhibited at 45—47°. Beet-sugar molasses is a better source of C for citric acid formation than is either fructose or

glucose. Submerged culture gives rise to less citric acid formation but stronger mycelial growth than does surface culture. P. G. M.

Acid formation from sugar by *Aspergillus niger*. XIII. Effect of selenious acid on production of citric acid by *A. niger*. H. Knobloch and J. N. Miksch (*Biochem. Z.*, 1941, 309, 90—99; cf. preceding abstract).—Production of citric acid by a strain of *A. niger* is increased by addition of H_2SeO_3 (optimum concn. approx. 0.002%). The effect varies with reaction (optimum with 0.03N-HCl), temp. (optimum 30—32°), and purity of sucrose used as substrate. H_2SeO_3 and H_2TeO_3 act like H_2SeO_3 . Acid production by some strains of *A. niger* is either unaffected or inhibited by H_2SeO_3 . W. McC.

Biochemistry of *Eidamella spinosa*. C. Enders and K. Theis (*Biochem. Z.*, 1941, 309, 202—211).—*E. spinosa* is an aerobic fungus with optimum growth at pH 4.5—5.5, but formation of the red dye, which takes place only in the presence of carbohydrate and protein of high mol. wt., is optimal at pH 7—8. The dye is non-cryst. and is sol. in water, glycerol, and acetic acid with a blood-red colour. It is decomposed by high concns. of mineral acid or alkali and, in weakly acid solution, is pptd. by 25%-saturation with $(\text{NH}_4)_2\text{SO}_4$. Repeated pptn. reduces its solubility. It is also pptd. from aq. solution by protein precipitants, and is decolorised by Br, H_2O_2 , or HNO_2 . It decolorises methylene-blue and reduces yeast fermentation in wort by 50%. The isoelectric point is pH 3. It is adsorbed on Al_2O_3 from aq. solution, and can be eluted by dil. acetic acid or ethyl alcohol, although it previously contained no alcohol-sol. portion. The chromoprotein is split into the two components by HCl at 80° in aq. alcoholic solution; it can then be extracted by CHCl_3 , from which it is pptd., after concn., by light petroleum. Alternative methods of prep. are given. The free dye sinters at 90—160° and melts at 165—205°. Reduction by Zn-acetic acid decolorises it, but the colour returns on treatment with I. P. G. M.

Effect of sodium nitrate concentration on metabolism of *Penicillium sclerotiorum*, van Beyma. D. Reilly, T. Long, and T. P. Curtin (*Biochem. J.*, 1944, 38, 37—39).—The utilisation of Cl' by *P. sclerotiorum* is an inverse function of the NO_3^- content of the medium. Growth and production of pigment and polyglucose are optimum when the NaNO_3 content of the medium is 0.1% and apparently independent of Cl' consumption until it is reduced to far below normal. E. C. W.

Penicillin. K. Meyer, E. Chaffee, G. L. Hobby, M. H. Danson, E. Schwenk, and G. Fleischer (*Science*, 1942, 96, 20—21).—The culture fluid is adjusted to pH 3—4, saturated with $(\text{NH}_4)_2\text{SO}_4$, and extracted with CHCl_3 , from which the active agent is extracted by $\text{PO}_4^{'''}$ buffer at pH 7.2. Stability is increased by acetylation or benzoylation. An activity corresponding to 240 Oxford units per mg. was obtained. E. R. R.

Large-scale production of penicillin. C. E. Clifton (*Science*, 1943, 98, 69—70).—A continuous-flow cascade method of growing *Penicillium notatum* on wood shavings over which culture solution circulates is described. The shavings are packed in a vertical column 4 ft. long and 2 in. diameter; air passes upwards and Czapek-Dox medium trickles downwards. It is suggested that acetic acid generators might be utilised for penicillin production. E. R. R.

Streptomycin, a substance exhibiting antibiotic activity against Gram-positive and -negative bacteria. A. Schatz, E. Bugie, and S. A. Waksman (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 66—69).—Two strains of *Actinomyces griseus*, grown in a medium containing glucose, peptone or tryptone, and broth or corn steep liquor gave in the culture filtrate, after 5—12 days, a substance possessing considerable antibiotic activity against many bacteria, including *E. coli*, and in some ways resembling streptothricin. V. J. W.

Resistance of yeast to low temperatures. J. D. Campbell (*Biodynamica*, 1943, 4, 65—70).—A single freezing at -50° or -30° followed by immediate thawing of *Saccharomyces cerevisiae* prevented most of the cells from multiplying. Several freezings were more damaging than a single one and actively growing yeast was less resistant than dormant yeast cells to the low temp. L. G. G. W.

Resistance to low temperatures of a culture of *Saccharomyces cerevisiae* grown from a single cell. H. M. Baum (*Biodynamica*, 1943, 4, 71—74).—Freezing of yeast cultures at -10° to -50° kills many of the cells but cultures derived from a single cell do not give more uniform results than less homogeneous cultures. L. G. G. W.

Carbohydrate reserve of pressed yeast. Effect of trehalose on growth and heat-sensitivity of yeast. K. M. Brandt (*Biochem. Z.*, 1941, 309, 190—201).—The degree of maturity of pressed yeast plays an important part in the synthesis of trehalose, which acts as a source of energy for growth of the yeast. P. G. M.

Vitamin-B₁₂ content of yeasts. II. H. Fink, F. Just, A. Scheunert, and K. H. Wagner (*Biochem. Z.*, 1941, 309, 1—12; cf. A., 1944, III, 293).—Chemical and biological (rats) determinations of aneurin show that the aneurin content of yeast is not affected by adding 2-amino-4-methyl-5-(γ-chloro-β-hydroxypropyl)thiazole to the medium. The content in *Torula utilis* is increased 50—100% by

fermentation during repeated propagation (glucose or malt wort medium). Bottom yeast grows poorly when malt wort or maltose is substituted for glucose in the medium. W. McC.

Vitamin-B₁ content of yeasts. III. Behaviour of brewer's and baker's yeast to aneurin. IV. Dependence of concentration effect on duration and temperature of fermentation, together with concentration of carbohydrate and electrolytes in substrate. H. Fink and F. Just (*Biochem. Z.*, 1941, 309, 212—218, 219—237; cf. preceding abstract).—III. A considerable part (approx. 75%) of vitamin-B₁ added to press-yeast fermenting in molasses solution is converted into cocarboxylase. Only 6—8% remains in solution, whilst 15—30% of the total -B₁ content remains in the washed yeast in the free form.

IV. The total -B₁ content per g. of dried yeast after 2 hr. fermentation is 152 µg. per g. of fermented glucose, rising to a max. of 306 µg. after 8 hr. During the same period, total -B₁ synthesised decreases from 3.185 mg. to 0.93 mg., and cocarboxylase in 10 g. of yeast from 3.062 mg. to 0.905 mg. per g. of fermented glucose. Considerable increase in -B₁ content occurs with rise of temp. up to 30°. There is no essential difference in the behaviour of *Torula* in fermentation of 5% glucose solutions in the presence of very low concns. of electrolytes. The total -B₁ content of the dried yeast increases from 79 µg. in the absence of glucose to 235 µg. per g. in presence of 20% of glucose. The highest val. for total -B₁ synthesised is 392 µg. per g. of glucose fermented in presence of 25% of glucose. Both galactose and maltose (10%) stimulate synthesis of -B₁, whilst lactose and xylose have no effect. P. G. M.

Electrophoretic analysis of yeast extracts. K. G. Stern (*J. Biol. Chem.*, 1944, 152, 345—361).—Unfractionated macerated extracts of dried yeast were examined in the Tiselius electrophoresis apparatus. A no. of electrochemically different colloidal components were observed and their mobilities and relative concns. were determined. Electrophoretic diagrams obtained with undialysed equilibrated yeast extracts were more complex than those given by dialysed solutions and were explained by removal of substances of low mol. wt. (co-enzymes, Mg⁺⁺, Mn⁺⁺) in dialysis; the charge distribution of protein carriers remaining in the non-dialysable fraction differed from that of complete enzyme systems. Marked quant. differences were found in diagrams obtained with maceration extracts of different types of yeast. G. D.

Staining of yeast spores. L. S. McClung (*Science*, 1943, 98, 159—160).—A modified Schaeffer-Fulton method using malachite-green is recommended. 1% malachite-green in 1% phenol, and 0.5% aq. safranin as counterstain, are used. E. R. R.

Relation between attachment to substratum and ingestion by *Ameba* in strychnine sulphate solution and conditioned media. Biological assay of conditioned media. R. A. Fennell (*J. Gen. Physiol.*, 1944, 27, 339—354).—0.000069M-Strychnine sulphate decreases the %-attachment to the substratum by *A. proteus* in 0.0029M-NaCl from 77.3 to 1.3, in 0.0029M-KCl from 40.8 to 2.5, in 0.002M-CaCl₂ from 73.3 to 68.0, and in 0.002M-MgCl₂ from 85.5 to 83.3. In presence of strychnine sulphate, the frequency of ingestion of chilomonads by *A. proteus* in aq. NaCl is increased from 1.3 to 2.3, in KCl from 0.75 to 2.25, and in CaCl₂ from 1.1 to 1.9 per min. In aq. MgCl₂, ingestion is not significantly increased. Frequency of ingestion of food by *A. proteus* is not closely correlated with attachment to the substratum in aq. NaCl or KCl in presence of strychnine sulphate. Chilomonads adhere to the plasmalemma of *A. proteus* in aq. NaCl, KCl, or CaCl₂ containing strychnine, but not in aq. MgCl₂. Frequency of ingestion is apparently correlated with adherence of chilomonads to the plasmalemma. Attachment to the substratum and ingestion by *Pelomyxa carolinensis* is increased by presence of dead *Chilomonas*, *Colpidium*, and *Paramecium*, or by materials obtained from *Paramecium* by extraction with alcohol-ether, or by solutions in which these organisms have lived. Attachment of *P. carolinensis* to the substratum is not closely correlated with presence of NaCl, KCl, CaCl₂, or MgCl₂. Extracts of *Paramecium* contain substances that pharmacologically resemble choline esters. Subcutaneous injection of aq. suspensions of *Paramecium* into young mice for 21 days inhibits the gonadotropic luteinising hormone of the pituitary. Ovaries from injected mice show no corpora lutea and the seminal vesicles are smaller and contain less fluid than do the controls. J. N. A.

Excystation, cultivation, and encystation of *Endameba coli*. M. F. Mayfield (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 20—22).—Cysts were isolated from faeces, and, when incubated on Locke's egg-serum medium with starch, usually excysted within 72 hr. and were maintained indefinitely in culture thereafter. Encystation occurred 4 times spontaneously but could not be produced at will. V. J. W.

Demonstration of the protozoan parasite of quail malaria by fluorescence microscopy. R. L. Patton and R. L. Metcalf (*Science*, 1943, 98, 184).—A table showing the nuclear, parasite, and leucocyte colours for six fluorochromes is given. E. R. R.

Effects of various chemicals on *Paramecium caudatum*. H. E. Potts (*J. Franklin Inst.*, 1944, 237, 227—231).—Of 23 compounds tested those that killed in 24 hr. at concns. of 1/1,000,000 or less

were 8-hydroxyquinoline, phenylmercuric nitrate and acetate, and diethylammonium benzyldithiocarbamate; those effective at concns. of 1/50,000—500,000 were atebine, rhodamine G.D.N., contramine (B.D.H.), benzylammonium benzyldithiocarbamate, and *p*-chlorophenylammonium *p*-chlorophenyldithiocarbamate. Sulphanilamide was effective in a concn. of 1/200. F. S.

***Paramecium caudatum* as test animal for organic arsenicals.**—See A., 1944, III, 361.

Biology of *Trypanosoma cruzi*. III. Retrogression of the trypanosome form. G. Elkeles (*Rev. Soc. argent. Biol.*, 1942, 18, 315—320).—The retranformation of trypanosoma into a round form was identical in the vertebrate and invertebrate hosts and in artificial culture media. Retrogression did not necessarily progress to a round (leishmania) form; sometimes multiplication occurred by binary fission in an intermediate, elongated, leptomaniiform stage. Certain intermediate crithidiomorphous forms are important as they may be mistaken for crithidia, though they are not genetically crithidia. J. T. L.

Cultivation of *Trypanosoma gambiense* in vitro in cell-free medium. D. Weinman (*Proc. Sec. Exp. Biol. Med.*, 1944, 55, 82—83).—This organism can be cultivated from blood of infected animals, and maintained, in a medium containing human plasma and haemoglobin with agar. V. J. W.

Case of histoplasmosis in infant with autopsy. H. G. Schlumberger and A. C. Service (*Amer. J. med. Sci.*, 1944, 207, 230—239).—A 7-week-old infant was admitted with anaemia, splenomegaly, and hepatomegaly. The diagnosis of histoplasmosis followed finding the parasite in material obtained by splenic puncture. This was proved by subsequent culture and animal inoculation. C. J. C. B.

Pathology of *Trichomonas vaginitis*; vaginal implants with *T. vaginalis* and *T. intestinalis*. J. F. Kessel and J. A. Gafford (*Amer. J. Obstet. Gynec.*, 1940, 39, 1005—1014).—Serial sections from vaginal biopsy material indicate that the pathological changes are not produced by simple invasion of the flagellates. Implants of exudate from cases of *Trichomonas vaginitis* containing *T. vaginalis* and bacteria into normal human vaginas resulted in characteristic vaginitis, while implants of cultured *T. vaginalis* and bacteria did not. Infection could be produced in human and monkey vaginas by the implantation of *T. vaginalis* but not of *T. intestinalis*. P. C. W.

Antisyphilitic therapy with clorarsen with evaluation of tolerance. F. Kalz, L. P. Ereaux, H. Prichard, and B. Dean (*Canad. Med. Assoc. J.*, 1944, 50, 237—240).—Tolerance to clorarsen and neoarsphenamine was tested in 50 cases with gastrointestinal upset and other minor reactions after injection of maphersen. Change of drug was beneficial in 47 cases; in 26 instances clorarsen was tolerated without reactions; in 11 reactions occurred. Neoarsphenamine was less suitable as an alternative drug, as reactions were more frequent and severe. C. J. C. B.

Influence of vitamin-C on Wasserman fastness in syphilis. S. L. Ruskin (*Amer. J. digest. Dis.*, 1943, 10, 170—174).—Vitamin-C increases the capacity of spirochaetes to take up As, Sb, Bi, and Au. 7 Wassermann-fast syphilitics became negative after treatment with Bi ascorbate. N. F. M.

Serological diagnosis of relapsing fever. G. J. Stein (*J. Exp. Med.*, 1944, 79, 115—128).—Relapsing fever spirochaetes were separated from saponin-haemolysed blood of mice and rats, followed by repeated washing with physiological saline; the organisms had antigenic specificity; antigens fixed complement in the presence of serum from man or animals infected with relapsing fever spirochaetes; the sera produced agglutination of the antigens. Positive serological reactions were not observed with convalescent sera obtained following infection with typhus, malaria, Rocky Mountain spotted fever, Weil's disease, syphilis, and typhoid fever. Storage in ice for 4 months did not alter the antigen. A. S.

Spontaneous and experimental encephalitozoon infection in laboratory animals. T. L. Perrin (*Arch. Path.*, 1943, 36, 559—567).—Encephalitozoon was found in 5 of 502 white Swiss mice, in 2 of 283 albino rats of the Wistar strain, and in 1 of 291 guinea-pigs; 50 rabbits were negative for encephalitozoon. All the infected animals exhibited meningoencephalitis; lesions elsewhere were less striking and const. A strain of encephalitozoon was isolated from the brain of a white mouse and successfully transmitted in series to other white mice. In the serial transmission, peritoneal exudate or saline suspensions of brain, liver, or spleen were used as inocula, and inoculations were made by intracerebral, intraperitoneal, and intranasal routes. Spread of infection to newborn mice through contact with infected mothers was demonstrated, but contact infection could not be established in adult mice even though contact was maintained for as long as 12 weeks. The strain of encephalitozoon was of low virulence, and no deaths were caused by it. Infected mice showed abdominal enlargement, and intraperitoneally inoculated mice killed in the relatively early stages of infection usually showed peritoneal exudate. Histologically the lesions were the same as those in spontaneous infections. Hamsters and infant rats

were susceptible, while results with a few rabbits were suggestive but inconclusive. The few attempts made to infect adult rats and guinea-pigs were unsuccessful. The parasites could not be cultivated and were not filterable through a Berkefeld N candle. Tissues containing them remained infectious when preserved at 4° in either 50% buffered glycerin or Tyrode's solution or when rapidly frozen or stored at -70°. C. J. C. B.

Toxoplasma and encephalitozoon in spontaneous and in experimental infections of animals. T. L. Perrin (*Arch. Path.*, 1943, 36, 568-578).—There were const. differential features in the appearance, staining reactions, and disposition of the two types of parasites in tissue sections and in smears, and in methods by which the parasites could be preserved. Less marked differences were observed in the distribution of the respective parasites in tissues and in the clinical and the pathological observations on experimentally produced infections. (12 photomicrographs.) C. J. C. B.

Reclaiming agar for bacteriological use. A. F. Roe (*Science*, 1942, 96, 23).—The medium is sterilised, made slightly alkaline to litmus, and filtered through cheesecloth and absorbent cotton. The cold, solidified filtrate, removed from the layer of sediment, is shredded, washed in a cheesecloth bag by running water for several hr. until "white," then infused at >50° with tap-water containing a little Ca⁺⁺. NaOCl is added. After several infusions, excess of water is drained off and salts are removed by distilled water. Water is removed by evaporation, freezing, or oven-drying at 100°. E. R. R.

Reclamation of used agar. H. I. Thaller (*Science*, 1942, 96, 24-25).—Bacterial growth is removed, the medium autoclaved at 15 lb. pressure for 30 min., and poured into tubes. After solidification, the gel is removed, sediment cut off at the bottom, and the shredded agar washed in a cotton bag, with occasional kneading, for 10 hr. Water is allowed to drain out and the agar dried in large ovens at 80° for 12 hr. E. R. R.

Lead semisolid agar, a medium for use in the identification of the enteric group of bacteria. F. Friewer and H. J. Shaughnessy (*Amer. J. Path. Tech. Sect.*, 1944, 8, 1-5).—A Pb semisolid agar medium was found useful for the routine examination of specimens for the enteric group of organisms. Lactose fermentation, H₂S production, and motility can be read in one tube. C. J. C. B.

Dark-field diagnosis of penile lesions. R. Cares (*J. Lab. clin. Med.*, 1944, 29, 82-90).—A general summary. C. J. C. B.

Rapid staining method for Gram-positive and Gram-negative organisms in frozen and paraffin sections.—See A., 1944, III, 320.

Method for collection of bacteria from air and textiles. H. M. Lemon (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 298-301).—Air is drawn through 20 c.c. of broth by suction through a Folin aeration tube at 25-30 l. per min. For textiles, the open end of the tube may be joined to a funnel placed on the material to be examined. (Diagram.) V. J. W.

Aeration of fluid culture media. R. Devignat (*Edinb. Med. J.*, 1944, 51, 124-130).—The attenuation of cultures of *B. pestis*, *dysenteriae*, and *typhosus* produced by aeration with air bubbled through 30% KOH is probably due to β -emanation from K. Ca and U have no effect. H. S.

Problem of the logarithmic order of death in bacteria. O. Rahn (*Biodynamica*, 1943, 4, 81-130).—A crit. discussion. L. G. G. W.

Dynamics of disinfection. I. New data on the reaction between phenol and *Bact. coli* using an improved technique: analysis of the distribution of resistance amongst the cells of the bacterial population studied. R. C. Jordan and S. E. Jacobs (*J. Hygiene*, 1944, 43, 275-289).—Phenol solutions were added to large cultures maintained at a steady population by the continuous automatic addition of nutrient, thus avoiding chilling or otherwise disturbing the viable bacteria. The death rate was not const. and it showed no sudden change. The time required to reduce the no. of bacteria to 1 per ml. varied inversely with the concn. of phenol. A detailed statistical analysis of the results revealed a normal distribution of survival time (*t*) when the concn. of phenol was low, and of log *t* at all concns. Apparent skew distributions are considered to be due to experimental errors. When resistance (*R*) was measured in terms of the dosage survived for a fixed time, about 70% of the cells showed a normal distribution of *R* when the time was not more than 50 min. For longer times the distribution of log *R* was normal. D. D.

Mode of action of sulphonamides. I. M. Klotz (*J. Amer. Chem. Soc.*, 1944, 66, 459-464).—Inhibition of bacterial growth by sulphonamides is quantitatively explained by a reversible combination of the basic form of the drug with the neutral protein, assuming the applicability of the law of mass action. Equations are derived relating drug potency to the acid ionisation const. of the sulphonamide and pH of the solution. Inhibition of sulphonamide action by *p*-aminobenzoic acid is treated on the same basis; the ratios of concns. of *p*-aminobenzoic acid to sulphonamide required to prevent bacteriostasis are calc. for various sulphonamides and pH. W. R. A.

Effect of sulphonamides on toxic and antigenic actions of endotoxins of certain Gram-negative bacteria. P. A. Zahl, S. H. Hutner, and F. S. Cooper (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 4-7).—All sulphonamides tried gave equal but limited protection against the endotoxin of *Salmonella typhimurium*. Sulphanilamide acts similarly against that of *Shigella paradysenteriae*, Flexner. There was no interference with immunisation. V. J. W.

Effect of propamidine on bacterial metabolism. F. Bernheim (*Science*, 1943, 98, 223).—The effect of m./80,000 propamidine on the oxidative action of *E. coli*, *Staphylococcus aureus*, and *Staphylococcus albus* on various substrates was determined. The oxidation of nitrogenous substances in the medium was inhibited after a certain latent period to various extents, but much more effectively at pH 7.8 than at pH 6.7. Oxidation of pyruvic acid and of glucose requires higher concn. of propamidine. Stilbamidine at high concn. shows similar effects. Propamidine, unlike sulphonamides, directly affects the oxidative metabolism of these bacteria. E. R. R.

Effect of propamidine on bacterial growth. H. I. Kohn (*Science*, 1943, 98, 224).—The growth of *E. coli* is inhibited 50% by a concn. of propamidine varying from 0.32 to 1.10 mg.-% according to the proteose peptone content and the pH of the medium. Stilbamidine is less effective. A similar action was noted with *Staphylococcus aureus*. Methylene-blue has no antagonistic action for *E. coli*, but synergises with propamidine for *S. aureus*. Sulphathiazole synergises with propamidine for *E. coli*. A latent period, which may involve activation of the drug, was observed in both cases. E. R. R.

Effect of polyamines on bacteriostasis by 4:4'-diamidinodiphenoxypropane. E. E. Snell (*J. Biol. Chem.*, 1944, 152, 475-476).—Inhibition of growth of *Lactobacillus casei* and of *Streptococcus lactis R* by propamidine di-isethionate (PD) is partly neutralised by triethylene tetramine (TT). TT stimulates and tetraethylenepentamine (TP) and spermidine phosphate (SP) inhibit growth of *L. casei*. TP and SP also neutralise inhibition of *S. lactis R* by PD. TP, but not TT and SP, partly inhibits growth of *S. lactis R*. R. L. E.

Effect of alanine on response of *Lactobacillus casei* to pyridoxine and folic acid. E. E. Snell (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 36-39).—Addition of *dl*-alanine to the culture medium of Landy and Dicken (A., 1942, III, 761) increases growth at threshold concns. of vitamin-B, especially with pyridoxine and folic acid. V. J. W.

Inactivity of coramine (nikethamide) for *L. arabinosus* and its conversion into an active substance. L. J. Teply and C. A. Elvehjem (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 72-73).—Nikethamide, which can replace nicotinic acid in diet of dogs or man, does not maintain growth of *L. arabinosus*. It is converted into a substance capable of doing so by autoclaving for 1 hr. at 15 lb. in 10N-NaOH. V. J. W.

Biochemical characterisation of action of chemotherapeutic agents. I. Measurement of growth of streptococcal cultures through gaseous metabolism, and effects of pantothenate and pantoyleurine on metabolism and growth. H. McIlwain (*Biochem. J.*, 1944, 38, 97-105).—Anaerobic evolution of gas by haemolytic streptococci from glucose-HCO₃' media is proportional to bacterial growth. For the first time pantothenic acid has been shown to be antagonistic to the action of pantoyleurine in inhibiting growth, and is effective in 0.0001 of the concn. of the latter, which probably acts by lowering the rate of formation of metabolic products from pantothenate essential to bacterial growth. The concn. of pantoyleurine required for inhibition of pantothenate acceleration is much less than that required for inhibition of growth of yeast, which does not require the presence of the latter to the same extent. P. G. M.

Absence of gross displacement of pantothenate and *p*-aminobenzoate from micro-organisms, by pantoyleurine and sulphanilamide. H. McIlwain (*Proc. Biochem. Soc.*, 1944, 38, xxxiv-xxxv).—Competitive interaction between pantoyleurine and pantothenate, and between sulphanilamide and *p*-aminobenzoate, is a function of growing cultures in contrast to preformed cells. This is related to their bacteriostatic rather than their bactericidal nature. P. G. M.

Nicotinic acid and pantothenic acid as essential growth factors for *Shigella paradysenteriae*. A. J. Weil and J. Black (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 24-26).—Out of 20 strains examined, 1 grew in a medium containing only glucose and inorg. salts. 15 others grew if nicotinic acid or nicotinamide was added, and 3 more on addition of Ca pantothenate. V. J. W.

Mechanism of butyric acid fermentation. H. Peldán (*Biochem. Z.*, 1941, 309, 108-144).—At pH 4.5-8.0 (optimum 7) and 35-40° (optimum 37°), *Bacillus saccharobutylicus* from soil, in presence of CaCO₃, produces butyric, acetic, lactic, and formic acid and ethyl alcohol from glucose. In absence of Ca⁺⁺, no butyric acid is produced but the concn. of this acid increases with increase in Ca⁺⁺ concn. The yield is also increased by H acceptors (including CO₂ and CO₃''). Triose and pyruvic acid (but not acetaldehyde or methylglyoxal) are produced as intermediates. The bacillus produces alcohol from glycerol and also ferments *d*- and *l*-glyceric and pyruvic acid (but not lactic acid), the chief product being acetic acid (butyric acid is

also produced from pyruvic acid). The production of butyric acid from glucose is explained by supposing that the pyruvic acid first formed undergoes aldol condensation, the product being converted into butyric acid by way of acetoacetic and β -hydroxybutyric acid. A scheme is given outlining these and the associated transformations by which the other products of fermentation arise. W. McC.

Chemistry of *Phytomonas tumefaciens*. II, III.—See A., 1944, II, 180.

Cutaneous anthrax. R. J. Lebowich, B. G. McKillip, and J. R. Conboy (*Amer. J. clin. Path.*, 1943, 13, 505—514).—Phagocytosis plays no part in the disposal of capsulated *B. anthracis* in human or experimental cutaneous lesions in the rabbit. The primary mechanism responsible for localisation of the human cutaneous infection is a mechanical barrier consisting of a plasma coagulum. Obstruction of the tributary lymphatics by fibrinous thrombosis is not a factor in preventing or retarding the dissemination of *B. anthracis* from the site of inflammation. The cellular exudate is predominantly hæmorrhagic in character and does not extend into the underlying voluntary muscle. (5 photomicrographs.) C. J. C. B.

Specificity of bacterium-decarboxylase. E. Geiger (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 11—13).—Conversion of histidine into histamine by *E. coli* does not occur if the histidine is combined as acetyl- or benzyl-histidine. V. J. W.

Toxic factor in tissues in cases of non-specific ulcerative colitis. P. E. Steiner, D. W. Stanger, and M. Bolyard (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 8—10).—The non-saponifiable lipid fraction of livers from persons dying of non-sp. ulcerative colitis contained a substance fatal to mice on subcutaneous injection. It was sometimes present in the lungs and, in milder form, was found in the livers of still-born infants. V. J. W.

Growth factor for *C. diphtheriae* present in liver. F. W. Chattaway, F. C. Happold, and M. Sandford (*Biochem. J.*, 1944, 38, 111—115).—An essential factor for the growth of certain *gravis* and *intermedius* strains of *C. diphtheriae* has been found in liver. The prep. of active concentrates is described, and the new factor is shown to differ from the stimulant of *Lactobacillus casei*, which accompanies it during the early stages of purification and which resembles folic acid. The new factor is dialysable, is resistant to the action of pepsin, trypsin, and takadiastase, and is unaffected by heating at 100° for 1½ hr. with 20% HCl or H₂SO₄. HNO₂, methylation, or acetylation destroy the activity, and acid hydrolysis does not regenerate it. H₂O₂ (20 vol.) destroys 70—80% of the activity, but heating with Br does not affect it. The resistance of the acetylated product to acid hydrolysis suggests the presence of *N*-acetyl groups. P. G. M.

Enzymic action of pepsin on antidiphtheritic serum. F. Modern and G. Ruff (*Rev. Soc. argent. Biol.*, 1942, 18, 93—105).—Antidiphtheritic serum, antidiphtheritic plasma, and antidiphtheritic serum conc. by salt pptn. were digested with pepsin. The optimum concn. of Na₂SO₄ for purification was also determined. J. T. L.

In-vitro toxigenicity and other characters of strains of *Cl. welchii* type A from various sources. J. Keppie and M. Robertson (*J. Path. Bact.*, 1944, 56, 123—132).—The toxin production of some strains of *Cl. welchii* type A from many sources was determined by the egg yolk turbidimetric test. Strains recently isolated from serious cases of gas gangrene all produced titres of 7 egg units per c.c. or more. Strains of similar or stronger toxigenicity were isolated from dust, a swab from a superficial wound, and a post-mortem. The combining power of the toxins was evaluated against 1 i.u. of antitoxin. This val. for 15 out of 16 strains was 38 egg units or 76 mouse M.L.D. The toxin of S 107 was unique in having the low val. of 25 egg units or 50 M.L.D. Striking differences in capsule width among strains of *Cl. welchii* are recorded. This character was fairly const. for the strain when examined in films from young cultures under optimum conditions of growth. If a strain has a narrow capsule this suggests good toxigenic ability; a wide capsule in most cases indicates poor toxigenicity. C. J. C. B.

Bactericidal power of guinea-pig serum on *H. influenzae*. J. Gordon and K. Zinnemann (*J. Path. Bact.*, 1944, 56, 55—59).—12 of 17 respiratory strains of *H. influenzae* tested showed a marked sensitiveness to guinea-pig serum which was abolished when the complement was inactivated, by heating or treatment with NH₃. 5 other respiratory strains tested died out in serum, even when the complement was inactivated. C. J. C. B.

The flea *Malariae telchinum*, a vector of *P. pestis*. A. L. Burroughs (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 10—11).—Specimens of the flea were found to contain plague bacilli and to transmit the disease to mice. V. J. W.

Active and passive immunity in experimental *Haemophilus pertussis* infection in mice. J. A. Toomey, N. Lewis, E. Averill, W. Druty, and W. S. Rakacs (*J. Lab. clin. Med.*, 1944, 29, 21—27).—Freshly isolated phase A *H. pertussis* organisms gave but slight protection to white mice. The mortality rate was 81% compared with 99% in controls. Antigens obtained from washings of the organisms, the washed organisms themselves, phase B organisms, and the lesser dilutions of

phase A organisms, gave no protection in white mice. Only slight passive protection was conferred by convalescent human serum; slight protection was given by one commercial horse anti-serum. Better protection was given by another antipertussis serum (rabbit) with a mortality of 44%; the best protection was obtained when human hyper-immune serum was used (3% mortality rate). Neither the pertussis agglutinin fraction nor the agglutinin fraction anti-serum protected white mice. C. J. C. B.

Protective properties of pertussis antisera in experimental infection. D. G. Evans (*J. Path. Bact.*, 1944, 56, 49—54).—Mice receiving an intranasal inoculation of *H. pertussis* can be protected against lung infection and death by pertussis antibacterial serum; the protective action of the serum is associated with its agglutinating property. Serum containing pertussis antitoxin and no antibacterial antibody can also protect mice against infection by *H. pertussis*. The protective properties of antitoxin cannot be demonstrated unless there is present at the site of infection a sufficient concn. of antitoxin to neutralise the toxin present in the infecting bacilli. When this condition is satisfied the organisms largely lose their power to infect and kill, a result which suggests that pertussis toxin plays a significant rôle in the infection of mice with *H. pertussis*. C. J. C. B.

Whooping cough: skin tests. N. Silverthorne, D. T. Fraser, and A. Brown (*Canad. Med. Assoc. J.*, 1944, 50, 129—130).—The pertussis skin test described by Strean (A., 1940, III, 688) and carried out according to directions is not sp. in distinguishing between an individual who has had whooping cough and one who has not had this disease. C. J. C. B.

Chemical nature of substance inducing transformation of pneumococcal types; induction of transformation by deoxyribonucleic acid fraction isolated from pneumococcus type III. O. T. Avery, C. M. MacLeod, and M. McCarty (*J. Exp. Med.*, 1944, 79, 137—158).—A highly purified fraction was isolated from type III pneumococci which, in exceedingly minute amounts, induced the transformation of unencapsulated *R* variants of type II pneumococci into fully encapsulated organisms of the same type from which the inducing material was prepared. Chemical, enzymic, serological, electrophoresis, ultracentrifugation, and ultra-violet spectroscopy experiments indicate that the purified fraction contains no protein, unbound lipid, or serologically active polysaccharide and consists mainly, if not solely, of a highly polymerised, viscous form of deoxyribonucleic acid; the induced alterations in cellular structure and fraction are predictable, type-sp., and transmissible in series. Methods for the isolation and purification of the transforming fraction are described. A. S.

Rheumatic pneumonia. K. T. Neuberger, E. F. Greever, and E. K. Rutledge (*Arch. Path.*, 1944, 37, 1—15).—8 of 63 cases of active and quiescent rheumatic fever with pulmonary inflammation showed the following features: peculiar granulomas in the alveolar ducts and alveoli; focal alveolitis with necrosis, fibrinous exudation, and hyaline lining membranes; arteriolitis; mononuclear cell exudation and septal cell proliferation. The term "Masson body" is suggested for the rheumatic pulmonary granuloma, which is considered equiv. to the Aschoff body in the heart. (8 photomicrographs.) C. J. C. B.

Comparison between reactions of acute phase serum with pneumococcus C-polysaccharide and with pneumococcus type 27. G. Löfstrom (*Brit. J. exp. Path.*, 1944, 25, 21—26).—The reaction between the somatic C-polysaccharide of pneumococci and serum from cases of acute infectious disease was compared with the non-sp. capsular swelling reaction. The C-reactive protein and the type 27 reactive protein agree in behaviour and properties, and their identity is confirmed by cross-absorption tests. The acute phase protein is formed in acute stages of bacterial disease, in some non-infectious acute diseases accompanied by disintegration of tissues, and after the injection of non-sp. stimulants such as colloidal S. F. S.

Reversal of pneumococcus "quellung" by digestion of the antibody with papain. G. M. Kalmanson and J. Bronfenbrenner (*Science*, 1942, 96, 21—22).—Digestion with papain removes the antibody from neutralised pneumococcus, type I, and restores its virulence for the mouse. Equal vols. of 24-hr. tryptose broth culture of pneumococcus, type I, and undiluted (rabbit serum) antibody were mixed. Quellung was evident in a few min. The mixture was incubated at 37° for 30 min. and divided into two portions, to which activated and non-activated papain were added. With activated enzyme, the agglutinated clumps were quickly dispersed and complete loss of quellung occurred after 30 min. Removal of the enzyme by centrifuging and washing with saline, and addition of further serum, rapidly caused quellung. The theory is discussed on a semi-quant. basis. E. R. R.

Induction of decidua-placental hæmorrhage in mice by endotoxins of certain Gram-negative bacteria. P. A. Zahl and C. Bjerknes (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 329—332).—Endotoxin-containing extracts of *Shigella paradyenteriae*, *Salmonella typhimurium*, or *Rhodospirillum rubrum* when injected intraperitoneally into 12—

18-day-pregnant mice cause decidua-placental hæmorrhage and fetal death. V. J. W.

Hyaluronidase production by hæmolytic streptococci of human origin. N. Crowley (*J. Path. Bact.*, 1944, 56, 27—35).—308 strains of group A streptococci were tested for hyaluronidase production. Only 2 serological types (types 4 and 22) showed hyaluronidase activity. 8 of 68 strains of group C and group G streptococci tested showed hyaluronidase activity. Hyaluronidase-producing strains were invariably non-capsulated. No evidence was obtained that hyaluronidase-producing strains were associated with any particular type of infection, nor do the observations recorded suggest that hyaluronidase production is related to the virulence of streptococci for man. C. J. C. B.

Antigenic composition of group A hæmolytic streptococci. II. Occurrence of strains in given type containing M but no T antigen. R. C. Lancefield and W. A. Stewart. **III. Types with serologically identical M but distinct T antigens; types 10 and 12.** R. F. Watson and R. C. Lancefield. **IV. Related T but distinct M antigens in types 15, 17, 19, 23, 30 and in types 4, 24, 26, 28, 29, 46.** Identification by slide agglutination. W. A. Stewart, R. C. Lancefield, A. T. Wilson, R. F. Watson, and H. F. Swift (*J. Exp. Med.*, 1944, 79, 79—88, 89—98, 99—114; cf. A., 1944, III, 372).—Group A hæmolytic streptococci are described which do not agglutinate in anti-T serum because of lack of T antigen. Other strains containing T antigen do not agglutinate in anti-T serum because T agglutination is blocked by the presence of large amounts of M substance in the streptococci.

III. Agglutinin, precipitin, and passive protection tests with unabsorbed and reciprocally absorbed antisera showed that representative type 10 and 12 strains contained serologically identical M antigens but unrelated type-sp. T antigens. 23 other strains of group A hæmolytic streptococci previously classified as either types 10 or 12, collected from various sources, was similar in antigenic composition to one or the other of the two representative type strains. The relationship of the M and T sp. antigens must be considered when any method employing the agglutinin reaction for the typing of group A hæmolytic streptococci is used.

IV. The occurrence of closely related T antigens in types 15, 17, 19, 23, and 30 accounts for most of the cross-reactions observed among these types. Similarly T antigens, unrelated to the first series but mutually related, occurred in types 4, 24, 26, 28, 29, and 46. Variants of these 11 types possessed type-sp. M antigens, as shown by precipitin or agglutinin reactions; in 7 types, no T antigen usually associated with these types was found. The slide agglutination technique is described. A. S.

Immunity to tetanus induced by a third dose of toxoid 3 years after basic immunisation. M. M. Peshkin (*Amer. J. Dis. Child.*, 1944, 67, 22—29).—The injection of a 3rd or "booster" dose of combined alum-pptd. diphtheria and tetanus toxoid or of tetanus toxoid alone into allergic children 3 years after the completion of basic immunisation with 2 doses of combined toxoids was followed within 1 month in all instances by an adequate tetanus antitoxin titre. This titre was always higher and lasted for a much longer period than that which followed basic immunisation as well as that which followed a "booster" dose of combined toxoids given 3 months—2 years after basic immunisation. The antitoxin titre obtained on the 7th day after the administration of a "booster" dose of toxoid given 3 years after basic immunisation was always adequate, and it was generally at its max. at this time. C. J. C. B.

Pigment production by tubercle bacillus in the presence of p-aminobenzoic acid. R. L. Mayer (*Science*, 1943, 98, 203—204).—The yellow cryst. pigment formed by tubercle bacilli in presence of p-aminobenzoic acid, and also by higher concn. of p-aminobenzoylethylaminoethanol hydrochloride, is not identical with riboflavin. It is insol. in ether, CHCl₃, or light petroleum, very sol. in acetic acid and phenol, and bacilli containing the pigment reduce AgNO₃ and Fehling's solution. E. R. R.

Growth promotion of bovine tubercle bacilli by pyruvate. C. H. Boissevain (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 344—345).—3 newly isolated strains which failed to grow on Long's medium grew well when 0.1% pyruvate was added. No effect was produced by pyruvate on growth of human strains. V. J. W.

Detection of tubercle bacilli in suspected environments. R. Pressman (*Amer. J. Pharm.*, 1944, 116, 85—101).—More positive results were obtained from large samples of air or dust than from small samples. Lowenstein's medium was the most suitable for promoting the growth of tubercle bacilli from air samples. Chloramine-T was more satisfactory than other commonly used chemical suppressants or contaminants in that its activity could be checked by the addition of an inert chemical. F. S.

Fluorescence microscopy for detection of the tubercle bacillus. G. C. Hughes (*Med. J. Austral.*, 1943, II, 353—355). F. S.

Laboratory diagnosis of tuberculosis. Comparative study of animal inoculation and microscopic examination. M. E. Koons (*J. Lab. clin. Med.*, 1944, 29, 75—80).—In 590 cases examined for the detection of tubercle bacilli, animal inoculation proved superior

(18% better) to the microscopic examination. 2.3% of "positives" may be missed by guinea-pig test alone. C. J. C. B.

Survival of tubercle bacilli in solutions containing glycerol or its oxidation products. C. H. Boissevain (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 342—344).—Tubercle bacilli suspended in 6% glycerol or 0.1% glyceraldehyde, dihydroxyacetone, glycerophosphate, phosphoglycerate, glycerate, or lactate died in 4—6 weeks. Suspensions in water or 0.1% pyruvate survived indefinitely. V. J. W.

Choroid plexus as origin of tuberculous meningitis. S. Engel (*J. Path. Bact.*, 1944, 56, 115—121).—No cerebral foci were found in 14 examined cases of tuberculous meningitis. The nature of the tuberculous changes in the choroid plexuses, especially in incipient cases, suggests that the meningeal process arises there. C. J. C. B.

Variation in morbidity and mortality of murine typhus infection in mice with changes in environmental temperature. V. Moragues and H. Pinkerton (*J. Exp. Med.*, 1944, 79, 41—43).—Intraperitoneal injection of murine typhus rickettsiae in *dba* mice caused fatal peritonitis if the animals were kept at a room temp. of 65—80° F.; the mortality was less than 25% at 85—98° F. Using different strains of mice and temp., conditions may be created where murine typhus will have any desired degree of mortality. A. S.

Depression of anaerobic glycolysis of embryonic tissue by Western strain of equine encephalomyelitis virus. Prevention of this effect by specific immune serum. J. Victor and C. H. Huang (*J. Exp. Med.*, 1944, 79, 129—135).—Western equine encephalomyelitis virus depressed the rate of anaerobic glycolysis of embryonic chick tissues, within 2 days after its addition to the tissues, by 17—82%; the virus had no effect 4 hr. and 6 days after mixing with the tissues. Anti-virus immune serum prevented the inhibiting effect of the virus in the anaerobic glycolysis of embryonic skeletal muscle. A. S.

Preparation and immunogenic properties of an ultra-violet-inactivated poliomyelitis vaccine. D. W. McKinstry and E. H. Reading (*J. Franklin Inst.*, 1944, 237, 71—73).—10% saline suspensions of brains of mice infected with the SK murine strain of poliomyelitis were rendered non-infective by ultra-violet radiation from a Hg-vapour lamp at an intensity of 53 μ -amp. The inactivated suspension protected mice against 1000—10,000 M.L.D. of the active virus after a total of 0.25—0.85 c.c. was injected intraperitoneally, subcutaneously, or intravenously in 4—6 doses. F. S.

Conditions for optimum production of PR8 influenza virus in chick embryos. G. L. Miller (*J. Exp. Med.*, 1944, 79, 173—183).—The effects of different concns. of the virus in the inoculum, of the incubation temp. of infected embryos and length of time of incubation, and of the age of the embryos at the time of inoculation with regard to optimum production of the PR8 strain were studied. Relative amounts of virus in different preps. were measured by means of determinations of chicken red cell agglutination titres. Frozen infectious allantoic fluid which produced infections in chick embryos at a dilution of 10⁻⁷ was used as a stock inoculum. Best results were obtained with 0.1 c.c. of the stock inoculum at 10⁻⁵ dilution, incubation temp. 35° for 36—48 hr., and embryos of 10—11 days of age at 37° or 9—10 days of age at 39°. A. S.

Resistance of Melbourne strain of influenza virus to desiccation. E. R. Parker, W. B. Dunham, and W. J. MacNeal (*J. Lab. clin. Med.*, 1944, 29, 37—42).—The Melbourne strain of influenza virus A of low potency is inactive a short time after drying, or so impaired that the virus no longer brings about death of embryonated eggs inoculated by a standard technique. When the original virus is of high potency, such as may be assumed in pandemic disease, the virus remains lethal to eggs for many days after drying in air. Highly potent virus mixed with mucus and dried in the air may retain its lethal potency for embryonated eggs for as long as 45 days. The transmission of epidemic and pandemic influenza through the agency of dust and dry fomites is a possibility, not to be ignored in the practical control of these diseases. C. J. C. B.

Persistence of influenza virus on human hand. E. R. Parker and W. J. MacNeal (*J. Lab. clin. Med.*, 1944, 29, 121—126).—Potent influenza virus of the Melbourne strain may remain active on the palm of the human hand for 45 min. in the dry state. The presence of soap solution tends to inactivate the virus on the skin. C. J. C. B.

Mouse infectivity titration of influenza virus. M. A. Lauffer and G. L. Miller (*J. Exp. Med.*, 1944, 79, 197—203).—The statistical significance of mouse infectivity titrations of influenza virus was studied. 3 criteria for evaluating the end-points were used: the presence or absence of pulmonary lesions, the occurrence of death, and a factor taking into account the extent of lung consolidation and the occurrence of death. It was found that the chances were 19 out of 20 that differences of 0.99, 0.77, and 0.73 logarithmic units respectively for the lesion, the death, and the end-points were significant. A. S.

Quantitative aspects of red blood cell agglutination test for influenza virus. G. L. Miller and W. M. Stanley (*J. Exp. Med.*, 1944, 79, 185—195).—The temp. at which the test is conducted has a marked effect,

variation of the pH between 6—8 has a negligible effect, on the red cell agglutination titre. Variations were due to changes in the red cells of different chickens, and to instability of the red cells themselves. Purified influenza virus, kept at 4°, gave const. results for several months. A procedure for quant. measurements of influenza virus with high accuracy is described. A. S.

Relationship of virus of louping ill in sheep and virus of Russian spring-summer encephalitis in man. J. Casals and L. T. Webster (*J. Exp. Med.*, 1944, 79, 45—63).—Sera of mice hyperimmunised to Russian encephalitis and to louping ill virus respectively produced complement fixation with both antigens at the same titre. Sera hyperimmune against the Russian virus protected against louping ill virus, and vice versa. In cross-resistance tests in mice, a vaccine consisting of formalised Russian virus gave strong protection against the latter and moderate protection against louping ill virus; formalised louping ill virus vaccine protected moderately against louping ill and considerably less against Russian virus. Sera from a subject recovered from louping ill or Russian virus infections gave positive complement fixation and neutralisation tests with both viruses. No such similarities were found with other central nervous system viruses. A. S.

Attack rate and incubation period of measles. M. Stillerman and W. Thalheimer (*Amer. J. Dis. Child.*, 1944, 67, 15—21).—The secondary attack rate of measles in 266 intimately exposed susceptible family contacts 1 month—14 years of age observed in the 1940—1941 epidemic in New York City was 75%. This attack rate was lowest for children in early infancy, highest for those 1—7 years of age (80—90%), and sharply lower for those in the 10—14-year group (15%). Of 21 children 6 months—10 years of age who escaped measles on one exposure and were re-exposed, 10 contracted the disease. Hospitalisation of patients after the appearance of the rash did not lower the secondary attack rate of the intimately exposed susceptible children. An increased intensity of exposure as measured by simultaneous contact of susceptible children with more than 1 patient with measles in 9 families did not increase the incidence of the disease. The incubation period of measles was 10—14 days for 80% of the contacts, 15—19 days for 14%, and less than 10 days for 6%. C. J. C. B.

Prophylaxis of measles with convalescent serum. M. Stillerman, H. H. Marks, and W. Thalheimer (*Amer. J. Dis. Child.*, 1944, 67, 1—14).—From 1938 to 1941 502 intimately exposed susceptible children were given convalescent measles serum. The dose according to age was raised yearly during 1938 to 1941 from a min. in 1938 of 5 c.c. for those up to 5 years of age, with 1 c.c. for each additional year, to a max. in 1941 of 10 c.c. for those 6—11 months, 15 c.c. for those 12—23 months, and 20 c.c. for those 2 years of age and over. Complete protection was obtained by 50% of the 502 children. The rate of complete protection was independent of dosage when the serum was given between the 4th and the 7th day after exposure. On the 8th day after exposure, the serum had a modifying effect, but did not prevent measles. The duration of passive immunity of contacts completely protected with doses of 20 c.c. of serum was at least 2 weeks. C. J. C. B.

Primary atypical pneumonia, aetiology unknown. I. J. H. Dingle, T. J. Abernethy, G. F. Badger, G. J. Buddingh, A. E. Feller, A. D. Langmuir, J. M. Rueggesser, and W. B. Wood, jun. (*Amer. J. Hyg.*, 1944, 39, 67—128).—Clinical, epidemiological, and aetiological studies were made on patients admitted to the Station Hospital of Camp Claiborne with atypical pneumonia and other respiratory infections. Cases were classified according to clinical diagnosis into atypical pneumonia (69) showing a definite lesion in the lungs but no bacteriological evidence of pneumococcal pneumonia, bronchitis resembling atypical pneumonia (11) showing no pulmonary infiltration, tonsillitis (57), and other respiratory diseases (73) including nasopharyngitis, bronchitis, "grippe," and the "common cold." Radiograms of the chest were taken routinely on all patients admitted to the respiratory disease wards. Bacteriological, serological, and virus studies were made. Similar procedures were taken for a control group of 101 soldiers on active duty. 216 cases of atypical pneumonia from hospital records were abstracted for clinical analysis. Case histories and radiograms are shown. A gradual transition occurred in symptoms, signs, and severity from cases of atypical pneumonia to those of bronchitis resembling atypical pneumonia through to cases of other respiratory illnesses. The main differences between the groups depended on duration and severity of symptoms and physical signs rather than on characteristic symptomatology. B. C. H.

Virus causing pneumonia in cats and producing elementary bodies. J. A. Baker (*J. Exp. Med.*, 1944, 79, 159—172).—An agent, obtained from a contagious respiratory disease in cats, was transmitted to mice, rabbits, guinea-pigs, hamsters, and embryonated eggs. Intranasal inoculation in cats produces a disease like that in naturally infected animals; parenteral inoculation causes only a mild fever. During the acute illness, the agent was demonstrated in the discharges from the eyes and nose and in the pneumonic lungs but not in other organs. The agent was demonstrated in the nasal mucosa

of cats 1—2 months after inoculation. Cultures of egg yolk sac and of active lung suspensions showed no growth; the agent did not pass Berkefeld N filters. Stained preps. of egg yolk sac membranes and of infected mouse or hamster lungs showed typical elementary bodies; the agent and the bodies sedimented at the same rate after centrifuging. Complement fixation experiments, using partially purified bodies as antigens, were negative with control sera and positive with sera from recovered cats. A. S.

Activation of latent mouse pneumonitis virus by human serum. L. Thomas and E. M. Kolb (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 1—4).—Intranasal inoculation of normal human serum caused pneumonitis in 80% of apparently normal mice. From these, 2 strains of a virus were isolated which were shown by complement fixation to belong to the psittacosis-lymphogranuloma group. V. J. W.

Further laboratory studies on classification of psittacosis-like agents. M. D. Beck, M. D. Eaton, and R. O'Donnell (*J. Exp. Med.*, 1944, 79, 65—77).—Variations were demonstrated in pathogenicity, latency, and active crossed immunity tests in a group of viruses isolated from several sources and producing coccid elementary bodies resembling those of psittacosis. The psittacosis-like viruses causing atypical pneumonia in man can be classified into psittacosis, ornithosis, and human pneumonitis (strain S-F) of undetermined origin. A. S.

Inclusion bodies in association with typhus rickettsiae. A. M. Begg, F. Fulton, and M. vanden Ende (*J. Path. Bact.*, 1944, 56, 109—113).—Mouse-lung-adapted strains of typhus rickettsiae, growing intracellularly in the lungs of mice, show no typical arrangement in the cytoplasm, but are diffusely distributed. Some cells (morulae) contain well-defined intracytoplasmic colonies of rickettsiae. Homogeneous inclusion bodies are not found. If mouse-lung-adapted strains of rickettsiae are passed into the lungs of rabbits, no bacillary forms are found at first, but only homogeneous inclusion bodies. By repeated passage it is possible so to adapt the strain that morulae appear in some cells, while others show a diffuse distribution of rickettsiae throughout their cytoplasm. If mouse-lung-adapted strains of typhus rickettsiae of the murine type are passed into the lungs of rats, the morula type of development is predominant and there are no homogeneous inclusion bodies. Homogeneous inclusion bodies are found in the lungs of mice during adaptation of strains from infected guinea-pig brain emulsion, also in the lungs of rats during early passage of epidemic strains which failed to adapt to this host. It is presumed that the homogeneous inclusion bodies occur only during the adaptation of a strain of rickettsiae to a new host, and it is conjectured that the morulae are more common when the invaded cell is somewhat resistant. (13 photomicrographs.) C. J. C. B.

Fatal murine typhus infection in dba strain of mice, with observations on strain variation in susceptibility. V. Moragues and H. Pinkerton (*J. Exp. Med.*, 1944, 79, 35—40).—Murine typhus rickettsiae, intracranially injected into dba mice, caused a serially transmissible meningoencephalitis similar to that due to psittacosis and certain other viruses; all animals became ill and 50% died 5—6 days after the infection. Swiss mice were less susceptible and no deaths occurred. Death in all dba mice occurred 3—7 days after intraperitoneal injection from rickettsial peritonitis; the mortality was less than 60% in Swiss, brown agouti, and A albino mice. A. S.

Presence of typhus antibodies in commercial frozen and dried complement. K. Wertmann and H. Plotz (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 29—31).—2 different commercial samples of guinea-pig serum were found to contain a heat-stable substance capable of fixing complement in the presence of antigen of epidemic rickettsia but not in the presence of antigen of murine rickettsia, psittacosis, or lymphocytic choriomeningitis. It is suggested that the animals had been used for testing typhus vaccine. V. J. W.

Antigenicity of yellow fever vaccine virus (17D) following 57 subcultures in homologous immune serum. J. C. Bugher and H. H. Smith (*Amer. J. Hyg.*, 1944, 39, 52—57).—57 subcultures in the presence of antibody barely sufficient to inactivate the virus failed to modify the antigenicity of the 17D strain of yellow fever virus in man as measured by intraperitoneal mouse protection tests. Results confirmed that for satisfactory immunisation of man 100 m.i.d. or more per person must be used. B. C. H.

Effect of formaldehyde and mercuric chloride on tobacco mosaic virus. B. Kassanis and A. Kleczkowski (*Biochem. J.*, 1944, 38, 20—24).—Tobacco mosaic virus is inactivated by 2% formaldehyde at all pH vals. between 3 and 7.5; the rate of inactivation is min. at pH 3.5. Inactivation is prevented at any stage by dilution or dialysis but there is no evidence that inactivated virus regains infectivity by such treatment. There is no loss of $\text{NH}_2\text{-N}$ when formaldehyde treatment causes loss of infectivity. Treatment with formaldehyde at pH 7.0 causes greater decrease in the Folin pH 8 colour than does treatment at pH 3.0. There is no real correlation between decrease in infectivity and colour val. HgCl_2 in sufficient concn. also acts as an inhibitor of infectivity. At pH exceeding 6.0 it causes loss of infectivity and serological activity.

Dilution, acidification, or addition of $(\text{NH}_4)_2\text{CO}_3$, $(\text{NH}_4)_2\text{SO}_4$, $(\text{NH}_4)_2\text{S}$, BaCl_2 , $\text{Ca}(\text{NO}_3)_2$, KCl , or NaCl prevents inactivation and interrupts its progress at any stage but there is no evidence that such treatment will reverse it. J. N. A.

Autocatalytic experiment to illustrate virus growth.—See A., 1944, I, 133.

Stored sheep cells for the complement fixation test. W. Ashby (*Amer. J. clin. Path. Tech. Sect.*, 1944, 8, 6—9).—Sheep cells could be satisfactorily stored in 3·8% Na citrate for a year without loss of antigenic power. C. J. C. B.

Effect of follicular hormones on anaphylactic shock.—See A., 1944, III, 343.

Pathology of arthritis. S. A. Goldberg (*Amer. J. clin. Path.*, 1944, 14, 1—23).—A general review with illustrative cases of the different stages. (20 photomicrographs.) C. J. C. B.

Tularemia meningitis. J. K. David, jun., and J. N. Owens, jun. (*Amer. J. Dis. Child.*, 1944, 67, 44—51).—Report of a case and summary of previously reported cases. (2 photomicrographs.) C. J. C. B.

Pathology of trichinosis. E. Gould (*Amer. J. clin. Path.*, 1943, 13, 627—643).—A general review. (13 photomicrographs.) C. J. C. B.

XXVI.—PLANT PHYSIOLOGY.

Freezing of black gum seed increases nursery productivity. C. B. Umland (*J. Forestry*, 1943, 41, 453).—Freezing for 60 days, followed by 40 days' stratification at low temp., increased the rate and % of germination of seed of black gum (*Nyssa sylvatica*). L. G. G. W.

Growth of orchid seeds after dehydration from the frozen state. R. D. Svihla and E. Osterman (*Science*, 1943, 98, 23—24).—Orchid seeds of two primary crosses were suspended in sterile blood serum or autoclaved coconut liquid, frozen at -78° for a short time, subjected to a vac. while kept at -5° to -10° for 3—4 hr., and sealed under vac. Some of the tubes were broken and the seeds germinated non-symbiotically. Nearly all those in coconut liquid germinated and grew satisfactorily. None in blood serum germinated. Seeds of tuberous begonia and snapdragon, similarly treated, failed to survive and grow. E. R. R.

Germination, growth, and respiration of rice and barley seedlings at low oxygen pressures. J. Vlamis and A. R. Davis (*Plant Physiol.*, 1943, 18, 685—692).—The % germination of barley seeds is unaffected by reducing the O_2 concn. from 21 to about 9·5%, but declines fairly rapidly in decreasing concns. from 9·5 to 2% and very rapidly in those below 2%. Germination rate for rice seeds is independent of O_2 tension. Barley root and shoot growth is markedly diminished with less than 9·5% of O_2 ; in rice, the roots show a smaller reduction of growth rate at lower O_2 levels, whilst shoot growth is a min. at 21% of O_2 , increasing with reduction in the O_2 concn. and becoming a max. at about 3%. The rate of CO_2 evolution by rice decreases with decreasing O_2 tension and that by barley decreases still more rapidly. R. H. H.

Effect of oxygen concentration on respiration of some vegetables. H. Platenius (*Plant Physiol.*, 1943, 18, 671—684).—The crit. O_2 concn. below which the tissue was injured by anaerobic respiration was about 1% for spinach and snap beans, 2·5% for asparagus, and 4% for peas and carrots kept at 20° for several days. Tolerance to low O_2 levels increased with age and with decrease in the storage temp. At the most effective O_2 concns., asparagus and peas, respectively, retained 8 and 2·5 times as much sugar as did similar samples in normal air. In asparagus, proteins form about one third of the substrate used in respiration. R. H. H.

Reaction of pinon (pine) and juniper seedlings to artificial shade and supplementary watering. G. S. Mcagher (*J. Forestry*, 1943, 41, 480—482).—Watering and shading increased the rate but not the amount of seed germination for the pines and junipers tested. L. G. G. W.

Determination of velocity of water absorption in individual root hairs by micro-technique. H. F. Rosene (*Plant Physiol.*, 1943, 18, 688—697).—Quant. data obtained by the micro-technique (described) give direct evidence that root hairs function in the process of water absorption by higher plants. The velocity of tap-water absorption by individual root hairs of young radish seedlings was min. at 2×10^{-4} and max. at 31×10^{-4} cu. mm. per sq. mm. per min. R. H. H.

Blossom induction of cranberry. R. H. Roberts and B. E. Struckmeyer (*Plant Physiol.*, 1943, 18, 534—536).—Data collected during 1942 are recorded. The time of induction of McFarlin cranberry blossom buds was approx. July 10 and the earliest observed blossom primordia were found on July 29. R. H. H.

Influence of hydrogen-ion concentration of substrate in development of leafy moss plants. S. L. Meyer and C. H. Ford (*Plant Physiol.*, 1943, 18, 530—533).—Leafy plants of *Funaria hygrometrica* developed on substrates of both high and low acidity (pH 4·28—7·97). R. H. H.

Influence of potassium, nitrogen, and water supply on transpiration and assimilation in oats.—See B., 1944, III, 84.

Foliar diagnosis: physiological balance between the bases lime, magnesia, and potash. Foliar diagnosis in relation to plant nutrition under different conditions of weather and soil reaction.—See B., 1944, III, 85.

Effects of sodium salts on growth of tomato. H. E. Hayward and E. M. Long (*Plant Physiol.*, 1943, 18, 556—569).—With increasing concns. of Na (as NaCl and Na_2SO_4) from 40 to 160 mg.-equivs. per l. of nutrient solution, the N, reducing sugars, and mineral constituents (Ca, K, Mg, etc.) of the fruit juice increased. The main deleterious effects of high salt concn. were marked reduction in the no. of fruits set and in the wt. and size of those that reached maturity. Flavour of the fruit was unaffected by the treatments. The incidence of blossom-end rot increased at high salt concns. and was probably related to wide fluctuations in water stress due partly to accumulation of K^+ . R. H. H.

Internal precipitation of phosphorus in relation to aluminium toxicity. K. E. Wright (*Plant Physiol.*, 1943, 18, 708—712).—Al-poisoned barley plants, compared with the normal plants, contained a higher % of total P, but a lower % of sol. P, particularly in the roots. Aq. H_2SO_4 of pH 3 extracted all of the P from normal plants, but much smaller quantities from plants grown in contact with Al, indicating pptn. of P by Al within the plant. R. H. H.

Utilisation of sulphate and sulphur dioxide for sulphur nutrition of lucerne. M. D. Thomas, R. H. Hendricks, T. R. Collier, and G. R. Hill (*Plant Physiol.*, 1943, 18, 345—371).—Leaves of S-deficient plants developed chlorosis. Treatment with SO_4^{--} was more efficient than fumigation with SO_2 , although both appreciably improved the yield of S-deficient plots. The transpiration rate was decreased in plants low in S. Absorption of S increased with increasing S supply. Deficiency symptoms appeared when the nutrient solution contained less than 1·5—2·0 p.p.m. of SO_4^{--} -S (if there was no other source of S). R. R. H.

Quantitative study of chlorosis in *Chlorella* under conditions of sulphur deficiency. G. R. Mandels (*Plant Physiol.*, 1943, 18, 449—462).—Chlorosis develops in two stages, the first due to a differential between the rate of chlorophyll formation and the rate of cell division, the formation decreasing before cell division, and the second due to decomp. of chlorophyll in the cells, initiated at about the time cell division ceases. Addition of SO_4^{--} results in rapid recovery, chlorophyll synthesis being evident within about 5 hr. and cell division occurring after about 24 hr. Features of the curve showing the rate of chlorophyll synthesis during recovery are discussed. About 0·34 mol. of chlorophyll is formed in the light, and about 0·42 in the dark, per mol. of SO_4^{--} added. R. H. H.

Effects of iron on growth and ash constituents of *Ananas comosus*, L., Merr. C. P. Sideris, H. Y. Young, and B. H. Krauss (*Plant Physiol.*, 1943, 18, 608—632).—Growth in cultures free from Fe (except for traces present as impurities in the nutrient salts) was as good as in cultures containing Fe, provided that NH_4^+ was the source of N, but was appreciably worse when NO_3^- supplied the N. In the NO_3^- series, the % of ash (particularly of K) was higher in Fe-free plants than in those receiving Fe, but in the NH_4^+ series no significant differences were found. R. H. H.

Effect of boron in substrate on rate of nitrate absorption and on nitrogen distribution in nasturtium. G. B. Briggs (*Plant Physiol.*, 1943, 18, 415—432).—Plants growing in nutrient solutions containing no B, compared with normal plants, showed a progressive decrease in NO_3^- absorption and a lower total sol.:insol. org. N ratio in the stems and roots. Carbohydrates, NH_4^+ compounds, and sol. org. N accumulated in B-deficient plants. R. H. H.

Food reserve depletion and synthesis in field bindweed, *Convolvulus arvensis*, L., as related to 7-day and 14-day intervals of cultivation. J. C. Frazier (*Plant Physiol.*, 1943, 18, 315—323).—The depletion of food reserves in plants grown under light-proof covers, following cultivation (severance of the rhizomes at a depth of 4 in.) at 7- and at 14-day intervals, was determined during two growing seasons; cultivation every 14 days, compared with every 7 days, removed 20% more of the readily available carbohydrates (total sugars and the starch-dextrin fraction) and over 100% more of the protein-N. Further comparison was made between the amount of food reserves in plants cultivated every 14 days and kept in the dark and that of plants similarly treated but allowed to emerge in the light. The average gains due to synthesis in the light are recorded. R. H. H.

Composition of roots and stubble of perennial ryegrass following partial defoliation. J. T. Sullivan and V. G. Sprague (*Plant Physiol.*, 1943, 18, 656—670).—During a recovery period of 36 days following partial defoliation, water-sol. carbohydrates (glucose, fructose, sucrose, and fructosan) rapidly decreased for several weeks and then increased, whilst cellulose, hydrolysable pentosan, and lignin remained fairly const. In plants placed in darkness after cutting, sol. carbohydrates continued to decrease to a very low level and protein hydrolysis occurred. R. H. H.

Germinating seeds as source of vitamin-C in human nutrition. II. Germination and processing of blue boiler peas (*Pisum sativum*) as palatable source of vitamin-C.—See A., 1944, III, 355.

Enzymes present in germinating seeds.—See A., 1944, III, 366.

Invert soaps. VIII. Reduction of tetrazolium salts by bacteria, fermenting yeast, and germinating seeds. R. Kuhn and D. Jerchel [with, in parts, E. F. Möller, M. von Czernucki-Hrebeljanowitsch, and F. Moewus] (*Ber.*, 1941, 74, [B], 949–952).—When *Lepidium sativum* is grown on filter-paper soaked in 1% solutions of 2:3-diphenyl-5-methyl- or -5-*n*-undecyl-tetrazolium chloride (A., 1944, II, 204), germination and growth are unaffected but the young leaves and roots become red owing to penetration of the salt into the seed and its reduction there to formazans; this reduction cannot be effected by ascorbic acid, cysteine, or glutathione at pH less than 9. When 2:3-diphenyl-5-*n*-hexyltetrazolium chloride is added to yeast actively fermenting sugar, some is reduced to formazan; the latter is present entirely in the yeast and is extracted by butyl alcohol only after autolysis. *Streptobacterium plantarum*, staphylococci, *B. coli*, Friedländer and paratyphus bacteria all become red when grown in non-bacteriostatic concns. of the hexyl compound, while the medium becomes nearly colourless; the media alone do not cause this reduction to formazan. The redox potential, E'_0 , of the tetrazolium salt \rightleftharpoons formazan system for the *n*-hexyl compound is between -0.167 and -0.258 v.; E'_0 for lactoflavin is -0.186 and for lumilactoflavin is -0.207 v. Tetrazolium salts may be useful as reduction indicators in biological reactions as they function under aerobic conditions. R. S. C.

Stimulative effect of X-rays on plants.—See A., 1944, III, 363.

Influence of light on tree growth. F. G. Gustafson (*J. Forestry*, 1943, 41, 212–213).—Seedlings of *Picea glauca* grown in green-houses at full, $\frac{3}{4}$, $\frac{1}{2}$, and $\frac{1}{4}$ sunlight (in Michigan) showed in 8 years the greatest height under $\frac{3}{4}$ light, and greatest girth under full light. L. G. G. W.

Pyrrole derivatives and iron chlorosis in plants. S. Aronoff and G. Mackinney (*Plant Physiol.*, 1943, 18, 713–715).—Experiments with maize, barley, and *Chlorella vulgaris* failed to confirm the theory that pyrrole derivatives are able to replace Fe in the synthesis of chlorophyll by green plants. R. H. H.

Effect of sulphanilamide on germination of seeds. F. Ribeiro (*J. Biol. Chem.*, 1944, 152, 665–667).—Aq. 0.01% sulphanilamide caused 60% inhibition of the germination and early root growth of rice seeds. In concns. above 0.04%, the sprouts were of normal appearance but smaller than the control, whilst the roots were almost completely atrophied. Aq. 0.01% phenol completely inhibited all germination; aq. 0.01% arsenobenzene caused 80% inhibition of germination, but the seeds that germinated grew quite well. The action of sulphanilamide is antagonised by *p*-amino-benzoic acid. J. F. M.

Incompatibility sieve for producing polyploids.—See A., 1944, III, 319.

Possible function of vitamin-K in plants. F. L. Wynd (*Amer. Naturalist*, 1944, 78, 59–67).—The formation of pptn. membranes by plant protoplasm resembles in some respects the clotting of blood and the necessity of vitamin-K for the formation of prothrombin in blood suggests that it may be concerned with the formation in plants of a "cytothrombin," a possible precursor of the pptn. membranes which prevent dissolution of plant protoplasm in water. L. G. G. W.

Nutritional relations of boron and indolylacetic acid in head lettuce. A. D. Moinat (*Plant Physiol.*, 1943, 18, 517–523).—B-deficiency symptoms were delayed by 0.001 p.p.m. of B in the nutrient solution, and were prevented by 0.005 p.p.m. Indolylacetic acid sprayed on the leaves could not replace B in promoting normal growth and development. Neither treatment prevented the appearance of tip-burn. R. H. H.

Polarisation and stimulation of onion root by direct current. L. J. Berry and R. C. Hoyt (*Plant Physiol.*, 1943, 18, 372–396).—The current required to stimulate rather than polarise the root varies in different roots and is less at lower temp., particularly in the apical segment. O_2 is necessary for stimulation, whilst polarisation occurs to an even greater extent in its absence (*e.g.*, in an atm. of H_2). The effects of current flow are relatively independent of the age and the length of the roots. R. H. H.

Stimulation of onion root by alternating current. L. J. Berry and R. C. Hoyt (*Plant Physiol.*, 1943, 18, 570–587).—Stimulation with a.c. produces electrical changes similar to those caused by application of d.c. (*cf.* preceding abstract). Environmental factors (O_2 , temp., and previous treatment of the root) influence irritability. R. H. H.

Voltage gradients in trees as an indicator of susceptibility to insect attack. T. Parr (*J. Forestry*, 1943, 41, 417–421).—In the trees tested a voltage gradient existed and in general in the spring the top of the tree is positive to the base but later this polarity is reversed. In "subnormal" trees there may be a late reversal to the spring condition (*i.e.*, top positive to base). L. G. G. W.

Structure and composition of citrus leaves affected with mesophyll collapse. F. M. Turrell, V. P. Sokoloff, and L. J. Klotz (*Plant*

Physiol., 1943, 18, 463–475).—Collapse symptoms and the results of histological examination are described. Collapsed tissue, compared with normal tissue, contained less Ca, more K, Mg, Na, Cl, and P, and about the same amount of S. R. H. H.

Specific biological activity of tobacco-mosaic virus as influenced by age of lesion and nitrogen supply.—See A., 1944, III, 376.

Intermittently-irrigated sand culture equipment. H. G. Gauch and C. H. Wadleigh (*Plant Physiol.*, 1943, 18, 543–547).—The main features of each unit are: two 5-gal. crocks, one holding sand in which the plants are grown and the other serving as the solution reservoir; a $\frac{1}{2}$ -gal. glass jug which supplies 2 quarts of nutrient solution at each irrigation; a check valve to control the direction of flow of solutions; and a compressed-air line. R. H. H.

XXVII.—PLANT CONSTITUENTS.

Chemistry and pharmacological action of *Entada pursaetha*, DC. (*E. scandens*, Benth.).—See A., 1944, III, 363.

Glucoside of a γ -hydroxy-carboxylic acid.—See A., 1944, II, 186.

Antihæmorrhagic factor of maize stigmata (vitamin- K_3).—See A., 1944, III, 355.

Distribution of A-provitamins. I. Carotene in plants. A. Fujita and M. Ajisaka (*Biochem. Z.*, 1941, 308, 430–438).—The α - and β -carotene contents of the principal parts of various plants are tabulated. Generally, the content of total carotene is highest in green leaves (mesophyll), whilst yellow flowers contain only traces. The rind is the part of fruits generally richest in carotene. Of the roots and rhizomes examined, the carrot is richest in carotene (approx. 60% β - and 30% α -carotene). Some marine algae have a high content, whilst green, but not black, tea contains appreciable amounts. F. O. H.

Carotene and lycopene in rose hips and other fruits. F. C. Jacoby and F. Wokes (*Proc. Biochem. Soc.*, 1944, 38, xxvii–xxviii).—Pigments are extracted with a mixture of light petroleum and acetone, the latter is removed by washing with water, and xanthophylls are separated by diacetone extraction. Carotenoids are chromatographed on Al_2O_3 and eluted with benzene. Carotene contents of rose hips were found to be 40–240 and lycopene 90–650 μ g. per g. Both biological and chemical assays of a sample of dried rose-hip extract indicated a vitamin-A content of 44 i.u. per g. P. G. M.

Absorption spectra of colouring matters of saffron.—See A., 1944, I, 141.

Chemical study of *Fritillaria raddeana*, RGL.—See A., 1944, II, 206.

Starch from Easter lily bulbs.—See B., 1944, III, 93.

Mono- and poly-saccharide content of barley and malt.—See B., 1944, III, 94.

Beech lignin (*Fagus sylvatica*). II. E. Clotovski and W. Junge (*Ber.*, 1941, 74, [B], 1415–1419).—By 72% H_2SO_4 the bark gives 28–32.5% of lignin (13.0–13.2% methoxyl), by Noll's method 32.2–34% (12.05% methoxyl), by Willstätter's method 36.15–37.1% (10.7% methoxyl), and by the cuproxam method 17.7–18.0% (15.45% methoxyl). Yields of vanillin, obtained by nitro-benzene-alkali, are: dry alcohol-extracted bark 6%, Willstätter lignin 10%, cuproxam lignin 16.7%. The bark contains 3.16–3.19% of tannins. An aq. extract (9.14%) of the bark contains 6.65% of methoxyl, gives approx. 5.8% of vanillin, and yields phlobaphens 58.3% (10.42% methoxyl; gives approx. 0.8% of vanillin) and carbohydrates 33.3%. The unhydrolysable part of the bark thus contains true lignin or very similar substances. R. S. C.

Lignin and related compounds. LXXV–LXXVIII.—See A., 1944, II, 176.

Distinction between ribose- and deoxyribose-nucleoproteins and its cytological implications. J. Dufrenoy (*Biodynamica*, 1943, 4, 131–152).—The permanent units of the nucleus (chromosomes etc.) consist chiefly of polymers of deoxyribose-nucleic acids and are Feulgen-positive. Permanent cytoplasmic units (chondriosomes, mitochondria, and, in green plants, plastids) are Feulgen-negative. The chromosomes consist of bands of deoxyribose-nucleic acids and masses of ribose- and deoxyribose-nucleic acids, attached to threads of protamine and with a histone coat. Exchange of material between nucleus and cytoplasm consists of diffusion of substances synthesised in the nucleus. L. G. G. W.

Alkaloids of the seeds of *Delphinium consolida*, L. E. Cionga and C. Iliescu (*Ber.*, 1941, 74, [B], 1031–1034).—The seeds yield 32% of fat and 0.08% of cryst. alkaloids including delsoline, m.p. 215–216° (block), 207–209° (tube; sinters 204°), $[a]_D^{24}$ -48.12° in $CHCl_3$, and delcosine, m.p. 205–206° (block), 196–197° (tube; sinters 196°), $[a]_D^{24}$ -54.41° in $CHCl_3$, both of which are $C_{25}H_{40}O_7N$ and contain 3 active H, 3 methoxyl groups, and 1 C=C (addition of Br) (*cf.* Markwood, A., 1925, i, 762). Delcosine contains at least 1 OH, since it gives an oily benzoate. R. S. C.

LIST OF ABBREVIATIONS ETC. USED IN ABSTRACTS.

absolute	abs.	electrocardiogram	e.c.g.	parts per million	p.p.m.
alternating current	a.c.	electromotive force	e.m.f.	per cent.	%
ampere	amp.	electron-volt(s)	e.v.	potential difference	p.d.
Angström unit	Å.	equivalent	equiv.	precipitate	ppt.
anhydrous	anhyd.	feet, foot	ft.	precipitated	pptd.
approximat-e, -ly	approx.	for example	e.g.	precipitating	pptg.
aqueous	aq.	freezing point	f.p.	precipitation	pptn.
Assignor in patent titles {	Assr.	gallon(s)	gal.	preparation	prep.
Assignee } only	Assee.	gram(s)	g.	qualitative	qual.
atmosphere, -es, -ic	atm.	horse power	h.p.	quantitative	quant.
atomic	at.	hour(s)	hr.	recrystallised	recryst.
atomic weight	at. wt.	hydrogen-ion concentration [H']	[H']	refractive index	n
boiling point	b.p.	inch(es)	in.	relative humidity	R.H.
British thermal unit	B.Th.U.	inorganic	inorg.	respiratory quotient	R.Q.
calculated	calc.	insoluble	insol.	revolutions per minute	r.p.m.
Calorie (large)	kg.-cal.	kilogram(s)	kg.	Roentgen unit	r.
calorie (small)	g.-cal.	kilovolt(s)	kv.	saponification value	sap. val.
candle power	c.p.	kilowatt(s)	kw.	second(s) (time only)	sec.
centimetre	cm.	litre(s)	l.	†secondary	sec.
cerebrospinal fluid	c.s.f.	maximum	max.	soluble	sol.
coefficient	coeff.	melting point	m.p.	specific	sp.
concentrated	conc.	metre(s)	m.	specific gravity	sp. gr.
concentration	concn.	micron(s)	μ.	square centimetre(s)	sq. cm.
constant	const.	milliampere(s)	ma.	temperature(s)	temp.
corrected	corr.	milligram(s)	mg.	†tertiary	tert.
critical	crit.	millilitre(s)	ml.	vacuum	vac.
crystalline	} cryst.	millimetre(s)	mm.	value	val.
crystallised (adjective only)		millivolt(s)	mv.	vapour density	v.d.
cubic centimetre(s)	c.c.	minimum	min.	vapour pressure	v.p.
cubic metre(s)	cu.m.	minute(s)	min.	viscosity	η
current density	c.d.	molecul-e, -ar	mol.	volt(s)	v.
decimetre(s)	dm.	molecular weight	mol. wt.	volume	vol.
decompos-ing, -ition	decomp.	namely	viz.	watt(s)	w.
density	ρ, d.	normal	N.	wave-length	λ
dilute	dil.	number	no.	weight	wt.
direct current	d.c.	organic	org.		

† The abbreviations for secondary and tertiary are used only in connexion with organic compounds.

In addition, elements, groups, and easily recognised substances are denoted in the text by symbols and formulæ. The groups are as follows: methyl, Me; ethyl, Et; *n*-propyl, Pr^a; isopropyl, Pr^b; *n*-butyl, Bu^a; isobutyl, Bu^b; *tert*-butyl, Bu^c; phenyl, Ph; acetyl (CH₃·CO), Ac; benzoyl (C₆H₅·CO), Bz. (In Section A., III this applies only to inorganic compounds, excluding water, and to chloroform and carbon tetrachloride.) "Oleum" is allowed to describe fuming sulphuric acid and "room temp." for "the ordinary temperature." The symbol for 10 A. is mμ. (not μμ.) and for the International X-ray unit it is X, not XU. The symbol for 10⁻⁶ g. is μg. (not γ).

The following symbols are used except in Section A., III: >, greater than; ≫, much greater than; ≧, not greater than (and <, ≪, ≦ conversely); ∝, (is) proportional to; ~, of the order of, or approximately.

The principal Pharmacopœias are denoted by B.P., U.S.P., and D.A.B., followed in each case by the identifying numeral.

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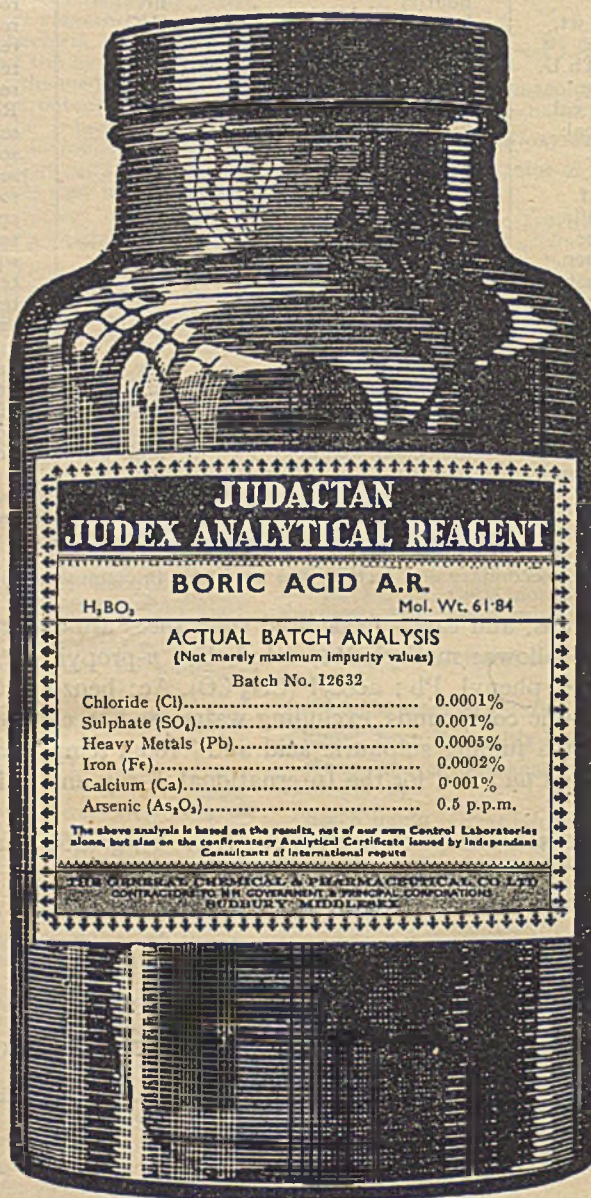
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