

# BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

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

MAY, 1939.

### (i) GENERAL ANATOMY AND MORPHOLOGY.

**Morphology of the lower jaw. II. Relationships of the mandibular artery and nerve.** H. INAGAWA (Keijo J. Med., 1938, 9, 215—239).—The spatial relationship of the mandibular artery to the nerve is not const. or symmetrical on both sides of an individual. Most frequently, on entering the mandibular canal, it lies laterally to the nerve and then, in its further course, it crosses over to the medial side. Variations are described. F. JA.

**Anatomy and development of the sacro-iliac joint in man.** G. B. SCHUNKE (Anat. Rec., 1938, 72, 313—331).—Variations in the adult sacro-iliac joint are described. Cavitation first appears in the 40-mm. foetus (10 weeks). Several cavities are formed and they remain separated by bands which persist until after birth and may be the same as the inter-articular bands of the adult. The cavity reaches its full relative extent by the 8th month of foetal life. No synovial layer is seen in foetal stages. Mobility, greatest around a transverse axis, increases to full term and then lessens. (11 figs.) H. L. H. G.

**Comparative anatomy of the dorsal interosseous muscles.** B. CAMPBELL (Anat. Rec., 1939, 73, 115—125).—Ruge's theory of the homology of the dorsal interosseous muscles is upheld. The deep short flexors migrate into the interosseous spaces to form the dorsal interossei. The opossum hand is considered in relation to these findings. H. L. H. G.

**Pyramidalis muscle.** B. J. ANSON, L. E. BEATON, and C. B. McVAY (Anat. Rec., 1938, 72, 405—411).—Variations in the size and attachments of the pyramidalis muscle in 165 human cadavers are given; the muscle is absent in 10.6% of cases. H. L. H. G.

**Rôle of long thoracic nerve and related scapular bursæ in the pathogenesis of local paralysis of the serratus anterior muscle.** M. T. HORWITZ and L. M. TOCANTINS (Anat. Rec., 1938, 71, 375—385).—The long thoracic nerve was examined in 50 human cadavers and variations in its composition, course, and relations (especially to bursæ) are described. It is believed that an accessory innervation of the lower digitations of the muscle is derived from the intercostal nerves. H. L. H. G.

**Fasciæ and fascial spaces of the head, neck, and adjacent regions.** M. GRODINSKY and E. A. HOLYOKE (Amer. J. Anat., 1938, 63, 367—408).—75 human adults and 5 full-term fetuses were examined by dissection, injection, and sectioning. A description

of the fasciæ and fascial spaces so determined is given. (21 figs.) H. L. H. G.

**Peripharyngeal fascial spaces in man.** G. WORMS, P. COULOUMA, J. DEBEYRE, and A. CAZALAS (Arch. Anat., Strasbourg, 1938, 25, 249—270).—A full description of these spaces is given according to the authors' dissections. There are 4 separated spaces, retropharyngeal and lateropharyngeal, the latter being divided into 3 by the lateral fascial expansions from the styloid process and its associates. The surgical approaches to these are considered. J. H. G.

**Fascial continuities in the abdominal, perineal, and femoral regions.** C. B. McVAY and B. J. ANSON (Anat. Rec., 1938, 71, 401—407)

H. L. H. G.  
**Fossa ovalis, and related blood vessels.** B. J. ANSON and C. B. McVAY (Anat. Rec., 1938, 72, 399—404).—The variations described in this region are based on the dissection of 200 human thighs. H. L. H. G.

**Blood supply of the hypophysis cerebri of the rhesus monkey.** G. B. WISLOCKI (Anat. Rec., 1938, 72, 137—150).—Dissection of the injected pituitary of a rhesus monkey showed the arterial supply to arise from superior and inferior hypophyseal arteries. Small portal venules connect the stalk and body of the gland; systemic venules pass from the body to the cavernous sinuses, but none pass from the stalk to the basilar veins. Vascular connexions between stalk and hypothalamus are too few and too small to be significant. (6 figs.) H. L. H. G.

**Extrahepatic biliary tract of *Hyrax*.** S. C. THOMSON (Anat. Rec., 1938, 72, 445—449).—There was no gall bladder in the specimen of *Hyrax* described; the right hepatic duct was enlarged. H. L. H. G.

**Volume of testicular parenchyma in Japanese children.** M. ENDO (Folia anat. japon., 1939, 17, 451—458). W. J.

**Relative weight of the testes in primates.** A. H. SCHULTZ (Anat. Rec., 1938, 72, 387—394).—Testis wt. is given as a percentage of body-wt. in 12 New World and 53 Old World monkeys, 14 apes, and 3 negroes. Wide discrepancies are apparent: 0.23% New World; 0.7% Cercopithecinae; 0.07% Semnopithecinae; 0.08% gibbons; 0.05% orang; 0.27% chimpanzee; 0.08% negro. Primates with relatively large testes have a greater proportion of glandular tissue and a smaller proportion of connective tissue than those with small testes. Some cases of unilateral cryptorchism are given. H. L. H. G.



**Subcutaneous corpora adiposa in *Rana tigrina*.** M. L. SHARMA (Proc. Indian Acad. Sci., 1938, 8, B, 405—412).—Four pairs of localised fat bodies occur ventrally, in the submandibular, prepectoral, axillary, and inguinal regions. One dorsal pair associated with the superficial gluteal septum is present. Their situation in relation to muscles and lymphatic septa and their blood supply and variations are recorded. Histologically they resemble adrenal corpora adiposa. W. F. H.

**Growth ratio of the fowl's tarsometatarsus variation with respect to (I) body-weight, (II) time.** I. M. LERNER (Growth, 1938, 2, 135—140, 141—144).—I. The growth ratio  $\alpha = (\log T_2/T_1)/(\log W_2/W_1)$ , where  $T$  and  $W$  are tarsometatarsus length and body-wt., fluctuates in different stages of growth. It tends to increase from 4 to 12 weeks and to decrease from 12 to 20 weeks of age.

II. The fluctuations in the relative growth ratio of tarsometatarsus with respect to body-wt. arise from variations in the growth patterns of the components entering into its determination. W. F. F.

**Maldevelopment of the kidney in an adult.** F. H. TER POORTEN (Acta neerland. Morph., 1938, 1, 302—312).—The kidneys of a man aged 23 who died of heart failure following mitral stenosis are described. There were numerous rose-coloured spots in the cortex; they were larger and more abundant superficially than towards the medulla. These areas differed from the surrounding kidney tissue histologically in that they showed no cloudy swelling, interstitial tissue was abundant, and the glomeruli and tubules were of an embryonic character. The embryonic structure was most marked in the distal convoluted tubules and least in the glomeruli; the collecting tubules were normally developed. There was no evidence of inflammatory or vascular changes. A convincing demonstration of the double origin of the kidney was afforded by these areas of developmental arrest. H. L. H. G.

**Active testicular epithelium in the connective tissue surrounding a human adrenal gland.** E. ALLEN and P. M. VESPIGNANI (Anat. Rec., 1938, 72, 293—296).—A testis tubule showing spermatogenesis was found in the connective tissue of the adrenal capsule in a middle-aged male. H. L. H. G.

**Unusual congenital abnormality of vagina.** A. A. GEMMELL, H. F. WOOLPENDING, and J. E. FRAZER (J. Obstet. Gynaec., 1938, 45, 663—666).—A case of a diverticulum of the anterior vaginal wall into the bladder is reported. It is suggested that the Müllerian ducts made contact with the urogenital sinus at a higher level than usual, and invaginated its wall, forming the diverticulum. W. D'A. M.

**Parallel duplication of face in an anencephalic foetus.** G. MAIZELS (J. Obstet. Gynaec., 1938, 45, 679—682).—A description of the monster *Diprosopus diotus triophthalmus distomus dignathus*, which showed also anencephaly and diplorachischisis. Similar cases are cited. W. D'A. M.

**Absence of pectoral muscles.** I. FRASIN and C. STRAT (Ann. Anat. path. méd-chir., 1938, 15,

942—944).—Congenital absence of left pectoralis major and minor in a male aged 21 years and of the sterno-costal portion on the right side in a male aged 28 years are recorded. The nipple was absent in both cases. Compensatory development of other muscles is described. W. F. H.

**Right aortic arch without dextrocardia but with a rare anomaly of the right lung.** C. APOSTOLAKIS and A. SAVVA (Ann. Anat. path. méd-chir., 1938, 15, 950—958).—The aorta passed upwards and to the right with the heart in its normal position. The abnormality was associated with absence of the innominate artery, an abnormal origin of the left subclavian artery, and a right lung with double apex. The relationships of vagi and recurrent laryngeal nerves are discussed from the embryological viewpoint. W. F. H.

**Unusual eruption of third molar.** T. E. DE JONGE-COEN (Acta neerland. Morph., 1938, 1, 328—330).—A case of resorption of the posterolateral root of the 2nd upper molar as a result of paraxial eruption of the 3rd molar is described. H. L. H. G.

**Molarisation of upper premolars in man.** T. E. DE JONGE-COEN (Acta neerland. Morph., 1938, 1, 331—332).—Three examples of this condition are figured. H. L. H. G.

## (ii) DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

**Species transformation.** B. REUSCH (Biol. Rev., 1939, 14, 180—222).—Undirected mutation and natural selection may be regarded as sufficient premises for evolution. In view of the manifold effects of mutations there is no justification in assuming an inherent process of unfolding. There is no simple scheme of species formation, but there exist various types of race and species development corresponding with the complex conditions of existence of the different organisms. A no. of different cases are distinguished.

**The Falkner ovum.** C. P. MARTIN and N. McI. FALKNER (Amer. J. Anat., 1938, 63, 251—271).—The probable age of the ovum is 15—16 days. The caudal end of the yolk sac is partly subdivided; the allantois arises from the ventro-caudal portion and pursues a long and tortuous course in the body stalk. These features are accounted for by the retardation of a normal expansion of the yolk sac towards the body stalk by the formation of bays or vesicles of which the allantois is a special example. H. L. H. G.

**Distribution of sweat glands of Japanese twin embryos.** T. TANIGUCHI and Y. KURITA (Folia anat. japon., 1939, 17, 297—316). W. J.

**Ovum of the mink (*Mustela vison*).** R. K. ENDERS (Anat. Rec., 1938, 72, 469—471).—Three living tubal ova of a mink are described. H. L. H. G.

**Development of the superior caval system in the rat.** L. A. SCHNEIDER (Anat. Rec., 1938, 71, 265—276).—A description of the cardinal system of



veins in rat embryos of 12–16 days is given. The azygos vein is mainly derived from the left posterior cardinal vein; a supracardinal plexus contributes only to its caudal end. H. L. H. G.

Origin of the penile urethra and bulbo-urethral glands with particular reference to the red squirrel (*Tamiasciurus hudsonicus*). N. J. BARNSTEIN and H. W. MOSSMAN (Anat. Rec., 1938, 72, 67–85).—Embryos of the red squirrel of 7 to 31 mm. crown-rump length were examined. The penile urethra is derived from the urethral plate; the latter arises from an ectodermal ingrowth, the dissolution of the inner cells of which produces the lumen of the penile urethra. The perineal raphe is the remnant of the line of ingrowth of the urethral plate. The bulbo-urethral glands are ectodermal in origin. (2 plates.) H. L. H. G.

Regeneration of testis in the fowl, and its bearing on germ-cell theory. C. W. HOOKER and B. CUNNINGHAM (Anat. Rec., 1938, 72, 371–385).—Of 500 castrated fowls, 5 showed a resumption of comb growth after periods of  $\frac{1}{2}$ –2 years despite complete gonadectomy. Testis tissue arose *de novo* from the peritoneum; it could be differentiated from possible hypertrophied fragments by its retro-peritoneal position, and by the immaturity and small size of the tubules. H. L. H. G.

Morphogenesis of the hypophysis cerebri of the domestic fowl during the second and third weeks of incubation. W. J. ATWELL (Anat. Rec., 1939, 73, 57–71).—Reconstructions were made of the developing hypophysis of the chick up to 1 day after hatching. The pars buccalis is divided by a ventro-lateral groove (occupied by the internal carotid arteries) into a rostral and a caudal part. The lumen of Rathke's pouch disappears early and no pars intermedia is recognisable after the 8th day of incubation. The fusion of the two halves of the pars tuberalis begins in the day-old chick. Connective tissue separates the neural and anterior lobes in later stages. (2 plates.) H. L. H. G.

Shape of the chick embryo growth curve. I. M. LERNER (Science, 1939, 89, 16–17).—A review of the published data on chick embryo wt. which are compared with the author's data. A regular and significant deviation from the usually accepted logarithmic law occurs from about 13 to 18 days of age. W. F. F.

Identification of normal stages in chick embryos. P. A. WALKER (Growth, 1938, 2, 145–147).—From a study of 361 chicks an index  $I = 1000W^{\frac{1}{3}}/L$  ( $W$  = wet wt.,  $L$  = crown-rump length) is proposed as a measure of normality. A frequency curve for  $I$  is plotted and the limits 315 and 353 are suggested for  $I$ . W. F. F.

Rôle of heredity versus environment in limb bud transplants between different breeds of fowl. H. L. EASTLICK (Science, 1939, 89, 17–18).—White Leghorn limb buds (60–70 hr.) were transplanted to the coelome of Brown Leghorn hosts of the same age and allowed to develop. In 9 cases, 7 developed a normal White Leghorn leg with white feathers and characteristically pigmented

scales, and 2 showed variations in which the environmental influence was visible. These latter were attached to the inner body wall, whereas the former were attached to mesentery only. W. F. F.

Embryology of the cormorant (*Phalacrocorax penicillatus*) during the period of somite formation. Comparison with the chick (*Gallus domesticus*) and the quail (*Lophortyx californica*). J. B. PRICE (Amer. J. Anat., 1938, 63, 409–455).—The development of cormorant embryos up to the 42-somite stage is compared with that of the chick and the quail. The chick and quail are of the same order and their early development is almost identical; the cormorant, belonging to a different order, differs in its manner of development and in the rate of development of its organs, as regards both somite formation and the relation of the organs to each other. While the Galliformes and Pelicaniformes can easily be distinguished after the 6-somite stage, the diagnostic characters differ at different stages. The val. of embryological differences in birds as a clue to their systematic position is discussed. (4 plates.) H. L. H. G.

Localisation of the neural inductor and tail mesoderm in a frog egg (*Hyla regilla*). A. M. SCHECHTMAN (Proc. Soc. Exp. Biol. Med., 1938, 39, 236–239).—The neural inductor is limited to the dorsal lip region of the mesodermal band. The tail mesoderm is limited to the lateral and ventro-lateral regions and the dorsal and ventral lips do not form tails on implantation. V. J. W.

Factor influencing the bilaterality of the eye rudiment in *Hyla regilla*. A. L. ALDERMAN (Anat. Rec., 1938, 72, 297–302).—In an early neurular stage pieces of mesoderm underlying one side of the anterior end of the neural plate were excised, rotated through 180°, and replaced. The eye which developed on the operated side was fused to the diencephalon. The mesoderm in the eye region is differentiated at an early stage into an eye-suppressing part medially, and an eye-supporting part laterally; this would account for the bilaterality of the eye rudiments in normal development. H. L. H. G.

Mechanics of sea-urchin development, studied by operative methods. S. HÖRSTADIUS (Biol. Rev., 1939, 14, 132–179).—A review, chiefly of the author's own work.

Effects of chemicals on the lethal mutation rate in *Drosophila melanogaster*. L. W. LAW (Proc. Nat. Acad. Sci., 1938, 24, 546–550).— $\text{CuSO}_4$ ,  $\text{KMnO}_4$ , and  $\text{KI}$  cause changes in the lethal mutation rate of the X-chromosome in *D. melanogaster*. Colchicine is ineffective. W. F. F.

### (iii) PHYSICAL ANTHROPOLOGY.

Nature of the human factor in infantile paralysis. I. Peculiarities of growth and development. II. Relation of age to maturing achievement and the disease picture. G. DRAPER and C. W. DUPERTUIS (J. clin. Invest., 1939, 18, 87–93, 95–100).—I. A method composed of mensuration,



observation, and statistical analysis was used for studying the external morphology of subjects with infantile paralysis. Among susceptibles there is a lack of co-ordination between growth and development, expressed as a tendency to overgrowth and retarded development, and the peculiar presence of the Mongoloid eye and the foetal and infant-like retardation of the eye-nose zone suggest adverse genetic or intra-uterine forces.

II. 6 characters are examined: presence of black spots, of large central incisors, of long eyelashes, of pronounced hyperextensibility of the joints, of spaced central incisors, and of internal eyefolds. Both paralysed and control groups possess 1 or all 6 characters but in every character the stricken persons possess them in a higher %. Children stricken under 7 years of age show a higher % of lower extremity paralysis and possess a greater no. of the 6 characters.

C. J. C. B.

**Dimensions of the pelvic inlet of 789 white females.** W. W. GREULICH and H. THOMS (Anat. Rec., 1938, 72, 45—51).—The higher is the economic status of the women examined, the greater is the tendency to a pelvis the antero-posterior diameter of which exceeded the transverse diameter at the inlet. Obstetrical interference was least in this "dolichopellic" group. The antero-posterior flattening usually considered normal for the female pelvis may be a result of inadequate nutrition. H. L. H. G.

**Hair colour changes in *Semnopithecus maurus*.** W. KEERS (Acta neerland. Morph., 1937, 1, 151—157).—The foetal hair of *S. maurus* is reddish; its colour changes soon after birth to the dark grey of the adult. Commonly in foetal hairs dark pigment granules are conc. towards the free end, whereas the red pigment, which is diffuse and agranular, is found mainly in the middle of the hair. The adult hair shows a mass of grey pigment granules. Occasionally a red-haired adult is found; the distribution of pigment in the hairs of such specimens differs from that of the foetus; they are atypical adults and not adults retaining a foetal type of hair. H. L. H. G.

#### (iv) CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

**The epithelium of the human ureter.** T. TAKAHASHI (Fol. anat. japon., 1939, 17, 389—424). W. J.

**Bodian technique as applied to the complicated cell boundaries of the renal epithelium in mammals.** A. L. GRAFFLIN and J. J. FOOTE (Anat. Rec., 1938, 72, 115—118).—Bodian's technique is recommended as a supplementary method of displaying cell boundaries in renal tubules.

H. L. H. G.

**Mechanical significance of collagenous fibres in human fibrocartilage.** R. AMPRINO (Z. Zellforsch., 1938, 28, 734—760).—Collagenous fibrils in the foetus appear in the precartilage and form a network around the cells. Later they increase in no. and pursue a more regular course. With the formation of isogenic groups the fibres are pushed towards the periphery of the groups and surround them, being arranged concentrically in part. Fibrillae in hyaline cartilage are mainly parallel but are partly linked

together, and these fibrils unite various regions of the cartilage. In old age the fibrils form dense rigid radiating bundles. With the application of strongly deforming forces the isogenic groups become flattened and the surrounding fibrils become more compact.

R. J. O'C.

**Epithelial components of the pituitary gland of the opossum.** A. B. DAWSON (Anat. Rec., 1938, 72, 181—193).—The pituitaries of 5 adult opossums were examined. The pars intermedia and the pars tuberalis are very simple in structure. Acidophils are found in the postero-lateral parts of the pars distalis; the anterior part is composed mainly of chromophobe and basophil cells and corresponds with the zona tuberalis of the cat and rabbit. The possible embryological and morphological significance of this segregation of cell types in the pars distalis is discussed.

H. L. H. G.

**Structure and innervation of the carotid glomus and carotid sinus.** H. A. MEIJLING (Acta neerland. Morph., 1938, 1, 193—288).—The structure and nerve supply of the glomus caroticum and the sinus caroticus in the horse are described; tissues from the cow, pig, dog, and cat were used for comparison. The glomus cells of the horse are of two kinds, light and dark, and they form a loose syncytium; they show no chromaffin reaction. Ag impregnation reveals a neurofibrillar network throughout the syncytium, especially dense near the nuclei. A small intravagal paraganglion found 10 cm. caudal to the carotid bifurcation shows a structure similar to the glomus. Anastomosing cells with a neurofibrillar structure were found in human glomus tumours. After denervation, all the medullated fibres degenerated but the neurofibrillar nets in the glomus cells remained intact. Nissl substance was demonstrated in the cells. Glomus cells stained vitally with methylene-blue in the same manner as ganglion cells; a varicose nerve net is present pericellularly and neurofibrillae extend to the nuclei. Morphologically glomus cells are small autonomic ganglion cells forming a syncytium. The sinus caroticus shows a network of nerve fibres intimately related to interstitial cells; the latter are peripheral autonomic ganglion cells. The functions of the glomus and sinus cells are discussed. (B.)

H. L. H. G.

**Morphological and experimental study of intranuclear crystals in hepatic cells of the dog.** H. L. WEATHERFORD (Anat. Rec., 1938, 71, 413—445).—Crystals, usually single, are found in the nucleus of hepatic cells in the dog, but in no other laboratory animal. There are up to 2.13% of crystal-containing nuclei; Dalmatians (which have a high uric acid and low allantoin excretion) show an average of only 0.26% nuclei with crystals. The no. of crystals is not affected by age, short fasts, or anaphylactic shocks. They can be isolated by micro-dissection of the living cell. Apart from the liver they are only found in the proximal convoluted tubules of the kidney. The crystals are refractile, hexagonal prisms; they show no birefringence, are sol. in dil. alkalis and conc. acids, insol. in alcohol, ether, and benzene. They are Fe-free and tests for haemoglobin and its derivatives, carbohydrates, fats, and bile pigments are negative. They



are not increased by the intravenous injection of hæmoglobin. Physical and chemical analyses show that the crystals are derived from a purine base, but the compound is not yet identified. (3 plates.)

H. L. H. G.

**Intranuclear crystals in the hepatic cells of Canidæ—wolves, foxes, jackals, and non-domestic dogs.** H. L. WEATHERFORD (Anat. Rec., 1939, 73, 29—37).—Intranuclear crystals in the hepatic cells of several species of Canidæ are described. The crystals are always hexagonal prisms; they vary considerably in size and no. but are largest and most numerous in domestic dogs. Homogeneous bodies in the nuclei are also described. The distribution and significance of both kinds of intranuclear inclusions are discussed. There is a relation between purine metabolism and crystal formation. (1 plate.)

H. L. H. G.

**Comparative study of the discs of cross-striated muscle and simulacra in smooth muscle, with special reference to so-called transitional musculature.** H. E. JORDAN (Amer. J. Anat., 1938, 63, 221—249).—The cross striation sometimes seen in smooth muscle fibres is not to be compared with that of skeletal muscle. Widely spaced striation corresponds with horizontally aligned contraction nodes; fine striation, which is seen only in young muscle fibres, is the result of a passive deformation of the cells by pressure from an adjacent mass of contracting muscle. There are no true *Q* or *J* discs, nor a *Z* membrane. Definitive smooth muscle cannot differentiate into cross-striated muscle.

H. L. H. G.

**Tissue culture of epithelium of choroidal plexus of the chick.** K. SCHLUDERMANN (PAPUSCHKE) (Z. mikr.-anat. Forsch., 1938, 44, 163—168).—Examination by cinematography of the choroid plexus of 9—13-day old chicks showed that epithelial movements begin 23 days after explantation, and that the network seen in the ventricle in fixed preps. is due to the setting free of globules of fluid from the damaged cells and not the coagulation of cerebrospinal fluid.

J. H. G.

**Growth of cell nuclei by doubling.** G. HERTWIG (Arch. exp. Zellforsch., 1938, 22, 212—214).—Certain exceptions to the growth of the nucleus by doubling are pointed out.

R. J. O'C.

**Histology of retractor muscles of *Thyone briareus*, Lesueur.** M. OLSON (Biol. Bull. Wood's Hole, 1938, 74, 342—347).—These consist of bundles of long, spindle-shaped, uninucleate, smooth muscle fibres. Each bundle contains 2—15 fibres held together by much connective tissue. The fibres tend to pass from one bundle to another. The nucleus of the fibre is usually at the periphery. The diameter of the fibres is 2—4  $\mu$ . when extended and 5—10  $\mu$ . when contracted.

A. D. H.

**Structure of nuclei in *Cucurbita pepo*.** HOCQUETTE and M. HOCQUETTE (Compt. rend. Soc. Biol., 1938, 129, 571—574).

P. C. W.

**Colchicine and acenaphthene as polyploidising agents.** D. KOSTOFF (Nature, 1938, 142, 752—753).—Acenaphthene and colchicine interfere with

mitotic and meiotic processes, creating conditions for chromosome doubling and inducing polyploidy.

W. F. F.

**Mechanism of mitosis.** F. WASSERMANN (Arch. exp. Zellforsch., 1938, 22, 238—251).—A review.

R. J. O'C.

**Theory of vital staining.** K. KIYONO, S. SUGIYAMA, and S. AMANO (Acta Sch. med. Univ. Kyoto, 1938, 21, 1—279).—Methods and results of vital staining with acid and alkaline dyes are critically reviewed. Staining is mainly due to electrical adsorption of the dye to the granules of the cell. The dye introduced into the cell acts as poison which should be excreted as quickly as possible but is also fixed to certain substances of the cell by which it is neutralised and detoxicated. The intracellular dye particles are adsorbed to the granules by electrostatic attraction and lose their free energy. By their excretion the equilibrium of adsorption on the surface of the granules is lost; the adsorbed dye particles become free and gradually leave the cells again. E. R.

**Vital staining of the cell nucleus with basic stains.** O. BANK (Protoplasma, 1938, 29, 587—594).—Certain basic stains which usually give no vital staining of the nucleus can be made to do so if mixed with a dehydrating agent. Best results are obtained with 1% of aniline in the staining solution. With "prune pure" and aniline addition of dehydrating ions, e.g.,  $\text{Ca}^{++}$ , is also necessary. With acid stains acidification of the solution is essential. The effect of the dehydrating agents is probably to induce coacervation of the plasma colloids, which appears to be an essential preliminary to staining.

M. A. B.

**Distribution of red carotenoid in the chlorochromoplasts.** R. SAVELLI (Protoplasma, 1938, 29, 601—607).—Chlorochromoplasts contain both green and red pigments. Three types of distribution of the red pigment are described: (1) general diffusion throughout the stroma, (2) distribution in parcels in admixture with green pigment, (3) distribution in parcels separately from the green. In some cases the pigmented parcels appear to be solid granules, in other cases liquid lipid drops into which the pigment diffuses from the stroma during development.

M. A. B.

**Submicroscopic structure of the cutinised cell membrane.** M. MEYER (Protoplasma, 1938, 29, 552—586).—The cuticular layer of the leaves and stem of *Clivia*, *Yucca*, *Gasteria*, and *Dasyliirion* contains an outer negatively birefringent layer and an inner layer which may be positively or negatively birefringent or isotropic according to the proportion of cellulose in it. The outer layer consists of a cutin framework containing tangentially oriented spaces in which plate-like micelles of cutin waxes are embedded; these give rise to the negative birefringence of this layer, although the wax mols. themselves are positively birefringent. The inner layer consists of a framework of oriented interwoven cellulose and cutin micelles with cutin wax in the spaces. The inner layer also contains a small amount of pectin.

M. A. B.

**Improved fused quartz living tissue illuminator.** M. H. KNISELY (Anat. Rec., 1938, 71, 503—508).—In the modification described the cooling



solution is passed through the quartz rod itself instead of using an accessory tube. H. L. H. G.

**Apparatus for dehydration and imbedding in vacuo without use of chemical substances.** E. LANDAU (Bull. Histol. Tech. micr., 1939, 16, 13—17).—The tissue is frozen at  $-25^{\circ}$ , dehydrated by a series of evacuating pumps giving a vac.  $1 \times 10^{-6}$ , and then imbedded in melted paraffin wax; the whole operation takes 20 min. Details of the apparatus are given. E. E. H.

### (v) BLOOD AND LYMPH.

**Hæmatology and practice.** W. MEYER-HARTMANN (Schweiz. med. Wschr., 1939, 69, 170—172).—A review. A. S.

**Action of follicle hormone on bone marrow function.** W. SCHRADER (Folia hæmat., Lpz., 1939, 61, 145—154). A. S.

**Pathogenesis and treatment of aplastic conditions of the bone marrow.** S. KUTHAN (Dtsch. med. Wschr., 1939, 65, 332—333).—A review. A. S.

**Bone marrow in typhus abdominalis. I. Erythropoiesis.** Z. GALINOWSKI (Folia hæmat., Lpz., 1938, 60, 243—257; cf. A., 1939, III, 226). C. J. C. B.

**Blood picture of rats from birth to twenty-four days of age.** H. D. BRUNER, J. VAN DE ERVE, and A. J. CARLSON (Amer. J. Physiol., 1938, 124, 620—626).—Blood vals. of 288 rats, observed in groups of 12 for each day from birth to 24 days of age, are recorded. The blood picture of the young rat is similar to that found in pernicious anaemia. The progressive changes from 1st to 24th day were: red cell count  $2.40\text{--}5.04 \times 10^6$  per cu mm.; hæmoglobin 10.31—8.52 g.%; mean corpuscular vol.  $134.6\text{--}59.8 \mu^3$ ; % vol. packed red cells 32.89—30.13; reticulocytes  $2.04\text{--}1.17 \times 10^6$  per cu. mm.; leucocytes  $4.65\text{--}5.45 \times 10^3$  per cu. mm. The counts indicate a change from megaloblastic to normoblastic erythropoiesis. M. W. G.

**Effect of vitamin-C on blood formation and melanophores in amphibian embryos.** P. W. SLONIMSKI (Arch. exp. Zellforsch., 1938, 22, 101—107).—The formation of hæmoglobin is unaffected by vitamin-C but at a later stage the red cell count is increased. -C decreases pigment formation. R. J. O'C.

**Blood and hæmopoietic organs of dogs with a direct Eck fistula.** O. A. TSCHERNIAEVA (J. Méd. Ukrain., 1938, 8, 1063—1074).—Dogs with a direct Eck fistula develop severe progressive anaemia, with cachexia leading to a loss of wt. of 40—60% at death; the symptoms commence 1 month after the operation, and their severity varies parallel with that of the degree of hepatic degeneration and cirrhosis. Exposure of such dogs to low pressures causes the usual rise in red blood cell count. Bone marrow smears indicate degenerative changes of the type found in liver disease, and involving both red and white blood cells. R. T.

**Blood and bone marrow smear count in brucellosis.** N. SCHMID (Schweiz. med. Wschr., 1939, 69, 191—193).—A typical change of the blood count in brucellosis (Bang's disease) is leucopenia

with lympho- and mono-cytosis. Sternal bone marrow shows mainly myelocytes and promyelocytes. One patient with undulant fever showed a severe hæmorrhagic diathesis, miliary Bang nodules in the bone marrow, and atrophy of the spongy part of the bone. A. S.

**Erythropoiesis in the mammalian embryonic liver.** R. MICHALOWSKI (Arch. Anat. micr., 1938, 34, 53—104).—A cytological study is made of red cell development in the liver of pig embryos (12—183 mm.) and of rat embryos (12—13 days, 6 mm. to 20 days, 37 mm.). The earliest phases, as seen in the smallest embryos, consisted of divisions of the red cells in certain dilated vessels in the liver. Later (pig 20 mm., rat 15 days) blood islands are formed in the liver parenchyma by migration of cells from these vessels. From the islands fresh generations of erythroblasts pass back into the circulation. Liver cells, endothelial cells, and giant cells in the liver give no hæmoglobin reaction. J. H. G.

**Blood elements and erythropoiesis during muscular dyspnoea.** P. FORNAROLI (Boll. Soc. ital. Biol. speriment., 1938, 13, 1186—1187).—With dogs severely exercised daily for a period of 6 months, the erythrocyte and reticulocyte counts increase, reaching max. after approx. 8 weeks, and then decrease to normal levels. The hæmoglobin content and the leucocyte count are practically unchanged. F. O. H.

**Ovalocytosis.** A. VISCHER (Z. klin. Med., 1938, 135, 123—132).—Three generations of a family with ovalocytosis were studied. It occurred in 12 out of 44 people and is a hereditary dominant factor. In the affected persons 80—90% of the red cells were oval. By means of blood transfusion the duration of life of the ovalocytes was found to be 12—13 days. 18—38% of reticulocytes were found in the blood; there was also polychromasia and punctate basophilia. Sternal puncture showed increased hæmatopoiesis. E. R.

**Duration of life of erythrocytes (transfusions of ovalocytic blood).** A. VISCHER (Z. klin. Med., 1938, 135, 134—136).—Ovalocytic blood was transfused into normal people; the ovalocytes disappeared in 12—13 days in 4 cases when donor and recipient were of the same group, and after 7 days when donor was group O and recipient group A. E. R.

**Physiological extravasations and the histological rôle of extravasated erythrocytes.** W. O. CLERC (Bull. Histol. Tech. micr., 1938, 15, 277—291).—Two types of extravasations are distinguished: (a) hæmorrhage with coagulation and rapid destruction of erythrocytes, (b) physiological or traumatic extravasation in which the erythrocytes by histolysis stimulate new formation of connective tissue. The second occurs normally during growth and post-embryonic modification of organs and also in inflammation. Many types of cells dissociate in the presence of extravasated erythrocytes, with formation of eosinophil cells. The stimulation of connective tissue formation plays an important part in reconstitution of damaged tissue. Lymphocytic proliferation and the presence of extravasated erythrocytes are mutually inhibiting. E. E. H.



**Development of red blood cells [in chick embryos].** P. R. VAINSCHEIN (Trans. Conf. Med. Biol., 1937, 159—164, 284).—Erythrocytes are formed in chick embryos by independent differentiation of the chorionic-allantoic mesenchyme. Erythropoiesis was observed in *in vitro* cultures of the embryonic discs only under conditions assuring supply of hæmoglobin. R. T.

**Anæmia of Bright's disease.** M. LOEPER and P. PERREAU (Sang, 1939, 13, 113—130).—A review of some of the causes with illustrative cases.

C. J. C. B.

**Iron ascorbate in treatment of anæmia.** J. G. FRIEND (New England J. Med., 1938, 219, 910—912).—Fe ascorbate is more effective than Fe NH<sub>4</sub> citrate, retains its vitamin-C activity, and can be given intravenously. It is, however, unstable and expensive. A. M. G.

**Experimental anæmias. I. II. Effect of acidic and alkaline diets.** S. CANNA (Boll. Soc. ital. Biol. sperim., 1938, 13, 1090—1092, 1092—1093).—I. Anæmia is produced in rats by continuous hæmorrhage. Hyperchromic anæmia follows subcutaneous injection of saponin but not to a significant extent after restriction to a diet of goat's milk. Blood changes accompanying the anæmias are described.

II. With various types of anæmia (rat, rabbit), regeneration of erythrocytes occurs more rapidly with alkaline than with acid diets. F. O. H.

**Hæmoglobin production in anæmia limited by low protein intake.** P. F. HAHN and G. H. WHIPPLE (J. Exp. Med., 1939, 69, 315—326).—Low protein intake in a standard anæmic dog causes retardation of hæmoglobin regeneration, even when an excess of Fe is taken, owing to lack of globin. Other factors than Fe content alone are responsible for potency of liver in anæmia secondary to hæmorrhage.

A. C. F.

**Pathogenesis of pernicious anæmia.** E. A. VINOGRADOVA (J. Méd. Ukrain., 1938, 8, 1131—1138).—Chronic purulent angiocholitis preceded or appeared together with pernicious anæmia in a no. of cases described. R. T.

**Gastroscopic observations in pernicious anæmia.** R. SCHINDLER and A. M. SERBY (Arch. intern. Med., 1939, 63, 334—355).—Gastroscopic observations on 23 cases of pernicious anæmia are reported; 9 were seen before treatment, 14 after treatment, and 3 before and after treatment. All untreated cases showed superficial gastritis, often with atrophy. After treatment the atrophy and gastritis usually disappeared, especially in the antrum. It is suggested that the primary abnormality is dysfunction of the cells producing the antianæmic principle, lack of which causes reversible atrophic gastritis.

C. A. K.

**Pernicious anæmia and phlegmonous gastritis.** A. ANDERSSON (Acta med. scand., 1938, 97, 401—406).—A patient in remission from pernicious anæmia (resulting from liver treatment) died suddenly from phlegmonous gastritis. The pathological findings in the stomach are discussed and a possible connexion between the two conditions is suggested. C. A. A.

**Myeloid pattern in pernicious anæmia.** E. A. SHARP, E. M. SCHLEICHER, and J. W. WOLTER (Amer. J. clin. Path., 1939, 9, 189—208).—The typical hæmogram of pernicious anæmia in relapse shows leucopenia with neutropenia and the presence of immature myeloid forms in the blood with hypersegmented neutrophils. No const. quant. relationship exists between the respective concns. of the leucocytes and the erythrocytes in the stage of relapse. Myeloid immaturity does not disappear usually until the red cells are restored to normal.

C. J. C. B.

**Effect of a second complicating disease on pernicious anæmia.** H. LIECHTI (Schweiz. med. Wschr., 1939, 69, 172—174).—A patient with pernicious anæmia developed a cancer of the stomach. The hyperchromic anæmia changed into a hypochromic type, megalocytes disappeared from the bone marrow, the colour index was lowered, and the total leucocyte and neutrophil count increased. Symptoms of pernicious anæmia disappeared in another patient when pulmonary tuberculosis became manifest.

A. S.

**Phagocytic activity of leucocytes.** R. B. GRAGEROVA (J. Méd. Ukrain., 1938, 8, 1041—1062).—The phagocytic index (with *B. mesentericus*) is raised in 37% of cases of scarlet fever, lowered in chronic diseases (cancer, myeloid leukaemia), and varies irregularly in other conditions. It is raised following blood transfusion in 50% of cases studied. Immunisation of rabbits and guinea-pigs towards *B. mesentericus* does not raise the val. of the index, and the same applies to leucocytes from typhus and typhoid fever patients and convalescents, with respect to the specific pathogenic bacteria. Variations in the index may be due to stimulation or depression of the active mesenchyme, or of the leucocytes in circulation. (8 photomicrographs.) R. T.

**Leucopoietic substance.** E. BAUMANN (Klin. Woch., 1939, 18, 14—19).—This substance is obtained by extracting liver, gastric or duodenal mucosa, or red bone marrow; it is present in serum 6—8 hr. after injection. The leucocyte count in man is increased by 300%; this is due to neutrophilia with shift to the left, and monocytosis; the action wears off in 48 hr. 30 mg. of mucosal extract are as active as 60 mg. of marrow or liver extract. Normal serum contains 0.6—1.4 mg.-% of this substance, a tenth only in granulocytopenia, and a tenfold val. in myeloid leukaemia. The substance is said to be formed in the gastroduodenal mucosa and stored in the liver, whence it is released by nervous or hormonal stimuli. E. M. J.

**Effects of organismal differentials on the distribution of leucocytes in the circulating blood.** H. T. BLUMENTHAL (Arch. Path., 1939, 27, 510—545).—Transplanted pieces of tissues and organs give off substances which cause changes in the relative and abs. no. of the various types of leucocytes circulating in the blood which paralleled closely the reactions of leucocytes around the transplants. After homotransplantation this general response was characterised by an abs. and relative increase in lymphocytes, while after heterotransplantation there was an early abs. increase in the polymorphonuclears with



a secondary increase in lymphocytes. By means of these reactions it was shown that the lens of the eye possessed individuality and species differentials.

C. J. C. B.

**Familial changes of the granulation of white cells.** A. ALDER (Dtsch. Arch. klin. Med., 1939, 183, 372—378).—A familial occurrence of large neutrophils and eosinophils is described. An increased granulation of the neutrophils with a low  $p_H$  and basophil granules in the eosinophils were found. The protoplasm of the leucocytes was immature. Acidophil granules were found in lymphocytes and monocytes. The phenomenon is attributed, on the basis of similar bone marrow smears, to a disturbance of the maturation of white cells.

A. S.

**Blood eosinophil count in asthmatics.** H. B. HUNT (J. Allergy, 1939, 10, 146—155).—The eosinophil count in individual asthmatics was subject to large fluctuations. Age, sex, symptoms, or the injection of vaccines and other foreign proteins had no definite influence on the count. Seasonal variations were a tendency to high counts in summer and lower counts in winter.

C. J. C. B.

**Increase in basophil polynuclears in experimental tuberculosis.** F. VAN DEINSE and J. SOLOMONIDES (Compt. rend. Soc. Biol., 1938, 129, 828—830).—While only 4 out of 90 normal rabbits had more than 10% basophils, 16 out of 63 injected with avian tubercle bacilli had such a high basophil count.

P. C. W.

**Multiple myeloma.** J. R. GROSGURIN (Sang, 1939, 13, 30—65).—A general review. (B.)

C. J. C. B.

**Diagnostic value of the plasma cell tendency in infectious mononucleosis.** R. WAITZ (Sang, 1939, 13, 131—139).—The fact that both lymphocytes and monocytes in infectious mononucleosis show appearances suggestive of plasma cells is considered an important point in differential diagnosis of the condition.

C. J. C. B.

**Simultaneous determination of the plasma volume with T-1824 and the "available fluid" volume with sodium thiocyanate.** M. I. GREGERSEN and J. D. STEWART (Amer. J. Physiol., 1939, 125, 142—152).—Directions for carrying out simultaneous determinations of plasma vol. with the blue dye T-1824 and of "available fluid" with thiocyanate are outlined. These methods may be combined without affecting the accuracy of T-1824 or the thiocyanate analysis. By determining the thiocyanate (as  $Fe^{III}$  thiocyanate) as well as the dye concn. with a spectrophotometer both analyses may be completed on 0.5 c.c. of serum. Simultaneous determinations of plasma vol. and "available fluid" in dogs show large individual differences in plasma vol. and "available fluid" per kg. body-wt. Under normal conditions plasma vol. is a function of total vol. of "available fluid." As the dogs mature a striking decrease in plasma vol. and "available fluid" per kg. body-wt. is shown. Females have more "available fluid" relative to plasma than males.

M. W. G.

**Blood volume in normal, pregnant, and puerperal women.** L. G. TRAVERSO (Arch. Ist. Biochim. Ital., 1938, 10, 65—108).—The blood vol. in normal women is 73.8 c.c. per kg.; at the end of pregnancy it is 88 c.c. per kg. A return to normal vol. occurs within 8—10 days after the birth.

F. O. H.

**Determination of potassium as a test for alteration in stored blood.** G. JEANNENEY and L. SERVANTIE (Compt. rend. Soc. Biol., 1938, 129, 1189—1190).—A concurrent increase of plasma-K occurs with the diminution in the rate of sedimentation of stored blood.

H. G. R.

**Blood donor organisation and blood transfusion.** K. A. SEGGEI and H. REIHER (Med. Welt, 1939, 13, 185, 262—266).—A review.

A. S.

**Blood transfusion equipment and some reaction prevention factors.** P. B. PATTON (Amer. J. clin. Path., Tech. Suppl., 1939, 3, 34—40).—To prevent reactions it is necessary to avoid heating or unnecessary handling of the blood, avoid harsh cleansing materials, refrigerate promptly at 4°, and sterilise the equipment by autoclaving within 2 hr. from the beginning of the cleansing processes. In 920 cases only 0.9% of mild reactions occurred.

C. J. C. B.

**Autologous and homologous transfusion of human ascitic fluid.** H. A. DAVIS and J. F. BLALOCK, jun. (J. clin. Invest., 1939, 18, 219—224).—The transfusion of human ascitic fluid in group-compatible animal and human recipients is practicable and gives few and mild reactions, which will probably be eliminated by better filtration of the fluid. Prolonged refrigeration of the fluid does not affect the physiological availability of ascitic fluid and its val. may be enhanced by concn.

C. J. C. B.

**Sedimentation rate of erythrocytes.** T. H. HAM and F. C. CURTIS (Medicine, 1938, 17, 447—517).—A general review of the influence of technical erythrocyte and plasma factors and quant. comparison of 5 commonly used sedimentation methods. The sedimentation rate of whole blood observed by the Rourke-Ernstene method shows a roughly linear correlation with the plasma-fibrinogen concn. when there are normal levels of serum-globulin, erythrocyte mean corpuscular vol., and the corr. defibrinated sedimentation rate. The erythrocyte cell vol. correction methods for whole blood and for defibrinated blood do not correct for the effect of variation in erythrocyte size. The Westergren method showed slightly lower correlations of the rate with fibrinogen content.

C. J. C. B.

**Red cell fragility in tropical macrocytic anaemia.** B. D. F. EVANS and L. WILLS (J. Path. Bact., 1939, 48, 437—442).—The uncorr. median corpuscular fragility in 40 cases of tropical macrocytic anaemia lay between 0.255 and 0.375% NaCl with a mean of 0.316% compared with the normal mean of 0.366%. The mean corpuscular fragility for men and non-pregnant women was significantly lower than for pregnant women. Using corr. figures for mean corpuscular fragility, there was no correlation between



the degree of anæmia and the mean corpuscular fragility figure. C. J. C. B.

**Effect of blood transfusion on the rate of sedimentation of erythrocytes, in scarlet fever.** B. M. JERUSALIMSKI and G. A. LISENKO (J. Méd. Ukrain., 1938, 8, 1123—1129).—The sedimentation rate falls after transfusion. This is a favourable prognostic sign. R. T.

**Sedimentation rate and leukæmoid reaction in metastatic tumours of bone.** D. H. KAUMP, F. J. HECK, and E. G. BANNICK (Amer. J. clin. Path., 1939, 9, 176—188).—In 62 cases of carcinoma with bone metastases the % of cases with evidence of immaturity of the myeloid cells in the blood increased both with the degree of anæmia present and with the degree of involvement of the bone. The sedimentation rate was increased and increased with increasing anæmia but not with successive metastatic involvement of bone. C. J. C. B.

**Sedimentation test in the differential diagnosis of acute pelvic inflammatory disease and acute appendicitis.** C. LINTGEN and K. FRY (Amer. J. Obstet. Gynec., 1938, 36, 393—399).—10% of patients with acute pelvic inflammatory disease had a normal sedimentation rate, while 90% were abnormal. 48% of patients with acute appendicitis had a normal sedimentation rate, while 52% were abnormal. The test therefore cannot be used to differentiate between these two conditions. M. H.

**New technique for determination of red cell fragility.** A. T. BERNARD (Bull. Soc. med. Hôp. Bucarest, 1938, 20, 268—270).—A new, simple, accurate technique is described. C. A. K.

**Localised hæmolysis.** F. CHessa (Boll. Soc. ital. Biol. sperim., 1938, 13, 1147—1148).—With normal dogs, the resistance to hæmolysis of blood from various abdominal regions is equal to that of the peripheral blood. Following severe hæmorrhage, the resistances are increased to extents differing with the source. F. O. H.

**Modification in osmotic pressure of erythrocytes kept for short periods in acid and alkaline media.** A. MANAI and F. CHessa (Boll. Soc. ital. Biol. sperim., 1938, 13, 1143—1144).—When normal blood is added to isotonic salt solutions, the resistance of the corpuscles to hæmolysis diminishes when the solution is acid ( $p_H$  5.8—6.85) and increases when it is alkaline ( $p_H$  7.7—8.15). With blood of acidosis, the (increased) resistance with alkaline media is lowered, whilst with blood of lobar pneumonia the resistance with alkaline media is increased. Slight changes in  $p_H$  of the media modify the rate of hæmolysis. F. O. H.

**Effect of cold on hæmolysis curve *in vitro*.** A. MANAI and F. CHessa (Boll. Soc. ital. Biol. sperim., 1938, 13, 1144—1145).—The rate of hæmolysis of erythrocytes in serum *in vitro* at 0—2° is greater than that at 18—20°; this difference is accentuated if the osmotic pressure of the suspending medium is adjusted to allow for the temp. or is replaced by physiological saline solutions. With dogs the body temp. of which is kept at 20—22° for 2 hr., the rate of hæmolysis is above normal. F. O. H.

**Determination of the sedimentation constant of hæmolysin.** M. PAIĆ (Compt. rend., 1938, 207, 1074—1076).—Inactivation of a hæmolytic serum does not affect the sedimentation rate of the hæmolysin or globulins; the albumins and globulins of normal and hæmolytic sera sediment at the same rate during about the first 40 min. From the data obtained the sedimentation const. of hæmolysin is calc. to be  $18.9 \times 10^{-13}$  cm. per sec. per dyne. J. L. D.

**Effect of temperature on changes in hæmolysis curve *in vitro*.** A. MANAI and F. CHessa (Boll. Soc. ital. Biol. sperim., 1938, 13, 1146—1147).—Max. resistance to hæmolysis of human erythrocytes in salt solutions of osmotic pressure corr. for temp. occurs at 35—37°. The increased rate of hæmolysis at 50° approx. equals that at 20°; at 55°, hæmolysis of all types of cell is complete. Variations in behaviour of erythrocytes differing in their resistance to hæmolysis are described. F. O. H.

**Permeability of erythrocytes. VI. Effect of reducing the salt content of the medium surrounding the cell.** H. DAVSON (Biochem. J., 1939, 33, 389—401; cf. A., 1938, III, 779).—The cation-permeability of erythrocytes suspended in a non-electrolyte is due to a reversible change in the membrane caused by the decrease in salt content. The loss of K is inhibited after it has begun by adding NaCl to the suspension medium. By plotting the K content of the erythrocytes of man, guinea-pig, and rat against time of suspension, smooth curves are obtained showing a decrease of rate of loss of K with time. This may be due to inhibition brought about by the building up of a potential gradient. The cells of ox and cat are permeable to K and Na but show irregularities. Those of rabbit and pig lose only 4% K after 7 hr. suspension. The magnitude of the permeability is correlated with the sedimentation rate in non-electrolyte solutions. E. M. W.

**Comparative study of methods used in hæmoglobin determinations.** A. D. MARENZI and E. LIDA (Rev. Soc. argent. Biol., 1938, 14, 339—346).—The following methods were studied: CO capacity (Van Slyke and Hiller) and O<sub>2</sub> capacity (Sendroy) by means of the Van Slyke-Neill manometric determination; total blood-Fe by Wong's method; hæmoglobin by Bürker's method using the original standard and a Leitz colorimeter; clinical methods in which hæmoglobin is determined colorimetrically after transforming it into acid hematin and comparing in the Zeiss Ikon hæmometer, Newcomer's and Hellige's hæmoglobinometers. The gasometric methods and the determination of Fe by Wong's method are the most accurate. Determination of blood-Fe is proposed as a method for recalibrating hæmometers. Bürker's method gives satisfactory results, but readings may be difficult when the blood-hæmoglobin is low. Methods based on the transformation of hæmoglobin into hæmatin are not satisfactory. J. T. L.

**Comparison of hæmoglobin determination as reduced hæmoglobin or hydrochloric acid hæmatin.** K. HUMPERDINCK (Dtsch. Arch. klin. Med., 1939, 183, 379—386).—The blood-hæmoglobin



concn. was determined in Bürker's hæmoglobino-meter (reduced hæmoglobin) and in the Zeiss Ikon hæmometer (HCl hæmatin). The Zeiss Ikon figures corresponded in 42 out of 70 cases to  $\pm 3\%$  with the hæmoglobino-meter vals.; 10 cases showed a variation of 6–12%. A. S.

**Determination of bilirubin in blood serum.** C. O. GUILLAUMIN (Bull. Soc. Chim. biol., 1939, 21, 127–133).—The technique of a modification of the method of Van den Bergh is described. The results, though lower than those obtained with other methods, are more const. A. L.

**Abnormal yellow diazo-reaction in certain icteric sera.** P. V. FUENTES and R. CANZONI (Sang, 1939, 13, 101–106).—From sera made icteric by multiple liver abscess, in hepatitis secondary to bronchopneumonia, and in acute hæmolytic crises,  $\text{CHCl}_3$  extracts a substance which is not present in normal serum but gives a deep yellow diazo-reaction. The colour turns green on alkalisation. The substance is believed to be urobilinogen and may be present in a concn. of 7 mg. per l. The presence of the urobilinogen may indicate functional inefficiency of the reticulo-endothelial system. C. J. C. B.

**Mixed molecules of hæmocyanins from two different species.** A. TSELIS and F. L. HORSFALL (J. Exp. Med., 1939, 69, 83–102).—Association products from mixtures of hæmocyanins of two different species can be investigated in detail by the improved electrophoretic technique. A. C. F.

**Action of methylene-blue in methæmoglobinæmia.** L. WALTERSKIRCHEN (Wien. klin. Wschr., 1939, 52, 317–318).—A solution of 1% of methylene-blue in glucose was intravenously injected in a case of severe methæmoglobinæmia. The alarming symptoms disappeared within 15 min. A. S.

**Hæmocuprein and hepatocuprein, copper-protein compounds of blood and liver, respectively in mammals.**—See A., 1939, II, 230.

**Value of examination of the coagulability of the blood by the coagulo-retractoviscometer, in internal diseases.** L. BLACHER (Sang, 1939, 13, 140–153).—The findings by this method in a large no. of clinical conditions are given. C. J. C. B.

**Mean bleeding time following surgical intervention.** J. HUGUES (Compt. rend. Soc. Biol., 1939, 130, 75–77).—Aseptic laparotomy or ovariectomy in the anaesthetised rabbit reduced the bleeding time 48 hr after the operation. Anaesthesia alone had no effect. P. C. W.

**Action of citrin [on blood].** C. T. DECKER (Münch. med. Wschr., 1939, 86, 292–293).—Daily intravenous or intramuscular injections of 1–3 ampoules of citrin and 100–500 mg. of cebion lower the bleeding time and increase the thrombocyte count in hæmorrhagic diatheses. A. S.

**Action of saliva on blood coagulation.** A. J. GLAZKO and D. M. GREENBERG (Amer. J. Physiol., 1939, 125, 108–112).—Saliva owes its blood-coagulation-accelerating properties to the presence of a substance acting as a thromboplastic. The active material is probably of cellular origin, appears to be

protein in nature, possibly lipoprotein, and can be partly purified by  $(\text{NH}_4)_2\text{SO}_4$  pptn. and dialysis followed by desiccation at room temp., in which condition it is fairly stable. M. W. G.

**Hæmostatic effect of adrenoxine.** G. DEROUAUX (Compt. rend. Soc. Biol., 1939, 130, 73–74).—Adrenoxine (1  $\mu\text{g}$ . intravenously) diminishes the bleeding time in rabbits. The action is slightly more pronounced than that of adrenaline. P. C. W.

**Threshold of hæmostatic activity of ephedrine.** G. DEROUAUX (Compt. rend. Soc. Biol., 1939, 130, 74–75).—The bleeding time in rabbits is reduced during 6 hr. following intravenous injection of 2  $\mu\text{g}$ .–2 mg. of ephedrine. Outside these dosage limits the effect is greatly diminished. P. C. W.

**Plasma-prothrombin: effect of partial hepatectomy.** E. D. WARNER (J. Exp. Med., 1938, 68, 831–836).—Plasma-prothrombin falls by 60–70% after removal of 60% of the liver. Return to normal runs parallel with the regeneration of the liver, being complete in 10–21 days. A. C. F.

**Plasma-fibrinogen response in man.** T. H. HAM and F. C. CURTIS (Medicine, 1938, 17, 413–445).—In uncomplicated and untreated cases of pernicious anæmia that have received inadequate dietary protein, the fibrinogen concn. varies from below normal to normal levels with a lower average concn. than in healthy subjects. Nutritional deficiency in pernicious anæmia, scurvy, or pellagra does not prevent an increase in fibrinogen above normal in the presence of an infection. In normal subjects the daily ingestion of animal protein in large amounts produces a moderate fibrinogen response, usually within normal limits. Remission from pernicious anæmia does not increase the plasma-fibrinogen when the diet is deficient in protein. Fever induced by high environmental temp. causes little or no elevation of plasma-fibrinogen, whereas intravenous injection of typhoid bacilli causes both fever and a prolonged elevation. In infectious diseases the fibrinogen response may be independent of the temp. and the leucocyte changes, and may occur despite a failure of the leucocyte response. A failure of fibrinogen to increase above normal in severe infections is a poor prognostic sign and may suggest the presence of liver damage even though clinical signs of liver damage are absent. C. J. C. B.

**Effect of intravenous injections of heparin in the dog.** L. B. JAKES (Amer. J. Physiol., 1939, 125, 98–107).—The normal heparin content (in units per 100 g. fresh tissue) of various tissues of the dog was: lung 1100, liver 2800, spleen 210, heart 100, kidney 400, muscle 400, blood 10, intestine 730. Injection of heparin does not increase the heparin content of any tissue except intestine. As the potency of heparin is the same *in vivo* and *in vitro* the effect of a given dose of heparin intravenously can be found from the standardisation curve *in vitro*. The rate of disappearance of heparin from the blood stream is proportional to its concn. in the blood. With increasing concns. a limiting val. is reached (2 mg. per kg. per min.) beyond which a



further increase in concn. does not increase the rate of removal. M. W. G.

**Use of *Bothrops atrox* venom as a hæmostatic.** C. J. HANUT (Sang, 1939, 13, 21—29).—*B. atrox* venom is a suitable hæmostatic agent for local use; when diluted suitably or mixed with antivenin it can be injected intravenously into rabbits and will decrease the coagulation time without ill effects. As it has no effect on the bleeding time it is probably of no val. in hæmorrhagic conditions other than hæmophilia. C. J. C. B.

**Blood groups in anthropoids.** P. DAHR and H. LINDAU (Z. Immunitätsforsch., 1938, 94, 253—264).—Orangs belong to group B and AB, the chimpanzees to group A and O. Absorption experiments with human blood showed no difference between human and anthropoid A and B. The M and N groups, although similar, are not identical with human M and N. G. W.

**Nature of blood group O.** L. HIRSZFELD and Z. KOSTUCH (Schweiz. Z. allg. Path. Bakt., 1938, 1, 23—49; cf. A., 1938, III, 975). E. M. J.

**"Hæmolytic" action of silicic acid.** H. GOLDIE (Compt. rend. Soc. Biol., 1938, 129, 1090—1093).—Addition of silicic acid to physiological saline permits the lysis of sheep cells by small doses of guinea-pig or rabbit serum. This effect cannot be produced with sera having no natural anti-sheep hæmolysin. The colloidal silicic acid absorbs the antialexic substances in the hæmolysin-alexin complex. P. C. W.

**Extraction of hæmolysin from the plasma gel obtained from a hæmolytic serum.** M. DOLADILHE (Compt. rend. Soc. Biol., 1938, 129, 1118—1119).—The gel is extracted by immersion in water for 12 hr. and the alexin destroyed by heating at 56° for 30 min. H. G. R.

**Analysis of blood of the sixth-instar southern armyworm (*Prodenia eridania*).** F. H. BABERS (J. Agric. Res., 1938, 57, 697—706).—Detailed analyses of org. and inorg. constituents are recorded. No evidence of the occurrence of a respiratory protein or pigment was obtained. A. G. P.

**Blood chemistry in human trichinosis.** H. B. PIERCE, E. HARTMAN, W. J. SIMCOX, T. AITKEN, A. B. MESERVEY, and W. B. FARNHAM (Amer. J. Hyg., 1939, 29, 75—81).—Blood analyses from 44 patients showed that, during the 2nd and 3rd months after infection, Ca, Cl, sugar, and non-protein-N were first low but increased during convalescence. Inorg. PO<sub>4</sub> was slightly raised throughout the study. Ca-P ratios were low in early periods; vals. for cholesterol decreased. The addition of cod-liver oil and Ca gluconate to the diet of trichinosis patients had no marked effect on any constituent determined. B. C. H.

**Fermentation inhibitors in blood.** W. FUNK (Fermentforsch., 1938, 16, 1—13).—At  $p_H$  7.3 in presence of 0.067M-PO<sub>4</sub> the fermentation of glucose by yeast is stimulated by normal human serum and plasma but is restricted by whole blood and erythrocytes. The fermentation is restricted by serum and

erythrocytes from persons suffering from cancer or uræmia, the effects being more pronounced than with healthy blood constituents. W. McC.

**Determination of blood-glucose with 2:6-dichlorophenol-indophenol.** E. M. ABRAHAMSON (Amer. J. clin. Path., Tech. Suppl., 1939, 3, 60—64).—The principle used is that the glucose in a Folin-Wu blood filtrate reduces ferri-cyanide in alkaline solution. After acidification, the ferrocyanide produced is titrated with a standard dye solution of 2:6-dichlorophenol-indophenol, which is its own indicator. C. J. C. B.

**Blood-sugar in pigeons of different species.** R. RUBINI (R.C. Atti Accad. Lincei, 1938, [vi], 27, 246—248).—In two species, the blood-sugar was 0.145—0.182 (average 0.162) and 0.157—0.235 (average 0.187%), respectively. F. O. H.

**Individual variations in fasting blood-sugar.** H. WAREMBOURG (Compt. rend. Soc. Biol., 1939, 130, 64—65).—Blood-sugar determinations were made every week for 3—10 weeks on 82 subjects (healthy or non-diabetics). 50% did not vary more than 10 mg.-%. The rest were considered to have imperfect glyco-regulation, giving variations of more than 20 mg.-% with a mean val. of 30 mg.-%. P. C. W.

**Reticulo-endothelial system and hyperglycæmia.** R. SARIC (Compt. rend. Soc. Biol., 1939, 130, 68—69).—The reticulo-endothelial system in the rabbit was blocked by intraperitoneal injection of trypan-blue. The hyperglycæmia following intravenous injection of glucose was not so great or so prolonged. P. C. W.

**Effect of rectal glucose on blood-sugar.** K. SCHWARTZER (Med. Klin., 1939, 35, 246—247).—Rectal administration of glucose abolishes hypoglycæmic shock symptoms in rabbits and infants. Acetonuria of fasting infants can be diminished. A. S.

**Effect of saliva on blood-sugar.** L. LIACI (Arch. Farm. sperim., 1939, 67, 71—81).—Parenteral injection of 5 c.c. per kg. of human saliva into rabbits is not well tolerated. Human saliva produces hyperglycæmia in fasting rabbits; the active principle, which is thermolabile, is more evident after meals, especially those rich in carbohydrate. F. O. H.

**Micro-determination of sucrose in blood.** B. DELLA MAGGIORE (Boll. Soc. ital. Biol. sperim., 1938, 13, 1086—1087).—The direct reducing val. (Bang's method) is subtracted from the reducing val. determined after hydrolysis by HCl, a correction being made for the change in mol. wt. due to inversion of the sucrose. F. O. H.

**Thyroid, pituitary, and serum-proteins.** I. GOLDBERG (Thesis, Buenos Aires, 1938, 62 pp.).—The mean vals. for the serum-proteins of 25 normal dogs were 3.69 g.-% albumin and 2.34 g.-% globulin. After hypophysectomy the total protein concn. is somewhat higher with a marked decrease of the albumin/globulin ratio. Alkaline anterior pituitary extracts increase the serum-proteins of normal dogs. After thyroidectomy the total proteins increase slightly, an increase which mainly affects the globulin fraction. In hypophysectomised toads the total



proteins decrease with a relative increase of the globulins. A new apparatus for determining N is described. (B.) S. O.

**Regeneration of blood-protein and colloid osmotic pressure. I. Experiments on starving rabbits. II. Influence of hormones after plasmapheresis.** H. SIBUYA (Tohoku J. exp. Med., 1938, 34, 571—585, 586—604).—I. Plasmapheresis was produced in starved rabbits and in rabbits given 20 c.c. of water daily. In the first group regeneration of the plasma-protein is delayed and the plasma colloid osmotic pressure rises faster than the protein. In the second group the colloid osmotic pressure rises quickly during the first 24 hr. but then remains stationary at 10% below normal.

II. If pituitrin (0.5 c.c. daily for 6 days) is injected following plasmapheresis the plasma-protein and osmotic pressure fall lower and regenerate more slowly than in controls. If thyroxine was given the protein regenerated normally and the osmotic pressure rose above normal in 24 hr. Insulin delayed protein regeneration but not the return of the osmotic pressure. E. R.

**Induced polypeptidæmia in cancer patients.** R. REDING (Compt. rend. Soc. Biol., 1938, 129, 881—883).—The fasting polypeptide and amino-acid content of the blood is higher in cancer than in non-cancer patients. After a broth meal with high polypeptide and amino-acid content the rise in concn. in the blood is markedly greater in cancer patients, suggesting impaired liver function. P. C. W.

**Non-protein-nitrogen of blood in normal Indian men.** S. K. GOKHALE (Indian J. Med. Res., 1939, 26, 675—697).—In 126 young Indians (age 18—32) the vals. found were similar to those generally accepted, although total urinary N is half the European and American val. H. B. C.

**Determination of histamine in blood.** W. A. DEN HARTOG JAGER (Arch. néerland. Physiol., 1938, 23, 537—540).—Determinations performed on the blood of men, cats, and dogs by Barsoum and Gad-dum's method confirmed these authors' results. C. E. B.

**Micro-determination of glyoxalines, especially histidine, in serum.** A. SCHWARTZ, A. RIEGERT, and M. BRICKA (Compt. rend. Soc. Biol., 1938, 129, 1159—1162).—The method described incorporates the diazo-reaction (Barac, A., 1937, III, 112) on the glyoxalines after adsorption on a cryst. NaCl-phosphotungstic acid complex. H. G. R.

**Clinical determination of blood-cholesterol.** J. GASCÓN and E. R. SCHEGGIA (Rev. Fac. Cienc. Quím. La Plata, 1937, 12, 31—36).—Neuschlosz's method (A., 1930, 1462) is modified by using 9 parts of isopropyl alcohol in place of 19 parts of ethyl alcohol with consequent reduction in vol. of the solutions. The method is compared with that of Myer and Wardell (cf. Castellano and Torres, A., 1932, 868). F. R. G.

**Determination of blood-lipins.** G. MONASTERIO (Boll. Soc. ital. Biol. sperim., 1938, 13, 1176—1177).—

Improvements in the author's method (A., 1934, 122) for total and free cholesterol are described.

F. O. H.

**Liberation of lipins from certain lipin-protein complexes of serum by soaps.** M. A. MACHE-BŒUF and F. TAYEAU (Compt. rend. Soc. Biol., 1938, 129, 1181—1184).—There is an optimum concn. of soaps for pptn. of the lipins from the lipin-protein complex; above this concn., the ppt. dissolves and Ca in the serum is pptd. H. G. R.

**Removal of lipins from serum-globulin without denaturation. Application to the study of the rôle of lipins in the fractionation of globulins into eu- and pseudo-globulin.** M. A. MACHE-BŒUF and F. TAYEAU (Compt. rend. Soc. Biol., 1938, 129, 1184—1186).—The lipins can be removed from the globulin fraction by means of K dibromostearate without denaturation of the protein (cf. preceding abstract). H. G. R.

**Acetylcholine-esterase activity of serum and hæmolysed blood of dogs.** G. DOMINI and N. COLOMBINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1177—1179).—The esterase activity, which varies from dog to dog both initially and after keeping the blood for different periods of time, is not related to body-wt., age, sex, diet, or muscular activity; in one dog, the activity was related to the emotional state of the animal. The esterase is mainly in the serum. Hæmolysed blood, for periods of 10 min. after its prep., hydrolyses acetylcholine more rapidly than does the corresponding serum. F. O. H.

**Determination of ascorbic acid, aldehydes, and ketones in blood by reduction and precipitation.** L. ESPI and G. MANDILLON (Compt. rend. Soc. Biol., 1938, 129, 1187—1188).—The application of the method of Espil and Genevois (A., 1939, III, 168) is described. H. G. R.

**Polarographic micro-determination of nitrobenzene in blood.** J. TEISINGER (Mikrochem., 1938, 25, 151—156).—The application of Heyrovský's method to the determination of not less than 0.002 mg.-% of nitrobenzene (or other aromatic nitro-compounds) in 2 c.c. of serum is described. L. S. T.

**Specificity of Widmark test for blood-alcohol.** J. GUTSCHMIDT (Klin. Woch., 1939, 18, 58—59).—Acetonæmia has no influence on the Widmark test. E. M. J.

**Acid-base balance of serum in hyperthermia.** W. H. DANIELSON, R. M. STECHER, E. MUNTWYLER, and V. C. MYERS (Amer. J. Physiol., 1938, 123, 550—557).—The acid-base balance of the serum was studied in patients subjected to artificial fever induced by the Kettering Hypertherm. Body temp. was maintained at 40° during the febrile period. Certain of the patients drank chilled 0.6% NaCl solution; others drank iced distilled water only. After 2—4 hr. fever in patients who were permitted water there occurred an elevated serum  $p_H$ , a decreased plasma- $CO_2$ , and decreases of the serum- $HCO_3$ , -Cl, -inorg. P, and -total base concn. Total measured acid concn. was decreased; the undetermined acid fraction was increased. Similar changes occurred in patients drinking the saline solution except that the serum-Cl was main-



tained above the pre-fever level. The major factor disturbing the acid-base balance of the blood in fever is the accompanying hyperventilation. M. W. G.

**Sodium chloride content of serum and changes of blood composition during venous thrombosis.** G. Russo (Med. Klin., 1939, 35, 248—249).—Normal NaCl concns. were found in serum of 44 patients suffering from spontaneous venous thrombosis. Hypochloræmia is not a cause of thrombosis. A. S.

**Micro-determination of calcium in serum and serum ultra-filtrates.** K. SCHOLTS (Mikrochem., 1939, 26, 150—157).—The sample (about 0.5 c.c.) is treated with 4%  $\text{NH}_4$  oxalate (0.3 c.c.) and dil.  $\text{NH}_3$  (0.2 c.c.) and is set aside for at least 30 min. The supernatant liquid is removed with a porcelain filter stick, and the ppt. washed 3—4 times with 0.5%  $\text{NH}_3$  saturated with Ca oxalate. The ppt. is then dissolved in 0.5 c.c. of  $\text{N-H}_2\text{SO}_4$  and titrated with 0.01N- $\text{KMnO}_4$ . The special forms of pipette, burette, rotatable hot plate, wash-bottle, and reagent reservoirs used are described. J. W. S.

**Composition of bovine blood. I. Magnesium content of blood plasma of normal dairy calf.** C. W. DUNCAN, C. C. LIGHTFOOT, and C. F. HOFFMAN (J. Dairy Sci., 1938, 21, 689—696).—The Mg content of the plasma of 107 calves was examined at 1—2-week intervals over a period of 3 years. The mean Mg vals. agreed closely from month to month, increasing up to the 12—13th month of age, and showing rhythmic variations extending over several months. The vals. were: mean 2.41, range 1.62—3.83, 80% within 1.90—2.80, and 73% within the band of normality. W. L. D.

**Culture of adult human spleen.** H. STIEVE (Arch. exp. Zellforsch., 1938, 22, 109—121).—Soon after explantation cells migrate from the culture; these are mainly small and medium lymphocytes. On the 2nd day new forms, including multinuclear and amoeboid cells, are seen at the periphery. Forms intermediate between histiocytes and fibrocytes are seen. There is an inverse relationship between the no. of lymphocytes and no. of fibroblasts. R. J. O'C.

**Explantation of the spleen.** K. BAUER (Arch. exp. Zellforsch., 1938, 22, 125—129).—Although organs and portions of organs can be explanted by the Carrel-Lindbergh technique, they show changes within a day or two depending on the surrounding medium. R. J. O'C.

**Puncture of the spleen for diagnosis of aleukæmic lymphadenosis.** F. V. MONTES (Med. Klin., 1939, 35, 249—250).—Smears obtained by splenic puncture are recommended for the diagnosis of aleukæmic lymphadenosis. Bleeding and coagulation time of the blood should be determined previously. A. S.

**Normal and pathological factors influencing the spread of a vital dye in the connective tissue.** R. J. PARSONS and P. D. McMASTER (J. Exp. Med., 1938, 68, 869—890).—The rate of spread of vital dyes in the skin of the ear is greater in living than dead mice. It is increased by active movement or developing oedema, and max. when the tissues are subjected

to intermittent external pressures of 2—8 cm.  $\text{H}_2\text{O}$  at a frequency of 20 per min. A. C. F.

**o-Tolidine and -toluidine tests for occult blood.** L. GERSHENFELD (Amer. J. Pharm., 1939, 111, 17—18).—The respective advantages of the two substances are discussed; o-tolidine is the more sensitive reagent. F. O. H.

## (vi) VASCULAR SYSTEM.

**Circulation and endocrines.** V. M. KOGAN-JASNI (Conf. Insuff. Circ., 1938, 143—162).—Circulatory disturbances associated with certain endocrine disorders are described. R. T.

**Cartilaginous foci in heart.** W. C. HUEPER (Arch. Path., 1939, 27, 466—468).—Attention is called to the not infrequent occurrence of physiological cartilaginous areas in the aortic ring in white rats and mice. C. J. C. B.

**Effect of vagus stimulation on the accelerans action on the heart.** E. T. BRÜCKE and H. SCHRÖCKSNADL (Pflüger's Archiv, 1938, 240, 300—311).—Experiments were performed on the rabbit's heart and the results recorded with the time ordinate recorder of Fleisch. The latent period of the vagal action is the same in the presence or absence of accelerans stimulation. If while a heart is stimulated by the sympathetic it is submitted to a period of vagus stimulation, the accelerans effect is not interrupted but only temporarily overcome. Accelerans stimulation applied after a period of vagus stimulation produces a more marked effect than when not so preceded. J. M. R.

**Hydrolysis of acetylcholine by [heart] tissues.** A. J. CLARK and J. RAVENTÓS (Quart. J. Exp. Physiol., 1938, 28, 155—176).—The isolated frog's auricle wetted with acetylcholine solution recovers activity at a rate dependent on the initial concn. of the drug. The relation between the rate of recovery and the initial concn. of the drug indicates that activity of the auricle esterase is equiv. to a concn. of enzyme centres  $2 \times 10^{-5}\text{M}$ . While injected choline esters are rapidly removed, probably by reversible adsorption, from the blood of the cat, the relation between dosage and the duration of the fall of blood pressure indicates esterase activity. The time of recovery of the frog's auricle from acetylcholine and the duration of its action on the cat's blood pressure are prolonged by eserine in a manner which suggests almost complete inhibition of the esterase. T. S. G. J.

**Release of acetylcholine [in the heart] by vagal stimulation.** A. J. CLARK and J. RAVENTÓS (Quart. J. Exp. Physiol., 1938, 28, 177—193).—The rate of recovery of frog's auricle wetted with acetylcholine solution is  $\frac{1}{2}$  that following vagal stimulation. Vagal stimulation causes a local concn. of acetylcholine of the order of  $10^{-8}$ . Summation effects produced by vagal stimulation are in accord with the kinetics of hydrolysis established by other means. The duration of the slow response of skeletal muscle to acetylcholine indicates an esterase activity approx. 10 times that of the auricle. T. S. G. J.



**Potassium changes in the heart under conditions of ischaemia and congestion.** J. DENNIS and R. M. MOORE (Amer. J. Physiol., 1938, **123**, 443—447).—The K content of coronary venous blood after a period of myocardial ischaemia (5—9 min.) averaged 38.1 mg.-% (normal 21.7, cats, amytal anaesthesia). The vena cava blood had a K content of 24.8 mg.-% (normal 22.2). After 20 min. congestion produced by ligating all the major cardiac veins coronary venous K content was 19.8 mg.-%, and that of the vena cava 19.5 mg.-%.

M. W. G.

**Effect of pharmaceutical substances on cardiac muscle cultured *in vitro*.** E. DELORENZI (Arch. Farm. sperim., 1939, **67**, 32—44; cf. A., 1939, III, 310).—The effect of digitalis glucosides, strophanthin, caffeine, camphorsulphonic acid, sparteine, and adrenaline on chick-embryo heart *in vitro* was determined. The greatest effect was due to digitalis preps. and adrenaline, the frequency and amplitude of contraction being increased and diminished, respectively, in all cases.

F. O. H.

**Effect of calcium on the myocardium.** V. KRUTA (Compt. rend. Soc. Biol., 1938, **129**, 791—795).—The amplitude of contraction of the isolated guinea-pig auricle is plotted against frequency with varying temp. and Ca content of perfusing fluid. The prolongation of contraction produced by Ca only holds in narrow limits.

P. C. W.

**Comparative effects of aminoethoxydiphenyl derivatives on the heart.** J. TRÉFOUEL, H. STRICKLER, and D. BOVET (Compt. rend. Soc. Biol., 1939, **130**, 27—29).—12 derivatives were tested by their action in preventing fibrillation in the rabbit and their antagonism to auriculo-ventricular block produced by adenosinephosphoric acid injection in guinea-pigs. The differences were only quant. 2-Diethylaminoethoxydiphenyl was the most effective.

P. C. W.

**Effect of 2-diethylaminoethoxydiphenyl (1262F) on induced fibrillation.** D. BOVET, J. TRÉFOUEL, J. STERNE, and H. STRICKLER (Compt. rend. Soc. Biol., 1939, **130**, 29—31).—The ventricles of the chloralosed dog are made to fibrillate by application of faradic stimuli of 0.01—0.05 v. directly on the apex of the heart. Following the injection of 10—40 mg. of 1262F the necessary voltage is 1—17 v. The drug also increases the refractory period of the frog heart. It antagonises the hyperexcitability, extrasystoles, and tachycardia produced in the rabbit by adrenaline, BaCl<sub>2</sub>, or aconitine.

P. C. W.

**Effect of phenylpropylamines on the frog heart.** A. LUMÈRE and P. MEYER (Compt. rend. Soc. Biol., 1938, **129**, 1197—1199).— $\alpha$ -,  $\beta$ -, and  $\gamma$ -phenylpropylamine applied externally to the isolated frog heart cause acceleration (2 drops of 0.5% solution); in larger dose (10 drops) they cause slowing. Applied internally they have no effect on the rhythm; solutions of 1 in  $5 \times 10^4$  increase but 1 in  $2.5 \times 10^4$  decrease the amplitude.

P. C. W.

**Combined effect of adrenaline and nicotine on non-pulsating, auricular tissue of rabbit's heart.** S. HOLZ (Boll. Soc. ital. Biol. sperim., 1938, **13**,

1173—1175; cf. A., 1939, III, 182).—The continued effect of adrenaline and nicotine on the left auricle, subjected to faradic stimulation, resembles that on the right. Whilst nicotine never, and adrenaline rarely, produces automatic, rhythmic movement of the left auricle after faradic stimulation, adrenaline + nicotine are effective. The responses of the right auricle deprived of nodal tissue resemble those of the left.

F. O. H.

**Effect of nicotine on the rabbit's auricle.** V. GRONCHI (Boll. Soc. ital. Biol. sperim., 1938, **13**, 1170—1173; cf. A., 1939, III, 182).—The triphasic action (demonstrable by faradic stimulation) of nicotine is shown by the right auricle, deprived of nodal tissue, and also by the heart deprived of its automatic, rhythmic activity by removal of nodal tissue.

F. O. H.

**Frequency accommodation during electric polarisation of the heart.** M. SEGERS (Compt. rend. Soc. Biol., 1939, **130**, 87—91).—Experiments were carried out on the isolated ventricle of the frog, toad, tortoise, and axolotl. A polarising current (about 10 ma.) was applied by non-polarisable electrodes in the perfusing fluid and in the fluid in which the heart was suspended. When the interior of the ventricle was negatively polarised the frequency increased, when positively charged it diminished. The initial changes (proportional to current intensity) were not maintained but the frequency tended to revert to normal. Before normal vals. were obtained, however, the frequency became stabilised.

P. C. W.

**Frequency changes following depolarisation of the heart.** M. SEGERS (Compt. rend. Soc. Biol., 1939, **130**, 91—95).—Following depolarisation of the isolated heart (see preceding abstract) there is a frequency change in the heart rhythm which is in the opposite sense to that produced by polarisation and is not so great. The rhythm returns gradually to normal. The magnitude of the change is proportional to the duration of the polarisation up to a max. attained at the time required for the heart rhythm to accommodate to the polarising current. The frequency change following depolarisation is a phenomenon of disaccommodation since a polarising current reapplied before the frequency has returned to normal does not take so long to reach stabilisation as normally.

P. C. W.

**Relative refractory period of the heart. IV. New action [potential] phenomenon of the heart.** B. LUEKEN and E. SCHÜTZ (Z. Biol., 1939, **99**, 338—354).—Stimulation of the frog's heart during the relatively refractory period produces, under certain abnormal conditions (cold, HCl, K, acetylcholine), peculiar forms of action potentials, viz., a small and brief monophasic action current, which may be followed by a normal action current (so-called "double excitation"). The size of the monophasic "action phenomenon" depends on the strength of the stimulus; it dies out locally, or after decremental conduction over a short distance. The "action phenomenon" is due to a local excitation which initiates the propagated action potential if the stimulus is strong enough.

B. K.



**Electrocardiographic studies on *Astacus fluviatilis*.** J. SOMMER (Z. Biol., 1939, 99, 397—413).—Electrocardiographic records obtained from *Astacus* show, under normal conditions, single action potentials. The frequency of the heart action increases approx. linearly with temp.  $\text{CO}_2$ , in physiological concns., reduces the heart rate. In higher concns.  $\text{CO}_2$  causes systolic arrest, initiated and accompanied by oscillatory action potentials. This tetanic contraction is due to abnormal activity of the heart ganglion, and also to that of secondary "pacemakers." The nervous origin of crustacean hearts is confirmed. B. K.

**Electrocardiogram in 100 patients with healthy hearts.** H. SCHULZ (Z. klin. Med., 1938, 135, 137—157).—The main abnormalities were: *P-R* interval longer than 0.2 sec. in 5 cases; change in the *P-Q* position in 2 cases; diminished *S-T* interval in at least 2 leads in 23 cases; negative *T* wave in all leads in 1 case, in lead II only in 1 case, in lead III only in 12 cases at rest and in 5 cases at rest and after exercise. *U* wave was present at rest in 46 cases, and after exercise in 86 cases. E. R.

**Fœtal electrocardiography.** E. O. STRASSMANN (Schweiz. med. Wschr., 1939, 69, 217—218).—Records were taken with the routine peripheral leads and from right arm-right leg and left arm-right leg. 70 records were taken in 52 pregnant women. 61 records showed a fœtal electrocardiogram, 9 were negative. 59 records were taken with the fœtus in normal position (54 positive, 5 negative); 7 out of 11 electrocardiograms with the fœtus in the breech position were positive. A. S.

**Electrocardiography as a method of diagnosis of disturbances of cardiac function.** V. F. ZELENIN (Conf. Insuff. Circ., 1938, 309—318). R. T.

**Respiratory arrhythmia in labile circulation.** G. SCHLOMKA and P. NEUKING (Z. Kreislaufforsch., 1938, 30, 825—834).—In labile circulation respiratory arrhythmia is increased, more so in advanced age, and is more pronounced in those with higher pulse rates. G. SCH.

**Respiratory variations of  $Q_3$  [in the electrocardiogram].** G. SCHLOMKA and M. DRESSEN (Z. Kreislaufforsch., 1939, 31, 46—55).—Respiratory variations of  $Q_3$  are not pathognomonic when consisting of an inspiratory diminution; inspiratory increase of  $Q_3$  occurred rarely and in cases of serious myocardial damage only. G. SCH.

**Cheyne-Stokes respiration and auriculo-ventricular conduction.** W. J. COMEAU (New England J. Med., 1938, 219, 977—982).—A case report, with post-mortem findings and electrocardiographic records, showing sudden changes in cardiac rhythm during Cheyne-Stokes respiration. A. M. G.

**Electrocardiographic study of asphyxia.** G. MOTTA (Arch. Fisiol., 1938, 38, 272—304; cf. A., 1939, III, 1221).—In rapid asphyxia there is bradycardia (rabbit) or tachycardia (dog, guinea-pig) followed by disturbances of conduction and coronary circulation. S. O.

**Four-lead electrocardiograms taken shortly before and after coronary occlusion.** A. SCHOTT

(Brit. Med. J., 1939, I, 213).—4-lead electrocardiograms were taken 53 hr. before and after an attack of coronary occlusion in a hypertensive subject. The val. of the chest lead is discussed. C. A. K.

**Compensatory hyperdiastole.** A. CLEMENTI (Arch. Fisiol., 1938, 38, 305—342).—A detailed account of work already noted (A., 1938, III, 373). S. O.

**Duration of electric systole in myocardial disease.** G. SCHLOMKA and G. KÖNIGS (Z. Kreislaufforsch., 1938, 30, 825—834).—The relative duration of electric systole is generally prolonged in patients with myocardial disease and is independent of the heart rate. This contributes further to the shortening of the diastole with higher rates, and consequent failure. G. SCH.

**Relative duration of electric systole in a hot bath.** M. LATZEL (Z. Kreislaufforsch., 1938, 30, 865—870).—In a bath of 42° the relative duration of the electric systole, determined by the Fridericia formula, is shortened by 7.5—10%. In a  $\text{CO}_2$  bath of 38° the relative duration of the electric systole was prolonged by 4%. G. SCH.

**Relative duration of electric systole following a ventricular ectopic beat.** L. MARX (Z. Kreislaufforsch., 1939, 31, 42—46).—The longer is the compensatory pause after a ventricular ectopic beat the shorter is the following normal *Q-T*. G. SCH.

**Relative duration of systole in adipose subjects.** G. SCHLOMKA and F. WITSCH (Z. Kreislaufforsch., 1939, 31, 142—152).—The relative duration of electric systole in adipose subjects is increased. G. SCH.

**Bundle branch block.** H. A. FREUND and R. SOKOLOV (Arch. intern. Med., 1939, 63, 318—333).—Clinical studies in 210 cases of bundle branch block are described. C. A. K.

**Electrocardiogram in left ventricular hypertrophy.** F. KIEBLE (Arch. Kreislaufforsch., 1939, 4, 19—48).—7 cases (verified at autopsy) of left ventricular hypertrophy and myocardial degeneration confined to the left heart had electrocardiograms with a depressed *S-T* segment in lead I and 2. G. SCH.

**Signs of right ventricular lesions.** F. KIEBLE and V. MALAMANI (Klin. Woch., 1939, 18, 121—123). E. M. J.

**Electrocardiographic changes in uræmia.** R. AGNOLI and D. BUSSA (Cuore e Circol., 1939, 23, 2—24).—Intraperitoneal or intravenous injections of whole, dialysed, or ultrafiltered serum from cases of uræmia into guinea-pigs damaged the myocardium, producing electrocardiographic changes of an anoxic type. Hemorrhages commonly occurred into the myocardium. The toxic changes are reversible, and do not occur on injection of normal serum or its ultrafiltrate, or serum from non-uræmic chronic nephritics or from hypertensives. B. W.

**Electrocardiographic changes in chronic rheumatism.** B. KERN (Münch. med. Wschr., 1939, 86, 365—369).—20% of all patients suffering from various forms of rheumatism showed a reduction



in size of the *QRS* complex below 10 mm. The *QRS* complex increased when the patients improved.

A. S.

**Treatment of paroxysmal tachycardia.** H. J. KOHNBROK (Klin. Woch., 1939, 18, 165—168).

E. M. J.

**Physical exercise and heart hypertrophy.** W. NÜRMBERGER (Arch. Kreislaufforsch., 1939, 4, 1—18).—22 rats were made to swim several hr. daily for 29—90 days. In all animals increase in size and wt. of heart relative to body-wt. occurred. The right ventricle was mainly affected, followed by the right auricle, left ventricle, left auricle. Some rats, after being subjected to intensive training, were given complete rest for 5—6 months and then had normal hearts. It is concluded that sport hypertrophy can disappear completely.

G. SCH.

**Therapeutic action of local application of cold on the heart.** V. LACHNIT and S. ZOLLNER (Wien. klin. Wschr., 1939, 52, 208—212).—A container with cold water (8—10°) was applied to the heart of 81 patients suffering from various cardiac disturbances. The heart rate was lowered in hyperthyroid patients. A beneficial effect in other cases was not observed. Lowering of the *S-T* segment and negative *T* waves were observed in many cases.

A. S.

**Angina pectoris and its relation to coronary artery disease.** S. A. LEVINE (New England J. Med., 1938, 219, 743—746).—True angina pectoris is almost always associated with pathological changes in the coronary arteries. The diagnosis of angina depends on the correct interpretation of symptoms.

A. M. G.

**Influence of diet on cardiac output.** L. ROEMHELD (Z. Kreislaufforsch., 1939, 31, 73—82).

G. SCH.

**Physical determination of stroke volume.** I, II. B. DEPPE and E. WETTERER (Z. Biol., 1939, 99, 307—319, 320—337).—I. Different methods of calculating the stroke vol. from central blood pressure curves and sphygmographic records, according to the formulæ of Broemser and Ranke, O. Frank, and Wezler and Böger, are discussed. Results obtained in experiments on rabbits differ up to 100%, depending on the method used.

II. The different formulæ for calculating the stroke vol. from sphygmograms were tested by comparison with the results of direct blood flow measurements, using the induction tachograph (Wetterer, A., 1939, III, 124). The experiments were made on rabbits and cats, with varying circulatory conditions. Vals. obtained with Broemser and Ranke's formulæ agree best with the direct measurements, although under certain conditions divergences up to 90% are found.

B. K.

**Cardiac output in congestive failure.** J. MCGUIRE, R. SHORE, V. HAUENSTEIN, and F. GOLDMAN (Arch. intern. Med., 1939, 63, 290—297; cf. A., 1939, III, 18).—In 19 of 20 cases of congestive heart failure the cardiac output was subnormal, the mean val. being  $1.52 \pm 0.06$  l. per sq. m. per min.; in the controls the mean was  $2.16 \pm 0.03$  l. The reduction of output was proportional to the severity of failure.

C. A. K.

**Relation between cardiac frequency and output in the dog [after atropine].** J. LEQUINE and H. DENOLIN (Compt. rend. Soc. Biol., 1938, 129, 899—901).—The cardiac output was determined in trained dogs by the direct Fick method (using  $\text{CO}_2$ ). Coincident with the increased cardiac frequency produced by atropine there is a rise in output.

P. C. W.

**Clinical method of determining velocity of circulation of blood.** I. B. SCHUR and F. V. KIRIUSCHIN (J. Méd. Ukrain., 1938, 8, 1151—1158).—0.5 c.c. of acetone in 1 c.c. of saline is injected into the cubital vein, and the moment of appearance of acetone ( $\text{CHI}_3$  test) in expired air is noted. This occurs after 8—10 sec. in normal subjects, and after 12—14 sec. in decompensated myo- or endo-carditis (photograph of apparatus).

R. T.

**Viscero- and cutaneo-visceral cardiac reflexes in *Helix pomatia*.** B. V. PAVLOV (Trans. Conf. Med. Biol., 1937, 92—105, 273).—Irritation of various viscera causes reflex retardation of the heart rate in 0.5—2 min., followed by acceleration, lasting for 15—20 min. Extirpation of ganglia does not abolish these effects. The outer margin of the mantle differs in giving acceleration of the heart rate.

R. T.

**Autonomic nervous system in circulatory disturbances.** I. S. M. SCHARAVSKI. II. V. A. ELBERG (Conf. Insuff. Circ., 1938, 163—169, 171—175).—The sympathetic system dominates in the early, and the para-sympathetic system in the late, stages of cardiac insufficiency.

R. T.

**Neural regulation of circulation.** L. A. ORBELI (Conf. Insuff. Circ., 1938, 53—72).—A review.

R. T.

**Cold as a standard stimulus of blood pressure.** D. AYMAN and A. D. GOLDSHINE (New England J. Med., 1938, 219, 650—655).—48 patients with normal blood pressure and 88 with hypertension were studied; measured cold caused some rise in blood pressure in 98%, but the rise in the hypertensives was 2—4 times greater than that in the normals.

A. M. G.

**Pulse rate and posture.** E. ASMUSSEN, E. CHRISTENSEN, and M. NIELSEN (Skand. Arch. Physiol., 1939, 81, 190—203).—No change in systolic blood pressure or  $\text{O}_2$  consumption was observed when normal subjects were passively tilted from the horizontal to the head-up (+60°) position; pulse rate was instantaneously increased and heart minute-vol. diminished. Blood pressure, heart minute-vol., and  $\text{O}_2$  consumption remained unchanged, pulse rate diminished and stroke vol. of the heart increased, when the subjects were tilted from the recumbent to the head-down position (−60°). Plethysmography of the legs showed considerable shifts of the blood following the changes of posture.

A. S.

**Influence of posture on pulse rate during exercise.** E. ASMUSSEN, E. H. CHRISTENSEN, and M. NIELSEN (Skand. Arch. Physiol., 1939, 81, 225—233).—The increase in pulse rate following arm exercise is greater in the upright (+60°) than in the recumbent position.

A. S.

**Regulation of blood pressure in different postures.** E. ASMUSSEN, E. H. CHRISTENSEN, and



M. NIELSEN (Skand. Arch. Physiol., 1939, 81, 204—213).—The lower extremities of normal subjects were made ischæmic by a tourniquet for 30 min. The fall of systolic blood pressure following the release of the circulation is greatest in the upright, smaller in the horizontal, and negligible in the head-down position. The instantaneous increase in pulse rate after releasing the circulation is attributed to a pressoreceptor reflex. A. S.

**Circulatory insufficiency in upright posture with normal blood pressure and diminished heart minute volume.** E. ASMUSSEN, E. H. CHRISTENSEN, and M. NIELSEN (Skand. Arch. Physiol., 1939, 81, 214—224).—Water diuresis in normal subjects is markedly diminished in the upright compared with the horizontal position; blood-protein concn. is increased (from 7.4 to 8.5%) in the upright and diminished in the horizontal position (7.4 to 7.05%) following water ingestion. A. S.

**Statistical study of pulse rates of male Italians.** A. OCCHIUTO (Arch. Sci. biol., Napoli, 1938, 24, 281—302).—The slowest rates were found at ages 20—25. The correlation between age and pulse rate is less than that between age and wt. R. S. CR.

**Differential pressures in the lesser circulation of the unanæsthetised dog.** W. F. HAMILTON, R. A. WOODBURY, and E. VOGT (Amer. J. Physiol., 1939, 125, 130—141).—Modifications of the London technique for placing angiotomy cannulae on pulmonary vessels, for administering artificial respiration, and for making optical tracings of pressures in the pulmonary artery and vein in unanæsthetised dogs are described. In normal unanæsthetised dogs, breathing quietly, the average pulmonary arterial pressure is 37/10 mm. Hg [mean average pressure (integrated) is 20 mm. Hg]; the average pulmonary venous pressure is 3—12 mm. Hg. Inspiration lowers total pressure in systemic and pulmonary arteries but raises slightly the effective pressure in the pulmonary artery. Expiratory increase in systemic arterial pressure is caused by increase in intrathoracic pressure and increase in cardiac output. The gradient of pressure forcing blood through the lungs is decreased by a prolonged rise in intrathoracic pressure and increased immediately afterwards; it is also increased by air embolism. The rise in pulmonary arterial pressure observed after large doses of adrenaline is due to back pressure from the left ventricle and is not accompanied by an increase in the gradient of pressure from artery to vein. M. W. G.

**Graphical recording of intra-arterial pressure in man.** R. MARTINETTI and M. FRISCELLI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1095—1097).—A technique is described. F. O. H.

**Abolition of secondary variations in arterial pressure by administration of ergotamine.** F. GUERCIO and M. PEZZINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1116—1117).—Respiratory variations in arterial pressure are abolished by intravenous injection of 1—1.5 mg. of ergotamine per kg. (rabbit, dog, cat). F. O. H.

**Essential hypertension.** K. S. SARACOGU (Dtsch. med. Wschr., 1939, 65, 379—380). A. S.

**Classification and frequency of arterial hypertension.** E. BARÁTH (Wien. klin. Wschr., 1939, 52, 249—251).—A review. A. S.

**High blood pressure in sportsmen and non-sportsmen.** A. PLENCZNER (Z. Kreislaufforsch., 1938, 30, 793—804).—Among 5974 juveniles of Budapest between 7 and 22 years, of both sexes, 215 (3.59%) had a systolic blood pressure of 145 mm. or more. Similar figures were obtained in 1934. 51% of those that were X-rayed showed some evidence of left ventricular hypertrophy. G. SCH.

**Arterial hypertension in the production of acute cerebral oedema.** J. LE BEAU and M. BONVALLET (Compt. rend. Soc. Biol., 1938, 129, 833—836).—The oedema of the brain caused by section of the brain above the posterior end of the fourth ventricle does not occur if the coincident hypertension is prevented by previous section of the spinal cord more posteriorly. P. C. W.

**Thiocyanate therapy in vascular hypertension.** E. MASSIE, C. B. ETHRIDGE, and J. P. O'HARE (New England J. Med., 1938, 219, 736—740).—NaCNS was given to 14 patients suffering from uncomplicated vascular hypertension, with marked symptomatic relief and lowering of blood pressure in every case; dosage has to be controlled by frequent blood-CNS determinations and therefore the clinical application of this therapy is limited. A. M. G.

**Tonus rigidity of blood-vessel walls.** F. MARCEAU (Compt. rend. Soc. Biol., 1938, 129, 1199—1201).—Placing a cannula in the blood vessels of reptiles or amphibians results in the production of tonus rigidity in the vessel 3 cm. proximally and completely distally. This condition has all the mechanical properties of rigor mortis in the vessels of the higher vertebrates but there is a spontaneous recovery of rapid contractility after 8—9 hr. P. C. W.

**Influence of sinus arteriosus on intrinsic activity of artery walls.** F. MARCEAU (Compt. rend. Soc. Biol., 1938, 129, 1202—1204).—Tonus rigidity (see preceding abstract) only develops a short distance proximal to the cannulation as this portion of the artery is in direct connexion with the sinus. The sinus does not itself initiate peristaltic contractions in the arteries; they can be elicited by pulsating injections of Ringer's solution into the aorta 24 hr. after the death of the animal. The sinus exerts a nervous control over the artery walls since tonus rigidity cannot be produced in the dead animal or after application of the 3rd Stannius ligature. P. C. W.

**Nerve impulse frequency and its relation to vasomotor reflexes.** D. M. ASHKENAL (Amer. J. Physiol., 1939, 125, 119—129).—Using controlled stimulation with a thyatron stimulator it was shown (cats under ether anaesthesia, decerebrate, curarised or unanæsthetised spinal cats) that the direction of the vasomotor responses (pressor or depressor) elicited by electrical stimulation of afferent somatic nerves at const. intensity is determined by the



frequency of stimulation. The magnitude of the response is related to the intensity of the stimulus. Associated respiratory responses are not entirely responsible for the reversals obtained. M. W. G.

**Effect of padutin on the circulation.** D. SCHNEIDER and P. W. SPRINGORUM (Arch. klin. Chir., 1939, 194, 373—389).—Padutin (1½—16 units) was injected intravenously into intact dogs; changes in blood flow were recorded by means of Rein's thermostromuhr. Brief vaso-dilatation with increased blood flow occurred in the muscles, brain, and skin; the splanchnic, spleen, and kidney blood flow were diminished. The accompanying fall in arterial pressure and increase of cardiac frequency persisted long after cessation of the vaso-dilatation, especially after large doses. Increase in pulse rate suggested a secondary cardiac insufficiency. Padutin therefore closely resembles histamine in its circulatory effects and intravenous administration should be employed with care. B. W.

**Vasomotor effects of caffeine.** R. MARTINETT (Arch. Fisiol., 1938, 38, 373—388; cf. A., 1938, III, 940).—Intravenous injection of caffeine (as benzoate, 1—20 mg. per kg. in dogs; 50 mg. per kg. in rabbits) produces a moderate and transient fall of carotid and peripheral femoral blood pressure in normal, spinal, or ergotaminised animals. Injection into the central end of a femoral artery produces a fall of blood pressure in the peripheral end of the femoral artery of the same side which is more marked after ergotamine. If caffeine is injected into the peripheral end of the carotid there is an immediate transient rise of pressure in both the central carotid and peripheral femoral arteries even after denervation of the carotid sinus. S. O.

**Vascular modifications following cerebral embolism.** R. CACHERA (Compt. rend. Soc. Biol., 1938, 129, 1100—1103).—Ground pumice-stone or glass wool was injected into the carotid artery in dogs. The blood vessels in the pia were examined after trephining. Even 39 days after the injection spasmodic dilation and constriction still occurred. This was not general but appeared irregularly in isolated arterioles. P. C. W.

**Effect of  $p_{H}$  on the tonus and adrenaline reaction of isolated mesenteric and diaphragmatic arteries.** W. A. SCHULER (Pflüger's Archiv, 1938, 240, 393—406).—Change of  $p_{H}$  to the acid or alkaline side increases the tone of arterial rings, especially in solutions with a high K or Ca content. Adrenaline contraction is usually max. in a weakly alkaline medium. Adrenaline dilatation was occasionally observed with diaphragmatic arteries. J. M. R.

**Experimental restoration of blood flow by thrombectomy.** H. HINTZE and H. ZOLLENKOPF (Arch. klin. Chir., 1939, 194, 406—412).—Venous thrombosis was experimentally produced in 15 rabbits, 2 cats, and 2 dogs; venesection with removal of the thrombus was carried out after 3—24 days. After thrombectomy, permeability of the veins was seen, and later confirmed at autopsy or by X-ray after intravenous injection of uroselectan, in 12 cases. No infarct or embolus was observed. B. W.

**Effect of temperature on the skin.** H. C. BAZETT (J. invest. Dermatol., 1938, 1, 413—425).—A review. (B.) C. J. C. B.

**Blood flow and vasomotor reactions in the hand, forearm, foot, and calf in responses to physical and chemical stimuli.** P. KUNKEL, E. A. STEAD, jun., and S. WEISS (J. clin. Invest., 1939, 18, 225—238).—Following strong sensory stimuli, the forearm and calf respond by (1) a decrease in vol., (2) an increase in vol., or by (3) an initial increase followed by a decrease. The decrease in vol. is attributed to reflex vasoconstriction; the increase is due to a transient increase in cardiac output. The vessels of the upper part of the body are more sensitive than in the lower part. Local heat (43°) produces nearly complete vasodilatation in the skin but only slight vasodilatation in the underlying muscles; exercise promotes vasodilatation in the muscles, but not in the skin. Adrenaline and pitressin greatly decrease the blood flow in the hand but do not interfere with the dilatation of the muscle vessels in response to exercise or arterial occlusion. The plethysmographic method for measuring forearm blood flow is inaccurate unless the circulation to the hand is completely obstructed. C. J. C. B.

**Nutritive tissue sensitivity as basis for activity hyperaemia.** A. FLEISCH and P. WEGER (Pflüger's Archiv, 1938, 240, 553—560).—The hind limb of cats and dogs was perfused with Ringer's solution or with the animal's own blood. The perfusion rate was measured by the stromuhr of Fleisch. The addition of novocaine in amounts sufficient to produce a concn. of 1 in 2000 in the arterial blood (used for perfusion) inhibits activity hyperaemia, though stimulation of the central end of the vagus still produces vasodilatation. It is suggested that metabolic products produced during muscular exercise stimulate certain nervous elements present in the tissues which control the blood vessels through nervous paths. J. M. R.

**Circulation in the human skull in different postures.** O. MUCK (Münch. med. Wschr., 1939, 86, 361—362).—The pulsation of the dura mater was recorded in patients with trephine openings. The pulsations are diminished if the legs of the patient, sitting upright, are lifted at an angle of 35°. A. S.

**Innervation of the intracranial blood vessels.** E. BUSCH (Acta Psychiat. Kbn., 1938, 13, 131—138).—With a modified Ehrlich methylene-blue stain intracranial blood vessels were examined for nerves in the mouse, cat, rabbit, and man. Reticular nerves were found in all arteries and veins and in some capillaries. Freely terminating medullated nerves, similar to the sensory nerves found in the outer parts of blood vessels elsewhere, occur along the meningeal vessels; they are not found on the blood vessels of the brain except along the big arteries at the base of the brain and proximal parts of their immediate branches. (Illust.) W. M. H.

**Hypotensive tissue constituents.** O. A. STEP-PUN (Conf. Insuff. Circ., 1938, 115—126).—A review. R. T.

**Pharmacology of the vasoconstrictor substances in blood-serum.** A. SIMON (Magyar Orv.



Arch., 1938, 39, 648—653).—During clotting the thrombocytes liberate substances influencing blood pressure (thrombovasins);  $\alpha$ - or early thrombovasin is vasodilator, and  $\beta$ - or late thrombovasin is vasoconstrictor. The effect of  $\beta$ -thrombovasin of cats, sheep, cows, and rabbits on the blood pressure of decapitated rats is potentiated by cocaine. The thrombovasins of men, dogs, and horses are not potentiated by cocaine. Both  $\alpha$ - and  $\beta$ -thrombovasin increase the tonus of rabbit's small intestine (potentiated by cocaine) after a short initial depression. Cat, but not dog, thrombovasins can be dialysed from the serum. A. W. M.

**Vasoconstrictor substances in serum and freshly drawn blood.** A. SIMON and E. KOMLÓS (Magyar Orv. Arch., 1938, 39, 654—659).—The vasoconstrictor effect was determined in decapitated rats. Cat serum has a const. content of pressor substances under identical conditions, concn. being unchanged in anæmia. An alcoholic extract of fresh rabbit blood contains a pressor substance similar to that present in serum. A. W. M.

**Elimination of metabolites in circulatory insufficiency.** N. B. SCHTSCHUPAK (Conf. Insuff. Circ., 1938, 223—228).—The non-protein-, urea-, and  $\text{NH}_3$ -N contents of bile exceed those of blood, and are exceptionally high in circulatory insufficiency. R. T.

**Oxidation-reduction processes in circulatory insufficiency.** A. A. AIZENBERG (Conf. Insuff. Circ., 1938, 195—206).—Glutathione occurs in the reduced form (GSH) in the erythrocytes; in the plasma it occurs in small amounts, but exclusively in the oxidised form (GSSG). In healthy subjects blood-GSH rises 5 min. after fatiguing exercise, and GSSG falls; the vals. return to normal within 60 min. In general the GSH content varies inversely with the alkali reserve, and directly with the lactic acid content. In early circulatory insufficiency the GSH content rises, and the GSSG content falls, both at rest and after exertion, after which restitution is delayed to an extent approx. corresponding with the severity of the condition. Later the sum of GSH and GSSG is high, and the GSSG/GSH quotient rises. R. T.

**Metabolism in circulatory insufficiency.** V. C. VASILENKO (Conf. Insuff. Circ., 1938, 177—186).—Exertion is followed in decompensated heart disease by an excessive rise in pulse and respiratory rate, serum-viscosity, -globulin, blood-fibrinogen, -non-protein- and -polypeptide-N, -uric acid, -creatinine, and -lactic acid, with a corresponding fall in serum-albumin and blood- $\text{NH}_3$ , -alkali reserve, -sugar, -cholesterol, and osmotic pressure. These changes are followed by a gradual return to initial vals. R. T.

**Polypeptidæmia in circulatory insufficiency.** E. E. KRISTEV (Conf. Insuff. Circ., 1938, 187—194).—Blood-polypeptide-N rises from 5.8 mg.-% in healthy subjects to 18.6 mg.-% in terminal cardiac insufficiency. R. T.

**Changes in the composition of cerebrospinal fluid in circulatory disturbances.** M. L. AVIOSOR (Conf. Insuff. Circ., 1938, 229—237).—In circulatory insufficiency P, Ca, and uric acid are within upper

normal limits, whilst non-protein-, amino-acid-, and urea-N, and K are considerably above normal. The results vary according to the nature of the associated complications. R. T.

**Tissue changes in circulatory insufficiency.** F. J. PRIMAK (Conf. Insuff. Circ., 1938, 85—98).—Extensive degenerative changes are found in skeletal and heart muscle, kidney, liver, and lung tissues of persons dying of myocarditis. Limited regeneration was also observed. R. T.

**Rôle of vessels in circulatory insufficiency.** N. A. KURSCHAKOV (Conf. Insuff. Circ., 1938, 127—141).—A review. R. T.

**Oxidation coefficient of urine and blood in experimental traumatic shock.** V. S. ILJIN and E. I. VAVSHIKOVSKAJA (Proc. Shock Congress, Kiev, 1937, 101—104).—The "vacate" O/N ratio of urine is raised in traumatic shock in rabbits. The corresponding ratio for blood (allowing for glucose and lactic acid) remains unchanged. The results are in accordance with depression of oxidation processes, and are considered to confirm the vasomotor reflex theory of shock. R. T.

**Determination of venous pressure; relationship of tissue pressure to venous pressure.** G. E. BURCH and W. A. SODEMAN (J. clin. Invest., 1939, 18, 31—34).—The application of the tissue pressure apparatus (cf. A., 1938, III, 15) to the direct determination of venous pressure was satisfactory. Comparison of indirect (Hooker's method) and direct determinations of venous pressure on the same vessel indicates that the former are in error by approx. the tissue pressure. This factor becomes increasingly important as the venous pressure decreases. C. J. C. B.

**Changes in venous pressure in normal subjects due to drugs.** A. TURCHETTI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1047—1049).—Injection of pilocarpine, histamine, ergotamine, adrenaline, or pituitrin increases, whilst that of atropine decreases, the venous pressure; changes in arterial (which are not related to those in venous) pressure and pulse rate are recorded. F. O. H.

**Changes in venous pressure.** L. CONDORELLI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1045—1047). The factors influencing venous pressure and the (two) types of venous hypertension and their clinical significance are discussed. F. O. H.

**Changes in venous pressure in normal subjects due to variations in the venous circulation of reflex, mechanical, or thermal origin.** F. SCHIAPPOLI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1043—1045).—Reflex (compression of the carotid sinus or ocular bulb) or mechanical (compression of the right hypochondriac or lower abdominal region) stimulation increases venous pressure; thermal stimulation (application of ice or water at 40° to the forearm) has little or no effect. F. O. H.

**Relationship between arterial and venous pressures during normal circulation.** V. SCAFFIDI, jun. (Boll. Soc. ital. Biol. sperim., 1938, 13, 1041—1043).—In resting subjects (age 14—65 years), the venous pressure (taken at the elbow) varies be-



tween 25 and 147 mm. of water, with an average val. (50 determinations) of 84 mm. and major frequency of 75–115 mm. The val. is lowest when the age is above 40 and is higher (by an average of 17 mm.) in males than in females. There is no direct correlation between venous pressure and the peripheral arterial pressure. F. O. H.

**Arteriovenous aneurysms.** M. R. REID and J. McGUIRE (Ann. Surg., 1938, 108, 643–694).—A method of producing a controllable arteriovenous communication between the aorta and vena cava, using a Venturi meter, in heparinised dogs is described. There is an increased cardiac output, decreased circulation time below the fistula, increased venous pressure, and reduced systolic pressure. G. C. K.

**Spontaneous arteriovenous aneurysms of the thorax.** E. L. ARMSTRONG, C. B. COGGIN, and H. S. HENDRICKSON (Arch. intern. Med., 1939, 63, 298).—Two cases are reported and the literature is fully reviewed. C. A. K.

**Experimental re-establishment of cardiac circulation (cardio-pulmonary anastomosis).** A. GRASSI (Cuore e Circol., 1939, 23, 25–32).—Cardio-pulmonary anastomosis was performed in 6 rabbits by ligature of the coronary arteries and suture of the lung to a small stained area of the heart surface. Microscopic and radiographic examinations 2 or 4 months after operation demonstrated the growth and development of new blood vessels between the lung and the heart in 5 animals, one dying of pneumonia. B. W.

**Lymphatic pathway from the nose and pharynx.** J. M. YOFFEY, E. R. SULLIVAN, and C. K. DRINKER (J. Exp. Med., 1938, 68, 941–948).—In cats, dogs, monkeys, and rabbits egg-albumin passes freely through the nasal mucous membrane into the cervical lymph channels. Horse serum does not pass through and if T-1824 is added to it, no dye is found in the cervical lymph. Serum-albumin passes through in cats but not in rabbits. A. C. F.

## (vii) RESPIRATION AND BLOOD GASES.

**Influence of endogenous factors on the diffusional type of respiration of invertebrates.** M. V. ERMAKOV (J. Méd. Ukrain., 1938, 8, 1099–1113).—The  $O_2$  intake of scorpions is 30–40 and the  $CO_2$  output 30 cu. mm. per g. per hr.; the corresponding vals. for myriapods are 20–30 and 10–20 cu. mm., and the R.Q. is 0.6 for both animals. Partial or total occlusion (with wax) of the apertures leading to the “lungs” of these animals, or destruction or stimulation of the central nerve chain, does not affect  $CO_2$  excretion, pointing to existence of a mechanism accelerating the rate of diffusion of  $O_2$  from the air enclosed in the sealed “lung” pockets to the hæmolymp. Removal of the pectic organs of scorpions has no effect on respiration. R. T.

**Respiratory mechanism in birds.** J. MAKOWSKI (Pflüger's Archiv, 1938, 240, 407–418).—The pressure falls in the lung sacs during inspiration and rises during expiration. The frequency and amplitude of the pressure changes increase during oper-

ations on the lung. Liberation of one lung from the body wall has no marked effects on the constitution of the air in the lung sacs; there is a small decrease in the  $CO_2$  content due to the increase in the rate and amplitude of respiration. The more posterior lung sacs have a higher  $O_2$  and a lower  $CO_2$  content. J. M. R.

**Individual variations in speech and their electro-acoustical demonstration.** A. GEMELLI (Boll. Soc. ital. Biol. speriment., 1938, 13, 1194–1196; cf. A., 1938, III, 986).—The characteristics of speech variations are discussed and methods for their experimental examination described. F. O. H.

**Break between voice registers in singing. II. Changes in voice by the action of the natural vocal tube.** W. TRENDLENBURG (S.B. preuss. Akad. Wiss. Phys.-math. Kl., 1938, 21, 188–226; cf. A., 1938, III, 881).—No evidence could be found for any coupled resonance effect of the vocal tube affecting the vibration mechanism of the larynx. Hence it is concluded that the break between vocal registers is not due to such an effect. P. M. T. K.

**Structure of vowels.** F. A. GEMELLI (Arch. néerl. Phon. exp., 1938, 14, 126–164).—New oscillographs of vowels, and their analyses, are given and considered in relation to the theory of their structure. P. M. T. K.

**Physiology of the contralto voice.** R. CURRY (Arch. néerl. Phon. exp., 1938, 14, 73–79).—8 radiographs, with simultaneous oscillograms and sound disc records, for a contralto singing a, i, u, over 175–768 cycles per sec., show elevation and advancement of the larynx, and opening up of the mouth with rising pitch. The positions and transverse concavity of the tongue are also visible. P. M. T. K.

**Physiology of playing the flute. II. Flageolet tones.** J. ROOS (Arch. néerl. Phon. exp., 1938, 14, 49–57).—The pressure and velocity of the air leaving a flautist's mouth were higher when producing flageolet tones than when producing the same note in the ordinary way. The lip space was often but not constantly wider in the former case. The increase in pressure was not great enough to be considered harmful. The findings do not explain the acoustic result. P. M. T. K.

**Applied physiology of the nose and accessory sinuses [distribution of glands].** A. W. PROETZ (Amer. J. Surg., 1938, 42, 190–193; cf. A., 1939, III, 124).—Respiratory pressure variations in the region of the ostia do not exceed 10 mm.  $H_2O$  pressure. Since only negligible air currents pass into the ostia very little secretion is required to maintain the humidity within the sinuses. This is related to the scarcity of glands found in their mucosa; the nasal mucosa, however, which is exposed to air currents contains many glands. G. C. K.

**Relation between sucking and respiratory centres in the human suckling.** A. PEIPER (Pflüger's Archiv, 1938, 240, 312–324).—At first the respiratory centre has a lower basic rate than the sucking centre. The sucking centre, however, imposes its rhythm on the respiratory centre during feeding so that respiration is increased; the antagonism



between the two centres is, however, usually marked by a short period of apnoea. The effect of the sucking centre in increasing respiratory rate may be observed after the sucking movements have ceased.

J. M. R.

**Fœtal respiration in relation to atelectasis and intrauterine pneumonia.** F. F. SNYDER and M. ROSENFELD (Amer. J. Obstet. Gynec., 1938, 36, 363—371).—The state of dilatation of the alveoli in lungs of rabbit fœtuses obtained before air was breathed was compared with those of animals which had breathed air for various intervals following delivery. The alveoli before birth are well formed and partly dilated, being filled with amniotic fluid. Breathing air instead of fluid results in a rapid increase in alveolar dilatation. Breathing abnormal amniotic fluid containing debris which obstructs the respiratory passages may result in injury to the lungs before birth and cause atelectasis. Bacterial contamination of amniotic fluid may result in intrauterine pneumonia.

M. H.

**Cyanosis following intracranial injuries.** S. H. CLIFFORD (New England J. Med., 1938, 219, 900—901).—A summary is given of the mechanism by which birth traumata lead to damage of the respiratory centre. Emphasis is laid on prophylaxis by good obstetrics.

A. M. G.

**Obstetric aspects of cyanosis.** H. M. TEEL (New England J. Med., 1938, 219, 906—907).—The obstetric causes leading to cyanosis in the newborn are discussed under the general headings of intrauterine asphyxia, birth trauma, and the use of sedative, analgesic, and anæsthetic drugs during labour.

A. M. G.

**Determination of lung volume: simple constant-volume modification of Christie's method.** F. J. C. HERRALD and J. McMICAHEL (Proc. Roy. Soc., 1939, B, 126, 491—501).—Modifications in technique are described which eliminate the error in Christie's method of lung vol. determination while retaining its simplicity and ease of application. In a series of duplicate determinations on 42 untrained subjects the standard error of a single determination is 0.183 l.

F. B. P.

**Lung volume and its subdivisions in normal males.** E. A. ASLETT, P. D'A. HART, and J. McMICAHEL (Proc. Roy. Soc., 1939, B, 126, 502—528).—The lung vol. in the sitting position of 64 men aged 19—63 years was determined by a modification of Christie's method. In advancing age total lung vol. and vital capacity diminish slightly with an increase in the relative val. of the residual air expressed as a % of the total lung vol. Correlation coefficients were calc. between total lung vol. and vital capacity on the one hand, and various physical and radiological measurements on the other. The highest degrees of correlation were those between total lung vol. and "radiological chest vol." and between vital capacity and stem height. Obesity is associated with a considerable reduction in the val. of the reserve air, with a corresponding gain in the complementary air, a finding which may be due to the broad or hypersthenic type of chest frequently found in obese subjects.

F. B. P.

**Changes in pulmonary volume following lobectomy for bronchiectasis.** G. E. LINDSKOG (J. clin. Invest., 1939, 18, 251—255).—Clinically successful resection of 1 or 2 bronchiectatic lung lobes causes no permanent reduction in pulmonary vol. and its component parts, and may actually be followed by a progressive increase and return towards normal vals.

C. J. C. B.

**Analysis of the reflex-tonic vagus action on respiration.** H. SCHMIDT (Pflüger's Archiv, 1938, 40, 419—426).—Section of the vagi increases the tone of the respiratory muscles in rabbits when the lungs are normally or excessively filled, and decreases tone when inflation is below normal. When the lungs are distended section of the vagi produces an increase in the amplitude of respiration. When the lungs are collapsed vagal section causes a slowing of the respiration with an increase in amplitude. The results are the same whether the thorax is closed or open.

J. M. R.

**Effect of respiration on the blood flow through the isolated lungs.** I. SIBUL (Pflüger's Archiv, 1938, 40, 491—497).—Experiments were performed on cats' and rabbits' lungs; the blood flow to and from the lungs was optically registered; the lungs were perfused with the animal's own blood (treated with liquoid) by the method of Fleisch. Increased depth of respiration and raising of the mean respiratory position caused a 5—20% increase in the blood flow. A further increase of respiration beyond a certain limit and rise of the mean respiratory position leads to a decrease in the blood flow. Change in the respiratory rate has, in itself, no effect on the blood flow.

J. M. R.

**Occurrence of histamine and other bases in ox lung.** D. ACKERMANN and H. G. FUCHS (Z. physiol. Chem., 1939, 257, 153—160; cf. Bloch and Pinösch, A., 1936, 885).—The isolation of histamine (yield of dipicrate 10.63 mg. per kg.), spermine, creatine, tyrosine, arginine, histidine, urea, betaine, choline, lysine, and methylguanidine from ox lung is described. The presence of arginine and histidine in lung and liver explains the lack of detrimental action by histamine (cf. Edlbacher *et al.*, A., 1937, III, 265).

W. McC.

**Roentgen treatment of asthma.** C. K. MAYTUM and E. T. LEDDY (J. Allergy, 1939, 10, 135—145).—Of 161 patients without sp. cause for their asthma 24% obtained marked relief, 16% moderate relief from treatment with X-rays alone, while 46% had no relief. 5 patients considered themselves worse after treatment. Paravertebral fields were used for the irradiation.

C. J. C. B.

**Prevention of pulmonary lesions caused by irritant gases.** G. UNGAR and M. BOLGERT (Compt. rend. Soc. Biol., 1938, 129, 1107—1109).—The pulmonary lesions are prevented in the guinea-pig by the intravenous injection of ascorbic acid (0.5 g. per kg.) or histaminase (10 units per kg.). The ascorbic acid is only effective if given at least 15 min. before the inhalation but the histaminase may be given immediately after. Both prevent a rise in blood-histamine.

P. C. W.



**Pulmonary epithelium and proliferative reactions in the lungs.** I. S. ROSS (Arch. Path., 1939, 27, 478—496).—Vital and supravital staining techniques were used in the study of the cellular responses consequent to the introduction of staphylococcal toxin and of iodised oil into the lungs of rabbits. The toxin stimulated the production of macrophages which arose from the connective tissue macrophages and migrated freely across the alveolar epithelial borders, and also stimulated non-phagocytic cells lining the alveoli. The oil stimulated only the macrophages. (16 photomicrographs.) C. J. C. B.

**Relative value of pure oxygen and carbon dioxide mixtures in experimental resuscitation.** N. J. EASTMAN, R. B. DUNN, and J. KREISELMAN (Amer. J. Obstet. Gynec., 1938, 36, 571—577).—Dogs under  $\text{CHCl}_3$  anaesthesia were asphyxiated by inhaling 100%  $\text{N}_2\text{O}$ . After breathing had ceased for 30 sec., artificial respiration was instituted with a Kreiselman resuscitator, various gas mixtures being employed. Resuscitation was accomplished just as quickly with pure  $\text{O}_2$  as with  $\text{CO}_2$  mixtures; in the presence of prolonged asphyxia, pure  $\text{O}_2$  was more efficacious than  $\text{CO}_2$ . Following  $\text{O}_2$  resuscitation the restored respiration remained normal in rate and amplitude; following  $\text{CO}_2$  resuscitation, the respiration tended to be convulsive and irregular. 9 animals were allowed to breathe 25%  $\text{CO}_2$  in  $\text{O}_2$  for 7—15 min.; toxic effects were produced which often resulted in death. M. H.

**Oxygen embolism.** F. DORELLO and P. ROWINSKY (Arch. Fisiol., 1938, 38, 398—403).—Rapid decompression of guinea-pigs which have been subjected for 20—30 min. to pressures of 5—6 atm. pure  $\text{O}_2$  produces gaseous embolism of the mesenteric vessels which differs from  $\text{N}_2$  embolism in being of short duration and causing no permanent damage. S. O.

**Pipette for the micro-determination of respiratory gases.** F. R. HAYES (Proc. Nova Scotian Inst. Sci., 1939, 19, 373—388).—0.2 ml. or less of gas is drawn into a capillary tube of uniform bore containing saturated  $\text{CaCl}_2$ . The length of the column of gas is measured before and after treatment with sp. absorbents (e.g.,  $\text{CrSO}_4$  for  $\text{O}_2$ ). E. M. W.

**Simple apparatus and technique for gas analysis.** S. BERG (Amer. J. clin. Path., Tech. Suppl., 1939, 3, 63—68). C. J. C. B.

**Methods of determining the respiratory quotient at rest and during exercise.** E. H. CHRISTENSEN and O. HANSEN (Skand. Arch. Physiol., 1939, 81, 137—151).—The R.Q. at rest and during exercise was determined by the Douglas method and with the apparatus of Hansen and Krogh. The latter yields more accurate results with untrained subjects; the Douglas method is preferable in trained persons because of its higher accuracy. All connexions and valves used with the Douglas method should have wide borings if the pulmonary ventilation reaches 100 l. per min. in order to diminish the expiratory resistance. A. S.

**Experimental anoxæmia.** J. H. THOMPSON and W. CORWIN (Arch. Neurol. Psychiat., Chicago, 1938,

40, 1233—1240).—A case of experimental anoxæmia in a man is reported in which severe physical and mental manifestations persisted for a considerable period after restoration of normal atm. conditions. A. M. B.

**Anoxia in aviation.** H. G. ARMSTRONG (J. Aviation Med., 1938, 9, 84—91).—A review. W. F. F.

**Effect of repeated daily exposures to anoxæmia.** H. G. ARMSTRONG and J. W. HEIM (J. Aviation Med., 1938, 9, 92—96).—Rabbits were exposed daily for 4 hr. to an atm. pressure corresponding with an altitude of 18,000 ft. One group received premedication with 1.5 c.c. of adrenal cortex extract daily. The animals deteriorated and died from hæmorrhage into the spinal cord or paralysis of the vital centres. The administration of adrenal cortex extract diminished the mortality rate. W. F. F.

**Reaction to oxygen want.** C. L. LEEDHAM (J. Aviation Med., 1938, 9, 150—154).—A description of the subjective sensations on a flight to about 22,500 ft. undertaken without special  $\text{O}_2$  apparatus, the pilot believing that the altitude was not above 12,500 ft. (owing to an altimeter reading error). Mental and emotional disturbances are recorded, with complete recovery within 24 hr. The immediate after-effects were fatigue, loss of appetite, tremor, and loss of confidence. W. F. F.

**Individual respiratory responses to currents of air at varying temperatures.** A. FACCHINI (Boll. Soc. ital. Biol. sperim., 1939, 14, 8—10). F. O. H.

**Effects of low pressures in man.** I. M. BAZILEVITSCH and I. M. TUROVETZ (Conf. Insuff. Circ., 1938, 239—258).—Exposure for 30—45 min. to a pressure of 525 mm. does not affect healthy individuals. At 405 mm. compensated arterial anoxæmia is observed. At pressures corresponding with altitudes above 5000 m. the compensatory mechanisms fail, and marked symptoms of anoxia develop. R. T.

**Voluntary apnoea. I. Changes due to air at varying temperatures. II. Habitual apnoea with air at varying temperatures. III. Composition of alveolar air during apnoea with air at varying temperatures.** A. M. DI GIORGIO (Boll. Soc. ital. Biol. sperim., 1939, 14, 37—39, 40—42, 42—44). F. O. H.

**Reflex activity in the substratosphere.** H. STRUGHOLD (Dtsch. med. Wschr., 1939, 65, 281—285).—The knee jerk in man is depressed at a barometric pressure (experiments in a chamber) corresponding with 2500—5000 m., a gradual increase in the jerk was observed between 5000 and 9000 m.; convulsions and subsequent disappearance of the jerk occurred at higher altitudes. Administration of  $\text{O}_2$  restores the reflex. The changes in reflex activity pass through the same phases when at a high altitude, reached with the aid of  $\text{O}_2$ , the administration of  $\text{O}_2$  is suddenly discontinued. A. S.

**Electro-acoustic recording of respiratory murmur in normal and diseased subjects.** C. COLOMBI (Boll. Soc. ital. Biol. sperim., 1938, 13,



1054—1056).—The sounds rendered audible by means of a microphone are described and discussed.

F. O. H.

### (viii) MUSCLE.

**Development of striated muscle tissue [in amphibia].** Z. S. KATZNELSON (Trans. Conf. Med. Biol., 1937, 172—176, 287).—A review of the author's work.

R. T.

**Influence of muscle-cell surface electrolytes on the rheobase.** T. YAMAGA (Japan. J. Med. Sci., III, 1938, 5, 315—328).—The toad sartorius muscle soaked in Ringer's solution has a higher, and in non-electrolytes a lower, rheobase than normal.

T. F. D.

**Electrotonus and potassium migration.** T. YAMAGA (Japan. J. Med. Sci., III, 1938, 5, 349—354).—Spectrographic analysis shows that K and Al migrate to the cathode in the extirpated sartorius muscle when the electrical potential is increased.

T. F. D.

**Potassium and aluminium migration in the toad sartorius muscle.** T. YAMAGA (Japan. J. Med. Sci., III, 1938, 5, 337—341).—Migration of K, Al, Cu, and Ca on stimulation in toad sartorius after soaking in Ringer's or glucose solution was determined by spectrographic analysis of 15-mg. portions of dried muscle.

T. F. D.

**Influence of nerve-cell surface electrolytes on the rheobase.** T. YAMAGA (Japan. J. Med. Sci., III, 1938, 5, 329—336).—The toad ischiadicus-gastrocnemius nerve prep. soaked in non-electrolyte solution has a higher, and in Ringer's solution a lower, rheobase than normal.

T. F. D.

**Influence of non-electrolytes on membrane potential in toad nerve and muscle.** T. YAMAGA (Japan. J. Med. Sci., III, 1938, 5, 343—348).—Sartorius muscle and ischiadicus nerve show increases in membrane potential after soaking in sugar and urea solutions and slighter increases in Ringer's solution.

T. F. D.

**Irritability of single skeletal muscle fibres.**  
**II. Stimulation by elliptical capillary electrodes.** M. SUGI (Japan. J. Med. Sci., III, 1938, 5, 307—314).—Single muscle fibres of toad sartorius were stimulated with a Hg-calomel micro-electrode. Changes in shape of the opening, from circular to elliptical, produced varying effects.

T. F. D.

**New rhythm in skeletal muscle.** R. C. GARRY and H. S. D. GARVEN (Chinese J. Physiol., 1938, 13, 431—436).—The sciatic-gastrocnemius prep. of the frog, dissected or *in situ*, was stimulated until contracture appeared and then rested for 10—60 sec. On continuing the stimulation, contracture reappeared, its base-line undulating 2—4 times per min.; this still occurred if the sympathetic was not stimulated, but the contractions were more irregular.

N. H.

**Summated muscular contractions during stimulation with rectangular currents.** H. MEYER (Z. Biol., 1939, 99, 387—396).—Curarised frog's sartorius muscles were stimulated with rectangular current pulses of a strength and duration sufficient

to cause double excitation. The size of the summated contraction depends on the strength of the current. Weaker (and correspondingly longer) currents, with which the second impulse occurs later, produce a greater summated contraction.

B. K.

**Stimulating effect of rectangular current pulses.** H. PINK (Z. Biol., 1939, 99, 379—386).—Curarised sartorius muscles of frogs were stimulated with rectangular current pulses of varying intensity and duration. The size of the contraction increases in steps as the duration of the stimulus increases, the strength being greater than the "rheobase" for a max. twitch. The steps are due to repetitive excitation. With stronger currents, the current duration required for repetitive excitation becomes less.

B. K.

**Electrical responses of single motor-units in the biceps muscle in a case of traumatic lesion of the musculocutaneous nerve.** H. SEYFFARTH (Acta Psychiat. Kbn., 1938, 13, 297—311).—From electromyograms of flexion of the upper arm in a case of injury to the musculocutaneous nerve, the frequency of potential oscillations was shown to be closely related to the load on the paretic muscle.

W. M. H.

**Muscle atrophy. I. Decrease of weight in muscle atrophy.** S. HIROHARI (Japan. J. Med. Sci., III, 1938, 5, 367—379).—The dog gastrocnemius muscle decreases in wt. after section of its motor nerve or tendon, or bandaging with plaster of Paris.

T. F. D.

**Experimental muscular dystrophy in the guinea-pig; nutritional myodegeneration.** H. CHOR and R. E. DOLKART (Arch. Path., 1939, 27, 497—509).—Degenerative changes in the skeletal muscle of the guinea-pig were produced by the administration of cod-liver oil to animals receiving a normal diet or by feeding animals on a synthetic diet of Madsen, McCay, and Maynard plus viosterol or cod-liver oil. The pathological changes are those of coagulative necrosis. Despite extensive degeneration of the muscle fibres, the intramuscular nerves and their endings were well preserved so that this type of lesion must be of extra-neural origin. (8 photomicrographs.)

C. J. C. B.

**Effect of ketosis and of ingestion of creatine in myotonia congenita.** A. T. MILHORAT and H. G. WOLFF (Arch. Neurol. Psychiat., Chicago, 1938, 40, 1135—1140).—The metabolism of creatine and creatinine in a patient with myotonia congenita was normal both during a period of normal diet and during a period of induced ketosis. Administration of large amounts of creatine did not influence the muscular defect.

A. M. B.

**Pigment in striated muscle of the toad.** F. LIPPAY (Z. mikr.-anat. Forsch., 1938, 44, 207—213).—The pigment in muscles of the toad is abundant and enclosed in melanophores, which adhere chiefly to vessels, but also occur in fascial septa and in perimysium. There is greater concn. of pigment in the forearm muscles of the male (muscles associated with sexual embrace).

J. H. G.



**Effect of oxygen saturation of arterial blood on the formation of lactic acid by striated muscle.** M. PIÉRY, J. ENSELME, C. PESCHIERA, and M. A. NOVA (Compt. rend., 1939, 208, 231—233).—The greater is the degree of saturation of arterial blood with  $O_2$ , the less is the lactic acid content of the muscles of the back legs of the rabbit. J. L. D.

(A) Dynamics of extractive substances in muscle tissue at 4° and 36°. I. A. SMORODINCEV and N. V. NIKOLAEVA. (B) Dynamics of sulphur compounds of muscle extract in tissue autolysis. I. A. SMORODINCEV and P. A. TZIGANOVA. (C) Electrical conductivity and freezing point of the extract in autolysing muscle. I. A. SMORODINCEV and N. N. KRUILOVA. (D) Dynamics of non-nitrogenous extractives in autolysing muscle tissue. I. A. SMORODINCEV and L. A. FILIPPOVA (Arch. Sci. biol. U.S.S.R., 1935, 37, 449—456, 457—462, 463—467, 469—479).—(A) Increase in temp. of autolysing tissue from 4° to 36° does not affect the general course of production of N extractives but accelerates the process. The total amount of org. and inorg. extractives is ultimately the same at both temp. The amount of creatine in the extract reaches max. in 12—14 hr. and later declines (more rapidly at 36°). Rates of formation of volatile acids are higher at 36° than at 4°.

(B) The total S in extracts of hydrolysing tissue reaches max. in 48 hr. and thereafter decreases. Inorg. S does not exceed 10% of the org. S. Thiol compounds diminish more rapidly at 36° than at 4°. Presence of 'S-S' compounds was not detected.

(C) Measurements at 4° and 36° are recorded. Vals. serve as a measure of freshness of meat.

(D) Fission of glycogen occurs most rapidly in the early stages of autolysis. Resynthesis begins after 3 days at 36° and 5—10 days at 4°. Glucose produced by glycolysis exceeds that equiv. to the amount of glycogen lost. The combined amount of glucose and lactic acid present at any time is approx. equiv. to the loss of glycogen. 30% of the total P of the tissue extracts appears in the protein fraction; the amounts of org. and inorg. P are inversely related.

CH. ABS. (p)

**Nitrogenous muscle extractives, and their importance for study of comparative biochemistry.** J. M. HEFTER (Trans. Conf. Med. Biol., 1937, 33—46, 259—260).—A review. R. T.

**Choline-esterase in voluntary muscle.** D. NACHMANSOHN (J. Physiol., 1939, 95, 29—35).—Further details are given of findings already recorded (cf. A., 1938, III, 759, 989). The great variations of esterase power, per unit of wt. and time, of growing muscle result from a change in the ratio vol. of end-plates (or nerve elements) to vol. of muscle fibre. Embryonic muscle tissue is rich in nerve elements and the end-plates are at birth nearly fully developed, whereas the fibres are very small. This explains the high val. in muscles of chicken embryos.

J. A. C.

**Choline-esterase in muscle following section of sympathetic nerves.** C. TORDA and E. MARTINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1056—1057; cf. A., 1937, III, 393).—Section of the left lumbo-

sacral sympathetic nerves in dogs has no effect on the choline-esterase activity of the left or right gastrocnemius muscle. Section of the motor nerves of the muscle is followed by a fall in the esterase content parallel with the atrophy of the muscle. Section of a superior sympathetic ganglion in rabbits produces changes in muscle-esterase similar to those produced in dogs. F. O. H.

**Fibrillary contractions produced by eserine.** J. SZELÖCZEY and J. HORVÁTH (Magyar Orv. Arch., 1938, 39, 671—679).—In rats the previous administration of an almost lethal dose of atropine may depress fibrillation. No relationship was found in rabbits between the strength of the fibrillary contractions and blood-Ca. KCl has no effect on the duration or strength of the contractions.

A. W. M.

**Effect of eserine on capacity of muscle for work.** I. E. MILLA (Boll. Soc. ital. Biol. sperim., 1938, 13, 1053—1054).—Injection of eserine (0.05—0.07 mg. per 200 g. of body-wt.) into rats increases the capacity for work and decreases lactic acid formation in the gastrocnemius muscle. F. O. H.

**Effect of eserine on resistance to fatigue in man.** I. E. MILLA (Boll. Soc. ital. Biol. sperim., 1938, 13, 1126—1127).—Injection of eserine or other substance inhibiting choline-esterase activity into young men increases their work-output and diminishes the blood-lactic acid level attained during work.

F. O. H.

**Influence of phenols on muscular contraction.** S. TOKUYAMA (Japan. J. Med. Sci., III, 1938, 5, 269—305).—The addition of phenol, pyrocatechol, *p*-cresol, and quinol to the medium perfusing gastrocnemius sciatic nerve of toad or rabbit in concns.  $10^{-2}$ — $10^{-3}$  decreased, and in concns.  $5 \times 10^{-4}$ — $4 \times 10^{-6}$  increased, the magnitude of the muscular contraction after electrical stimuli, whereas *p*-cresolsulphuric acid had no effect. T. F. D.

**Effect of xanthine derivatives on muscular work.** G. FICHERA (Boll. Soc. ital. Biol. sperim., 1938, 13, 1101—1103).—Ingestion of 0.1—0.2 g. of theobromine, theophylline, or caffeine increases the muscular ability of men, the effect persisting for 2—2.5 hr.; the purines are increasingly effective in the order given. With theobromine, a dose of 0.2 g. is twice as effective as one of 0.1 g. but with theophylline and caffeine the muscular ability is increased by only approx. 33%. F. O. H.

**Relation between electric and acoustic phenomena in muscle.** P. BRANDSTÄTER (Pflüger's Archiv, 1938, 240, 348—351).—Experiments were carried out on m. pectoralis of the pigeon. During a strychnine tetanus the action currents and muscle sounds have the same frequency. J. M. R.

**Muscle sounds.** H. D. BOUMAN and G. VAN RIJNBERK (Arch. néerland. Physiol., 1938, 23, 441—507).—A review. C. E. B.

**Slippage of smooth muscle fibres during contraction.** O. M. OLIVO (Boll. Soc. ital. Biol. sperim., 1939, 14, 25—26).—Reciprocal slipping of the fibres occurs in a lateral, and not in a longitudinal, direction. F. O. H.



**Action of glycine on plain muscle contraction.** J. LESZEZYNSKI (Arch. int. Pharmacodyn., 1939, 61, 201—206).—Glycine, 1 in 1250, induces active and frequent contractions in quiescent uterine muscle of rabbits and guinea-pigs, and in frog's stomach. This effect does not depend on excitation of nerves. It increases the amplitude of contractions of the isolated gut. D. T. B.

### (ix) NERVOUS SYSTEM.

**Cutaneous sensitivity to visible and infra-red light.** N. B. POZNANSKAJA (Trans. Conf. Med. Biol., 1937, 106—111, 274).—The threshold of cutaneous sensitivity to light, as evidenced by reflex reactions in human subjects, falls continually with repetition of stimuli, from 0.013 to 0.01 cal. for visible, and from 0.014 to 0.06 cal. for infra-red, light. The chronaxie of the skin of the chest falls as the intensity of infra-red illumination is raised from 0 to 0.4 cal., thereafter rising continuously. The intensity-duration of effect curve is a hyperbola, in the case of infra-red light. Cutaneous perception of visible light is not due exclusively to its thermal effect. R. T.

**Effect of brief electric shocks on excitatory process in human sensory nerves.** H. GATTNER (Pflüger's Archiv, 1938, 240, 718—726).—A finger immersed in 10% saline was stimulated by two rectangular pulses of 0.2 m.sec. duration at varied intervals. The equality or inequality of the sensation was subjectively determined. The presence and length of primary and secondary relative and intermediary abs. refractory periods depend on the (set) intensity of the test shock relative to the intensity of the conditioning shock (the latter being of double threshold strength). The peculiar results are explained in terms of recognised facts of peripheral nerve stimulation and excitation. H. Ro.

**Relation between chronaxie and accommodation.** L. LAPICQUE and M. LAPICQUE (Compt. rend. Soc. Biol., 1938, 129, 724—727).—Determinations of chronaxie and accommodation in frog, tortoise, and snail show a const. relation between the two vals. P. C. W.

**Chronaxie of the blink reflex.** A. K. M. NOYONS and F. P. FISCHER (Arch. néerland. Physiol., 1938, 23, 579—591).—The reflex was elicited in rabbits either by means of electrical or warm water stimuli applied to the cornea. For the former the average chronaxie was 0.60 $\sigma$  in 25 experiments (min. 0.3 $\sigma$ , max. 0.9 $\sigma$ ). The effects of various substances were examined. The stimuli were applied by an apparatus devised for the purpose. (Illustr.) C. E. B.

**Seasonal changes in frog's nerve activity.** H. VON BRACKEN and H. SCHAEFER (Pflüger's Archiv, 1938, 240, 527—541).—Comparative measurements of excitability and action potential of the frog's sciatic nerve were made in autumn, winter, and spring, and during keeping in a cool dark ranarium. The vals. tested vary without definite correspondence. In spring threshold voltage and after-potential are higher but chronaxie, threshold for make tetanus, action potential, and d.c. resistance are lower than in autumn. The "true" rheobase, i.e., the electro-

tonic fraction of the threshold voltage, and the "safety margin" of conduction remain fairly const. During keeping the nerves undergo an "adaptive crisis" after 2 weeks, and deteriorate noticeably after 5 and severely after 9 months. H. Ro.

**Mechanical stimulation of nerve.** W. SCHMITZ and W. WIEBE (Pflüger's Archiv, 1938, 240, 289—299).—Frog's nerve, stimulated with an electro-dynamically operated hammer, responds with an ordinary submaximal action potential if the compression is rapid (pressure and velocity of the hammer being recorded separately). The delay between onset of stimulus and start of action potential is minute. In the fatigued irresponsive nerve the compression evokes a local negativity and the decompression a local positivity at the stimulated point (almost absent in dead material). This electrical change is proportional to the pressure exerted and, in the stimulated region of a fresh nerve, superimposed on the action potential. It is supposed that the mechanical stimulus excites the membrane directly without introductory partial discharge of the membrane potential. H. Ro.

**Tonic innervation of skeletal muscle.** G. HÄGGQVIST (Z. mikr.-anat. Forsch., 1938, 44, 169—186).—The abdominal aorta was compressed by a clamp (Stenson's method) in rabbits to induce paralysis of the hind limbs. Prolonged compression caused flaccid paralysis with degeneration of all the fibres of the anterior spinal roots. A shorter period of compression caused spastic paralysis with degeneration of the fibres of large diameter (11—14  $\mu$ .) only. Statistical analysis of the fibre measurements is given. This is taken as further evidence for Häggqvists' theory of thin "tonic" fibres and thick fibres concerned with movement. J. H. G.

**Causation of paralysis in diphtheria.** I. TAYLOR (Brit. J. Child. Dis., 1938, 35, 250—259).—A general review. C. J. C. B.

**Peripheral nerve lesions in cases of pernicious anaemia.** W. M. VAN DER SCHEER and H. C. KOEK (Acta Psychiat. Kbn., 1938, 13, 61—92).—Four cases illustrate the rôle of peripheral nerve lesions in pernicious anaemia. Loss of myelin sheaths was shown at biopsy. W. M. H.

**Reversible organic lesions in central and peripheral nerve fibres during local anaesthesia.** A. DONAGGIO (Arch. exp. Zellforsch., 1938, 22, 171—180).—Using a special histological technique, reversible changes were demonstrated in the nerve fibres of sciatic nerve, spinal cord, and sympathetic nervous system during local anaesthesia with percaïne and novocaine. These changes affected both axon and nerve sheath. Similar reversible changes were obtained after exposure of the nerves to blue light, ultra-violet light, X-rays, and short light waves. R. J. O'C.

**Case of periodic paraplegia.** E. SUGIMOTO (Folia endocrin. japon., 1938, 14, 65—67).—The paralysis was produced by a high-carbohydrate meal in a patient suffering from Graves' disease. Improvement set in after treatment with insulin, adrenal extract, and Lugol's solution. E. M. J.



**Aberrant ganglion cells as a source of intact fibres in severed dorsal roots.** D. DUNCAN and E. S. CROCKER (*J. Neurophysiol.*, 1939, 2, 3—8).—If lumbo-sacral dorsal roots are cut in cats and dogs and an interval is allowed for degeneration, occasional normal myelinated fibres are seen in the central ends of the roots. A further examination reveals aberrant ganglion cells in these central stumps and it is suggested that they are the cells of origin of the intact fibres and that they account for the so-called efferent fibres. A quant. study showed that the cells were far more numerous in the dog than in the cat; they were mostly found in the long extradural portion of the roots, but some were also found intradurally.

S. CR.

**Anterior spinal root fibre diameter in man.** Å. SWENSSON (*Z. mikr.-anat. Forsch.*, 1938, 44, 187—206).—Diameters of anterior spinal root fibres were measured in two adult men; a full statistical analysis was made. The two sorts of fibre, thin (2—3 to 3—4  $\mu$ .) and thick (8—9 to 10—11  $\mu$ .), were found in all roots. In thoracic segments the thin fibres are 70—85% of total. In TI, LI, SIV the thin are 50%; in other segments the thick fibres predominate. Fine fibres are statistically negligible in the upper three sacral roots.

J. H. G.

**Defective movement of the eye-lids.** R. THUREL (*Arch. Ophthal.*, Paris, 1938, [ii], 2, 795—812).—A discussion of the mechanism of normal and defective lid movements, including description of a case in which a wound of the face was followed by re-innervation of orbicularis oculi and masseter partly from the nerves of each other, as proved by anaesthetising the trigeminal nerve.

E. E. P.

**Survival of spinal centres in the rabbit during ischaemia.** H. HERMANN, F. JOURDAN, and P. SÉDALLION (*Compt. rend. Soc. Biol.*, 1938, 129, 1193—1195).—By cross-circulation experiments in rabbits it is shown that 27 min. after depriving the spinal cord of its blood supply spinal reflexes can be elicited if the circulation is recommenced.

P. C. W.

**Similarity of effects of barbiturate anaesthesia and spinal trans-section.** H. K. BEECHER, F. K. McDONOUGH, and A. FORBES (*J. Neurophysiol.*, 1939, 2, 81—88).—The striking similarity of the effects of low spinal trans-section and barbiturate anaesthesia on the flexion reflex of the leg is reported. Isotonic and isometric muscle studies with muscle action currents in the cat showed that under ether anaesthesia a relatively sustained, cumulative reflex contraction of the leg flexors is found on repeated central stimulation, whereas under barbiturate anaesthesia larger isolated non-cumulative twitches of the muscle occur.

S. CR.

**Respiratory fibres in anterior column of spinal cord.** E. TOSATTI (*R.C. Atti Accad. Lincei*, 1938, [vi], 28, 114—116).—Respiratory fibres are found in the anterior as well as in the lateral columns of the spinal cord in dogs and rabbits as shown by cutting both lateral columns at the level of the 3rd cervical nerve. If one phrenic nerve is cut and the cervical cord hemisected on the opposite side there is no paralysis of the corresponding side of the

diaphragm unless the remaining anterior column is also divided. There are thus crossed respiratory fibres in the anterior column; the crossing takes place at the level of the phrenic nuclei.

S. O.

**Reflex sympatho-inhibitory centre in the medulla oblongata.** C. L. YI (*Chinese J. Physiol.*, 1938, 13, 411—416).—On central stimulation of the cut vagus or of the sinus, brachial, or sciatic nerves of dogs, the arterial pressure fell and the spleen and kidney vol. and intestinal motility increased. The effects were abolished by removal of the medullary depressor centres or the sympathetic chains or by ergotoxine, but not by decerebration, removal of the medullary pressor centres, or atropine.

N. H.

**Changes in post-rotatory ocular reaction due to unilateral stimulation by light.** M. GRILLI (*Boll. Soc. ital. Biol. speriment.*, 1939, 14, 55—57; cf. A., 1938, III, 186).—Modifications in the reaction are described.

F. O. H.

**Localisation in the brain stem of the oestrous responses of the female guinea-pig.** E. W. DEMPSEY and D. McK. RIOCH (*J. Neurophysiol.*, 1939, 2, 9—18).—Typical oestrous responses were obtained from ovariectomised guinea-pigs after suitable hormone injections following removal of neocortex, caudate-putamen, hippocampus, septal nuclei, and other portions of the fore-brain. They were also observed in the guinea-pig and cat after trans-section of the brain stem just anterior to the mamillary bodies. Partial or complete trans-section at the level of the inferior colliculi abolishes sexual behaviour. Therefore the neural mechanism for sexual behaviour probably lies between these limits. An afferent pathway for the sexual responses runs through the cord within the posterior quadrant, decussates at some point below the inferior colliculi, and runs through the roof of the mesencephalon.

S. CR.

**Familial supranuclear ophthalmoplegia and ptosis.** J. SCHARF (*Klin. Mbl. Augenheilk.*, 1938, 101, 71—76).—Three cases of familial ptosis are described, in which there was limitation of ocular movements to voluntary effort but not of movements associated with closure of the eyes, flexion of the head, etc. Attempted voluntary movements were accompanied by miosis.

E. E. P.

**Complex involuntary movements appearing late following resection of cerebellar hemisphere.** R. S. DOW and L. VAN BOGAERT (*J. belge Neurol. Psychiat.*, 1938, 38, 803—807).—Clinical observations are recorded on a case of complete resection of the left cerebellar hemisphere with a late appearance of dyskinetic movements on the same side. A hypothesis is proffered, the basis of which is trans-synaptic degeneration of the red nucleus and thalamic nuclei.

W. K. S.

**Responses following electrical stimulation of the cerebellar cortex in the normal cat.** S. L. CLARK (*J. Neurophysiol.*, 1939, 2, 19—35).—Electrodes were fastened permanently into the skulls of cats over some previously determined point on the cerebellum; experiments could then be made with the animal unanaesthetised and unrestrained. Stimul-



ation resulted in movements which varied with the strength and duration of the current and with the immediately previous experience of the animals. The movements appear first with the stimulus, then as a rebound, and thirdly as a prolonged slow series involving various parts of the animal in a definite sequence lasting several min. The pattern of movements elicited from the same point remains the same from day to day, and definite cerebellar areas have sp. patterns. S. CR.

**Sensory and motor functions in long-surviving midbrain pigeons.** R. THAUER and G. PETERS (Pflüger's Archiv, 1938, 40, 503—526).—The cerebrum and corpus striatum were removed from pigeons, which survived from periods up to 2 years. Some of the animals behaved as previously described (Magendie, Bethe). One pigeon was exceptional in that a return of almost all functions occurred. This animal was not completely blind; spontaneous reactivity was present and it was able to feed of its own accord. Histological examination showed that in this animal (unlike the others) there was almost no damage to the midbrain. J. M. R.

**Efferent connexions of the centre median nucleus.** W. E. LE G. CLARK and W. R. RUSSELL (J. Anat., Lond., 1939, 73, 255—262).—In a human brain a lesion of the external capsule isolating the insular cortex and involving part of the putamen was found to be associated with degeneration of the centre median nucleus, suggesting a projection from this nucleus to the insular cortex. A similar lesion was produced in a monkey by devascularisation, but in this case no degeneration occurred in any of the thalamic nuclei. Possibly the extra-thalamic efferent connexions are different in man and monkey. E. E. H.

**Connexions of cortex with thalamus in the rabbit.** K. HIRASAWA and S. OKANO (Z. mikr.-anat. Forsch., 1938, 44, 214—233).—Connexions between the cerebral cortex and thalamus in the rabbit were studied by diathermic cauterisation of large areas of the cerebral cortex of new-born animals which were killed at intervals up to 10 months, and examined by the Nissl and Weigert-Pal methods. The many thalamic nuclei affected were listed, and included some phylogenetically old nuclei, thus conflicting with Monakow's hypothesis. J. H. G.

**Function of the thalamus.** V. NERI and A. CHIATELLINO (Boll. Soc. ital. Biol. sperim., 1939, 14, 29—32).—Experimental coagulation of the thalamus in cats produces catalepsy and non-response to all types of stimulation. F. O. H.

**Anatomical basis of the thalamic syndromes.** A. EARL WALKER (J. belge Neurol. Psychiat., 1938, 38, 69—95).—A review based mainly on personal work on the thalamus of the chimpanzee. W. K. S.

**Pathological changes in the nervous system in yellow fever.** L. D. STEVENSON (Arch. Path., 1939, 27, 249—266).—In 20 human cases, the chief lesion in the brain was perivascular hæmorrhage, most frequently in the subthalamic and periventricular region at the level of the mamillary bodies. The

temporal pole and cerebellum were next most involved. Perivascular lymphocytic exudate was present in 9 cases. Changes in the nerve cells and the microglia and astrocytes were slight and no inclusion bodies were seen. (9 photomicrographs.) C. J. C. B.

**Hypothalamic regulation of body temperature.** G. CLARK, H. W. MAGOUN, and S. W. RANSON (J. Neurophysiol., 1939, 2, 61—80).—Large lesions in the hypothalamus in cats cause marked disturbances in temp. regulation and frequently result in the death of the animal. The further back the hypothalamic lesions are placed the greater is the impairment of the ability to keep the body temp. up to the normal level and the more rapidly does death occur. Lesions in various parts of the hypothalamus are described; in some parts the animal's ability to prevent overheating is upset and in others the ability to prevent chilling is affected. S. CR.

**Chorea and athetosis in childhood.** J. SHAFAR (Brit. J. Child. Dis., 1938, 35, 259—266).—A general review. C. J. C. B.

**Electromyography in diagnosis of tremor.** B. INGEBRIGTSEN (Acta Psychiat., Kbn., 1938, 13, 11—20).—In cases of early Parkinsonism, electromyograms may show an incipient rhythmic activity in groups of muscles which are apparently free from tremor. W. M. H.

**Olfactory conditioning in a parasitic insect; nature of conditioning process.** W. H. THORPE (Proc. Roy. Soc., 1938, B, 126, 370—397).—The experiments do not support the theory of inheritance of acquired characteristics. Adult *Nemeritis* reared from the normal host (*Ephestia*) exposed immediately on emergence to a stream of air which had passed over living *Meliphora* larvæ (the abnormal host) showed as effective conditioning as those confined in contact with the *Meliphora* larvæ. By exposure of *Nemeritis* to cedar-wood oil in a stream of air, the animals become tolerant to the odour, which is repellent to the normal insect, and are not injured by it. Within limits, variation in the period of conditioning does not alter the intensity of the final effect. The effect of conditioning is greatest immediately after the exposure, and on subsequent isolation it decreases to zero in 10 days. Contact with *Ephestia* after conditioning to *Meliphora* reduces the latter's attractiveness. The odour of *Nemeritis* exerts a slight attraction on its own kind. Conditioning in *Nemeritis* is not a simple association between the experience of a given constituent on the environment (e.g., odour) and the calling forth of a single specialised response (e.g., oviposition), but is the association of the given constituent with a favourable environment as a whole, giving rise to a positive response which will tend to keep the parasite in the type of environment in which the host itself occurs. A similar concept provides the only satisfactory basis on which to explain various well-known observations on the behaviour of ants. F. B. P.

**Histology of cerebral cortex of the new-born bear.** W. RIESE (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 208—214).—The structure of the



cerebral cortex of the new-born bear is embryonic, consisting chiefly of germinating cells, with very few neuroblasts. In the first 3 days of life a primary granular layer is formed by migration and rapid maturation of cells, and alterations in the distribution of nuclear chromatophil substance occur prior to the formation of Nissl's granules. C. A. K.

**Traumatic bilateral destruction of the prefrontal lobes.** H. BAONVILLE, J. LEY, and J. TITECA (Ann. méd. psychol., 1939, 1, 38—58).—The authors studied the change of personality that occurred over a period of 2 years after suicidal destruction of the prefrontal lobes in a psychotic individual. Primary changes of morbid egotism with an emotional indifference to external affairs, deficient temporal orientation, and dissociation of attention were noted and the intellectual capacity, judgment, and initiative remained impaired throughout. The subject, however, comported himself in a more moral manner than formerly, whilst there were no gross abnormalities of his physical state, although occasionally incontinence was observed. The study was completed by post-mortem examination. W. K. S.

**Effects of ablation of prefrontal lobes in the monkey.** R. MESSIMY (Rev. Neurol., 1939, 71, 1—37).—A review of personal observations on 6 monkeys with ablation of the prefrontal lobes and of current literature. Stress is laid on inhibitory functions of the lobes and on modifications of autonomic nervous system with special reference to the gastro-intestinal tract. W. K. S.

**Influence of the forebrain on the blood picture and body temperature.** S. KUSZAKI (Arch. klin. Chir., 1939, 194, 326—346).—Various parts of the forebrain were continuously stimulated in male rabbits by introducing sterilised glass balls or pieces of laminaria (2—3 mm.) into the cerebral tissue. The blood picture and body temp. were recorded in four types of control animals: normal, newly-fed, fasting, and after trephining, and in stimulated animals. Stimulation of most regions of the forebrain affected either the blood picture or the body temp. or both; parts of the walls of the third ventricle and the hypothalamus gave the most marked changes. B. W.

**Variations in threshold of auditory stimuli necessary to awaken the sleeper.** F. J. MULLIN and N. KLEITMAN (Amer. J. Physiol., 1938, 123, 477—481).—A sleep-depth curve was plotted by determining the threshold of auditory stimuli (loud-speaker) necessary to awaken the sleeper during the first hour of sleep. 20 subjects (adults, feeble-minded adults, and normal children) showed a gradual S-shaped decrease in auditory irritability, reaching a max. in 25 min., a sustained low irritability for 25 min., and a rapid increase of irritability not quite to waking level for 15 min. The sleep-depth curve during the first hr. is not duplicated in length or depth during the rest of the night's sleep. M. W. G.

**Macular representation in the monkey.** G. L. MAISON, P. SETTLAGE, and W. F. GREYER (Arch. Neurol. Psychiat., Chicago, 1938, 40, 981—984).—In 2 monkeys section of one optic tract and removal

of the contralateral optic lobe was performed. Vision was reduced to very crude brightness perception only. A. M. B.

**Necrotic miliary process of unknown origin in *Macacus rhesus*, observed clinically as blindness.** L. VAN BOGAERT and A. DEWULF (J. belge Neurol. Psychiat., 1938, 38, 583—597).—Histopathology of a macaque which developed amaurosis with dilatation of the pupils showed numerous miliary necrotic foci in the cortex and demyelination in the white matter with mesenchymatous proliferation around the arterioles in these zones. W. K. S.

**Left occipito-parietal brain tumour.** R. S. LYMAN, S. T. KWAN, and W. H. CHAO (Chinese Med. J., 1938, 54, 491—516).—A left occipito-parietal tumour in a Chinese æt. 42 was associated with headache, choked discs, right hemianopsia, impairment of memory, alexia, and agraphia, the rest of the speech mechanism being intact. Previously equally fluent in English and Chinese, reading of the latter was most affected. Expression was also easier in English. That the first language acquired, or the most fluent, is least affected in aphasia and is the first to recover did not hold in this case. The greater facility in English is explained by the structure of the language, which permitted better connexion to be made with the intact auditory and motor-speech functions. Sub-total removal of a large sub-cortical fibroblastoma resulted in improvement in all functions except vision in the hemianopic fields. W. J. G.

**Can *Octopus vulgaris* distinguish different shapes?** J. TEN CATE and B. TEN CATE (Arch. néerland. Physiol., 1938, 23, 541—551).—This animal acquired a conditioned response to a square body which it could distinguish from an isosceles or a right-angled triangle. C. E. B.

**Temperature changes in the cortex and hypothalamus during sleep.** H. M. SEROTA (J. Neurophysiol., 1939, 2, 42—47).—Thermocouples were fixed into various parts of the cat's brain so that the temp. could be recorded in the unæsthetised animal. The hypothalamus is consistently warmer than the cortex and its temp. rises with activity and emotional states, but falls and is stabilised during sleep. On awakening it rises more rapidly than that of other parts of the brain. The sp. temp. fall of the hypothalamus in sleep is shown to be due to lowered cell metabolism rather than to any marked change in blood flow, indicating that sleep is associated with a decreased rather than an increased activity of a hypothalamic sleep centre. S. CR.

**Faradic and strychnine stimulation of the sensory-motor region of the cerebral cortex in the ass.** E. FULCHIGNONI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1071—1073).—Stimulation of the "sensory-motor centre" (situated between the anterior fissure of Sylvius and the sub-Sylvian sulcus) produces contraction of the orbicular muscles but not rhythmic, clonic convulsions. F. O. H.

**Localisation of cortical ataxias.** M. A. GEREBTZOFF (J. belge Neurol. Psychiat., 1938, 38, 108—132).—A review of comparative studies of cerebellar cortical connexions. In the rabbit the



relay of the superior cerebellar peduncle is in the nucleus magno-cellularis and the cortical projection is in the prepirietal area 5 of Brodmann. The magnocellular nucleus is less definite in higher animals. In monkeys and in man the superior cerebellar peduncle may end in the magnocellular nucleus which no longer has the characteristic crescent shape and has been regarded as part of the central median nucleus or of the dorso-anterior section of the lateral ventral nucleus. The rôle of corticopontine and middle cerebellar fibres in cerebro-cerebellar atrophies is discussed. W. M. H.

**Localisation of activity in the brain.** E. D. ADRIAN (Proc. Roy. Soc., 1939, B, 126, 433—449).—Ferrier lecture. F. B. P.

**Effect of sodium fluoride and methylene-blue on electric activity of the cerebral cortex.** G. MORUZZI (Compt. rend. Soc. Biol., 1938, 129, 884—889).—NaF markedly depresses electrical activity, both spontaneous and induced, of the isolated brain prep. in the cat. Methylene-blue has an augmentary effect. P. C. W.

**Electrocorticogram during establishment of urethane anaesthesia.** Z. DROHOCKI and J. DROHOCKA (Compt. rend. Soc. Biol., 1938, 129, 895—898).—Simultaneous records were taken from the area striata and the area præcentralis granularis of the rabbit cortex during induction of anaesthesia. There was a gradual disappearance of the rapid low-amplitude waves but a persistence of the high-amplitude low-frequency waves which were independent in the two areas. The waves became more regular and after 1 hr. the two areas synchronised, with very low frequency and practically identical form. P. C. W.

**Electro-encephalographic study of brain "automatism."** Z. DROHOCKI (Compt. rend. Soc. Biol., 1939, 130, 99—103).—The regular "automatic" waves recorded from various parts of the brain during anaesthesia in the rabbit can be simulated by various stimuli. Electro-encephalograms from the area striata show similar waves during illumination of the eye and in the phases between convulsions following strychnine. It is suggested that the waves are the representation, not of a cell or complex, but of a "primary structure" with characteristic automatism. P. C. W.

**"Electro-spectrography" of the brain.** Z. DROHOCKI (Compt. rend. Soc. Biol., 1938, 129, 889—893).—By placing filters between the electrodes and the amplifier in the electro-encephalograph all the waves of any frequency can be isolated. These are shown to occur in short bursts which are not apparent in the ordinary record. P. C. W.

**Electro-spectrogram of the brain.** Z. DROHOCKI and J. DROHOCKA (Compt. rend. Soc. Biol., 1939, 130, 95—98).—Cathode oscillograph records from the brain surface are passed through resonance filters so that the various wave frequencies are recorded separately. Such electro-spectrograms show that the amplitude of the waves with frequency below 50 Hertz is greatest in various areas of the rabbit cortex. Above this frequency the amplitude

of the waves diminishes. Under anaesthesia this diminution in amplitude tends to occur at lower frequencies. P. C. W.

**Synchronisation of electrical cortical activity.** Z. DROHOCKI (Pflüger's Archiv, 1938, 240, 183—190).—Cortical areas, ordinarily differentiated electrically, show, at intervals, a conformity in their potential patterns, suggesting a similarity of certain structures in areas of generally different cytoarchitecture. With disintegration of the distinct regional patterns during narcosis their independent variability disappears and is substituted by synchronism and even identity of their patterns, the narcosis affecting primarily the structures of special organisation. H. Ro.

**Periodic and automatic electrical activity of the cortex.** Z. DROHOCKI (Pflüger's Archiv, 1938, 240, 171—182).—The electrocorticogram of rats and rabbits disintegrates gradually as narcosis proceeds. The normal irregularity is replaced by rhythmically repeated periods of a certain pattern which may suddenly turn into another pattern of potential changes. This condition depends on the degree of anaesthesia and is independent of the type of narcotic. The pattern shifts to simplicity and monotony. Each pattern is attributed to some temporarily stabilised functional association of structural units in the cortical area involved, the normal interaction of the various components being eliminated. H. Ro.

**Electro-encephalographic study of two cases of hysterical anaesthesia.** J. TITECA (J. belge Neurol. Psychiat., 1938, 38, 442—477).—The electro-encephalogram was unaffected by stimulation of the anaesthetic areas in two cases of hysteria; the existence of potentials of high voltage is noted and compared with those occurring in experimental strychninisation and epilepsy. W. K. S.

**Electro-encephalogram in bromide intoxication.** M. A. RUBIN and L. H. COHEN (Arch. Neurol. Psychiat., Chicago, 1938, 40, 922—927).—In a case of bromide intoxication the electro-encephalogram showed a low alpha wave frequency. The frequency and average amplitude of the alpha waves increased when the blood-bromide level fell. A. M. B.

**Electro-encephalographic records during experimental beriberi.** M. GOZZANO and G. VERCELLANA (Boll. Soc. ital. Biol. speriment., 1938, 13, 1165—1167).—Electro-encephalograms of pigeons indicate that the cerebral cortex participates in the production of convulsions during beriberi. F. O. H.

**Simultaneous electromyograms and electro-encephalograms in paralysis agitans.** R. S. SCHWAB and S. COBB (J. Neurophysiol., 1939, 2, 36—41).—In 37 cases of paralysis agitans simultaneous electro-encephalograms and electro-myograms failed to show any relationship between the two rhythms. S. Cr.

**Electro-encephalogram in epilepsy.** P. PAGNIEZ, W. LIBERSON, and A. PLICHET (Presse méd., 1938, 46, 1465—1468).—Electro-encephalograms were recorded in 33 epileptic subjects. Electrical crises



consisting of abnormally rapid waves of increased voltage replacing the alpha waves sometimes announced a fit or an attack of petit mal but would occasionally occur without any accompanying clinical manifestation. Apart from such transitory crises these patients showed normal electro-encephalograms. Constantly abnormal curves with alpha waves of low frequency (less than 8 per sec.) were found in a group consisting of the severest cases that were least amenable to treatment. G. SCH.

**Brilliant-vital-red as an anticonvulsant in treatment of epilepsy.** R. OSGOOD and L. J. ROBINSON (Arch. Neurol. Psychiat., Chicago, 1938, 40, 1178—1204).—Brilliant-vital-red diminished the no. and severity of epileptic attacks in 6 of 13 cases tested. It tended to be more effective in petit mal than in grand mal. A. M. B.

**Anticonvulsive action of vital dyes.** S. COBB, M. E. COHEN, and J. NEY (Arch. Neurol. Psychiat., Chicago, 1938, 40, 1156—1177).—Neutral-red and brilliant-vital-red seem to show anticonvulsive action when tested on experimental animals and in cases of human epilepsy. A. M. B.

**Effect of tetracor [pentamethylenetetrazole] and *p*-methyltetracor [on the central nervous system].** B. ISSEKUTZ (Magyar Orv. Arch., 1938, 39, 582—597).—*p*-Methyltetracor has a stimulating effect on the central nervous system 10—16 times that of tetracor. For rapid injections the lethal dose is 8 times that producing convulsions. Subcutaneous injection of *p*-methyltetracor and tetracor has one fifth the effect of intravenous injection, and the lethal dose is much nearer that producing convulsions. Both compounds are excreted at the rate of 20—25% per hr. The therapeutic administration of the drugs in the treatment of schizophrenia and paralysis of the respiratory and vasomotor centres is discussed. A. W. M.

**Variations of glycaemia due to injection of pentamethylenetetrazole in schizophrenics.** P. CLEMENS (J. belge Neurol. Psychiat., 1938, 38, 357—365).—Determination of blood-sugar in 30 schizophrenics under cardiazol treatment showed that the hyperglycaemia occurred before, and was independent of, the epileptiform convulsion. There were associated autonomic disturbances and the conclusion reached is that the hyperglycaemia had a sympathetic origin. W. K. S.

**Case of marantic intracranial venous sinus thrombosis.** K. FREMMING and K. WINTHER (Acta Psychiat. Neurol., 1938, 13, 271—280).—A case of marantic sinus thrombosis is described in which there were signs of increased intracranial pressure and psychotic symptoms. W. M. H.

**Physiochemical properties of brain, especially in senile dementia and cerebral oedema.** L. ALEXANDER and J. M. LOONEY (Arch. Neurol. Psychiat., Chicago, 1938, 40, 877—902).—Atrophy or oedema of the brain can be measured only in terms of the relationship between skull capacity and brain vol. These pathological states are not correlated with alterations in the water content of either grey

or white matter. The average water content of grey matter is 85%, of white matter 70%. A. M. B.

**Donaggio's reaction and changes in the blood picture following stimulation of the pituitary.** D. ZANELLO (Boll. Soc. ital. Biol. sperim., 1938, 13, 1077—1079; cf. A., 1939, III, 130).—Stimulation of the autonomic nervous centre (via the nasal mucous membrane) in man is followed by a positive Donaggio's reaction (cf. A., 1937, III, 170) in the urine and changes (e.g., leucopenia, lymphocytosis) in the blood picture. F. O. H.

**Effect of  $p_{H_2}$  on Donaggio's reaction.** G. OGGIONI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1081—1083).—Donaggio's reaction (A., 1937, III, 170) in the urine of mental patients occurred independently of changes in urinary  $p_{H_2}$ . F. O. H.

**Urea content of cerebrospinal fluid (C.S.F.) in various degrees of circulatory insufficiency.** M. L. AVIOSOR (J. Méd. Ukrain., 1938, 8, 1159—1168).—The urea content of C.S.F. is generally less than that of blood or ascitic fluid; exceptionally, in certain cases of circulatory insufficiency, it may exceed the blood val. In most cases blood- and C.S.F.-urea run parallel. C.S.F.-urea continues to rise after death from heart failure. The urea/non-protein-N quotient of C.S.F. falls in the early stages of cardiac insufficiency, rising again in the terminal stages. The highest vals. for C.S.F.-urea were found in heart disease complicated by impairment of renal function. High C.S.F.-urea was found in endocarditis, and is ascribed to breakdown of C.S.F.-albumin. R. T.

**Specific factor in extracts of the choroid plexus influencing the permeability of the myelencephalic roof.** H. COHEN and S. DAVIES (Nature, 1939, 143, 285).—Extracts of the choroid plexus of the rabbit, dog, cow, sheep, and guinea-pig contain a factor with the following properties: (1) it increases intradermal spread of dyes, and is species-sp.; (2) stale extracts are less potent than fresh; (3) it influences permeability of the membranous area of the myelencephalic roof in the chick embryo. W. F. F.

**Metabolic explanation for irritation and coma produced by rise in intracranial pressure.** K. C. DIXON (Nature, 1939, 143, 380).—Measurements of metabolism of human brain cortex are reported, and the results related to intracranial pressure changes and convulsive states. W. F. F.

**Buffer properties of nervous tissue.** V. V. KOVALSKI (Trans. Conf. Med. Biol., 1937, 82—86, 269—270).—The buffering capacity of nerve tissue rises in the series: starfish, skate, haddock, cod, carp, frog, turtle, pigeon, siskin, hedgehog; this order corresponds with that of the position of these animals in the phylogenetic scale. The results for different mammalian species are diversified, but in general buffering capacity falls with higher phylogenetic development; this is ascribed to increasing efficiency of the blood-brain barrier. The buffering capacity of nerve tissue is less than that of blood, and is less variable; that of grey matter exceeds that of white matter. R. T.



**Tyrosine and tryptophan contents of brain-protein in vertebrates.** S. KAPLANSKI, V. BOROVSKAJA, and A. BUDANOVA. **II. Cystine content of the protein.** V. BOROVSKAJA and A. TUSTANOVSKI. **III. Phenylalanine content of the protein.** V. BOROVSKAJA and N. BOLDIREVA (Arch. Sci. biol. U.S.S.R., 1935, 37, 485—489).—I. Tyrosine (4.2—4.6%) and tryptophan (1.3—1.6%) contents in brain-proteins of man, cow, dog, rabbit, sheep, mouse, frog, and fish were approx. the same.

**II. The cystine contents (1.10—1.34%) of brains of these species were also similar.**

**III. Phenylalanine contents of grey and white matter were 4.47—4.78 and 3.75—3.97% respectively.**

CH. ABS. (p)

**Function of nervous system and oxidations occurring in it.** G. MANSFELD (Magyar Orv. Arch., 1938, 39, 626—637).—The concn. of narcotic which paralyses the isolated frog's spinal cord does not affect its oxidation processes; with concns. 10—20 times greater oxidation is depressed. Deep narcosis does not affect the  $O_2$  consumption of a rabbit brain. Acetylcholine formation is unaffected by narcosis.

A. W. M.

**Mechanism of oxidation in the nervous system.** S. HUSZÁK (Magyar Orv. Arch., 1938, 39, 578—581).—The mechanism of oxidation in the cortex, central grey mass, and sensory ganglia corresponds with the Fe-containing catalytic system of Warburg and Keilin (A., 1929, 470).

A. W. M.

**Structure and terminations of the autonomic nervous system.** P. STÖHR, jun. (Klin. Woch., 1939, 18, 41—42).—A review.

E. M. J.

**Innervation of the glomus aorticum and paraganglion (Palme).** M. WATANABE (Folia endocrin. japon., 1938, 14, 49—51).—The glomus aorticum lies in a plexus formed by the depressor nerve and fibres from the sympathetic trunk; the depressor nerve fibres do not usually enter the glomus. The paraganglion aort. supracard. sup. (Palme) has a capsule which sends septa into the ganglion, separating several cell groups. The fibres from the cardiac plexus form capsular and intranodal plexuses. The nerve fibres in all the plexuses mentioned are thin or medium sized; the ganglion Palme does not receive sensory vagus fibres.

E. M. J.

**Parasympathetic "trophic" fibres in the trigeminal nerve.** S. MOTEGI (Klin. Woch., 1939, 18, 25).—Anatomical evidence is presented.

E. M. J.

**Alteration of resting potential of skeletal muscle during selective stimulation of autonomic nerve fibres.** H. MIES (Z. Biol., 1939, 99, 372—378).—The effect of selective stimulation of sympathetic and parasympathetic fibres on the demarcation potential of frog and rabbit muscle was studied. In frog muscle stimulation of adrenergic fibres of the sciatic nerve with sine wave currents, at 0.1—0.125 cycle per sec., caused a reduction of the injury potential without visible motor effect. Higher frequencies of stimulation were used to excite cholinergic fibres, but were usually ineffective, unless the threshold of the motor fibres was exceeded. In

rabbits, red muscles seem to be supplied mainly by adrenergic, white muscles by cholinergic, fibres.

B. K.

**Modification of chronaxie of motor nerves following sympathectomy.** M. LAPICQUE (Compt. rend. Soc. Biol., 1938, 129, 727—730).—Sympathectomy in the frog produces a temporary elevation of the chronaxie in the sciatic nerve. The duration of the elevation is dependent on the amount of pain suffered during the operation.

P. C. W.

**Effects of the stimulation of the cervical sympathetic on the position of the rabbit's ear.** G. M. LIBELLI (Arch. Fisiol., 1938, 38, 353—372).—Stimulation of the cervical sympathetic or of the superior cervical ganglion changes the position of the ear on the corresponding side. These effects are obtained under light ether narcosis or after curare and are independent of the accompanying vasomotor changes (which may be either dilatation or constriction).

S. O.

**Changes in the position of the auricle of the rabbit's ear due to stimulation of the cervical sympathetic nerve and their independence of vasomotor phenomena.** G. M. LIBELLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 10—12).

F. O. H.

**Far-fetched theories of the functional rôle of acetylcholine.** L. LAPICQUE (Compt. rend. Soc. Biol., 1939, 130, 3—6).—In criticism of certain recent papers it is pointed out that eserine has other actions besides its inhibition of acetylcholine breakdown.

P. C. W.

**Comparison of acetylcholine yield from frog's central nervous system on extraction with alcoholic hydrogen chloride and trichloroacetic acid, and on boiling.** O. LOEWI and H. HELLAUER (Pflüger's Archiv, 1938, 40, 449—457).—Trichloroacetic acid extracts contain twice as much acetylcholine as HCl-alcohol extracts. HCl-alcohol extracts all the acetylcholine from the central nervous system, but only part of it passes into the Ringer's solution in which it is assayed (leech). Acetylcholine is slowly decomposed in eserinated Ringer extracts of the central nervous system owing to its high esterase content. When the extract is boiled, the esterase is destroyed and decomp. of acetylcholine no longer occurs.

J. M. R.

**Pigments and secretion of chemical transmitter in sympathetic ganglia.** E. HERZOG (Beitr. path. Anat., 1938, 101, 390—409).—Mainly a crit. review. The pigment of the nerve cells of the sympathetic ganglia is present in 3 forms which probably interchange during cell activity: (1) a faintly yellow pigment which cannot be stained, (2) lipofuscin, and (3) melanin. The intramural ganglia contain lipofuscin only. No morphological basis was found for the secretion of acetylcholine, which, in particular, cannot be related to changes in the pigments.

H. W. K.

**Acetylcholine formation by tissues.** B. B. DIKSHIT (Quart. J. Exp. Physiol., 1938, 28, 243—251).—All isolated tissues of the dog containing nerve cells form acetylcholine when suspended in warm



eserinated Locke's solution and oxygenated for 5 hr. Plain muscle does not produce acetylcholine. The production of acetylcholine by the gastro-intestinal tract and the bladder is due to nerve plexuses. The production of acetylcholine by the auricle is 10 times that by the ventricle and is explained by the proportion of nerve cells in these tissues (cf. A., 1938, III, 825). T. S. G. J.

**Mechanism of precocious nerve block in the synapses following preganglionic nerve section.** P. CHANCHARD (Compt. rend. Soc. Biol., 1939, 130, 45—47).—Following section of a preganglionic or motor nerve fibre the distal portion becomes inexcitable before degeneration has occurred. This is due to increased chronaxie of the post-ganglionic fibre and muscle respectively. By applications of agents (adrenaline, eserine, acetylcholine, pilocarpine) which lower the chronaxie to normal, excitability can be re-established. P. C. W.

### (x) SENSE ORGANS.

**Transplants of eyes in adult fishes; effect on chromatophores.** J. SZEPSSENWOL (Rev. Soc. argent. Biol., 1938, 14, 347—349).—Extirpation of one eye in adult *Fitzroya lineata*, Günther, produced a slight darkening on the 2nd day, but the chromatophores reacted normally to light. Extirpation of both eyes produced darkening that began 20 min. after the operation and reached its peak on the 2nd or 3rd day; there was no reaction to light. Section of the optic nerve, leaving the eye in the orbit, or transplantation of the eye to the other orbit produced darkening but less marked than that of blind fishes; a certain capacity for reacting to light remained. The experiments indicate that besides the reflex control of chromatophores through the optic pathway, the eye exercises a humoral control over the pigment cells. J. T. L.

**Orientation of *Brachionus pala*, Ehrenberg, to two light-sources.** G. VIAUD (Compt. rend. Soc. Biol., 1938, 129, 1177—1178, 1178—1180). P. C. W.

**Fluid equilibrium of the body and its relation to the eye.** J. D. ROBERTSON (Brit. J. Ophthal., 1939, 23, 106—124).—The intra-ocular pressure, as measured with the Schiötz tonometer in man, was normal in cases of nephritis with low blood-protein, and was const. in nephrosis during recovery of the blood-protein. 30% NaCl injected intravenously lowered the blood-haemoglobin concn. transiently, and recovery was complete in about  $\frac{1}{2}$  hr., but it depressed the intra-ocular pressure, the effect reaching a max. at 1 hr. and then persisting. It produced a similar depression of the rate of gastric secretion in the cat receiving continuous histamine administration. 50% glucose, which dehydrated the general body tissues similarly, did not alter the intra-ocular pressure or the rate of gastric secretion. The formation of aqueous humour, as reflected in the intra-ocular tension, thus contrasts in behaviour with the filtration process of tissue fluid formation, but agrees with the behaviour of gastric secretion. E. E. P.

**Cataract associated with hereditary retinal lesion in rats.** M. C. BOURNE, D. A. CAMPBELL, and M. PYKE (Brit. J. Ophthal., 1938, 22, 608—613).—Cataracts started to form at an age of several months, a thickening of the anterior capsule of the lens occurring at about this time. The cataract developed in most of the rats showing the retinal degeneration. Various possible causes were excluded. E. E. P.

**Effect of dinitrophenol on production of cataracts by lactose.** W. E. BORLEY and M. L. TAINTER (Amer. J. Ophthal., 1938, 21, 1091—1098).—Dinitrophenol did not influence the rate of formation of cataracts in response to lactose feeding in rats. E. E. P.

**Section of posterior ciliary arteries in the rabbit.** J. V. V. NICHOLLS (Brit. J. Ophthal., 1938, 22, 672—687).—Section of about  $\frac{3}{4}$  of the arteries often produced pigmentary degeneration in the equatorial region of the retina in young rabbits. The operative procedure also damaged the ciliary nerves. Rods and cones degenerated equally rapidly, the nuclei being affected late. The appearances are in contrast with those in retinitis pigmentosa in man and rat. E. E. P.

**Direct perception of pigment in the nerve tissue of human retina.** D. KEELIN and E. L. SMITH (Nature, 1939, 143, 333).—In spectroscopic investigation, the almost invariable presence of two diffuse absorption bands lying at about 495 m $\mu$ . and 455 m $\mu$ . is said to be due to pigment in the nerve tissue in front of the cones of the fovea centralis. The pigment is thought to be a flavin or a carotenoid compound. W. F. F.

**Ocular manifestations of alcohol.** W. H. POWELL (J. Aviation Med., 1938, 9, 97—103).—4 drinks each of 45 c.c. of 100-proof rye whiskey were administered at hourly intervals to 7 subjects, after dinner, with the following results: some decrease in visual acuity; definite tendency to esophoria at 6 m.; exophoria at 33 cm.; gradual decrease in angle of convergence. The manifestations were variable in extent in the different subjects, not evident until the later stages, and passed off within a few hr. W. F. F.

**Hereditary degeneration of the rat retina.** M. C. BOURNE, D. A. CAMPBELL, and K. TANSLEY (Brit. J. Ophthal., 1938, 22, 613—623).—The degeneration was transmitted as a Mendelian recessive, and started as a degeneration of rod nuclei, unassociated with evidence of vascular disease. The condition is compared with retinitis pigmentosa in man. E. E. P.

**Hemeralopia in thyrotoxicosis and diseases of the liver.** K. H. ZAFFKE (Dtsch. Arch. klin. Med., 1939, 183, 433—447).—Dark-adaptation was determined with Birch and Hirschfeld's apparatus. Disturbances of dark-adaptation are an early symptom of vitamin-A deficiency. All patients with thyrotoxicosis showed hemeralopia. Disturbances of dark-adaptation were also found in cases of liver disease. The thyrotoxic hemeralopia is attributed to -A deficiency following thyrotoxic liver damage. A. S.



**Colour-blindness in a family.** A. M. VIANNA (Ann. Oculist., Paris, 1938, 175, 901—910).—A genealogy of four generations includes a marriage between colour-blind cousins producing 2 sons and 5 daughters, all colour-blind. The method and results of testing are described. E. E. P.

**Comparative anatomy of the ganglion cells associated with the vertebrate inner ear sensory areas.** J. K. WESTON (J. Anat., Lond., 1939, 73, 263—288).—The inner ear of a large no. of different species of vertebrates was investigated to determine the positions of the ganglion cells related to each of the inner ear sensory areas, and to examine the relationships of the ganglion cells associated with the perilymphatic (organ of Corti type) sensory areas as compared with those associated with the endolymphatic (crista and macula type) areas. The findings are fully summarised. E. E. H.

**Modifications of vestibular chronaxie in rabbits under the influence of alcohol.** M. BRUN (Encéphale, 1938, 33, 46—60).—In 6 rabbits after administration of varying doses of alcohol, the vestibular chronaxie showed first a progressive augmentation followed by a progressive diminution to the original level; the latter had no relation to the duration of narcosis. W. K. S.

#### (xi) DUCTLESS GLANDS, EXCLUDING GONADS.

**Pituitary and blood.** A. S. PARODI (Thesis, Buenos Aires, 1937, 107 pp.).—The subject is thoroughly reviewed. The main original points are: increased rate of blood cell sedimentation in hypophysectomised puppies; globular resistance of hypophysectomised dogs is increased; in hypophysectomised rats there is leucopenia, a lower red cell count (—8%) and hæmoglobin (—10%). In the toad (*Bufo arenarum*) removal of the pituitary, or of its anterior lobe only, is also followed by a decrease of the white and red cells and hæmoglobin; this is improved by injection of extracts of toad's anterior lobe. (B.)

**Inhibition of sexual cycle in *Rana temporaria* following hypophysectomy.** L. GALLIEN (Compt. rend. Soc. Biol., 1938, 129, 1043—1045).—Hypophysectomy in the spring does not interfere with the elimination of spermatogenic material but inhibits pre-spermatogenesis and spermatogenesis. The testes in September weigh 10—15 mg. instead of 250—400 mg. and are infantile in appearance. P. C. W.

**Action of insulin and anterior pituitary extract in normal and hypophysectomised rats.** J. A. RUSSELL (Amer. J. Physiol., 1938, 124, 774—790).—The sensitivity to insulin of the starved (24 hr.) hypophysectomised rat is increased 30 times over that of the normal starved rat. This increased sensitivity is far greater than that observed after adrenal demedullation.  $O_2$  consumption of starved hypophysectomised rats was profoundly reduced by very small doses of insulin. Insulin raises the R.Q. and decreases muscle-glycogen in both normal and hypophysectomised rats; these changes are prevented by adrenal-demedullation. In normal rats given glucose, insulin raises muscle-glycogen at the expense

of liver-glycogen and blood-sugar, but does not affect  $O_2$  consumption. Glucose-fed hypophysectomised rats are only moderately more sensitive to insulin than normal rats similarly treated;  $O_2$  consumption of such animals is progressively lowered by increasing doses of insulin; there is a parallel fall in R.Q. Alkaline extract of anterior pituitary in appropriate dosage prevents the hypoglycæmic action of insulin in both normal and hypophysectomised rats but spontaneous hypoglycæmia in the latter is not affected. This extract prevents completely the fall in  $O_2$  consumption produced by insulin in hypophysectomised rats. M. W. G.

**Hormonal control of urine secretion in the toad.** R. Q. PASQUALINI (Thesis, Buenos Aires, 1938, 117 pp.).—Complete removal of the pituitary in the toad (*Bufo arenarum*) produces, from the 2nd day, a marked and persistent polyuria in 70% of the animals, which is prevented by injection of posterior lobe extracts, even after destruction of the spinal cord. The inulin clearance is the same in both normal and pituitrin-treated (oliguric) animals, showing that the extracts act on tubular reabsorption; although the glomerular circulation may be temporarily decreased by the extracts, the oliguria always lasts much longer. The anterior pituitary has no influence on the diuresis. Lesions of the infundibulum and tuber cause only a transient polyuria. (B.) S. O.

**Anterior pituitary in culture.** P. J. GAILLARD (Arch. exp. Zellforsch., 1938, 22, 65—67).—Growth was best when the medium contained plasma from adult dogs, and better than when the medium contained embryonic extract. This difference was seen in both morphological and histological details.

R. J. O'C.

**Anterior pituitary and metabolism.** M. REISS (Klin. Woch., 1939, 18, 57—58).—A review.

E. M. J.

**Adiposo-genital syndrome and epilepsy.** A. RADOVICI and R. PAPAZIAN (Bull. Soc. méd. Hôp. Bucarest, 1938, 20, 316—320).—Anterior pituitary disease with epilepsy occurred in a boy aged 12 years.

C. A. K.

**The  $r_H$  of some hormones.** H. HANDOVSKY and L. HAUSS (Bull. Soc. Chim. biol., 1939, 21, 112—114).—The polarographic curve of the aq. extract of the anterior lobe of the pituitary shows three inflexions of  $r_H$  —0.23, —1.00, and —1.65 v. Preps. having only gonadotropic and thyrotropic activity have  $r_H$  —0.23 and —1.56 v. respectively. Extracts of the posterior lobe possessing only ocytotoxic or hypertensive activity respectively have  $r_H$  —1.00 v. A. L.

**Effects of formalin on thyroid-stimulating and gonadotropic hormones of cattle anterior pituitary glands.** S. J. HAYWARD, J. H. POLLOCK, and L. LOEB (Amer. J. Physiol., 1939, 125, 113—118).—Single anterior pituitary glands were immersed in formalin solution for 3—7 days and then implanted in fractions in guinea-pigs; the atresin and luteinisation effects are annulled but full maturation of the follicles is produced instead. The effects of thyroid-stimulating hormone are abolished by formalin. The untreated anterior pituitary gland produces slight or



no enlargement of the uterus or proliferation in vagina, cervix, and mammary glands; the implantation of the formalin-treated gland produces full heat changes in these organs. The  $p_H$  at which formalin acts is important; the optimum is at  $p_H$  4 and  $p_H$  6. M. W. G.

**Pituitary control of creatine and creatinine excretion.** I. SCHREIBER and E. P. SHARPEY-SCHAFER (Clin. Sci., 1938, 3, 369—376).—In normal men, thyrotropic extract increases the urinary creatine by stimulating the thyroid. Gonadotropic pituitary extract increases creatinine excretion without affecting urinary creatine. Urinary and serum gonadotropic and growth extracts are without effect on the excretion of either. Their excretion in acromegaly is discussed. B. McA.

**Inter-relations between pituitary and thyroid.** J. REFORZO MEMBRIVES (Thesis, Buenos Aires, 1938, 184 pp.).—The thyrotropic action of the anterior pituitary was confirmed and work of Houssay's laboratory extended. As regards the action of the thyroid on the pituitary, the increase in wt. of the latter, decrease of eosinophil (25% of normal after 30 days), increase of basophil cells (300% of normal after 20 days) and colloid material of the anterior lobe after thyroidectomy were confirmed on male rats (94 thyroidectomised, 131 normal controls). Increased wt. of the pituitary after thyroidectomy was found in a small no. of dogs, guinea-pigs, and toads. If dried thyroid is given *per os*, the pituitary does not increase in wt., or only slightly, after thyroidectomy. The thyrotropic and gonadotropic activities of pituitaries from thyroidectomised animals are markedly decreased (i.e., no luteinisation of immature ovaries is produced); thyroid feeding increases the gonadotropic activity but does not affect, or even lowers still more, the thyrotropic activity of those pituitaries. The subject is thoroughly reviewed. (B.) S. O.

**Mechanism of the anti-insulin activity of aqueous-glycerol extracts of anterior pituitary gland.** G. BARENGHI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1139—1140).—The difference between venous and (the lower) capillary blood-sugar in man following ingestion of glucose partly or wholly disappears if anterior pituitary prep. is injected 30 min. before ingestion of the glucose. The pituitary prep. probably acts antagonistically to the insulin liberated into the circulation by the glucose. F. O. H.

**Hyperostosis frontalis interna and pituitary diabetes.** H. BARTELEMEYER (Wien. med. Wschr., 1939, 89, 341—343).—A woman suffered from Stewart-Morel syndrome. The diabetes mellitus is attributed to hyperactivity of the anterior pituitary. A. S.

**Anterior lobe of the hypophysis, and experimental gigantism.** A. A. VOITKEVITSCH (Trans. Conf. Med. Biol., 1937, 33—38, 258).—Implantation of the "eosinophilic zone" of anterior pituitary causes retardation of metamorphosis and gigantism in tadpoles; the opposite effects are obtained with the "basophilic zone." It is concluded that the eosinophilic cells are responsible for production of growth hormone, and the basophilic cells for that of thyrotropic hormone. R. T.

**Effect of continued treatment with anterior pituitary extracts on milk volume and milk-fat production in the lactating cow.** S. J. FOLLEY and F. G. YOUNG (Biochem. J., 1939, 33, 192—197; cf. A., 1939, III, 48).—Repeated injection of prolactin into cows results in a more pronounced increase of milk yield than does injection of thyrotropic hormone, but in neither case does the increase continue indefinitely even with prolonged treatment. Prolactin causes an increase in milk-fat content. These phenomena cannot be ascribed to the action of a single substance. P. G. M.

**Lactogen content of pituitary gland of lactating rat.** R. P. REEVE, I. L. HATHAWAY, and H. P. DAVIS (J. Dairy Sci., 1939, 22, 1—5).—The glands contained 51 hr. after parturition 10.5, 16 days 9.6, and 23 days 8.3 bird units per gland. The lactogenic hormone plays no part in determining the height of the lactation curve but may be a factor in determining the rate of decline of milk production. W. L. D.

**Action of prolan on nitrogen metabolism.** K. MORIOKA (Folia endocrin. japon., 1938, 14, 69—71).—Injection of prolan obtained from the urine of pregnant women inhibits the N metabolism in normal or castrated white rats. E. M. J.

**Gonadotropic hormone: clinical application of extraction methods for assay purposes.** C. G. HELLER and E. J. HELLER (Endocrinol., 1939, 24, 319—325).—Pptn. by alcohol-ether was found to give better results than by tannic acid, and the final product was made less toxic if salts were removed by dialysis. V. J. W.

**Activation of gonadotropic hormone by ascorbic acid.** B. GIEDOSZ (Klin. Woch., 1939, 18, 63).—Daily injection of 1.05 g. of ascorbic acid for 3 days increases the activity of gonadotropic substance or of urine from pregnant women on the ovaries and uterus of rabbits. E. M. J.

**Anti-gonadotropic action of carcinoma serum.** W. RODEWALD (Klin. Woch., 1939, 18, 26).—Sera of patients with malignant disease diminish the action of gonadotropic pituitary extracts on the mouse ovary; injected alone they slightly further its development. E. M. J.

**Vagus-post-pituitary reflex. IV. Determination of its pathways; hypothalamic sympathetic mechanism.** J. J. HUANG. V. Secretory cells of pars nervosa. K. J. WANG (Chinese J. Physiol., 1938, 13, 367—382; 405—410).—IV. In dogs with the spinal cord crushed in the neck, a rise of arterial pressure occurred on stimulation of points in the anterior and posterior hypothalamus, particularly the supraoptic region; on removing the pituitary or crushing its stalk these responses and those to stimulating the central end of the vagus were abolished. The responses were slow; in the intact animal they are rapid. By cauterisation in different places, it was found that the vagus reflexes travelled to the pituitary via the supraoptic region and the supraoptic-hypophyseal tract.

V. The pars nervosa of dogs was fixed in 10% formalin and stained by the Penfield modification of the del Rio-Hortega  $Ag_2CO_3$  method. In the resting



gland, or after afferent sympathetic stimulation, the pituicytes had long processes ending on the walls of blood-vessels and contained granules. After afferent vagus stimulation, the processes and granules were fewer. N. H.

**Action of pituitary extracts on the colon of the cat.** F. R. STEGGERDA, C. GIANTURCO, and H. E. ESSEX (Amer. J. Physiol., 1938, 123, 400—403).—The colon in cats was made opaque to Roentgen rays with  $\text{ThO}_2$ . 0.1 c.c. of pitressin per kg. body-wt. was a subthreshold dose, but 0.2 c.c. caused defecation in a large no. of experiments. Contraction of the colon following pitressin may be secondary to some other disturbance. Pitocin or pituitrin had no effect on colonic response. M. W. G.

**Intravenous administration of post-pituitary extracts for obstetric purposes.** J. HOFBAUER (Amer. J. Obstet. Gynec., 1938, 36, 522—524).—A review of the indications and contra-indications of the use of this method for various obstetric conditions. M. H.

**Prophylactic intravenous injection of posterior pituitary extracts post partum.** J. P. EMMRICH (Münch. med. Wschr., 1939, 86, 329—330). A. S.

**Effect of pituitary extracts on diuresis in the toad.** R. Q. PASQUALINI (Compt. rend. Soc. Biol., 1938, 129, 1240—1241).—Posterior pituitary extracts cause antidiuresis in the toad (10 milliunits). Larger doses (50 milliunits) cause also a wt. increase. The polyuria of hypophysectomised toads can be corr. with these extracts. Anterior lobe extracts do not affect diuresis. Glomerular circulation is only arrested by large doses of posterior lobe extracts and only for some min., while the resulting antidiuresis lasts for hours. P. C. W.

**Thyroid function in diabetes insipidus in the rat.** H. G. SWANN and P. E. JOHNSON (Endocrinol., 1939, 24, 397—403).—Diabetes insipidus caused by removal of the posterior pituitary is only slightly affected by thyroidectomy. Thyroid administration increases the diabetes only if this is already exaggerated by NaCl administration. V. J. W.

**Histology of the pineal gland in normal and castrated horses.** G. ZUDDAS (Boll. Soc. ital. Biol. sperim., 1938, 13, 1153—1155).—Differences are observed which indicate a greater functional activity of the gland in normal than in castrated horses. F. O. H.

**The thymus and its relation to the gonads.** H. CHIODI (Thesis, Buenos Aires, 1938, 157 pp.).—In rats early thymectomy has no effect on growth, endocrine glands, skeleton, or time of appearance of somatic characters even if carried out on 5 successive generations. The course of avitaminoses A and  $B_1$  is not influenced by thymectomy. Injections of thymus extracts (Hanson) in 5 generations were equally ineffective. The shape of the curve of development and involution of the thymus is not affected by prepubertal castration but the parenchyma of the gland becomes hypertrophied. Injection of male or female sex hormones produces an atrophy of the thymus of both normal and castrated animals. (B.) S. O.

**Effect of castration before puberty on the thymus.** H. CHIODI (Compt. rend. Soc. Biol., 1938, 129, 866—868).—The thymus gland in young rats following castration is heavier than in controls. The curve of growth and involution runs parallel to the normal. P. C. W.

**Effect of toxic agents on the thymus in the adrenalectomised animal.** C. P. LEBLOND and G. SEGAL (Compt. rend. Soc. Biol., 1938, 129, 838—840).—Colchicine and X-irradiation of the abdomen only produce slight pyknosis of the thymocytes in the adrenalectomised rat. The reduction in wt. of the thymus is also slight and only apparent 4 days after operation. P. C. W.

**Thymo-pancreatic synergism.** E. SARTORI (Boll. Soc. ital. Biol. sperim., 1939, 14, 17—19).—The hypoglycæmic action of insulin (approx. 0.3 unit per kg.) in a child of 5 months suffering from hypertrophy of the thymus gland was much greater (as indicated by blood-sugar and hypoglycæmic syndrome) than that in a normal child. F. O. H.

**Action of extracts of several endocrine glands on the calcium and phosphorus content of skeletal muscle and bone.** H. HAYASHI (Folia endocrin. japon., 1938, 14, 67—69).—2 injections of thymus extract in rabbits in 24 hr. raise the Ca and P content of muscle and bone. Daily injections for a week lower the P content of muscle and bone and the Ca content of muscle, that of bone rising. Injection of splenic extract raises the Ca and P and lowers the water content of bone and muscle. Lymphatic gland extract raises the P content only in these tissues. E. M. J.

**Histophysics of thyroid gland.** C. MANZINI and G. VERARDI (Boll. Soc. ital. Biol. sperim., 1939, 14, 35—37).—Normal thyroid gland (dog, rabbit, guinea-pig, rat, man) has  $p_H$  vals. of 2.22—2.96, 4.00—4.80, and 5.40—5.91 for the nuclear, cytoplasmic, and colloid tissue, respectively; during hypersecretion, the vals. are 2.40—3.30, 4.50—5.50, and 5.00—5.95, respectively. The bearing of the data on observed staining reactions is discussed. F. O. H.

**Structure and activity of the thyroid at various temperatures.** A. A. VOITKEVITSCH (Trans. Conf. Med. Biol., 1937, 29—32, 257).—Exposure of mice, rats, and pigeons to low temp. (2—10°) causes a discharge of colloid and an increase in height of epithelial cells; the opposite changes are found at high temp. (28—30°). Implantation of gland tissue into tadpoles has little effect in the former, as compared with the latter, case. R. T.

**Effect of œstrone and testosterone on experimental hyperthyroidism.** A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1938, 129, 1224—1225).—Intraperitoneal injections of œstrone or testosterone propionate in guinea-pigs did not prevent stimulation of the thyroid by thyrotropic extracts. P. C. W.

**Difluorotyrosine in experimental hyperthyroidism.** A. W. ELMER, B. GIEDOSZ, and M. SCHEPS (Compt. rend. Soc. Biol., 1938, 129, 1225—1226).—Difluorotyrosine *per os* does not inhibit the



stimulation of the guinea-pig thyroid by thyrotropic hormone. The inhibitory effect of di-iodotyrosine must be due to its I content. P. C. W.

**Reduction of calorogenic action of thyroxine by large oestradiol injections.** J. MAHAUX (Compt. rend. Soc. Biol., 1939, 130, 77—80).—Injection of oestradiol benzoate (12,500—25,000 units per day) produces a slight fall in basal metabolism and diminished metabolic response to thyroxine in the rabbit. P. C. W.

**Production of goitre in chickens.** A. R. PATTON, H. S. WILGUS, and G. S. HARSHFIELD (Science, 1939, 89, 162).—A diet containing only 0.145 mg. of I per kg. body-wt. resulted in goitre in White Leghorn chicks. The addition of 5 mg. of I per kg. prevented goitre. W. F. F.

**Blood-iodide. VII. Influence of exertion on blood-iodides in normal and thyrotoxic subjects. VIII. Influence of X-rays on blood-iodides [in thyrotoxicosis]. IX. Post-operative reaction after thyroidectomy.** K. GUTZEIT and G. W. PARADE (Z. klin. Med., 1938, 135, 158—165, 166—171, 172—177).—VII. Normally the blood-I rises after exercise and returns to its original val. in 24 hr. The rise is mainly due to the org. I. In thyrotoxic cases there is little change in total I; org. I remain const. or falls and regains its initial val. in 24 hr.

VIII. The thyroid gland in cases of thyrotoxicosis was irradiated. In patients who improve clinically the org. blood-I falls and the ratio inorg. : org. I approaches normal. In cases which do not react favourably, the blood-I does not fall, and may rise. Org. I increases compared with inorg. I.

IX. 2 cases of post-operative thyroid crisis showed an increase of org. blood-I and in the ratio org. : inorg. I before and after operation, in spite of pre-operative I treatment. E. R.

**Iodine metabolism in exophthalmic goitre.** G. M. CURTIS and I. D. PUPPEL (Ann. Surg., 1938, 108, 574—584).—A study of ten cases with normal controls showed an elevation of blood-I and increased I elimination in urine, faeces, and sweat up to 2 or 3 times normal. I depletion and decreased thyroid gland-I ensue. G. C. K.

**Action of iodine on the thyroid in goitre.** G. LIEBEGOTT (Endokrinol., 1938, 21, 81—92).—1 g. of KI per day was given by mouth to 2 dogs with goitre over 2 periods of 24 and 46 days. Thyroid specimens obtained before and after the KI feed were compared. The thyroid stored colloid under the KI action; the epithelium was flattened. The inorg. I content of the blood increased from 5.3  $\mu\text{g.}\%$  to 181.0 and from 4.0 to 347.0  $\mu\text{g.}\%$ . The basal metabolic rate remained unchanged. A. S.

**Treatment of Graves' disease.** H. DENNIG and K. VEIEL (Med. Klin., 1939, 35, 237—241).—A review. A. S.

**Thyrotoxic crisis and coma.** H. W. BANSI (Dtsch. med. Wschr., 1939, 65, 241—245).—Large doses of I are recommended, in addition to glucose and saline injection, for this condition. A. S.

**Action of thyroid extracts on serum-potassium, -calcium, and -protein.** H. HAYASHI (Folia endocrin. japon., 1938, 14, 54—60).—In rabbits, saline thyroid extract (0.2 mg. of I per kg. body-wt.) lowers serum-K and raises -Ca; twice the dose reverses the action. Small and large doses of colloidal substance have the opposite effect. Extract of epithelial cells lowers serum-K. Thyroxine (0.4 mg. of I per kg. body-wt.) and di-iodotyrosine raise both serum-K and -Ca with increase of K/Ca. Large doses have no effect. Saline extract of the dried acetone residue of anterior pituitary lowers serum-K and -Ca, K/Ca falling. Alcoholic extracts of thyroid gland raise serum-K and lower -Ca. Saline extract of alcoholic residue lowers, and acetone extract raises, -K; saline extract of acetone residue lowers -K and raises -Ca. HCl-alcohol extracts of thyroid gland raise -K in small doses; a large dose lowers -K and raises -Ca. The saline extract of the acid alcohol residue lowers -K and raises -Ca in small doses; a large dose has the reverse result. Urine of patients with Graves' disease lowers -K and raises -Ca. In all the experiments the extracts were injected subcutaneously. E. M. J.

**Vitamin-A deficiency in thyroid disease: its detection by dark-adaptation.** M. G. WOHL and J. B. FELDMAN (Endocrinol., 1939, 24, 389—396).—In 18 out of 20 hyperthyroid patients, and all hypothyroid ones examined, there was marked deficiency of dark-adaptation. V. J. W.

**Thyroid in treatment of menstrual irregularities.** R. C. FOSTER and M. J. THORNTON (Endocrinol., 1939, 24, 383—388).—A no. of patients with painful, scanty, or excessive menstruation were benefited by thyroid treatment. V. J. W.

**Changes of thyroid function during various immunological reactions.** C. PICADO and W. ROTTER (Endokrinol., 1938, 21, 93—98). A. S.

**Tetany in new-born infants (relation to physiological hypoparathyroidism).** H. BAKWIN (J. Pediat., 1939, 14, 1—10).—A physiological hypoparathyroidism occurs in new-born infants. This is indicated by the abrupt fall in serum-Ca within 24 hr. after birth, the low urinary P, and the marked response to  $\text{PO}_4'''$  ingestion. The tetany is not related to vitamin-D deficiency; large doses of -D do not influence the fall in serum-Ca following  $\text{PO}_4'''$  ingestion. Ca salts produce a prompt cure. A second mechanism leading to tetany is excess of phosphate, either released endogenously during the physiological starvation, or, more probably, ingested from without in cow's milk. C. J. C. B.

**The renal lesion in hyperparathyroidism.** W. A. D. ANDERSON (Endocrinol., 1939, 24, 372—378).—In 3 cases of parathyroid tumour with renal calcification, the renal changes were interstitial and the glomeruli and tubules were relatively unaffected. V. J. W.

**Blood-glutathione. IV. Thyroparathyroidectomy and treatment with glutathione.** P. CACCIALANZA (Boll. Soc. ital. Biol. sperim., 1938, 13, 1107—1108; cf. A., 1937, III, 403).—Injection of glutathione in operated dogs increases the lowered



blood-glutathione and alleviates the condition of tetany. F. O. H.

**Tetany and spasmophilia.** W. JAENSCH and H. J. DOERBECKER (Wien. med. Wschr., 1939, 89, 309—321).—Blood-Ca level, chronaxie, and galvanic threshold of motor points are often no indication of the severity of tetany. Chronaxie and galvanic threshold do not change in some cases after administration of Ca and parathormone in spite of clinical improvement. Further lowering of the blood-Ca can occasionally be observed if small doses of parathormone are given in tetany. A. S.

**Rôle of the vagi in carbohydrate metabolism.** II. **Effect of insulin on heart-, liver-, and muscle-glycogen of vagotomised pigeons.** V. ZAGAMI (R.C. Atti Accad. Lincei, 1938, [vi], 27, 249—255; cf. A., 1937, III, 41).—In normal, fasting pigeons, insulin (10—20 units) increases the glycogen content of the heart and diminishes that of liver and muscle; the effects in vagotomised pigeons are similar but the increase of glycogen in the heart and decrease in muscle are less, and the decrease in liver is more, accentuated than in normal pigeons. F. O. H.

**Formation of islets of Langerhans from acinar tissue in castrates.** J. TUSQUES (Compt. rend. Soc. Biol., 1938, 129, 1103—1106).—The formation of islet tissue following gonadectomy in birds is particularly marked and stages in the transformation of acinar into islet tissue can be seen. In guinea-pigs and rabbits the transformation is not so evident. The formation of islet tissue does not account for the great loss of pancreatic wt. P. C. W.

**Influence of insulin on protein metabolism of nephrectomised dogs.** I. A. MIRSKY (Amer. J. Physiol., 1938, 124, 569—575).—The rate of protein catabolism was measured (in dogs under amytaesthesia) by the rate of accumulation of non-protein-N in the blood after bilateral nephrectomy. Observations were made on nephrectomised and eviscerated animals in each case with and without insulin. Intravenous insulin decreases the rate of protein catabolism in nephrectomised dogs, decreases the rate of amino-acid liberation from the muscles of eviscerated dogs, and increases the utilisation of exogenous amino-acids by the muscles of eviscerated dogs. Data suggest that the protein-sparing action of insulin is due to decreased rate of deamination by the liver and an increased rate of amino-acid utilisation by muscles for protein synthesis. M. W. G.

**Action of insulin on glycogen formation from glucose in the normal animal.** C. BRENTANO (Klin. Woch., 1939, 18, 42—46).—The amount of glycogen deposited in the normal rabbit 5 hr. after administration of 10 g. of glucose per kg. body-wt. is increased by 38% in the musculature and diminished by 20% in the liver when 0.5 unit of insulin is simultaneously given per 1 g. of glucose compared with that without insulin. E. M. J.

**Effect of zinc on the iodine-binding power of insulin.** E. H. VOGELZANG (Nature, 1939, 143, 161).—The I-binding power of insulin was measured at  $pH$  7.2 in presence of Ca, Al, Cd, Zn, and Pb. The addition of Zn and Cd (to a smaller degree) decreased

I-binding power, and the magnitude of the effect is related to physiological activity. W. F. F.

**Capillary and venous blood-sugar during hyperinsulinism.** F. GERIOLA and R. MESINA (Boll. Soc. ital. Biol. sperim., 1938, 13, 1137—1139).—In schizophrenics receiving large doses of insulin, the capillary blood-sugar falls to lower levels than does the venous blood-sugar (e.g., 0.035 and 0.07%, respectively). The difference is probably related to liberation of adrenaline and muscle-glycogenesis. F. O. H.

**Fall in respiratory quotient during hypoglycaemia due to insulin.** F. GERIOLA and R. MESINA (Boll. Soc. ital. Biol. sperim., 1938, 13, 1148—1150).—Data for the fall in capillary and venous blood-sugar (to, e.g., 0.014%) and in R.Q. of insulin-treated schizophrenic patients are tabulated and discussed. The fall in R.Q. is accompanied by a fall in  $O_2$  consumption. F. O. H.

**Insulin hypoglycaemia in cancer patients.** R. REDING (Compt. rend. Soc. Biol., 1938, 129, 878—880).—Intramuscular injection of 10 units of insulin in 9 cancer patients caused an average fall in blood-sugar in 1 hr. from 95 to 68 mg.-%. In 7 non-cancer patients the fall was from 99 to 94. The average max. falls were 14 and 32 mg.-% respectively. 5 cancer patients treated by radiotherapy approximated more nearly to normal figures. P. C. W.

**Resistance to insulin in guinea-pigs with experimental sarcomata.** J. LA BARRE and R. LOICQ (Compt. rend. Soc. Biol., 1938, 129, 876—878).—Guinea-pigs with large grafted sarcomata (Daels) show no fall in blood-sugar when injected with insulin (0.2 unit per kg.). The rise in blood-sugar occurring normally after taking blood samples is unaffected. P. C. W.

**Action of insulin in allergic conditions.** W. BRÜHL (Dtsch. med. Wschr., 1939, 65, 326—328).—Severe allergic symptoms (urticaria, skin oedema, allergic eczema) disappeared after repeated intravenous injections of 10 units of insulin. The effect is attributed to a compensatory increase in adrenaline secretion. A. S.

**Adrenal cortex and obesity.** C. BOMSKOV and E. SCHNEIDER (Klin. Woch., 1939, 18, 12—13).—Adrenalectomised rats die either of acute Addison's disease in a few days or of prolonged cachexia in up to 35 days; 50% survive and develop into giant rats with a wt. 50% above normal. This is due to the compensatory hypertrophy of accessory adrenals. All the organs are enveloped in thick fatty capsules. The thyroid gland is (histologically) inactive. E. M. J.

**Salt taste thresholds of normal and adrenalectomised rats.** C. P. RICHTER (Endocrinol., 1939, 24, 367—371).—With free choice normal rats choose water containing not less than 0.05% NaCl rather than pure water. After adrenalectomy this threshold was lowered to 0.003% NaCl. V. J. W.

**Extent of regeneration of the enucleated adrenal gland of the rat as influenced by the amount of capsule left at operation.** D. J. INGLE and G. M. HIGGINS (Endocrinol., 1939, 24, 379—382).—See A., 1939, III, 139. The amount of adrenal



cortex regenerated varies with the amount of capsule left. V. J. W.

**Kidney function in adrenal cortical insufficiency.** I. GERSH and A. GROLLMAN (Amer. J. Physiol., 1939, 125, 66—74).—Histologically the kidneys and liver of rats, cats, and dogs with adrenal cortical insufficiency were unaltered. During marked insufficiency there is a demonstrable increase in the rate of water reabsorption by the renal tubules. In the late stage of insufficiency glomerular filtration is diminished or ceases. No post-pituitary changes were found. M. W. G.

**Variations in sensitivity of arteries in the ovariectomised frog to adrenaline.** F. KARASEK and O. POUPA (Compt. rend. Soc. Biol., 1938, 129, 783—785).—After ovariectomy in frogs the response to adrenaline is diminished by 60% on the third day. By the 11th day the response has returned to normal and becomes supernormal. The same changes occur following the laying of the spawn; if the animal is ovariectomised 20 days later (when the response is again normal) no changes are produced. Anterior pituitary extracts increase the response to adrenaline; the increased response following oestrone injection also takes place in the hypophysectomised frog. The depressor action of testosterone on the adrenaline response is reversed after ovariectomy. P. C. W.

**Adrenaline secretion produced by alkaline-earths.** H. HERMANN, F. JOURDAN, G. MORIN, and J. VIAL (Compt. rend. Soc. Biol., 1938, 129, 843—845).— $\text{CaCl}_2$ ,  $\text{SrCl}_2$  (10—50 mg. per kg.), and  $\text{BaCl}_2$  (2—10 mg. per kg.) provoke secretion of the adrenaline in the chloralosed dog. The action is central and is abolished by denervation of the adrenals.  $\text{MgCl}_2$  has no effect or may reduce adrenaline secretion. P. C. W.

**Inversion of pressor effect of adrenaline [by alcohol].** RAYMOND-HAMET (Compt. rend. Soc. Biol., 1938, 129, 1116—1118).—Injection of 4 ml. of 35% ethyl alcohol in a dog caused a rapid fall of blood pressure with slow recovery. 0.01 mg. of adrenaline injected subsequently produces a rapid fall in blood pressure, a rapid recovery, and a slow secondary fall. P. C. W.

**Inhibition by purines of pressor and respiratory effects of adrenaline.** R. MARTINETTI (Arch. Fisiol., 1938, 38, 389—397).—Caffeine and other purine derivatives inhibit both the pressor effect and the apnoea produced by adrenaline. The pressor effect of pitressin is also inhibited by caffeine. S. O.

**Effect of perfusate of X-rayed frog's leg on adrenals.** B. HASAMA (Pflüger's Archiv, 1938, 240, 165—170).—The perfusate increases the negative potential of the frog's adrenals and puts the retinal pigment in a condition of light-adaptation. The perfusate is said to increase the adrenaline discharge from the glands. J. M. R.

**Respiratory and circulatory changes due to intravenous injection of novocaine together with adrenaline.** R. MARRI (Boll. Soc. ital. Biol. sperim., 1939, 14, 46—48).—Injection of novocaine alone into rabbits increases the amplitude and frequency of respiration; that of novocaine + adrenaline causes

marked disturbances in the respiratory rhythm which are much greater than those due to adrenaline alone, and ultimately cause death (for doses of 60—120 mg. of novocaine per kg.) by respiratory paralysis. F. O. H.

**Changes in adrenaline hypertension due to veronal.** R. MARTINETTI and R. MARRI (Boll. Soc. ital. Biol. sperim., 1939, 14, 48—50).—The changes (which are attributed to diminished sino-carotid reflex activity) in rabbits and cats include reduction in the initial bradycardia, enhanced hypertension, and reduction or abolition of apnoea; the pressure in the right auricle is unaffected. F. O. H.

**Adrenaline and blood-lactic acid: effect of evisceration.** F. R. GRIFFITH, jun., J. E. LOCKWOOD, and F. E. EMERY (Amer. J. Physiol., 1938, 123, 432—440).—The bowel (from the cardiac end of the stomach to the anus), spleen, and pancreas were removed in cats under chloralose anaesthesia. 2 or 3 hr. later adrenaline was infused intravenously (0.001—0.004 mg. per kg. per min. for 5 min.). The blood-lactic acid usually fell. M. W. G.

## (xii) REPRODUCTION.

**Biochemistry of sexual hormones.** L. MAMOLI (Chim. e l'Ind., 1939, 21, 70—74).—A review.

**Fecundity in the mouse.** N. KOBOZIEFF and N. A. POMBRIASKINSKY-KOBOZIEFF (Compt. rend. Soc. Biol., 1939, 130, 39—41).—Litters bred from 1 male and 2 female litter-mates from a lineage giving rise to large litters were consistently larger than those bred from similar mice from a lineage giving small litters. In both cases the litters in  $F_3$  and  $F_4$  were smaller than those in  $F_1$  and  $F_2$ . P. C. W.

**Sterility in the bitch.** A. SCHOTTERER (Z. Zuchtung, 1938, B, 40, 89—95).—A review of the causes of sterility. E. R.

**Rupture of the Graafian follicles. II.** J. T. SMITH and R. C. KETTERINGHAM (Amer. J. Obstet. Gynec., 1938, 36, 453—460).—Histological examination of the ovaries of rabbits, every 2 hr. after an injection of pregnancy urine, showed that the Call and Exner bodies of the follicle walls alter and finally migrate into the follicular fluid, where they disintegrate 8 hr. after the injection. These "bodies" may supply glycogen or a sugar to the follicular fluid, raising the osmotic pressure of the fluid so that the follicle ruptures. When the blood-sugar of the injected rabbits was kept at a low level with insulin, no rupture of the follicles took place. M. H.

**Artificially induced parthenogenetic activities in a human ovum.** S. P. REIMANN and B. J. MILLER (Arch. Path., 1939, 27, 412—418).—Parthenogenetic activities resulting in extrusion of polar bodies and the formation of a deep cleft in the oocyte are described as they occurred in an unfertilised tubal ovum after mechanical stimulation in a medium of human blood serum containing a minute trace of ethyl acetate. H. C. J. C. B.

**Visual stimulation and ovulation in pigeons.** L. H. MATTHEWS (Proc. Roy. Soc., 1939, B, 126, 557—560).—Ovulation occurred in female birds separated



from the male by a sheet of glass, or confined with a female, or alone with a mirror. Visual stimulation therefore produces ovulation. Control experiments show that the ovulation stimulus is not olfactory or auditory. A male confined with a mirror calls and displays to its mirror image. F. B. P.

**Visual pathways concerned in gonadal stimulation in ferrets.** W. E. LEG. CLARK, T. McKEOWN, and S. ZUCKERMAN (Proc. Roy. Soc., 1939, B, 126, 449–468).—Experiments designed to discover the possible nervous pathways through which retinal stimulation may affect the pituitary indicate that the visual response depends on retinal impulses passing either to the ventral nucleus of the lateral geniculate body or to the subthalamus by way of the accessory optic tracts. Results are discussed in relation to views on the exteroceptive stimulation of the pituitary in general, and to the question of pituitary innervation in particular. F. B. P.

**Estrogen content of chicken egg during incubation.** J. RIBOULLEAU (Compt. rend. Soc. Biol., 1938, 129, 1045–1046).—Eggs with male embryo contain the equiv. of 24–28  $\mu$ g. of oestrone; those with female embryo only 12–13  $\mu$ g. Diminution is rapid after the 16th day. P. C. W.

**Cycle of responsivity of castrated albino mice and of human beings to oestrone injection.** E. V. SHUTE (Nature, 1939, 143, 161).—A discussion of results of Duszyńska (A., 1938, III, 1010). W. F. F.

**Estrous cycle [and copulation] in *Lebistes reticulatus* (Petus).** C. J. JASKI (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 201–207).—Successful copulation in this fish requires that the female shall assume an oblique position (head upwards), forming an angle of 30–70° with the horizontal. This elevation is stimulated by 2 processes, (1) a cyclic change in the female (every 4–6 days), which is suppressed by lowering the water temp. from 27° to 22°; (2) a substance secreted into the water by the male. This is probably a sterol (kopulin). C. A. K.

**Persistence of the 4- to 5-day activity cycles in vitamin-A-deficient rats with constant cornification of the vaginal epithelium.** C. P. RICHTER and B. BARELARE, jun. (Endocrinol., 1939, 24, 364–366).—In A- and D-deficiency vaginal cornification is permanent after about 40 days, but cycles of increased running activity occur every 4 days for 50–60 days more. V. J. W.

**Spawning of *Ostrea virginica* at low temperatures.** V. L. LOOSANOFF (Science, 1939, 89, 177–178).—Evidence is adduced opposing the view that eastern oysters do not spawn at sea temp. below 20°. W. F. F.

**Estrogen in birds' feathers.** L. R. CHANTON (Compt. rend. Soc. Biol., 1938, 129, 1047–1049).—An oestrogenic substance is obtained by dissolving the feathers in aq. NaOH and extracting with  $\text{CHCl}_3$ . Tested by the ovariectomised rat's vaginal smear, hen's feathers contain the equiv. of 70–80  $\mu$ g. of oestrone per 100 g., cocks' feathers only 30–35  $\mu$ g. The effect on the uterus is more pronounced than

with oestrone. There is no evidence of progesterone activity. P. C. W.

**Lipæmia and calcæmia in the cock induced by diethylstilbæstrol.** B. ZONDEK and L. MARX (Nature, 1939, 143, 378–379).—An increase of blood-fat from 125 mg. to over 5000 mg. per 100 c.c. was found in the cock after treatment with 24 mg. over a period of 6 days. An increase in blood-Ca from 11 to over 40 mg. occurred. W. F. F.

**Difference of effect between oestrogenic hormones and diethylstilbæstrol.** O. MÜHLBOCK (Nature, 1939, 143, 160–161).—When 0.4  $\mu$ g. of testosterone dissolved in 0.2 c.c. of oil is smeared twice daily, in amounts of 0.1 c.c., for 4 days on the comb of a capon, growth is stimulated, about 15% growth being recorded in 5 days. Suppression of this growth is obtained with simultaneous application of oestradiol and oestrone compounds in suitable doses. No suppression of growth was obtained with doses of diethylstilbæstrol up to 1 mg. per 0.4  $\mu$ g. of testosterone. W. F. F.

**Action of diethylstilbæstrol.** H. KREITMAR and W. STECKMANN (Klin. Woch., 1939, 18, 156–160).—Diethylstilbæstrol, its acetate and propionate produce oestrus in mice in the same dosage as oestrone; in rats they are 5 times as effective by subcutaneous, and 20 times by oral, administration. The duration of action is only prolonged with the esters. The action on the rabbit's uterus is 4 times as strong as that of oestrone. High dosage is well tolerated by the dog (300 mg.); mice succumb to 0.5–1 mg. per g. after 14 days when the genital organs are degenerated in males and females. Antimasculine action was demonstrated in capons. E. M. J.

**Action of stilbæstrol in women.** H. BUSCHBECK and K. HAUSKNECHT (Klin. Woch., 1939, 18, 160–162).—90 women with various gynaecological disorders were treated with diethylstilbæstrol. Menstruation was produced in 4 cases of amenorrhœa by 5  $\times$  5 mg. of stilbæstrol. Vaginal ulcers and pruritus vulvæ cleared up. Menopausal disorders were ameliorated. The side actions were lassitude, feeling of illness, and vomiting. E. M. J.

**Analysis of mechanism of oestrogenic activity.** G. PINCUS and N. T. WERTHESSEN (Proc. Roy. Soc., 1938, B, 126, 330–356).—Comparison with the oestrone standard was made for 4 types of oestrogen and 29 synthetic compounds. On a molar basis (oestrone = 100%) the activity is never above 1.72%, and is usually lower or nil. A chain of reactions *in vivo* may be effected by (or permit participation of) oestrogens. Compounds of widely varying chemical structure can produce vaginal stimulation. More sp. structural configuration is necessary for participation in certain of the uterine reactions; e.g., reactions involving ovum growth are unaffected by certain native hormones which do affect both uterine proliferation and vaginal activity. F. B. P.

**Sex hormones and related substances. XII. Comparison of cinchol with sitosterol and stigmasterol.**—See A., 1939, II, 157.



**Hormonal influences on the excitability of the muscular protoplasm of the rat's uterus.** F. C. KATZENSTEIN and S. SOSKIN (Endocrinol., 1939, 24, 311—318).—Chronaxie of responses to min. electrical stimulation is modified by quinine or pitocin, and they are therefore purely muscular and do not involve the nervous elements. In oestrus, and after injection of oestrogenic hormone or anterior-pituitary-like hormone, chronaxie is lessened, but it is not increased after castration. V. J. W.

**Fibres innervating the uterine musculature. Effect of ergotamine, cocaine, and atropine on the [rabbit] uterus *in situ*.** F. GUERCIO and M. PEZZINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1117—1119).—Cocaine enhances the motor responses to adrena-line or hypogastric stimulation; it probably paralyses inhibitory fibres of the hypogastric nerve. Ergotamine and atropine do not modify the response to hypogastric stimulation; ergotamine occasionally enhances uterine tonus and spontaneous contraction. F. O. H.

**Effect of stimulation of the hypogastric nerve on the rabbit's uterus.** F. GUERCIO and M. PEZZINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1114—1115).—In virgin and pregnant rabbits, stimulation of the hypogastric nerve produces contraction of the uterus, followed by a relaxation, at the beginning of which the uterus is not excitable (indicating presence of inhibitory fibres in the nerve). The contraction, which is independent of the adrenal glands, is inhibited during the uterine spasm produced by injection of pituitary preps. F. O. H.

**Effect of single injection of oestradiol on the uterus of the immature rat.** J. VARANGOT (Compt. rend. Soc. Biol., 1939, 130, 13—15).—0.1 µg. of oestradiol injected into immature rats produced a max. hydration 6 hr. after the injection. The max. wt. increase of the fresh organ was obtained 24 hr. after the injection. 96 hr. later the wt. had returned to normal. P. C. W.

**Uterine adenomata in the rabbit.** H. S. N. GREENE (J. Exp. Med., 1939, 69, 447—468).—Endocrinological changes, which characterise animals with spontaneous adenocarcinoma of the uterus, do not occur when the tumours are transplanted into the anterior chamber or the testicle. Following successful transplantation there is a refractory phase when re-inoculation fails. A similar refractoriness may occur with spontaneous tumours. A. C. F.

**Inactivation of progesterone in the organism.** B. ZONDER (Nature, 1939, 143, 282—283).—Extraction and assay of rat tissue after injection of progesterone showed that the hormone is inactivated in 48 hr. in immature rats, whereas the decidual transformation of the uterine mucosa does not occur until 100 hr. after injection. W. F. F.

**Effect of corpus luteum on hypogastric stimulation of the rabbit's uterus.** F. GUERCIO and M. PEZZINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1119—1120).—Corpus luteum extracts do not reverse the motor effect of hypogastric stimulation; the latent period after excitation of the uterus is increased and the spontaneous contraction reduced. F. O. H.

**Maintenance of pregnancy by progesterone in rabbits castrated on the 11th day.** W. M. ALLEN and G. P. HECKEL (Amer. J. Physiol., 1939, 125, 31—35).—Pregnancy can be maintained to term in rabbits castrated on the 11th day after mating when 2 mg. of progesterone are given daily from 11th to 15th days inclusive and 4 mg. daily from 16th to 28th days inclusive; the uterus and mammary glands were indistinguishable from those of normal pregnancy. M. W. G.

**Relation of the pituitary gland to the menopause.** B. P. WATSON, P. E. SMITH, and R. KURZROK (Amer. J. Obstet. Gynec., 1938, 36, 562—570).—11 patients, aged 25—66 years, were injected (for a varying no. of days) with gonadotropic hormone preps. derived from mare serum or from castrate urine. The total amount of gonadotropic substance given varied between 1100 and 8800 M.U. The injections did not induce the formation of normal follicles but resulted in multiple cysts in the younger ovaries, varying from 5 mm. to 2 cm. in size. In the older ovaries there was no response. The menopause is due to a loss of response on the part of the ovary to gonadotropic hormones. M. H.

**Gonadotropic hormone in urine of women [at the menopause].** C. G. HELLER and E. J. HELLER (J. clin. Invest., 1939, 18, 171—178).—Urine from 66 menopausal patients was assayed for gonadotropic potency. This was not related to symptoms, age, hysterectomy, or uterine involution. No difference in potency was found between menopausal women with symptoms and senile women, castrated women, or menopausal women without symptoms. Urinary gonadotropic concn. was low in women with regular normal menstrual cycles, high in menopausal women in whom cycles had ceased, and intermediate in menopausal women with irregular cycles. Oestrogen treatment alleviated the vasomotor symptoms of 15 menopausal women but failed to reduce concurrently their gonadotropic potency. Continued oestrogen therapy slightly reduced the potency. C. J. C. B.

**Placental transmission of neoarsphenamine in relation to the stage of pregnancy.** F. F. SNYDER and H. SPEERT (Amer. J. Obstet. Gynec., 1938, 36, 579—586).—In rabbit foetuses examined 1 hr. following injection of the mother with neoarsphenamine, no As was detected until the period of viability was approached; in a second series, examined 24 hr. following injection, As was found in the foetus as early as the beginning of the latter half of pregnancy. The average As content of the placenta was 18 times that of a foetus at full term 1 hr. after injection. The fetal portion of the placenta contained 6 times as much As as the maternal portion. Variations in the As content of the placenta could not be correlated with the stage of pregnancy. M. H.

**Nomenclature of gonad-stimulating hormones of placental origin.** E. B. ASTWOOD and R. O. GREIF (Science, 1939, 89, 81).—The name "cyonin" is proposed for all hormones of chorionic origin and of protein nature which act to sustain a female sex hormone balance favourable to the maintenance of pregnancy. W. F. F.



**Period of gestation of *Loris*.** L. NICHOLLS (Nature, 1939, 143, 246).—A period of 174 days was recorded for the species *L. tardigradus grandis* found at a height of 5000—6000 ft. in Ceylon. W. F. F.

**Hyperemesis gravidarum.** M. A. NOVEY and C. L. GOODHAND (Amer. J. Obstet. Gynec., 1938, 36, 486—489).—A study of 87 cases. M. H.

**Weight changes and toxæmia of late pregnancy.** R. S. SIDDALL and H. C. MACK (Amer. J. Obstet. Gynec., 1938, 36, 380—386).—100 patients with toxæmia of late pregnancy had an average gain in wt. of 17 lb. during the last 4 months of pregnancy as compared to 15.7 lb. in normals. The presence or absence of excessive wt. increases bore little or no relationship to the severity or to the type of toxæmia. Sudden wt. increase was more frequent with toxæmia than among normal patients. The occurrence of excessive wt. gains in pregnancy is of doubtful significance in predicting impending toxæmia. M. H.

**The cold pressor test in pregnancy.** W. J. DIECKMANN, H. L. MICHEL, and P. W. WOODRUFF (Amer. J. Obstet. Gynec., 1938, 36, 408—412).—The cold pressor test was used in 152 normal pregnant women. 90 patients showed an increase in systolic pressure of 30 mm. or more; this was considered abnormal. Of these, 15 developed toxæmia and 13 had transient abnormal vascular renal signs. 62 patients gave a normal test; only 2 developed toxæmia and 5 had transient signs. An abnormal reaction to the cold pressor test in a pregnant woman indicates that she may develop a toxæmia in which the hypertension is the predominant finding. An abnormal pituitrin reaction commonly occurs in patients with toxæmia of the pre-eclamptic type. M. H.

**Mammary gland of rhesus monkey under normal and experimental conditions.** S. J. FOLLEY, A. N. GUTHKELCH, and S. ZUCKERMAN (Proc. Roy. Soc., 1939, B, 126, 469—491).—Until ovulation occurs (the first menstrual cycles of the rhesus monkey are usually anovular) the mammary glands grow by proliferation of their ducts. Alveoli do not form until luteinisation occurs. The male mammary gland consists of a simple duct system which does not extend far beyond the base of the nipple. In one otherwise normal male there was gynecomastia with clumps of fully formed alveoli. Injection of male monkeys with œstrone resulted in duct proliferation. Alveolar formation occurred only in 1 of 13 monkeys so treated and no alveoli were present in the 2 animals treated for 368 and 484 days respectively. Of 4 female rhesus monkeys spayed before œstrone injections were begun, 2 showed alveolar formation, and 2 did not. Testosterone propionate stimulates stunted duct development and alveolar formation in male monkeys. There were no carcinomatous changes in the mammary glands of any of the 6 monkeys injected with œstrone for periods between 365 and 938 days. F. B. P.

**Spermatogenesis in the myriapod *Pachyiulus communis*.** N. COLOMBINI (Arch. Fisiol., 1938, 38, 241—250).—The spermatogonia have 22 chromosomes, one of which (chromosome-X) is larger than

the others. There must be another heterochromosome (Y) since the total no. is even. In the prophase of the first maturation division of the spermatocyte the chromosomes conjugate in pairs, 11 double chromosomes being thus formed; later these segment longitudinally during the second division. S. O.

**Artificial insemination in dairy cattle.** C. L. COLE and L. M. WINTERS (J. Dairy Sci., 1939, 22, 107—110).—Bulls produce 4—10 ml. of semen at one ejaculation. Three methods of collecting semen are described, those of massaging and the use of an artificial vagina being preferred. The semen is diluted with an equal vol. of diluting fluid, stored at 7°, then slowly raised to blood heat before use. 0.5 ml. per cow is used for insemination by means of a special pipette which introduces the semen into the cervix. The time of insemination is at the end of œstrus or shortly after. In 121 cows 87% of successful pregnancies were obtained. W. L. D.

**Regeneration of mouse spermatogonia after irradiation.** P. HERTWIG (Arch. exp. Zellforsch., 1938, 22, 68—73).—On the first day after irradiation there is a reduction of the no. of spermatogonia. On the 6th day a min. is reached consisting of 14% of the normal. Recovery is not complete until the 40th day. Recovery is due to repopulation of the tubules by re-formation from clear cells with a dust-like nucleus. R. J. O'C.

**Nerve supply of the testis and interstitial cells.** H. OKKELS and K. SAND (Compt. rend. Soc. Biol., 1938, 129, 807—810).—Cell groups are described in the human testes resembling both Leydig cells and nerve ganglion cells, situated in the interstitial tissue and in intimate contact with the intratesticular nerve supply. P. C. W.

**Build of eunuchs and eunuchoids.** H. GÜNTHER (Endocrinol., 1938, 21, 98—111).—The measurements of various parts of the body of eunuchs are compared. The prolongation of growth after castration before puberty is restricted to the long bones; the spine does not take part in it. A. S.

**Effect of testosterone on genital tract of intersex female mice.** A. RAYNAUD (Compt. rend. Soc. Biol., 1938, 129, 1033—1038).—Testosterone propionate (4—15 mg.) injected in intersex female mice immediately after birth or 4—6 months later causes full development of epididymis, Wolffian duct, seminal vesicles, prostate, and penis. P. C. W.

**Treatment of the menopause with male sex hormone.** L. KURZROK, C. H. BIRNBERG, and S. LIVINGSTON (Endocrinol., 1939, 24, 347—350).—Symptoms can be controlled by the weekly administration of 30—50 mg. of testosterone propionate. V. J. W.

**Treatment of extragenital disturbances with sex hormones.** H. ARNDT (Wien. med. Wschr., 1939, 89, 222—227).—17 men suffering from intermittent claudication, angina pectoris, or Raynaud's disease responded well to prolonged treatment with testosterone propionate. 12 women suffering from menopausal pseudo-angina pectoris, Raynaud's disease, or thyrotoxicosis benefited from administration of androgen. A. S.



**Glaser-Haempel fish test.** (A) E. GLASER and O. HAEMPEL. (B) H. A. MÜLLER (*Endocrinol.*, 1939, 21, 111—130, 130—132).—I. Polemical against the objections raised by H. Müller (*ibid.*, 1937, 18, 251) with regard to the specificity of the Glaser-Haempel fish test of male sex hormones.

II. A reply. A. S.

**Suppressive action of testosterone propionate on menstruation and its effect on vaginal smears.** G. N. PAPANICOLAOU, H. S. RIPLEY, and E. SHORR (*Endocrinol.*, 1939, 24, 339—346; cf. A., 1939, III, 48).—Doses of 25—75 mg. every other day caused amenorrhoea with a menopausal type of vaginal smear. V. J. W.

**Daily excretion of urinary androgens in normal children.** I. T. NATHANSON, L. E. TOWNE, and J. C. AUB (*Endocrinol.*, 1939, 24, 335—338).—Amounts varied, especially in adolescence, but the variations were not cyclical. Excretion increased with age and was higher in boys than in girls. V. J. W.

**Excretion and fate of androgens.** C. D. KOCHAKIAN (*Endocrinol.*, 1939, 24, 331—334).—After injection of various testosterone derivatives into castrate male dogs, only about 0.3% of the original activity could be recovered from the urine, as determined by capon comb tests. V. J. W.

**Stability of testis hormone.** D. R. McCULLAGH (*Endocrinol.*, 1939, 24, 326—330).—Boiling for 15 min. with 5%  $H_2SO_4$  decreases the activity of testosterone by 10% but decreases the activity of testis extract by 50%. V. J. W.

**Effect of testosterone on development of benzpyrene-induced cancer.** J. MAISIN, Y. POURBAIX, and G. RIJCKAERT (*Compt. rend. Soc. Biol.*, 1939, 130, 109—112).—3 groups of 100 mice were treated with benzpyrene, 2 groups receiving simultaneous injections of testosterone propionate (0.01 mg. and 0.1 mg. every 15 days, total dose 0.09 mg. and 0.9 mg.). There was slightly diminished mortality in the testosterone-treated groups and no evidence of increased incidence of cancer compared with the control group. P. C. W.

**Prolonged administration of sex hormones to castrated rats.** V. KORENCHESKY, K. HALL, and M. A. ROSS (*Biochem. J.*, 1939, 32, 213—222).—An increased effect is obtained by prolonged administration of all the male hormones except *trans*-dehydroandrosterone, but only testosterone propionate completely restores atrophied sexual organs. Oestradiol dipropionate shows co-operative activity with testosterone, and antagonistic activity towards androsterone and dehydroandrosterone. Androsterone, alone, does not cause a decrease in body-fat, and even neutralises the effect of oestradiol dipropionate in this respect. The male hormones almost completely neutralise the pituitary hyperplasia produced by oestrogens, whilst they co-operate with the latter in their effect on the involution of the thymus. P. G. M.

**Prostatectomy and rejuvenation.** H. LASSEN (*Arch. klin. Chir.*, 1939, 194, 621—633).—Subcutaneous administration of 1 c.c. of an alcoholic extract of freshly excised prostatic adenoma to male rats weigh-

ing 30—40 kg., for periods of 14 days to 3 weeks, inhibited the development of the prostate and seminal vesicle but had no uniform effect on testicular growth. Doses of testicular hormone annulled this action. It is assumed, as an explanation of clinical rejuvenation after prostatectomy, that the hypertrophic prostate inhibits the generative glands, affecting, by way of the testes, the whole endocrine system. B. W.

**Contractility and survival of isolated human epididymis.** T. MARTINS and J. R. VALLE (*Compt. rend. Soc. Biol.*, 1938, 129, 1152—1155).—Human epididymis placed in oxygenated Locke's solution at 36—38° exhibits slow spontaneous contractions. These are augmented by adrenaline, acetylcholine, nicotine,  $BaCl_2$ , ephedrine, hydrastinine, and histamine but inhibited by spermine, papaverine, and atropine. Yohimbine or ergotamine inhibits or reverses the effects of adrenaline. When kept in Locke's solution at 6° the excitability is maintained 10—20 days. P. C. W.

**Contractility and survival of isolated human vas deferens.** T. MARTINS, J. R. VALLE, and A. PORTO (*Compt. rend. Soc. Biol.*, 1938, 129, 1155—1158).—The reactions are the same as with human epididymis (see preceding abstract). P. C. W.

**Pharmacology of isolated accessory male organs from normal, castrated, and sex hormone-treated rats.** T. MARTINS, J. R. VALLE, and A. PORTO (*Compt. rend. Soc. Biol.*, 1938, 129, 1148—1152).—The excitability of the isolated vas deferens, seminal vesicles, and prostate from castrated or castrated and oestradiol-treated rats is much greater than from normal or castrated and testosterone-treated rats. Ephedrine, adrenaline, muscarine, hydrastinine, and histamine excite contractions. Ephedrine contractions are abolished by yohimbine or ergotamine, muscarine contractions by atropine. P. C. W.

**Effect of spermine and yohimbine on isolated accessory male glands.** T. MARTINS and J. R. VALLE (*Compt. rend. Soc. Biol.*, 1938, 129, 1129—1131).—Yohimbine stimulates contractions in the vas deferens, seminal vesicles, and prostate of the rat, guinea-pig, and monkey (*cebus* and *rhesus*). It reverses the excitatory action of adrenaline. Spermine has an inhibitory effect. P. C. W.

**Pharmacology of vas deferens in *Macacus rhesus*.** T. MARTINS and J. R. VALLE (*Compt. rend. Soc. Biol.*, 1938, 129, 1122—1125).—The vas from normal animals or castrated animals treated with testosterone showed no automatism when isolated in oxygenated Locke's solution; that from castrated animals or castrated animals treated with oestradiol showed clear automatism. Tonus and contractility in the vas deferens from these latter groups were stimulated by acetylcholine, adrenaline, hydrastinine, nicotine, yohimbine,  $BaCl_2$ , ephedrine, and histamine. Eserine, muscarine, and pituitrin had inconst. effects. Atropine, spermine, and papaverine acted as inhibitors. The effects of adrenaline and ephedrine were abolished or reversed after ergotamine or yohimbine. The vas from normal or testosterone-treated castrate animals was much less sensitive to



the drugs. The vas still reacts after being kept in Locke's solution at 6° for 40 days. P. C. W.

**Pharmacology of isolated seminal vesicles of *Macacus rhesus*.** T. MARTINS, J. R. VALLE, and A. PORTO (Compt. rend. Soc. Biol., 1938, 129, 1126—1129).—The effects of drugs were the same as on the vas deferens under similar conditions (see preceding abstract). In general the reactions were less pronounced. P. C. W.

**Effect of sex hormones on contractility of vas deferens.** T. MARTINS and J. R. VALLE (Compt. rend. Soc. Biol., 1939, 130, 189—192).—The contractility and excitability of the isolated cat vas deferens is inhibited by testosterone; it is augmented in the castrated or the castrated oestrone-treated animal. Oestrone sensitises the prep. to pituitrin. Adrenaline inhibits the vas of an oestradiol-treated animal, but has an excitatory action on that from a testosterone-treated animal. P. C. W.

**Progesterone is androgenic.** R. R. GREENE, M. W. BURRILL, and A. C. IVY (Endocrinol., 1939, 24, 351—357).—Very large doses of progesterone given to castrate male rats maintain the size of the prostate and seminal vesicles and cause enlargement of the clitoris in females. V. J. W.

### (xiii) DIGESTIVE SYSTEM.

**Appetite and eating.** G. MARTINO (Boll. Soc. ital. Biol. sperim., 1938, 13, 1073—1074).—Conditioned reflexes associated with enhancement of the excitability of the "food centres" (as compared with more direct reflexes, e.g., of salivation, which become weaker on repetition) are advanced to explain the phenomenon of appetite. F. O. H.

**Effect of sympathetic and chorda stimulation on the composition of the submaxillary saliva.** L. KESZTYÜS and J. MARTIN (Magyar Orv. Arch., 1938, 39, 416—427).—Stimulation of the sympathetic and parasympathetic nerves in dogs decreases the K, Na, Cl', and org. content of saliva in proportion to the amount secreted. The Ca concn. is decreased by stimulation of the sympathetic but not of the chorda tympani. The total concn. of K, Ca, and org. matter after sympathetic stimulation is higher and the Na and Cl' concn. lower than after stimulation of the chorda tympani. This higher concn. is accompanied by higher mucin and albumin contents. Previous sympathetic stimulation does not affect the inorg. but increases the org. content, and decreases the rate of secretion of saliva after chorda tympani stimulation. A. W. M.

**Progress in gastroenterology in 1936 and 1937.** E. S. EMERY (New England J. Med., 1938, 219, 42—59). A. M. G.

**Histology of cells in gastric juice.** W. HAUTH (Dtsch. Arch. klin. Med., 1939, 183, 363—371).—White cells contained in gastric juice are destroyed at  $pH$  below 6.17. Satisfactory specimens of gastric juice cells can be obtained if, during a test meal, all gastric juice is removed and 10 c.c. of a solution containing 5—10 g. of  $NaHCO_3$  in 150 c.c. of water are given through the tube. 10 min. later, the gastric

contents are filtered and centrifuged, and the sediment is stained in the usual way. A. S.

**Changes in gastric secretion and blood count following stomach operations.** G. G. FRAY (Schweiz. med. Wschr., 1939, 69, 174).—16 out of 50 patients with gastrectomy were anæmic. Only one patient showed pernicious anæmia; gastric achylia was present in this patient before the operation. The causes of the anæmia in the 15 patients were recurrent ulcers or malignant growth; 2 patients had intestinal tuberculosis. A. S.

**Effects of partial gastrectomy.** F. BRAUCH (Klin. Woch., 1939, 18, 53—57).—After a Billroth I resection the remaining part of the stomach may regain considerable peristaltic activity. Only sluggish variations in tone occur after a Billroth II resection. The Billroth I stomach is inhibited after administration of oil through a duodenal tube. E. M. J.

**Effects produced in the normal stomach by the ingestion of aluminium hydroxide gel.** J. P. QUIGLEY, I. H. EISEL, and I. MESCHAN (J. Lab. clin. Med., 1939, 24, 485—494).—The administration of  $Al(OH)_3$  gel in massive doses (120 c.c. daily) for 79 days to normal dogs did not affect gastric evacuation time, or the histological structure of gastric tissue; it only transiently reduced the gastric response (of free acid) to histamine. Quantities of gel within the clinical range produce no changes in motility or tone of the stomach or pyloric antrum (balloon records made while the drug was introduced into the stomach or duodenum). C. J. C. B.

**Effect of hæmatoporphyrin on gastric motility.** D. SIMICI (Bull. Soc. méd. Hôp. Bucarest, 1938, 20, 321—324).—Hæmatoporphyrin, given by mouth or intravenously, increased gastric tone and motility in dogs. C. A. K.

**Heat production of pancreas. V. Distribution of secretory fibres of pancreatic nerves.** N. YOSHII (Japan. J. Med. Sci., III, 1938, 5, 381—393).—Vagal and splanchnic nerves are not evenly distributed in the dog's pancreas. The secretory fibres are most dense on the pars epiduodenalis, then on the corpus, pars duodorsalis, and pars lienalis in descending order. The thermopotential of the pars duodorsalis usually falls and rises respectively after stimulation of the left and right splanchnic nerves. The rise in thermopotential is due to stimulation of secretory and the fall to stimulation of vasoconstrictor fibres of the pancreatic nerve. T. F. D.

**Pancreas secretion induced by hydrochloric acid.** H. KUBO, S. KANASUGI, K. KAMAKURA, G. OGIHARA, and K. YOSHIKAWA (Japan. J. Med. Sci., III, 1938, 5, 395—412).—A cannula fixed into the pancreatic duct of dogs enabled the pancreatic secretion produced by injections of dil. HCl in the duodenum to be compared under various conditions. Extirpation of the spleen or section of the splenic nerve caused inhibition of the pancreatic secretion; section of the pancreatic nerve had no effect. The electrical potential of the spleen rises during pancreatic secretion induced by HCl. T. F. D.



**Histochemical study of lipins in the pancreas of reptiles.** C. BIGNARDI (Arch. ital. Anat. Embriol., 1939, 41, 430—446).—Lipin granules (stained by Sudan-black B) are not abundant in the pancreas cells and are mainly localised at their basal ends. Lipin granules are mainly found in islet cells around blood vessels. Lipins are also present in reticulo-endothelial elements of the blood vessels and in fibroblasts. Differentiation of the lipins was not possible. S. O.

**Intestinal absorption of fat in the goose.** G. C. MORANDO and P. MONTALDO (Arch. Fisiol., 1938, 38, 343—352).—The absorption of neutral fat is only slightly impaired after ligation of the pancreatic ducts but is abolished after pancreatectomy. S. O.

**Reabsorption of fat in mesenteric lymph nodes of swine.** O. ROEMMELE (Z. Fleisch-Milchhyg., 1938, 48, 241—242).—Fat pigs were fed for 3 weeks before slaughter with milk and maize meal; animals on wheat bran and water were used as control. The lymph nodes of the maize-fed animals were turgid with creamy matter loaded with fat globules and coloured yellow; those of the control pigs were white and contained a few fat globules only. Fat absorption occurs in that part of the small intestine where the bile salts are active. W. L. D.

**Colonic explants in dogs. Relation of muscular spasm to ulcerative colitis.** R. LIUM and J. PORTER (Arch. intern. Med., 1939, 63, 202—209, 210—225).—Colonic explants were made in dogs, the continuity of the bowel being restored. If constantly protected by dressings the explant retains its normal function for many months, as shown by const. mucus secretion and a normal histological picture. If unprotected the gut soon shows inflammatory changes. Muscular spasm, induced by mechanical stimulation, parasympatheticomimetic drugs, or dysentery toxin, damages the mucosa and produces hæmorrhage and ulceration. At first mucus flow is stimulated; later a thin watery fluid inadequate for protective purposes appears. Muscle spasm may thus be an important factor in the production of ulcerative colitis. C. A. K.

**Changes in the musculature of the appendix in chronic appendicitis.** J. GOLDNER (Arch. Path., 1939, 27, 546—561).—In chronic appendixes there were changes in the muscular layers, with attenuation or thickening, disappearance, and the production of supplementary fibres. Aberrant fibres appeared ectopically, forming median coats, surrounding lymph follicles or lying in the fibrous capsule of the sub-mucosa. Abnormal contractions may correspond to these changes and explain in part the pathogenic mechanism of this disease. C. J. C. B.

**Variation of weight of dry faeces in short-period experiments with a low-residue neutral-ash diet.** I. M. RABINOWITCH and A. F. FOWLER (J. Nutrition, 1938, 16, 565—569).—With a low-residue neutral-ash diet the dry wt. of faeces over short periods was fairly const. for the same individual on different days and for different individuals. A. G. P.

**Proportions of chlorophyll and carotenoids in the faeces of various animals.** A. SEYBOLD and

K. EGLE (Z. physiol. Chem., 1939, 257, 49—53).—Chromatographic analysis of extracts of the diet and of the fresh faeces of a sheep on a diet of clover, a goose on a diet of nettles, and snails on a diet of lettuce showed that, during digestion, more chlorophyll-*a* than -*b* and more xanthophyll than carotene were destroyed. The proportions of these substances in the fresh faeces of silkworms on a diet of mulberry leaves are almost the same as in the leaves, but in silkworm faeces kept for 42 days, destruction of chlorophyll-*a* and of chlorophyll-*a* + -*b* is found to exceed that of -*b* and of xanthophyll + carotene, respectively. W. McC.

**Determination of potassium in faeces.** A. D. MARENZI (Compt. rend. Soc. Biol., 1938, 129, 1241—1242).—The method of Marenzi and Gershman (A., 1933, 81) has been applied to faeces, from which 93—97% of added K has been recovered. H. G. R.

**Determination of different forms of faecal phosphorus.** G. BARAC and L. BRULL (Bull. Soc. Chim. biol., 1939, 21, 134—138).—The determination of three forms of P in faeces is described, viz., that sol. in 33% aq. trichloroacetic acid, that sol. in acid after treatment of the faeces with HNO<sub>3</sub> and HClO<sub>4</sub>, and the lipin-P, sol. in CHCl<sub>3</sub>. A. L.

#### (xiv) LIVER AND BILE.

**Plasmosin: the gel- and fibre-forming constituent of the protoplasm of the hepatic cell.** R. R. BENSLEY (Anat. Rec., 1938, 72, 351—369).—Washing mammalian liver cells with 0.85% NaCl until no more protein is extracted leads to a 70% loss in dry wt., but the cells remain microscopically unchanged; extraction of the residue for 24 hr. at a low temp. with 10% NaCl yields plasmosin, only slight microscopic changes being seen in the cells although they have lost a further 6% dry wt. By dilution with water the plasmosin is pptd. from the extract as a mass of fine fibres which contract to a clot. Plasmosin is present in the apparently structureless ground substance of the cytoplasm; its presence is important in helping to explain some of the physical properties of protoplasm. H. L. H. G.

**Transport and metabolism of lipins in the liver under the action of adrenaline.** A. POLLACK (Compt. rend. Soc. Biol., 1939, 130, 149—152).—Adrenaline increases the fatty acid and, to a smaller extent, the phospholipin content of the liver (rabbit), the levels falling to subnormal vals. in a few hr. Concomitantly with these increases, the ratio of esterified cholesterol to total cholesterol rises. H. G. R.

**Hyperglycaemia produced by asphyxia in perfused liver.** H. BÉNARD, M. TISSIER, L. DERMER, G. BAREILLIER, and H. PÉQUIGNOT (Compt. rend. Soc. Biol., 1938, 129, 746—748).—In the isolated perfused liver if the air in the oxygenator is replaced by N<sub>2</sub> or CO, hyperglycaemia is produced. 50% CO<sub>2</sub> also produces hyperglycaemia. P. C. W.

**Carbohydrate metabolism in minced liver.** A. HAHN, H. GERSTENBERGER, and I. ISENSEE (Z. Biol., 1939, 99, 414—419).—In minced liver (in



contrast with muscle) glycogen is destroyed without formation of lactic acid. This is due to absence of transformation of glycerophosphoric acid into pyruvic acid +  $H_3PO_4$ . If both glycerophosphoric acid and pyruvic acid are added, lactic acid is formed by minced liver. B. K.

**Liver rhythm.** [Glycogen, phosphorus, and calcium in the rabbit liver.] B. SJÖGREN, T. NORDENSKJÖLD, H. HOLMGREN, and J. MÖLLERSTRÖM (Pflüger's Archiv, 1938, 240, 427—448).—A new rapid micro-method for determining glycogen in the liver is described; amounts up to 0.02% can be determined with  $\pm 5\%$  accuracy. In fed rabbits liver-glycogen shows rhythmic variations with max. (independent of feeding time) at 5 a.m. and 3 p.m. In females starved for 24 hr. the first max. is absent and the second occurs at 1 p.m.; the same is observed in males starved for 48 hr. Liver-P and -Ca show no variations during the 24 hr. in fed animals.

J. M. R.

**Minute-volume uptake and output of substances perfused through liver surviving in an oncometer.** C. D. SNYDER, R. E. JOHNSON, and C. McI. PEEK (Amer. J. Physiol., 1938, 124, 704—716).—Perfused turtles' livers kept in an oncometer were used. Samples, analysed for K, sugar, and  $Cl^-$ , were collected from the hepatic outflow at frequent intervals while the organ was responding to injections of acetyl- $\beta$ -methylcholine chloride or adrenaline into the inflow cannula. The differences in content (of substances added to the perfusate) under certain conditions per unit time may be out of proportion to the differences in content per unit vol.

M. W. G.

**Regulation of the level of calcium in the liver during pregnancy.** M. BODANSKY and V. B. DUFF (J. Amer. Med. Assoc., 1939, 112, 223—229).—A review.

R. L. N.

**Aspiration of biopsy material from the liver.** E. BARON (Arch. intern. Med., 1939, 63, 276—289).—Hepatic aspiration (subcostal approach), performed 48 times in 35 patients, was useful in the diagnosis of metastatic carcinoma and other diseases of the liver. One death from hæmorrhage was attributable to the procedure and in 1 case colonic mucosa was aspirated.

C. A. K.

**Basal metabolism in liver diseases.** I. G. TONKONOGI and I. M. TUROVETZ (J. Méd. Ukrain., 1938, 8, 1139—1149).—Basal metabolism was lowered in 28 cases of uncomplicated hepatic insufficiency (infectious icterus, hepatitis, cirrhosis, carcinoma). This effect is ascribed to disturbances of the autonomous nervous system.

R. T.

**Simplified Eck fistula technique.** A. GESINK (Arch. néerland. Physiol., 1938, 23, 508—522).—The operation was performed under morphia anaesthesia using gastroenterostomy clamps and paraffined ligatures. Two bitches survived 6 weeks; one of these showed no signs of intoxication. Microscopical investigations of the anastomosis are described.

C. E. B.

**Catatonic symptoms after Eck's fistula.** H. DE JONG (Arch. néerland. Physiol., 1938, 23, 523—524).—

LL (A., III.)

536).—Of four dogs in which a modified Eck fistula was made, two showed temporary catatonia. Its disappearance is explained by adhesions between liver, stomach, and intestine.

**Surgical aspects of hypoglycæmia associated with damage to the liver.** F. A. COLLIER and H. C. JACKSON (J. Amer. Med. Assoc., 1939, 112, 128—133).—Glucose-tolerance curves in 3 cases of hypoglycæmia showing symptoms due to liver damage from gall-bladder disease showed abnormalities which returned to normal after removal of the gall bladder.

R. L. N.

**Treatment of liver cirrhosis with uncooked food.** FRIEDRICH and PETERS (Münch. med. Wschr., 1939, 86, 453—455).—Good results in severe cirrhosis of the liver with ascites and oedema were obtained by keeping the patient on a protein-poor diet consisting mainly of fruit and vegetables.

A. S.

**Structure and emptying mechanism of gall bladder.** H. SCHREIBER (Anat. Anz., 1939, 87, 257—275).—The histology and X-ray appearance of 30 human and many quadruped gall bladders is described. Postural differences and occurrence or absence of bile resorption may affect the presence of the spiral valve and the mode of emptying. In man the valve neutralises the pressure in the gall bladder and secretion pressure from the liver. Accurate comparisons show the weakness of the human gall bladder muscle compared with that of quadrupeds. Elastic tissue is important in man to facilitate the siphon-like mode of emptying of the gall bladder when the sphincter of Oddi relaxes.

J. H. G.

**Effect of benzedrine, benzedrine and atropine, and atropine on the gall bladder.** P. G. SCHUBE, A. MYERSON, and R. LAMBERT (Amer. J. med. Sci., 1939, 197, 57—61).—Benzedrine had no effect on gall bladder emptying time in man. Benzedrine together with atropine delayed the emptying time but not as adequately as atropine alone.

R. L. N.

**Action of bile and bile salts on the absorption of tetraiodophenolphthalein.** W. LUTZ and H. SEYFRIED (Wien. klin. Wschr., 1939, 52, 226—229).—The absorption of tetraiodophenolphthalein in the intestines is greatly diminished in the absence of bile. Simultaneous administration of bile or bile salts in cases of obstructive jaundice increases the absorption of the substance. Addition of bile salts to the phthalein *in vitro* makes the otherwise insol. substance sol. in water.

A. S.

**Preparation of cholecystokinin.** G. ÅGREN (Skand. Arch. Physiol., 1939, 81, 234—243).—Cholecystokinin was prepared from hog's small intestine; its isoelectric point was between  $p_H$  5.0 and 5.5. A substance obtained by repeated electrophoresis at  $p_H$  4.25 and 6.60 was free from secretin and had no vasodilator effect. 2 mg. of this prep. produced contraction of the isolated guinea-pig's gall bladder. Cholecystokinin forms less easily than secretin salts with picric, picrolonic, salicylic, and benzoic acid. Secretin is more sol. in higher concns. of ethyl alcohol and dialyses more rapidly through Cellophane membranes.

A. S.



## (xv) KIDNEY AND URINE.

**Structure and physiology of the Malpighian tubules in the potato beetle (*Leptinotarsa decemlineata*, Say).** L. LISON (Compt. rend. Soc. Biol., 1938, 129, 873—875).

**Structure and physiology of Malpighian tubules in the potato beetle.** R. PATAY (Compt. rend. Soc. Biol., 1938, 129, 1098—1099).

**Rate of removal of hæmoglobin from the circulation and its renal threshold in man.** R. OTTENBERG and C. L. FOX, jun. (Amer. J. Physiol., 1938, 123, 516—525).—4—8 g. of sterile stroma-free hæmoglobin were injected intravenously into 20 normal subjects. The initial plasma-hæmoglobin concn. depended on plasma vol. When the concn. was below 150 mg.-% there was a uniform gradual removal; when above this val. the plasma concn. fell rapidly in 3—5 hr. and hæmoglobinuria generally occurred. The threshold in terms of injected hæmoglobin per kg. was 72 mg. in women and 92 mg. in men.

M. W. G.

**Effect of induced hyperpyrexia on urea clearance of rheumatic patients.** L. E. FARR and J. K. MOEN (Amer. J. med. Sci., 1939, 197, 53—57).—In 7 patients the average urea clearance was 62% of normal during a period of increasing artificially induced hyperpyrexia, and 75% when the fever was maintained at its max. The control clearance averaged 105% of normal.

R. L. N.

**Fate of indican in the organism and its elimination by the kidneys.** P. SCHLIERBACH (Dtsch. Arch. klin. Med., 1939, 183, 387—421).—100 mg. of indican were intravenously injected; 60% was excreted in urine of normal subjects within 3 hr., 80% after 8 hr., 94% after 24 hr. Max. blood-indican was 0.3 mg.-% after 3 hr. in subjects with normal kidney function. Vals. above 0.3 mg.-% without accompanying disturbance of renal function were found in 2 out of 162 cases. Normal figures were obtained in cases of cardiac failure, liver diseases, and acute glomerulonephritis. An increase in blood-indican and a delayed renal indican elimination after intravenous injection were found in pre-uræmic conditions and in uræmia. Less than 20 mg.-% were excreted under those conditions within 3 hr. following the injection. The indican elimination test is of val. in diagnosing early renal failure at a time when the blood-indican is still normal.

A. S.

**Renal amyloidosis.** H. O. ALTNOW, C. C. VAN WINKLE, and S. S. COHEN (Arch. intern. Med., 1939, 63, 249—275).—The clinical course of 57 cases of renal amyloidosis occurring in tuberculous patients is described.

C. A. K.

**Pathogenic significance of lipid nephrosis.** M. I. FRANKFURT (J. Méd. Ukrain., 1938, 8, 1191—1216).—Lipoid nephrosis is a consequence of generalised increase in membrane permeability, leading to albuminuria; a consequence of this is hypoproteinæmia, which in turn causes oedema and lipæmia. In view of increased permeability the blood-lipins readily pass the glomerular filter, and are found in the urine.

R. T.

**Amino-acid and polypeptide content of blood following ligation of the ureters.** M. POLONOVSKI, P. DESGREZ, and R. ISSARTEL (Compt. rend. Soc. Biol., 1938, 129, 1096—1098).—In the dog ligation of the ureters causes a rapid increase in blood-urea and non-protein-N, but only a slight rise in amino-acids or polypeptides even 54 hr. after the ligation.

P. C. W.

**Histological changes in the muscle of the urinary bladder following injury of the peripheral innervation.** O. R. LANGWORTHY and L. C. KOLB (Anat. Rec., 1938, 71, 249—263).—In cats after bilateral section of the preganglionic parasympathetic nerves, the muscles of the bladder became thickened (individual fibres were large with pale granular sarcoplasm); unilateral section resulted in greater muscle development on the operated side. Cutting the posterior sacral nerve roots led to dilatation of the bladder with muscle atrophy; if the postganglionic sympathetic nerves were subsequently cut, the bladder regained some contractility and attempts at muscle division occurred. Section of postganglionic sympathetic fibres decreased the vol. of the bladder with dilatation of the ureter and vaso-dilatation of the ureter, bladder, and urethra. The sympathetic nerves are mainly responsible for the innervation of the ureters, Bell's muscles, and the urethral crest.

H. L. H. G.

**Experimental hyposthenuria.** J. M. HAYMAN, jun., N. P. SHUMWAY, P. DUMKE, and M. MILLER (J. clin. Invest., 1939, 18, 195—212).—Hyposthenuria (inability to excrete a conc. urine under usual conditions) may be produced in dogs by reduction of the kidney mass, U poisoning, ureteral obstruction, denervation, or a low-protein diet. Dogs after subtotal nephrectomy excrete a conc. urine under certain conditions, including increased concn. of plasma-colloids, low blood pressure, or injections of  $\text{Na}_2\text{SO}_4$  after water deprivation. A urine of high sp. gr. is not excreted by dogs with tubular damage. Pituitrin leads to excretion of a conc. urine after renal denervation but not in the other groups. (B.) C. J. C. B.

**Independence of hormonal and central nervous inhibition of diuresis of total renal blood flow or arterial pressure.** P. W. SPRINGORUM (Pflüger's Archiv, 1938, 240, 342—347).—The blood flow through the kidneys of dogs was measured by Rein thermstromuhr, the urine flow by an electromagnetic drop recorder. With injection of small doses of adrenaline or inhalation of low concns. of  $\text{CO}_2$  the blood flow through the kidneys remains const. (though there is a rise in blood pressure) but there is some inhibition of diuresis. The urinary secretion is increased by a pressor carotid sinus reflex and by  $\beta$ -(*p*-hydroxyphenyl)isopropylmethylamine, although the renal blood flow remains const. Although the total of renal blood flow can be measured, the distribution of the blood to the various parts of the organ is unknown.

J. M. R.

**Occurrence of an antidiuretic substance in the urine of patients with pre-eclampsia and eclampsia.** H. M. TEEL, and D. E. REID (Endocrinol., 1939, 24, 297—310).—Urine concentrates from eclamptic patients inhibit water-diuresis in rats even



if large vols. of water have been given to such patients. The same substance can be prepared from normal pregnant patients who are dehydrated by abstinence from water. It resembles posterior pituitary extract.

V. J. W.

**Experimental diabetes insipidus.** J. H. BIGGART and G. L. ALEXANDER (J. Path. Bact., 1939, 48, 405—425).—Temporary polyuria was produced in 29 dogs by the production of lesions in the anterior hypothalamus, and in 14 of these the polyuria was permanent. The onset of this permanent polyuria was through a transient stage of polyuria, a period of normal output, and then the final stage. Hypophysectomy or pancreatectomy abolishes this polyuria, whilst thyroid medication usually increases it. The lesions of the anterior hypothalamus may be followed by obesity and gonadal atrophy. (8 photomicrographs.)

C. J. C. B.

**Normal variations in water tolerance and diuresis.** J. MÖLLERSTRÖM and S. FORSSMAN (Acta med. scand., 1938, 97, 508—526).—Large variations in fluid output were observed in repeated tests on the same subjects after ingestion of 1 l. of water. There was a fall of blood-sugar which roughly paralleled the urinary vol. Any hepatic influence on water metabolism was therefore independent of glycogen metabolism.

C. A. A.

**Watermelon diuresis.** C. ROBY, J. H. LAST, and C. PFEIFFER (Amer. J. Pharm., 1939, 111, 68—72).—Watermelon juice contains a volatile diuretic principle which disappears on ageing of the melon. It is not injurious to the kidney (dog). Extracts of the juice or seeds do not contain any such principle.

P. G. M.

**Acid-base changes in urine in various stages of decompensated heart disease.** A. D. ADENSKI (J. Méd. Ukrain., 1938, 8, 1179—1190).—The titratable and total acidity of the urine are normal during the initial stages of cardiovascular insufficiency, and rise during the beginning of the 2nd stage, thereafter falling to sub-normal levels during the dystrophic stage, in which alkali reserve is low. The  $p_H$  vals. vary within normal limits. In the initial stages acidity is due chiefly to  $H_2PO_4'$ , and in the final stages to uric acid.

R. T.

**Symptomatology of acute porphyria and classification of porphyrias.** A. ELDAHL (Acta med. scand., 1938, 97, 527—537).—A review.

C. A. A.

**Porphyryns and clinical methods for their demonstration [in urine].** A. ELDAHL (Acta med. scand., 1938, 97, 538—546).—Review of the chemistry of the clinically important forms of ætio-, uro-, and copro-porphyrin and methods of detecting and determining them in urine.

C. A. A.

**Determination of urinary coproporphyrin.** K. DOBRINER and C. S. RHOADS (New England J. Med., 1938, 219, 1027—1029).—The technique is described.

A. M. G.

**Thormählen's reaction.** F. BÖHM (Z. physiol. Chem., 1939, 258, 108—116; cf. A., 1937, III, 211; Linnell and Raper, A., 1935, 235).—In rabbits, after administration of 5-methyl- or 5-methoxy-indole, the urine contains indican and two forms of esterified

$H_2SO_4$ . One of these is possibly identical with a substance, found in urine after administration of 5-methoxyindole, which is oxidised to a green compound sol. in amyl alcohol. After administration of 5-methylindole, more indican than esterified  $H_2SO_4$  is excreted but the reverse is the case after administration of 5-methoxyindole. The results confirm the view that the substance responsible for Thormählen's reaction is an indole derivative the benzene ring of which contains OH groups.

W. McC.

**Properties of reducing material in certain fractions of normal urines. III. Non-fermentable reducing substances in "fasting" urine.** T. F. NICHOLSON and R. M. ARCHIBALD (Biochem. J., 1939, 33, 516—522; cf. A., 1936, 502).—A fraction of urine free from N and containing a large % of true sugars is obtained by successive treatment with basic Pb acetate,  $HgSO_4-BaCO_3$ , and  $CuSO_4-Ca(OH)_2$ . Oxidation of the sugars with Br yields new reducing substances which are resistant to further oxidation by Br or NaOI and also to fermentation by yeasts. Oxidation of the sugars with NaOI gives practically none of these oxidation-resistant substances, and 75% of the original sugars behaves as an aldose. The Br-resistant reducing material, uroketose (Everett *et al.*, A., 1934, 317), is not a single substance but is probably a mixture of Br- and NaOI-resistant reducing substances (part of which is a ketopentose) already present in the urine, and new reducing material produced by the action of Br.

J. N. A.

**Variations of formol and phthalein acidity in urine. Graphical interpretation.** L. LESCŒUR (Compt. rend., 1939, 208, 390—392).—The ratio,  $(CO_2 \text{ converted into urea} + NH_3 \text{ excreted as a salt}) / (X) / NH_3 \text{ excreted as a salt}$ , plotted against the ratio,  $X / \text{titratable acidity in 4-hourly specimens of urine}$ , gives information as to the changes in the acid-base equilibrium of the body.

J. L. D.

**Determination of hippuric acid in urine.** T. E. WEICHSELBAUM and J. G. PROBSTEN (J. Lab. clin. Med., 1939, 24, 636—639).—The method of Quick is inaccurate. A clinically accurate modification is described with directions for the preliminary treatment of urine which contains bile, dark colouring matter, or albumin.

C. J. C. B.

**Significance of urea-splitting bacteria in the formation of urinary calculi.** R. CHUTE (New England J. Med., 1938, 219, 1030—1032).—50% of all cases of urinary stone have an infection due to a urea-splitting organism, commonly *B. proteus*, then non-hæmolytic streptococci, staphylococci, *B. pyocyaneus*, *B. influenzae*, and *M. flavus*, in order of frequency; 80% of cases of recurrent stone show a similar infection and 67% of cases with infection develop stones.

A. M. G.

## (xvi) OTHER ORGANS, TISSUES, AND BODY-FLUIDS.

**Evolutionary physiology.** M. B. ERMAKOV (Trans. Conf. Med. Biol., 1937, 47—60, 261—264).—A review and discussion.

R. T.



The word "protoplasm." F. K. STUDNÍČKA (Protoplasma, 1937, 27, 619—625).—The significance attached to the word "protoplasm" by various workers is discussed. M. A. B.

Determination of true volume and specific gravity of man by means of change in atmospheric pressure. J. JONGBLOED and A. K. M. NOYONS (Pflüger's Archiv, 1938, 240, 197—201).—The subject is weighed at two different pressures. The accuracy of the method has been confirmed. 20 determinations within several weeks on one subject gave vals. for the sp. gr. of  $1.080 \pm 0.007$ . J. M. R.

Growth and development. XLVIII. Relation between body-weight, amount of wool or feathers, and temperature regulation. S. BRODY and J. CAMPBELL. XLIX. Growth, milk production, energy metabolism, and energy efficiency of milk production in goats. S. BRODY [with C. SANDBERG and S. A. ASDELL] (Missouri Agric. Exp. Sta. Res. Bull., 1938, No. 287, 27 pp., No. 291, 64 pp.).—XLVIII. In yearling sheep wool wt. is almost directly proportional to surface area. In older sheep wool wt. per unit area decreases with increasing body-wt. In domestic fowls feather wt. is related to body-wt. rather than to surface area.

XLIX. The energy efficiency of milk production is of the same order in goats, cows, and rats. The rate of decline of milk production with advance in lactation period tends to be greater in goats than in cows. Resting metabolism in goats increased approx. with (body-wt.)<sup>2/3</sup> the actual proportionality varying somewhat with the season of birth (lower in Feb. and higher in July). The metabolic peak coincides with the period of min. breeding frequency in spring.

A. G. P.

Ossification. VI. General changes in the composition of long bones after experimental fracture. J. ROCHE and M. MOURGUE. VII. Phosphatase of the bones, teeth, and skin of bony and cartilaginous fish. J. ROCHE and E. BULLINGER (Bull. Soc. Chim. biol., 1939, 21, 143—165, 166—184).—VI. The successive changes as healing takes place in the P and N content of the epiphyseal and diaphyseal regions of the fractured pigeon humerus and rat femur follow the same course. There is a preliminary demineralisation of the whole bone during the first 25 days, followed by a period during which the normal vals. are slowly attained. During this process qualitatively similar but less marked changes take place in the intact humerus or femur.

VII. The skeleton, teeth, and scales of bony and cartilaginous fish contain phosphomonoesterase A1 identical with that in the bones of the superior vertebrates. In the cartilaginous fish the phosphatase is localised in the perichondrium. The teeth are always rich in the enzyme, except during the period immediately preceding their decay, and the activity is particularly high just before calcification. The phosphatase activity of the young teeth and their ability to fix mineral salts are independent. A. L.

Solubility of bone salt. IV. Solubility of bone in biological fluids. M. A. LOGAN and L. W. KANE (J. Biol. Chem., 1939, 127, 705—710; cf. A.,

1938, III, 920).—Powdered foetal bone, adult bone (ox, man), and glycerol-extracted bone, shaken with serum (horse, man) or ascitic fluid at 37° until equilibrium is established, do not diminish in Ca<sup>++</sup> or PO<sub>4</sub><sup>'''</sup> concn. when only small amounts of bone (1 mg. per l.) are used, but as the amount of solid is increased, the concn. of Ca<sup>++</sup> and PO<sub>4</sub><sup>'''</sup> in the fluids decreases. The max. vals. of the product [Ca<sup>++</sup>]<sup>3</sup>[PO<sub>4</sub><sup>'''</sup>]<sup>2</sup> for the glycerol-extracted bone are similar to those found for artificial ppts. but are greater when bone is used, due to the effect of the colloidal solution produced from part of the org. matter present. F. H.

Teeth and internal diseases. H. H. REBEL (Med. Welt, 1939, 13, 407—412).—A review.

A. S.

Zinc content of epidermal structures. W. G. E. EGGLETON (Chinese J. Physiol., 1938, 13, 399—404).—Zn was determined in the ash of human head hair, finger- and toe-nails, whole skin and epidermis, in chicken feathers, fish scales, and the cast skins of snakes and cicadas. Dry fat-free pigmented or unpigmented hair contained 84—444 p.p.m., dry fat-free skin 12—55 p.p.m. mostly in the epidermis. The richest source was a snake-skin. N. H.

Thermal conductivity of the integuments of fish. M. V. ERMAKOV (J. Méd. Ukrain., 1938, 8, 1075—1097).—The conductivity of the skin of fresh- and salt-water fish is proportional to its thickness. The scales do not play any decisive part in thermal regulation, this being apparently a function chiefly of the true skin. R. T.

Behaviour of mature male salmon parr, *Salmo Salar*, juv. L. G. M. KING, J. W. JONES, and J. H. ORTON (Nature, 1939, 143, 162—163).—Evidence is adduced for possible differences in movements between mature and immature male salmon parr at spawning time. W. F. F.

Light fish, *Malacocephalus laevis* (Lowe). Y. HANEDA (Japan. J. Med. Sci., III, 1938, 5, 355—366).—The light-producing organs of the fish are described. In the light glands are enclosed symbiotic light bacteria radiating light of 638—430 mμ. T. F. D.

Chemical composition of the sea mussel (*Mytilus edulis*). A. J. J. VANDE VELDE (Natuurwetensch. Tijds., 1939, 21, 32—46).—Mussels contain on the average 6.4% of dry matter independent of the size, the amount being highest in winter and lowest in May. Seasonal and individual variations according to size in the N (8.3—10.5), glycogen (0.6—1.75), physiological ash (11.9—23.9), sand, P (0.06—0.11), and fat (3.9—8.5%) contents are discussed. Isolated protein from the mussel is relatively low in N (10.1—10.5%) and the conversion factor for analytical purposes is protein = N × 8. S. C.

Excretion of acid dyes in *Cyclops* studied by micro-injection. L. LISON (Compt. rend. Soc. Biol., 1939, 130, 261—263).—Colloidal acid dyes slowly accumulate in the cells of the sacculi whereas the diffusible dyes are rapidly fixed by the intestinal cells. H. G. R.

Sericin. III, IV. T. ITO and K. KOMORI (J. Agric. Chem. Soc. Japan, 1939, 15, 50—55; cf. A., 1938, III, 210).—III. The amounts of NH<sub>3</sub>, melanin-,



cystine-, arginine-, lysine-, histidine-, mono-NH<sub>2</sub>-, and non-NH<sub>2</sub>-N in sericin-A and -B are determined. The melanin-N content of -B is much greater than that of -A. More carbohydrate and aminocarbohydrate are present in the difficultly sol. -B than in the easily sol. -A.

IV. When the cocoon layer is heated with water, NH<sub>3</sub> is evolved, most of which arises from sericin. -A yields more NH<sub>3</sub> than -B when heated with water for several hr. at 100–130°. Fibroin, heated under the same conditions, gives small amounts of NH<sub>3</sub>. The fibroin carbohydrate contains N. J. N. A.

**Amino-acid composition of the keratins.** Composition of gorgonin, spongin, turtle scutes, and other keratins.—See A., 1939, II, 234.

**Volumetric determination of calcium and magnesium in milk.** D. RAFFAELLI (Annali Chim. Appl., 1939, 29, 32–37).—Ca is determined by pptn. as oxalate and titration with 0.1N-KMnO<sub>4</sub> and Mg by pptn. as MgNH<sub>4</sub>PO<sub>4</sub>·6H<sub>2</sub>O, heating the ppt. to 80°, and titration (methyl-orange) with 0.1N-NaOH after addition of excess of 0.1N-H<sub>2</sub>SO<sub>4</sub>. The methods are applicable to the ash or the trichloroacetic acid-treated milk (10–20 c.c.). F. O. H.

**Composition of mare's milk.** H. DITTRICH (Milch. Forsch., 1938, 19, 406–412).—Fractional milkings show great variation in fat contents. 38 samples from 4 mares taken over periods of 30 days gave a range of total solids 9.12–14.55, fat 0.09–5.79, lactose 6.08–7.78, ash 0.26–0.66, and N 0.260–0.450%. There was no correlation between fat and lactose contents. There is much variation between milks from different mares and from the different halves of the udder. W. L. D.

## (xvii) TUMOURS.

**Pituitary and cancer.** W. RODEWALD (Dtsch. med. Wschr., 1939, 65, 290).—A lecture. A. S.

**Ætiology of malignant disease.** G. DOMAGK (Z. Krebsforsch., 1939, 48, 283–297).—A review. E. M. J.

**Chemistry of tumours. I. Ætiology of malignant tumours.** F. KÖGL and H. ERXLEBEN (Z. physiol. Chem., 1939, 258, 57–95).—Of the total amino-acids obtained by acid-hydrolysis of the proteins of tumours (man, rabbit, mouse), 10% or more is in racemic form. The acid of which the largest proportion occurs in the *d*-form is glutamic but considerable proportions of leucine, lysine, and valine also occur in this form. The proteins of healthy tissue yield no racemic amino-acids other than those racemised during hydrolysis. The significance of the results in connexion with the relationship between stereochemical structure and enzyme action, with the metabolism of amino-acids, and with various aspects of the cancer problem is discussed and it is suggested that cancer cells differ from healthy cells in lack of power to incorporate only natural amino-acids. W. McC.

**Occasional neutralisation of the active agent of filterable fowl tumours by fluid media from tissue cultures.** R. J. LUDFORD (Amer. J. Cancer,

1939, 35, 63–71).—A neutralising substance of unknown nature, capable of inactivating a Fujinami filtrate, is occasionally found in culture flasks containing fowl plasma clots. E. B.

**Experiments on the des Ligneris fowl sarcoma.** C. R. AMES, J. G. CARR, and W. J. PURDY (Amer. J. Cancer, 1939, 35, 72–79).—The des Ligneris fowl sarcoma originated in a fowl inoculated with normal chick fibroblasts which had been incubated *in vitro* with dibenzanthracene. In its structure and behaviour it closely resembles the Fujinami sarcoma. E. B.

**Influence of low-temperature environment on the growth of mouse sarcoma 180.** F. BISCHOFF and M. L. LONG (Amer. J. Cancer, 1939, 35, 86–89).—Mice of the Marsh-Buffalo strain injected with sarcoma 180 were kept in an environment 10–15° colder than the control mice. 100% increase of food consumption, loss of body-wt., and hypertrophy of heart and kidney resulted. Tumour growth was diminished regardless of whether the transplants were subcutaneous, intraperitoneal, hepatic, or renal. E. B.

**Relation of nursing to the extra-chromosomal theory of breast cancer in mice.** J. J. BITTNER (Amer. J. Cancer, 1939, 35, 90–97).—New-born mice of the high breast cancer strain (A), of which 83.6% of females develop cancer, were fostered on mice of the cancer-resistant strains C57 (B) or CBA. The breast cancer incidence of the fostered females was 7.4%. A few observations on BA and AB hybrids fostered on B or A mice showed a similar effect. E. B.

**Effect of the presence of a malignant tumour on the development of a second malignant tumour.** G. M. BONSER and K. I. CONNALL (J. Path. Bact., 1939, 48, 263–274).—Experiments were performed to show the effect of the presence of a breast cancer on the development of tar warts and tar cancer in female mice of Kreyberg's white label strain and the effect of previous tar cancer on the development of breast cancer. The development of the second malignant tumour was not delayed. C. J. C. B.

**Neoplasm of monocytes of mice and its relation to similar neoplasms of man.** J. FURTH (J. Exp. Med., 1939, 69, 13–30).—Malignant neoplasms of histiocyte-like cells are transmissible in mice by inoculation of cellular material, but not by cell-free fluid. A. C. F.

**Spontaneous tumours in axolotls.** K. A. SCHEREMETIEVA and V. V. BRUNST (Trans. Conf. Med. Biol., 1937, 143–148, 281).—Tumours consisting of pigmented chromatophore cells appeared in a male and a female axolotl. The offspring of this pair show a high incidence of this same tumour. R. T.

**Mitogenetic diagnosis of malignant tumours.** S. J. SALKIND (Trans. Conf. Med. Biol., 1937, 9–16, 250–252).—The mitogenetic radiation of blood is absent in 95% of malignant tumour cases, being retained in skin and laryngeal tumours. Reappearance of radiation followed extirpation of the tumours. Abolition of radiation is ascribed to production by the tumours of a sp. substance of enzymic



nature, adsorbed on kaolin, and inactivated by heating at 70–80°.

R. T.

**Tumour production by intradermal inoculation of chicken leukæmia virus.** C. OBERLING and M. GUÉRIN (Compt. rend. Soc. Biol., 1938, 129, 1059–1060).—Intradermal inoculation of fresh serum from leukæmic fowls is more effective in producing leukæmic sarcomata than intramuscular inoculation. The higher is the dose, the higher is the proportion of sarcomata.

P. C. W.

**Immunisation by intracutaneous inoculation of chicken leukæmia virus.** C. OBERLING and M. GUÉRIN (Compt. rend. Soc. Biol., 1938, 129, 1061–1062).—Intracutaneous inoculation gives no greater immunity than other inoculation methods.

P. C. W.

**Transformation *in vitro* of cultures of normal cells treated with Rous sarcoma agent into sarcoma cultures.** L. HALBERSTAEDTER and L. DOLJANSKI (Nature, 1939, 143, 288).—Addition of a fragment of tissue or of a pure culture of normal fibroblasts to an irradiated (Ra) culture of Rous sarcoma which has received double the dose required to kill the cells, results in an invasion of the normal cells by the still active agent. The resulting cell colony acquires all the morphological and physiological properties of a real Rous sarcoma, including malignancy on injection.

W. F. F.

**Present condition of a twelve-year old pure strain of carcinoma cells *in vitro*.** A. FISCHER and F. DAVIDSOHN (Nature, 1939, 143, 436–437).—The properties of cultures of a mouse adenocarcinoma have remained const. over a period of 12 years.

W. F. F.

**Walker 256 rat mammary carcinoma *in vitro*.** W. R. EARLE (Arch. Path., 1939, 27, 80–87).—This carcinoma has now been grown in pure culture for 22 months. During this time no extractives from rats have been used, the culture fluid consisting of horse serum, extract of chick embryo, and saline solution. The range of cell shape has varied greatly. (5 photomicrographs.)

C. J. C. B.

**Use of anti-reticular cytotoxic serum [in malignant disease and septicæmia].** J. B. DINERMAN (J. Méd. Ukrain., 1938, 8, 143–148).—Injections of the serum caused softening and arrest of growth of metastatic malignant tumours (15 cases), facilitating their surgical removal. Considerable improvement followed injection of the serum in 3 cases of septicæmia.

R. T.

**Application of anti-reticular cytotoxic serum to human cancer.** M. P. FEDIUSCHIN (J. Méd. Ukrain., 1938, 8, 121–142).—Injections of cytotoxic serum caused symptomatic improvement in 131 cases of cancer. Cancer patients do not develop anaphylactic sensitivity to repeated injections of the serum.

R. T.

**Susceptibility of mice to spontaneous lung carcinomas.** J. J. BITTNER (U.S. Publ. Health Rep., 1938, 53, 2197–2202).—The incidence of pulmonary carcinoma in hybrid mice from the A and C57 black strains indicates that susceptibility to lung

cancer is transmitted by a single dominant Mendelian factor.

E. B.

**Transplantable lymphosarcoma in mice.** M. R. LEWIS (Amer. J. Cancer, 1938, 34, 399–406).—4 lymphosarcomas were produced in pure strain mice by injection with 0.8 mg of 1:2:5:6-dibenzanthracene in olive oil. 2 of the tumours in C3H mice were transplanted into mice of the same strain, but would not grow in mice of other strains. The tumours were also transmitted by implantation of pieces of lung, liver, spleen, kidney, and lymph node, and of whole blood, but not by plasma or cell-free extracts of the tumours.

E. B.

**Increased susceptibility of rabbits to Brown-Pearce epithelioma induced by oestrogens in human pregnancy urine.** J. W. MU (Amer. J. Cancer, 1938, 34, 407–412).—An oestrogenic substance, prepared from human pregnancy urine by extraction with butyl alcohol, was injected subcutaneously into pure strain male rabbits bearing the Brown-Pearce epithelioma. Growth of the tumour was accelerated and the formation of metastases was stimulated.

E. B.

**Genetic segregation mammary cancer to no mammary cancer, in the mouse.** W. S. MURRAY (Amer. J. Cancer, 1938, 34, 434–441).—The variation in the incidence of mammary cancer in Marsh's strain 3 was not due to the presence or absence of intestinal worms. The incidence is 85–100% in breeding females living up to 5 months.

E. B.

**Production of a melanotic neoplastic disease in fishes by selective matings. IV. Genetics of geographical species hybrids.** M. GORDON and G. M. SMITH (Amer. J. Cancer, 1938, 34, 543–565).—A spontaneous melanotic neoplastic disease occurs in species hybrids between *Platycephalus maculatus* and *P. conchianus*, *P. xiphidium*, and *P. variatus*. The disease is carried as a sex-linked character. It is similar to the melanotic condition found in generic hybrids between *P. maculatus* and *Xiphophorus hellerii*.

E. B.

**Comparative study of the ovaries and other endocrine glands in rats with benign transplanted breast tumours and in normal rats injected with sex hormones.** J. HEIMAN (Amer. J. Cancer, 1938, 34, 586–588).—Tumour-bearing rats injected with antuitrin S and theelin had a higher % of cysts in the ovaries and other endocrine glands than non-injected rats.

E. B.

**Urine extractives in cancer.** H. SOBOTKA and E. BLOCH (Amer. J. Cancer, 1939, 35, 50–54).—2100 l. of pooled urine from cancer patients were extracted with butyl ether and fractionated. No chemical or biological evidence was found for the presence of carcinogenic hydrocarbons.

E. B.

**Localisation of dyes and foreign proteins in normal and malignant tissues.** F. DURAN-REYNALS (Amer. J. Cancer, 1938, 35, 98–107).—Mice bearing tumours 180, S.37, and the Bashford adenocarcinoma, chickens bearing the Rous tumour, and rabbits with the Brown-Pearce tumour were injected intravenously with solutions of a dye T1824 and



other more diffusible dyes. In all cases the dyes were localised in the tumours and in the surrounding tissues. Horse, pig, and chicken sera were similarly localised. The dyes appear to be taken up by the stroma of the tumour and not by the tumour cells.

E. B.

**Higher fatty acids and blood-lipins in cancer and other diseases.** R. REDING, N. I. JOUKOVSKY, and A. M. TIMMERMAN (Compt. rend. Soc. Biol., 1939, 130, 273—276).—In cancer a decrease in fatty acid, unsaponifiable matter, and lecithins in the blood with little variation in the cholesterol were observed.

H. G. R.

**Relative viscosities of tumour cells as determined by the ultra-centrifuge.** M. F. GUYER and P. E. CLAUS (Anat. Rec., 1939, 73, 17—27).—Ultra-centrifuging of tumour cells showed little derangement of the cell contents compared with normal cells. The order of resistance was: rat adenofibroma, rat carcinoma, mouse adenocarcinoma, and rat sarcoma. Doubling of chromosomes was common; this may be due partly to an increase in viscosity and partly to the prevention of spindle formation. (2 plates.)

H. L. H. G.

**Tumour production in mice with ultra-violet irradiation.** H. P. RUSCH and C. A. BAUMANN (Amer. J. Cancer, 1939, 35, 55—62).—Male mice of pure strains were irradiated from a quartz Hg-vapour lamp for varying times daily over a period of 14 months. Ear tumours occurred in 62—83% of albinos, those receiving longest doses developing the tumours most quickly. Black mice were less susceptible.

E. B.

**Tumour production with radioactive substances.** E. UEHLINGER (Schweiz. Z. allg. Path. Bakt., 1938, 1, 444—457).—A review. E. M. J.

**Lung tumour development in a resistant strain of mice, subjected to inhalation of soot.** M. G. SIELIG and E. L. BENIGNUS (Amer. J. Cancer, 1938, 34, 391—398).—100 mice of a tumour-resistant strain which inhaled a mixture of 10% of carcinogenic tar in lampblack did not develop lung cancer within 10 months.

E. B.

**Comparative activity of some carcinogenic hydrocarbons.** J. M. TWORT and C. C. TWORT (Amer. J. Cancer, 1939, 35, 80—85).—The relative potency of various carcinogenic substances when applied to the skin of mice was compared. The solvent used had an important effect. Dissolved in  $\text{CHCl}_3$  the potencies of dibenzanthracene, benzpyrene, and methylcholanthrene are as 1:5:10. Benzpyrene and dibenzanthracene dissolved in  $\text{CHCl}_3$ , oleic acid, mineral oil, and liquid paraffin are decreasingly potent in that order. Application of lanoline after benzpyrene does not reduce the incidence of tumours; treatment with oleic acid increases the incidence.

E. B.

**Mode of action of carcinogenic substances.** N. BROCK, H. DRUCKREY, and H. HAMPERL (Arch. klin. Chir., 1939, 194, 250—263).—A collodion sac, filled with ground cryst. benzpyrene (0.5—25 mg.) in physiological salt solution, was implanted aseptically intraperitoneally in rats. The high fat

content at the site of application dissolves the benzpyrene, which produces acute fatty degeneration of the cells, followed by generalised poisoning owing to protein breakdown. Inflammatory processes soon encapsulate the degenerative areas and the toxic phenomena regress. Tumour formation rapidly follows, independently of the amount of benzpyrene administered. This is a sp. chronic effect distinct from the acute non-sp. cell destruction and general poisoning, which are not a necessary preliminary.

B. W.

**Production of primary bone tumours (fibrosarcoma of bone) by intramedullary injection of methylcholanthrene.** A. BRUNSCHWIG (Amer. J. Cancer, 1938, 34, 540—542).—4 fibrosarcomas of bone were produced in 33 rats by implantation of solid methylcholanthrene with paraffin after 8 to 12 months.

E. B.

**Methylcholanthrene-sarcoma cultured *in vitro*.** S. MORIGAMI (Gann, 1938, 32, 389—393).—Tissue cultures of a sarcoma produced by injection of methylcholanthrene into mice contained small wandering cells, spindle cells, and macrophages.

E. B.

**Mode of action of methylcholanthrene on cultures of normal tissues.** W. R. EARLE and C. VOEGTLIN (Amer. J. Cancer, 1938, 34, 373—390).—Cultures of rat and mouse fibroblasts were incubated in the presence of methylcholanthrene and 1:2:5:6-dibenzanthracene dissolved in olive oil. Both substances caused growth retardation and degeneration, but not changes in cell morphology resembling malignant growths.

E. B.

**Inhibition of growth of rats by oral administration of methylcholanthrene. Effects of dietary cystine and methionine supplements.** J. WHITE and A. WHITE (Proc. Soc. Exp. Biol. Med., 1938, 39, 527—529).—Methylcholanthrene inhibits growth in the young rat, but this effect is abolished if *l*-cystine or *dl*-methionine is also added to the diet. Growth is not re-established by addition of glycine, taurine, or  $\text{Na}_2\text{SO}_4$ .

V. J. W.

**Carcinogenesis experiments based on intraperitoneal injections. III. Dimethylaminoazobenzene.** W. NAKAHARA and T. FUJIWARA (Gann, 1938, 32, 477—483).—Repeated intraperitoneal injection of dimethylaminoazobenzene into 57 rats produced hepatomata in 3 out of 6 which survived over 250 days. Cirrhosis and nodular hyperplasia were found in many rats, but no cholangiomata occurred.

E. B.

**Leukæmia and sarcoma of mice caused by 1:2:5:6-dibenzanthracene.** N. D. JUDINA (J. Méd. Ukrain., 1938, 8, 149—156).—Injection of 1:2:5:6-dibenzanthracene into mice was followed after 18 weeks by fusiform-cell sarcoma, with myeloid leukæmia (leucocyte count up to 126,000). Transplantation of the tumours led to development of sarcoma, with or without leukæmia, whilst injection of leukæmic blood did not cause tumour formation or leukæmia. (12 photomicrographs.)

R. T.

**Production of sarcomata in hamsters by 3:4-benzpyrene.** W. E. GYE and L. FOULDS (Amer. J. Cancer, 1939, 35, 108).—Two hamsters developed



tumours at the site of injection of 5 doses of 0.2 c.c. of a 0.4% solution of benzpyrene in lard. Tumours were palpable after 13 weeks. One of the hamsters developed metastases, and the tumour in this animal was transplantable. E. B.

**Effect of the solvent on the carcinogenic power of 3:4-benzpyrene.** C. OBERLING, P. GUÉRIN, M. GUÉRIN, and C. SANNIÉ (Compt. rend. Soc. Biol., 1939, 130, 17—19).—The use of the body-fat of rats as a solvent does not affect the carcinogenic action. H. G. R.

**Photodynamic activity of the urine of mice treated with blastogenic hydrocarbons.** J. C. MOTTRAM (Proc. Roy. Soc., 1939, B, 126, 560—566).—After inoculation of mice with a series of blastogenic hydrocarbons the urine always contained photodynamic substances. When hydrocarbons which do not produce tumours were used, photodynamic substances were not excreted. The correlation was very close. F. B. P.

**Comparison of the carcinogenic action of oestrogens.** A. LIPSCHÜTZ and L. VARGAS, jun. (Compt. rend. Soc. Biol., 1939, 130, 9—11).—The carcinogenic action of oestrone and oestradiol is less than that of oestradiol benzoate. Sesamé and olive oils, used as a vehicle for the hormone, have no action. H. G. R.

**Experiments with cysteine hydrochloride in the treatment of animal tumours.** J. L. CARR, C. L. CONNOR, and L. L. GINZTON (Amer. J. Cancer, 1938, 34, 428—430).—3 rat tumours and the Brown-Pearce rabbit epithelioma were treated with cysteine hydrochloride. Subcutaneous and intravenous injections had no effect, but a regression of the Jensen sarcoma was caused by injection into the tumour. Rats in which this tumour had regressed were immune to the Jensen sarcoma and to the Emge adenofibroma. E. B.

**Does vitamin-B<sub>1</sub> inhibit the experimental production of liver cancer?** W. NAKAHARA, K. MORI, and T. FUJIWARA (Gann, 1939, 33, 13—17).—The addition of aneurin to the polished rice and carrot diet did not influence the incidence of liver cancer in rats fed with dimethylaminoazobenzene. E. B.

**Effect of liver feeding on experimental production of liver cancer.** W. NAKAHARA, K. MORI, and T. FUJIWARA (Gann, 1938, 32, 465—467).—Rats fed on polished rice, carrots, and dimethylaminoazobenzene developed hepatomas and cholangiomas, but when 10% of dried liver was added to the diet no liver tumours were produced. E. B.

**Inertness of sulphanilamide in relation to tumours in mice.** M. R. LEWIS (Amer. J. Cancer, 1938, 34, 431—433).—Subcutaneous injection of a sulphanilamide suspension in olive oil did not produce tumours in mice, nor cause them to be refractory to subsequent inoculation with a tumour. Daily repeated subcutaneous injection of 9 mg. of sulphanilamide in saline did not cause inhibition of growth of spontaneous tumours or of a very rapidly growing transplanted sarcoma. E. B.

**Biological method for freeing Walker tumour no. 256 from contaminating bacteria.** R. E.

GARDNER and R. R. HYDE (Amer. J. Cancer, 1938, 34, 442—445).—Metastases formed from Walker carcinomas implanted in the tails of rats are usually sterile, even if the parent tumour is heavily contaminated with bacteria. E. B.

**Application of the antigonadotropic action of human urine to the diagnosis of cancer.** J. FLAKS and A. BER (Compt. rend. Soc. Biol., 1939, 130, 306—309).—The method depends on the antigonadotropic action (inhibition of oestrus) of an extract of urine when injected into impuberal mice together with pregnyl. Positive reactions were obtained in 81 and 27.6% respectively of cases of cancer and other diseases. H. G. R.

**Three-phase modified Bendien reaction [for malignant disease].** C. H. G. PRICE (Brit. Med. J., 1939, I, 551—554).—In 427 blood specimens the three-phase modified Bendien test for active malignancy agreed with the clinical findings in 55.5% of cases. It is therefore useless. C. A. K.

### (xviii) NUTRITION AND VITAMINS.

**Dietary problems.** W. KOLLATH (Med. Welt, 1939, 13, 255—259).—A review. A. S.

**Cure by dietary changes.** W. VON DRIGALSKI (Dtsch. med. Wschr., 1939, 65, 285—287).—A lecture. A. S.

**Biennial reviews of progress of dairy science.** A. Physiology of dairy cattle. I. Reproduction and lactation. J. A. B. SMITH. II. Nutrition. S. MORRIS (J. Dairy Res., 1939, 10, 133—152, 153—164).—I. A review dealing with hormones, biochemical and biophysical aspects, and clinical chemistry of dairy cattle.

II. A review dealing with physiology of digestion, energy and mineral metabolism, and vitamins. W. L. D.

**Nutrition in Bihar. II. Local foodstuffs.** K. MITRA (J. Indian Chem. Soc., 1938, 15, 623—628).—Data are given for the contents of water, protein, fat, carbohydrate, crude fibre, Ca, P, and Fe and the calorific val. of various cereals, vegetables, fish, and mixed foods. J. N. A.

**Digestibility of raw potato starch in man.** J. M. BEAZELL, C. R. SCHMIDT, and A. C. IVY (J. Nutrition, 1939, 17, 77—83).—The amount of starch lost during passage through the intestinal tract was less when fed in the form of frozen than in unfrozen pudding. All starch disappearing is not utilised; a considerable proportion of raw starch is decomposed by intestinal bacteria. A. G. P.

**Dietary indispensability of valine.** W. C. ROSE and S. H. EPPSTEIN (J. Biol. Chem., 1939, 127, 677—684).—Valine is an essential component of diets in which proteins are substituted by mixtures of purified amino-acids. Omission of valine from such diets gives rise to loss of body-wt., a typical roughness of the fur, and extreme weakness in the rat, whilst administration of valine rapidly cures these symptoms. P. G. M.

**Chronic sodium chloride intoxication as aetiological factor in malnutrition diseases of cattle.**



L. RAMBE (Skand. Arch. Physiol., 1938, 78, Suppl. 13, 1—157).—Addition of large quantities of NaCl (100—300 g. per day) to the food of cattle produces inanition and death of the animals. The percutaneous NaCl excretion (determined in skin flakes obtained by brushing) on adding 20 g. of NaCl daily to the food is 0.63%. The excretion increases to 3.26% if 250—300 g. of NaCl are given daily. Haemoglobinuria occurs, usually preceded by oliguria with considerable subcutaneous oedema and followed by polyuria. The NaCl excretion through the skin is increased during the period of oliguria. A low inorg. P and Ca content of the long bones was found in some animals. The no. of protozoa in the rumen is diminished by NaCl administration. A. S.

**Availability of phosphorus in rice.** A. SREENIVASAN (Nature, 1939, 143, 244—245).—The rate of growth of young rats fed on two varieties of rice adjusted to the same protein content but differing in P content is greater with the variety containing most P. L. S. T.

**Acid-soluble phosphorus content of muscle of rats under various diet modifications.** H. C. STRUCK, C. I. REED, and J. L. COHEN (J. Nutrition, 1939, 17, 34—41).—The acid-sol. P content of skeletal muscle of rats increased from 13 to 43 weeks of age and later (43—63 weeks) declined. The extent of the changes was influenced by differences in the P and vitamin-B content of the diet (introduced at 13 weeks). Addition of growth hormone almost prevented the decrease in vals. in older rats. High-P diets tended to retard both the early increase and later diminution in acid-sol. P vals. A. G. P.

**Pathological responses to vitamin deficiencies.** G. DALLDORF (Bull. N. Y. Acad. Med., 1938, 14, 635—640).

**Nutritional muscular dystrophy—a multiple vitamin-deficiency disease.** S. MORGULIS (Z. Vitaminforsch., 1939, 8, 220—233).—The muscular dystrophy produced in rabbits by a diet of rolled oats, wheat bran, caseinogen, lard, cod-liver oil, NaCl, and  $\text{CaCO}_3$ , treated with  $\text{FeCl}_3$  or  $\text{H}_2\text{O}_2$  and mixed with skim milk powder, or of acetone-extracted wheat germ, lard, cod-liver-oil, sucrose, McCollum's salt mixture,  $\text{CaCO}_3$ , and yeast which has been treated with  $\text{FeCl}_3$  in aq. ether, is prevented and cured by supplementing the diet with the fat- and water-sol. fractions of wheat germ. The disease develops when either of the two fractions is absent and is cured by adding the missing fraction. The fat-sol. factor is probably vitamin-E and the water-sol. factor a vitamin of the B-complex, possibly  $-B_4$ . Dried brewers' yeast is a good source of the water-sol. factor. Possibly health is maintained only when the factors are present in a definite ratio. W. McC.

**Action of water-soluble vitamins on tissue cultures *in vitro*.** H. HENGSTMAN (Z. Vitaminforsch., 1939, 8, 208—215).—The growth of cultures of embryonic chick heart, of human embryonic connective tissue, and of leucocytes from fowl's blood is not affected by lactoflavin in concns. of 1:2000 to 1:10<sup>5</sup> but is irreversibly inhibited by low concns. (1:10<sup>4</sup>—1:200) of vitamin-C and  $-B_1$ ;

$-B_1$  in concns. of 1:10<sup>4</sup> and 1:2 × 10<sup>4</sup> has a slight growth-promoting effect. W. McC.

**Diet and rate of depletion of hepatic vitamin-A.** E. J. LEASE and H. STEENBOCK (J. Nutrition, 1939, 17, 85—90).—The rate of loss of vitamin-A from the liver of rats was not appreciably affected by the fat content of the diet, by feeding rancid lard, or by rapid depletion of liver-fat by choline administration. A. G. P.

**Corneal ulceration and avitaminosis-A.** H. WOLFF (Acta Ophthal., Kbn., 1938, 16, 323—331).—A case, of which the dietary history is not stated, had night blindness, measured by Gullstrand's method, and corneal ulceration, both responding to vitamin-A and -D administration. E. E. P.

**Vitamin-A formation in liver disease.** E. RISSEL (Wien. klin. Wschr., 1939, 52, 214—218).—Hemeralopia was observed in cases with damaged liver parenchyma. Increased serum-bilirubin in obstructive jaundice produces disturbances of dark-adaptation only when the liver tissue is damaged. A. S.

**Liver and vitamin-A excretion in the urine.** W. THIELE and S. SEEDORF (Klin. Woch., 1939, 18, 51—53).—Excretion of vitamin-A in the urine is not diagnostic of hepatic disease. It often occurs in hyperpyrexia and after Bi therapy. E. M. J.

**Antagonism between vitamin-A and -C and thyroid action.** G. BALASSA and G. SZÁNTÓ (Z. Vitaminforsch., 1939, 8, 233—237).—The vitamin-A content of the livers of healthy and scorbutic guinea-pigs is subject to seasonal variations. In guinea-pigs on a scorbutogenic diet, the content is lower in summer than in winter and lower when -C is added to the diet than when it is not; this is also true when the diet is supplemented with -A. The content is either increased or unaffected by thyroidectomy when the diet is scorbutogenic. Administration of thyroxine causes the content to decrease in healthy, but to increase in scorbutic, guinea-pigs. When the scorbutogenic diet is supplemented with -A, administration of thyroxine has no effect on the content and when it is supplemented with -A + thyroxine, the content is decreased by adding -C. In scorbutic guinea-pigs, there is probably, in addition to thyroxine, a factor which regulates -A metabolism so that the -A content of the liver is increased. This factor, which probably originates in the adrenal cortex, has an antithyroid action. W. McC.

**Biological value of carotene in various fats.** E. J. LEASE, J. G. LEASE, H. STEENBOCK, and C. A. BAUMANN (J. Nutrition, 1939, 17, 91—102).—Carotene added to decolorised butter fat (Lloyd's reagent) was as effective as that given in cottonseed oil and other fats in promoting the growth of rats. Inferior growth was obtained with triolein, linseed oil, or refined peanut oil as vehicle but the rate of cure of ophthalmia was essentially the same with all oils. Feeding of excessive amounts of carotene in lard, soya-bean or cottonseed oil, butter fat, or hydrogenated vegetable fat resulted in similar storage of -A in livers. A. G. P.



**Rapid visual test for vitamin-A deficiency.** R. W. DITCHBURN (*Nature*, 1939, 143, 285).—A new test is described and tests described by other workers are criticised. W. F. F.

**Determination of carotene and vitamin-A in milk.** F. R. OLSON, D. M. HEGSTED, and W. H. PETERSON (*J. Dairy Sci.*, 1939, 22, 63–66).—Milk fat is extracted twice by mixed ethers from milk treated with conc. aq.  $\text{NH}_3$  and an equal vol. of alcohol. The solvent-free fat is saponified with 5% alcoholic KOH, and the unsaponifiable matter extracted with 3 portions of ether, which are combined and washed with water. The ether-free extract is dissolved in methyl alcohol and the carotene content determined with the visual spectrophotometer and vitamin-A by the  $\text{SbCl}_3$  method. Vals. identical with those found for the corresponding butter fat obtained by churning were obtained. Various forms of storage for 3 weeks had no effect on the carotene and -A contents of milk. W. L. D.

**Determination of vitamin-A in milk and butter.** A. K. VAN BEVER (*Arch. néerland. Physiol.*, 1938, 23, 552–578).—Whilst the blue product of halibut oil and  $\text{SbCl}_3$  varies according to the law of a unimol. reaction, there is in the Carr-Price curve for milk products a sudden and non-linear weakening of the absorption at 620  $\mu$ . and a characteristic wide absorption band with a max. at 540  $\mu$ .

C. E. B.

**Determination of vitamin-A and carotenoid contents in 1–2 c.c. of blood.** J. C. LANZING (*Geneesk. Tijdsch. Neder-Indië*, 1938, 78, 3136–3144; cf. A., 1938, III, 464).—A reliable micro-method is described for the determination of carotenoids and vitamin-A in 0.5–1.0 c.c. of serum, which is hydrolysed with 60% KOH, extracted with light petroleum, and the solutions compared against standards, calibrated in a Lovibond Tintometer. The colour with  $\text{SbCl}_3$  is used to determine the -A content. The method can be used for determining very low -A contents (below 0.1 I.U. per c.c.) if 4–5 c.c. of blood are used. S. C.

**Determination of vitamin-A by spectrophotometry and by photo-electric colorimetry.** W. D. MCFARLANE and A. J. SUTHERLAND (*Canad. J. Res.*, 1938, 16, B, 421–431).—Determinations of vitamin-A in cod-liver oils and concentrates by (a) extinction coeff. measurements at 3280  $\text{\AA}$ , and (b) photo-electric colorimetry, are of equal accuracy, but with cod-liver oils special precautions have to be taken in the prep. and purification of the unsaponifiable fraction. The determination of -A by direct spectrophotometric measurements before and after its destruction by intense ultra-violet irradiation has been investigated. The conditions described permit the complete destruction of -A in a concentrate with apparently no significant effect on the other absorbing constituents of the oil except carotene; the residual absorption was 5% of the initial absorption.

F. R. S.

**Poisoning of muscle in total B-avitaminosis and in experimental, mineral disequilibrium.** R. LECOQ and R. DUFFAU (*Bull. Sci. pharmacol.*, 1938, 45, 493–498).—On a diet containing 66% of

glucose or sucrose without yeast, pigeons rapidly develop a polyneuritis typical of B-avitaminosis, but if dried brewers' yeast be given daily, the diet has no harmful effect over a long period. Total reducing sugars,  $\text{PO}_4'''$ , lactic, creatinephosphoric, and adenylypyrophosphoric acid, easily hydrolysable esters, and total acid-sol. P were determined in muscles of pigeons on the two diets. On the yeast-containing diet, the muscles after 6 months contain more reducing sugars when glucose is used in place of sucrose. With the yeast-free, sucrose diet, both reducing sugars and lactic acid are increased in muscle whilst with glucose, reducing sugars are decreased and lactic acid increased. With either sugar,  $\text{PO}_4'''$  and acid-sol. P increase, but this is more pronounced with glucose. With the glucose diet, the content of creatinephosphoric acid is decreased. With a diet containing 61% of sucrose and 5% of  $\text{Na}_2\text{SO}_4$ , polyneuritis also develops. Addition of 0.5–4 g. of yeast daily to the diet increases the reducing sugars in muscle (especially with the small doses), but in no case is the amount of lactic acid increased; with additions of 4 g. of yeast,  $\text{PO}_4'''$  and total acid-sol. P decrease. J. N. A.

**Vitamin-B complex in toxic conditions.** A. MUKHERJI (*J. Indian Chem. Soc.*, 1938, 15, 617–622).—In presence of 3% of whole dried yeast (but not autoclaved yeast), aneurin, lactoflavin, and frankonite filtrate of aq. yeast extract counteract the toxic effects caused by addition of large amounts of cod-liver oil to the diet of rats. An extra 12% of whole dried yeast is more effective than the frankonite filtrate. Lactoflavin appears to be the most effective, whilst vitamin-B complex acts better than any of the factors alone. Nicotinic acid is inactive. J. N. A.

**Reaction to acetylcholine of small intestine of pigeons suffering from vitamin-B<sub>1</sub> lack.** E. ABDERHALDEN and R. ABDERHALDEN (*Pflüger's Archiv*, 1938, 240, 388–392).—The small intestine of pigeons fed on polished rice heated to 120° became less sensitive to acetylcholine than that of normal or fasting pigeons. Aneurin increases the response to acetylcholine. J. M. R.

**Prevention of toxic manifestations of an excess of vitamin-B<sub>1</sub> by supplements of manganese to the diet.** D. PERLA (*Science*, 1939, 89, 132–133).—In rats Mn was essential for the utilisation of vitamin-B<sub>1</sub> in the tissues. W. F. F.

**Wernicke's encephalopathy (polioencephalitis hæmorrhagica superior): its alcoholic and non-alcoholic incidence.** A. C. P. CAMPBELL and J. H. BIGGART (*J. Path. Bact.*, 1939, 48, 245–262).—12 cases are recorded, only one with a frank alcoholic history. The condition occurred as a complication of a wide range of diseases. The common factor was vitamin deficiency, especially of B<sub>1</sub>. (11 photomicrographs.) C. J. C. B.

**Vitamin-B<sub>1</sub> in diseases of the spinal cord.** F. LEINS (*Z. Vitaminforsch.*, 1939, 8, 215–217).—Intramuscular injection of the vitamin had a beneficial effect on a woman suffering from amyotrophic lateral sclerosis. W. McC.



**Effect of yeast and of thiamin on production of low-iodine goitre.** P. L. HARRIS and R. E. REMINGTON (J. Nutrition, 1939, 17, 31—34).—Dried brewers' yeast was ineffective in influencing the size or I content of thyroid glands of rats receiving a low-I goitre-producing diet. Thyroids of rats receiving supplements of dried or autoclaved yeast or autoclaved yeast with thiamin were of similar size, dry matter, and I contents. Vitamin- $B_1$  cannot replace I in preventing goitre. A. G. P.

**Secondary deficiency of vitamin- $B_1$  and riboflavin in the blacktongue-producing diet.** L. H. MARGOLIS, G. MARGOLIS, and S. G. SMYTH (J. Nutrition, 1939, 17, 63—76; cf. A., 1939, III, 402).—Liver extract added to a blacktongue-producing diet completely eliminated the disease in dogs. Nicotinic acid had a curative effect in the first or second but not in subsequent attacks. Thiamin + riboflavin + nicotinic acid was a complete substitute for liver extract. Riboflavin and thiamin were probably secondary deficiencies in the blacktongue-producing diet. The vitamin- $B_1$  requirement increases with successive attacks of blacktongue. A. G. P.

**Vascularisation of rat cornea in riboflavin deficiency; corneal vascularisation in vitamin-A deficiency.** O. A. BESSEY and S. B. WOLBACH (J. Exp. Med., 1939, 69, 1—12).—Rats on a riboflavin-deficient diet constantly exhibit vascularisation of the cornea after 4 weeks, owing to asphyxia of the tunica propria. Its appearance is a reliable criterion of riboflavin deficiency and its repair may be used for the biological assay of riboflavin compounds.

A. C. F.

**Ætiology of pellagra.** J. NITZULESCO (Arch. Neurol. Bucarest, 1938, 2, 347—368).—A comprehensive account of the literature. The rôle of digestive troubles in the pathogenesis, and the importance of the absorption of toxins from the intestinal tract in association with lack of the anti-pellagra factor, are stressed. Petri's experimental work on gastric extirpation which is productive of a neuro-cutaneous syndrome, and the correlation of this latter with hypothalamic lesions and with neuritic symptoms in megalocytic anæmia, are noted. W. K. S.

**Case of enterogenous beri-beri.** H. SCHROEDER (Med. Klin., 1939, 35, 245—246).—A patient, suffering from a histamine-resistant achylia and enteritis following typhoid fever, developed typical beri-beri symptoms. Yeast preps. given by mouth were not absorbed from the intestinal canal. The patient was cured by intravenous injections of vitamin- $B_1$ .

A. S.

**Nicotinic acid in pellagra.** A. GRECOU, N. G. IONESCO, and P. CONSTANTINESCO (Bull. Soc. méd. Hôp. Bucarest, 1938, 20, 283).—Nicotinic acid given in large doses (mostly intravenously) to 18 cases of pellagra produced smaller responses than have been reported recently in America. Symptoms improved but the differences from control cases (given high-protein diet, liver, etc.) were slight. Possible explanations are discussed. C. A. K.

**Pellagra.** N. G. IONESCO and P. CONSTANTINESCO (Bull. Soc. méd. Hôp. Bucarest, 1938, 20, 305—315).—

Blood-carotene, -fibrinogen, -creatinine, and -creatinine, Takata's reaction, Congo-red index, and sero-coagulation test of Weltmann were normal in cases of pellagra.

C. A. K.

**Effect of nicotinic acid deficiency on the cozymase content of tissues.** A. E. AXELROD and C. A. ELVEHJEM (Nature, 1939, 143, 281—282).—In 2 pigs and 1 dog showing nicotinic acid deficiency, the cozymase content of the liver was halved and that of the muscles reduced to a tenth. W. F. F.

**Occurrence of vitamin- $B_2$  (lactoflavin). II. In organs.** J. SCHORMÜLLER (Z. Unters. Lebensm., 1939, 77, 346—357; cf. A., 1939, III, 287).—Liver, kidney, heart, and spleen are rich in vitamin- $B_2$ . When extracted with water, conc. aq. urea,  $PO_4^{3-}$  buffer solution, or aq.  $NH_3-(NH_4)_2HPO_4$ , the  $-B_2$  is mainly bound as yellow enzyme, but in muscle much of the  $-B_2$  is adsorbed non-specifically on cell-proteins. Autolysis of liver does not lead to measurable decomp. of  $-B_2$ ; it is, however, progressively split from combination as yellow enzyme. In heart and kidney  $-B_2$  is irregularly distributed. E. C. S.

**Separation of lactoflavin (vitamin- $B_2$ ) and lactoflavin phosphate.**—See A., 1939, II, 229.

**Factor I (vitamin- $B_6$ ) requirement of the rat.** M. K. DIMICK and C. B. SCHREFFLER (J. Nutrition, 1939, 17, 23—29).—Rats receiving a diet deficient in factor I responded slightly to 1  $\mu$ g. of the cryst. material; 10  $\mu$ g. nearly satisfied requirements. Rats receiving I but with a food intake limited to that of I-deficient controls utilised the food more effectively. Deficiency of I is associated with accelerated atrophy of the thymus. A. G. P.

**Vitamin-C metabolism in lactating mothers.** F. T. CHU, T. WOO, and C. SUNG (Chinese J. Physiol., 1938, 13, 383—394).—The output of vitamin-C was followed in the milk and urine of 4 women by Harris and Ray's method (A., 1935, 417). The urinary output dropped at once when extra -C was discontinued and rose at once when it was added to an already adequate diet; when the previous diet was deficient in -C, extra excretion did not occur for some days. The output in the milk rose and fell more gradually, and indicated the degree of saturation of the body as shown by the urinary response to test doses. Less than 4 mg. of -C per 100 c.c. of milk indicated deficiency and 8 mg. per 100 c.c. saturation. The optimum daily intake during lactation was 82 mg. Cabbage or turnip was an adequate source. N. H.

**Vitamin-C requirements of pregnant and lactating women.** K. U. TOVERUD (Z. Vitaminforsch., 1939, 8, 237—248).—In healthy women receiving daily 30 mg. of ascorbic acid, the proportion excreted in the urine is 50%. This proportion is attained in few pregnant and in no lactating women when the intake is 75 mg. daily but is reached after 2—3 weeks in pregnant, and after 5—8 weeks in lactating, women when the daily intake is 175 mg. When the level of urinary excretion indicates that the organism is saturated, the ascorbic acid content of the blood usually reaches 1 mg.-% or more but is sometimes only 0.6—0.8 mg.-%. Usually the ascorbic acid content (which is very variable) of the milk of lactating



women increases before the urinary excretion of the acid increases. The average ascorbic acid content of the blood of infants aged 0.5–4 months is 0.67 mg.-%.

W. McC.

**Gingivitis during pregnancy** [from avitaminosis-C]. R. BRAUER (Med. Klin., 1939, 35, 280–281).—Gingivitis gravidarum is due to C-hypovitaminosis and can be cured by administration of ascorbic acid.

A. S.

**Etiology of infantile scurvy.** C. BENNHOLDT-THOMSEN (Med. Klin., 1939, 35, 136–138).—A review.

A. S.

**Crystalline vitamin-C in prophylaxis and treatment of infantile scurvy.** A. S. KENNEY and M. RAPOPORT (J. Pediat., 1939, 14, 161–182).—Vitamin-C was given prophylactically (1.83 mg. per kg. daily) for 5 months. No evidence of scurvy was found. In the treatment of 21 cases of infantile scurvy crystalline C caused satisfactory healing, but there was no const. effect on the capillary fragility test after administration.

C. J. C. B.

**Action of ascorbic acid on serum-lipase.** W. KRÜGER (Klin. Woch., 1939, 18, 19–20).—300 mg. of ascorbic acid by mouth or 800 mg. intravenously usually raise the serum-lipase in man.

**Hypovitaminosis-C.** A. VOGT (Schweiz. med. Wschr., 1939, 69, 213–216).—Prolonged administration of lactoflavin does not prevent the further development of senile cataract. Patients with senile cataract have no greater vitamin-C deficit than old people without cataract. -C has no effect on senile cataract.

A. S.

**Ascorbic acid, a precursor of vitamin-C.** I. H. LUND, E. TRIER, M. OTTSEN, and A. ELMBY. II. H. LUND and E. TRIER (Klin. Woch., 1939, 18, 79–80, 80–82).—I. Determination of synthetic ascorbic acid in serum by the method of Lund and Lieck gives higher vals. if the ascorbic acid is added before deproteinisation than after. The cause of this phenomenon is discussed.

II. A micro-method for determining ascorbic acid described allows quant. determination of ascorbic acid added to serum before deproteinisation; this is not possible with the original method of Lund and Lieck. The methods give similar vals. for the original ascorbic acid content of serum.

E. M. J.

**Simple test for the saturation deficit of vitamin-C.** H. BURMEISTER and K. WACHHOLDER (Klin. Woch., 1939, 18, 85–87).—The rapid method of Gander and Niederberger is adequate as compared with Wachholder and Hamel's detailed method (cf. A., 1938, III, 677, 985) if certain corrections are used.

E. M. J.

**Ascorbic acid saturation.** G. LEMMEL (Dtsch. Arch. klin. Med., 1938, 183, 277–288).—The human organism begins to be saturated with ascorbic acid when, on daily administration of 200 mg. of redoxon, 10 mg.-% of ascorbic acid are excreted in the urine for the first time. The organism does not store vitamin-C.

A. S.

**Ascorbic acid content of serum and urine in health and disease.** H. HERTEL and L. ARNOLD (Dtsch. Z. Verdaukr. Stoffw., 1939, 1, 258–271).—

Serum-ascorbic acid vals. do not significantly differ in health and diseases, such as carcinoma, diphtheria, and pneumonia.

E. M. J.

**Isolation of crystalline l-ascorbic acid from the tonsils of man and of the ox.** H. H. MEYER (Biochem. Z., 1939, 300, 297–300).—The tonsils are cut into small pieces and heated for 6–7 min. at 100° in CO<sub>2</sub> with 4 parts of 10% acetic acid. The mixture is filtered and proteins, glutathione, and cysteine are removed by addition of 25% aq. Hg acetate, pptd. material being eliminated by ultrafiltration at 25 atm. of N<sub>2</sub>. The filtrate is freed from Hg with H<sub>2</sub>S and again filtered under pressure. Colloidal S is extracted, if necessary, with CS<sub>2</sub>. The liquid is evaporated in a vac. at 35–40°, the residue is shaken with acetone, and the solution, decanted from insol. material, is conc. in a vac. The deposited crystals are repeatedly recryst. from a 1:1 acetone-light petroleum mixture. The yields from 86.5 g. of ox tonsils and 44.7 g. of human tonsils are 0.5 and 0.3 mg. respectively.

W. McC.

**Test for vitamin-C deficiency.** M. VAUTHEY (Lancet, 1939, 236, 695–696).—The normal subject excretes 1 mg. of ascorbic acid in the urine during the hr. after the first morning micturition. After saturation with vitamin-C this figure is 2 mg. The amount of ascorbic acid (by intramuscular injection) necessary to produce the latter is a measure of the previous degree of unsaturation. Normally 600 mg. on 3 successive days produce saturation. Errors due to early or delayed excretion and to low concns. of -C are avoided.

C. A. K.

**Distribution of vitamin-C in animal and plant tissues.** II. A. FUJITA and T. EBIHARA (Biochem. Z., 1939, 300, 143–147; cf. A., 1937, III, 233).—The vitamin-C contents (oxidised and reduced forms) of certain vegetables, fruits, and marine algæ and of some foods, petals of flowers, and leaves are recorded. The -C content of some leaves is much greater than that of Hungarian paprika. Human milk contains 1.95–9.56 mg.-% of -C (58–100% reduced), the -C content decreasing as the strength of the Arakawa reaction increases.

W. McC.

**Deterioration of ferrous sulphate and ascorbic acid solutions.**—See A., 1939, I, 279.

**Determination of vitamin-C in foodstuffs.**—See B., 1939, 433.

**Determination of vitamin-C in milk.** C. A. KNIGHT, R. A. DUTCHER, and N. B. GUERRANT (Science, 1939, 89, 183–185).—An apparatus for collecting milk without exposure to light, heat, or air is described. The ascorbic acid, which is in the reduced form, is titrated with 2:6-dichlorophenol-indophenol after the addition of NaPO<sub>3</sub> + HCl (p<sub>H</sub> 2.5–3.0) to ppt. protein and delay oxidation. After preliminary extraction with anhyd. ethyl ether, solutions of 2:6-dichlorophenol-indophenol remain stable for 21 days.

L. S. T.

**Determination of ascorbic acid in strongly coloured fruit.** L. S. LANKE (Skand. Arch. Physiol., 1939, 81, 300–309).—The titration end-point with 2:6-dichlorophenol-indophenol during the determination



of ascorbic acid in strongly coloured fruit can be observed by addition of amyl alcohol and toluene. The fruit dyes are insol.; the indophenol is sol. in this mixture. A. S.

### Colorimetric determination of vitamin-C. A.

FUJITA and T. EBIHARA (Biochem. Z., 1939, 300, 136-142; cf. A., 1937, III, 233; 1938, III, 744).—In the authors' method, turbidity in the deproteinised filtrate is counteracted by adding methyl alcohol, filtering, and measuring the depth of colour after 12 min. Use of deproteinising agents in addition to  $\text{HPO}_3$  is usually unnecessary. At  $p_{\text{H}}$  above 6,  $\text{H}_2\text{S}$  completely reduces dehydroascorbic acid, but the more acid is the medium, the more incomplete is the reduction. W. McC.

### *D*-Avitaminosis causing paralyzes in rats.

M. P. J. VAN DER RIJST and P. ARONS (Arch. néerland. Physiol., 1938, 23, 592—596).—75% of albino rats fed on Steenbock and Black's diet showed paralyses resulting from hæmorrhages at the level of the 4th—6th dorsal spinal roots where the cord was compressed by a curving of the vertebral column. The microscopical appearances also suggested a local myelitis in some cases. C. E. B.

## Antirachitic vitamin of irradiated milk. A

FLEISCH (Z. Vitaminforsch., 1939, 8, 217—220; cf. Haman and Steenbock, B., 1936, 345).—A greater degree of calcification in the epiphysis of the tibia of the chick is produced by supplementing the diet with irradiated milk powder than with the same proportion of non-irradiated powder to which there has been added a proportion of vitamin- $D_3$  having antirachitic power (for rats) greater than that of the antirachitic vitamin in the irradiated milk. Irradiated milk contains an antirachitic substance, probably  $-D_3$ , together with other irradiation products of provitamin- $D_3$  but no  $-D_2$ . As dietary supplements, cod-liver oil and  $-D_3$  are superior to irradiated milk.

W. McC.

Treatment of rickets with vitamin- $D_3$ . W.

WENTZ (Dtsch. med. Wschr., 1939, 65, 378—379).—16 infants (3—14 months old) with severe rickets were treated by administration, twice daily, of 10 drops of vitamin- $D_3$ . The average total dose required to cure the condition was 7 mg. One infant suffering from severe rickets and malnutrition did not respond after 4 weeks' treatment with  $-D_3$ . A. S.

### Influence of phytin and fats on production of

rickets by a cereal diet. N. PALMER and J. C. MOTTRAM (Biochem. J., 1939, **33**, 512—515).—Previous indications (A., 1937, III, 463) that the tendency of cereals to produce rickets is due to their low Ca and high P contents are confirmed. This effect can be eliminated entirely by adding sufficient Ca lactate to the diet to make the ratio Ca : P = 1 : 0.5. The rachitogenic action of cereals is not due to the phytin which they contain. Addition of phytin to the diet reduces or completely prevents rickets. Addition of a vegetable oil free from vitamin-D does not prevent incidence of rickets. The results of McDougall (A., 1938, III, 745) are not confirmed.

**Vitamin-E and related compounds.** P. KARRER (Helv. Chim. Acta, 1939, 22, 334—350).—A review.

*E*-Vitamins. G. GRIJNS (Z. Vitaminforsch., 1939).

8, 197—208).—Male and female rats grow well, but the males of the second generation lose their reproductive power, when the diet consists of maize, peanut or coconut meal, hardened arachis oil, and salt mixture. When the diet consists of rice starch, albumin, caseinogen, hardened fat, marmite, salt mixture, lemon juice freed from acid, and extract of carrots, the males and females are fertile but the females cannot suckle their young and ability to suckle is not restored by adding wheat-germ oil to a very similar diet. When a liver-oil prep. is added to the rice starch diet, the females, but not the males, lose their reproductive power. Fertility and ability to suckle young are lost when milk is omitted from a diet of whole wheat, fat, meat meal, milk, and salt mixture. Females of the second generation are unable to suckle their young when the diet consists of whole wheat (or whole wheat extracted with acetone), wheat starch, hardened fat, butter fat, caseinogen, marmite, salt mixture, and lemon juice freed from acid. Ability to suckle is much greater with albumin as the dietary protein than with caseinogen. Further experiments with fractions of wheat-germ oil (cf. A., 1933, 757) show that the methyl-alcoholic fraction contains a factor which counteracts sterility in female, but not in male, rats and that the benzene fraction probably contains a factor which counteracts sterility in the males but not in the females. The results indicate that the male differs from the female anti-sterility vitamin and that both differ from the lactation factor.

W. McC.

Vitamin-E content of royal jelly and "bee bread." M. H. HAYDAK and L. S. PALMER (J.

Econ. Entom., 1938, **31**, 576—577).—The jelly was devoid of vitamin-*E*; the "bread" contained very small amounts. A. G. P.

### Occurrence of $\gamma$ -tocopherol in maize embryo

oil. O. H. EMERSON, G. A. EMERSON, and H. M. EVANS (Science, 1939, **89**, 183).—The isolation of  $\gamma$ -tocopherol (allophanate, m.p. 137–140°) from maize oil (yield ~700 mg. from 3 kg.) is described. The  $\alpha$ -isomeride is not present to any large extent in maize oil. L. S. T.

**Vitamin-F.** F. GRANDEL (Fette u. Seifen, 1939, 46, 150—152).—The usefulness of the Shepherd-Linn

test for vitamin-*F* by cutaneous application of dil. solutions of material to the tails of young rats is confirmed: inclusion of hardened fat (I val. = 3) in the *-F*-free diet does not inhibit or diminish the deficiency symptoms. A preliminary announcement is made of a new *-F*-active concentrate of unsaturated acids (other than linoleic acid) which keeps better than the usual preps. of linoleic or linseed oil acids, and is suitable (after dilution) for peroral or percutaneous administration. The mechanism of absorption of *-F* and its action, which probably depends on the presence or liberation of the free unsaturated acids, are discussed. E. L.

**Vitamin-K.** G. DAM (Z. Vitaminforsch., 1938—9, 8, 248—257).



**Isolation of vitamin-K in purified form.** H. DAM, A. GEIGER, J. GLAVIND, P. KARRER, W. KARRER, E. ROTHSCCHILD, and H. SALOMON (Helv. Chim. Acta, 1939, 22, 310—313).—Vitamin-K is purified by a combination of mol. distillation and chromatographic separation processes. The absorption spectrum max. is parallel to the biological activity. Many purifications gave a prep. of which the extinction coeff. of absorption was unaltered by further separation. It is a light yellow oil; abs. purity is not claimed. Absorption spectrum shows max. at 248, 261, 270, and 328 m $\mu$ . Catalytic reduction in hexane gives a product which shows the first three max., but not the last. Vitamin-K in alcoholic Na ethoxide gives a violet-blue solution, changing gradually to brown; acidification then gives a product showing no characteristic max. and no activity. Cryst. by-products from lucerne extraction are recorded: a hydrocarbon, C<sub>30</sub>H<sub>62</sub>, and two isomeric medicagosterols, C<sub>29</sub>H<sub>48</sub>O, 0.5H<sub>2</sub>O, I, m.p. 133°, [ $\alpha$ ]<sub>D</sub><sup>25</sup> -22.5° in CHCl<sub>3</sub> (acetate, m.p. 120—121°; 3:5-dinitrobenzoate, m.p. 205°), and II, m.p. 164°, [ $\alpha$ ]<sub>D</sub><sup>25</sup> -2.4° in CHCl<sub>3</sub> (acetate, m.p. 173°; 3:5-dinitrobenzoate, m.p. 195°). A. T. P.

**Use of phosphotungstic acid in the preliminary refining of extracts containing vitamin-K.** A. A. KLOSE and H. J. ALMQUIST (J. Amer. Chem. Soc., 1939, 61, 532—533).—Vitamin-K in hexane extracts of lucerne is conveniently conc. without loss of efficiency by removing impurities with phosphotungstic acid in ether. R. S. C.

**Nutritional cytopenia (vitamin-M deficiency) in the monkey.** W. C. LANGSTON, W. J. DARBY, C. F. SHUKERS, and P. L. DAY (J. Exp. Med., 1938, 68, 923—940).—A condition (vitamin-M deficiency) characterised by anæmia, leucopenia, loss of wt., and ultimate death and sometimes with ulceration of the gums and thrombocytopenia occurs in young rhesus monkeys having a diet deficient in -B complex. It is not attributable to lack of -B<sub>1</sub>, riboflavin, or nicotinic acid, but is relieved by yeast or liver extract. A. C. F.

**Hæmoptysis and lung infiltration caused by avitaminosis.** T. JERSILD (Lancet, 1939, 236, 632—633).—A woman aged 36 had hæmoptysis and lung infiltration, but there was no evidence of pulmonary tuberculosis. There were signs of hæmorrhagic diathesis and the condition (including infiltration) was cured by citrin (vitamin-P). C. A. K.

**Effect of chondroitinsulphuric acid on gizzard erosion and growth in chicks.** L. A. CRANDALL, jun., F. F. CHESLEY, R. E. GRAY, and H. E. ROBINSON (J. Nutrition, 1939, 17, 53—61).—The acid favours growth of chicks under certain conditions but has no direct action in preventing gizzard erosion. A. G. P.

### (xix) METABOLISM, GENERAL AND SPECIAL.

**Diseases of metabolism and nutrition.** R. M. WILDER, D. I. RUTLEDGE, and D. L. WILBUR (Arch. intern. Med., 1939, 63, 356—427).—A review. C. A. K.

**Registration calorimeter for larger animals.** W. BOTHE, R. WETZEL, and H. WOLLSCHITT (Pflüger's Archiv, 1938, 240, 498—502).—The method is similar to that previously described for small animals (Physiol. Abs., 1938, 22, 130). J. M. R.

**Oxygen consumption of isolated tissues of guinea-pigs during the early days of life.** O. BUSSE (Pflüger's Archiv, 1938, 240, 202—211).—Observations on the O<sub>2</sub> consumption of the diaphragm and kidneys were made with the Warburg method in premature, new-born, and young animals. The val. of Q<sub>O<sub>2</sub></sub> [= O<sub>2</sub> consumption in cu. mm. ÷ (mg. dry wt. × hr.)] for the diaphragm is lower in premature animals than in those born at the normal time and varies little during the first 3 weeks of post-natal life. Q<sub>O<sub>2</sub></sub> of the kidney is also much lower in premature animals; the O<sub>2</sub> consumption of the kidneys gradually increases in the first 3 weeks of post-natal life. J. M. R.

**Influence of cyanide on the oxygen consumption of isolated frog's skin.** E. HUF (Pflüger's Archiv, 1938, 240, 573—577).—1 g. of moist skin of *Rana esculenta* used 0.125 mg. of O<sub>2</sub> per hr. at 20°; this fell to 0.022 mg. in presence of 0.001M-CN<sup>-</sup>. Within certain limits variations in the O<sub>2</sub> concn. had no effect on the O<sub>2</sub> consumption. J. M. R.

**Relation between respiration and irreciprocal osmosis in the isolated frog's skin.** E. HUF (Pflüger's Archiv, 1938, 240, 578—587).—The diffusion rates through frog's skin from the epithelial to the serous side, and vice versa, were measured for many hr. in normal and diluted Ringer's solution in a differential osmometer and the effects of CN<sup>-</sup> determined. They show a relation between respiration and the osmotic resistance of frog's skin. J. M. R.

**Effect of iodine on the gas metabolism of the tissues.** C. SELLEI and G. MAYER (Magyar Orv. Arch., 1938, 39, 519—523).—The effect of various concns. of aq. KI and Lugol's solution on the respiration and glycolysis of a rat's kidney is examined. A. W. M.

**Endocrinologic and metabolic observations in exfoliative dermatitis.** W. J. HANES and R. S. CREW (Endocrinol., 1939, 24, 404—413).—Five cases showed increased basal metabolic rate and gonadal insufficiency. Blood-cholesterol and glucose tolerance were decreased. V. J. W.

**Metabolism of the eggs of *Psammecinus miliaris* during the fertilisation reaction.** H. LASER and (LORD) ROTHSCCHILD (Proc. Roy. Soc., 1939, B, 126, 539—557).—During the first 5 min. after insemination of the eggs there are sudden increases in O<sub>2</sub> consumption and acid production; neither of these effects persists. Results indicate that immediately after activation, the R.Q. falls to an unusually low val. F. B. P.

**Effect of porphyrins on the metabolism of warm-blooded animals.** K. HINSBERG and R. MERTEN (Biochem. Z., 1938, 299, 137—140).—In rabbits, on a diet of oats and green food, daily intramuscular injection of 4 mg. of hæmatoporphyrin causes a large increase in the urinary excretion of N, C, and Cl, five-fold increase in the "vacate"-O:N



ratio, and 100% increase in the C:N ratio. These changes and simultaneously occurring changes in the composition of the blood (e.g., increase in haemoglobin content and temporary large decrease in lactic acid content) indicate disturbance of protein metabolism. The increased Cl excretion possibly results from disturbance of endocrine function. Similar disturbances may occur in porphyrinuria and in related diseases.

W. McC.

**Specific dynamic action and deamination of amino-acids.** K. OBERDISSE (Biochem. Z., 1939, 300, 183—192).—In dogs given intravenous injections of *dl*-alanine (1 g. per kg. of body-wt.), there is a parallelism between the changes in  $O_2$  consumption and those in blood- $NH_3$  during the 7 hr. following the injections. The curves rise steeply to a max. attained approx. 0.5 hr. after the injection and then fall slowly to the original levels, exhibiting slight rises at intervals; the increase in blood- $NH_3$  is approx. 4-fold. Hence parenterally administered amino-acids are very rapidly deaminated and the resulting sp. dynamic action is due almost entirely to the N-free deamination products which are oxidised partly directly and partly indirectly after conversion into carbohydrate.

W. McC.

**Metabolism of certain amino-acids with special reference to respiratory exchange and heat production.** M. KRISS (J. Nutrition, 1939, 17, 1—14).—Glutamic acid, glycine, and alanine, given as supplements to a maintenance ration, were absorbed to the extent of 95, 100, and 100% respectively. Approx. 3, 7, and 29% respectively were excreted in urine as unoxidised amino-acids. The metabolisable energy of the compounds was 80.8, 65.7, and 64.5% respectively when fed in amounts equiv. to 7.5 kg.-cal. daily. The respiratory exchange and heat production in the metabolism of these acids were closely related to their C:N ratio.

A. G. P.

**Influence of the structure of amino-acids on their fate in the organism.** M. POLONOVSKI and P. BOULANGER (Bull. Soc. Chim. biol., 1939, 21, 92—97).—Examination of the deamination *in vivo* and the excretion of dextrorotatory amino-acids by the dog kidney shows that the deamination except in the case of *l*-alanine takes place only to a small extent and does not occur with  $\alpha$ -substituted  $\alpha$ -amino-acids. The process of excretion is independent of the deamination.

A. L.

**Creatine-creatinine metabolism and the hormones.** P. PIZZOLATO and H. H. BEARD (Endocrinol., 1939, 24, 358—363).—Administration of theelin, testosterone propionate, or anterior pituitary extract causes in rats increase in muscle-creatinine and creatine excretion with decrease in creatinine excretion. Castration causes the same results except that muscle-creatinine is not affected in the male.

V. J. W.

**Biochemistry of choline and its derivatives.** VIII. Experimental methods. Water-soluble choline of (IX) blood, (X) the organs of mammals, and (XI) invertebrates (limpet). E. KAHANE and J. LÉVY (Bull. Soc. Chim. biol., 1939, 21, 223—240, 241—249, 250—255, 256—263).—VIII. Aq. extracts are deproteinised by  $Fe(OH)_3$  and free choline

in the filtrate is determined before and after hydrolysis (either directly or after first pptg. by Reinecke salt) by chemical or biological means. The two methods give comparable vals.

IX. Three groups of animals can be distinguished by the water-sol. choline content of the blood: first, a group containing small amounts in the free state (e.g., man, horse, dog, rat); secondly, a group containing large amounts of free choline (e.g., cattle); thirdly, a group in which choline is almost completely combined (e.g., rabbit).

X. The water-sol. choline content of different organs varies regularly from species to species. Four groups are distinguished: (1) traces of water-sol. choline (e.g., rat's heart, dog's heart, ovary, or uterus), (2) preponderance of free choline (e.g., dog pancreas and dog, guinea-pig, and rat spleen), (3) preponderance of combined choline (e.g., dog prostate, guinea-pig and rat seminal vesicles), (4) both forms present (e.g., rabbit brain and liver, intestines, kidneys of several animals).

XI. A gastropod (limpet) is distinguished from other molluscs by its high content of combined water-sol. choline (0.4—2.5 mg. per g.), which is localised mainly in the foot. This compound appears to resemble closely that present in sperm, bile, etc. P. G. M.

**Chemical tissue changes in certain forms of shock.** N. B. MEDVEDEVA (J. Med. Ukrain., 1938, 8, 1025—1039).—In fatal shock due to hetero-transfusion the non-protein N of the press-juice of various tissues (liver, kidneys, heart, skeletal muscle, brain, intestine, skin) of rabbits is above normal, and continues to rise during incubation at 37° (1 hr.); the alkalinity of the juice is lowered, and similarly continues to fall during incubation. The same effect is obtained in peptone shock, except that incubation causes no further fall in alkalinity, whilst histamine shock differs in that alkalinity is raised in muscle and intestine, but lowered in the other, juices. Reducing sugars are raised in the first, lowered (except for liver) in the second, and vary irregularly in the third, type of shock.

R. T.

**Effect of titanium on oxidation of thiol groups by various tissues.** F. BERNHEIM and M. L. C. BERNHEIM (J. Biol. Chem., 1939, 127, 695—703).—Cysteine and thioglycollic acid are oxidised by washed liver-protein and the nitroprusside test becomes negative. Na pertitanate completely inhibits oxidation. Glutathione is oxidised to the dithio form, a reaction which is not affected by Na pertitanate. The  $O_2$  uptake in the oxidation of cysteine corresponds with the formation of cysteic acid but deamination does not occur. Since Ti occurs in the liver, it may regulate the oxidation of thiol compounds to sulphonic acids.

P. G. M.

**Treatment of painful obesity (Dercum's disease).** R. BOLLER (Med. Welt, 1939, 13, 329—335).—The painful fat deposits are repeatedly infiltrated with novocaine. Permanent disappearance of pain occurred in 5 patients. The obesity was treated with thyroxine and diet.

A. S.

**Chemical studies of a Gaucher spleen.** J. S. McCONNELL, J. C. FORBES, and F. L. APPERLY



(Amer. J. med. Sci., 1939, 197, 90—92).—The cerebroside in the spleen of a case of Gaucher's disease was isolated and found to be kerosin. Phrenosin was absent. R. L. N.

**Central control of the metabolism of fats.** C. D. DE LANGEN (Acta. med. scand., 1938, 97, 427—439).—Control of fat metabolism by a centre in the mesencephalon is indicated by: (i) the hyperlipæmia induced in rabbits by extensive bleeding or by injection of  $\text{NH}_4\text{OH}$  is abolished by section between the 3rd and 4th thoracic vertebrae; (ii) veronal, other barbiturates, and sulphonal in doses to produce deep sleep markedly increased the blood-fat, while morphine and bromides did not; (iii) the barbiturate effect is abolished by spinal section (3rd thoracic); (iv) liver-fat was enormously increased (probably from depot fat) and the liver much enlarged in these hyperlipæmias. C. A. A.

**Influence of low and high planes of nutrition on composition and synthesis of fat in the pig.** T. P. HILDITCH, C. H. LEA, and W. H. PEDELTY (Biochem. J., 1939, 33, 493—504).—The fatty acids in depot (back) fat of pigs fed on different planes of nutrition is determined. With restriction of the diet the amounts of oleic and linoleic acids in the fat increase and the fat is more slowly deposited. Stearic acid shows very little variation. Production and deposition of the most saturated fat occurs most rapidly when a high-level diet is used after the first 16 weeks. Abundant food is more important during the later stages of growth than during the first 16 weeks of life. The pig can synthesise  $\Delta^9$ -hexadecenoic, oleic, stearic, and palmitic acids, 1 mol. of the latter being formed to approx. 1.9 mols. of  $\text{C}_{18}$  acids. It is doubtful whether myristic acid is synthesised. Linoleic and unsaturated  $\text{C}_{20-22}$  acids are not synthesised. Saturated acids of lower mol. wt. than myristic acid are neither synthesised nor assimilated by the pig. J. N. A.

**Dietary prevention of fatty livers. Compounds related to choline.** A. P. PLATT (Biochem. J., 1939, 33, 505—511).—Choline methyl ether (aurichloride, m.p. 155°), tetra-( $\beta$ -hydroxyethyl)ammonium chloride, cholamine, and creatine do not prevent deposition of liver-fat in rats maintained on high-fat, low-protein diets. Betaine possesses lipotropic action, and its activity is approx. 30% of that of choline. The significance of the results is discussed. J. N. A.

**Primary systemic amyloidosis. Involvement of cardiac valves, joints, and bones with pathological fracture of the femur.** S. KOLETSKY and R. M. STECHER (Arch. Path., 1939, 27, 267—288).—A case of 14 years' duration is reported. C. J. C. B.

**Diet in the prevention of diabetes mellitus.** D. ADLERSBERG and S. SIEGAL (New England J. Med., 1938, 219, 194—197).—Diabetes is regarded as being largely an hereditary metabolic impairment, transmitted as a Mendelian recessive. A potential diabetic should eat a normally balanced diet, containing at least 200 g. of carbohydrate, and should avoid overnutrition. A. M. G.

**Action of glucose and insulin on glycogen breakdown in starvation and phloridzin poisoning.** C. BRENTANO (Klin. Woch., 1939, 18, 82—85).—Glycogen breakdown and creatinuria during starvation and phloridzin poisoning in rabbits are prevented by simultaneous administration of glucose and 0.5 unit of insulin per g. of glucose. 5 hr. later muscle-glycogen has risen by 38—135% whereas liver-glycogen has fallen by 25%. E. M. J.

**Cardiomegalia glycogenica circumscripta.** S. VAN CREVELD and H. M. VAN DER LINDE (Arch. Dis. Child., 1939, 14, 14—21).—Description of a case and review of the literature. (4 photomicrographs.) C. J. C. B.

**Liver- and muscle-glycogen in fasting rats after overdosage with glucoplastic amino-acids.** R. STÖHR (Biochem. Z., 1938, 299, 242—248).—The glycogen content of the liver of fasting rats is increased by gastric administration of single doses (0.2—0.4 g. per 100 g. of body-wt.) of *d*- or *dl*-alanine, *l*-cysteine, *l*-cystine, arginine, aspartic acid, or *d*-glutamic acid, but is not affected by giving *dl*-serine, *dl*-aminobutyric acid, or *d*-ornithine; an increase is sometimes produced by glycine, *l*-proline, *l*-hydroxyproline, or *dl*-aminohexanoic acid. The muscle-glycogen is not affected. The results support the view that certain amino-acids are converted into carbohydrate in the organism. W. McC.

**New interpretation of hyperglycæmia in obese middle-aged persons.** L. H. NEWBURGH and J. W. CONN (J. Amer. Med. Assoc., 1939, 112, 7—11).—Of 370 patients who showed spontaneous glycosuria associated with delayed disposal of ingested glucose 49% were obese, and nearly all over 30 years of age. Reduction of wt. by diet rendered more than 90% of 21 obese patients aglycosuric, and was followed by a normal glucose-tolerance curve. Recurrence of obesity reproduced the original lowered tolerance. R. L. N.

**Selective hæmoglycolysis.** V. V. OPPEL (Arch. Sci. biol., 1935, 37, 433—447).—Dog and sheep bloods are capable of selective splitting of glucose in presence of fructose. Fructolysis is delayed by addition of glucose but accelerates as the latter is removed. The selective action is associated with differences in the rate of formation of phosphoric ester from the two sugars. CH. ABS. (p)

**Nervous system and carbohydrate metabolism of invertebrates.** M. B. ERMAKOV and NATHALIE B. MEDVEDEVA (Trans. Conf. Med. Biol., 1937, 61—81, 265—268).—Injection of adrenaline into jellyfish, or destruction of the nervous system, does not affect the reducing sugar content of the body fluid. In the earthworm a rise in blood-sugar follows adrenaline injection. In mollusca various effects were obtained, according to the degree of development of the nervous system. Thus anodonta did not react, whilst snails gave a marked hyperglycæmic effect, associated with disappearance of hepatopancreatic glycogen; the opposite effects were found with hibernating animals. The crayfish, crab, scorpion, silkworm larva (but not imago), locust, and praying-mantis react similarly to adrenaline. Extirpation of the parapharyngeal ganglia of snails, or section of the sympathetic



division of the abdominal neural chain of crayfish, or of the anterior part of this chain in scorpions and silkworms, causes hyperglycaemia of varying intensity and duration; in the case of the silkworm glycogenolysis is associated with increased carbohydrate metabolism in the region caudal to the point of section of the chain. The mechanism of adrenaline hyperglycaemia is the same as for vertebrates, as is shown by the effect of simultaneous nicotine and ergotamine injection. The results suggest independent evolution of nervous control of carbohydrate metabolism in the phyla studied. R. T.

**Case of essential fructosuria.** EDHEM, F. ERDEN, and K. STEINITZ (Acta med. scand., 1938, 97, 455—472).—Injection of a liver extract lowered fructose elimination after administration of 50 g. in a patient with fructosuria. C. A. A.

**Utilisation of pentoses in the biological synthesis of protein. I. Analytical methods for use in formulating pentose balances.** R. LECHNER and R. ILLIG (Biochem. Z., 1938, 299, 174—193).—The best method for the determination of xylose or arabinose, preferably in amounts of 100—200 mg., is that of Peter *et al.* (A., 1933, 1278). When the amount is less than 50 mg., the accuracy of the results diminishes. With 100—200 mg., glucose and fructose, except when present in very large excess, do not interfere and mannose and galactose interfere only when their amount is above 50% of that of pentose. W. McC.

**Carbohydrate metabolism and morphogenesis in the amphibians.** J. BRACHET (Bull. Soc. Chim. biol., 1939, 21, 115—121; cf. A., 1934, 1390).—Eggs of *Rana viridis* treated with NaF and iodoacetate at concn. below 0.025M. show no change in  $O_2$  consumption. With 0.03M-iodoacetate the respiration is affected only when the blastopore becomes circular, the inhibition slowly reaching 90%. A. L.

**Rhythmic oscillations in carbohydrate metabolism in the toad.** P. MAZZOCCO (Compt. rend. Soc. Biol., 1938, 129, 1256—1258).—Glycogen content of the muscles increases and diminishes regularly over 4-month periods. In early spring (commencement of mating season) there is a fall in liver-, muscle-, and cardiac glycogen. In winter the glycogen in the body tends to be augmented. P. C. W.

**Influence of electrolyte solutions on sugar metabolism.** A. REZEK and M. CIGLAR (Arch. int. Pharmacodyn., 1939, 61, 187—200).—Natural mineral waters given to rabbits with turnips and corn cause increased tolerance of sugar. When given with hay and potatoes they modify the blood-sugar curve but do not cause increased tolerance. Solutions of carbonates and Ca also raise the tolerance. D. T. B.

**Glycogen production from butyric acid and acetonuria.** V. VENDIEG (Pflüger's Archiv, 1938, 240, 561—572).—Acetonuria was produced in dogs by administering an exclusively fat diet (water was given *ad lib.*). An increase in ketones occurs when the liver can no longer convert  $\beta$ -hydroxybutyric acid into sugar. At this stage the capacity of the liver to produce glycogen is greatly decreased. Insulin increases M M (A., III.)

the production of sugar from fat, when no carbohydrates are available. J. M. R.

**Fission of  $\alpha$ -benzylacetoacetic acid in the kidney.** A. ROSSI (Boll. Soc. ital. Biol. sperim., 1939, 14, 20—21).—Incubation of the acid with kidney slices (rat) at  $p_H$  7.4 and 37° for 3 hr. yields benzoic acid; hydrolysis to acetic and  $\beta$ -phenylpropionic acids is probably the first stage of the degradation. F. O. H.

**(A) Metabolism of pyruvic acid in brain tissue.** **(B) Biological formation of citric acid.** P. E. SMOLA and H. ALAPEUSO (Suomen Kem., 1939, 12, B, 9—10, 10; cf. A., 1938, III, 511).—(A) Addition of pyruvic acid to brain tissue in presence of  $O_2$  yielded large amounts of lactic and  $\alpha$ -ketoglutaric acids, and small amounts of succinic acid, citric acid, and alanine. In absence of  $O_2$  no citric acid, and smaller amounts of lactic acid and alanine, were formed. Acetic acid was not detected in either case, and is probably not a normal breakdown product of pyruvic acid.  $\alpha$ -Ketoglutaric acid was not derived from citric or from acetic and pyruvic acids, but some was formed from glutamic acid.

**(B) Addition of pyruvic acid greatly increased formation of citric acid by brain tissue from fumaric or oxalacetic acids.** Addition of acetic acid has no effect. Although *Aspergillus niger* converts pyruvic, fumaric, or oxalacetic acid into citric acid, the effect of adding pyruvic acid to an oxalacetic acid substrate is purely additive. M. H. M. A.

**Water exchange of premature infants. Comparison of metabolic (organic) and electrolyte (inorganic) methods of measurement.** H. H. GORDON, S. Z. LEVINE, E. MARPLES, H. McNAMARA, and H. R. BENJAMIN (J. clin. Invest., 1939, 18, 187—194).—Under carefully controlled conditions, calculation of the water balance from the metabolic mixture and from the electrolytic exchange gives similar results. Where perceptible perspiration is present the metabolic method is more reliable. The similarity of the actual retentions of Na, K, and P and calc. retentions from the Cl, N, and Ca retentions indicates that in normal growth electrolytes are retained in approx. the relations to each other that exist in body tissues. C. J. C. B.

**Mineralisation of plumage in osteomalacia.** R. SALGNES (Compt. rend. Soc. Biol., 1938, 129, 751—753).—The mineral content of the plumage of ducks is const. in normal conditions, but varies in osteomalacia. There is a relative increase in  $Ca_3(PO_4)_2$  and decrease in  $Ca(H_2PO_4)_2$ . P. C. W.

**Biological action of magnesium. I. Mechanism of corrosion of magnesium and its alloys.** G. KOSAKA (Fukuoka Acta med., 1938, 31, 171—173).—Pieces of Mg were implanted in various tissues of dogs and rabbits; corrosion occurred within 6 hr. There is first a substitution reaction between the Mg and the H<sup>+</sup> of water in the tissue fluid. The oxide so formed is then either destroyed by Cl<sup>-</sup> or transformed into sol.  $Mg(HCO_3)_2$ . The presence of anions is essential for the process of corrosion. W. D'A. M.

**Abnormalities of calcium metabolism.** F. B. TAYLOR, P. MICHAEL, and L. BARNARD (Arch. intern.



Med., 1939, 63, 226—248).—Details of cases of various disturbances of Ca metabolism are reported.

C. A. K.

**Phytic acid and mineral metabolism in poultry.** R. H. COMMON (Nature, 1939, 143, 379—380; cf. A., 1938, III, 934).—Pullets fail to hydrolyse much of the phytic acid present in their food. As in the case of the rat (A., 1937, III, 17),  $\text{CaCO}_3$  supplements appear to lower the proportion hydrolysed. When a ration is supplemented with Ca as  $\text{Ca}_3(\text{PO}_4)_2$ , a greater proportion of the phytic acid is hydrolysed than is the case with  $\text{CaCO}_3$ . The conclusions of Knowles *et al.* (A., 1933, 627) concerning the nature of the Ca and P compounds present in the excreta of the domestic fowl require modification. L. S. T.

**Distribution of radioactive sodium after injection into the rabbit.** J. H. E. GRIFFITHS and B. G. MAEGRAITH (Nature, 1939, 143, 159—160).—Radioactive Na ( $^{24}\text{Na}$ ) was administered to rabbits in the form of NaCl, and the distribution of the Na determined by examination of ashed blood and tissues with a Geiger counter. 20—25 min. after administration, the  $^{24}\text{Na}$  was dissolved in fluid to the extent of 30—35% of body-wt., as judged by sampling. This fluid is mainly extracellular. W. F. F.

**Is the radioactive potassium isotope stored in the organism?** J. POHLMANN (Pflüger's Archiv, 1938, 240, 377—385).—No evidence for a selective storage was obtained. J. M. R.

**Fate of  $\Delta^3$ -12-ketocholenic acid in the rabbit. Synthesis of dehydronorcholadiene.**—See A., 1939, II, 218.

## (xx) PHARMACOLOGY AND TOXICOLOGY.

**Sulphanilamide additive compounds with cinchona alkaloids.**—See A., 1939, II, 232.

**Organic compounds in chemotherapy. I. Derivatives of sulphanilamide. II. Formaldehydesulphoxylate derivatives of sulphanilamide and 4:4'-diaminodiphenyl sulphone.**—See A., 1939, II, 208.

**Placental transfer of sulphanilamide.** R. H. BARKER (New England J. Med., 1938, 219, 41).—Sulphanilamide, given to pregnant women shortly before, or during, labour, appears in almost equal concn. in the maternal and foetal blood. A. M. G.

**Sulphanilamide in treatment of streptococcal mastitis.** E. M. GILDOW, D. L. FOURT, and A. O. SHAW (J. Dairy Sci., 1938, 21, 759—775).—Cows dosed at 12-hr. intervals with 10 mg. of sulphanilamide daily per 100 lb. live wt. showed a uniform level of 8 mg. per 100 ml. in blood, and, with the dose recommended for man, *i.e.*, 5 mg. per 100 lb., 2 mg. per 100 ml. Poisoning appeared in 1—3 days when the daily dose was 15 mg. per 100 lb. and 1 cow out of 11 died. Doses of 5—15 mg. per 100 lb. live wt. failed to eliminate  $\beta$ -haemolytic streptococci from infected udders, but a 7—10-day treatment at the 5—10 mg. level relieved symptoms of acute infection. 6 out of 9 severely affected udder quarters in 4 chronic cases were improved, but no effect was

observed on 3 cases of initial infection where clinical symptoms had not developed. W. L. D.

**Sulphanilamide rash.** G. W. PALMER and D. R. HANBURY (Brit. Med. J., 1939, I, 561).—A maculopapular eruption occurred in a 25-year old Gurkha after 12 g. of sulphanilamide. C. A. K.

**Control of methaemoglobinemia with methylene-blue [after sulphanilamide].** W. B. WENDEL (J. clin. Invest., 1939, 18, 179—185).—Following sulphanilamide therapy, the functionally active blood pigment may be decreased by 15—30% by formation of methaemoglobin. The extent of methaemoglobin formation is not proportional to the concn. of sulphanilamide in the blood. Following intravenous injection of methylene-blue the methaemoglobin disappears from the blood and is replaced by an equiv. amount of haemoglobin. C. J. C. B.

**Prophylactic administration of prontosil in manual removal of the placenta.** A. POHL (Med. Klin., 1939, 35, 346—347).—Intramuscular injection of 0.25 g. of prontosil is recommended in cases where manual removal of the placenta, particularly after surgical intravaginal delivery, is necessary. A. S.

**Sulphanilamide therapy in pneumonia and meningitis due to type 3 pneumococci.** J. F. SADUSK (New England J. Med., 1938, 219, 787—790).—Of 9 cases of pneumonia, all recovered; of 2 cases of meningitis, both died, but blood cultures became sterile. A. M. G.

**Use of sulphanilamide in scarlet fever.** C. WESSELHOEFT and E. C. SMITH (New England J. Med., 1938, 219, 947—953).—In the eruptive stage it causes no reduction in toxæmia nor in the incidence of complications; the latter are reduced when the drug is continued for a longer period. Meningitis and blood stream infection are indications for sulphanilamide; it is of no val. in reducing the carrier rate. A. M. G.

**Sulphanilamide [in undulant fever and *Strept. viridans* infection].** E. F. TRAUT and C. E. LOGAN (J. Lab. clin. Med., 1939, 24, 604—608).—Patients have been benefited. C. J. C. B.

**Prontosil in *Brucella melitensis* infection.** J. E. DEBONO (Brit. Med. J., 1939, I, 326—327).—Prontosil had no significant effect on 25 cases of undulant fever. C. A. K.

**Sulphanilamide in undulant fever.** E. C. BARTELS (New England J. Med., 1938, 219, 988).—Report of a case showing apparent response to sulphanilamide. A. M. G.

**Mode of action, clinical use, and toxic manifestations of sulphanilamide.** P. H. LONG, E. A. BLISS, and W. H. FEINSTONE (J. Amer. Med. Assoc., 1939, 112, 115—121).—From experiments on mice it was concluded that sulphanilamide exerts its effect through a bacteriostatic action. Blood levels in clinical cases from 10 to 15 mg.-% are necessary for the control of severe infections, but 5—10 mg.-% are satisfactory for mild or moderate infections. The toxic manifestations are discussed. R. L. N.

**Bacteriostatic action of sulphanilamide on haemolytic streptococci *in vitro*.** E. NETER (J.



Lab. clin. Med., 1939, 24, 650—653).—Using a special medium it was found that sulphanilamide was bacteriostatic towards various strains of fibrinolytic hæmolytic streptococci but not, or only slightly, towards hæmolytic enterococci isolated from man. The amide in a concn. of 0.8% may inhibit the growth of susceptible strains, while smaller concns. may retard their growth. C. J. C. B.

**Disseptal neuritis.** W. W. KÜHNAU (Med. Klin., 1939, 35, 377—379).—8 cases of polyneuritis occurred in the course of gonorrhœa treatment with disseptal B and C and with uleron. Neuritic symptoms have not been observed with less than a total dose of 20 g. A. S.

**Delayed collapse [due to uleron].** G. W. GÜNTHER (Z. klin. Med., 1938, 135, 247—257).—A man aged 25 with acute gonorrhœa, after taking uleron for 14 days, developed dermatitis, hæmaturia, and increasing circulatory failure, and died. E. R.

**Chemotherapy of male gonorrhœa with uleron and albucid.** A. GLINGAR (Med. Klin., 1939, 35, 315—317).—Albucid is better tolerated than uleron. Sulphanilamide is recommended in fresh cases of male gonorrhœa. A. S.

**Action of uleron and albucid in gonorrhœa of the uterine cervix during pregnancy.** F. SCHAEFER (Dtsch. med. Wschr., 1939, 65, 373—375).—4 out of 5 pregnant women with gonorrhœa of the cervix were cured with uleron or albucid without toxic effects. Gonorrhœal salpingitis responds favourably to sulphonamide treatment. The spread of the gonorrhœal infection from vagina and cervix to the Fallopian tubes cannot, with certainty, be prevented by uleron or albucid. A. S.

**Otogenic cellular meningitis treated with M. & B. 693.** M. H. HUGHES (Brit. Med. J., 1939, I, 214—215).—M. & B. 693 was successfully used in a case of otogenic cellular meningitis secondary to acute pneumococcal otitis media. C. A. K.

**Treatment of pneumonia with M. & B. 693.** T. F. ANDERSON and R. M. DOWDESWELL (Lancet, 1939, 236, 252—254).—In 50 cases of pneumonia given M. & B. 693 there was one death; in 50 cases given non-sp. treatment there were 8 deaths. The drug lowered the temp. to normal in 2 days, and there was often a small secondary rise. Vomiting seen in 12 cases did not interfere with treatment. The drug was effective against all types of pneumococci. C. A. K.

**Treatment of pneumonia with M. & B. 693.** H. G. L. SMITH (Brit. Med. J., 1939, I, 506).—Two cases are reported. C. A. K.

**Treatment of pneumonia with M. & B. 693.** A. L. AGRANAT, A. O. DREOSTI, and D. ORDMAN (Lancet, 1939, 236, 309—317, 380—384).—M. & B. 693 was used in 280 cases of pneumonia in Europeans and non-Europeans in Johannesburg (with 270 controls). It reduced the mortality rate and the severity of the disease, and shortened the pyrexial period and total duration of illness. Vomiting and diarrhœa occurred in a no. of cases, sulph-hæmoglobinæmia and skin eruptions were rare,

and there was one case of agranulocytosis who recovered. Bacteriological studies are reported. C. A. K.

**Pneumococcal pneumonia complicating pulmonary tuberculosis treated with M. & B. 693.** J. H. CRAWFORD (Brit. Med. J., 1939, I, 608—609).—A successful case is reported. C. A. K.

**M. & B. 693 and pneumococci.** I. H. MACLEAN, K. B. ROGERS, and A. FLEMING (Lancet, 1939, 236, 562—568).—The sensitivity of pneumococci to M. & B. 693 was tested in human blood *in vitro*. Variations were more closely associated with individual strain rather than with type of organism. A single dose of pneumococcus vaccine, given to mice or rabbits, greatly enhances the action of M. & B. 693 against experimental pneumococcal infection. Pneumococci in mice can acquire resistance to the drug on prolonged exposure to small doses. C. A. K.

**Reaction following M. & B. 693 and exposure to ultra-violet light.** R. HALLAM (Brit. Med. J., 1939, I, 559—560).—Pyrexia and an extensive bullous eruption occurred in a man who took 12 g. of M. & B. 693 in 4 days followed by 3 min. exposure to ultra-violet light. Rapid recovery occurred without treatment. C. A. K.

**Chemotherapy in plague infection.** H. SCHÜTZE (Lancet, 1939, 236, 266—268).—M. & B. 693 was more effective than soluseptasine and a diamino-diphenylsulphone glucoside against *B. pestis* infection in mice and rats, and was about as active as anti-plague serum. C. A. K.

**Chemotherapy of gonorrhœa.** R. MARINKOVITCH (Brit. Med. J., 1939, I, 317—320).—From a study in 200 acute gonococcal male patients it is shown that sulphanilamide has a permanent-cure rate of 46.3%, uleron 56%, and M. & B. 693 86%, the last-named also being the best tolerated and most effective in preventing complications. C. A. K.

**Chemotherapy of gonococcal vulvovaginitis.** D. K. BROWN (Brit. Med. J., 1939, I, 320—323).—M. & B. 693 is more effective than sulphanilamide and uleron. C. A. K.

**Effect of some new derivatives on streptococci and pneumococci.** F. NITTI, D. BOVER, J. TRÉFOUËL, and (MME.) J. TRÉFOUËL (Ann. Inst. Pasteur, 1938, 61, 811—812).—Compounds made by substitution of the free amino-group of *p*-aminophenylsulphonamide have much less chemotherapeutic activity than the original substance. Compounds formed by substitution of the amide group (especially *p*-aminobenzenesulphonamidopyridine) are very active in experimental streptococcal and pneumococcal infections and gonococcal infections of man. Clinically acetyl and formyl derivatives of di-(*p*-aminophenyl)sulphone were also very effective. G. P. G.

**Anti-endotoxic chemotherapy.** C. LEVADITI, A. VAISMAN, and L. REINIÉ (Ann. Inst. Pasteur, 1938, 61, 635—661; cf. A., 1938, III, 224, 938, 940).—Certain benzenesulphonic acid derivatives not only possess an antibacterial activity, but are also able to neutralise *in vivo* the endotoxins of gonococcus, meningococcus, *B. typhi* murium, *B. dysenteriae*



(Flexner and Shiga), and *Past. aviseptica*. The effect could not be obtained *in vitro*. There was not always a relation between the anti-endotoxic and anti-infective effect. Exotoxins of staphylococcus, *C. diphtheriae*, and the spore-bearing anaerobes were not neutralised. G. P. G.

**Action of acranil in lamblasis.** J. W. GOTT (Münch. med. Wschr., 1939, 86, 373—374).—Acranil (an acridine derivative) was given over 5 days ( $3 \times 0.1$  g. per day) to 7 patients with lamblasis. 5 were permanently cured, their duodenal juice being free from lamblæ. A. S.

**Chemotherapy of malaria and recent advances in parasitology.** W. KIKUTH (Münch. med. Wschr., 1939, 86, 362—365).—A review. A. S.

**Mode of action of piperidinomethylbenzdioxan (933 F.).** R. S. MORISON and K. LISSAK (Amer. J. Physiol., 1938, 123, 404—411).—933 F. reduces the responses of the salivary gland nictitating membrane or blood pressure to injected adrenaline in cats anaesthetised with dial. Destruction of adrenaline *in vitro* is accelerated by 933 F. M. W. G.

**Relation between rate of reduction of nitro-genous colouring matters and their therapeutic properties.** J. TRÉFOUËL, (MME.) J. TRÉFOUËL, F. NITTI, D. BOVET, and V. HAMON (Ann. Inst. Pasteur, 1938, 61, 812—813).—The rate of reduction influences therapeutic properties. G. P. G.

**Thiocyanate as treatment for mange on dogs and other laboratory animals.** E. B. CARMICHAEL (J. Lab. clin. Med., 1939, 24, 656).—Lauryl thiocyanate (loro) is effective. C. J. C. B.

**Treatment of pneumococcic pneumonia by hydroxyethylapocupreine.** W. W. G. MACLACHLAN, J. M. JOHNSTON, M. M. BRACKEN, and G. E. CRUM (Amer. J. med. Sci., 1939, 197, 31—39).—In 136 cases of pneumococcic pneumonia which had received no sp. treatment the mortality was 50%. In 329 cases treated with hydroxyethylapocupreine the mortality was 24.9%. No disturbances in vision followed treatment. R. L. N.

**Treatment of chronic arthritis with rubrophen.** O. ERLSACHER (Wien. klin. Wschr., 1939, 52, 273—276).—Satisfactory results in cases of chronic arthritis were obtained with oral administration of rubrophen (4—6 tablets per day) over many months. The treatment should be discontinued if a significant improvement does not occur after a total dose of 300—350 tablets. A. S.

**Chemotherapy of surgical tuberculosis.** H. BÜCHLER (Schweiz. med. Wschr., 1939, 69, 247—252).—28 patients with surgical tuberculosis were treated with oral and intravenous administration of rubrophen. 15 patients improved, 7 patients did not respond; aggravation of the condition was observed in 2 cases. Control of blood count, sedimentation rate, and body-wt. should indicate after 3—4 weeks whether continuation of the treatment promises success. No untoward toxic effects were observed. A. S.

**Absorption of aristouquine.** L. BUTTURINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1135—1137).—Oral

administration of aristouquine is followed by excretion of approx. 63% (as quinine) in the urine and 33% in the faeces; when administered in keratinised capsules, the faecal excretion is increased. Hence gastric hydrolysis is essential for complete efficacy of the drug; this accounts for the low therapeutic action of the esterified alkaloid, euquinine. F. O. H.

**Preparation and therapeutic properties of certain 4-substituted quinoline derivatives.**—See A., 1939, II, 227.

**Physiological effects of garlic and derived substances.** M. CARL, R. S. MCKNIGHT, B. SCOTT, and C. C. LINDEGREN (Amer. J. Hyg., 1939, 29, 32—35).—Acraldehyde and crotonaldehyde, tested on guinea-pigs and rats by means of intraperitoneal injections or administration by stomach-tube, were cumulative poisons and were bactericidal in low concn. Garlic added to a nutrient mixture and fed to rats, guinea-pigs, and mice showed a poisonous effect, probably due to the presence of sulphides; there was no protection against pneumococcal peritonitis in the case of mice. Acraldehyde afforded a certain amount of protection against pneumococci. Therapeutically, the poisonous nature of garlic renders it of little use, but the derived aldehydes, especially acraldehyde, have possibilities as therapeutic agents. B. C. H.

**Use of new disinfectants.** H. MÜLLER (Dtsch. med. Wschr., 1939, 65, 290—292).—Of lavasteril, zephirol, sagrotan, bactol, bacillol, zephirol is the most potent, killing in a concn. of 1:1500 all germs within 20 min. Gas gangrene and tetanus spores are killed in concn. of 1:200 within 30 min. A. S.

**Treatment of mustard gas wounds with camomile.** J. METELMANN (Arch. exp. Path. Pharm., 1938, 191, 263—265).—No difference was found between camomile and chloramine treatment. H. O. S.

**Action of phenyl-substituted aliphatic amines on body temperature.** E. JACOBSEN (Skand. Arch. Physiol., 1939, 81, 244—249).—On subcutaneous injection many substances which excite the central nervous system ( $\beta$ -phenylisopropylamine, *p*-hydroxy- $\beta$ -phenylisopropylmethylamine, ephedrine) increase the body temp. in rabbits. This action is partly due to increased heat formation and peripheral vasoconstriction. A. S.

**Hypotensive and sympatholytic effects of hydrocinchonidine.** RAYMOND-HAMET (Compt. rend., 1938, 207, 1252—1254).—Adrenaline (0.01 mg.) injected intravenously into a dog under chloralose after dihydrocinchonidine (40 mg. per kg.) is solely depressor. The diminution in kidney vol. originally caused by adrenaline is abolished. 0.1 mg. of adrenaline gives a marked pressor response after which 0.01 mg. is without effect on the blood pressure. J. L. D.

**[Pharmacology of]  $\beta$ -diethylaminoethyl diphenylacetate hydrochloride.** K. SAMAN and K. SAAD (Quart. J. Pharm., 1938, 11, 679—691).—The intramuscular and intravenous min. lethal dose of the drug in rabbits is 0.5 and 0.03 g. per kg., respectively. In many pharmacological properties it re-



sembles atropine but it does not produce mydriasis (rabbit, dog); it acts on vagal nerve ends and directly on plain muscle fibres.

F. O. H.

**Bulgarian belladonna in postencephalitic Parkinsonism.** F. J. NEUWAHL (Lancet, 1939, 236, 693—695).—An aq. extract of Bulgarian belladonna root was successfully used in 123 cases of post-encephalitic Parkinsonism. English belladonna was equally effective in 45 cases but 10—20% larger doses were necessary.

C. A. K.

**Vasoconstrictor action of cocaine.** W. H. CROSBY (J. Pharm. Exp. Ther., 1939, 65, 150—155).—Constriction of conjunctival vessels in response to cocaine persists after adrenalectomy. Pre- and post-ganglionic section of the cervical sympathetic lessens the response. The vasoconstriction is partly due to sensitisation of the smooth muscle of the vessel wall to tonic sympathetic discharges.

E. M. S.

**Effect of anaesthesia on the vasomotor reversal.** R. P. HERWICK, C. R. LINEGAR, and T. KOPPANYI (J. Pharm. Exp. Ther., 1939, 65, 185—190).—Adrenaline reversal in cats, following ergotamine or ergotamine, was elicited best under urethane anaesthesia. Reversal was prevented by previous administration of atropine. Under barbiturate narcosis ergotamine potentiated the pressor effect of adrenaline.

E. M. S.

**Synergism and antagonism of drugs. III. Action of nicotine and physostigmine on sympathetic ganglia.** C. R. LINEGAR, R. P. HERWICK, and T. KOPPANYI (J. Pharm. Exp. Ther., 1939, 65, 191—204; cf. Physiol. Abs., 1937, 22, 733).—The pressor response to acetylcholine, obtained in atropinised cats and dogs, is abolished or reversed by nicotine. Eserine restores the vasopressor action of acetylcholine by lowering the threshold of the ganglionic cells to acetylcholine, thus antagonising the depressant action of nicotine on the ganglia.

E. M. S.

**Pharmacological action of D<sub>2</sub>O. VII. Its effect on the hydrolysis of acetylcholine.** H. G. BARBOUR and V. C. DICKERSON (J. Pharm. Exp. Ther., 1939, 65, 281—286; cf. A., 1938, III, 517).—The presence of D<sub>2</sub>O slows the hydrolysis of acetylcholine to an extent dependent on the concn. of D<sub>2</sub>O, and the inhibition is proportionately the same whether serum is present or not. D<sub>2</sub>O inhibits choline-esterase activity by its effect on hydrolysis, not by poisoning the enzyme.

E. M. S.

**Use of prostigmine as a preparation for abdominal roentgenography.** M. J. FARRELL (New England J. Med., 1938, 219, 270—272).—The drug is used to dispel gas, preparatory to X-ray.

A. M. G.

**Pressor effect of amphetamine (benzedrine) on normal, hypotensive, and hypertensive patients.** W. W. DYER (Amer. J. med. Sci., 1939, 197, 103—108).—Moderate overdosage of benzedrine vapour inhaled by 28 normal and hypertensive subjects had little effect on blood pressure. An increase in blood pressure after the administration of 20—30 mg. of benzedrine sulphate by mouth was proportional to dosage. After a single dose a significant rise occurred in 10% or less of the subjects. Hypertension did not

contraindicate the use of the drug in doses of less than 30 mg.

R. L. N.

**Effect of mecholyl on arterial hypertension.** J. LOMAN, M. F. LESSES, and A. MYERSON (Ann. int. Med., 1939, 12, 1213—1222).—The effect of mecholyl (acetyl-β-methylcholine), introduced by iontophoresis, was studied in cases of dementia præcox given enough benzedrine (40—50 mg.) to raise blood pressure, and in cases of senile hypertension. In the former group the blood pressure fell to normal with mecholyl alone, in the latter only after prior administration of prostigmine.

C. A. K.

**Ineffectiveness of acetylcholine and histamine introduced into intestinal loops.** E. RENTZ (Arch. exp. Path. Pharm., 1938, 191, 183—191).—High concns. of acetylcholine and histamine disappear rapidly from the interior of guinea-pig's intestinal loops without producing peristaltic contractions. Pilocarpine and morphine administered by the same route are readily absorbed and produce their usual effects on the intestine.

H. O. S.

**Occurrence and mode of action of adrenaline and acetylcholine in *Paramecium caudatum*.** T. WENSE (Med. Welt, 1939, 13, 348—350).—A review.

A. S.

**Action of erythrophloëin on the heart.** L. M. VAN DEN BERG (Z. Kreislaufforsch., 1939, 31, 119—123).—Subcutaneous injection of erythrophloëin (Merck) in frogs caused partial asystole of the ventricles (regular alternating or periodic variations in amplitude).

G. SCH.

**Strophanthin in disturbances of the peripheral circulation.** H. ZOTHE (Z. Kreislaufforsch., 1938, 30, 889—897).—0.3 mg. of strophanthin given intravenously to patients suffering from intermittent claudication caused clinical improvement and up to 100% increase in efficiency of the calf-muscles. The circulation time, measured with Mathes and Malikiosis' method, remained unaltered. The effect is attributed to increased permeability of the capillaries to O<sub>2</sub>.

G. SCH.

**Effect of *Nerium oleander* in decompensated heart diseases.** L. BINDER (Magyar Orv. Arch., 1938, 39, 551—557).—The results of the treatment of 71 cases of failing compensation are reported. Because of the rapid absorption and slight toxicity of the glucoside, it is considered to be better than digitalis preps. in severe cases. It is less effective in chronic cases on account of its small cumulative properties. Injections are unnecessary, as it is well absorbed when given by mouth.

A. W. M.

**Action of "folinerin" in auricular fibrillation.** C. ILIESCU, H. AUBERT, and G. E. PALADE (Bull. Soc. méd. Hôp. Bucarest, 1938, 20, 300—304).—"Folinerin," a cryst. glucoside prepared from oleander leaves, successfully controlled the ventricular rate in 8 cases of auricular fibrillation on oral administration.

C. A. K.

**Action of quinidine-sympatol in auricular fibrillation.** W. STEPP and L. L. KIRCHMANN (Münch. med. Wschr., 1939, 86, 433—436).—The lethal dose of quinidine in cats under chloralose



anæsthesia is increased by 40% if sympatol is given simultaneously. Quinidine lowers the arterial blood pressure and increases the pressure in the right auricle; subsequent administration of sympatol raises the arterial and lowers the auricular pressure. The fall of arterial blood pressure after administration of a quinidine-sympatol mixture is less and recovery is quicker than if quinidine is given alone. Good results were obtained with 0.2–0.4 g. of quinidine and 0.2 g. of sympatol (5 times per day) in cases of persistent auricular fibrillation and ventricular arrhythmia.

A. S.

**Use of quinidine sulphate in children.** C. R. MESSELOFF (J. Lab. clin. Med., 1939, 24, 574–580).—The electrocardiographic changes produced by the drug in children were identical with those in adults. The usual adult daily dose of 15–30 grains may safely be given to children.

C. J. C. B.

**Action of quinidine and hydroquinidine on auricular fibrillation.** S. DE BOER (Arch. int. Pharmacodyn., 1939, 61, 246–254).—Ordinary quinidine contains hydroquinidine. Pure quinidine prevented auricular fibrillation in cats in doses of 5–70 mg. (exceptional) per kg. Toxic effects were observed with 45 mg. per kg. Pure hydroquinidine is also effective but less so than quinidine.

D. T. B.

**Sensibility to calcium of animals treated with digitalis.** J. LA BARRE and J. VAN HEERSWYN-CHIELS (Arch. int. Pharmacodyn., 1939, 61, 233–245).—Ca gluconate causes in the cat bradycardia, slowed auriculo-ventricular conduction, diminution of the R deflexion, inversion of T, extrasystoles, and fibrillation. After digitalis it causes immediate onset of extrasystoles and fibrillation, and the fatal dose of Ca gluconate is 60% of the ordinary fatal dose.

D. T. B.

**Influence of digoxin on the potassium content of heart muscle.** A. M. WEDD (J. Pharm. Exp. Ther., 1939, 65, 268–274).—The action of digoxin on ventricular strips of turtle heart causes no change in the K content of the muscle, unless high concns. of digoxin are used with a resulting K loss. Lowering of the K content of heart muscle represents a toxic rather than a therapeutic action of digitalis.

E. M. S.

**Potassium fibrillation.** L. H. NAHUM and H. E. HOFF (J. Pharm. Exp. Ther., 1939, 65, 322–331).—Electrocardiograms of the rabbit heart show that increased K produces widespread block in all parts of the heart. With slow administration K slows, and finally stops, the heart; rapid administration stimulates automaticity before the ultimate depression. Ventricular fibrillation results from intraventricular block occurring when foci of automaticity still persist.

E. M. S.

**Action of mistletoe on the electrocardiogram of the frog.** H. EBSTER (Arch. exp. Path. Pharm., 1938, 191, 19–22).—Extracts of *Viscum album* produce bradycardia, a prolongation of the P-R interval, and other changes resembling those caused by digitalis. The bradycardia is not abolished by atropine.

H. O. S.

**Mistletoe bradycardia.** H. RICHTER and H. SCHRÖCKSNADL (Arch. exp. Path. Pharm., 1938, 191,

23–29).—The bradycardia produced by extracts of *Viscum album* in cats is of central origin.

H. O. S.

**Action of mistletoe extracts on liver volume.** A. JARISCH and C. HENZE (Arch. exp. Path. Pharm., 1938, 191, 30–39).—Extracts cause a reflex vasodilatation of the hepatic blood vessels.

H. O. S.

**Effect of vagotonin on reflex apnoea.** D. SANTENOISE, C. FRANCK, R. GRANDPIERRE, and M. VIDACOVITCH (Compt. rend. Soc. Biol., 1938, 129, 817–820).—The reflex apnoea produced in the unanæsthetised rabbit by inhalation of  $\text{CHCl}_3$ , Br, or  $\text{NH}_3$  is diminished by injection of vagotonin (5 mg. per kg.).

P. C. W.

**Types of apnoea produced by morphine in the rabbit under urethane.** P. NICOLLE (Compt. rend. Soc. Biol., 1938, 129, 836–838).

P. C. W.

**Standardisation and stabilisation of drugs of the *Filix* group.** R. JARETZKY and W. PUNZEL (Arch. Pharm., 1938, 276, 559–575).—These drugs should be standardised by their biological action on fish, as this bears no relation to the content of ether-sol. matter or filicin. Vac.-dried, but not other, extracts are stable.

R. S. C.

**Influence of certain metals on the stability of insulin.** M. SAHYUN, A. NIXON, and M. GOODSELL (J. Pharm. Exp. Ther., 1939, 65, 143–149).—Zn (0.05, 0.1, and 0.4 mg. per 1000 units) retards the rate of deterioration of insulin. Co, Ni, and Al (1 mg. per 1000 units) are as effective as Zn in preserving the activity of insulin incubated at 52° for 7 weeks.

E. M. S.

**Effect of bananas on laxation.** P. L. HARRIS and G. L. POLAND (J. Lab. clin. Med., 1939, 24, 580–582).—Fully ripe bananas are more laxative than partly ripe ones. Free pectin and bound tannin are probably the chief laxative factors.

C. J. C. B.

**Mechanism of the histamine effect.** J. SZELÖCZEY (Magyar Orv. Arch., 1938, 39, 665–670).—Histamine does not contract the small intestine of the guinea-pig in absence of  $\text{O}_2$ , but does so when the supply of  $\text{O}_2$  is restored. This shows that histamine does not decompose but is rendered inactive, or the intestine has become refractory. Acetylcholine does not show this effect. Small doses of acetylcholine, ineffective alone, can restore histamine efficiency.

A. W. M.

**Relation between histamine and anaphylaxis.** S. SISIMA (Fukuoka Acta Med., 1938, 31, 178–179).—The lungs and small intestine of guinea-pigs contain histamine, but none is demonstrable in the blood. The organs of guinea-pigs in anaphylactic shock contain less histamine than normal, but some is detectable in the blood. Anaphylactic shock is produced with difficulty in histamine-resistant guinea-pigs, and guinea-pigs immune to anaphylactic shock are resistant to histamine. Histamine is probably liberated from the tissues in anaphylactic shock and the “anaphylatoxin” is identical with histamine.

W. D'A. M.

**Relationship of the structure of *l*-carnosine to its depressor activity.**—See A., 1939, II, 229.



**Liberation of a histamine-like substance following inhalation of irritant vapours.** G. UNGAR and M. BOLGERT (Compt. rend. Soc. Biol., 1938, 129, 929—930).—Inhalation of irritant vapours (HCl, nitrous fumes) causes pulmonary oedema with hemorrhagic lesions and an increase in blood-histamine in guinea-pigs. H. G. R.

**Human autonomic pharmacology.** J. LOMAN, B. GREENBERG, and A. MYERSON (New England J. Med., 1938, 219, 655—660).—The effects of mecholyl, prostigmine, benzedrine sulphate, and atropine on the urinary tract are described as demonstrated by intravenous pyelography. A. M. G.

**Use of *Equisetum* as a diuretic.** K. BREITWEISER (Arch. Pharm., 1939, 277, 53—61).—*E. arvense* and various extracts and decoctions thereof are not diuretic when given to rats. R. S. C.

**Pharmacodynamics of mercurial diuretics.** I. M. A. MANCINI (Boll. Soc. ital. Biol. sperim., 1939, 14, 53—55).— $\text{Hg}^{II}$  theophylline-quinoline-carboxylic propylamide has a comparatively low toxicity and high diuretic action and does not produce secondary effects in rabbits, dogs, rats, and mice. F. O. H.

**Diuresis in rats dosed with silica and siliceous drugs.** R. JARETZKY, K. BREITWIESER, and F. NEUWALD (Arch. Pharm., 1938, 276, 552—559).— $\text{SiO}_2$  solutions or suspensions do not cause diuresis in rats and the effect of siliceous drugs is thus due to other ingredients. R. S. C.

**(A) Comparative toxicity, (B) respiratory and blood-pressure effects, of narcotics of the barbituric acid series.** L. DONATELLI and R. ABBATE (Boll. Soc. ital. Biol. sperim., 1939, 14, 3—5, 5—8).—The min. lethal dose (intravenous administration), production of respiratory paralysis, and effect on blood pressure (rabbit) indicate that the narcotics examined give a series of decreasing toxicity of rectidon, pernocton, eunarcon, narconumal, and evipan. Hence the toxicity increases with length of the alkyl chain in the 5- $\alpha$ -position and is increased by introduction of Br into the mol. and diminished by *N*-methylation. F. O. H.

**Comparative effects of evipan, narconumal, eunarcon, pernocton, and rectidon on vasomotor reflexes.** R. ABBATE (Boll. Soc. ital. Biol. sperim., 1939, 14, 44—45).—Vasomotor reflexes are generally diminished by therapeutic doses and inhibited by toxic doses of the above barbituric acid derivatives. The effect increases with increasing toxicity, i.e., in the order given above (cf. preceding abstract). F. O. H.

**Metabolic fate of *N*-methylbarbituric acids.** T. C. BUTLER and M. T. BUSH (J. Pharm. Exp. Ther., 1939, 65, 205—213).—After intravenous injection in dogs of anaesthetic doses of *N*-methylbarbital, *N*-methylphenobarbital, and *NN'*-dimethylbarbital, considerable amounts of the corresponding 5:5-disubstituted barbituric acids were recovered from the urine. The significance of this demethylation with regard to the duration of action of *N*-methylbarbituric acids is discussed. E. M. S.

**Excretion of bromide through the skin.** T. CORNBLEET (J. invest. Dermatol., 1938, 1, 399—411).—Unfiltered sweat from normal persons contained 18.2—50.2  $\mu\text{g.}\%$  of Br. The range of normal filtered sweat was 16.5—41.2  $\mu\text{g.}\%$ . On ingestion of 3 g. of NaBr per day for 1 week the vals. for unfiltered sweat were 45.6—152  $\mu\text{g.}$  and for filtered sweat 35.2—63.4  $\mu\text{g.}$  Shortly after the continuous ingestion of bromides the Br concn. in the sweat reaches an upper limit which is maintained for a long time. The Br concn. in the epithelium reaches high vals. during accumulation of Br in the body during continuous ingestion. Soon after cessation of ingestion, the Br content of the epithelium drops and then declines to normal. The epithelial scales from cases of exfoliating dermatitis receiving no Br' contained 0.11—0.1809 mg. of Br per g. The differences between the vals. of Br in filtered and unfiltered sweat are due to the epithelial content of the former. In 2 cases of Br' eruptions the Br content of the sweat was above normal 49 and 31 days respectively after stoppage of the drug. C. J. C. B.

**Distribution of administered bromide in comparison with chloride and its relation to body fluids.** G. B. WALLACE and B. B. BRODIE (J. Pharm. Exp. Ther., 1939, 65, 214—219).—Br', administered to cats and dogs, is distributed in the tissues in a manner corresponding with the distribution of Cl', except in the brain. Br' is distributed in extracellular fluid in inorg. form. E. M. S.

**Distribution of iodide, thiocyanate, bromide, and chloride in the central nervous system and spinal fluid.** G. B. WALLACE and B. B. BRODIE (J. Pharm. Exp. Ther., 1939, 65, 220—226).—Administered I', CNS', and Br' are distributed in the extracellular water of the central nervous system in ionic equilibrium with spinal fluid. The brain contains less of the administered ion than expected from its Cl' content. The data do not explain the pharmacological action of Br'. E. M. S.

**Respiratory inhibitory and paralytic effects of some barbitaric hypnotics and coal-tar analgesics.** A. J. LEHMAN (J. Pharm. Exp. Ther., 1939, 65, 235—242).—Depression and paralysis of the respiration by barbital, phenobarbital, amylal, and evipal was of central origin. The peripheral neuromuscular mechanism in the diaphragm was not poisoned by barbiturates nor by Na salicylate, acetylsalicylic acid, or cinchophen. The latter group caused respiratory paralysis as a result of circulatory failure. E. M. S.

**Carbazole derivatives. I. Aminocarbazoles. II. Aminoalcohols, and derivatives of tetrahydrocarbazole.** N. B. EDDY (J. Pharm. Exp. Ther., 1939, 65, 294—307, 308—317).—I. 20 amino-derivatives of carbazole were administered orally to cats. Carbazole itself was slightly depressant but not analgesic. The derivatives were more depressant and somewhat analgesic; 1- and 3-aminocarbazole were the most active. A second amino-group, primary, sec., or tert., attached to the nucleus, decreased the activity. The introduction of a second substituent, methyl, ethyl, or acetyl, on the bridge N increased the analgesic activity.



II. 9-Methyl-2- $\gamma$ -diethylamino- $\alpha$ -hydroxy-*n*-propylcarbazole and 1-hydroxy-9-methyl-2-dimethylaminomethyl-1:2:3:4-tetrahydrocarbazole have a marked analgesic action more potent and prolonged than that of the corresponding phenanthrene compounds, but the carbazoles are also more emetic. (For chemical details see A., 1939, II, 227.) E. M. S.

**Morphine as a metabolic stimulant.** H. G. BARBOUR, J. A. PORTER, and J. M. SEELYE (J. Pharm. Exp. Ther., 1939, 65, 332—342).—From determinations of the metabolic rate in dogs before, during, and after chronic morphine poisoning, morphine is shown to be a metabolic stimulant regardless of the presence or extent of chronic morphinism.

E. M. S.

**Determination of ether in blood by Widmark's technique.** L. GISSELSOON and G. LINDGREN (Skand. Arch. Physiol., 1939, 81, 279—289).—The experimental error of the determinations is  $\pm 1\%$ . The ketonæmia during prolonged anaesthesia does not as a rule impair the accuracy of the method.

A. S.

**Local anæsthetic properties of certain heterocyclic compounds.** G. A. LEVY and H. B. NISBET (J. Pharm. Exp. Ther., 1939, 65, 129—135).—1-Phenyl-5-(2-*n*-butoxyphenyl)-3-( $\beta$ -piperidinoethyl)-pyrazoline hydrochloride and the corresponding methoxy- and ethoxy-compounds are non-irritant, less toxic than cocaine, and more potent local anæsthetics both on rabbit's cornea and on intradermal injection in man. The butoxy-compound has the highest therapeutic val.  $\beta$ -Amino-ketones containing thiazole and furan nuclei, and the unsaturated ketones from which the pyrazolines were prepared, are too irritant to be of val.

E. M. S.

**cycloPropane.** V. Effect of morphine, barbital, and amytal on the concentration of *cyclopropane* in the blood required for anaesthesia and respiratory arrest. B. H. ROBBINS, J. H. BAXTER, jun., and O. G. FITZHUGH (J. Pharm. Exp. Ther., 1939, 65, 136—142).—Premedication reduced the control vals. (cf. A., 1937, III, 65) for the *cyclopropane* content of blood required for surgical anaesthesia. The amount of *cyclopropane* required for respiratory arrest was not reduced, except after premedication with larger doses.

E. M. S.

**cycloPropane "sleep" with percaïne spinal anaesthesia.** H. DODD and J. T. HUNTER (Lancet, 1939, 236, 685—688).—A combined percaïne spinal and *cyclopropane* anaesthesia was successfully used in 70 major operations.

C. A. K.

**Intravenous anaesthesia in obstetrics.** F. C. LABRECQUE (New England J. Med., 1938, 219, 954—956).—Intravenous anaesthesia may be useful in obstetrics, especially in acute upper respiratory infections. It must not be used in conjunction with amnesic or analgesic drugs, or when intra-uterine manipulations are necessary.

A. M. G.

**Intravenous anaesthesia with special reference to pentothal sodium in Africans.** G. D. DRURY (E. Afr. Med. J., 1938, 15, 256—262).—Blood pressure readings were taken on 12 African adults of 20—30 years undergoing minor operations, immediately

before a dose of 12 c.c. (0.6 g.) of pentothal and immediately after operation. Systolic blood pressure fell 10 mm. Hg, and diastolic rose 2 mm. A. J. B.

**Treatment of dangerous reactions to novocaine.** S. GILMAN (New England J. Med., 1938, 219, 841—844).—Three dangerous types of reaction are described, nervous, circulatory, and allergic. Treatment of the first is illustrated by 2 case reports. No satisfactory therapy is available for the others.

A. M. G.

**Action of certain amines on the central nervous system.** E. JACOBSEN, A. WOLLSTEIN, and J. T. CHRISTENSEN (Klin. Woch., 1938, 17, 1580—1583).—Derivatives of isopropylamine containing a phenyl group in the  $\beta$ -position ( $\beta$ -phenyl-, *N*-methyl-, ethyl-, or -isopropyl- $\beta$ -phenyl, etc.) arouse mice treated with barbiturates. Introduction of hydroxyl in the aliphatic chain diminishes, and in the ring abolishes, this action, as does increase in the no. of C atoms. The same applies to the action on the central nervous system in man.

E. M. J.

**Effect of  $\beta$ -phenylisopropylamine on respiration.** L. BUTTURINI and M. CAPUZZI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1111—1114).—Injection of 5—25 mg. of the amine into rabbits, in which respiration was depressed by drugs, increases the respiratory rate by up to 140%.

F. O. H.

**Contraction of the spleen and blood changes due to  $\beta$ -phenylisopropylamine.** M. FINI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1132—1135).—The drug has no effect on the size of the isolated rabbit's spleen but contracts the spleen of anaesthetised dogs, and increases the erythrocyte, leucocyte, and platelet counts of the peripheral blood.

F. O. H.

**Effect of  $\beta$ -phenylisopropylamine on organs and nervous system.** R. MARRI (Boll. Soc. ital. Biol. sperim., 1939, 14, 59—60).—The min. lethal doses of the amine for frog, rat, and guinea-pig are 1, 0.28, and 0.168 mg. per g., respectively. Some pharmacological properties of the amine are described.

F. O. H.

**Pharmacology of  $\beta$ -*p*-hydroxyphenylisopropylmethylamine ("veritol").** (A, B) A. TURCHETTI. (C, D) V. SCAFFIDI, jun. (E) G. M. RASARIO (Boll. Soc. ital. Biol. sperim., 1938, 13, 1033—1034, 1034—1036, 1036—1037, 1038—1039, 1039—1041).—(A) In normal men, intravenous injection of the drug increases arterial and venous pressure and produces bradycardia.

(B) The hypertension is not due to liberation of adrenaline whilst the bradycardia is a secondary reflex of arterial origin due to the hypertension.

(C) With Ringer-Locke perfusion fluid containing 1—4 p.p.m. of the drug, vaso-constriction is shown by aorta-cava preps. of dogs and rabbits.

(D) The drug, in concns. above 0.002%, increases the tonus of smooth muscle of uterus and intestine (guinea-pig, rabbit); no effect occurs with the muscle of bronchus (pig) or of bladder (guinea-pig, rabbit), even with concns. of 0.02%.

(E) Electrocardiographic records following injection of 10 mg. of the drug into healthy, young men are described and discussed.

F. O. H.



**Action of pentamethylenetetrazole (metrazol) on the circulatory system.** V. G. HAURY and C. M. GRUBER (J. Pharm. Exp. Ther., 1939, 65, 227—234).—In anesthetised animals, metrazol (5 or 20 mg. per kg.) produced an increase in organ vol. and a fall in blood pressure. The larger dose subsequently produced decreased organ vol. and a rise in blood pressure. The secondary effect of the larger dose, which was absent in spinal animals, is due to a central action of the drug; splanchnic dilatation and fall in blood pressure are due to a peripheral action.

E. M. S.

**Experimental convulsions in the rat.** W. L. SAMPSON and L. FERNANDEZ (J. Pharm. Exp. Ther., 1939, 65, 275—280).—Picrotoxin produces convulsions in rats in doses above the min. lethal dose. The convulsive doses of camphor and thujone are below the lethal doses; the action of camphor is prolonged, that of thujone least harmful. Thujone convulsions are prevented by Na phenobarbital, NaBr, and chloretone, but unaffected by bulbo-capnine.

E. M. S.

**Constitution of pharmacologically useful purine derivatives in solution.**—See A., 1939, II, 229.

**Effect of thio-bismol on therapeutic malaria.** W. F. SCHWARTZ (J. Pharm. Exp. Ther., 1939, 65, 175—184).—Single injections of thio-bismol (Na Bi thioglycollate) are effective in the control of therapeutic malaria. In every case a definite alteration of the succeeding malarial cycle is produced.

E. M. S.

**Sodium bismuth pyrocatecholdisulphonate.** II. **Chemotherapy.** L. ZANCAN (Boll. Soc. ital. Biol. sperim., 1938, 13, 1188—1190; cf. A., 1939, III, 191).—Subcutaneous injection of 0.04—0.08 g. (of Bi) per kg. removed trypanosome infection in mice and guinea-pigs and syphilis infection in rabbits. Intramuscular injection of doses of 0.0246 g. (of Bi) per kg. into men caused a significant improvement in the 2nd and 3rd stages of syphilis.

F. O. H.

**Anti-luetic action of lead salts.** M. KUMASAWA (Fukuoka Acta Med., 1938, 31, 177—178).—Basic Pb carbonate and Pb acetate were given to rabbits injected with *Sp. pallida*. The intravenous injection of 0.1 c.c. of 1% Pb acetate per kg. body-wt. 3 times a week cured scrotal chancres in 3 out of 6 rabbits in 5—7 weeks (3 died after a few injections). The subcutaneous injection of 1.0 c.c. per kg. 3 times a week cured scrotal chancres in 5 out of 6 rabbits in 5—7 weeks (1 died after 4 injections). Basic Pb carbonate was ineffective in syphilitic rabbits, and neither salt affected animals injected with trypanosomes. Pb acetate was less effective in syphilitic rabbits than were proprietary Bi preps., but it was more effective than Hg.

W. D'A. M.

**Lead poisoning.** S. L. TOMPSETT and A. B. ANDERSON (Lancet, 1939, 236, 559—562).—From a study of 11 cases of Pb poisoning it is suggested that a blood level of more than 100 µg. of Pb %, or a total daily excretion of more than 1 mg., indicates plumbism. A modified technique of determining Pb is described.

C. A. K.

**Excretion of esidron.** L. PANIZZON (Schweiz. med. Wschr., 1939, 69, 200—201).—90% of the intravenously injected Hg in esidron (Na salt of quinalinhydroxypropylamide-Hg-theophylline) is excreted in urine within 6 hr. 2% appears as ionised Hg in urine, the rest is excreted either unchanged or as a complex Hg compound of the amide. A. S.

**Sodium sulphide as antidote to mercuric chloride.** I. SIMON (Arch. Farm. sperim., 1939, 67, 27—28).—Gastric administration to rabbits of 3 c.c. of 0.1N-Na<sub>2</sub>S 30 min. after (or of 6 c.c. 1 hr. after) that of 3 c.c. of 0.1N-HgCl<sub>2</sub> prevents the lethal action of the latter.

F. O. H.

**Mercury poisoning.** G. C. ELTENTON (Rev. Sci. Instr., 1939, 10, 68).—The incidence of chronic Hg poisoning in U.S.S.R. has been reduced by wetting with saturated H<sub>2</sub>S solution the floors of rooms in which the concn. of Hg is approaching danger level even though all visible Hg has been removed. The rooms are then sealed up for 48 hr., the scum of HgS reducing to negligible val. the v.p. of Hg. Amalgamated Cu effectively withdraws Hg from fine cracks. Milk is used as an antidote to Hg poisoning. F. H.

**Thallium poisoning.** G. BĂLTĂCEANU, M. STĂNESCU, and N. IOANID (Bull. Soc. méd. Hôp. Bucarest, 1938, 20, 261—267).—A case is described. C. A. K.

**Chemotherapy and chemoprophylaxis in arsenical-resistant trypanosomiasis and in experimental syphilis.** A. BESSEMANS, A. VAN MEIRHAEGHE, E. VAN THIELEN, H. DE WILDE, P. WITTERBOLLE, and O. DE BORCHGRAVE (Ann. Inst. Pasteur, 1938, 61, 813—814).—Experimental infection of guinea-pigs by an arsenical-resistant strain of *Trypanosoma gambiense* could not be prevented by the administration of "trystibine" (Sb<sup>III</sup> derivative), but was prevented by "belganyl" (similar to germanine and moranyl). Some therapeutic effect was also obtained with the latter. Quinine compounds had little or no therapeutic effect for experimental rabbit syphilis.

G. P. G.

**Relation between constitution of 4-*p*-arsino-anilinonaphtha-1:2-quinone-8-sulphonic acid (2654 N) and its therapeutic action.**—See A., 1939, II, 191.

**[Treatment of] congenital syphilis.** P. J. HOWARD (J. Pediat., 1939, 14, 220—233).—Complete serological and clinical cure was obtained in 20 out of 45 children, but 85% showed a final satisfactory clinical result. Infants in the neonatal period or early infancy should have the first course of neoarsphenamine preceded by 10% glucose intravenously as protection to the liver and to counteract the well-known toxic effects common at this period.

C. J. C. B.

**Sodium dehydrocholate solution as a solvent for neoarsphenamine in the treatment of syphilis.** C. SHAW (J. Lab. clin. Med., 1939, 24, 624—626).—5% Na dehydrocholate solution used as a solvent for neoarsphenamine is beneficial to patients who develop the delayed type of gastrointestinal reaction. It is valueless where nausea and vomiting occur immediately after injection of the arsphenamine.

C. J. C. B.



**Value of liver to patients intolerant to arsenicals.** G. D. ASTRACHAN and E. A. SHARP (J. invest. Dermatol., 1938, 1, 427—449).—Injections of liver extract were of prophylactic val. in preventing pruritus, and in preventing or ameliorating intestinal disturbances, and erythema with scaling as well as fixed eruptions; they were of no val. in preventing recurrence of exfoliative dermatitis. Liver treatment benefited many cases with hæmatological and dermatological lesions and improved the patients' general condition. C. J. C. B.

**Action of magnesium on central nervous system: antagonism by calcium.** G. W. BRYANT, G. LEHMAN and P. K. KNOEFEL (J. Pharm. Exp. Ther., 1939, 65, 318—321).—In the spinal dog loss of reflex response, due to the action of Mg, occurred at a much lower level of blood-Mg than that which abolished response to stimulation of the motor nerve. Ca restored both reflex and direct motor response. The central and peripheral mechanisms are dependent on the Mg/Ca ratio in the blood. E. M. S.

**Systemic effects resulting from exposure to certain chlorinated hydrocarbons.** L. GREENBURG, M. R. MAYERS, and A. R. SMITH (J. Ind. Hyg., 1939, 21, 29—38).—3 cases of exposure to chlorinated hydrocarbons died of acute yellow atrophy of the liver. Histories and autopsy findings are given in detail. E. M. K.

**Poisoning with sodium silicofluoride.** B. HEYDRICH (Z. klin. Med., 1938, 135, 268—282).—14 persons accidentally poisoned with  $\text{Na}_2\text{SiF}_6$  showed drowsiness, cramps in the muscles, colic, and collapse; 2 died. E. R.

**Osteotropism of pharmaceutical substances.** IV. Fixation of fluoride *in vitro*. V. Fixation of oxalate *in vitro*. N. ERCOLI (Boll. Soc. ital. Biol. sperim., 1939, 14, 15—16, 16—17; cf. A., 1939, III, 179).—IV.  $\text{Ca}_3(\text{PO}_4)_2$  irreversibly removes  $\text{F}^-$  from aq. solutions;  $\text{PO}_4^{4-}$  is liberated, there being a parabolic relationship between initial  $[\text{F}^-]$  and liberated  $\text{PO}_4^{4-}$ . V. Oxalate ions in presence of  $\text{Ca}_3(\text{PO}_4)_2$  behave similarly to  $\text{F}^-$ . F. O. H.

**Spreading factor in certain snake venoms and its relation to their mode of action.** F. DURAN-REYNALS (J. Exp. Med., 1939, 69, 69—82).—Many snake venoms, especially rattlesnake, contain a skin spreading-factor which can be differentiated by heating from the more thermo-labile toxic factor. Antivenine inactivates both. A. C. F.

**Poisoning caused by the processional caterpillar (*Thaumetopea pythiocampa*, Fabricius).** P. LAURENT (J. Physiol. Path. gén., 1938, 36, 1097—1107).—White rats and other rodents were placed in contact with the living caterpillars; death ensued in 10 days with symptoms of broncho-pneumonia, ecchymoses, and paralysis. Contact with the box in which they had lived, but free from excrement, caused death in a few hr., as also did mastication of the caterpillars. Ingestion of excrement or injection of a saline extract of the organism led to toxic symptoms and death. Glycerol extracts of the caterpillars, painted on the mouth or nose, were less toxic and

practically innocuous after filtration, though the results were rather indefinite. C. A. A.

**Sting of the ant *Paraponera clavata*.** N. A. WEBER (Science, 1939, 89, 127—128).—A description. W. F. F.

**Complications of intramuscular injections [of quinine or atophanyl].** F. KÜLS (Med. Klin., 1939, 35, 376—377).—Sterile intramuscular abscesses occurred in 9 out of 500 cases treated with 2000 intramuscular injections of quinine preps. as well as after injections of atophanyl. A. S.

**Local necrosis following intramuscular injection of quinine, solutions.** R. WIGAND (Münch. med. Wschr., 1939, 86, 450—452).—Several cases are reported where intramuscular injections of quinine solutions, in the course of pneumonia treatment, produced severe intramuscular necroses. One patient died of hæmorrhage from a necrotised gluteal artery. The necroses are explained as signs of quinine hypersensitivity. A. S.

**Cause of death in extensive burns.** A. FAIR (Arch. int. Pharmacodyn., 1939, 61, 172—186).—Rabbits scalded at 80° may survive 3 days and at autopsy show cardiac lesions which are the cause of death. Anomalies of the electrocardiogram can be observed. D. T. B.

**Relation between skin sensitivity, liver function, leucopenic index, and toxic effects from cinchophen.** W. B. RAWLS, B. J. GRUSKIN, A. A. RESSA, and A. S. GORDON (J. Lab. clin. Med., 1939, 24, 597—601).—79% of patients who showed positive intradermal tests with cinchophen-serum mixtures developed toxic symptoms after cinchophen was administered by mouth compared with 33% of those who gave negative skin tests. 71% of negative skin reactors had normal liver function tests while 73% of positive reactors had liver dysfunction. The leucopenic index was not as valuable as the skin test for determining the likelihood of toxic symptoms following cinchophen administration. C. J. C. B.

**Toxicity of benzene.** R. CHARLIER (Arch. int. Pharmacodyn., 1939, 61, 123—154).—Benzene paralyses the peripheral vasomotor mechanism by direct action on the vascular muscle. It is toxic to cardiac muscle, commercial benzole being more toxic than pure benzene. D. T. B.

**Toxic action of nicotine.** H. ASSMANN (Münch. med. Wschr., 1939, 86, 457—460).—A review. A. S.

**Effects of tobacco smoking on health.** J. J. SHORT, H. J. JOHNSON, and H. A. LEY, jun. (J. Lab. clin. Med., 1939, 24, 586—589).—In 2031 medical records symptoms related to the respiratory, gastrointestinal, and nervous systems were more frequent in the smoking group. C. J. C. B.

**Comparison of reactions of human system to tobacco smoke and adrenaline.** J. J. SHORT and H. J. JOHNSON (J. Lab. clin. Med., 1939, 24, 590—593).—The characteristic effects of tobacco smoke on pulse, blood pressure, peripheral skin temp., and blood-sugar can be explained by an increased output of



adrenaline, probably resulting from the stimulating effect of nicotine on the sympathetico-adrenal system.

C. J. C. B.

**Dangers in the use of chemical hair straightener.** F. LEWIS (J. Amer. Med. Assoc., 1939, 112, 36—37).—Two cases of severe burn following the use of hair straightener containing NaOH are described.

R. L. N.

**Difficulties in the detection of saponins by the blood-gelatin method.** R. JARETZKY and W. LINDNER (Arch. Pharm., 1939, 277, 45—49).—Cholesterol compounds of some saponins, e.g., those of condurago, are decomposed by cold ether, alcohol,  $\text{CHCl}_3$ , or xylene, and thus escape detection by the ordinary cholesterol technique in the blood-gelatin method. However, formation of the compound in methyl alcohol allows its detection. In some cases small amounts of weakly hæmolytic saponins are detected in the extracts, but not in the plants themselves. In others, saponins occur as cholesterides or similar compounds and produce hæmolysis only after heating in xylene. Examples are given. R. S. C.

**Biological assay of *Gelsemium*.** B. V. CHRISTENSEN and L. G. GRAMLING (J. Amer. Pharm. Assoc., 1938, 27, 1208—1215; cf. B., 1937, 728).—A method of assay by production of emesis in pigeons is described; frogs are not suitable test animals. The 75% min. lethal dose in mice is related to the min. emetic dose in pigeons, indicating the suitability of the method. With doses up to 20 mg. per kg., sempervirine and gelsemoline produce emesis in pigeons, whilst gelsemine and gelsemidine are inactive.

F. O. H.

**Comparative physiological action of benzedrine (amphetamine) and derivatives on *Daphnia magna*.** A. VIEHÖEVE and I. COHEN (Amer. J. Pharm., 1938, 110, 526—532).—The order of decreasing activity is benzedrine sulphate, paredrine sulphate, paredrine hydrobromide, gauged by speed of onset of convulsive locomotion and depression of respiratory and cardiac systems.

H. G. R.

**Toxicity and antipyretic properties of halogenated acetanilides.** M. F. W. DUNKER and M. R. THOMPSON (J. Amer. Pharm. Assoc., 1939, 28, 70—73).—The toxicity of *p*-fluoroacetanilide in cats is of the same order as that of acetanilide. *p*-Chloro- and *p*- or *m*-fluoro-acetanilide have little antipyretic activity.

F. O. H.

**Chronic oral administration of atebtrin.** S. J. MARTIN, B. COMINOLE, and B. B. CLARK (J. Pharm. Exp. Ther., 1939, 65, 156—165).—Daily doses of 3% of the fatal oral dose of atebtrin produced cumulative toxic effects in dogs, cats, and rabbits. The survival period decreased progressively with larger doses. Symptoms were associated with disturbances of the medullary centres and the gastro-intestinal tract. Lesions found post-mortem were not specifically characteristic of atebtrin poisoning.

E. M. S.

**Effect of atebtrin on liver and kidney function.** B. B. CLARK, B. COMINOLE, and S. J. MARTIN (J. Pharm. Exp. Ther., 1939, 65, 166—174).—In dogs, oral administration of atebtrin (in doses which produced cumulative toxic effects) resulted in a diminu-

tion of liver function as measured by the bromo-sulphalein and bilirubin tests. There was no evidence of renal damage.

E. M. S.

**Comparison of the effect of calcium and of atropine and scopolamine on the plasma loss and on the general symptoms of guanidine intoxication.** A. S. MINOT (J. Pharm. Exp. Ther., 1939, 65, 243—252).—Ca hinders the loss of plasma fluid and protein in early guanidine intoxication in dogs. Atropine and scopolamine are more effective than Ca in reducing plasma loss, also in preventing a fall in blood-sugar, and in abolishing gastro-intestinal symptoms.

E. M. S.

**Study of the mechanisms involved in the loss of plasma in guanidine intoxication and in the prevention of such a loss by atropine and by calcium.** A. S. MINOT (J. Pharm. Exp. Ther., 1939, 65, 253—267).—Section of the vagi, in dogs, is as effective as atropine medication in preventing plasma loss due to guanidine intoxication. Prolonged vagal stimulation in untreated animals causes a loss of plasma. Evidence is given that secondarily induced sympathetic activity, associated with a period of parasympathetic overactivity, is responsible for the loss of plasma caused by guanidine.

E. M. S.

**Prevention of liver cirrhosis by the subcutaneous injections of xanthine-containing preparations.** J. C. FORBES (J. Pharm. Exp. Ther., 1939, 65, 287—293).—Na xanthine, xanthine, and a crude liver prep. containing xanthine all retard or prevent liver cirrhosis from chronic  $\text{CCl}_4$  poisoning in rats.

E. M. S.

**Toxicological studies of *N*-isobutylamides of aliphatic acids.** W. DEICHMANN-GRUEBLER (J. Ind. Hyg., 1939, 21, 48—52).—*N*-Butyrisobutylamide by subcutaneous injection or oral administration caused depression in rats, and with larger doses coma and death, often preceded by asphyxial symptoms. Laur- or undeceno-isobutylamide were only very slightly toxic. None of the compounds caused local irritation when applied to the skin; inhalation of mists of the compounds had no sp. toxic effect.

E. M. K.

**Action of alcohol on the permeability of the frog's skin.** F. BISKUPSKI (Pflüger's Archiv, 1938, 240, 287—288).—Low concns. (2—3%) of alcohol produce a reversible increase, medium concns. (5—6%) a reversible decrease, and high concns. (20—30%) an irreversible increase in the permeability of the frog's skin.

J. M. R.

**Narcotic action of deuteroalcohol.** K. HANSEN and O. DYBING (Arch. exp. Path. Pharm., 1938, 191, 275—280).—The narcotic action of alcohol containing D on fish and larvæ is greater than that of alcohol.

H. O. S.

**Potentiation by cyanide of the convulsant action of brucine and hydrastinine.** H. BERGSTEGERMANN and B. KRAUSKOPF (Arch. exp. Path. Pharm., 1938, 191, 46—54).—Subliminal doses of CN<sup>-</sup> potentiate the convulsant effects of brucine and hydrastinine in frogs. Combinations of HCN with coramine and veratrine have little or no potentiating effect.

H. O. S.



**Skin tests, and their connexion with serological phenomena.** P. D. MARTSCHUK and L. M. VAISBERG (J. Med. Ukrain., 1938, 8, 1115—1122).—Of 84 scarlet fever patients only 4 gave a positive reaction with horse serum, whilst 14 developed serum sickness after prophylactic anti-diphtheritic serum injections; of these only one had given a positive horse serum reaction. It is concluded that serum sickness is not due to sensitivity to horse serum.

R. T.

**Sensitisation of the conjunctiva.** R. JAHEL and R. NECTOUX (Compt. rend. Soc. Biol., 1938, 129, 1073—1075).—0.5 c.c. of ox serum was injected into the conjunctiva of a rabbit. Intravenous injection of 2 c.c. 20 days later caused hyperæmia of the eye. This was not produced by intravenous injection of horse serum. Successive intravenous injections give similar results.

P. C. W.

**Anaphylaxis and antianaphylaxis in the rabbit.** R. NECTOUX and A. BESREDKA (Compt. rend. Soc. Biol., 1938, 129, 1083—1084).—In the sensitised rabbit anaphylactic reactions with rise of intraocular tension are produced in the eye by injection of foreign protein into the vitreous humour. These are characterised by their earlier onset, and greater severity than in non-sensitised animals. The rabbit can be desensitised by vaccination with the same protein the day before the intraocular injection.

P. C. W.

**Salivary hæmorrhagic allergy.** G. SANARELLI (Compt. rend. Soc. Biol., 1938, 129, 1049—1052).—Following the intravenous injection of sterilised saliva in the rabbit, 3 injections of fresh saliva produce toxic, generally fatal, symptoms due to hæmorrhages in smooth muscle, intestines, uterus, and lungs. This allergic condition is not sp. and is induced in rabbits surviving slight infections with other typical enterotropic bacilli.

P. C. W.

**Inhibition of anaphylactic and anaphylactoid shock by atropine.** L. LUMIÈRE and P. MEYER (Compt. rend. Soc. Biol., 1938, 129, 1195—1197).—Injection of 40 mg. per kg. of atropine sulphate in the guinea-pig diminishes anaphylactic shock and also the anaphylactoid shock produced by intra-arterial injection of ground pumice-stone.

P. C. W.

**Are patch tests of real value in dermatology?** J. G. DOWNING (New England J. Med., 1938, 219, 698—703).—Patch tests have no diagnostic val. but are superior to scratch and intradermal tests and are of val. in occupational dermatology.

A. M. G.

**Use of the scratch test in dermatology.** J. GOODMAN (New England J. Med., 1938, 219, 705—708).—Apart from infantile eczema and atopic dermatitis, the scratch test is of no val. in the investigation and treatment of dermatoses.

A. M. G.

**Visceral allergy.** J. R. GOODALL and R. M. H. POWER (Amer. J. Obstet. Gynec., 1938, 36, 372—380).—A report of cases of intestinal, hepatic, peritoneal, cardiac, muscular, and cerebral allergy.

M. H.

**Treatment of pneumonia.** H. KALK and FROBENIUS (Dtsch. med. Wschr., 1939, 65, 321—325).—

A lecture. Quinine treatment is compared with serum administration.

A. S.

**Comparative pathology of anaphylaxis.** V. A. SAMTZOY (Trans. Conf. Med. Biol., 1937, 112—129, 275—278).—Anaphylactic shock could not be induced in lizards (*Lacerta agilis* and *muraris*, and *Ophisaurus apus*), snakes (*Tropidontus natrix*), amphibia (frog, axolotl), insects (caterpillars, stag-beetles), arthropods (crayfish), or worms (earthworm, leech). These data, together with those of other authors, support the contention that anaphylactic shock is possible only in the higher reptiles, birds, and mammals.

R. T.

**Ragweed hay fever: effect of dosage in treatment of 314 cases.** H. D. DUNDY, L. LEVIN, and H. MARKOW (J. Lab. clin. Med., 1939, 24, 583—586).—Results of sp. therapy in late hay fever bear a relationship to the dosage of extract administered, and an important factor in the apparent superiority of perennial over preseasonal treatment is the high dosage employed in the former.

C. J. C. B.

**Mould spore content of the air in Boston. [Atopic sensitivity.]** H. N. PRATT (J. Pediat., 1939, 14, 234—241).—25% of 177 children suffering from hay fever and asthma reacted strongly to the common *Alternaria* mould. The seasonal incidence of symptoms in patients sensitive to moulds corresponded closely with the seasonal variations in the mould counts.

C. J. C. B.

**Discussion on convalescent serum therapy.** C. M. HYLAND, J. A. CONNER, S. O. LEVINSON, F. M. MEADER, and W. THALHIMER (J. Pediat., 1939, 14, 255—274).—The use of convalescent serum therapy in scarlet fever, mumps, chicken pox, other hæmolytic streptococcal infections, whooping cough, and measles is discussed.

C. J. C. B.

**Hyperpyrexial treatment of chronic colitis.** E. LAUDA (Med. Klin., 1939, 35, 381—384).—Good results in cases of chronic colitis were obtained with artificial fever, produced by intramuscular injections of milk or intravenous injections of typhoid vaccine.

A. S.

**Pharmacological comparison of the oils of *Matricaria chamomilla*, L., and *M. discoidea*, L.** R. JARETZKY and F. NEUWALD (Arch. Pharm., 1939, 277, 50—53).—The oil from *M. discoidea* is much less effective than that of *M. chamomilla* in reducing inflammation of the rabbit's eye.

R. S. C.

**Hyperprexia produced by the hot box in combination with the Elliott treatment.** W. S. GURNEE (Amer. J. Obstet. Gynec., 1938, 36, 482—489).—84% of cases of acute gonorrhœa were cured after two treatments in the hot box in combination with the Elliott vaginal bag. The mouth temp. was maintained at 105° F. and the water in the vaginal bag at 115° F.

M. H.

**Erysipelas: analysis of 60 cases with ultra-violet irradiation as adjuvant in treatment.** H. W. WILLIS (Arch. Pediat., 1939, 56, 39—45).—In a small group of cases the mortality was less when massive doses of ultra-violet light were given than among those receiving small doses.

C. J. C. B.



**Rheumatism and arthritis.** P. S. HENCH, W. BAUER, M. H. DAWSON, F. HALL, W. P. HOLBROOK, and J. A. KEY (Ann. int. Med., 1939, 12, 1005—1104, 1295—1374).—A review including physiological studies and actions of drugs. C. A. K.

### (xxi) INDUSTRIAL PHYSIOLOGY AND HYGIENE.

**Metabolism during prolonged severe exercise.** E. H. CHRISTENSEN and O. HANSEN (Skand. Arch. Physiol., 1939, 81, 152—159).—Three well-trained subjects worked for 160—180 min. at the rate of 1120 kg.-m. per min. until exhaustion set in; they produced 2000—2500 cal. The R.Q. showed a gradual increase in fat combustion during the exercise. At the end of the experiment, when hypoglycæmic symptoms appeared (blood-sugar level 52 mg.-%), 40% of the energy output was still derived from carbohydrate combustion. A. S.

**Working capacity and diet.** E. H. CHRISTENSEN and O. HANSEN (Skand. Arch. Physiol., 1939, 81, 160—171).—The capacity for severe exercise in well-trained subjects is 2—3 times as great after a carbohydrate-rich diet (90% of the cal. derived from carbohydrates) than after a fat-rich diet (5% of the cal. derived from carbohydrates; 3500—5000 cal. were given daily in each case. The protein content of the diet was small. The diminished capacity for exercise on a fat diet is attributed to the low blood-sugar level and the ketonæmia. A. S.

**Hypoglycæmia, working capacity, and fatigue.** E. H. CHRISTENSEN and O. HANSEN (Skand. Arch. Physiol., 1939, 81, 172—179).—Trained subjects were kept for several days on a carbohydrate-free diet; they worked subsequently until complete exhaustion set in and were then given 200 g. of glucose. The blood-sugar was in one subject, in the phase of complete fatigue, 40 mg.-%. The subjects were able to continue exercise when the blood-sugar had risen. A. S.

**Respiratory quotient and oxygen uptake in exercise.** E. H. CHRISTENSEN and O. HANSEN (Skand. Arch. Physiol., 1939, 81, 180—189).—No change in blood-lactic acid content was observed during light exercise; metabolism is qualitatively identical with that at rest. Blood-lactic acid and R.Q. are increased during severe exercise. Muscle metabolism becomes increasingly anaërobic during max. exercise, and lactic acid accumulates. A. S.

**Fungus infection of lungs.** A. R. SMITH (Industr. Hyg. Bull., N.Y., 1939, 18, 15—16).—Fungus infections of the respiratory tract occur less frequently than infections of the skin but are more frequent than is generally recognised. Their importance lies in their association with certain industrial dusts and in the fact that their industrial origin is very likely to be overlooked owing to the fact that they may simulate tuberculosis almost exactly. C. G. W.

**Silicosis.** A. BÖHME (Dtsch. med. Wschr., 1939, 65, 366—369).—A lecture. A. S.

**Silica dust exposure in quarries.** L. GREENBURG, C. B. FORD, W. J. BURKE, and B. H. DOLIN

(Industr. Hyg. Bull., N.Y., 1938, 17, 575—577).—The dust hazard in rock drilling in New York State is regulated by Industrial Code No. 33 and certain rules promulgated by the Industrial Commissioner. According to this Code, all rock formations are divided into two classes: Class I, rock formations containing uniformly less than 10 wt.-% of free  $\text{SiO}_2$ , and Class II, rock formations containing 10 wt.-% or more of free  $\text{SiO}_2$ , and those formations having a variable and unpredictable content of free  $\text{SiO}_2$ . Under this classification the Code allows dust concn. up to and including  $10^8$  particles per cu. ft. of air for drilling operations in Class I rock, whereas the max. permissible dust concn. for drilling in Class II rock is fixed at  $10^7$  particles per cu. ft. of air. In the enforcement of the Code the problem of determining a just classification of the rock is extremely important. Most of the sampling of the State's quarries is performed by the Division of Inspection and the following conclusions have been drawn. (1) Rock drilling in the open, in Class I rock, is accompanied by a dust concn., in the breathing zone of the worker, of less than  $10^8$  particles per cu. ft. of air. (2) For Class I rock this amount is within the limits of, and meets the requirements of, the Code; when Class I rock is being drilled in the open, the use of approved dust control methods is unnecessary. (3) Rock drilling in the open, both in Class I and Class II rock, is always accompanied by a dust concn. in the breathing zone of the worker of more than  $10^7$  particles per cu. ft. of air. (4) For Class II rock this is above the permissible limits, and therefore when Class II rock is being drilled in the open, the approved methods of dust control must be provided. C. G. W.

**Pulmonary effects of zeolite inhalation.** A. POLICARD (Compt. rend. Soc. Biol., 1938, 129, 1204—1206).—Na Al silicate in particles of less than 2  $\mu$ . diameter was inhaled by rats 3 hr. daily for 7 days. The lungs became congested with a serous exudate and there was a large mobilisation of monocytes. These monocytes and the histiocytes of the alveolar walls became hypertrophied with large nuclei and vacuolated cytoplasm even if they had ingested no particles. After several days the exudate became granular and disappeared but the monocytes still increased until localised parts of the lungs were transformed into solid masses of parenchymatous cells. Even 2 months after treatment these areas were still solid, although the alveolar structure was still intact and there was no fibrosis. P. C. W.

**Presence of "curious bodies" in the lungs of South African gold miners.** E. WILLIAMS (J. Path. Bact., 1939, 48, 475—477).—19 of 32 routine autopsies in Johannesburg miners showed the presence of bodies of asbestosis type in the lungs and also black-cored similar bodies. There was no evidence of relationship between their occurrence and the presence of lung lesions. C. J. C. B.

**Effects of high humidity on skin temperatures at cool and warm conditions.** H. FREEMAN and B. A. LENGUEL (J. Nutrition, 1939, 17, 43—52).—At 24° the cooling of the skin normally occurring with 20% R.H. was partly inhibited by exposure to high R.H., and skin temp. rose. The heating of skin



normally following exposure to 32° and 20% R.H. was increased by rise in R.H., the extremities being more affected than the trunk. The increase in skin temp. caused by high R.H. was no greater at 32° than at 24°.

A. G. P.

**Dupuytren's contraction among upholsterers.** K. D. SMITH and W. E. MASTERS (J. Ind. Hyg., 1939, 21, 97—100).—Six cases occurred among 536 upholsterers of more than 2 years' employment; there was no familial history in these cases, and no aetiological factor in the personal histories; all had been employed for 20 years or longer.

E. M. K.

**Use of biophotometer and vitamin-A therapy in industry.** O. H. SCHETTLER, R. F. BISBEE, and B. H. GOODENOUGH (J. Ind. Hyg., 1939, 21, 53—55).—A group of colour matchers was tested for deterioration of light threshold with a biophotometer. Where deficiency was found carotene in oil was administered. Re-examination showed improvement of light-adapted threshold under treatment, and eye comfort at work was increased.

E. M. K.

## (xxii) RADIATIONS.

**Short-wave therapy.** S. JELLINEK (Schweiz. med. Wschr., 1939, 69, 165—170).—A lecture.

A. S.

**Calcium and phosphorus metabolism in osteomalacia. VII. Effect of ultra-violet irradiation from mercury-vapour quartz lamp and sunlight.** H. I. CHU, T. F. YU, K. P. CHANG, and W. T. LIU (Chinese Med. J., 1939, 55, 93—124).—Metabolic studies showed that irradiation, like vitamin-D administration, produces a marked clinical improvement in osteomalacia; bone pain and tetany disappear, bone density increases, and Ca and P excretion is diminished. Heliotherapy in the early summer in Peiping in the dosage employed produces results comparable with those of artificial irradiation. Aetiological, lack of sunlight is more important than dietary deficiency in rickets and osteomalacia.

W. J. G.

**Importance of early diagnosis of helioxicosis.** F. J. PRIMAK and A. S. ALEXEENKO (J. Méd. Ukrain., 1938, 8, 1169—1178).—Insolation may exert a profound noxious influence on susceptible individuals. Most of the harmful effects may be avoided by early diagnosis (capillaroscopic) of such susceptibility.

R. T.

**Quantitative action of  $\alpha$ -rays on plant tissue.** F. HERCIK (Compt. rend. Soc. Biol., 1939, 130, 377—379).—The effect of  $\alpha$ -rays on plant tissues is followed by immersion of the tissue in 0.1% erythrosin solution for 1 min., when the cells damaged by irradiation are coloured deep pink. The first modification caused by irradiation takes place in the nucleus and not in the protoplasm.

H. G. R.

**Effect of the space factor in irradiation of a tissue by  $\alpha$ -rays.** F. HERCIK and M. KLUSAKOVA (Compt. rend. Soc. Biol., 1939, 130, 379—382).—The degree of injury diminishes as the surface area irradiated is decreased and does not depend on the quantity of rays absorbed by the cells.

H. G. R.

**Respiration changes following irradiation with X-rays.** J. C. FARDON and W. A. SULLIVAN (Nature, 1939, 143, 287).—Inhibition and stimulation of respiratory activity of mouse tissue, taken from irradiated mice, was observed.

W. F. F.

**Action of X-rays on biological structures. Recovery factor.** J. REBOUL (Compt. rend., 1939, 208, 541—542).—A certain % of resting cells, uninfluenced by extrinsic or intrinsic growth factors, are killed by a known dose of X-rays but after a time the remaining cells multiply due to the operation of a "recovery factor." Mathematical equations are deduced which show the probable effect of a known dose of X-rays.

J. L. D.

**Biological action of X-rays.** S. A. NIKITIN (Trans. Conf. Med. Biol., 1937, 87—91, 271—272).—A review.

R. T.

**Effect of ultra-short waves on enzymes.** Y. TOGASAWA (J. Agric. Chem. Soc. Japan, 1939, 15, 71—79).—Under various conditions commercial preps. of diastase, papayotin, and pancreatic lipase are unaffected.

J. N. A.

**Electrolyte balances during artificial fever with special reference to loss through the skin.** E. H. KEUTMANN, S. H. BASSETT, and S. L. WARREN (J. clin. Invest., 1939, 18, 239—250).—Electrolyte balance was determined before, during, and after artificial fever (39.5—40.5°). The skin loss of Na and Cl during fever represented 7—19% and the total losses 7—22% of the amount present in the extracellular water at the beginning of treatment. Differences in skin loss depended on variations in ability of the individual to sweat. The two patients with the greatest loss of water developed heat cramps. The proportion of Na to Cl lost varied.

C. J. C. B.

## (xxiii) PHYSICAL AND COLLOIDAL CHEMISTRY.

**Skin reactions. VII. Relationship of skin permeability to electrophoresis of biologically active materials into the living human skin.** H. A. ABRAMSON and M. H. GORIN (J. Physical Chem., 1939, 43, 335—346).—Iontophoresis and electro-osmosis through animal tissues are discussed. The outer layer of human skin is considered as a membrane containing pores which are incompletely filled with liquid. Under the influence of a p.d., electro-osmotic forces tend to displace the air in the pores with liquid. The resulting continuous conducting fluid through the membrane can then be the seat of electrokinetic phenomena. Simple ionic migration, electro-osmotic flow, and diffusion then operate during the movement of charged mols. through the pores. Histamine which has been electrically transported into the skin remains there for about a week, and can be recovered by reversing the current.

C. R. H.

**Effect of calcium ions on the electrophoresis of haemocyanin from *Helix pomatia*.** P. PUTZEYS and P. V. WALLE (Bull. Soc. Chim. biol., 1939, 21, 185—195).—Ca ions, which increase the range within which haemocyanin is stable, owe their in-



fluence exclusively to their effect on the ionic atm. surrounding the protein ions, and not to changes they might cause in the charge thereon. A. L.

**Biological boundary potentials.** H. LUNDEGÅRDH (Biochem. Z., 1939, 300, 167—174; cf. A., 1938, III, 948).—At protoplasmic boundaries, the electric charge of the effective membrane modifies the Donnan equilibrium. The study of roots of wheat indicates that variations of  $10^{-3}$ — $10^{-5}$  in  $[H^+]$  of the surrounding medium have no effect on the  $[H^+]$  of the boundary protoplasm, i.e., the boundary has a true membrane effect. At approx.  $p_H$  3, the membrane has a max. charge of  $H^+$ , corresponding with max. ion-exchange and cation-binding capacity. For normal root cells, the  $[H^+]$  of the boundary protoplasm must be greater than that of the medium; this implies a negative charge of the protoplasmic boundary (in distilled water, a surface potential of approx. 200 mv. is attained) and a strong affinity for cations. The uptake of cations by the membrane and the resulting effect on the surface potential are exemplified. Data for the potential changes in roots in aq. KCl of varying concn. are given and their bearing on anion uptake and respiration is discussed. F. O. H.

**Distribution of electrolytes in mammalian tissues.** J. F. MANERY and A. B. HASTINGS (J. Biol. Chem., 1939, 127, 657—676).—A direct relationship exists between  $[Cl^-]$  and  $[Na^+]$  and an inverse relationship between  $[Cl^-]$  and  $[K^+]$  in mammalian tissues. Two groups of tissues exist, those which have a large proportion of  $Cl^-$ -free cells, e.g., liver, kidney, and brain, and those which have a large proportion of  $Cl^-$ -containing cells, e.g., blood and connective tissue. The former have a  $Na:Cl$  ratio equal to that of an ultrafiltrate. P. G. M.

**Influence of an electric current on plasma-permeability of plant cells.** O. SUOLAHTI (Protoplasma, 1937, 27, 496—501).—Permeability of *Chara ceratophylla* to highly dispersed sulphonic dyes was increased by subjecting the cells to an electric current only in those cases where the cells were permanently damaged by the current. No exosmosis of  $Cl^-$  ions from undamaged cells in a  $Cl^-$ -free  $NO_3^-$  solution could be induced by similar treatment. M. A. B.

**Osmotic pressure of organs. XII. Osmotic pressure of blood and organs at different periods after intravenous injection of pharmaceutical substances.** I. SIMON (Arch. Farm. sperim., 1939, 67, 45—70; cf. A., 1938, III, 1046).—A review of previously published data indicates that max. changes in the osmotic pressure occur in liver, striated muscle, and kidney and that the changes in osmotic pressure of various organs and blood are related to their respective functions of elimination and detoxication. F. O. H.

**Diffusibility of substances with a blue fluorescence.** A. GOURÉVITCH (Compt. rend. Soc. Biol., 1939, 130, 15—17).—Tadpoles weighing more than 100 mg. contain a reducible, dialysable substance with a blue fluorescence, the leuco-derivative being oxidisable by  $O_2$ . H. G. R.

**Plant colloids. Ageing of starch solutions.**—See A., 1939, I, 258.

**Behaviour of microscopic bodies consisting of biocolloid systems and suspended in aqueous media.**—See A., 1939, I, 260.

**Kikyo-root. VI. Colloidal properties of platycodin (Kikyo saponin).** M. TSUJIMOTO, R. SENJU, and T. MATSUMOTO (J. Agric. Chem. Soc. Japan, 1939, 15, 199—205).—The surface tension of platycodin in water decreases with increase of concn.,  $\gamma$  being 0.9938 and 0.7883 for solutions of concn. 0.01 and 0.16% respectively. Viscosity increases with increase of concn.,  $\eta$  being 1.012 and 2.239 for solutions of the above concn. respectively. The empirical formula for adsorption on C is  $x/m = 0.1202C^{0.518}$ . Platycodin is a negative colloid and it exhibits Liesegang's phenomenon. The Au no. is 16. J. N. A.

**Swelling of skin.** G. BALASSA and G. EMÖDI (Biochem. Z., 1939, 300, 292—296).—The amount of swelling when pieces of guinea-pig or albino rat skin are placed in Sørensen's glycine buffer depends on the  $p_H$  of the solution. The curve has a max. at  $p_H$  2.9 (increase 700%) and a min. at  $p_H$  6.1 (increase 200—270%). Further increase in  $p_H$  produces only a slight increase in swelling. In the  $p_H$  range 6.1—13.1 pigmented skins swell slightly less than white skins. The skins of thyroidectomised animals show a greatly increased swelling capacity on the acid side, that of guinea-pig at  $p_H$  2.9 increasing by 2000%, but on the alkaline side swelling is normal. Skins of newly born animals show a gradual increase but no max. in acid solution, and with increasing  $p_H$  swelling still increases until at approx.  $p_H$  11 there is a very pronounced rise. J. N. A.

**Buffer-indicator analysis of plant and animal tissue.** H. M. FRANKE (Z. Zellforsch., 1938, 28, 617—634).—By using indicators as dyes, tissues are stained varying colours which alter with the  $p_H$  of the dye used. Curves can then be plotted giving the relationship of the dissociation of the protein dye complex and the  $p_H$  of the dye used. These curves vary in different tissues indicating differences in protein content. The theoretical basis for the method is given. R. J. O'C.

## (xxiv) ENZYMES.

**Energy of activation of enzyme reactions. Their velocity below  $0^\circ$ .** H. LINEWEAVER (J. Amer. Chem. Soc., 1939, 61, 403—408).—Temp. characteristics of unorganised enzyme reactions, of microbial action, and of non-enzymically catalysed reactions are discussed in relation to changes occurring in cold storage, e.g., of fruit. R. S. C.

**Manganese as activator of dihydroxymaleic acid oxidase.** H. THEORELL and B. SWEDIN (Naturwiss., 1939, 27, 95—96).—A prep. of dihydroxymaleic acid oxidase, obtained from the juice of leaves of *Rumex acetosa* by concn. in a vac. and pptn. with acetone, after addition of pyridine and  $Na_2S_2O_4$  showed a protohaemochromogen spectrum with a strong band at 557  $m\mu$ . and a weak one at 525  $m\mu$ . HCN (0.0033M.) completely inhibits the activity, whilst the inhibiting action of catalase indicates that  $H_2O_2$  participates in the oxidative mechanism although the amount present at any instant is very small. The



autoxidation of dihydroxymaleic acid in presence of (ferri-)cytochrome *C* does not take place in presence of Fe, Cr, Ni, Co, and Cu, but in presence of Mn (2  $\mu$ g.) a marked uptake of  $O_2$  occurs after an incubation period, which is not observed if  $H_2O_2$  (8  $\mu$ g.) is added. The activity of this model dihydroxymaleic acid oxidase system consisting of cytochrome *C* and Mn was completely inhibited by catalase (50  $\mu$ g.) but not by HCN. When the purified enzyme from *Rumex acetosa* is dialysed, it loses much of its activity but is reactivated by small quantities of Mn (1  $\mu$ g.), the reactivated enzyme being largely but not completely inhibited by CN'. The activity of the undialysed enzyme is not appreciably increased by Mn. Mn probably functions as an activator of peroxidase systems. W. O. K.

**Flavin component of the pyruvic acid oxidation system.** F. LIPMANN (Nature, 1939, 143, 436).—Repeated pptns. of phosphate extracts from lactic acid bacteria with 50%  $(NH_4)_2SO_4$  at  $p_H$  3 and 1–2° gave a protein fraction which, on addition of thiamin pyrophosphate and flavin-adenine dinucleotide, catalysed pyruvic oxidation. Thiamin pyrophosphate alone does not catalyse this oxidation. L. S. T.

**Mechanism of the oxidation of reduced co-enzyme I.** F. B. STRAUB, H. S. CORRAN, and D. E. GREEN (Nature, 1939, 143, 119).—The co-enzyme factor and the flavoprotein isolated from heart muscle (A., 1939, III, 359) are identical. Under optimal conditions, 1 mol. of flavoprotein catalyses the oxidation of 8500 mols. of reduced co-enzyme I per min. at 38°. The new flavoprotein plays a fundamental rôle in cellular respiration. Muscle flavoprotein cannot act as an intermediate between reduced co-enzyme and  $O_2$ , and there is evidence that under physiological conditions flavoprotein catalyses the reaction between reduced co-enzyme and  $O_2$  via the cytochromes. L. S. T.

**Non-enzymic methylene-blue reduction by pyruvic acid and pyruvic acid aldol.** P. E. SIMOLA (Suomen Kem., 1939, 12, B, 10).—Methylene-blue is reduced slowly by pyruvic acid and more rapidly by pyruvic acid aldol, which appears to be the active agent in the first case also. The reductions are accelerated by light, no appreciable change taking place in the dark. M. H. M. A.

**Enzyme reactions in the cell and in solution.**  
I. Influence of alkali ions on dehydrogenation processes in the yeast cell. F. FLEISCHMANN and L. SCHWARZ (Protoplasma, 1937, 27, 552–555).—Addition of KCl hastened decolorisation of methylene-blue by suspensions of yeast cells, the effect increasing with increasing [KCl]. Small concns. of NaCl and LiCl accelerated decolorisation, but in a much smaller degree, whilst higher concns. retarded the process. None of the salts had any influence on decolorisation by yeast extract, and the different behaviour in the case of the cell suspensions may be due to an effect of the salts on adsorption of the enzyme by the protoplasm in the living cell. M. A. B.

**Preparation of fumarase-free dehydrogenase solutions, especially of hydroxysuccinic- and**

**succinic-dehydrogenase.** E. HOFF-JØRGENSEN and J. LEHMANN (Skand. Arch. Physiol., 1939, 81, 269–278).—Phosphate extracts of minced pig's heart muscle were diluted at  $p_H$  9.5–10.0 and pptd. with  $H_2SO_4$  at  $p_H$  4.25–4.30. The ppt. was suspended in  $Na_2HPO_4$ . Pptn. with  $H_2SO_4$  was repeated until the enzyme solution was free from fumarase. The solution contains hydroxysuccinic-, succinic-, and lactic acid-dehydrogenases. A. S.

**Soluble enzymes produced by Hymenomycete fungi. Coupled "antioxygen" reactions.** L. LUTZ (Compt. rend., 1939, 208, 392–394).—Reaction vessels containing a culture of *Corticium quercinum*, an alcohol (geraniol or citronellol), a ketone (acetone, carvone, or methyl nonyl ketone), and methylene-blue show nearly complete decolorisation in 15 days in sunlight. The reaction is retarded in the dark. When no ketone is added, the reaction is very slow and in the absence of the alcohol the rate is nearly zero. When geraniol-benzoquinone and geraniol-thymoquinone are used as alcohol and ketone, decolorisation is complete in 7 days. Nerol and citronellol are also used as alcohols in the latter system. In the dark, the rate of decolorisation is very slow. J. L. D.

**Enzymes of lactic acid bacteria. II. Lactic dehydrogenase.** K. KITAHARA (J. Agric. Chem. Soc. Japan, 1939, 15, 19–24; cf. A., 1938, III, 844).—See *ibid.*, 1056. J. N. A.

**Specificity and biological function of animal peroxidases.** M. POLONOVSKI and M. F. JAYLE (Bull. Soc. Chim. biol., 1939, 21, 66–91).—In animal tissue three types of peroxidases are present: the hydroperoxidases like that in milk and in leucocytes which have properties similar to the plant peroxidases; the hydroalkyl peroxidases present in blood plasma, the activity of which with alkyl peroxides is greater than that of the plant analogues; hæmoglobin, which is the most important of the animal peroxidases. In human blood plasma, associated with the protein, there is present a substance which activates the peroxidase action of hæmoglobin. This activator is not present in certain other vertebrates. Oxyhæmoglobin can act as a H acceptor and is thereby converted into a more highly oxidised derivative which is responsible for the peroxidase action previously studied *in vitro* (see below). A. L.

**Comparative study of the catalytic action of plant peroxidases and hæmoglobin.** M. F. JAYLE (Bull. Soc. Chim. biol., 1939, 21, 14–47).—A method for determining peroxidase based on the times required to oxidise varying amounts of ascorbic acid by  $H_2O_2$ , methyl or ethyl H peroxide in the presence of HI is described, the end-point being taken at the first appearance of I. Determination of the peroxidase activity of hæmoglobin by this method gives vals. 10 times the corresponding vals. obtained by the pyrogallol method. Using methyl and ethyl H peroxide the activity is still further increased in contrast with plant peroxidases which are able to utilise such substances to a much smaller extent than  $H_2O_2$ . Unlike plant peroxidases, the peroxidase activity of hæmoglobin is dependent on the oxidation-reduction



potential of the medium, biological reducing agents such as ascorbic acid, glutathione, and cysteine have a marked effect on the activity of the system ethyl H peroxide-haemoglobin-HI, phenols in the presence of ethyl H peroxide are oxidised only to a small extent, and haemoglobin catalyses the oxidation of ascorbic acid as rapidly in the absence as in the presence of HI. The peroxidase activity of methaemoglobin is twice that of haemoglobin using ethyl H peroxide. Carboxy- and cyan-haemoglobin are also active, but sulph-haemoglobin has no enzymic action.

A. L.

**Occurrence and detection of peroxidases in fresh plant preparations.** W. BRANDRUP (Pharm. Zentr., 1939, 80, 177—181).—The guaiacol- $\text{H}_2\text{O}_2$  test for peroxidases is considered the most sp., whilst that involving the use of *p*-phenylenediamine, guaiacol, and  $\text{H}_2\text{O}_2$  is not sp. Homoeopathic tinctures, expressed juices from *Chelidonium*, dried preps. from the latter containing lactose and nipagin (preservative), and fresh lettuce juice all give a strong peroxidase reaction, whilst various infusions with the exception of *Bryonia* give a negative reaction. The latter does not necessarily indicate absence of peroxidases. In some cases the reaction may not be due to peroxidases.

J. N. A.

**Detection of peroxidases in plants and their stability in pharmaceutical preparations.** D. SCHMALTZ (Süddeut. Apoth.-Ztg., 1939, 79, 222—224).—Methods for detection of peroxidases are reviewed. The best reagents are guaiacum resin +  $\text{H}_2\text{O}_2$  and benzidine +  $\text{H}_2\text{O}_2$  as modified by Peyer. Peroxidases in aq. solution and in dried powdered preps. are quite stable. Many fresh preps. from *Chelidonium* contain peroxidases but they are not detected if the concn. of  $\text{H}_2\text{O}_2$  is too large (optimum concn. 0.1—0.3%). In preparing dried samples it is necessary to dry quickly to preserve the oxidases. Additional sieving or storing under unfavourable conditions or long keeping of solutions under non-sterile conditions and without exclusion of air has no harmful effects.

J. N. A.

**Chemical properties of choline-esterase.** D. NACHMANSON and E. LEDERER (Compt. rend. Soc. Biol., 1939, 130, 321—324).—The enzyme is inactivated by dialysis but can be reactivated by the addition of the dialysate, glutathione, cysteine, glycine, HCN, or salicylaldehyde. Substances reacting specifically with SH groups decrease the activity of the enzyme.

H. G. R.

**Hydrolytic decomposition of butter fat with pancreatic lipase.** E. PELTOLA (Suomen Kem., 1939, 12, B, 5—6).—Butyric and hexoic acids are formed more rapidly than oleic acid in the initial stages of the hydrolysis, but after 40% of the fat is decomposed all three acids are formed at the same rate. The results are independent of the amounts of the acids in the original fat.

M. H. M. A.

**Relationship between esterase, ascorbic acid, and glutathione contents of the living animal.** S. RAABE (Biochem. Z., 1938, 299, 141—167; cf. A., 1938, III, 928).—In healthy rabbits, the ascorbic acid contents of the blood and organs (liver, kidney,

N N (A., III.)

intestine) show parallel variations; the esterase contents behave similarly. There is no parallelism between the variations in ascorbic acid content and those in esterase content, although the ratio ascorbic acid : esterase remains fairly const. in the individual rabbit. Injection of ascorbic acid or of glutathione increases the ascorbic acid and esterase contents. Probably glutathione acts, not on the co-enzyme, but on the apoenzyme and ascorbic acid by maintaining a negative redox potential, probably protecting an active group of the esterase from oxidation.

W. McC.

**Protein of *d*-amino-acid oxidase.** E. NEGELEIN and H. BRÖMEL (Biochem. Z., 1939, 300, 225—239).—The isolation of the oxidase from sheep kidney and its decomp. into the protein (yield 4.2%) and the prosthetic group, alloxazine-adenine dinucleotide, are described. The process consists essentially of a series of pptns. of the crude oxidase and finally of the protein by means of  $(\text{NH}_4)_2\text{SO}_4$  at 38° and  $p_{\text{H}}$  vals. ranging from 5.0 to 8.3. The dinucleotide is separated from the protein by the method of Warburg and Christian (A., 1938, III, 1047). The protein has not been cryst. and the combining wt. of the purest sample is 70,000. In presence of *d*-alanine and the prosthetic group 1 mg. of protein causes an uptake of 438 c.c. of  $\text{O}_2$  per min. The activity is not lost easily; after 17 days at 0° it decreases only 13%. Using very small amounts of protein the rate of  $\text{O}_2$  uptake increases with increasing protein more rapidly than protein concn., whilst between 15 and 33  $\mu\text{g}$ . of protein the rate is proportional to the amount of protein. In absence of catalase 1 mol. of *d*-alanine requires 1 mol. of  $\text{O}_2$ , whilst in presence of catalase only 0.5 mol. is required. The absorption spectra of the protein, prosthetic group, and oxidase in visible and long-wave ultra-violet light have been determined. Union of the prosthetic group to the protein causes a small displacement of the spectrum of the dinucleotide towards the longer waves. In absence of  $\text{O}_2$ , *d*-alanine hydrogenates the alloxazine component of the oxidase and the reaction has been followed by determining the absorption spectrum using light of  $\lambda$  450 m $\mu$ .

J. N. A.

**Activation of arginase.** A. ROSSI (Boll. Soc. ital. Biol. speriment., 1939, 14, 19—20).—Arginase preps. (from glycerol extracts of pig and ox liver) are activated by cysteine- $\text{FeSO}_4$ ,  $\text{Fe}^{II}$  2:2'-dipyridyl (max. at  $p_{\text{H}}$  5.3, especially if enzyme and activator are kept at  $p_{\text{H}}$  5.3 for 30 min. before addition of substrate), or dialysis against 45% glycerol.

F. O. H.

**Enzymes concerned in the decomposition of alanine and aspartic acid by *Aspergillus niger*.** J. C. MOOR (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 195—200).—When *A. niger* is placed in solutions of alanine or aspartic acid the rate of deamination of both acids increases with time, and is practically the same for both. With increase of concn. of alanine, deamination reaches a max. at 0.4-M., and decreases in higher concns. In the case of aspartic acid there is no max. and the rate increases with concn. up to saturation. The rate of deamination of mixtures of the two  $\text{NH}_2$ -acids is greater than the sum of the rates for the separate acids. Two



distinct enzymes, deaminating alanine and aspartic acid respectively, probably occur in *A. niger*.

J. N. A.

**Deaminases of adenosine and adenylic acid in blood and tissues.** E. J. CONWAY and R. COOKE (Biochem. J., 1939, 33, 479—492; cf. A., 1938, III, 980).—The distribution of adenylic acid and adenosine deaminases in 36 tissues of the rabbit is determined. The amount of adenylic acid deaminase in voluntary muscle is 40 times that in any other tissue, but its effective action on normal concn. of substrate is 500—1000 times as great. Other tissues and blood contain inhibitors. The highest concn. of adenosine deaminase is in the vermiform appendix and somewhat smaller amounts occur in the duodenum and jejunum. Plasma contains small amounts of adenylic acid deaminase, and the latter is also present in appreciable amounts in the claw muscles of the crab (cf. Lohmann, A., 1936, 104). The relationship between adenosine deaminase and substrate concn. is normal; that between adenylic acid deaminase and substrate concn. is affected by sp. buffer inhibition and also by special inhibitors in tissues. These displace adenylic acid from an adsorbing surface.  $\text{CO}_2$ ,  $\text{HCO}_3^-$ ,  $\text{PO}_4^{3-}$ , and veronal act similarly, whilst maleic and citric acids are inactive. Special tissue inhibitors are either absent from or ineffective in voluntary muscle. Dilution of blood by decreasing the concn. of inhibitors greatly increases the deamination of adenylic acid per c.c. of blood. Nerve tissue, auricle muscle of heart, and erythrocytes deaminate adenylic acid normally, but kidney, liver, intestine, smooth muscle, ventricular muscle of heart, and blood after loss of  $\text{CO}_2$  deaminate it only after a preliminary dephosphorylation. Two methods for the determination of the path of deamination are described. The significance of the adenylic acid and adenosine deaminations is discussed.

J. N. A.

**Crystalline proteases.** T. LAINE (Suomen Kem., 1939, 12, A, 36—38).—A review. M. H. M. A.

**Bacterial proteases. XI. New proteinase and activatable peptidases from *B. sporogenes*.** E. MASCHMANN (Biochem. Z., 1939, 300, 89—112; cf. A., 1938, III, 760; 1939, III, 198).—*B. sporogenes* grown in broth containing peptone produces first a proteinase which has optimum aerobic activity at  $p_H$  7, no activator being required. The action of the proteinase on caseinogen is 8—16 times as great as that on ovalbumin, peptone, or gelatin. Clupein is not attacked. Citric acid, a  $p_H$  of less than 5.4, and relatively high concns. (0.01M.) of HCN and cysteine inhibit the action. Fe, Cu, and Hg interfere with the action, probably by reacting with the substrate. The proteinase probably contains no metal or CO group. Serum (man, horse, ox, pig, wether, rabbit, but not guinea-pig or dog), even after heating to 56°, native  $\psi$ -globulin, and native albumin (but not euglobulin) usually inhibit the action on caseinogen and gelatin (but not that on peptone) of the proteinase as well as that of anaërobiase and that of the enzyme of *Pyocyanus*. Guinea-pig serum, which contains di- and aminopoly-peptidase, stimulates the action of the proteinase. The action of the di- but not that of the aminopoly-peptidase is inhibited by

HCN and by cysteine. *B. sporogenes* produces no other proteinase but later it produces peptidases which usually require to be activated by  $\cdot\text{SH} + \text{Fe}$  (activation by  $\text{Fe}^{II}$ , cysteine, cysteine + Fe, ascorbic acid +  $\text{Fe}^{II}$ , and citric acid +  $\text{Fe}^{II}$  is less pronounced). The action of these peptidases is inhibited by HCN and that of the aminopoly-peptidase is also inhibited by cysteine (but not by reagents for the CO group). W. McC.

**Effect of oxygen tension on proteolysis.** K. H. LEE and T. T. CHEN (Chinese J. Physiol., 1938, 13, 395—398).—The non-protein-N was determined at intervals in a glycerol extract of sheep's liver in acetate buffer at  $p_H$  4.8 and 37° aerated with  $\text{O}_2$ , air, or  $\text{N}_2$ . Proteolysis was most rapid in  $\text{N}_2$ ; replacement of  $\text{O}_2$  by  $\text{N}_2$  accelerated proteolysis, but not up to its rate in  $\text{N}_2$ . N. H.

**Specificity of pepsin.** J. S. FRUTON and M. BERGMANN [with W. P. ANSLOW, jun.] (J. Biol. Chem., 1939, 127, 627—641; cf. A., 1938, III, 760).—The optimum  $p_H$  for the hydrolysis of carbobenzyloxy-L-glutamyl-L-tyrosine by cryst. pepsin is 4.0; the enzyme is much less active at  $p_H$  1.8—2.0, usually regarded as the optimum for pepsin. All the peptides which are hydrolysed by pepsin contain either tyrosine or phenylalanine residues, the most sensitive being those in which tyrosine is combined with glutamic acid. For new peptides described see A., 1939, II, 213. P. G. M.

**Liberation of ammonia from zein in peptic hydrolysis.** T. LAINE (Suomen Kem., 1939, 12, B, 7—8).—In the hydrolysis of zein with pepsin at  $p_H$  1.5—2.0 all the amide and 30% of the peptide linkages are hydrolysed in 52 days. All the amide groups are probably contained in glutamine, and the glutamine dipeptides formed are particularly labile.

M. H. M. A.

**Specificity of trypsin.** M. BERGMANN, J. S. FRUTON, and H. POLLOK (J. Biol. Chem., 1939, 127, 643—648).— $\alpha$ -Benzoyl-L-arginineamide hydrochloride (I) is rapidly hydrolysed by cryst. trypsin at  $p_H$  7.8 and 40°, by papain and bromelain, but not by chymotrypsin.  $\alpha$ -Toluenesulphonyl-L-arginineamide hydrochloride and other synthetic amides are not hydrolysed by trypsin.  $\alpha$ -Toluenesulphonyl-L-arginine, in cryst. form, m.p. 256—257°, and benzoyl-L-histidineamide, m.p. 234°, were prepared. P. G. M.

**Isolation of crystalline heterotrypsin from beef pancreas.** K. HOFMANN and M. BERGMANN (Science, 1939, 89, 86—87).—Heterotrypsin (I) (A., 1937, II, 234) is contained in the exudates from bovine pancreas in amounts several times that of trypsin, whilst chymotrypsin is practically absent. (I) is isolated by 0.4 saturation with  $(\text{NH}_4)_2\text{SO}_4$  at  $p_H$  7.0. The fibrous crystals obtained show a high activity towards benzoylglycyl-lysineamide. L. S. T.

**Pectase activity of certain micro-organisms.** H. H. THORNBERRY (Phytopath., 1938, 28, 202—205).—Pectase in certain plant-pathogenic fungi or their culture media is demonstrable by hydrolysis of mono-Ca methyltartrate (Neuberg and Ostendorf, A., 1931, 392). The mechanism of destruction of plant tissue by these organisms, and the possible parts



played by pectase, pectinase, and protopectinase therein, are discussed. A. G. P.

**Diastase reactions and chain reactions.** J. COURTOIS (J. Pharm. Chim., 1939, [viii], 29, 354—372).—A review.

**Purification of malt amylase.** O. HOLMBERGH (Svensk Kem. Tidskr., 1938, 50, 258—264).—Malt amylase consists of at least three interdependent enzymes. During dialysis partial separation occurs with loss of activity. Highly active preps. are obtained from conc. malt extract ( $Sf_{30} = 6$ ) by pptn. of impurities thrice with  $Ba(OH)_2$  and alcohol. The final filtrate must be kept at  $0^\circ$  and contain less than 45% of alcohol to prevent coagulation. This solution ( $p_H$  8) is treated with  $H_2S$  to  $p_H$  7, centrifuged, and  $Ba$  removed with solid  $(NH_4)_2SO_4$ . Addition of aq.  $(NH_4)_2SO_4$  causes loss of activity. The filtrate ( $Sf_{30} = 45$ ) is pptd. with acetone, and the ppt. washed with acid acetone ( $p_H$  5.5). The residue is dried in a vac. and gives an aq. solution having  $Sf_{30} = 73$ . It contains both protein and carbohydrate. Methods for determining the activity of preps. are described.

M. H. M. A.

**Koji amylase. XII. Protective substances for heat-inactivation of  $\alpha$ - and  $\beta$ -amylases and maltase, and regeneration of enzymic activity after heat-inactivation.** Y. TOKUOKA (J. Agric. Chem. Soc. Japan, 1939, 15, 43—49; cf. A., 1938, III, 845).— $Ca^{++}$ , as  $CaCl_2$  or  $CaHPO_4$ , even in concn. as low as 0.002-M. protects  $\alpha$ -amylase from heat-inactivation, heating at  $p_H$  5.5—8.0 at  $40^\circ$  for 20 hr. having no effect, whilst without  $CaCl_2$  40—100% of the activity is lost under these conditions.  $NH_4^+$ ,  $Na$ ,  $K$ , and  $Mg$  ions have no protective action.  $Ca^{++}$  is not protective for  $\beta$ -amylase or maltase from saké-koji. Starch, dextrin, peptone, ovalbumin, maltose, and glucose also protect  $\alpha$ -amylase, their effect decreasing in the order given, but all are less active than  $Ca^{++}$ . They have a very slight protective action on  $\beta$ -amylase and maltase. Nearly 5% of activity can be recovered if  $\alpha$ -amylase which has been inactivated at  $80^\circ$  for 15 min. is cooled at  $25$ — $27^\circ$  for 2 hr. Nearly 70% reactivation occurs with inactivated maltase and  $\beta$ -amylase under the same conditions. The org. substances mentioned above markedly inhibit the regeneration of inactive maltase and  $\beta$ -amylase.

J. N. A.

**Differentiation of disaccharide-splitting enzymes.** J. LEIBOWITZ and S. HESTRIN (Nature, 1939, 143, 333).—On short incubation at  $p_H$  3.5, taka-maltase retains full activity, but taka-invertase is completely destroyed, showing that these are distinct enzymes. Weidenhagen's theory (A., 1933, 92) is refuted.

L. S. T.

**New enzymic protein from yeast. Reversible enzymic synthesis of glycogen.** W. KIESSLING (Naturwiss., 1939, 27, 129—130; cf. A., 1937, III, 394).—After removal of  $B$ -protein,  $C$ -protein (free from  $A$ -protein), which catalyses the esterification of glycogen with inorg.  $PO_4'''$ , is obtained from yeast maceration juice or muscle extract by repeated pptn. with aq.  $(NH_4)_2SO_4$  (30—35% saturated). Approx. 15% of added inorg.  $PO_4'''$  is consumed and glucose-

1-phosphoric acid is produced.  $C$ -Protein, added to this acid, causes 85% hydrolysis, a mixture of inorg.  $PO_4'''$  and glycogen being produced in a unimol. reaction having  $k = 5.2$  at  $28^\circ$  when the total  $PO_4'''$  concn. is  $2.04$ — $22.24 \times 10^{-2}$  mol. Glycogen is not involved in the equilibrium set up since it is in colloidal form in another phase. The heat of esterification is  $-1200$  g.-cal.  $C$ -Protein requires no dialysable co-enzyme. Since enzymic protein catalyses esterification of starch with inorg.  $PO_4'''$  it is possible that an analogous mechanism for the conversion of starch into glycogen exists. In the juice, the esterification of glycogen catalysed by  $C$ -protein with production of hexose monophosphate is followed by the transfer, catalysed by  $A$ -protein, of  $PO_4'''$  from phosphopyruvic acid to the monophosphate. W. McC.

**Co-enzyme of glycolysis from tumours. IV.** H. KRAUT, G. SCHMATOLLA, and R. NEUMANN (Z. physiol. Chem., 1939, 258, 101—107; cf. A., 1935, 1008).—Minced ox brain or embryo is dried with acetone and extracted with dil. aq.  $NH_3$  and the extract is treated with aq.  $Ba(OH)_2$ . After 2 weeks, the ppt. is treated with  $H_2SO_4$  and the co-enzyme, removed from  $BaSO_4$  by extraction with 20% aq.  $NaOH$ , is filtered through C and kieselguhr and pptd. from the well-cooled solution with 25%  $HCl$ . The ppt. is dissolved in conc. aq.  $Na_2CO_3$ , the solution is passed through a membrane not permeable to impurities of very high mol. wt., and the co-enzyme, after repptn. with 25%  $HCl$ , is dried with acetone and ether; 10—30 mg. of dry material are obtained from 200—300 g. of dried brain or embryo. Glycolysis in tissue equiv. to 1 mg. of dried brain is increased 30% by 0.1—1  $\mu$ g. of the co-enzyme (N content 3—12%), which contains or is associated with protein.

W. McC.

**Coupling between pyruvic acid dehydrogenation and adenylic phosphorylation.** F. LIPMANN (Nature, 1939, 143, 281).—A new coupling of oxidation and phosphorylation, with thiamin pyrophosphate as a link of the reaction chain, occurs with dry preps. of *Bacterium Delbrückii* (*acidificans longissimum*). Phosphorylation of added adenylic acid occurs when pyruvic acid is dehydrogenated, and thiamin pyrophosphate is the prosthetic group of the enzyme catalysing the dehydrogenation of pyruvic acid. The coupling takes place anaerobically as well as aerobically. The linking between the thiamin and adenylic acid systems may be of great importance in the metabolic function of thiamin in the living cell.

L. S. T.

**Fission of yeast-nucleic acid by a kidney-phosphatase preparation of high esterase activity.** M. COVELLO (Annali Chim. Appl., 1939, 29, 12—16).—The phosphatase prep. (cf. Albers, A., 1935, 784), with optimum  $p_H$  7.42, split off 95.2% of the total P from yeast-nucleic acid in 72 hr. Increase in concn. of enzyme increased the rate of removal of P in accordance with Schütz's law; increase in concn. of substrate increased the rate up to a val. at which it remained const. Under comparable conditions, fission of P from Na  $\beta$ -glycerophosphate by the enzyme prep. is approx. 6-fold that from the nucleic acid.

F. O. H.



**Activity of the phosphorylating enzyme in muscle extract.** G. T. CORI, S. P. COLOWICK, and C. F. CORI (J. Biol. Chem., 1939, 127, 771—782; cf. A., 1938, III, 761).—Dialysed extracts of rabbit muscle incubated with glycogen, inorg.  $\text{PO}_4'''$ ,  $\text{MgCl}_2$ , and adenylic acid convert 93—97% of the glycogen into hexose monophosphate in 10—30 min. In electro-dialysed extracts in the absence of inorg. P, no glycogen disappears. With 1% glycogen and  $\text{M}/18\text{-PO}_4'''$ , the time to esterify the P is inversely proportional to the enzyme concn., the rate of enzyme activity decreasing with time at all concns. The optimum  $p_H$  is 7.0—8.0 and the temp. coeff. less than 0.5 for the range 20—37°.  $\text{Mg}^{++}$ ,  $\text{Mn}^{++}$ , and  $\text{Co}^{++}$  increase the activity by accelerating the conversion of glucose-1- (strongly inhibitory) into -6-phosphoric acid (weakly inhibitory). E. M. W.

**Alkaline phosphatase.** F. CEDRANGOLO and F. DEL REGNO (Boll. Soc. ital. Biol. sperim., 1939, 14, 22—23).—The alkaline phosphatase of brain (A., 1938, III, 997) is not a true protein, does not migrate at  $p_H$  8.8—9 in an electric field, and is adsorbed at  $p_H$  7 by kaolin and, to a greater extent, by  $\text{Fe}(\text{OH})_3$  and  $\text{Al}(\text{OH})_3$  (cf. Albers *et al.*, A., 1935, 784; 1938, III, 954). F. O. H.

## (xxv) MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY.

**Kinetic theory of alcoholic fermentation.** G. MEDVEDEV (Protoplasma, 1937, 27, 242—263).—An equation is deduced for the kinetics of alcoholic fermentation, based on the heterogeneity of the system and the difference in concn. of the sugar mols. at the surface of the yeast cells and in the rest of the solution. It conforms with experimental results. M. A. B.

**Mechanism of alcoholic fermentation with living yeast.** K. KRUYK and V. KLINGMÜLLER (Biochem. Z., 1939, 300, 343—353; cf. Willstätter and Rohdewald, A., 1937, III, 355; Goda, A., 1938, III, 1051).—During the first few min. of the fermentation of glucose by bakers' or brewers' yeast (fresh or 1—2 days old, washed or unwashed), the  $\text{CO}_2$  and alcohol produced at 20° in equiv. amounts account for only a part (10% after 1.5 min., 33% after 3 min.) of the glucose which disappears but no glycogen or other substance yielding reducing material on hydrolysis is produced from the glucose lost. Simultaneously the contents of acid-sol. and difficultly hydrolysable  $\text{PO}_4$  decrease and that of easily hydrolysable  $\text{PO}_4$  first increases (max. after 7—10 min.) and then decreases to a val. less than the initial val. The acid-insol.  $\text{PO}_4$  of the cells also undergoes alteration. Hexose diphosphate is produced during the fermentation. W. McC.

**Relation between glutathione and the inhibiting action of iodoacetic acid on alcoholic fermentation.** E. HAAG and P. BOLOMEY (Compt. rend. Soc. Biol., 1939, 130, 217—218).—Inhibition of fermentation by iodoacetic acid is not due to immobilisation of glutathione since there is no relationship between the fermenting power and the

glutathione content of the zymase and reactivation cannot be obtained by the addition of glutathione. H. G. R.

**Relation between the increase in opacity of yeast suspensions during glucose metabolism and assimilation.** T. J. B. STIER, M. I. NEWTON, and H. SPRINCE (Science, 1939, 89, 85—86).—When washed yeast cells are suspended in glucose-phosphate solutions, the opacity of the suspension, as measured photo-electrically, increases with time. No significant increase in cell nos. was found in experiments in which the optical density (log opacity) increased 2- or 3-fold in a few hr. after addition of glucose to aerobic cell suspensions at 25°. The changes in optical characteristics accompany the formation and storage of anabolic materials within the cells. W. F. F.

**Yeast and trehalose. II.** K. MYRBÄCK (Svensk Kem. Tidskr., 1939, 51, 36—37; cf. A., 1937, III, 143).—Addition of yeast extract or glucose to yeast samples incapable of fermenting trehalose did not induce this fermentation. Wide variation of trehalose-fermenting power shown by different yeast samples is not due to variations in cell-wall permeability. M. H. M. A.

**Nitrogen assimilation of yeast. XII. Value of amino-acids as nitrogen sources for yeast.** V. HARTELIUS (Compt. rend. Trav. Lab. Carlsberg, 1939, Sér. physiol., 22, 303—322; cf. A., 1938, III, 532).—The utilisation of various  $\text{NH}_2$ -acids by yeast was determined in media which contained also an excess of  $(\text{NH}_4)_2\text{SO}_4$ . Of the series glycine, alanine, etc., to amino-octoic acid (excluding  $\text{C}_7$ ), the first and last were much less readily utilised than were the intermediate compounds. Branched-chain compounds are less utilised than those with straight chains;  $\beta$ -methyl substitution has a greater effect than  $\gamma$ -substitution.  $\beta$ -Substitution of phenyl in alanine has little effect, whilst that of OH increases utilisation. Dipeptides of glycine and leucine show utilisation intermediate between that of the components. Leucylglycine is better used than glycyl-leucine; possibly preliminary hydrolysis of the latter is necessary. The foregoing  $\text{NH}_2$ -acids are less well utilised than is  $(\text{NH}_4)_2\text{SO}_4$ ; aspartic acid and asparagine are, however, better utilised than the salt. Glutamic acid and urea are utilised in absence, but not in presence, of  $(\text{NH}_4)_2\text{SO}_4$ . I. A. P.

**Fermentation of maltose.** A. S. SCHULTZ and L. ATKIN (J. Amer. Chem. Soc., 1939, 61, 291—294).—Maltase, present in dried baker's yeast, or glucose accelerates fermentation of maltose by yeast. Glucose may be thus determined. The initial rate of fermentation is max. at  $p_H$  4.5. R. S. C.

**Biology of yeasts producing alcoholic fermentation at low temperature.** B. PORCHET (Ann. Ferm., 1938, 4, 578—600).—Two bottom yeasts of the *S. ellipsoideus* type produced spontaneous fermentation in wine musts at -3°. Cold-resistance is a racial, and not an adaptive, character. The effects on alcohol production of temp., sugar concn., and seeding rate are noted. Colonies can be developed from single cells, even at -2°, but this approaches the lower



limit of development. Growth factors are without apparent accelerating effect at such low temp. Enzymes hydrolysing di- and tri-saccharides remain active. Zymase activity is apparently independent of multiplication, at least over a certain time interval, since ordinary yeasts incapable of developing at  $-2^{\circ}$  can still produce alcohol. Storage of unfermented must at  $0-3^{\circ}$  is unsafe; temp. approaching the f.p. of the must is necessary, following sterile filtration. The val. of the low-temp. yeasts for fermentation under cold conditions is noted. I. A. P.

**Production of yeast. IV. Repeated propagation with simple compounds as sources of carbon.** H. FINK and J. KREBS (Biochem. Z., 1939, 300, 175—182; cf. A., 1939, III, 99).—Acetic acid, acetaldehyde, and alcohol serve as sole C sources for the repeated (4—11 times) propagation, by the aëration method, of *Torula utilis*. Decreases in the yield, when they occur, are not great and the properties of the yeast remain unaltered. W. McC.

**Utilisation of pentoses in the biological synthesis of protein. III. Propagation of *Torula utilis* in xylose and xylose-glucose mixtures.** R. LECHNER (Biochem. Z., 1939, 300, 204—207; cf. A., 1939, III, 325).—*Torula utilis* grows in aërated and non-aërated media containing only xylose or xylose + glucose and inorg. salts, the xylose being utilised. The yields of yeast remain fairly const. when propagation is repeated many times. *Torula utilis* also galactose and mannose. W. McC.

**Yeasts of genus *Schizosaccharomyces* indigenous to Iô island.** K. SAKAGUCHI and Y. ÔTANI (J. Agric. Chem. Soc. Japan, 1939, 15, 11—18).—Four new varieties of *S. pombe* have been isolated from fermented molasses. Their ability to hydrolyse urea, liquefy gelatin, and ferment dextrin and inulin has been determined. J. N. A.

**Nutrition and fat production in *Endomyces vernalis*.** M. STEINER (Ber. deut. bot. Ges., 1938, 56, Gen.-versammlungs-Heft, 73—83).—Storage of reserve fat in *E. vernalis* occurs when any factor concerned in protein synthesis (N, S,) is reduced to a min. A. G. P.

**Mechanism of synthesis of fatty acids and fats by the yeast *Endomyces vernalis*.** L. REICHEL and O. SCHMID (Biochem. Z., 1939, 300, 274—283).—Addition of 0.005—0.1% of the bisulphite compounds of higher unsaturated aldehydes to cultures of *E. vernalis* does not inhibit growth and results in the formation of small amounts of fatty acids with longer C chains. Thus hexadienal gives a yellow oil with average equiv. 307, showing that 3 mols. have been condensed. Similarly 2 mols. of octatrienal yield a vaseline-like product. Saturated aldehydes undergo no condensation. Glycerol yields only very small amounts of fatty acid but glycerides are formed from glycerol and pyruvic acid or octatrienal. Carbohydrates also give rise to fat or fatty acid, 21.5% of added glucose and 24.8% of added fructose being converted. The mechanism of fatty acid formation is discussed. J. N. A.

**Formation of coloured zones by wood-destroying fungi in culture.** H. HOPP (Phytopath., 1938,

28, 601—620).—The coloured zones are due to pigment produced by hyaline type of vegetative mycelium. Pigmentation occurs only in presence of air and water but is not an oxidation process.

A. G. P.

***Polyporus abietinus*. I. Enzyme-producing ability. II. Utilisation of cellulose and lignin.** K. H. GARREN (Phytopath., 1938, 28, 839—845, 875—878).—I. The organism produces 15 hydrolytic and 4 oxidising enzymes. Materials stored in wood parenchyma are important in the nutrition of the fungus.

II. *P. abietinus* utilises lignin or cellulose, the latter being a more effective nutrient. N compounds are more important for growth on lignin than on cellulose. The organism produces laccase which is probably concerned in the decomp. of lignin. A. G. P.

**Reactions of the active principle of the smut of *Zea mays*.** P. TORTI (Boll. Chim. farm., 1938, 77, 545).—Colour- and pptn. reactions of decoctions of the fungus are given. F. O. H.

**Physiology of *Dematium pullulans*, de Bary.** R. BAUER (Zentr. Bakt. Par., 1938, II, 98, 133—167).—The form of development of the organism is examined in relation to nutritional conditions ( $p_{\text{H}}$ , salt concn., energy sources, aëration, presence of bios). *D. pullulans* exhibits considerable specificity in regard to C and N sources. A. G. P.

**Measurement of growth of moulds: influence of gas pressure.** F. KUHN (Zentr. Bakt. Par., 1938, II, 98, 430—444).—Methods of determining the  $O_2$  requirement of moulds are described. Growth and spore formation are progressively retarded by reduction of pressure (ceasing at 4 mm. Hg) and by increased  $[CO_2]$ . A. G. P.

**Nutrition of fungi. I. Thiamin, its constituents, and the source of nitrogen.** L. H. LEONIAN and V. G. LILLY (Phytopath., 1938, 28, 531—548).—Effects on growth of fungi of various sources of N in presence and absence of thiamin or its intermediates are recorded. In some cases mixtures of  $NH_2$ -acids with thiamin facilitate growth. The thiazole intermediate alone did not induce growth in any species examined; the pyrimidine intermediate alone was effective in many cases. Several species responded only to thiamin. Activity of the pyrimidine intermediate is associated with  $NH_2$  in position 6 and that of the thiazole constituent with H in position 2 and  $\beta$ -hydroxyethyl in position 5. Autoclaving thiamin destroyed its ability to induce growth in a few species; of these, some responded to an autoclaved mixture of the two intermediates.

A. G. P.

**Dependence of respiration of *Aspergillus niger* on temperature.** N. NIELSEN and D. DRESDEN (Compt. rend. Trav. Lab. Carlsberg, 1939, Sér. physiol., 22, 287—300).—Respiration of *A. niger* on a liquid medium is dependent on the stage of evolution of the mycelium, older and slowly growing having a very much weaker respiration than young, actively growing mycelia. At  $22^{\circ}$  or  $32^{\circ}$  the respiration of a 24 hr. old mycelium is approx. 10 times that of one 4 to 6 days old. Respiration also varies with mycelia



of the same age, but in general is inversely proportional to the amount of dry material in the mycelium. The temp. coeff. of respiration is independent of age and of the increasing wt. of the mycelium, but decreases with rise in temp. This decrease is probably connected with the respiration process and not with any limiting of sugar uptake. J. N. A.

**Mechanism of citric fermentation.** I. R. CRUSA and L. BRÜLL (Annali Chim. Appl., 1939, 29, 3—11).—In sucrose-containing media at  $p_H$  3.5, the yields of citric acid produced by a strain of *Aspergillus niger* on addition of malic, glycollic, and malic + glycollic acids were 332, 132, and 928% of the sucrose utilised. Hence the last stage of the formation of citric acid during the fermentation appears to be condensation of 1 mol. each of malic and glycollic acids to give 1 mol. of citric acid. F. O. H.

**Mechanism of the formation of organic acids by mould fungi.** III. Effect of iodoacetate and of fluoride on the formation of acids. E. M. JOHNSON, E. C. KNIGHT, and T. K. WALKER (Biochem. J., 1939, 33, 357—365; cf. A., 1937, III, 315).—0.0025M-Na iodoacetate in a culture of *Aspergillus niger* in 10% sucrose causes a decrease in total acid formation, quantity of sugar used, and the yield of citric acid on the basis of sugar used and an increase in the gluconic acid on the basis of sugar used. With 0.001M- or 0.002M-Na iodoacetate, a decrease in total and gluconic acid and an increase in citric acid occur. Na iodoacetate does not prevent formation of malic and citric acids by *Penicillium citroenum* and *P. Johannioli* from Na acetate or of l-malic acid by *A. niger* from succinic acid. 0.0025—0.007M-NaF decreases consumption of sugar and formation of total acid and citric acid by *A. niger*, whilst 0.01M-NaF inhibits completely germination of spores and formation of citric acid. H. G. R.

**Biochemistry of some Fusaria.** L. B. LOCKWOOD, J. J. STUBBS, and C. E. SENSEMAN (Zentr. Bakt. Par., 1938, II, 98, 167—171).—In cultures of 29 strains of *Fusarium* examined succinic acid was formed in nearly all cases. Alcohol and acetic acid were produced by some of the strains. A. G. P.

**Pathogenic fungi.** II. Lipins of *Monilia albicans*. R. L. PECK and C. R. HAUSER (J. Amer. Chem. Soc., 1939, 61, 281—284).—The lipins of this fungus are qualitatively similar to those of *Blastomyces dermatiditis* (A., 1939, III, 102), but the yields, particularly of phosphatide, are much lower. R. S. C.

**Potential differences in Amæbae.** F. BUCHTHAL and T. PÉTERFI (Protoplasma, 1937, 27, 473—483).—Between an *Amæba* and its surrounding medium there exists a p.d., which disappears on treatment with KCN, but is not affected by removal of the nucleus. Injection of a hypotonic solution into the cell renders it negative to the medium, injection of a hypertonic solution renders it positive. M. A. B.

**Endamæba histolytica; experimental infection of the stomachs of dogs and cats.** Y. JORANSON and J. SIMONS (Arch. Path., 1939, 27, 218—238).—Cultures of *E. histolytica* were inoculated into the pyloric submucosa. Only local lesions

occurred and the *E. histolytica* could be seen in the lesions. The lesions closely resembled human peptic ulcer, and a possible connexion between the two is suggested. (5 photomicrographs.) C. J. C. B.

**Asexual life cycle of the avian malaria parasite, Plasmodium circumflexum.** R. D. MANWELL and F. GOLDSTEIN (Science, 1939, 89, 131—132).—Exoerythrocytic stages in development of the parasite are described. W. F. F.

**Phagocytosis of trypan-blue in rats of different age groups [in relation to immunity].** J. T. CULBERTSON (Arch. Path., 1939, 27, 212—217).—The Kupffer cells of nursing rats ingest particles of trypan-blue less actively than those of older animals. The difference can be correlated with a gradually acquired resistance of rats against a natural blood flagellate (*Trypanosoma lewisi*) of this animal. The resistance may be due to the enhanced phagocytic capacity of the rat as age increases. (3 photomicrographs.) C. J. C. B.

**Antigenic properties of some ciliates belonging to the Glaucoma-Colpidium group as shown in their response to immune serum.** M. ROBERTSON (J. Path. Bact., 1939, 48, 323—338).—Sera were prepared from ciliates by treating them in different ways and injecting them into rabbits. The antigenic substances in the protozoa can be divided into 2 groups possessing different powers of resistance to heat and alcohol. C. J. C. B.

**Reactions in vitro of ciliates belonging to the Glaucoma-Colpidium group to antibodies in the sera of rabbits immunised therewith.** M. ROBERTSON (J. Path. Bact., 1939, 48, 305—322).—The characteristic agglutination formation of a sheath from substance excreted from the alveolar layer beneath the cuticle, death of the organisms, or, in lower serum concns., the discarding of the sheath, are described. *Glaucoma* is extremely sensitive to exposure to normal serum with intact complement of rabbit and guinea-pig, being rapidly lysed and killed in dilutions up to 1/160. In fresh mouse serum the organisms are not lysed but are agglutinated. Heated normal sera have no effect. Immune serum with suitably diluted complement enhances the effect of the serum. Absorption of the immune body by the homologous organisms is demonstrated. C. J. C. B.

**Mode of growth of bacterial colonies.** K. A. BISSET (J. Path. Bact., 1939, 48, 427—435).—The structure of the bacterial colonies examined did not depend on any qualities inherent in the organisms other than their rigidity and their tendency to divide completely or grow in the form of a chain or undivided thread. The other characters of colonial form are impressed on them by the resistance to their growth of extraneous forces, such as the friction of the surface of the medium. The mode of growth of various colonial types is described and the process of division of the component bacteria discussed. In all particulars the behaviour of bacterial species which may be only distantly related appears to be very similar. (11 photomicrographs.) C. J. C. B.

**Trimethylamine formation in relation to the viable bacterial population of spoiling fish**



muscle. J. M. SHEWAN (Nature, 1939, 143, 284; cf. A., 1939, III, 331).—There is no close correlation between the viable count and the trimethylamine content of the flesh of haddocks stowed in ice. The di- and tri-methylamine contents of haddocks thus stowed are useful indices of spoilage. Spoilage may pursue different courses in different species, e.g., in the dogfish the di- and tri-amine contents during stowage in ice never rise to the extent to be expected from the larger amount of trimethylamine oxide present as compared with the haddock. L. S. T.

**Biochemistry of nitrite production. II. Non-association of nitrite production with dehydrogenation.** K. M. PANDALAI (Biochem. Z., 1939, 300, 122—127; cf. A., 1939, III, 328).—In presence of nitrite bacteria,  $\text{NH}_3$  does not donate H to methylene-blue and the extent of dehydrogenation of glucose by *B. coli* and *Azotobacter chroococcum* in presence of methylene-blue is not increased by the bacteria. Dehydrogenases do not activate H of inorg. compounds.  $\text{NO}_2^-$  production by the bacteria is probably a catalytic surface reaction since they contain no special enzyme and do not activate H. W. McC.

**Effect of minerals on growth of root nodule bacteria. I.** K. KONISHI, T. TSUGE, and A. KAWAMURA (J. Agric. Chem. Soc. Japan, 1939, 15, 139—146).—The amounts of P and Mg in soya-bean and lupin bacteria grown in yeast-water-mannitol are higher whilst that of Na is lower than for the other organism (clover bacteria?).  $\text{PO}_4^{3-}$  is usually effective in stimulating growth of the organisms, whilst large amounts of CaO present in culture media are unfavourable for development of either lupin or soya-bean bacteria. There is an antagonism between CaO and  $\text{PO}_4^{3-}$  during growth of clover and soya-bean bacteria. J. N. A.

**Bacterium (*Pseudomonas fibrolysis*, n. sp.) which decomposes cellulose.** Y. OTANI (Bull. Agric. Chem. Soc. Japan, 1939, 15, 1—3).—The morphology and cultural characteristics of the bacterium which decomposes cellulose under aerobic conditions at ordinary temp. are described. *B. fibrolysis* reduces  $\text{NO}_3^-$  to  $\text{NO}_2^-$ , but not to  $\text{NH}_3$ , forms indole in broth and peptone water, but does not liquefy gelatin. The optimum temp. for decomp. of cellulose is 22—28°. Growth occurs from 10° to 37°, but is max. at 22—32°. There is no anaerobic growth. The most suitable sources of N are  $\text{NH}_4\text{NO}_3$  and  $\text{NH}_4\text{Cl}$ , whilst  $\text{KNO}_3$  and asparagine give practically no growth. J. N. A.

**Bacterial metabolism of sulphur. III. Formation of hydrogen sulphide by thermophilic bacteria.** F. M. CLARK and F. W. TANNER (Zentr. Bakt. Par., 1938, II, 98, 298—311).—Commercial peptones varied considerably in their total S and cystine contents and in their ability to serve as S sources for  $\text{H}_2\text{S}$  production by thermo-bacteria. Cystine (1% in culture media) was readily reduced to  $\text{H}_2\text{S}$ , but in amounts comparable with those in peptones yielded  $\text{H}_2\text{S}$  only in a few cultures. The majority of organisms examined produced  $\text{H}_2\text{S}$  from S,  $\text{S}_2\text{O}_3^{2-}$ , and  $\text{SO}_3^{2-}$ , but few formed  $\text{H}_2\text{S}$  from gelatin, methionine,  $\text{SO}_4^{2-}$ , or CNS'. A. G. P.

***Lactobacillus acidophilus* and *Saccharomyces cerevisiae*.** I. Comparative value of media recommended for *L. acidophilus*. II. Simple medium for culturing *L. acidophilus*. III. Growth of *S. cerevisiae* in media recommended for *L. acidophilus*. IV. Effects of phenol on *L. acidophilus* in various liquid media. R. L. MOBLEY (Zentr. Bakt. Par., 1937, II, 96, 329—333, 333—335, 335—337; 1938, II, 98, 311—314).—I. The type of colony produced varies with the nutritive substances present in the medium. Peptone favours the rough type.

II. A peptone-tryptone extract medium is described.

III. A no. of media favouring growth of *L. acidophilus* also produce good yeast growth. The inferiority of others for this purpose is due to inadequate nutrient supply or unfavourable ionic or molar concns.

IV. *L. acidophilus* was killed by phenol (1 in 400) in certain media but was scarcely affected in others.

A. G. P.

**Agglutination of baker's yeast by *Lactococcus agglutinans*.** E. A. PLEWAKO and O. A. BAKUSCHINSKAJA (Zentr. Bakt. Par., 1936, II, 94, 64—77).—In symbiosis with yeast in aerated cultures *L. agglutinans* causes flocculation of the yeast cells. Formic acid produced in the medium by the bacteria causes the formation of a mucilaginous covering on yeast cells and their subsequent agglutination. Mechanically flocculated yeast retained its fermentative activity, but in that flocculated by formic acid metabolism was disturbed and the capacity for fermentation diminished. A. G. P.

**Differentiation of lactic acid bacteria in starter cultures.** W. C. SMIT (Zentr. Bakt. Par., 1936, II, 94, 289—295).—Solid media suitable for this purpose are described. A. G. P.

**Vitamin requirement of (A) lactic acid bacteria, (B) bacteria other than the lactic group in milk.** S. ORLA-JENSEN, N. C. OTTE, and A. SNOG-KJÆR (Zentr. Bakt. Par., 1936, II, 94, 434—447, 447—452).—(A) True lactic bacteria require pantothenic acid and lactoflavin for their development. For this purpose lactoflavin cannot be replaced by glutathione.

(B) Numerous organisms require bios and lactoflavin for growth. In the absence of these factors, e.g., in milk treated with activated C, pigment production in certain species is diminished or entirely prevented. A. G. P.

**Growth substance in peptones.** S. ORLA-JENSEN, N. C. OTTE, and A. SNOG-KJÆR (Zentr. Bakt. Par., 1936, II, 94, 452—459).—Bacteriological peptone contains sufficient lactoflavin for lactic bacteria. Its bios content is inadequate for streptococci but not for lactic organisms. Beneficial effects of increasing the peptone content of media on the growth of lactic organisms is due to the bios content but that on growth of streptococci results from increased buffer capacity. Commercial preps. of proteolytic enzymes contain much lactoflavin together with bios and other activators. The lactoflavin content of peptone depends largely on the enzymes used in its manu-



facture whereas the bios content is influenced by the nature of the protein from which the peptone was obtained.

A. G. P.

**Nitrogen nutrition of lactic acid bacteria.** S. ORLA-JENSEN, N. C. OTTE, and A. SNOG-KJÆR (Zentr. Bakt. Par., 1936, II, 94, 460—477).—Lactic bacteria, although excreting no proteolytic enzymes, utilise colloidal caseinate as effectively as peptone. Species which cannot use caseinate, even if they ferment lactose, do not sour milk. Lactalbumin does not serve as a N source for lactic organisms. Thermobacteria do not require tryptophan, but in addition to cysteine, tyrosine (or phenylalanine), lysine, and histidine, need an adequate supply of arginine, glutamic acid, asparagine, or creatine. Glutathione may become injurious owing to its disturbing influence on redox potential. *Streptobacterium* spp. thrive on  $\text{NH}_4$  salts and cysteine alone although creatine, diketopiperazine, and possibly glutamic acid may be utilised. Streptococci develop with  $\text{NH}_4$  salts as sole source of N but show improved growth on addition of histidine and leucine. Creatine and yeast nucleic acid have favourable effects. Lactic bacilli require, in addition to activators absorbable on C, an additional activator found in milk.

A. G. P.

**Respiration of rod-shaped lactic acid bacteria.** P. A. HANSEN (Zentr. Bakt. Par., 1938, II, 98, 289—297).—Certain types of these organisms contain the yellow enzyme whereas others (*Microbacterium* spp.) possess, in addition, a hæmin compound which inhibits respiration when glucose is used as substrate. The  $Q_{O_2}$  of glucose varies from 1 (*Thermobacterium*) to 124 (*Microbacterium flavum*). The classification of species as aerobic or anaerobic is discussed.

A. G. P.

**Protein metabolism and acid production by lactic acid bacteria in milk. Influence of yeast extract and chalk.** M. BRAZ and L. A. ALLEN (J. Dairy Res., 1939, 10, 20—34).—The growth of streptococci and lactobacilli in milk with several weeks' incubation causes an increase of protein derived from the proteose-peptone and not from the  $\text{NH}_2$ -acid fraction, but in a few cases and with mixed cultures there is considerable protein breakdown. Addition of chalk also caused proteolysis to proteoses and peptones mainly, but to some amino-acids with lactobacilli. The addition of yeast extract increases acid development apparently not accompanied by higher bacterial counts, and decreases the viability of cultures especially of streptococci in the absence of chalk. Growth of the above species in milk is accompanied by synthesis and degradation of protein, the latter process being inhibited by high acidity. The addition of  $\text{NH}_2$ -acids as yeast extract increases the anabolic action. The proteolytic power of lactic acid bacteria is associated with their acid-producing power.

W. L. D.

**Flavins produced during fermentation by acetone-butyl alcohol bacteria. I. Flavin from rice.** I. YAMASAKI (Biochem. Z., 1939, 300, 160—166; cf. A., 1938, III, 850).—The flavin,  $\text{C}_{18}\text{H}_{22}\text{O}_7\text{N}_4$ , m.p. 257° (decomp.), absorption max. at 440, 355 (weak), and approx. 265  $\mu$ , is purified by adsorption on fuller's earth, elution with aq. pyridine-methyl

alcohol, adsorption on  $\text{PbS}$ , and elution with water. The flavin, which occurs in the free state, is not destroyed by conc.  $\text{HNO}_3$  but is reversibly reduced by  $\text{Na}_2\text{S}_2\text{O}_4$ . Normal growth is promoted in rats on a diet deficient in vitamin- $\text{B}_2$  by daily doses of 22—50  $\mu$ g. of the flavin. The fluorescent compound obtained by irradiation of the flavin has absorption max. at 468, 440, 355, and 265  $\mu$ . W. McC.

**Serological analysis of antianthrax sera by means of synthetic azoantigens.** G. IVÁNOVICS and V. BRUCKNER (Magyar Orv. Arch., 1938, 39, 469—479).—*p*-Aminobenzoylglutamic acid, *p*-aminobenzoyl-*dl*-aspartic acid, *p*-aminoglutamic acid and *p*-aminoadipic acid were treated with horse or human serum-protein after diazotisation. The immune serum from rabbits treated with the *d*-glutamic acid azoprotein of horse serum gave a highly sp. pptn. of azoprotein produced from human serum-protein. Various dilutions of these azoproteins were tested with anthrax immune sera containing capsular antibody. The immune sera irreversibly pptd. the *d*-glutamic acid azoprotein. No apparent reaction occurred between the immune sera and the azoproteins containing radicals other than *d*-glutamic acid.

A. W. M.

**Bartonella muris and its cultivation in vitro.** W. LAWKOWICZ (Trans. Roy. Soc. trop. Med., 1939, 32, 601—604).—Prophylactic treatment of normal adult rats with arsenobenzene prevents the development of bartonellosis and anaemia as a result of splenectomy. Young rats 3 weeks old did not develop bartonellosis or anaemia after splenectomy although 100% of adult rats succumbed. Two strains of *B. muris* were isolated in vitro on a modified Noguchi semi-solid medium from the blood of splenectomised adult rats. The antigenic properties of the cultivated strains point to their relationship with rickettsia. Experimental anaemia with bartonellosis was produced in both 3-week old and adult rats after injections of the isolated cultures. (4 photomicrographs.)

C. J. C. B.

**Gas production by *Bacterium coli* and by lactic acid streptococci under different conditions.** M. M. HASSOUNA and L. A. ALLEN (J. Dairy Res., 1939, 10, 7—19).—Using the capillary-tube method with inocula of 0.1 and 0.001 ml. of vigorous strains of *B. coli* and *Str. lactis* in separated milk, gas production by the former was inhibited by the growth of the latter, but larger inocula of *B. coli* caused gas formation. In sterile milk,  $\text{CO}_2$  only was evolved, but in glucose and lactose broths, both  $\text{H}_2$  and  $\text{CO}_2$  were formed, and it appears that the  $\text{H}_2$  formed from the lactose in milk cultures is used up in a secondary reaction. Lactic acid streptococci of the type commonly found in starters, in pure and mixed cultures gave no gas in separated milk with and without yeast extract, but small amounts of  $\text{CO}_2$  could be detected by titration when using H tubes. *Str. diaceti lactici* in milk and *Leuconostoc mesenteroides* in milk-glucose-yeast extract gave large quantities of gas. *Str. paracitrovorus* gave no gas by the tube method but when inoculated into tins of evaporated milk produced sufficient gas to cause bulging.

W. L. D.

**Soft-rot and colon groups of bacteria.** A. R. STANLEY (W. Virginia Agric. Exp. Sta. Bull., 1938,



No. 287, 35 pp.).—Physiological and serological reactions of 120 strains of these organisms are examined. Soft-rot bacteria belong to the colon-typoid-dysentery group. A. G. P.

**Production of acetylmethylcarbinol by *B. coli*.** A. J. KLUYVER and E. L. MOLT (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 118—124).—In a medium containing peptone (1%), glucose (2%),  $K_2HPO_4$  (0.1%), and NaCl (0.5%) buffered with  $NaHCO_3$  (2%), eight typical faecal strains of *B. coli* produced very small amounts of acetylmethylcarbinol. In media usually applied in the Voges-Proskauer test, *B. coli* always produce small but definite amounts of acetylmethylcarbinol. J. N. A.

**Reoxidation of leuco-derivatives of dyes by *B. coli* in presence of nitrates.** A. GRIBENSKI (Bull. Soc. Chim. biol., 1939, 21, 275—281).—*B. coli*, grown anaerobically in the presence of  $KNO_3$ , will reduce the latter to  $KNO_2$  and at the same time reoxidise leuco-methylene-blue and other leuco-compounds, provided that they have an  $r_H$  val. below 15.1. This reoxidation does not take place in the absence of  $NO_3^-$  or when KCN is added, even in concns. insufficient to prevent bacterial growth. P. G. M.

**Histology of cutaneous reaction to *Brucella melitensis* antigen.** I. GERSH and W. C. BLACK (Arch. Path., 1939, 27, 307—312).—When mild the reaction shows infiltration of the dermis with lymphocytes and monocytes; when severe, there is also connective tissue necrosis and infiltration with polymorphonuclear leucocytes. (4 photomicrographs.) C. J. C. B.

**Active diphtheria immunisation in children with alum-precipitated diphtheria toxoid ("Diphtheria Toxoid Asid").** G. PASCHLAU (Klin. Woch., 1939, 18, 7—12, 60—62).—Diphtheria toxoid pptd. with K alum was given in doses of 0.2, 0.5, and 1.0 c.c. to 100 infants and school children. All the children with a previously high antitoxin titre react well; those with originally low vals. are often refractory to single and even repeated injections. The titre rises rapidly in responsive cases, usually surpassing the Schick threshold (0.2 unit per c.c.) in 1 week; it reaches its max. in 3—4 weeks and then falls slowly to the initial val. after 3—6 months. Simultaneous administration of antitoxin inhibits antitoxin formation in those who form antibodies with difficulty. Vaccination reactions are most pronounced in those who will reach a high titre finally. E. M. J.

**Mol. wt. of the diphtheria toxin protein.** H. P. LUNDGREN, A. M. PAPPENHEIMER, jun., and J. W. WILLIAMS (J. Amer. Chem. Soc., 1939, 61, 533—534).—Ultra-centrifuge measurements indicate 72,000 as the approx. mol. wt. of the toxin. The toxin moves under electrophoresis as a single component (a smaller amount of faster-moving impurity is present). R. S. C.

**Magnesium ion and lysis of *Bac. megatherium* by antimegathierium bacteriophage.** P. C. FLU (Proc. K. Akad. Wetensch. Amsterdam, 1938, 41, 1156—1166).—Lysis of *B. megatherium* occurs only in presence of  $Mg^{++}$  (min. 60 g. of  $Mg_2SO_4$  per l. of substrate). Production of bacteriophage by *B. mega-*

*therium* strain 899 (de Jong) does not require Mg. Strain 338, artificially rendered lysogenic, does not produce phage on Mg-free solid media but does so in liquid media from which Mg has been removed by means of Na oxalate. A. G. P.

**Biochemical characters of *Microsporium canis* (Bodin, 1897), Grigoraki and Guiart, emend. 1928.** L. GRIGORAKI and R. DAVID (Compt. rend. Soc. Biol., 1939, 130, 203—205).—An active casease and trypsin were present, indole was absent, and the colour reactions with various sugars (litmus method) were characteristic. H. G. R.

**Production of a serum rich in anti-mallein sensitisers.** J. DESCAZEAUX, G. GUILLOT, and R. COURTADE (Compt. rend. Soc. Biol., 1939, 130, 24—26).—Serum rich in anti-mallein sensitisers is obtained by subcutaneous injection into a horse of an emulsion of the killed organisms in an oily excipient. H. G. R.

**Quantitative studies of antibody purification.** M. HEIDELBERGER, P. GRABAR, and H. P. TREFFERS (J. Exp. Med., 1938, 68, 913—922).—Dissociation of sp. ppts. from antipneumococcus sera with conc. salt solutions causes no significant change in the antibody reaction with homologous polysaccharide. Formaldehyde causes a reversible inactivation of purified pneumococcus anticarbohydrate. A. C. F.

**Mechanism of chemotherapeutic action of sulphur derivatives in experimental pneumococcal infections.** C. LEVADITI, A. VAISMAN, and D. KRASSNOFF (Ann. Inst. Pasteur, 1939, 62, 36—80; cf. A., 1938, III, 224).—The chemotherapeutic action of benzenesulphonic acid derivatives in experimental pneumococcal infections of mice is due to the prevention of capsule formation by the organism, and consequent phagocytosis by the leucocytes. G. P. G.

**Specificity of pneumococcus types by "Quellung" and agglutination reactions.** A. NOBLE and B. C. CAMERON (J. Lab. clin. Med., 1939, 24, 559—566).—The 30 types of *Diplococcus pneumoniae* were found to be sp. by the "Quellung" and agglutination reactions and cross tests. C. J. C. B.

**Relationship of infecting dosage, leucocytic response, bacteræmia, and extent of pulmonary involvement to outcome of experimental lobar pneumonia in the dog.** O. H. ROBERTSON and J. P. FOX (J. Exp. Med., 1939, 69, 229—246).—In experimental type I pneumococcal lobar pneumonia in dogs the mortality rate increases with the vol. of starch inoculum used, due to involvement of more lung surface, with absence of leucocytosis after 24 hr., or with the presence of pneumococci in the blood stream. A. C. F.

**Toxin of *B. perfringens*. I. Effect in laboratory animals. II. Lecithin.** G. BENZONI (Boll. Soc. ital. Biol. sperim., 1938, 13, 1190—1192, 1192—1193).—I. Comparative data for the toxicity and hæmolytic activity of various preps. of the toxin are given and discussed.

II. Administration of lecithin emulsion with the toxin diminishes general toxicity and local reaction on injection and increases the immunising action. F. O. H.



Studies on *Bacillus pertussis*. I. Experimental whooping cough. II. Toxic substance of *B. pertussis*. III. Comparative study of *B. pertussis*, animal type *B. pertussis*, and *B. bronchisepticus*. I. WATANABE (Jap. J. exp. Med., 1938, 16, 523—527, 527—529, 529—539).—I. The Bordet bacillus was inoculated intratracheally into dogs, rabbits, and guinea-pigs and intrapulmonarily into dogs, and a true variant, viz., the animal type *B. pertussis*, was found later in the trachea of the animals. This variant is motile and gives an intracutaneous reaction in infected animals. In a human case infected with the animal type bacillus, the variant bred true and did not revert to the Bordet type.

II. Toxic substances were isolated in the form of a white amorphous and non-hygroscopic powder, from aq. extracts of Bordet and animal types of bacilli. The substance passes through a Seitz filter and is non-dialysable. It is toxic to puppies, rabbits, and mice with the production of distinctive symptoms after an incubation period. The powder shows the pptn. reaction and complement fixation against the serum of a rabbit immunised with the corresponding bacillus. There is a group reaction between Bordet and animal types. The substance is also immunogenic on injection into rabbits.

III. *B. pertussis*, the animal type *B. pertussis*, and *B. bronchisepticus* resemble one another in morphology, cultural behaviour, immunological and biological characteristics, also in toxicity and intracutaneous reaction of the substance obtained from the bacterial aq. extracts. The extracts all show group reactions but by precipitin absorption methods sp. antigens can be demonstrated. Similarly group agglutination occurs but sp. agglutinins can be separated by absorption technique. C. J. C. B.

Failure of whooping cough sera to neutralise *pertussis* toxin. D. G. EVANS and H. B. MATTLAND (J. Path. Bact., 1939, 48, 465—467).—23 sera from cases of whooping cough failed to neutralise *pertussis* toxin which was in the form of an extract of frozen and thawed and ground bacilli freshly prepared, as shown by skin tests in rabbits. C. J. C. B.

Agglutination as a diagnostic test for whooping cough. D. H. EVANS and H. B. MATTLAND (J. Path. Bact., 1939, 48, 468—470).—Agglutination tests were more sensitive than complement fixation tests as an indicator of sp. antibody in whooping cough. C. J. C. B.

Increase in toxicity of a strain of *Plectridium tetani* after culturing in acidified brain broth at a moderate temperature. A. R. PRÉVOT (Compt. rend., 1939, 208, 394—396).—A 5-week culture was inoculated into a broth containing calf brain, Na pyruvate,  $\text{KH}_2\text{PO}_4$ , and glucose at  $p_{\text{H}}$  6.4. After sterilising at  $110^\circ$ , the sealed, evacuated tubes were incubated at  $33^\circ$  and then at room temp. during which the  $p_{\text{H}}$  changed to 6.9—7.1. By repeating the process the toxicity increased and after 14 passages through the brain broth, the culture needed no Na pyruvate or  $\text{KH}_2\text{PO}_4$  to develop a toxicity three times as great as the original. J. L. D.

Transmission experiments on relapsing fever with tropical rat-mite, *Liponyssus* sp. T. MORISITA (Jap. J. exp. Med., 1938, 16, 551—558).—When a suspension of infected mites was inoculated intraperitoneally into the healthy mouse, with adult mites infection of the mouse occurred until the 7th day after the mite had sucked infected blood and in the case of the protonymphal mite only until the 5th day. Oral and cutaneous infection of the healthy mouse was possible when the no. of spirochaetes in the mite were adequate. Transmission could not be observed on biting alone. The eggs and larvæ from the infected female mite contain no spirochaetes. C. J. C. B.

Dark-field examination of pus for *Spirochaeta pallida*. L. FRIEDMAN (J. Amer. Med. Assoc., 1939, 112, 134—135). R. L. N.

Rôle of bacteria in the reduction of methylene-blue in milk. B. C. HOBBS (J. Dairy Res., 1939, 10, 35—58).—In good-quality raw milk, *Staph. aureus* and coliform organisms were the commonest organisms present at the time of reduction of methylene-blue added to milk and incubated at  $37^\circ$ . Staphylo-, micro-, and certain strepto-cocci were present in smaller nos. Of the organisms isolated at the time of reduction, examined in raw sterile milk (count below 300 per ml.), the coliform group gave most rapid reduction of methylene-blue, followed in decreasing order by *Str. lactis*, faecal streptococci, *Staph. aureus*, *albus*, *citreus*, *Str. agalactiae*, and aerobic spore-bearers. There was little relation between rate of  $\text{O}_2$  absorption (Barcroft) and rate of dye reduction,  $\text{O}_2$  being absorbed most rapidly after reduction by organisms producing nascent  $\text{H}_2$ . From electrode time-potential drift measurements, organisms which gave a rapid fall in potential reduced the dye at a higher  $\text{O}_2$  tension than others. Raw sterile milk contained two factors, one a bacterial clumping effect which had no influence on the time of reduction, and a bacteriostatic effect which diminished the plate count. The reduction of methylene-blue is not due to the reducing properties of milk coming into operation when dissolved  $\text{O}_2$  has been removed but to the metabolic action on the surface of the organisms. The reducing substances in milk are important only with organisms of low reducing power. The test is a good index of the extent of bacterial metabolism in milk. W. L. D.

Effect of  $p_{\text{H}}$  on the thermoresistance or thermolability of staphylococcus hæmolyisin. J. BEUMER (Compt. rend. Soc. Biol., 1939, 130, 283—286).—The broth-toxin is inactivated by heating at  $60^\circ$  or  $70^\circ$  for 30 min. but exhibits thermoresistance at  $75^\circ$ — $80^\circ$  particularly at  $p_{\text{H}}$  7.4. The gelose-toxin in neutral solution is more thermostable and is sensitive to  $p_{\text{H}}$  to a smaller degree than the broth-toxin. H. G. R.

Effect of sucrose on the behaviour of staphylococcus hæmolyisin to heat. J. BEUMER (Compt. rend. Soc. Biol., 1939, 130, 286—288).—Sucrose increases the resistance of the hæmolyisin to heat at  $60^\circ$ — $65^\circ$  particularly in neutral or alkaline solution but decreases the partial thermoresistance at  $75^\circ$ — $80^\circ$ . H. G. R.



Unity of the hæmolytic, dermonecrotic, and lethal properties of staphylococcal exotoxin and of their corresponding counterparts in staphylococcal antitoxin. B. S. LEVINE (J. Path. Bact., 1939, 48, 291—298).—Titration of alpha staphylococcal antitoxin for anti-hæmolytic, antinecrotic, and antilethal activity gives identical results. Absorption of alpha toxin with rabbit cells removes the lytic, necrotic, and lethal properties proportionally. Evidence is given to suggest that the reaction between alpha toxin and rabbit erythrocytes is an absorption phenomenon. C. J. C. B.

Normal serum content of antistaphylolysin in Poland. S. BRZEZINSKI (Schweiz. Z. allg. Path. Bakt., 1939, 2, 18—30).—1000 normal sera were examined with reference to their antistaphylococcal activities. They rise during childhood, reach the max. at age 15—20, and then fall slowly. They are higher in males and show differences according to race and social groups. E. M. J.

Factors which determine the fate of hæmolytic streptococci (group A) in shed blood and in serum. A. T. FULLER, L. COLEBROOK, and W. R. MAXTED (J. Path. Bact., 1939, 48, 443—464).—The fate of hæmolytic streptococci in normal (defibrinated) human blood *in vitro* is a resultant of: (1) the efficiency of the destructive agencies of the blood (leucocytes, opsonic and pro-tryptic functions of the serum); (2) the nutritive requirements originally present in the blood, and (3) chemical changes occurring in the blood during incubation, especially loss of CO<sub>2</sub> if the blood is agitated in an open tube at 37°. The blood of normal individuals varied greatly in its power to destroy hæmolytic streptococci, nor was the power related to recent streptococcal infection. The blood of mice and rabbits always failed to kill hæmolytic streptococci in spite of phagocytosis. These animals are relatively insusceptible to streptococcal infection. Hæmolytic streptococci are less sensitive to reduction in CO<sub>2</sub> in the blood of rabbits and mice than in human blood, while the nutritive content for streptococci of rabbit and mouse blood is higher than in human blood. When determining the bactericidal efficiency of a sample of blood for streptococci, the mixture should be kept in motion for 24 hr. in a closed tube having an air space not more than 20 times its vol., and the temp. of the blood should not be allowed to rise above 38°. C. J. C. B.

Differences in immunisation and sensitisation in rabbits injected with relatively avirulent or highly virulent cultures of the same strain (H) of hæmolytic streptococcus. D. M. ANGEVINE (J. Exp. Med., 1939, 69, 211—228).—Hæmolytic streptococci the virulence of which has been enhanced by repeated passage through rabbits exhibit greater immunising power but less sensitising action than an avirulent strain. A. C. F.

β-Hæmolytic streptococcus. I. Technique of serological classification (Griffith). R. H. P. SIA. II. Serological types isolated from scarlet-fever patients and their contacts. C. J. WU and R. H. P. SIA (Chinese Med. J., 1939, 55, 146—150,

150—153).—Methods for overcoming in Griffith's method such difficulties as the occurrence of cross-agglutination and the formation of granular suspensions are described. That in scarlet fever there are multiple types of hæmolytic streptococci is confirmed. The same type of organism is generally present when several cases occur together in a family. 83% of contacts harbour the same organism as the patients. The claim of previous workers that serological typing of the hæmolytic streptococcus is a valuable aid in the epidemiological study of scarlet fever is supported. W. J. G.

Relationship between acute rheumatism and streptococcal antifibrinolysin. C. B. PERRY (Arch. Dis. Childh., 1939, 14, 32—39).—Antifibrinolysin was present in 78% of patients with acute rheumatism, which is approx. the proportion of normal patients who develop antifibrinolysin after a streptococcal infection. There was no correlation between the duration of presence of antifibrinolysin and the duration of the rheumatic attack or its severity. Administration of salicylates in streptococcal infections inhibits formation of antifibrinolysin. C. J. C. B.

Selective propagation of *Streptococcus agalactiae* and *Brucella*. (A) A. PÜCHLER. (B) H. GERSCHPACHER. (C) A. MILAKNIS (Milch. Forsch., 1938, 19, 385—388, 389—391, 392—396).—(A) The effect of 52 aliphatic compounds in inhibiting the growth of *S. agalactiae* was investigated. 0.1% of chloral hydrate and 0.2% of trichlorotert.-butyl alcohol inhibited *S. lactis* but allowed *S. agalactiae* to grow. Most of the compounds were toxic to *Brucella*, but *B. coli* was less resistant than *Brucella* to amyl alcohol and trional.

(B) A micrococcus was inhibited by thioacetic and linoleic acids, and *B. subtilis* by K palmitate and pyruvic acid. *Brucella* was inhibited by all compounds. 55 org. compounds were investigated.

(C) Elaidic, aconitic, and itaconic acids were toxic to one micrococcus but not to *S. agalactiae*. A broth containing Na azide 0.02%, LiCl 0.2%, and  $1:3 \times 10^6$  crystal-violet allowed all Gram-negative bacteria and Gram-positive bacilli and filaments, derived from dung, to grow. W. L. D.

Rôle of tissue temperature in localising syphilitic lesions. A. BESSEMANS (Compt. rend. Soc. Biol., 1939, 130, 107—109).—Determinations were made of tissue temp. in the various organs, particularly the eye, of the rabbit. The internal parts of the eye have a high temp. and consequently destroy the germs, while the outer parts, especially the cornea, have a lower temp. favouring the growth of the germs with consequent localisation of the lesions to such areas. P. C. W.

Gold sol reaction [for syphilis]. J. RICHTER (Z. Hyg., 1937, 120, 219—225).—A slight increase in the concn. of the NaCl solution reduces the time interval necessary before readings can be taken to 1 hr. M. A. B.

Production of tetanus toxin. A. R. PRÉVOT (Ann. Inst. Pasteur, 1939, 62, 126—127).—Good production of tetanus toxin was obtained in a peptic meat digest medium by adding PO<sub>4</sub>''' buffer, glucose,



and Na pyruvate. Glucose and pyruvate, besides acting as sources of C, act as a redox system, keeping the  $r_H$  below 3.1. Poor production of toxin may be due to a dissociation of the strain with the formation of variants producing little or no toxin. G. P. G.

**Cellular reactions to tuberculo-proteins compared with the reactions to tuberculo-lipins.** F. R. SABINE (J. Exp. Med., 1938, 68, 837—852).—In the normal animal, tuberculo-protein (a) in solution, induces monocyte formation; (b) if freshly pptd., epithelioid cells; (c) insol. forms, complex tubercular tissue. In tuberculous animals the reaction is enhanced and epithelioid cells are formed in all cases. A. C. F.

**Cellular reactions to defatted tubercle bacilli and their products.** F. R. SABIN and A. L. JOYNER (J. Exp. Med., 1938, 68, 853—868).—Tubercle bacilli partially defatted with alcohol-ether and  $\text{CHCl}_3$  give reactions similar to whole bacilli. The lipid removed contains an acid-fast hydroxy-acid, which causes giant cell formation and eosinophil infiltration, and a non-acid-fast polysaccharide, which induces a neutrophil response. A. C. F.

**Sensitisation, antibody formation, and lesions produced by tubercle bacilli in the albino rat.** E. HEHRE and J. FREUND (Arch. Path., 1939, 27, 289—306).—Rats infected with highly virulent bovine tubercle bacilli failed to show cutaneous sensitivity to tuberculin but died of tuberculin shock. Rats given repeated injections of heat-killed tubercle bacilli do not show cutaneous sensitisation, but such rats subsequently infected are more susceptible to the systemic action of tuberculin than non-immunised controls. Complement-fixing antibodies were not found in infected rats unless they were given repeated injections of tuberculin, although they were present in rats injected with killed tubercle bacilli. Tuberculosis in rats immunised with killed bacilli before infection show similar lesions to controls but greater destruction of tubercle bacilli. (3 photomicrographs.) C. J. C. B.

**Antigenic value of various chemical fractions of the tubercle bacillus towards blood serum and the pleural fluid in tuberculosis.** N. D. KHOI (Compt. rend. Soc. Biol., 1939, 130, 215—217).—The lipid antibodies predominate in the serum and pleural fluid, but in some cases antibodies reacting with the polysaccharide-protein complex are also found. Incompletely purified lipid antigens gave the best identification of the lipid antibody. H. G. R.

**[Effect of body temperature on] reactivity of animals during infection and on anaphylaxis.** N. N. SIROTININ (Trans. Conf. Med. Biol., 1937, 130—142, 279—280).—Inoculation of tortoises with *B. tuberculosis*, Freedmani, did not cause tuberculosis when the animals were maintained at 5—10°, whilst at 18—20° the disease developed in every case. Similarly, injection of horse serum did not affect the heart rhythm of tortoises kept at 10°, but retarded it at 25—30°. Anaphylactic shock following re-injection developed in animals kept at 20—30°, but not at 10°. Anaphylactic shock could not be induced in hibernating dormice. R. T.

**Prevention of tuberculosis by subcutaneous vaccination with BCG.** K. SAKAI (Jap. J. exp. Med., 1938, 16, 541—549).—73 tuberculin-negative nurses were vaccinated subcutaneously with 0.001—0.002 mg. of BCG and 49 revaccinated with 0.01—0.02 mg. BCG caused infiltrations at the site of injection in 56% and cold abscesses in 23%. 47 tuberculin-positive nurses were vaccinated and cold abscesses developed in 70%. The abscesses cleared up spontaneously with scarring in 6—12 months. There was a lowered morbidity and mortality of tuberculosis in the vaccinated groups. C. J. C. B.

**Recent developments in bacteriology and immuno-biology of tuberculosis.** P. KALLÓS (Schweiz. Z. allg. Path. Bakt., 1939, 2, 47—64).—A review. E. M. J.

**Synthesis of flavins by tubercle bacilli.** F. ROHNER and F. ROULET (Biochem. Z., 1939, 300, 148—152).—The bacilli, grown in a medium of glycerol, asparagine, and inorg. salts, sometimes produce flavin, which is separated with a loss of approx. 40—50%, after removal of material sol. in alcohol and ether, by aq. extraction and chromatographic adsorption; it is determined by conversion into lumiflavin, which is extracted with  $\text{CHCl}_3$  and examined photometrically. The amounts of flavin (calc. as lacto-flavin) obtained from 100 g. of dry bovine and human bacilli are 1.64 and 1.25 mg., respectively. Flavin is responsible for only approx. 33% of the colour of the aq. extract. W. McC.

**Separation of a protein antibody from the lipid- and polysaccharide-antibody in horse serum prepared from a smooth strain of bovine *B. tuberculosis*.** W. SCHAEFER and G. SANDOR (Compt. rend. Soc. Biol., 1939, 130, 155—159).—The method of sp. inhibition allows the separation of independent anti-protein, -lipid, and -polysaccharide antibodies from the antiserum obtained with bovine *B. tuberculosis*. H. G. R.

**Experimental studies on the O-inagglutinability and vi-antigen of *B. typhosus*.** S. KIGUCHI (Jap. J. exp. Med., 1938, 16, 491—506, 507—522).—All cultures freshly isolated from cases of typhoid fever contain vi-, O-, and H-antigens, the amount of vi-antigen being in proportion to the amount of O-hypoagglutinability. The vi-antigen decreases on subculture more rapidly with some strains than others, and more rapidly on ordinary broth agar than on ascitic fluid agar. The toxicity of *B. typhosus* is unrelated to the vi-antigen content in the cells. The min. lethal dose for mice of V-type bacilli is less than that of W-type organisms, and the former has a greater protective power in mice after immunisation. C. J. C. B.

**Evaluation of H and O antigens in agglutination tests for typhoid fever.** L. R. HAC, C. S. FLYNN, and C. A. PERRY (J. Lab. clin. Med., 1939, 24, 567—573).—An O-agglutination titre of 1/160 with an antigen of satisfactory sensitivity may be considered as positive for typhoid; a titre of 1/80 is suggestive. This conclusion is based on a series of 313 positive tests. C. J. C. B.



**Localised cutaneous immunity based on the Schwartzman reaction.** N. STOLYHWO (Compt. rend. Soc. Biol., 1938, 129, 827—828).—Intra-cutaneous injection of typhoid culture in the rabbit affords protection over the whole skin area against the necro-hæmorrhagic lesions produced by the Schwartzman reaction; a compress saturated with the culture applied to the skin confers an immunity which is strictly limited to the area covered. P. C. W.

**Anaërobic culture of *Vibrio cholerae*. Variations in  $p_H$  and the toxic power.** D. N. BANERJEE (Compt. rend. Soc. Biol., 1939, 130, 32—34).—Satisfactory growth may be obtained anaërobically using Ramon's medium with added glucose, only slight changes in the  $p_H$  of the medium occurring. H. G. R.

**Characteristics of the hæmolysins of cholera vibrios.** P. N. BERNARD, J. GUILLERM, and J. GALLUT (Compt. rend. Soc. Biol., 1939, 130, 228—230).—A complex may be extracted from cholera vibrios in which the hæmolytic portion can be destroyed by heating, leaving a substance which will neutralise hæmolysin and can convert hæmoglobin into methæmoglobin. H. G. R.

**Extraction of the hæmolysin from the El Tor vibrio.** P. N. BERNARD, J. GUILLERM, and J. GALLUT (Compt. rend. Soc. Biol., 1939, 130, 23—24).—The hæmolysin can be extracted from saline in which the living organisms have been suspended for 24 hr. or from a 24-hr. broth culture, whilst the common cholera vibrio must be suspended in saline for 5 days to allow the hæmolytic power to develop. H. G. R.

**Epidemiology of yellow fever.** G. M. FINDLAY and F. O. MACCALLUM (Nature, 1939, 143, 289).—Monkeys (*Macaca mulatta* and *Cercopithecus æthiops*) were infected with yellow fever introduced by stomach tube. Attempts to infect man and other mammals by the same route have failed. W. F. F.

**Buffer-indicator analysis of human viruses and neoplasms.** H. W. Y. TAYLOR and H. M. FRANKE (Z. Zellforsch., 1938, 28, 635—647).—In molluscum contagiosum three elements were distinguished: the pathogenic agent, the primary tissue reaction, and necrosis. In a series of epithelial neoplasms one or more pathogenic elements were observed. R. J. O'C.

**Ætiology of infective hepatitis (epidemic catarrhal jaundice).** G. M. FINDLEY, F. O. MACCALLUM, and F. MURGATROYD (Trans. Roy. Soc. Trop. Med., 1939, 32, 575—586).—One strain of attenuated tissue-culture yellow fever virus caused cases of hepatitis in a certain no. of persons inoculated with it over a period of years. A new strain had no such effects. The hepatitis is due to a further contaminating virus in apparently normal serum used in the prep. of the first strain. C. J. C. B.

**Infectious myxomatosis of rabbits.** T. M. RIVERS, S. M. WARD, and J. E. SMADEL (J. Exp. Med., 1939, 69, 31—48).—The serum of rabbits, inoculated with partly purified myxomatous antigen, contains

homologous precipitins, and agglutinates the elementary bodies of myxoma. It has no protective properties against myxoma virus infection. A. C. F.

**Lesions produced experimentally by cowpox virus.** A. W. DOWNIE (J. Path. Bact., 1939, 48, 361—379).—Egg membranes infected with cowpox virus showed extensive proliferation of ectodermal and mesodermal cells, hæmorrhage and œdema in the mesoderm, and the presence of large compact acidophil cytoplasmic inclusions in the cells of ectoderm, mesoderm, and occasionally endoderm. Infected guinea-pig pads and rabbit skin, and secondary lesions in skin, mucous membranes, and testes of rabbits showed similar appearances. In vaccinal lesions cellular necrosis was more marked and occurred earlier, while hæmorrhage was not a conspicuous feature. The inclusions appeared as irregular acidophil granular masses in the cytoplasm of infected cells; they were much less frequent in fibroblasts or other cells of mesodermal origin. (13 photomicrographs.) C. J. C. B.

**Inclusion bodies of vaccinia and their relationship to the elementary bodies studied in cultures of rabbit's cornea.** J. O. W. BLAND and C. F. ROBINOW (J. Path. Bact., 1939, 48, 381—403).—In epithelial cells of the rabbit's cornea grown *in vitro* vaccinia virus undergoes a progressive and obligatory process of development. This starts with the penetration of elementary bodies into the cytoplasm where, either by growth or by the deposit on them of some coating material, they become enlarged and altered so that they stain more purple with Giemsa's stain and become Feulgen-positive. These enlarged bodies constitute the first of a series of 5 types which can be recognised as development proceeds. Only at the end of these stages can elementary bodies be found in the cells. (28 photomicrographs.) C. J. C. B.

**Inactivation of herpes virus by immune sera. Experiments using the chorio-allantoic membrane technique.** F. M. BURNET and D. LUSH (J. Path. Bact., 1939, 48, 275—286).—The virus of herpes febrilis can be adapted to growth on the chorio-allantois of the developing hen's egg and can be titrated by the pock-counting technique, the coeff. of variation with the strain *H.F.* being 30%. Under the conditions used, highly diluted virus maintains a const. titre for at least 24 hr. After inoculation of virus on to an egg 2—4 hr. must elapse before an excess of immune serum fails to prevent the initiation of a sp. focus. The inactivation of the virus by immune rabbit and human sera showed that when sufficient time is allowed an equilibrium level is reached at which concn. of immune serum  $\times$  % of survivors is const.; the time necessary to reach this level is inversely related to the concn. of the immune serum. For some time after the equilibrium level is reached, dilution experiments show that the union is freely reversible; with strong virus-serum mixtures a subsequent development of partial irreversibility may occur. The inactivation of the virus by natural human immune serum progresses more slowly than with rabbit immune sera of the same final titre. C. J. C. B.



**Antibody content of human sera in herpes simplex.** F. M. BURNET and D. LUSH (*Lancet*, 1939, 236, 629—631).—Herpes antibody in human sera was titrated on the chorio-allantoic membrane. Sera contain either large amounts of antibody or none at all. There is no relation between susceptibility to clinical poliomyelitis and absence of antibody. No herpes virus was found post mortem in the Gasserian ganglion of subjects with high titre herpes antibody. Aphthous stomatitis in infancy is the common manifestation of primary herpes virus infection.

C. A. K.

**Neurotropic strain of human influenza virus.** C. H. STUART-HARRIS (*Lancet*, 1939, 236, 497—499).—A variant of the W.S. strain of human influenza virus was found to be neurotropic for mice.

C. A. K.

**Micrurgical studies on virus-infected plants.** F. M. L. SHEFFIELD (*Proc. Roy. Soc.*, 1939, B, 126, 529—538).—Micromanipulative methods were used to examine the cells of virus-infected plants. The  $p_H$  of the cell contents was the same in diseased and in healthy plants. Non cryst. intracellular inclusions of aucuba mosaic disease of tomato disintegrate immediately on slight mechanical pressure or on pricking, and are almost unaffected by acids from  $p_H$  7 to 2.2. They break down if the osmotic pressure is below 0.07M. but can be isolated in solutions of 0.1M. These inclusions contain virus, but virus may also be dispersed through the cell. It is impossible to isolate the striate material of tobacco and enation mosaics since, when touched with a micro-needle, it breaks down at once into needle-like fibres.

F. B. P.

**Sulphur and phosphorus contents of tobacco mosaic virus.** A. F. ROSS and W. M. STANLEY (*J. Amer. Chem. Soc.*, 1939, 61, 535—536).—The pure virus contains 0.60% of P, all in the nucleic acid, and 0.24% of S, 0—0.4% as  $SO_4$ , (?) 0.04% as methionine, and 0.14% as cystine + cysteine. Removal of P and S occurs at  $p_H$  above 9.3. Removal of the nucleic acid by 5% NaOH removes also the  $SO_4$  and methionine, but not the cystine-cysteine.

R. S. C.

**Fermentative activity of tobacco-mosaic virus.** V. L. RISCHKOV and K. S. SOUCHOV (*Compt. rend. Acad. Sci. U.R.S.S.*, 1938, 21, 265—268).—The virus shows no oxidase, peroxidase, reductase, catalase, amylase, protease (at various  $p_H$ ), chlorophyllase, asparaginase, urease, or phosphatase activity, nor does it affect the activity of peroxidase. Its effect on the plant is therefore not due to direct action on the plant enzymes.

A. L.

**Particle size of tobacco mosaic virus.** C. H. HILLS and C. G. VINSON (*Missouri Agric. Exp. Sta. Res. Bull.*, 1938, No. 286, 18 pp.).—The radius of particles at  $p_H$  5.0 is  $4.09 \pm 0.31$  m $\mu$ . and in presence of trypsin 17.40 m $\mu$ . The rate of diffusion of trypsin decreases in presence of the virus. Trypsin is probably absorbed by the virus. The isoelectric point of highly purified virus protein is  $3.6 \pm 0.1$ .

A. G. P.

**Estimate of the maximum value for the mol. wt. of the tobacco mosaic virus protein.** V. L. FRAMPTON and A. M. SAUM (*Science*, 1939, 89, 84—85).—A virus prep. obtained by Duggar's method gave

a diffusion const. of  $4.5 \times 10^{-9}$ . Dispersion of the prep. in urea + phosphate buffer at  $p_H$  7 increased this val. to  $4.6 \times 10^{-7}$ . Sols of the virus protein in phosphate buffer show anomalous  $\eta$ . The max. val. for the mol. wt. of the virus protein is  $\sim 10^5$ .

L. S. T.

**Separation of plant viruses by chemical means.** W. B. ALLINGTON (*Phytopath.*, 1938, 28, 902—918).—A detailed account of work already noted (A., 1938, III, 538).

A. G. P.

**Effect of sodium citrate on release of curly-top virus from the alcohol precipitate of plant juice.** J. M. FIFE (*Phytopath.*, 1938, 28, 561—574).—The virus may be so intimately associated with proteins etc. pptd. by alcohol that water fails to extract an infective dosage. Addition of Na citrate (optimum 0.006M.) facilitates removal of virus from the mixed ppt.

A. G. P.

**Action of neutral salts on bacterial cell membranes.** W. DIERCHEN (*Zentr. Bakt. Par.*, 1938, II, 98, 110—132).—Salts of the alkali and alkaline-earth metals deform the membranes of bacteria, the effect being lessened by the presence of agar. The action of electrolytes on the colloidal condition of the cell plasma is examined in relation to nutritional physiology.

A. G. P.

**Determination of heat-resistance of non-spore-forming bacteria.** E. E. BAKER and L. S. McCLUNG (*Food Res.*, 1939, 4, 21—29).—The customary methods of determining heat-resistance are critically examined. If accurate data are desired, at least 5 and preferably 10 tubes should be heated at each time period, and the experiment repeated to ensure that the max. heat-resistance has been determined. When comparative data are required, e.g., to calculate "food factors," the times of survival of cells in 1% of the tubes should be determined by Esty and Williams' method (*J. Infect. Dis.*, 1924, 31, 516).

**Bactericidal action of natural honey.** M. PRICE (*Z. Hyg.*, 1938, 120, 437—443).—Natural honey, even diluted as much as 1:5 with tap-water, is strongly bactericidal for both Gram-positive and Gram-negative organisms. The bactericidal constituent is destroyed by a short heating at 60—90° but not by neutralising the acidity of the honey or by long exposing to diffused daylight. It is filterable, and appears to be sensitive to acid, since, in all the honeys examined, higher bactericidal action was always associated with lower acidity.

M. A. B.

**Cause of the inhibitory action of saliva on the growth of capsulated bacteria.** A. BERG (*Z. Hyg.*, 1938, 120, 450—460).—The action depends mainly on a thermolabile substance present in the saliva, and not on the saliva bacteria, although these, when present in sufficient nos., can antagonise other bacteria, through the secretion of a thermostable substance which is diffusible through Cellophane.

M. A. B.

**Favourable effect on the growth of bacteria of vitamin- $B_1$  and - $B_2$  together and in varying doses in the culture medium.** A. SARTORY, J. MEYER, and D. SCHMUTZ (*Compt. rend.*, 1938, 207, 1262—1263; cf. A., 1939, III, 427).—Vitamin- $B_1$  and - $B_2$



together in equal doses of 0.005 to 5  $\mu$ g. favour multiplication of bacteria. When 5  $\mu$ g. of  $-B_2$  is present with varying amounts of  $-B_1$ , the optimal effect is observed on the third day.  $-B_1$  is regarded as the main stimulus for growth. J. L. D.

**Action of radon and of Gastein thermal water on micro-organisms.** A. JANKE [with A. BACHER, R. GARZULY-JANKE, and A. VON SZILVINYI] (Zentr. Bakt. Par., 1938, II, 98, 97—109).—Rn in thermal water stimulates the budding of yeast but retards alcoholic fermentation. Its action probably depends on stimulation of oxidative processes. A. G. P.

**Antibacterial action of *p*-nitrobenzoic acid and its esters.** R. L. MAYER and C. OECHSLIN (Compt. rend. Soc. Biol., 1939, 130, 211—214).—*p*-Nitrobenzoic acid and some of its derivatives have a marked chemotherapeutic activity against experimental streptococcal and pneumococcal infections in mice. H. G. R.

**Bactericidal power of certain oils, particularly cod-liver oil.** P. NÉLIS (Compt. rend. Soc. Biol., 1939, 130, 329—332; cf. A., 1938, III, 699).—The bactericidal power of cod-liver oil corresponds with that of 1% phenol solution. H. G. R.

**Synthesis and bactericidal properties of 5-*n*-alkylresorcinols.**—See A., 1939, II, 153.

**Starch media as substitute for agar.** W. ZIMMERMANN (Klin. Woch., 1939, 18, 27).—10—15% of maize or potato starch heated in bouillon gives a medium similar in properties to agar. E. M. J.

**Blood plasma gel as culture medium.** R. BUCHER (Klin. Woch., 1939, 18, 62).—20 parts of a special citrate plasma mixed with 3 parts of a solution containing glucose 50 and  $\text{CaCl}_2$  1.25% ( $p_H$  6.0) give an opalescent gel which can be used for the culture of *B. tuberculosis* (human) and various cocci. E. M. J.

**Activation of the peritoneal mechanism of defence.** H. L. JOHNSON (New England J. Med., 1938, 219, 661—664).—A review. A. M. G.

**Serology of xanthoproteins.** W. MUTSAERS (Ann. Inst. Pasteur, 1939, 62, 81—120).—Immunological reactions (pptn. and complement-fixation) between nitrated horse serum and its antibody are specifically inhibited by nitrotyrosine, dinitrohydroxyphenylpropionic, dinitrohydroxy-*o*-coumaric, 3-nitro-4- and 4-nitro-3-hydroxybenzoic, *o*- and *p*-nitrosalicylic acids, and methyl 3:5-dinitrosalicylate. Slight inhibition was obtained with 3:5-dinitroresol and 5-nitro-3-amino-2-hydroxybenzoic acid and no inhibition with mono-, di-, and tri-nitrophenols, nitroanisic acid, nitrophenylalanine, *o*-, *m*-, and *p*-nitrobenzoic acids, nitroarginine, and dinitroaminophenols. In order to inhibit the reaction, the substance must be an aromatic compound containing OH besides one or more  $\text{NO}_2$  groups in the benzene ring. Carboxyl (free or esterified) is also required for complete inhibition, although slight inhibition was obtained when it was replaced with methyl. G. P. G.

**Precipitinogen in serum prior to onset of acute rheumatism.** A. F. COBURN and R. H. PAULI (J. Exp. Med., 1939, 69, 143—162).—A

precipitin reaction occurs between sera collected in the 2nd and 3rd stages of acute rheumatism, even with repeated attacks. A. C. F.

**Electrophoretic study of immune sera and purified antibody preparations.** A. TISELIUS and E. A. KABAT (J. Exp. Med., 1939, 69, 119—132).—By electrophoresis horse serum antibody migrates between the  $\beta$  and  $\gamma$  components, but rabbit antibody is identical with the  $\gamma$  globulin component and can be isolated in solutions of high purity. From integration of electrophoretic diagrams of unabsorbed and absorbed sera the % of antibody in serum or the  $\gamma$  globulin fraction can be estimated. The isoelectric points of pig, cow, horse, and rabbit serum are 5.1, 4.8, 4.4, and 5.8, respectively. Degradation of horse antibody with the formation of a new, less mobile, component occurs on prolonged immunisation. (Cf. A., 1938, III, 553.) A. C. F.

**Mol. wt. of antibodies.** E. A. KABAT (J. Exp. Med., 1939, 69, 103—118).—Antibodies from the sera of the cow, horse, and pig have a heavy mol. of mol. wt. 990,000, but from man, monkey, and rabbit, the mol. size is that of normal serum-globulin. Horse antibody is not affected by change in  $p_H$  from 3.4 to 9.0. At  $p_H$  1.44 some breakdown of the mol. occurs but at  $p_H$  12.4 it is completely destroyed. A. C. F.

**Distribution of antibody in different tissues.** C. F. WANG and H. WU (Chinese J. Physiol., 1938, 13, 417—428).—The antibody content of the various tissues in rabbits immunised against ovalbumin decreases in the order: lungs, bone-marrow, kidney, spleen, heart, liver; none is found in the brain, stomach, and skeletal muscle. The max. contents are found 5—7 weeks after immunisation, and the antibody can be removed by saline perfusion. These findings are in agreement with the reticulo-endothelial origin of antibody. A. L.

**Isolation of anti-crystalline ovalbumin precipitin from rabbit's serum.** S. C. LIU and H. WU (Chinese J. Physiol., 1938, 13, 437—447).—The immune ppt. is treated with 0.2N-NaOH at 0° for 30 min. and the solution neutralised with N-HCl. The centrifuged solution is then pptd. twice with  $(\text{NH}_4)_2\text{SO}_4$  at half-saturation, and the ppt. dialysed until free from  $\text{NH}_4^+$ . 96% of the product is pptd. by ovalbumin. A. L.

**Mechanism of the recovery of antibody from the immune precipitate.** S. C. LIU and H. WU (Chinese J. Physiol., 1938, 13, 449—460).—Examination of the liberation of antibody from the immune ppt. from antipneumococcus (type I) horse serum by dil. alkali and solutions of salts (e.g., NaCl,  $\text{CaCl}_2$ ) indicates that the liberation is due to a shift in the equilibrium between the immune ppt. and its antibody content.  $\text{PO}_4^{'''}$ , as in the method of Felton (A., 1932, 1290), is not necessary. A. L.

**Comparison of intradermal tests with agglutinability and certain *in vitro* tests of various organisms isolated in chronic infections.** G. H. CHAPMAN and C. BERENS (J. Lab. clin. Med., 1939, 24, 601—604).—The intradermal tests showed agreement with either agglutinability or the *in vitro* tests in more than 70% of *Micrococcus catarrhalis*, staphylo-



cocci,  $\gamma$  type streptococci, and enterococci. There was less than 57% agreement with either test in  $\alpha$  and  $\beta$  type streptococci, *B. coli*, *Aerobacter aerogenes*, and *paracoli*. C. J. C. B.

**Intradermal test as an aid in the diagnosis of enterobiasis.** H. TSUCHIYA and T. C. BAUERLEIN (J. Lab. clin. Med., 1939, 24, 627—631).—Animal experiments with enterobius antigen showed positive skin tests in the presence of homologous infection and negative tests in other helminth infestations. In 24 persons with pruritus ani positive reactions were obtained in 19 and worms were found in the stools; 5 gave positive tests and worms could not be found. The skin test is not always positive in the early stages. Negative tests are of val. in exclusion of the disease. C. J. C. B.

## (xxvi) PLANT PHYSIOLOGY.

**Spiral structure of protoplasm.** W. D. FRANCIS (Science, 1939, 89, 127).—The Fe bacterium, *Leptothrix ochracea*, is composed of longitudinal spirals. Spiral structure has also been observed in fixed preps. of green, filamentous, fresh-water algae, in living cells of stamen hairs of *Rhoeo discolor*, and of the onion, *Allium cepa*. The spiral structure of protoplasm can be regarded as the basis of the cryst. conception of living material. L. S. T.

**Formation of a new [plant]-cell wall at cell division.** J. H. PRIESTLEY and L. I. SCOTT (Proc. Leeds Phil. Soc., 1939, 3, 532—545).—Removal of the pectin matrix by maceration of plant tissue separates cells completely enclosed by a cellulose wall. Wall formation at cytokinesis does not involve production of a partition but that of a cellulose wall completely surrounding the daughter protoplast. Formation of intercellular spaces is discussed. A. G. P.

**Mechanism of protoplasmic streaming.** Effects of high hydrostatic pressure on cyclosis in *Elodea canadensis*. D. A. MARSLAND (J. Cell. Comp. Physiol., 1939, 13, 23—30).—With increasing pressure protoplasmic streaming in the cells diminishes and ceases at 400—500 atm. On release of pressure streaming is resumed provided that it has not been stopped for more than 30 min. V. J. W.

**Influence of carbon dioxide on exosmosis from stalk cells.** H. KAHN (Protoplasma, 1937, 27, 502—522).—Exosmosis of salts from chlorophyll-free stalk cells of *Lupinus albus* seedlings was increased by placing the cells in water containing CO<sub>2</sub>. The rate of exosmosis reached a max. after 3 hr. and then fell again to the control level. M. A. B.

**Rhythmic precipitations in plant tissues.** E. LIEBALDT (Protoplasma, 1937, 27, 264—269).—Liesegang rings are produced by treatment of leaf tissue of certain plants with aq. AgNO<sub>3</sub>. M. A. B.

**Electro-chemical theory of salt absorption and respiration [in wheat roots].** H. LUNDEGÅRDH (Nature, 1939, 143, 203—204).—The surface layer of wheat roots, in distilled water, behaves like a membrane charged with H ions in a concn. of 10<sup>-3</sup>N. ( $p_H$  about 3). The addition of neutral salts, with consequent adsorption, causes increase of  $p_H$ . Oxid-

ation processes in the cell supply the energy required for the uptake of anions. Experimental evidence for this theory is cited. W. F. F.

**Mechanism of frost injury to plants.** D. SIMONOVITCH and G. W. SCARTH (Canad. J. Res., 1938, 16, C, 467—481).—Injury may result from intracellular freezing when ice forms first in the protoplasm or from extracellular freezing when water from the cell forms ice outside the cell, which collapses through dehydration. Rapid freezing favours intracellular and slow cooling favours extracellular freezing.

A. G. P.

**Time of flowering of plants. I. Relation of nocturnal translocation to time of flowering.** J. GRAINGER (Ann. Appl. Biol., 1938, 25, 1—19).—Late flowering ("short-day") chrysanthemums showed evidence of delayed nocturnal translocation when compared with early-flowering varieties. Transportable carbohydrates were not detectable in leaves during short summer nights and appeared only shortly before dawn in long spring nights. Artificial lengthening of summer nights accelerated flowering probably by facilitating translocation. Late-flowering varieties produce starch more readily than early-flowering types. Delayed translocation retards attainment of high C : N ratio associated with flowering.

A. G. P.

**Mineralisation of manganese by the plant cell membrane.** K. SCHÖNLEBER (Protoplasma, 1937, 27, 599—618).—Deposits of MnO<sub>2</sub> observed in various plants grown in 0.1—0.2% MnCl<sub>2</sub> solution are described. M. A. B.

**Nutrition of apple trees.** M. A. BLAKE, G. T. NIGHTINGALE, and O. W. DAVIDSON (New Jersey Agric. Exp. Sta. Bull., 1937, No. 626, 41 pp.).—Effects of deficiency of Ca, Mg, N, P, and K on the growth and leaf appearance of apple trees are examined. K and Mg stored in old roots were readily re-utilised by the trees. The carbohydrate contents of current-year stems decreased in Mg or K deficiency but were high when other elements were deficient. A. G. P.

**Fixation and transfer of nitrogen in the soya bean.** (A) P. W. WILSON and W. W. UMBREIT. (B) G. BOND (Zentr. Bakt. Par., 1937, II, 96, 402—411; 1938, II, 98, 32—36).—(A) During the period of max. fixation of N by nodule organisms 80—90% of the N fixed is transferred to the host plant. In the early stages of fixation a larger proportion of N is retained in the nodule. The theory of transfer of N by excretion (cf. Bond, A., 1936, 1164) is not supported. (B) A reply to criticism. A. G. P.

**Magnesium as a factor in nitrogen fixation by soya beans.** E. R. GRAHAM (Missouri Agric. Exp. Sta. Res. Bull., 1938, No. 288, 30 pp.).—With colloidal clay as a substrate N fixation increased with the % saturation of clay by Mg, when the % saturation with Ca was const. With low Ca levels no fixation occurred in the absence of Mg but was initiated by small additions of Mg. On clays containing const. proportions of Ca but increasing proportions of Mg growth and fixation of N were directly related to the Mg level. Addition of H<sup>+</sup> to the Ca-Mg-clay cultures decreased growth of plants and N fixation, whereas addition of



K: increased growth but diminished fixation, probably by disturbing the carbohydrate-N metabolism. Ability of plants to fix N diminished with successive crops probably through exhaustion of exchangeable bases in the clay. A. G. P.

**Symbiotic nitrogen fixation in leguminous plants.** A. I. VIRTANEN (Svensk Kem. Tidskr., 1939, 51, 19—35; cf. A., 1938, III, 157, 250, 444).—A review. M. H. M. A.

**Excretion of nitrogen by leguminous plants.** T. H. STRONG and H. C. TRUMBLE (Nature, 1939, 143, 286—287).—The increases in the total N content of oats brought about by shading or by association with peas are independently significant statistically. The legume effect is significant when the effect of shading on the oats is eliminated. W. F. F.

**Reduction of nitrous acid by higher plants. Rôle of ascorbic acid. II.** M. LEMOIGNE, P. MONGUILLON, and R. DESVEAUX (Bull. Soc. Chim. biol., 1939, 21, 212—222; cf. A., 1938, I, 204; III, 697).—At room temp., ascorbic acid reduces  $\text{HNO}_2$  to NO which, in the presence of air, is rapidly oxidised to  $\text{NO}_2$ , producing with water  $\text{HNO}_3 + \text{HNO}_2$ . In the absence of air, no  $\text{HNO}_3$  is formed, nor is the NO further reduced to  $\text{NH}_2\text{OH}$  or  $\text{NH}_3$ . P. G. M.

**Radioactive carbon in the study of photosynthesis.** S. RUBEN, W. Z. HASSID, and M. D. KAMEN (J. Amer. Chem. Soc., 1939, 61, 661—663).—Fixation of  $\text{CO}_2$  by barley, in presence and absence of light, has been observed using  $^{14}\text{C}$  as radioactive indicator. The bulk of the radioactive material found in the plant was not  $\text{H}_2\text{O}$ -sol., and was not carbohydrate, carbonate, keto-acids, or pigment. The results indicate that the cell contains substances, directly involved in photosynthesis or in respiration, which react reversibly with  $\text{CO}_2$  in a non-photochemical process. E. S. H.

**Carbohydrates of the cotton plant under different seasonal conditions and fertiliser treatment.** D. R. EGGLE, L. E. HESSLER, and J. E. ADAMS (J. Amer. Soc. Agron., 1938, 30, 951—959).—Effects of fertilisers on seasonal variations in mono-, di-, and poly-saccharide content of plants are examined. Whole plants reflect fertiliser effects less definitely than do separate tops and roots. A. G. P.

**Nature of the carbohydrate stored by a hybrid of two Gramineæ with different carbohydrate reserves.** A. DE CUGNAC and H. BELVAL (Compt. rend., 1939, 208, 377—379).—*Agropyrum caninum* stores tritol, a fructoholoside, whilst *Elymus riparius* stores elymoside, a fructoglucoside (cf. Colin and Belval, A., 1937, III, 445). The hybrid, *Agroelymus Piettei*, stores tritol. J. L. D.

**Synthesis of  $\beta$ -(2-chloroethyl)-D-glucoside by potato tubers treated with ethylene chlorohydrin.** L. P. MILLER (Contr. Boyce Thompson Inst., 1939, 10, 139—141).—Acetylation of the Cl-containing  $\beta$ -glucoside formed by potato tubers from absorbed ethylene chlorohydrin yielded  $\beta$ -(2-chloroethyl)-D-glucoside tetra-acetate. The glucoside formed by the tubers is thus  $\beta$ -(2-chloroethyl)-D-glucoside and O O (A., III.)

is identical with that formed by gladiolus corms treated with ethylene chlorohydrin. AUTHOR.

**Oxidation and reduction enzymes in *Triticum sativum*: use in differentiating varieties.** J. VOSS (Angew. Bot., 1938, 20, 265—293, 333—348).—The tyrosinase activity of grain and husk of individual wheat varieties shows only a small range of variation according to origin and season, and is normally shown by colour reactions at  $3^\circ$  but not at  $20^\circ$ . The rate of melanin formation increases with temp. Variety-sp. tyrosinase activity is shown by the phenol coloration (monophenol-oxidase) and by the tyrosine reaction. Tyrosinase probably produces benzoquinone from phenol, and by a further series of reactions melanin is formed. The presence of polyphenol-oxidases also shows varietal differences in colour produced in aq. extracts by guaiacum. Peroxidase activity is best shown by leucomalachite-green or pyrogallol in presence of  $\text{H}_2\text{O}_2$ , and dehydrogenase activity by reduction of malachite-green or fluorescein. A system, based on these tests, is established for detecting varieties of wheat. A. G. P.

**Distribution of nicotine in the tobacco plant.** T. ANDREADIS and E. TOOLE [with X. BINOPULOS and J. ZIROPULOS] (Z. Unters. Lebensm., 1939, 77, 262—272).—In plants grown early in the season the nicotine content increases from the lower to the upper leaves, whereas in plants grown late the reverse is the case, and in those grown at the normal time max. vals. occur in the middle leaves. In individual leaves the nicotine content increases from the petiole to the tip and from the midrib to the edge, and is high in the parenchyma remote from the lateral veins. The distribution is discussed in relation to the physiology of development of the leaf tissues. E. C. S.

**Hard shell in *Robinia* seeds and its removal.** G. GASSNER (Angew. Bot., 1938, 20, 293—303).—Hard-coated seeds of *R. pseudacacia* are softened and their germination is improved by boiling for 3 min. in 1% aq.  $\text{NaHCO}_3$  with subsequent washing. A. G. P.

**Germination and growth of some rock garden plants.** E. M. SCHROEDER and L. V. BARTON (Contr. Boyce Thompson Inst., 1939, 10, 235—255).—Effects of temp. and exposure to light on germination of a no. of species of seeds are recorded. AUTHORS.

**Carboxylase and cocarboxylase in germinating *Avena*.** F. C. J. ZEIJLEMAKER (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 187—194).—The total amount of cocarboxylase remains unaltered during germination. The "protein" component (atizymase) of the carboxylase at first increases, but decreases rapidly with the evolution of the first leaves. The action of the active carboxylase in the plant also increases at first, but decreases later. The roots and leaves contain approx. equal amounts of active carboxylase. The intramol. respiration is increased by addition of cocarboxylase and also by addition of pyruvic acid, the increase being greater in young than in older plants. J. N. A.

**Vegetative reproduction of squash types.** W. K. BAILEY (Science, 1939, 89, 128—129).—



Vegetative reproduction of squash types, *Cucurbita* spp., is now being used to supplement sexual reproduction methods. The plants thus propagated grow more rapidly and fruit earlier than those produced from seed. The application of growth-promoting substances or other special growth aids is unnecessary.

L. S. T.

**Reduction of carbon dioxide with molecular hydrogen in green algae.** H. GAFFRON (Nature, 1939, 143, 204—205).—A vigorously growing culture of *Scenedesmus* sp. D.3 was suspended in 0.01M-KHCO<sub>3</sub> in the dark in an atm. of H<sub>2</sub> and 2% CO<sub>2</sub>. The cells absorbed H<sub>2</sub>. On exposure to light, no O<sub>2</sub> evolution but further H<sub>2</sub> absorption occurs. A second experiment with H<sub>2</sub> uptake is described.

W. F. F.

**Influence of salt intake on root respiration of *Aster tripolium*.** M. VAN ELJK (Proc. K. Akad. Wetensch. Amsterdam, 1938, 41, 1115—1121).—Increase in CO<sub>2</sub> production by roots due to salt intake is proportional to the amount of salt taken up and to a factor *k*. For *A. tripolium* *k* is small compared with the val. for non-halophytes. The intake of NaCl and Na<sub>2</sub>SO<sub>4</sub> by halophytes is effected with a relatively small energy consumption.

A. G. P.

**Effect of nitrate reduction on respiration of roots.** W. P. POSTMA (Proc. K. Akad. Wetensch. Amsterdam, 1939, 42, 181—186; cf. Lundegårdh, A., 1937, III, 237).—*Avena* plants after 13 days in daylight in Knop's solution containing CaCl<sub>2</sub> in place of Ca(NO<sub>3</sub>)<sub>2</sub> were placed in the dark for 2 days, then the stems and leaves were removed, and the roots were placed in media containing varying amounts of N and glucose. With both N and glucose present there was a rapid reduction of NO<sub>3</sub><sup>-</sup> and uptake of N with synthesis of protein and a very great increase in respiration (evolution of CO<sub>2</sub>). With neither N nor glucose present the roots were very poor, and owing to lack of carbohydrate a dissimilation of protein occurred, whilst respiration was only slightly more than that observed in water. With N and no glucose, or glucose and no N, there was no reduction of NO<sub>3</sub><sup>-</sup> and no protein synthesis. In the second case there was a slightly higher total N in the roots because, sufficient carbohydrate being present, there was no decomp. of protein. Respiration in each case was about twice that in water.

J. N. A.

**Photoperiodism in the plant kingdom.** R. O. WHYTE and M. A. OLSHOVNIKOV (Nature, 1939, 143, 301—302).—A review.

L. S. T.

**Chlorophyll formation and development of photosynthetic activity in young leaves of mango (*Mangifera indica*).** B. N. SINGH and J. D. JHA (Nature, 1939, 143, 161—162).—In young leaves of *M. indica* the assimilation rate of CO<sub>2</sub> increases continuously but is not proportional to chlorophyll content. This behaviour is similar to that observed in seedlings in which the storage organ is different from the first assimilating organ, and the photosynthetic activity lags behind chlorophyll formation.

L. S. T.

**Chloroplastin symplex and the formation of chlorophyll.** W. A. BECK (Protoplasma, 1937, 27, 530—533).—Chlorophyll develops better in compressed air than at the ordinary pressure up to a certain

optimum time of exposure, after which less chlorophyll develops than at ordinary pressure. The pigment fails to develop in compressed CO<sub>2</sub> and develops only poorly in compressed O<sub>2</sub>.

M. A. B.

**Relation between leaf tissue pigment concentration and yield in maize.** E. S. MILLER and I. J. JOHNSON (J. Amer. Soc. Agron., 1938, 30, 941—946).—A relationship is established between the chlorophyll and carotenoid contents of parental inbred lines of maize and in their *F*<sub>1</sub> crosses. The % of chlorophyll in *F*<sub>1</sub> crosses exceeded the average of that in either parent. No significant relation between chlorophyll content and yield was found. The freezing and acetone methods of preserving leaf tissue for spectrophotometric examination gave similar results although freezing caused slightly less decomp. of pigments.

A. G. P.

**Effect of naphthalene and diphenyl on karyokinesis.** P. GAVAUDAN, N. GAVAUDAN, and J. F. DURAND (Compt. rend. Soc. Biol., 1939, 130, 53—56).—Naphthalene vapour produces blocking of the mitoses in the root cells of *Triticum vulgare*. The effect cannot be followed to its conclusion since the vapour and solution are toxic. The roots will, however, survive contact with crystals of diphenyl for longer than 24 hr. The mitotic aberrations produced by this substance are the formation of more than 2 chromosome groups in anaphase and telophase with consequent production of 3—4 nuclei or one large abnormally lobed nucleus. The formation of the membranes is retarded.

P. C. W.

**Induction of polyploidy in chilli (*Capsicum annum*, L.) by colchicine.** B. P. PAL and S. RAMANUJAM (Nature, 1939, 143, 245—246).—Plants grown from seeds immersed in 0.05—0.4% aq. colchicine show abnormalities in growth and have an increased no. of chromosomes (tetraploids).

L. S. T.

**Effect of colchicine and of chloral on roots of *Vicia faba*.** R. GARRIGUES (Compt. rend., 1939, 208, 461—463).—*V. faba* grown in Knop's solution containing 0.005—0.0005% of colchicine shows swellings in the growing root tips and amitoses; chloral does not produce these effects. Colchicine does not affect the nuclear structure in the resting phase of mitosis, but chloral produces many chromocentres and a tendency to form pyknotic nuclei. Colchicine, but not chloral, rapidly increases the nuclear and cell vols. due to repeated doubling of the no. of chromosomes (slow process) as well as an increase in cell and nuclear vols. of resting cells (cf. Mangelot, A., 1939, III, 437). Chloral inhibits mitoses which have commenced and prevents the commencement of mitosis as shown by the rapidly diminishing no. of prophase observed.

J. L. D.

**Leaf-epinasty tests with chemical vapours.** F. E. DENNY (Contr. Boyce Thompson Inst., 1939, 10, 191—195).—Of 77 volatile chemicals tested for ability to induce epinasty of potato leaves, only three, ethyl bromide and iodide and propyl chloride, gave positive responses. The epinasty-inducing volatile product from various organs of plants is ethylene.

AUTHOR.



**Influence of *p*-phenylenediamine on the rooting response of cuttings.** B. HUBERT and J. RAPAPORT (Natuurwetensch. Tijds., 1939, 21, 56—62).—Root formation on cuttings of *Ligustrum ovalifolium*, Hassk., *Euonymus japonica*, Thunb., *Eurya japonica*, Thunb., *Acalypha Wilkesiana*, Müll. Arg., *Osmanthus aquilum*, Sieb. et Zucc., and *Myrrhinum sacropetalum* is stimulated by *p*-phenylenediamine (100—1000 mg. per l.) or  $\beta$ -indolylacetic acid (25—200 mg. per l.). Both substances show an optimum concn. and are very similar in effect, although the similarity may be only superficial. S. C.

**Activation of cinnamic acid by ultra-violet light and the physiological activity of its emanations.** P. W. ZIMMERMAN and A. E. HITCHCOCK (Contr. Boyce Thompson Inst., 1939, 10, 197—200).—Commercial cinnamic acid is less active as a plant growth substance than is naphthyl- or indolyl-acetic acid. Ultra-violet irradiation increased the physiological activity of cinnamic acid by converting the *trans*- into the *cis*-form. When applied to plants as aq. solutions or lanoline preps. the converted form induced curvatures of stems and epinasty of leaves as is characteristic of cryst. growth substances and unsaturated hydrocarbons. Vapours arising from the *cis*-cinnamic acid induced epinasty of leaves and bending of stems similar to that produced by ethylene.

AUTHORS.

**Substance in seedlings which promotes growth and cell-division.** F. K. PAULMANN (Biochem. Z., 1939, 300, 153—159).—Press-juice from seedlings 5—6 days old (e.g., sunflower leaves, maize stalks) is treated with 1 vol. of alcohol, the dried, finely ground ppt. extracted with hot  $\text{PO}_4^{'''}$  buffer at  $p_H$  6.0—6.5, inactive material removed from the extract by pptn. with acetone, the extract treated with C which adsorbs all active material, and this is separated by elution with warm acetone + alcohol, the solvents being subsequently removed by evaporation under reduced pressure. The yield is 0.03 g. per 1000 c.c. of juice (3000-fold concn. of activity). The seeds contain no active material. Mitosis in fibroblast cultures from chick embryo is increased by  $1.6 \times 10^{-8}$  g. of the substance, which does not, however, promote the growth of yeast. The curve showing the relationship between the concn. of the substance and the increase in mitosis has a max. at approx.  $3 \times 10^{-8}$  g. Possibly the substance is accompanied by a substance which, in relatively high concn., inhibits mitosis since the highly purified extract at concn.  $1:2 \times 10^4$  prevents mitosis. The substance is inactivated (oxidised) by  $\text{O}_2$  but activity is restored by reduction with ascorbic acid, quinol, or  $\text{H}_2\text{S}$ . W. MCC.

**Effect of  $\beta$ -indolylacetic acid on the tuber tissues of the carrot.** R. J. GAUTHERET (Compt. rend. Soc. Biol., 1939, 130, 7—9).—Fragments of xylem, phloem, and cambium were grown in culture with various concns. of acid. Concn. of  $10^{-6}\%$  produces no cellular growth or roots but has cambigenic action. Increasing concn. produces cell division, root formation, and finally the formation of giant cells that cannot divide. Concn. higher than  $10^{-5}\%$  leads to differentiation and is unsuitable for cultures.

P. C. W.

**3-Indolylacetic acid in various plant organs.** J. LEFÈVRE (Compt. rend. Soc. Biol., 1939, 130, 225—227; cf. A., 1937, III, 771).—The concn. of 3-indolylacetic acid in the fresh leaves and roots of various normal and pathological plants is given. H. G. R.

**[Plant] growth-substances.** H. SÖDING (Ber. deut. bot. Ges., 1938, 56, Gen.-versammlungs-Heft, 46—57).—A crit. review. A. G. P.

**Assay of growth-promoting substances utilizing straight growth of the *Avena* coleoptile.** R. L. WEINTRAUB (Smithsonian Misc. Coll., 1938, 97, No. 11, 1—10).—The method is based on vertical growth of the coleoptiles following symmetrical application of the active material in agar blocks to the cut surface. A. G. P.

**Necessity of boron for plants.** W. MAIER (Ber. deut. bot. Ges., 1938, 56, Gen.-versammlungs-Heft, 84—100).—Elimination of B-deficiency symptoms of plants by application of  $\text{H}_3\text{BO}_3$  to stems and leaves is examined. Application of B to shoots does not improve root growth as effectively as does addition of B to the nutrient solution. A. G. P.

**Growth-retarding substances occurring in the plant and animal kingdom.** R. RAPP (Pharm. Zentr., 1939, 80, 145—151).—A growth-retarding substance is isolated from a dry yeast macerate and from a fermented sugar solution and is detectable in many plant juices and animal organs. It can be dialysed, pptd., and adsorbed and is probably an  $\text{NH}_2$ -acid derivative. Variations in concn. and  $p_H$  of the substance in relation to its effect on the germination and growth of cress seeds are examined. E. H. S.

**Plant growth inhibitor.** W. S. STEWART, W. BERGEN, and C. E. REDEMANN (Science, 1939, 89, 185—186).—A growth-inhibiting substance was extracted from the cotyledons of radish plants grown in the light or dark, but was not found in the hypocotyl in either case. W. F. F.

**Influence of mineral nutrition on reaction of sweet maize to *Phytophthora stewartii*.** E. L. SPENCER and G. L. MCNEW (Phytopath., 1938, 28, 213—223).—Infection of seedlings dwarfed by high concns. of N, P, and K in media was greater than in those grown in media more conducive to rapid growth. Deficiency of N or P had little influence, but K deficiency caused severe infection. After-effects of infection were differently affected by deficiencies of N, P, or K. A. G. P.

***Pseudomonas tumefaciens* (Sm. et Towns.), the cause of crown gall in relation to the host plant.** F. DAME (Zentr. Bakt. Par., 1938, II, 98, 385—429).— $\beta$ -Indolyl-acetic and -butyric acids in small amounts induce tumour-like cell proliferation; larger amounts cause adventitious rooting. *P. tumefaciens* produces similar effects. Only virulent strains of the organism produce growth-substance, the process being favoured by presence of complex N substances (notably tryptophan) in the substrate. Partial immunisation of plants is attained by infiltration of avirulent cultures. A. G. P.

**Influence of four mosaic diseases on plastid pigments and chlorophyllase in tobacco leaves.**



P. D. PETERSON and H. H. MCKINNEY (Phytopath., 1938, 28, 329—342).—Tobacco leaves affected with common, yellow, mild dark-green, or mild mosaic contained abnormally low proportions of chlorophyll, xanthophyll, and carotene. In nearly all cases chlorophyllase activity exceeded that of healthy leaves. Yellowed areas in the same leaf had less chlorophyll and more chlorophyllase than green areas. In healthy leaves chlorophyll and chlorophyllase contents are proportional. A. G. P.

**Composition of bacterial galls on *Pelargonium zonale* and of the tissues from which they develop.** A. GOSSET, A. TCHAKIRIAN, and J. MAGROU (Compt. rend., 1939, 208, 474—477; cf. A., 1938, III, 705).—The water and ash contents of the leaves, stems, and galls (induced by *B. tumefaciens*) are similar, but the galls contain more K and P, and less  $\text{SiO}_2$ , Ca, and Mg, than the stems. Fe, Al, and Na vary irregularly; the leaves are rich in  $\text{SiO}_2$ . J. L. D.

**Examination of potato tubers for diagnosis of virus infection.** P. MANIL (Compt. rend. Soc. Biol., 1939, 130, 80—84).—The diagnostic method of Friedrich gives irregular results. H. G. R.

## (xxvii) PLANT CONSTITUENTS.

**Use of the Lundgårdh spectrographic method.** M. A. GRIGGS (Science, 1939, 89, 134).—Data for the Cu, Fe, and Mn contents of orange juices obtained by this method are recorded. Ca and K contents can also be determined without a prior concn. of the juice. Determinations by this method are rapid, accurate, and trustworthy. L. S. T.

**Oxalates in pineapples.** H. E. CLARK (Food Res., 1939, 4, 75—79).—Ripe Cayenne pineapples contained less than 0.01%, and probably less than 0.005%, of oxalic acid, but the amounts were too small for accurate determination. The prep. of the tissue for analysis and the analytical procedure are detailed. E. C. S.

**isoGuanine from the croton bean.** J. R. SPIES (J. Amer. Chem. Soc., 1939, 61, 350—351).—Prep. of isoguanine,  $+1.5\text{H}_2\text{O}$  (sulphate,  $+ \text{H}_2\text{O}$ ), from *Croton tiglium*, L., and its conversion by hot, 25% HCl (not  $\text{HNO}_3$ ) into xanthine is described. R. S. C.

**Variations in the constituents of the roots of *Curcuma xanthorrhiza*, Roxb. ("Temoe lawak"), at different times of the year.** T. MEIJER and D. C. KOOLHAAS (Arch. Pharm., 1939, 277, 91—100).—The contents of essential oil and curcumin (determined spectrophotometrically) are max. in the young plant and decrease with age, whilst the starch content increases. The ratio of oil to curcumin is approx. const. Varieties differ considerably in oil and curcumin contents; climate affects both. R. S. C.

**Leaf-alcohol. III. Odorous principle of cucumber (*Cucumis sativus*, L.).** S. TAKEI and M. ÔNO (J. Agric. Chem. Soc. Japan, 1939, 15, 193—195; cf. A., 1938, II, 345).—The oil obtained from cucumbers by distillation in steam contains *trans-trans*- $\Delta^8$ -nonadienal and *trans-trans*- $\Delta^8$ -nonadienol in the proportion of approx. 1:2. J. N. A.

**Occurrence and determination of squalene in vegetable and animal fats.** K. TÄUFEL, H. THALER, and G. WIDMANN (Biochem. Z., 1939, 300, 354—372).—Squalene, if necessary after removal of impurities by adsorption on  $\text{Al}_2\text{O}_3$  and fuller's earth and elution with benzene, methyl alcohol, and ether, is best detected in the unsaponifiable matter of fats by dissolving in acetone saturated with HCl and passing in dry HCl for 3 hr. at  $-5^\circ$ . The cryst. hexahydrochloride is deposited. The fats of *Hyphomycetes*, ergot, pine-seed oil, hazelnut, cacao butter, mandarin seeds, wheat-germ oil, the meal worm, and the duck (belly) contain little or no squalene. Possibly squalene is a rudimentary material, a pathological product, or an intermediate in the production of carotenoids. W. McC.

**Constituents of *Bragantia wallachii*, Lour.** B. L. MANJUNATH and M. S. S. RAO (J. Indian Chem. Soc., 1938, 15, 646—648).—The oil obtained by extraction of the roots with light petroleum (b.p. 50—60°) contains palmitic, lignoceric, oleic, and linoleic acid. Extraction with ether, ethyl acetate, or  $\text{CHCl}_3$  yields isocostic acid (A., 1935, 1433). The roots contain 0.03% of alkaloids. J. N. A.

**Occurrence of behenic acid in oil from seeds of *Pongamia glabra*, Vent.** L. MANJUNATH and M. S. S. RAO (J. Indian Chem. Soc., 1938, 15, 653).—The crude oil contains behenic acid, which is present probably in the free condition as it is absent from the purified oil. J. N. A.

**Constituents of the flowers of *Arnica montana*, L.** I. H. DIETERLE and K. FAY (Arch. Pharm., 1939, 277, 65—74).—Hydrolysis of the fat of these flowers yields palmitic, lauric, oleic,  $\text{C}_{26}$ , and a little stearic acid, an alcohol,  $\text{C}_{30}\text{H}_{50}\text{O}_2$ , m.p.  $251^\circ$ , and two sterols, m.p.  $151^\circ$  and  $124^\circ$ , respectively; a hydrocarbon is also isolated. R. S. C.

**Lipins (phosphatides and sterols) in the vacuoles of certain vegetable cells.** A. GUILLERMOND (Protoplasma, 1937, 27, 290—307).—Bibliographical review. M. A. B.

**Rate of sugar production in wheat autolysates as determined by various methods.** R. KLEMEN and D. ŠTUCIN (Biochem. Z., 1939, 300, 338—342; cf. A., 1939, III, 222; Sosedov and Drosdova, A., 1937, III, 159).—Results of determinations of the reducing sugars of wheat by the method of Bertrand are lower after autolysis for 1 hr. but higher after autolysis for 3 hr. or more than are those obtained by the methods of Auerbach and Bodländer and of Willstätter and Schudel, probably because an active invertase is present. With not more than 2 hr. autolysis the differences may be neglected. W. McC.

**Effect of press-juice from tobacco stalks on sucrose.** A. WENUSCH (Z. Unters. Lebensm., 1939, 77, 281—283).—Sucrose is converted into a gelatinous substance swelling strongly, but insol., in water. E. C. S.

**Amaryllidaceae and Liliaceae. Carbohydrate reserve of the onion and tuberous plants.** H. BELVAL (Bull. Soc. Chim. biol., 1939, 21, 294—297).—The fructoside of the onion is identical with that of tuberous plants, and the name "tuberoholoside" is



suggested. The classification of plants according to the position of the ovary is as satisfactory as that based on the nature of the flowering process, from the point of view of chemical relationship. P. G. M.

**Sources of uronic acid in the apple.** I. A. MANVILLE, F. J. REITHEL, and P. M. YAMADA (Food Res., 1939, 4, 47—53).—The uronic acid, determined by the  $\text{CO}_2$  evolved at  $140^\circ$ , amounts to 5.6% of the dry wt. and is distributed as follows: pectin 37.5, sugars, 35.7, hemicelluloses 12.5, and an unknown source in the alcohol-sol. fraction 14.3%. E. C. S.

**Pectic substances. II. Araban from carbohydrate constituents of pea-nut. III. Composition of apple pectin and mol. structure of the araban component.**—See A., 1939, II, 203.

**Celluloses of algæ.** G. VIEL (Compt. rend., 1939, 208, 532—534).—The celluloses of *Fucus vesiculosus*, *F. serratus*, *Laminaria saccharina*, and *L. cloustoni* with conc. HCl give glucose (89.9—94.4% yield). When heated,  $\text{H}_2$ ,  $\text{CH}_4$ ,  $\text{CO}$ , and  $\text{CO}_2$  are formed in amounts which fall within the range of gases given off by wood celluloses. Those of *F. serratus* and *L. cloustoni* react to heat as do cotton and chestnut celluloses. J. L. D.

**Membranes of epidermal cells of the Avena coleoptile.** W. K. FARR and W. A. Sisson (Contr. Boyce Thompson Inst., 1939, 10, 127—137).—Microscopic and X-ray studies of the structure of cell membranes and their development during growth are recorded. AUTHORS.

**Formation of cellulose in the cell wall.** K. HESS, H. KIESSIG, W. WERGIN, and W. ENGEL (Ber., 1939, 72, [B], 642—652).—Comparative X-ray and optical investigation shows that the appearance of the Röntgen diagram of cellulose is coincident with that of strong double refraction. Since these phenomena occur in the primary wall after removal of a wall component by extraction with water it is probable that they have a common cause. The component is not the fat-wax phase observed previously but an amorphous material removable by water and provisionally designated substance X. A part of X appears to be derived from the wall and to be so placed that it hinders the lattice arrangement of cellulose. Since X can only be removed after removal of the wax it is probable that the latter encloses the former. The function of X is discussed. H. W.

**Structure of lignin and nature of plant synthesis.**—See A., 1939, II, 221.

**Properties of protoplasm in yellowed leaves.** L. REUTER (Protoplasma, 1937, 27, 270—279).—The viscosity of the protoplasm and the resistance to heat and narcotics (ether) are greater, and the permeability of the protoplasm to urea, glycerol,  $\text{KNO}_3$ , and  $\text{CaCl}_2$  is less, in yellowed leaves than in green ones. These differences are probably due to an increase in Ca and a decrease in K in yellowed leaves. M. A. B.

**Relationship between the protein-nitrogen content of pollen and the classification of the Ranunculaceæ.** C. SOSA-BOURDOUIL (Compt. rend., 1939, 208, 536—538).—The protein-N content of the

pollen of many species is determined and agrees well with a classification based on other available morphological and biological characteristics. The non-protein-N is 10—25% of the total N. J. L. D.

**Biological oxidation and reduction.** J. WOLFF (Compt. rend., 1939, 208, 467—469).—Orcein, distributed on filter-paper, in presence of a substance (not chlorophyll, carotene, or xanthophylls) extracted from green plants with benzene or ether is oxidised in sunlight to a red and then red-brown material but the reaction does not proceed in vac. A non-absorbent paper or the absence of water inhibits the reaction. If sunlight is shut off from the red material by metal or glass it is decolorised. Reduction is probably due to the contact between the solid object and the filter-paper. J. L. D.

**Leaf pigments.** G. ENDRES, R. HÜTTEL, and L. KAUFMANN (Annalen, 1939, 537, 205—213).—Green bean leaves contain chlorophyll and a yellow pigment querciturone,  $\text{C}_{21}\text{H}_{18}\text{O}_{13}\cdot\text{H}_2\text{O}$ , m.p.  $192^\circ$  (after re-solidification, above  $260^\circ$ ), characterised by its hydrolysis to quercetin and glycuronic acid. The yellow colour of the etiolated leaves is due to querciturone and carotenoids. The latter are determined colorimetrically in the methyl alcohol-benzene extract and the former in the aq. extract. Querciturone is formed very rapidly initially and its amount remains const. after 2 days. Carotenoids are formed slowly, the max. content, about 10% of that of querciturone, being attained after about 8 days. Exposure of an etiolated leaf to light causes speedy production of chlorophyll but does not alter the querciturone content. Polyphenol-oxidase and  $\text{O}_2$  dehydrogenate querciturone to a quinonoid form which is hydrogenated by ascorbic acid, querciturone behaving in this system as a H carrier. Ascorbic acid, which is almost unaffected by phenol-oxidase, is rapidly and under suitable conditions completely oxidised after addition of querciturone. If the concn. of querciturone is sufficient, the oxidation of the pigment can be followed manometrically. Simultaneously the solution acquires a dark brown colour whereas in presence of ascorbic acid it retains the original pale yellow-brown tint. H. W.

**Chlorophyll in sugar beet and mangolds.** E. W. SCHMIDT and H. KIRCHHOFF (Z. Wirts. Zuckerind., 1937, 87, 587—593).—In seedlings of various mangolds and types E and ZZ of sugar beets, the contents of chlorophyll and carotenoids per unit area of cotyledons differed in parallel with the known sugar-producing capacities of the various types, sugar beet containing more than mangolds and ZZ more than E. In plants affected by mosaic disease or leaf blight, sound portions of the leaves contained more chlorophyll than unsound portions. J. H. L.

**Distribution of  $\alpha$ -sorinin and  $\alpha$ -sorigenin.** Z. NIKUNI (J. Agric. Chem. Soc. Japan, 1939, 15, 109—111; cf. A., 1938, II, 173).—The aglycone  $\alpha$ -sorigenin is present in the bark of *Rhamnus japonica* not only as the glucoside  $\alpha$ -sorinin but also in the free condition and it can be extracted by boiling 90—95% alcohol. The amounts of  $\alpha$ -sorinin and  $\alpha$ -sorigenin in two varieties of *R. japonica* and *R. dahurica*



from different districts and at different seasons have been determined.  $\alpha$ -Sorinin is present only in *R. japonica* and is most abundant during autumn.

J. N. A.

**Delphinine.**—See A., 1939, II, 190.

**Constituents of poppy flowers.** L. SCHMID and W. Hosse (Mikrochem., 1939, 26, 59—66).—Dry corn-poppy flowers were treated with dry  $\text{NH}_3$ , extracted with  $\text{CHCl}_3$ , and alkaloids removed from this solution by repeated extraction with 5% tartaric acid and finally with 2%  $\text{HCl}$ . The unsaponifiable portion of the remaining solution comprises a mixture of  $\text{C}_{26}\text{H}_{53}\text{OH}$ , m.p.  $75.5^\circ$ , separated by adsorption on activated  $\text{Al}_2\text{O}_3$ , and a series of saturated hydrocarbons amongst which  $\text{C}_{27}\text{H}_{56}$  (m.p.  $61.5^\circ$ ) was separated and identified by X-ray methods. No phytosterols could be detected. The saponifiable constituents contain palmitic, stearic, and oleic acids, and probably also the acid  $\text{C}_{19}\text{H}_{39}\text{CO}_2\text{H}$ .

J. W. S.

**Constituents of the field poppy (*Papaver rhæas*).** W. AWE (Forsch. Fortschritte, 1939, 15, 117—118).—The seeds of *P. rhæas* contain approx. 45% of oil, about half of which is obtained by cold-pressing. The only known alkaloid present in the seed is rhæadine,  $\text{C}_{21}\text{H}_{21}\text{O}_6\text{N}$ . The constitution and formation of opium alkaloids are discussed.

F. O. H.

**Nicotine and citric acid content in progeny of the allopolyploid hybrid *Nicotiana rustica*, L.  $\times$  *N. glauca*, Grah.** D. KOSTOFF (Current Sci., 1939, 8, 59—62).—*N. rustica* contains only nicotine whereas *N. glauca* and all the allopolyploid hybrids contain only anabasine, frequently in amounts exceeding that of the parent. Plants of the  $F_{3/4}$  generation of the back cross (*N. rustica*  $\times$  *N. glauca*)  $\times$  *N. rustica* contained both nicotine and anabasine. The citric acid content of the allopolyploids and the back-crosses did not exceed that of *N. rustica*. Possible use of the hybrids as raw material for insecticides is indicated.

A. G. P.

**Alkaloids of *Senecio integerrimus*, *S. longilobus*, *S. spartioides*, *S. ridellii*, and *Erechtites hieracifolia*.**—See A., 1939, II, 232.

**Alkaloid in bulbs of *Narcissus tazetta*, L.**—See A., 1939, II, 233.

**Valerian: new alkaloid.**—See A., 1939, II, 233.

**Active principles of curare.**—See A., 1939, II, 233.

## (xxviii) APPARATUS AND ANALYTICAL METHODS.

**Anaërobic determination of  $p_{\text{H}}$  of blood and other physiological solutions.** A. KETOMAA (Suomen Kem., 1939, 12, A, 38).—The liquid is covered by a layer of paraffin in a specially designed cell.

M. H. M. A.

**Relationship between potential of platinum and the vitamin-C content of solutions exposed to air.** N. BEZSSONOFF and M. WOLOSZYN (Bull. Soc. Chim. biol., 1939, 21, 319—354; cf. A., 1938, I, 460).—A simple technique is described for the determination of the potential of Pt electrodes in solutions of oxidation-reduction agents, e.g., ascorbic acid, in

the presence of air. The relationships between potential and concn. of ascorbic acid were determined for concns. below 0.1N. at  $p_{\text{H}}$  2.6 and  $20^\circ$ . P. G. M.

**Apparatus for rapid and accurate determination of low osmotic pressures.**—See A., 1939, I, 281.

**Colorimetric determination of cysteine and cystine.** A. FUJITA and I. NUMATA (Biochem. Z., 1939, 300, 264—273).—The deproteinised solution containing 2% of  $\text{HPO}_3$  is treated with dimethyl-*p*-phenylenediamine hydrochloride in 4N- $\text{H}_2\text{SO}_4$  and 10%  $\text{Fe}^{\text{III}}$  alum in N- $\text{H}_2\text{SO}_4$ . After heating at  $100^\circ$  for 40 min. the mixture is cooled, made up to vol., centrifuged, and the extinction of the dark reddish-violet liquid is determined. The amount of cysteine is given by  $7.5(E - E_0)v$ , where  $E$  and  $E_0$  are the observed and control extinctions respectively and  $v$  is the dilution.  $E$  should be less than 0.6 to ensure accurate determination. The colour reaction is practically sp. for cysteine and is not given by cystine or glutathione. The latter exerts an influence only when its concn. is twenty-five times that of cysteine, and in the case of ascorbic acid five times that of cysteine. Total cysteine is determined by this method after reduction of the cystine by  $\text{H}_2\text{S}$  in presence of Hg acetate. Data are given for the amounts of cysteine and cystine in animal and plant tissues. The amounts of free cysteine and cystine in animal tissues in relation to the amount of glutathione are very small.

J. N. A.

**Iodometric determination of glutathione in tissues.** I. Reduced glutathione. II. Total glutathione. A. FUJITA and I. NUMATA (Biochem. Z., 1938, 299, 249—261, 262—273; cf. A., 1935, 772).—I. The tissue is ground with sand and dil.  $\text{HPO}_3$  (there is no advantage in replacing  $\text{HPO}_3$  by sulphosalicylic acid), solid matter is removed in a centrifuge, dil. aq. KI is added, and the mixture is titrated at  $0^\circ$  with 0.001N- $\text{KIO}_3$ , using starch as indicator; reduced glutathione and ascorbic acid are thus determined. In another portion of the liquid, ascorbic acid is destroyed by adding ascorbic acid oxidase at  $p_{\text{H}}$  6—7, warming to  $30^\circ$ , passing  $\text{O}_2$  through for 5 min., adjusting the  $p_{\text{H}}$  to 1.8—2.2, adding dil. aq. KI, and titrating at  $0^\circ$  as before. Methods which involve destruction of glutathione with formaldehyde or its pptn. with  $\text{Cd}^{++}$  are untrustworthy.

II. Methods so far suggested for the quant. reduction of oxidised glutathione in tissues are untrustworthy. The purpose is achieved, after grinding with sand and  $\text{HPO}_3$ , by adding Na acetate and  $\text{Hg}^{\text{II}}$  acetate, saturating with  $\text{H}_2\text{S}$ , leaving overnight, adding  $\text{HCl}$ , and removing  $\text{H}_2\text{S}$  in a vac. Total glutathione is then determined as before after destruction of ascorbic acid. Vals. for the reduced and oxidised glutathione contents of the blood and tissues of men and animals are given. In some cases more than 50% of tissue-glutathione occurs in the oxidised form.

W. McC.

**Colorimetric determination of glutathione.** I. Reduced glutathione. II. Total glutathione. A. FUJITA and I. NUMATA (Biochem. Z., 1939, 300, 246—256, 257—263).—I. The deproteinised solution



containing 2% of  $\text{HPO}_3$  is treated with saturated  $\text{NaCl}$ ,  $\text{Na}$  nitroprusside, and  $\text{N}$ -aq.  $\text{NH}_3$ . A red colour develops in presence of glutathione. The extinction is determined in a Pulfrich photometer and the glutathione ( $x$  mg.-%) determined from the formula  $x = (E - E_0)/f_i v$  where  $E$  and  $E_0$  are the extinctions of the solution and control respectively,  $v$  is the dilution, and  $f_i$  is a factor depending on the temp. of the solution. Vals. of  $f_i$  from  $10^\circ$  to  $29^\circ$  are given. Max. absorption occurs at about 530  $\text{m}\mu$ . Cysteine gives a similar colour reaction but the extinction val. quickly decreases; other biological substances give only yellow or brown colours. If  $E$  is less than 0.4 the intensity remains at a max. for at least 3 min.  $E$  is proportional to amount of glutathione up to at least 20 mg.-% of the latter. In presence of  $\text{NaCl}$  and/or  $\text{NH}_3$  there is a smaller extinction, but the max. colour intensity persists for a longer time. Other salts also decrease the extinction, and in the case of  $\text{K}_2\text{SO}_4$ ,  $\text{NH}_4\text{Cl}$ ,  $\text{NH}_4\text{NO}_3$ , and  $\text{NaNO}_3$  by considerably more than 50%. The lower is the temp. the greater is  $E$ , and  $f_i$  increases with temp. The more dil. is the solution the smaller is the effect of ascorbic acid. Cysteine has practically no effect unless its concn. is greater than 0.05 that of glutathione. Adrenaline must be removed before the determination. Thymus, corpus luteum, and testis give lower glutathione vals. than when determined by the I method.

II. The deproteinised solution containing 2% of  $\text{HPO}_3$  is treated with  $\text{Hg}$  acetate and  $2\text{N}$ - $\text{HCl}$ , followed by  $\text{NaOAc}$  and  $\text{H}_2\text{S}$ . After filtration, addition of  $2\text{N}$ - $\text{HCl}$ , and removal of  $\text{H}_2\text{S}$  in vac., the solution is treated as above. In many tissues glutathione is present mainly in the reduced form, but lung, spleen, and skeletal muscle contain some of the oxidised form, whilst more is present in heart, blood, pituitary, thyroid, vitreous humour, and retina. Milk contains exclusively oxidised glutathione. Liver and eye lens contain most total glutathione. Plant tissues in general are poor in reduced, but contain more oxidised, glutathione.

J. N. A.

**Glutathione. VIII. Determination in tissues by method of Okuda and Ogawa and the modified method of Fujita and Numata.** M. OGAWA (J. Agric. Chem. Soc. Japan, 1939, 15, 1-7).—The methods (A., 1933, 1184, and preceding abstract) are compared. Reduction of oxidised to reduced glutathione by  $\text{H}_2\text{S}$  is nearly as effective as reduction with  $\text{Zn}$ , but results are slightly lower and the method is longer.  $\text{KIO}_3$  titration vals. for reduced glutathione which have been corr. by ascorbic acid oxidase are much higher than those obtained when corr. by 2:6-dichlorophenol-indophenol. In general, correction by ascorbic acid oxidase gives inaccurate results.

J. N. A.

**Micro-determination of urea in biological fluids by oxidation of dioxanthylurea with iodate.** I. CLAUDATUS and M. BOTEZATU (Biochem. Z., 1939, 300, 325-327; cf. Fosse, A., 1914, ii, 757).—Urea (e.g., in 1 c.c. of serum deproteinised with Tanret's reagent) is converted into the dioxanthyl compound, which is dried, mixed with  $\text{KIO}_3$  and  $\text{Na}$  tungstate, and heated at  $200^\circ$  for 30 min. with conc.  $\text{H}_2\text{SO}_4$  in a sealed tube. I liberated on dilution with water is distilled into 5% aq.  $\text{KI}$  and titrated with 0.04N-

$\text{Na}_2\text{S}_2\text{O}_3$ . A blank determination must be made. When the urea content is 0.2-0.4 mg. per c.c. the error does not exceed 1.5%.

W. McC.

**Determination of uric acid in urine and blood by the phosphotungstic acid and chromometric methods. Its condition and transformations. Effect of physico-chemical agents.** A. IONESCO-MATIU and A. POPESCO (Bull. Soc. Chim. biol., 1939, 21, 264-274).—The phosphotungstic acid method is preferred for the determination of uric acid. Solutions of pure uric acid undergo, on keeping, autoxidation and hydrolysis which may be retarded by sterilisation or addition of antiseptics, particularly in the presence of  $\text{PO}_4'''$ . Piperazine is the best org. solvent and preservative for uric acid, which is present in urine in the free state and is preserved there by  $\text{PO}_4'''$  present.

P. M. G.

**Micro-determination of veronal in blood and fluid.** R. FISCHER (Mikrochem., 1939, 26, 255-263).—The blood or spinal fluid is treated with a buffer solution of  $p_{\text{H}}$  3.3-3.5 (1%  $\text{NaH}_2\text{PO}_4$  with addition of  $\text{H}_3\text{PO}_4$  and  $\text{KCN}$ ) to prevent separation of albumin, and the veronal is extracted with ether. The extract is dried, purified with  $\text{C}$  and  $\text{MgO}$ , and, after evaporation, the residue is sublimed at  $90$ - $150^\circ$ , the sublimate being weighed. The method permits determination of 70-300  $\mu\text{g}$ . of veronal with an error of 2.5-6.7%. Veronal can be separated from succinic acid by adsorption of the latter from ether solution on  $\text{MgO}$ ,  $\text{Al}_2\text{O}_3 + \text{MgO}$ , or  $\text{MgCO}_3$ , the adsorbent being finally washed with ether containing alcohol (20-30%). Luminal can be separated from succinic acid in the same way.

J. W. S.

**Biological determination of small quantities of morphine.** D. G. FICHTENBERG and J. LÉVY (Compt. rend. Soc. Biol., 1939, 130, 312-316).—The method, depending on the antagonism between choline hydrobromide and morphine on the enervated dorsal muscle of the leech, will determine  $1$ - $5 \times 10^{-5}$  g. of morphine.

H. G. R.

**Analysis of tissues containing morphine and oxydimorphine.** D. G. FICHTENBERG (Compt. rend. Soc. Biol., 1939, 130, 316-319).—Qual. and quant. analysis of tissues containing morphine and oxydimorphine ( $\mu$ -morphine) is obtained by application of Straub's test, the sensitising of the action of acetylcholine on leech muscle, and the antagonism between morphine and choline hydrobromide on leech muscle (cf. preceding abstract).

H. G. R.

**Determination of protein in *Melilotus albus* with the aid of the Pulfrich photometer.** E. FUNCK (Mikrochem., 1939, 26, 175-176).—The finely-ground material (0.5 g.) is heated with conc.  $\text{H}_2\text{SO}_4$  (5 c.c.),  $\text{K}_2\text{SO}_4$  (3 g.), and  $\text{CeO}_2$  (~0.05 g.) in a Kjeldahl flask for 45 min. and allowed to cool. The residue is made slightly alkaline with 33%  $\text{KOH}$  and diluted to 200 c.c. After filtration 10 c.c. are diluted to 100 c.c. and shaken with 1 c.c. of Nessler reagent. The extinction coeff. of the solution, contained in a cell 10-20 mm. thick, is compared with that of 100 c.c. of distilled water containing 1 c.c. of Nessler reagent, using the Pulfrich photometer with an S 43 filter.

J. W. S.



**Electrophoretic investigation of casein.** O. MELLANDER (Biochem. Z., 1939, 300, 240—245).—The behaviour of casein from cow's milk towards electrophoresis in the apparatus of Tiselius (A., 1937, I, 305) at 0—1° and in borate buffer at  $p_H$  8.6 and maleate buffer at  $p_H$  6.14 has been determined. Three well-defined components,  $\alpha$ -,  $\beta$ -, and  $\gamma$ -casein, have been observed and the  $\alpha$ - and  $\gamma$ -fractions have been isolated.  $\alpha$ -Casein has the highest rate of migration and highest P content (0.96—1.00%), whilst  $\gamma$ -casein has the smallest rate and P content (0.05%). The P content of the original casein is 0.81—0.86%. Using cow's milk which has been dialysed against NaCl, four well-defined components are obtained, the fourth, occurring between  $\alpha$ - and  $\beta$ -casein, being probably lactalbumin. J. N. A.

**Methods for clinical investigation of intermediary metabolism. Distillation apparatus for the determination of acetone, acetaldehyde,  $\beta$ -hydroxybutyric and lactic acid, total or residual nitrogen, urea, amino-acid nitrogen, and ammonia.** F. LAUERSEN (Mikrochem., 1938, 25, 85—108).—The distillation apparatus is described and illustrated. Methods for the iodometric determination of acetone,  $\beta$ -hydroxybutyric and lactic acid, and mixtures of these three substances for N in blood and urine, and for urea in blood, are detailed. Data for lactic acid in blood and N in urine are recorded. L. S. T.

**Metabolism of pyruvic acid in normal and vitamin-B<sub>1</sub>-deficient states. I. Determination of blood-pyruvate.** G. D. LU (Biochem. J., 1939, 33, 249—254).—Pyruvic acid in 2—3 drops of blood (or in milk, cerebrospinal fluid, urine, or tissues) is rapidly and specifically determined, after removal of proteins with trichloroacetic acid [(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> for milk] by converting into 2:4-dinitrophenylhydrazones, extracting this from aq. solution with ethyl acetate, separating from 2:4-dinitrophenylhydrazones and the 2:4-dinitrophenylhydrazones of other aldehydes and ketones by extraction with 10% aq. Na<sub>2</sub>CO<sub>3</sub>, removing traces of 2:4-dinitrophenylhydrazine or -hydrazone by extraction with ethyl acetate, adding N-NaOH and, after 10 min., measuring with a photoelectric colorimeter the depth of the red colour produced. A light filter is used to eliminate interference by yellow colour and the results are read off a standard curve. When the pyruvic acid concn. is 20  $\mu$ g.-% the error is  $\pm 1.5\%$ . If all the keto-acids present are to be determined 15% aq. Na<sub>2</sub>CO<sub>3</sub> and 3N-NaOH are used and the colour is measured after 2 min., or the pyruvic acid is first determined and the concns. of aq. Na<sub>2</sub>CO<sub>3</sub> and NaOH are suitably adjusted (an appropriate standard curve is then required). W. McC.

**Determination of pentose.**—See A., 1939, II, 195.

**Diphenylamine in the determination of fructose in biological media. I. Determination of inulin. II. Determination of fructose in small amounts of blood.** A. C. CORCORAN and I. H. PAGE (J. Biol. Chem., 1939, 127, 601—606, 606—

608).—I. Conditions for the determination of inulin by means of the diphenylamine colour reaction are given, glucose and preformed fructose having been first removed by yeast fermentation.

II. Details are given for the determination of fructose in 0.2 c.c. of blood by means of the diphenylamine colour reaction. The colour is developed by heating with the reagent to 100° for 15 min. P. G. M.

**Direct colorimetric determination of inulin in blood and urine.** A. S. ALVING, J. RUBIN, and B. F. MILLER (J. Biol. Chem., 1939, 127, 609—616).—Serum, plasma, or urine is deproteinised by Cd(OH)<sub>2</sub> and inulin in the filtrate is determined, after removal of preformed fructose by yeast fermentation, by means of the diphenylamine colour reaction. Hydrolysis and colour development are effected by heating to 100° for 1 hr. with the reagent. None of the usual anticoagulants has any effect on the accuracy of the method. Concns. of approx. 2 mg.-% may thus be determined. P. G. M.

**Effect of citric acid on the colorimetric determination of inorganic phosphate. Significance in phosphatase experiments.** E. LUNDSTEEN (Enzymologia, 1939, 5, 383—384; cf. A., 1936, 1298).—Sorensen's citrate buffer is not suitable in the determination of PO<sub>4</sub>''' liberated from glycerophosphate by phosphatase owing to its inhibitory effect on the formation of the blue colour in the method of Lundsteen and Vermehren (A., 1937, III, 4). An acetic acid-acetate buffer is recommended. A citrate buffer can be used if phenyl phosphate is used in place of glycerophosphate. Citrate has no effect on the enzymic process. J. N. A.

**Determination of phosphorus by the method of Bell, Doisy, and Briggs.** G. BARAC (Bull. Soc. Chim. biol., 1939, 21, 139—142).—The method of Bell and Doisy modified by Briggs (A., 1922, ii, 718) is sp. for the determination of PO<sub>4</sub>''' in biological media, and is unaffected by the usual anticoagulants. A. L.

**Colorimetric micro-determination of phosphoric ion.**—See A., 1939, I, 215.

**Micro-determination of halogen ions. Acid-alkalosis test.**—See A., 1939, I, 275.

**Photometric micro-determination of iron.**—See A., 1939, I, 279.

**Micro-determination of copper, lead, and zinc in biological material with dithizone (diphenylthiocarbazon).** II. Ashing. J. SCHWAIBOLD and A. LESMÜLLER (Biochem. Z., 1939, 300, 331—337; cf. A., 1938, III, 972).—The destruction of organic matter containing Cu, Pb, and Zn is best effected in 20—30 min. by igniting at low temp. in a quartz vessel, moistening with HNO<sub>3</sub>, and continuing the ignition at 500—600°. A blank determination of Zn must be made. W. McC.

**Use of perchloric acid mixtures in the decomposition of animal tissues.** R. BALKS and O. WEHRMANN (Bodenk. Pflanzenernähr., 1938, 11, 253—254).—Use of HClO<sub>4</sub> to complete the decomp. of fish tissue initially digested with fuming HNO<sub>3</sub> involves risk of serious explosion. A. G. P.