

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

AUGUST, 1944



A III—PHYSIOLOGY. BIOCHEMISTRY. ANATOMY

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BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A III—Physiology. Biochemistry. Anatomy.

AUGUST, 1944



I.—GENERAL ANATOMY AND MORPHOLOGY.

Criteria for subspecies, species, and genera as determined by researches on fishes. C. L. Hubbs (*Ann. New York Acad. Sci.*, 1943, 44, 109—121). J. D. B.

Criteria for subspecies, species, and genera in ornithology. E. Mayr (*Ann. New York Acad. Sci.*, 1943, 44, 133—144). J. D. B.

Criteria for genera, species, and subspecies in zoology and palaeozoology. G. G. Simpson (*Ann. New York Acad. Sci.*, 1943, 44, 145—178). J. D. B.

Surface area of intestinal mucosa in rat and cat. H. O. Wood (*J. Anat.*, London, 1944, 78, 103—105).—From measurements made in transverse and longitudinal sections of the cranial and caudal ends of the small intestine in rats and cats, it was found that the area of the mucous membrane, per unit length of the gut, is greater in the jejunum than in the ileum. W. J. H.

Developmental anatomy of human osseous skeleton during the embryonic, foetal, and circumnatal periods. C. R. Noback (*Anat. Rec.*, 1944, 88, 91—125).—Special phases of normal prenatal development of the mandible, frontal, parietal, and occipital bones, tympanic annulus, scapula, clavicle, ribs, centra, neural arches, and ilium are discussed. Each prenatal centre of ossification is classified into one of two types—centric or eccentric—on the basis of the relation of the site of ossification centre to the geometric centre of the bone or part of the bone that the centre forms. A crit. review of the literature concerning the time of appearance of prenatal ossification centres is presented. W. F. H.

Patellar index in mammals. H. Haxton (*J. Anat.*, London, 1944, 78, 106—107).—The patellar index is not related to the size or speed of movement of the animal but it has a functional val. in the extension of the knee joint. W. J. H.

Experiments on possible relationship between vitamin-C and calcification. G. H. Bourne (*J. Physiol.*, 1943, 102, 319—328).—By feeding alizarin to intact guinea-pigs and those with holes bored in their femora, by histological sections of decalcified femora, and by sections of untreated costochondral junctions, it is shown that a scorbutic diet causes deficient calcification, which is corr. by giving pure vitamin-C. No experiments with a scorbutic diet + -P or Na citrate are recorded, but neither of these substances when given with -C improves its action. The amount of phosphatase in costochondral junctions is reduced in scorbutic animals. Neither the deficient calcification nor the deficient phosphatase can be dissociated from the recognised scorbutic deficiency of osteoid tissue, but -C may be as necessary for the production of phosphatase as for the formation of matrix itself. W. H. N.

Effects of potassium iodide on skeletal tissues of growing mice. M. Silberberg and R. Silberberg (*Amer. J. Path.*, 1944, 20, 329—337).—In growing mice, KI increases temporarily the proliferation of the epiphyseal and articular cartilages, accelerates the onset of regression in the latter, and stimulates the formation and subsequently the resorption of bone. Mice of the slowly ageing strain C57 are more responsive to the administration of KI than mice of the more rapidly ageing strain C3H. (6 photomicrographs). C. J. C. B.

Hereditary malformation of the hands and feet. K. A. Stiles and I. S. Pickard (*J. Heredity*, 1943, 34, 341—344).—Deformities called "crab claw feet" and "displaced thumbs," not correlated with low mentality, alcoholism, or inbreeding and traced through four generations, are described. L. G. G. W.

Otoplasty. P. W. Greeley (*Surgery*, 1941, 10, 457—461).—An operation for the reconstruction of the external ear is described. Transplantation of ear cartilage from another person is the basis of the procedure. G. P.

External morphology and anatomy of scorpion (*Buthus tamulus*, Fabr.). V. B. Tembe and P. R. Awati (*J. Univ. Bombay*, 1942, 11, B, Part 3, 54—81; 1944, 12, B, Part 5, 1—13). W. F. H.

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Histogenesis of pituicytes in chick. W. M. Shanklin (*J. Anat.*, London, 1944, 78, 79—93).—The neurohypophysis was studied in the embryo and adult after staining with hamatoxylin and eosin and the Hortege Ag₂CO₃ method. The neurohypophysis at its earliest stage of development is composed of primitive spongioblasts; these later develop processes and become supporting spongioblasts. Apolar, unipolar, and bipolar spongioblasts which later become multipolar migrate from the ependymal layer and become pituicytes. Two types of lobules are described, a primary with a lumen and a secondary devoid of a lumen. Each lobule is surrounded by a vascular capsule with a perivascular space along its inner border through which pass the pituicyte processes to establish vascular and pial attachments. Neuroblasts and nerve cells were found in the neurohypophysis. W. J. H.

Observations on development of human vertebral column. G. M. Wyburn (*J. Anat.*, London, 1944, 78, 94—102).—The vertebral column in its earliest membranous phase consists of an axial column of mesoderm with alternating light and dark areas, the latter forming the perichordal discs. The discs are formed from the ventral processes of the caudal sclerotomites with a contribution from the cranial sclerotomite of the same somite. Cartilaginous formation begins in the light area between the discs. The thoracic costal processes are attached to the discs cranial to the attachment of the neural process. The inclusion of the perichordal disc tissue in the adjacent vertebral bodies brings the mid-thoracic costal processes into contact with the upper end of the corresponding vertebra and the lower end of the vertebra above. W. J. H.

Factors affecting number and form of vertebræ in *Fundulus heteroclitus*. M. L. Gabriel (*J. Exp. Zool.*, 1944, 95, 105—147).—Artificially fertilised eggs were exposed to different, const. temp. until the time of hatching. A statistical analysis is made of the effects on the no. of vertebræ formed. Although the mean vertebral no. at any one temp. varies in sibships with the same parental phenotype, in general the mean vertebral no. is inherited. This genetic control is modified by temp., vertebral no. being increased by low temp. and decreased by exposure to high temp. during development: sibships differ in their sensitivity to temp. The no. of vertebræ varies in an inverse relation to the rate of development of the egg when the temp. is const. Possible mechanisms are discussed and it is suggested that differences arise through differential effects of temp. on growth and differentiation. Abnormalities of the vertebral column are described and discussed critically, particularly as to their possible causation. H. L. H. G.

Genetic and physiological problems of self-sterility in *Ciona*. VI. Theoretical discussion of genetic data. T. H. Morgan (*J. Exp. Zool.*, 1944, 95, 37—59).—Cross-fertilisation is the rule and self-fertilisation the exception in the hermaphrodite *C. intestinalis*. In 2632 cross-fertilisations there were 2 cases of reciprocal cross-sterility and 14 one-way steriles. 5% of cases showed self-fertility. An analysis of these data is made from a genetic viewpoint. In reciprocal cross-sterility it may be assumed that the individuals are identical in genetic composition in at least 3 factor pairs; a min. of 5 independent loci must be present if the reaction is between haploid sperm and diploid eggs. The nos. of alleles present in one or more loci in the general population is certainly more than 2. One-way sterility may be accounted for by assuming that one individual is *AA'* and the other is *A'A'*. If the eggs of one individual are fertilised by the sperm of another and the offspring, reared in the same jar, they give, as expected, more identicals and near identicals than are found in wild-type random crosses; in such cases self-fertilisation is not exceptionally high. It is suggested that self-fertilisation is due to a mutation in the sperm path of one of the allelomorphs with the result that such sperm come to differ from the eggs in more than 3 out of 5 like factor pairs; there is no obvious relation between its occurrence and that of reciprocal or one-way cross-sterility. H. L. H. G.

Embryonic grafts in regenerating tissue. II. Behaviour of transplants during host metamorphosis in *Rana pipiens*. H. S. Emerson (*J. Exp. Zool.*, 1944, 95, 61—88).—Grafts of the optic cup and

surrounding tissues were made into the regenerating blastema of amputated larval tails. The blastema proved a suitable environment for the differentiation and growth of grafts, many of which continued to live long after full regeneration of the tail; some grafts disintegrated but the frequency of disintegration was independent of the length of time in the host. With the occurrence of metamorphosis grafts were generally resorbed during the latter half of tail resorption; in some cases graft tissue remained near the tip of the urostyle; in one such case in which a large graft was preserved it was covered by larval tail epidermis which acquired some of the characters of adult skin. H. L. H. G.

Membrane formation and cleavage in unilaterally irradiated sea urchin eggs. J. D. Spikes (*J. Exp. Zool.*, 1944, 95, 89—104).—Irradiation of *Lytechinus pictus* eggs with 2537 Å. ultra-violet light causes suppression of a fertilisation membrane in the region irradiated; the first cleavage plane is determined by the irradiation and passes through the centre of this region. λ longer than 3000 Å. produced no observable effect. If eggs are photosensitised, irradiation with visual light suppresses membrane formation in the region irradiated. The irradiated region is more permeable and is strengthened mechanically. H. L. H. G.

Tyrosinase in parthenogenetic grasshopper eggs. J. H. Bodine and T. N. Tahmisan (*Biol. Bull.*, 1943, 85, 157—163).—Parthenogenetic eggs of *Melanoplus differentialis* develop about half as much tyrosinase as do normally fertilised eggs. Some possible explanations of this difference are discussed. G. P. W.

Criteria for species and their sub-divisions from point of view of genetics. W. F. Blair (*Ann. New York Acad. Sci.*, 1943, 44, 179—188).—In a system of classification making use of genetic and ecological criteria, the cenospecies is defined as a population that is infertile with every other population. Any isolated population which has not evolved far enough to be infertile with related populations is regarded as an incipient species. Such a system is considered to show relationships and evolutionary trends better than does the conventional taxonomic method. J. D. B.

Gene and cytoplasm. I. Determination and inheritance of "killer" character in *Paramecium*. II. Bearing of determination and inheritance of characters in *Paramecium* on problem of cytoplasmic inheritance, pneumococcus transformations, mutations, and development. T. M. Sonneborn (*Proc. Nat. Acad. Sci.*, 1943, 29, 329—338, 338—343).—I. A description of a previously unknown system of relations between a gene and a cytoplasmic substance both of which are required for the development of hereditary characters in variety 4 of *P. aurelia*. The pair of characters which are analysed as regards determination and inheritance are designated "killer" and "sensitive," protozoa possessing the latter character being killed when placed in fluid in which individuals possessing the former character had lived. When pure "killer" and pure "sensitive" races are crossed the two exconjugants of each pair produce phenotypically different clones; one is a "killer" and the other "sensitive." By marking the parents it can be demonstrated that the F_1 "killer" clones are those that derive their cytoplasm from the "killer" parent and the F_1 "sensitive" clones are those with cytoplasm from the sensitive parent.

II. A further analysis of the phenomenon recorded above and a comparison with related phenomena in other fields of biology. J. D. B.

Gene induction of an inherited cytoplasmic difference. M. M. Rhoades (*Proc. Nat. Acad. Sci.*, 1943, 29, 327—329).—Maize plants homozygous for the recessive gene *iojap* (*ij*) exhibit a chlorophyll stripping or variegation. When homozygous *ij* plants are used as pollen parents in crosses with normal (*IjIj*) individuals the F_1 progenies consist wholly of green plants but when homozygous *ij* plants are used as the female parents in crosses with *IjIj* plants the F_1 progenies often contain white and/or striped seedling seedlings in addition to the expected green ones. Cytological analysis of this situation suggests that the plastids, cytoplasmic constituents, have been modified by a nuclear factor and that this modification is transmitted by cytoplasmic heredity. J. D. B.

Development of eye; evidence that certain mutants of *Drosophila* develop in manner similar to Bar mutation. A. G. Steinberg (*Proc. Nat. Acad. Sci.*, 1944, 30, 5—13).—Experiments on the development of Lobe 2, Lobe 3, Lobe 4, and eyeless mutants of *D. melanogaster* are described and it is shown that the abnormalities produced can be interpreted in a manner similar to that used for the Bar mutation. J. D. B.

Balance and potency in natural populations. L. G. Wigan (*J. Genet.*, 1944, 46, 150—160).—In females of *Drosophila melanogaster* the variability in no. of sternopleural bristles (a polygenic character) was less between those families where homologous wild chromosomes were derived from different individuals than between families where the homologues were identical. Polygenic combinations controlling bristle no. are relationally balanced. The data indicate that there are local breeding populations within which a better balance exists than within the species at large. Mating and balance systems are adjusted to each other and any interference with the

mating system will increase the variability and reduce the fitness of the population. The word "potence" is suggested to describe a measurable relation (analogous to dominance) which exists between polygenic combinations. W. F. H.

Intersexual mutants in *Habrobracon* (a parasitic wasp). P. W. Whiting (*Biol. Bull.*, 1943, 85, 238—243). G. P. W.

III.—PHYSICAL ANTHROPOLOGY.

Variation of diastemata in dentition of anthropoid apes and its significance for origin of man. M. F. A. Montagu (*Amer. J. phys. Anthropol.*, 1943, 1, 325—353).—Data concerning skulls of 256 anthropoid apes of all age groups is presented. Premaxillary diastemata are present in all anthropoid apes except the adult female orang, in which it is absent in 5.8% of cases. Two steps were involved in the reduction of the premaxillary space: (1) reduction of the canine tooth by mutation, and (2) reduction of the premaxillary space following upon this only after a considerable period. It is suggested that the second step occurred in some form intermediate between *Pithecanthropus* and *Sinanthropus*, or in the *Sinanthropus* group itself. W. F. H.

Neglected anatomical feature of Foxhall jaw. L. C. Eiseley (*Trans. Kansas Acad. Sci.*, 1943, 46, 57—59).—Attention is drawn to the presence of triple foramina instead of a single mental foramen on the left side of the lost Foxhall jaw. In *Sinanthropus* the opening is constantly multiple. The Heidelberg jaw has three foramina on the right side and two on the left; Neanderthal specimens generally are characterised by two foramina on each side. In modern man three foramina openings have an incidence of 0.19%. J. D. B.

Racial and phylogenetic distinctions in intertemporal-interangular index [of Cameron]. L. C. Eiseley (*Trans. Kansas Acad. Sci.*, 1943, 46, 60—65).—Data are given for a no. of races (fossil and neanthropic, including caucasoids, negroids, and melanesians). It is concluded that there are clearly marked distinctions among the racial groups in regard to the index, but that there is a considerable degree of overlap in range as between individuals. J. D. B.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Perivascular spaces of mammalian brain. P. R. Patek (*Anal. Rec.*, 1944, 88, 1—24).—Perivascular spaces extend from the sub-arachnoid space to the beginning of capillaries where their contents are continuous with the neural tissue fluid. The formation of the mesothelial cell membranes forming the inner and outer lining walls of the spaces from arachnoid and pia respectively is described. Four potential, shrinkage or pathological, artefact intervals in relation to the spaces, glial membranes, and brain substance are identified. The perivascular spaces are regarded as extra-adventitial and it is concluded that no anatomical barrier exists between capillaries of the brain and brain tissue. W. F. H.

Histology of meninges of toad (*Bufo*). S. L. Palay (*Anat. Rec.*, 1944, 88, 257—270).—Pia, arachnoid, and dura, separated from one another by subarachnoid and subdural spaces, are present. The dura is firmly adherent to the inner walls of the cranium and vertebral canal. Cellular trabeculae connect arachnoid and pia. Flattened fibroblasts line the subdural space. "Inclusion-bearing" meningocytes cover the external surface of the arachnoid and are peculiar to this membrane. No mesothelial layer was observed. Meningocytes are capable of phagocytosing foreign particulate matter (e.g., India ink and blood). The cytoplasm contains fine argyrophil fibres. W. F. H.

Histology of meningeal myeloid tissue in ganoids *Amia* and *Lepidosteus*. E. Scharrer (*Anat. Rec.*, 1944, 88, 291—310).—In *Amia* and *Lepidosteus* the mass of tissue above the fourth ventricle is of myeloid character. In it, erythrocytes, granulocytes, and lymphocytes occur and are released into the circulation. Mature red cells can pass through its sinusoids. Myeloid tissue also fills small bone-lined cavities of the skull. Nerve fibres and nerve cells were demonstrated in this tissue and the question of the innervation of bone marrow in higher vertebrates is discussed. W. F. H.

Cytological study of diurnal cycle of liver of mouse in relation to storage and secretion. H. W. Dean (*Anat. Rec.*, 1944, 88, 39—65).—Glycogen appears first in the peripheral part of the lobule, then more centrally soon after feeding. There is not always a correlative increase in cell size. The appearances observed during the period of glycogenolysis are described. The secretion of bile acids reaches its max. shortly before the time of feeding. No antagonism exists between deposition of glycogen and that of fat, or between secretion of bile salts and storage of glycogen. Mitochondria are shorter, broader, and stain more darkly at the periphery of the lobule but they exhibited no change in relation to the diurnal cycle. More Golgi substance occurs in the peripheral por-

tion late in the diurnal and is larger and more osmophilic at this site than at the centre. Mitochondria and Golgi substance do not appear to play direct rôles in the storage of glycogen and fat, or in the secretion of bile acids. W. F. H.

Cytological study of effect of trypan-blue on liver of mouse. H. W. Deane (*Anat. Rec.*, 1944, 88, 245—255).—Trypan-blue in small doses is toxic to and produces mitoses of hepatic cells. Following injections of the dye there is a reduction in the amount of glycogen storage. The secretion of bile acids is unaffected. Peripheral zone mitochondria become broader and shorter than normal. Golgi substance suffers no visible change but signs of cellular abnormality in the preps. for Golgi substance were noted. There appears to be no relationship between mitochondrial changes and the processes of storage and secretion. W. F. H.

Rate of healing of cutaneous wounds of extremities of mice in relation to nerve supply. F. A. Gurevitch (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 400—401).—Experiments are described in which wound healing was studied after section or continuous block anaesthetisation of the sciatic nerve. In each set of experiments the healing time was markedly prolonged as compared with controls in which there was no interference with nerves. J. D. B.

Influence of surrounding tissues on wound healing. F. A. Gurevitch and V. E. Tschetschekin (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 31, 402—403).—Experiments on rats are described which are interpreted as demonstrating that the process of regeneration is dependent on the state of the immediately surrounding parts. J. D. B.

Cytoplasmic granules of sea urchin eggs. D. L. Harris (*Biol. Bull.*, 1943, 85, 179—192).—By breaking *Arbacia* eggs in isotonic Na citrate and then centrifuging, the granules and cytoplasm could be separated. The pigment granules are vacuoles, and behave as leaky osmometers. G. P. W.

Anaphase movement in insects. H. Ris (*Biol. Bull.*, 1943, 85, 164—178).—The movement of the chromosomes at anaphase was measured in living mitotic and meiotic divisions of the aphid *Tamalia*, and also in *Protenor* (Heteroptera) and *Thelia* (Homoptera). In all divisions except the first meiotic division of *Tamalia* the curve of distance between the separating chromosomes against time consisted of two S-shaped portions separated by a plateau. It is concluded that in the first part of anaphase the chromosomes move towards the poles while in the second the spindle is elongating. In the first meiotic division of *Tamalia* the anaphase movement is described by a simple unbroken curve. G. P. W.

Electron microscope studies of sea urchin sperms and eggs. E. B. Harvey and T. F. Anderson (*Biol. Bull.*, 1943, 85, 151—156).—When washed with distilled water and dried, the sperm tails of *Arbacia* break up into about 10 fibrils of thickness about 50 m μ , and also show regularly-spaced cross striations. The fertilisation membrane reveals no regular structures or patterns. G. P. W.

Effect of water-soluble chlorophyll derivatives and other agents on growth of fibroblasts in tissue culture. L. W. Smith and M. E. Sano (*J. Lab. clin. Med.*, 1944, 29, 241—246).—Vitamin-B complex and -C cause no change in the rate of growth of fibroblasts in tissue cultures. Sulphanilamide in concns. of more than 1:5000 retard such cell growth. Castilian malva, methionine, and Simms' ultrafiltrate cause a prompt but temporary increase in the rate of growth during the first 24—48 hr. followed by a levelling off of the curve to control level. Chlorophyll in concns. of 0.05—0.5%, when added to comparable tissue cultures of embryonic fibroblasts, causes an immediate growth response. This growth-stimulating effect can be maintained by replenishing the medium with chlorophyll every 48 hr. C. J. C. B.

Effect of l-ascorbic acid on epithelial sheets in tissue culture. R. Chambers and G. Cameron (*Amer. J. Physiol.*, 1943, 139, 21—25).—Guinea-pig embryo kidney and parotid gland and chick embryo kidney and intestine tissue cultures ceased to grow when treated with plasma and serum from scorbutic guinea-pigs; the epithelial sheets did not lose their coherence. l-Ascorbic acid is not essential to re-establish the coherence of epithelial sheets previously separated by the lack of Ca in the medium. Cultures, washed free from water-diffusible components of the medium and transferred to a buffered salt and glucose solution, remained healthy and active only in the presence of l-ascorbic acid. The viability of the tissue cultures was not affected by addition of adrenal cortex extracts either in the presence or absence of ascorbic acid. A. S.

Pappenheim stain—stable modification. G. A. Hunt (*J. Lab. clin. Med.*, 1944, 29, 207—210).—A stain of the Pappenheim bicolour type which is stable and gives as good differentiation as the original freshly prepared methyl-green-pyronine reagent consists of 1% aq. malachite-green 1.2 c.c., 0.5% aq. pyronine G or pyronine 2G 3 c.c., distilled water 20 c.c. A stock solution of malachite-green in distilled water is prepared 2 days before use and filtered. The material is stained for 30 sec.—3 min. and washed with water. C. J. C. B.

Bodian method applied to demonstration of melanin. W. B. Dublin (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 127—129).—Tissue is fixed in 10% solution of formalin, embedded in paraffin, and cut at 8 μ ; after removing the paraffin it is hydrated through graded alcohols in the usual manner. The sections are placed overnight at 37° in 1% aq. protargol, rinsed in tap water, reduced for 10 min. in 1% aq. quinol, rinsed in tap water, placed for 5 min. in 0.5% aq. AuCl₃, rinsed in tap water, placed for 5 min. in 5% aq. oxalic acid, rinsed well in tap water, placed for 5 min. in 10% Na₂S₂O₃, washed in running tap for 10 min., dehydrated through graded alcohols, cleared in xylol, and mounted in balsam. C. J. C. B.

Hæmatoxylin-eosin tissue stain. E. E. Ziegler (*Arch. Path.*, 1944, 37, 68—69).—A new technique for the routine hæmatoxylin-eosin tissue stain is described, requiring less than 15 min. The section is dipped 8 times successively in xylene, second xylene, abs. alcohol, second abs. alcohol, 95% alcohol, and isotonic solution of NaCl, stained in ripened alum-hæmatoxylin for 6 min., dipped 8 times in isotonic NaCl, 4 times in 2% phosphotungstic acid in isotonic NaCl, 8 times in isotonic NaCl, 4 times in 2% Na citrate in isotonic NaCl, and 8 times in isotonic NaCl, counterstained 2 min. in 5% eosin in a 50% mixture of alcohol and distilled water, dipped 8 times successively in 95% alcohol, abs. alcohol, second abs. alcohol, xylene, and second xylene, and mounted in balsam. C. J. C. B.

Decalcification of bone. R. D. Lillie (*Amer. J. Path.*, 1944, 20, 291—296).—Slow decalcification of decorticated cancellous bone with excellent subsequent marrow staining by Romanovsky stains may be accomplished with NH₄NO₃, NH₄Cl, or KH₂PO₄; decalcification of cortical bone is too slow for practical use. Buffered Na citrate-formic acid mixtures with initial pH above 3.0 are a little faster, decalcify cortical bone slowly, and permit good marrow staining even with several days' exposure beyond apparent decalcification. Buffered formic acid solutions with initial pH of 2.5 are faster, but impair marrow staining and are not better than 5% aq. formic acid. Acetic acid is an inefficient, and trichloroacetic acid a good, decalcifying agent. HNO₃ and H₂SO₄ are prompt decalcifying agents, but the first promptly spoils Romanovsky staining of marrow, and the second does so if decalcification takes 2 days or more. With 5% formic acid, 40 c.c. per g. of bone should be used for prompt decalcification. For simultaneous fixation and decalcification, 5% formic acid in place of acetic can be added in such fluids as Zenker's, Bouin's, and "PFF." 80% alcohol solutions of formic, acetic, and salicylic acids do not decalcify, nor do acetic or formic Carnoy's fluids. C. J. C. B.

Quick paraffin method for small biopsies. A. E. Slavkin (*J. Lab. clin. Med.*, 1944, 29, 74).—Satisfactory paraffin sections may be obtained within 1 hr. by the following procedure. The material is fixed in 4% formalin or in Zenker's fluid at room temp. for 10 min. (after Zenker fixation, it is washed in several changes of tap water), stained in hæmatoxylin for 1 min. so that the pieces may be more readily seen in the block, washed in tap water, dehydrated in 80% alcohol 3 min., 95% 3 min., abs. 3 min., cleared in xylol, 5 min., transferred to melted paraffin at 56° for 5 min. and a second paraffin at 56° for 5 min., and embedded in paraffin. Thin sections are cut, transferred to slides, dried for 5—10 min. at 50°, and cooled. The staining procedure is as usual for paraffin sections. After Zenker fixation Lugol solution is used as usual. If special stains are required, the hæmatoxylin may be decolorised in 1% acid alcohol. C. J. C. B.

V.—BLOOD AND LYMPH.

Tissue metabolism studies on bone marrow.—See A., 1944, III, 479.

Effect in vitro of propylene glycol on erythrocytes. T. G. Randolph and O. T. Mallery, jun. (*J. Lab. clin. Med.*, 1944, 29, 197—202).—The erythrocytes first disappear from the microscopic bright field but not from the dark field, coincident with the apparent gross "hæmolysis" of the blood-glycol solution. In time, depending on temp. and glycol concn., the erythrocytes reappeared in the microscopic bright field. The spontaneous reappearance of red cells at higher temp. and glycol concns. is attributed to an increase in the intracellular versus the extracellular density and is most probably associated with the coagulation or pptn. or other alteration of cellular proteins, a process which finally leads to cell destruction and the formation of a dark granular ppt. Alteration of cell-free plasma also occurs in the presence of higher concns. of propylene glycol, resulting in ppt. formation; this suggests that the physicochemical reaction produced by propylene glycol is not one specifically affecting erythrocytes. C. J. C. B.

Potent typing sera produced by treatment of donors with isolated blood group specific substances. E. Witebsky, N. C. Klendshoj, and C. McNeil (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 167—170).—Intravenous injection of blood group A or B sp. substances, from horse or pig stomach, increased 8—10 times the titre of anti-A or -B agglutinins in human subjects. V. J. W.

Isolation of blood group A substance from pseudo-mucinous ovarian cyst fluids. H. K. King and W. T. J. Morgan (*Proc. Bio-*

chem. Soc., 1944, 38, xxxvi—xxxvii).—A method is used similar to that adopted for isolation of an *A*-substance from hog gastric mucin (cf. A., 1934, 910; 1944, III, 226). It yields a product which is chemically similar but significantly more serologically active by the iso-agglutination inhibition test. Purified material has C 44.8, H 6.7, N 6.0, acetyl 10%, $[\alpha]_{D}^{25} +7^\circ$. Hydrolysis with *N*-HCl at 100° yields reducing substances 47%, hexosamine 25%, amino-N 4.4%, α -amino-acid-N 2.5%. Hydrolysis with 0.1*N*-Na₂CO₃ at 100° gives max. colour with Ehrlich's reagent after 10 min. heating equiv. to 15% *N*-acetylglucosamine, and reduction reaches a max. of 5.2% after 15 min. Both these fractions are almost completely dialysable through Cellophane. Complete acid hydrolysis yields amino-acids only from the non-dialysable fraction, whilst hexosamine and reducing substances are formed in equal amounts from both fractions. P. G. M.

Chemotherapeutic studies on transmitted mouse leukaemia.—See A., 1944, III, 480.

Case of methaemoglobinemia [treated with ascorbic acid]. E. J. King, M. Gilchrist, and J. C. White (*Proc. Biochem. Soc.*, 1944, 38, xxxiv).—A chronic case of methaemoglobinemia is described in which the condition was relieved by daily administration of 300–600 mg. of ascorbic acid, coincident with an increase in plasma- and urinary ascorbic acid and decrease in leucocyte count. P. G. M.

Respiratory and circulatory responses in dogs to acute methaemoglobinemia produced by aniline. B. B. Clark, E. J. van Loon, and W. L. Adams (*Amer. J. Physiol.*, 1943, 139, 64–69).—Methaemoglobin concns. of 48–68% were produced by ingestion of 50 mg. per kg. body wt. of aniline in unanaesthetised dogs; there was no respiratory stimulation. Cardiac output and heart rate were increased. Arterial O₂ content was reduced in proportion to the methaemoglobinemia, but the arterial O₂ saturation remained unchanged. The venous O₂ saturation decreased in spite of the increase in cardiac output. A. S.

Cyanosis in pregnancy due to sulphhaemoglobinemia. W. B. Ayre (*Canad. Med. Assoc. J.*, 1944, 50, 344–348).—Cyanosis occurred in the patient at a sulphhaemoglobin concn. of 0.444 g.-%; 0.12 g.-% of sulphhaemoglobin was found in the cord blood. The child otherwise appeared normal. The patient had been taking acetanilide and phenacetin. C. J. C. B.

Widespread capillary and arteriolar platelet thrombi. A. I. Bernheim (*J. Mt. Sinai Hosp.*, 1943, 10, 287–291).—Report of a case in a 33-year-old woman with acute, thrombocytopenic febrile anaemia, ending fatally within 2 weeks. No agglutinins for platelets of the same blood were found in the serum. E. M. J.

Relation between immunity, reticuloendothelial system, and antithrombin. M. Volkert (*Biochem. Z.*, 1941, 309, 337–342).—When rabbits are immunised with ox "Bordet plasma," 5% ovalbumin, or 5% edestin, the first two injections have no effect, whilst after the 3rd (given 5 days after the 1st) there is a gradual increase in the antithrombin content of the blood by 70% after 14 days. The curve of antithrombin resembles that of antibody formation. Although there is a great increase in antithrombin content the coagulation time is unaffected. Immunisation with a mixture of types 1, 2, 3, and 5 pneumococci has no effect. After anaphylactic shock there is a pronounced and rapid increase in antithrombin content, which decreases to normal in 6 hr. and after a further 2 hr. rises and attains the original max. val. 26 hr. after the shock. Blocking the reticuloendothelial system of the normal rabbit by intravenous injection of India ink (0.1 c.c. per kg.) causes only a slight decrease in antithrombin content, whilst with immunised rabbits there is no increase. Intravenous injection of India ink (0.5 c.c. per kg.) into cats produces a very marked decrease with no subsequent increase, of antithrombin. When rabbits suffer severe loss of blood after previous injection of India ink there is a further decrease in antithrombin content, but this increases during 1–2 days to the level before operation, from which it is concluded that injection of India ink does not block formation of antithrombin. It is suggested that the normal antithrombin of serum consists of at least two components; the first, which amounts to 20% of the total is formed by the reticuloendothelial system and is blocked by India ink, whilst the remaining 80% is independent of this system. J. N. A.

New heterocyclic compound with antihæmorrhagic (vitamin-K) activity.—See A., 1944, II, 199.

Rôle of oxidised part of vitamin-K in experimental -K avitaminosis.—See A., 1944, III, 489.

Possible function of vitamin-K in plants.—See A., 1944, III, 515.

Plasma-fibrinogen in guinea-pig scurvy.—See A., 1944, III, 488.

Intra-vitam staining and toxicity of chlorazol-fast-pink in mice and rats.—See A., 1944, III, 450.

Control of blood coagulability with [di]coumarin. J. E. Rhoads, J. Walker, and L. Panzer (*Northw. Med.*, 1943, 42, 182–185).—3 : 3'-Methylenebis-(4-hydroxycoumarin) was given by mouth in 13 cases of thrombophlebitis, 2 of pulmonary embolism, 2 of central retinal

thrombosis, and 1 of coronary occlusion, with resultant improvement. A dose of 600 mg. is aimed at in 3 days to produce a prothrombin time of 60–90 sec., the third dose being varied according to the time obtained on the third day. Prothrombin times of up to 240 sec. have been observed. Coagulation times may be kept steady by additional intramuscular injection of 10 c.c. of heparin per day. E. M. J.

Deterioration of complement activity in normal human serum. A. W. Pohl and D. D. Rutstein (*J. clin. Invest.*, 1944, 23, 177–180).—In normal individuals, the median amount of human serum required to produce 50% hæmolysis of a standardised sheep red cell suspension is 0.0049 ml. The median is not significantly changed by age, sex, or a 48-hr. delay, at 6°, between the time of collecting and of testing. At 6° the median complement activity of specimens of human serum is reduced beyond the lower limits of normal in 11–13 days. The median % decrease in this time interval is 44%. At room temp. (23–25°), there is a similar reduction in 2 days. C. J. C. B.

Clinical application of plasma. S. O. Levinson (*N.Y. Sta. J. Med.*, 1943, 43, 1615–1618).—A review. E. M. J.

Principles and methods of desiccation of plasma. F. Oppenheimer (*N.Y. Sta. J. Med.*, 1943, 43, 1611–1614). E. M. J.

Physiology of shock [and blood substitutes]. H. Necheles (*N.Y. Sta. J. Med.*, 1943, 43, 1601–1606).—A review. E. M. J.

Laboratory aspects of preparation and biological control of plasma. A. Milzer (*N.Y. Sta. J. Med.*, 1943, 43, 1606–1611). E. M. J.

Treatment of severely burned patient and controlled protein replacement. E. B. Mahoney and J. W. Howland (*N.Y. Sta. J. Med.*, 1943, 43, 1307–1313).—A review and report of 3 cases. E. M. J.

Diurnal rhythm in blood-sugar of white rat. G. C. Pitts (*Amer. J. Physiol.*, 1943, 139, 109–116).—A 10% difference between noon and midnight vals. of blood-sugar in white rats persists during 36–48 hr. of fasting but disappears during longer fasts. By training animals to feed during the day the feeding and spontaneous activity cycles of the animals can be dissociated; the blood-sugar cycle follows the feeding rather than the activity cycle. This change in the blood-sugar cycle becomes apparent after 5–14 days of the new feeding routine. A. S.

Effect of sodium iodide, magnesium sulphate, thyroxine, and thyrotropic hormone on blood-magnesium partition. L. J. Soffer, C. Vohn, G. Lesnick, H. Sobotka, and M. Jacobs (*J. clin. Invest.*, 1944, 23, 263–266).—The administration of MgSO₄, NaI, and thyroxine produced no change in the % of bound Mg in normal dogs. Injections of thyrotropic hormone increased the % of bound Mg, followed by a fall. After stopping injections the % of bound Mg increased. C. J. C. B.

Blood-ammonia data. R. R. Formenti (*Rev. Fac. Cienc. Quím., La Plata*, 1942, 17, 247–256).—Human and guinea-pig blood-NH₃ determined by the method of Parnas and Heller (A., 1925, i, 323) and expressed as N have vals. of 0.645–0.780 (mean 0.713) and 0.650–1.430 (mean 0.950) mg. per l. respectively. The rate of formation of NH₃ in human blood is decreased by addition of anticoagulating antierments but increased by heating at 56°, whence the formation of blood-NH₃ *in vitro* is considered to be an enzymic process. F. R. G.

Spectrographic study of normal and arthritic blood. J. S. Hepburn, C. A. Hull, and J. A. Doane (*J. Franklin Inst.*, 1943, 235, 167).—Na, K, Ca, Mg, Fe, Cu, Al, P, and Si were present in both normal and arthritic venous blood. Al was high in 5 (out of 40) of the arthritic bloods, and P was slightly less than in normal blood. Ni was found in 9 (out of 40) samples of normal blood. A. J. M.

Species variation in normal blood-lipins estimated by oxidative micro-methods. E. M. Boyd (*Canad. J. Res.*, 1944, 22, E, 39–43).—The plasma of 10 healthy bullfrogs and of 15 healthy, adult dogs was analysed for lipins by oxidative micro-methods. The lipin content of the plasma of bullfrogs was low (240 mg.-% ± 32) and of the order of that found previously in guinea-pigs, but there was no neutral fat present. The lipin content of dog plasma was high (590 mg.-% ± 133). The concn. of lipins in the red blood cells of bullfrogs was similar to the vals. previously found in rabbits, man, and guinea-pigs. C. J. C. B.

Effect of prolonged lecithin feeding on hypercholesterolaemia. D. Adlersberg and H. Sobotka (*J. Mt. Sinai Hosp.*, 1943, 9, 955–956).—5 cases of xanthomatosis and hypercholesterolaemia showed a 50% decrease in serum-cholesterol on daily doses of 12–15 g. of defatted or soya-bean lecithin over periods of 1–2 months. On stopping the lecithin the original high vals. were again reached after a few months. E. M. J.

Blood picture in furunculosis induced by *Bacterium salmonicida* in fish. J. B. Field, L. L. Gee, C. A. Elvehjem, and C. Juday (*Arch. Biochem.*, 1944, 3, 277–284).—Furunculosis was induced in carp by inoculation with *B. salmonicida*. The blood-sugar concn. fell from approx. 100 to 6–12 mg.-% in 3 days and then rose slowly.

The non-protein-N and amino-acid-N concns. in the blood rose to many times their previous (normal) vals.; the urea and creatine concns. also increased. There were no changes in red or white cell counts, hæmoglobin, or total plasma-protein. The fibrin clot from diseased fish was granular and flocculent, that from normal fish was firm and cohesive. These gross changes in the blood were related to the proteolytic power of the bacterium. E. R. S.

Behaviour of hydroxyapatite in serum and similar fluids. R. Klement and R. Weber (*Biochem. Z.*, 1941, 308, 391—398).—The greater solubility of hydroxyapatite, $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$, in aq. glycine or gelatin or serum than in water is conditioned by a shift of the reaction $\text{NH}_2\cdot\text{R}\cdot\text{CO}_2' + \text{OH}' \rightleftharpoons \text{NH}_2\cdot\text{R}\cdot\text{CO}_2' + \text{H}_2\text{O}$ towards the right-hand side. The dissolved Ca is in ionic form and not combined as a complex. Diffusion experiments indicate that withdrawal of Ca to produce bone tissue in the body is an adsorption phenomenon. The solubility in Tyrode's solution and sera shows that the circulating serum is supersaturated with hydroxyapatite. F. O. H.

Case of histoplasmosis (Darling) with autopsy. S. H. Colvin, jun., I. Gore, and M. Peters (*Amer. J. med. Sci.*, 1944, 207, 378—384).

Protein content of extracellular fluid in normal subjects after venous congestion and in patients with cardiac failure, anoxæmia, and fever. E. A. Stead, jun., and J. V. Warren (*J. clin. Invest.*, 1944, 23, 283—287).—The filtrate from the capillaries of the skin and subcutaneous tissues normally contains less than 0.24 g.-% of protein. Elevation of the venous pressure in the leg by a cuff to 30 mm. Hg produces œdema fluid which contains 0.4—1.3 g.-% of protein. Cardiac failure, fever, severe general anoxia, and acute infectious disease do not make the leg capillaries more permeable to protein. Although local ischæmia produces capillary damage and leakage of protein, generalised stagnant anoxia of a degree compatible with life does not increase capillary permeability. C. J. C. B.

VI.—VASCULAR SYSTEM.

Destruction of acetic acid by heating heart. J. Barcroft, R. A. McAnally, and A. T. Phillipson (*Proc. Biochem. Soc.*, 1944, 38, xxx).—Acetic acid is metabolised during passage through the coronary vessels of the heart to approx. the same extent as carbohydrate. This metabolic route of carbohydrate in herbivora thus appears to rank equally with other routes. P. G. M.

Low heart rate in newborn rats. F. L. Marcuse and A. U. Moore (*Amer. J. Physiol.*, 1943, 139, 49—51).—One-day-old rats, compared with 120-day-old animals, have a lower heart rate which shows less fluctuations; there were no sex differences in the rate of the newborn rats. Heart rate steadily increased in the first 11 days of life. No further increase was observed from the 11th to 21st day. Sex differences become apparent from the 10th day. A. S.

Correlation between vitamin-B₁ content of diet and electrocardiographic findings in 91 pregnant women.—See A., 1944, III, 486.

Differential effects of stretch on stroke volumes of right and left ventricles. W. G. Moss and V. Johnson (*Amer. J. Physiol.*, 1943, 139, 52—55).—The relationship between initial diastolic fibre length and stroke vol. in dogs was more direct in the right than in the left ventricle, a given increment in diastolic vol. of the right ventricle being more effective in increasing the stroke vol. than the same diastolic increment in the left ventricle. Following occlusion of the aorta the smaller stroke vol. increase of the left ventricle in response to stretch is partially due to the increase in peripheral resistance. The main reason for the greater stroke vol. response of the right ventricle to increased stretch is the straighter course of the muscle fibres in the right ventricle. A. S.

Electrocardiograms in gallbladder disease. E. Moschowitz (*J. Mt. Sinai Hosp.*, 1944, 10, 632—635).—A prolonged P-R interval returned to normal after cholecystectomy following non-visualisation on peroral cholecystography. E. M. J.

[Clinical diagnosis of] idiopathic dilatation of pulmonary artery. A. Grishman, M. F. Steinberg, and B. S. Oppenheimer (*J. Mt. Sinai Hosp.*, 1943, 10, 142—149).—Report of 4 cases in whom no clinical or angiocardigraphic evidence of other congenital abnormalities of the heart was found. In all cases a faint systolic murmur was heard over the apex and pulmonary area and in 2 cases a Graham-Steell murmur was present. E. M. J.

Respiratory changes in pulmonary vascular capacity. C. Dupee and V. Johnson (*Amer. J. Physiol.*, 1943, 139, 95—98).—Isolated dog hearts or dog heart-lung preps. were used. The magnitude of the increase in pulmonary vascular capacity in inspiration was adequate to accommodate the extra blood ejected by the right ventricle in inspiration. The respiratory changes in pulmonary vascular capacity occur chiefly in the pulmonary veins. A. S.

Effect of heparin on vasoconstrictor action of shed blood tested by perfusion of rabbit's ear. E. M. Landis, J. E. Wood, jun., and J. L. Guerrant (*Amer. J. Physiol.*, 1943, 139, 26—38).—Defibrinated

blood, used as perfusion fluid, produces marked, heparinised blood moderate, vasoconstriction in the surviving rabbit's ear. 0.2 c.c. of defibrinated blood and of serum from normal rabbits, dogs, and man produces marked vasoconstriction. Heparinised blood or blood from animals previously heparinised had a much less marked constrictor effect. Plasma rapidly separated from heparinised or "pre-heparinised" blood of normal rabbits, dogs, or man had little or no vasoconstrictor activity. A. S.

Capillary permeability in experimental burns and burn shock using radioactive dyes in blood and lymph. O. Cope and F. D. Moore (*J. clin. Invest.*, 1944, 23, 241—257).—Capillary permeability was studied in dogs by injecting radioactive salts and colloids into the blood stream and measuring their appearance in the lymph from various areas. Radioactive Br⁻ is found in the leg, cervical, and thoracic lymph within 5 min.; in 20 min. radioactive equilibrium was reached between these lymph and the blood serum. The rise in concn. in the lymph following injection of the radioactive colloids is slow and equality is not reached under control conditions. Following a hot-water burn of a leg, the concn. of radioactive colloids in the lymph from this leg rises abruptly and approaches that encountered after injection of the inorg. ion; there is also a preferential escape through the capillary wall of one fraction of the plasma-protein. Adrenal cortical extract injected intravenously had no effect on capillary permeability. C. J. C. B.

Effect of the injection of histamine into brachial artery on permeability of capillaries of forearm and hand. E. A. Stead, jun., and J. V. Warren (*J. clin. Invest.*, 1944, 23, 279—281).—Histamine injected intra-arterially increases the permeability of the capillaries supplied by the artery. The rapid loss of protein from the plasma can be detected by comparing the blood draining from the part before and after the injection. The hæmatocrit reading and hæmoglobin concn. increased markedly while the protein concn. rose only slightly. C. J. C. B.

Blood vessel defect in swine suffering from inherited bleeding disease. E. T. Mertz and L. A. Hensel (*Amer. J. Physiol.*, 1943, 139, 117—122).—The animals showed no correlation between saline bleeding time and coagulation time. The saline bleeding is not changed by fluctuations in blood coagulability and measures the contractile ability of injured blood vessels. The prolonged saline bleeding time in the swine is due to a failure of the injured vessels to constrict normally. A. S.

Effect of rutin on increased capillary fragility in man. J. Q. Griffith, jun., J. F. Couch, and M. A. Lindauer (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 228—229).—Administration of this glucoside (20 mg. thrice daily) decreased capillary fragility in 8 out of 11 hypertensive patients. V. J. W.

Obstructive lesions of main renal artery in relation to hypertension. C. L. Yuile (*Amer. J. med. Sci.*, 1944, 207, 394—404).—A crit. review. C. J. C. B.

Thoracolumbar sympathectomy in essential hypertension. J. W. Hinton (*N. Y. Sta. J. Med.*, 1944, 44, 884—888).—Report of 40 cases. E. M. J.

Influence of anaesthesia (ether, cyclopropane, sodium evipal) on circulation under normal and shock conditions. H. S. Bennett, D. L. Bassett, and H. K. Beecher (*J. clin. Invest.*, 1944, 23, 181—200).—The effects of Na evipal in the dog were: deepening the anaesthesia of subjects in good condition and in shock was followed by reduction in systolic, diastolic, and mean arterial pressures, rise in central venous pressure, and diminished blood flow. In shock, recovery was delayed and incomplete. The effects of ether were: with the subjects in good condition, deepening of the anaesthesia was associated with a progressive rise in venous pressure, a slight initial rise in systolic, diastolic, and mean arterial pressure, followed by a fall, and a diminution in blood flow. In shock, recovery was delayed. Repeated deepening of the ether anaesthesia was deleterious; it hastened the development and increased the degree of shock, as measured by the increasing delay in recovery. The effects of cyclopropane were: with the subjects in good condition, on deepening the anaesthesia, the central venous pressure rose progressively; arterial pressure showed inconsistent changes. Heart rate progressively decreased, femoral flow usually decreased, while that in the carotid and mesenteric beds increased. Repeated deepening of anaesthesia has no lasting deleterious effects. Cyclopropane may offer a wider margin of safety for anaesthesia in the seriously wounded than ether or Na evipal with respect to blood pressure and blood flow through essential vascular beds. C. J. C. B.

Effect of cyclopropane on blood pressure, stroke volume, and heart size of dog.—See A., 1944, III, 495.

Tissue-thiamin in hæmorrhagic shock. B. Alexander (*J. clin. Invest.*, 1944, 23, 259—262).—The concn. of total and phosphorylated thiamin in the liver of dogs rose during prolonged hæmorrhagic shock caused by fractional bleeding. The increase in liver-thiamin is related to the duration of shock. The non-phosphorylated thiamin of muscle rose markedly during hæmorrhagic shock at the

expense of the cocarboxylase. The change in the free thiamin-cocarboxylase ratio in muscle is attributed to *in vivo* phosphatase splitting of phosphorylated thiamin, associated with the tissue anaërobiosis occurring in shock. C. J. C. B.

Thrombophlebitis as complication of thiocyanate therapy of hypertension. A. Koffler and A. W. Freireich (*Amer. J. med. Sci.*, 1944, 207, 374—376).—4 cases of thrombophlebitis are reported in the course of treatment of 40 cases of hypertension with thiocyanate. C. J. C. B.

Combined treatment of arterial embolism of extremities by vasodilators, anticoagulants, and embolectomy. F. S. Wetherell (*N.Y. Sta. J. Med.*, 1944, 44, 35—42).—Report of 10 cases. E. M. J.

Influence of vitamin-K preparations on blood pressure in hypertensive rats. H. Schwarz and W. M. Ziegler (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 160—162).—In rats made hypertensive by placing silk around the kidneys, blood pressure was lowered by intramuscular injections of 2-methyl-1:4-naphthaquinone, but not of Na₂ 2-methyl-1:4-naphthaquinol diphosphate. V. J. W.

Naturally occurring blood-thiocyanates and their relation to blood pressure.—See A., 1944, III, 494.

Circulatory reactions of rat traumatised in Noble-Collip drum. R. Chambers, B. W. Zweifach, and B. E. Lowenstein (*Amer. J. Physiol.*, 1943, 139, 123—128).—10—15% of rats exposed to 650 revolutions in the Noble-Collip drum either died in the drum, showed gross hæmorrhage (usually in the gut), sustained intracranial hæmorrhage and fractured skulls, or died within 20 min. after removal from the drum; the remainder survived for at least 1—2 hr. There was marked vascular engorgement in the duodenum, upper jejunum, cæcum, and, to a smaller extent, lower ileum. There was free fluid in the lumen of the gut and engorgement of spleen, liver, kidneys, and adrenals. There was a consistent drop in rectal temp. from 98—100° to 93—95° F. The blood pressure was lowered to 60—70 mm. Hg or less in fatal cases. The hæmatocrit increased and the total plasma vol., determined with a dye method, decreased by 12—15%. Protection of the abdomen during the drumming prevented shock in rats exposed to 1000 revolutions. The hyperæmic state of the mesenteric capillaries was mainly due to the direct trauma on the viscera. Concurrently with the fall in blood pressure the flow slowed down and arteriolar vasomotion gradually diminished. Adrenaline sensitivity was initially increased, particularly of the veins; it then progressively diminished. Hæmoconcn. was present within 30 min. of the trauma. In the terminal stages, the capillary flow became increasingly restricted and was accompanied by stagnation, especially in the venous capillaries. A. S.

VII.—RESPIRATION AND BLOOD GASES.

Effects of low atmospheric pressure on rats. D. C. Darrow and E. L. Sarason (*J. clin. Invest.*, 1944, 23, 11—23).—Rats were exposed to atm. pressures equiv. to altitudes of 20,000 and 24,000 ft. 3 groups were studied: normal rats, rats on a diet low in K, and rats which received deoxycorticosterone acetate for 14 days before and during the exposure. Depletion of adrenal cortical lipin occurred within 2 hr., reaching a max. after 28 hr. Recovery of cortical lipin is complete in 7 days, even if the low atm. pressure is maintained. Fasting alone does not produce similar changes. The extent of the depletion of lipin varies directly with the evidence of distress, being greatest in rats receiving deoxycorticosterone acetate, intermediate in those on the diets low in K, and least in those on the normal diet. The tendency of deoxycorticosterone acetate to produce cardiac lesions is aggravated by exposure to low pressures. Decrease in muscle-K is found in rats fasted for 7 days or kept at a pressure equiv. to an altitude of 25,000 ft. for 7 days. On exposure to low atm. pressure, normal rats and those receiving deoxycorticosterone acetate show an increase in intracellular Na of muscle. No decrease in muscle-K accompanies this increase in intracellular Na. Changes in liver composition (except increase in liver-glycogen) can be related to fasting but not directly to low atm. pressure, but the latter frequently induces enlargement of the liver. C. J. C. B.

Beneficial effect of oxygen therapy in experimental shock.—See A., 1944, III, 458.

Effect of anoxia on pressure of cerebrospinal fluid and on rate of absorption of normal saline solution from subarachnoid space of dogs under ether anaesthesia.—See A., 1944, III, 460.

VIII.—MUSCLE.

Action of sodium iodide and sodium thiocyanate on the phosphate metabolism of muscle.—See A., 1944, III, 491.

Morphology and mechanics of muscle fibre. E. Wöhlisch (*Kolloid-Z.*, 1941, 98, 261—267).—A review on the optical, X-ray, and elastic properties of muscle. J. H. Ba.

Electron microscope observations of clam muscle fibrils. M. A. Jakus, C. E. Hall, and F. O. Schmitt (*J. Amer. Chem. Soc.*, 1944, 66, 313—314).—Submicroscopic fibrils are obtained from the adductor muscles of marine and fresh-water clams. The fibrous protein has the solubility properties of myosin. Electron-microscope examination reveals long needle-shaped, even fibrils 200—1000 Å. wide, and, after treatment with osmic acid, a periodic variation in density along the fibril. From measurements of 100 fibrils, the period is 290—470 Å., with a mean val. of 360 Å. X-Ray diffraction of dried intact muscle gives the fibre axis period as 720 Å. W. R. A.

Sudden destruction of motor end plates by lactic acid. E. J. Carey and L. Massopust (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 194—197).—Lactic acid, 0.05—0.3%, injected into the sternomastoid of the rat destroyed the motor end plates in 30 sec.—25 min. according to concn. used. Histological details, with photomicrographs, are given. V. J. W.

Elastic after-effects in muscle and kinetic elasticity. H. H. Weber (*Kolloid-Z.*, 1941, 98, 269—273).—The ratio of elastic after-effect to instantaneous extension increases with increase in initial extension for myosin and muscle. If the extension is carried out in one step and compared with that in several stages, the total extension is the same but the fraction appearing as after-effect increases with the no. of stages. These observations do not agree with the models proposed by Meyer and by Lewin and Wyman. The effect of temp. on the rate and amount of the after-effect is small, indicating that the effect is not due to crystallisation. J. H. Ba.

Degree, extent, and mechanism of muscle spasm in infantile paralysis. H. D. Bouman and R. P. Schwartz (*N.Y. Sta. J. Med.*, 1944, 44, 147—151).—A review. E. M. J.

Intramuscular pressure during life and after death. L. Gunther, H. H. Henstell, and E. John (*Amer. J. Physiol.*, 1943, 139, 161—170).—The resistance of the muscle mass to saline injections is a measure of tissue pressure but only during life a measurement of tonus. Intramuscular pressure increments above 18 mm. H₂O can be measured in terms of increased venous blood pressure. However, venous pressure is not transmitted to the muscle mass in terms of changed intramuscular pressures. A. S.

IX.—NERVOUS SYSTEM.

Injection method to demonstrate the blood supply of nerves.—See A., 1944, III, 446.

Optic connexions in sheep. O. E. Nichterlein and F. Goldby (*J. Anat., London*, 1944, 78, 59—67).—The connexions of the optic nerves were investigated after unilateral enucleation of the eyeball. Marchi degeneration showed that 90% of the optic fibres cross in the optic chiasma and about 10% remain uncrossed. Some aberrant retinal fibres terminate in the supra-optic recess. The removal of the eyeball is followed by transneuronal degeneration in the three cellular laminae of the dorsal nucleus of the lateral geniculate body. The crossed fibres are connected with laminae 1 and 3 and the uncrossed fibres with lamina 2. W. J. H.

Reappearance of flicker at high flash frequency in patients with brain pathology and in normal subjects.—See A., 1944, III, 463.

Brain metabolism during electronarcosis. A. van Harreveld, D. B. Tyler, and C. A. G. Wiersma (*Amer. J. Physiol.*, 1943, 139, 171—177).—Electronarcosis increases the blood flow through the brain in dogs; the arterio-venous O₂ difference decreases. A. S.

Effect of carbon dioxide tension on metabolism of cerebral cortex and medulla oblongata.—See A., 1944, III, 489.

Bilateral difference in α-activity in electroencephalograms. H. Strauss, W. T. Liberson, and T. Meltzer (*J. Mt. Sinai Hosp.*, 1943, 9, 957—962).—Bilateral asymmetry in α-activity was present in 10—20% of cases without cerebral pathology according to the region observed. Asymmetry indices of 2 or more were rare in normal cases, and present in 8 of 52 cases of cerebro-vascular disease. E. M. J.

Acute schizophrenia in childhood. L. F. W. Eickhoff (*Edinb. Med. J.*, 1944, 51, 201—204).—A case of schizophrenia occurred in a female aged 5 who was regarded as mentally defective. A Terman-Merrill intelligence test was of val. in the differential diagnosis, which is discussed. H. S.

Calcium-protein system in serum and in cerebrospinal fluid. C. E. Lockhart (*Rev. Fac. Cienc. Quím., La Plata*, 1942, 17, 265—277; cf. C., 1944, Part 3).—Total Ca of c.s.f. in mental cases and tuberculous meningitis is greater than the serum-Ca⁺⁺, and the difference is greater than can be attributed to fixation of Ca by the proteins present in c.s.f., although the concn. of Ca⁺⁺ must presumably be equal in both media. F. R. G.

Periodic sympathetic spasm and relaxation and rôle of sympathetic nervous system in pupillary innervation.—See A., 1944, III, 461.

X.—SENSE ORGANS.

Medical aspects of refractive problems. J. N. Evans (*Sight Saving Rev.*, 1943, 13, 147—159).—A discussion of some of the evidence of systemic disease that may be met with during a routine eye examination.

A. J. B. G.

Chemotherapy in ophthalmology. P. Heath (*J. Amer. Med. Assoc.*, 1944, 124, 152—155).—The use of the sulphonamides in ocular affections should be accompanied by careful supervision of the patient in regard to general and local toxic effects. Their use should not be indiscriminate and the author puts forward suggestions for both drug and dosage in the treatment of blepharitis, conjunctivitis, keratitis, and intra-ocular and peri-ocular inflammations.

A. J. B. G.

Less evident causes of lowered acuity in senility. R. I. Lloyd (*Amer. J. Ophthalm.*, 1944, 27, 232—243).—The early stages of Fuchs' dystrophy may be missed without careful slit-lamp examination which shows the endothelial degeneration. Other conditions which may be associated with reduced visual acuity are holes at the macula and fine pigmentary changes, the latter probably due to nutritional disturbance in the pigment epithelium and in the rods and cones. Scotomata, central and paracentral, may be due to chronic glaucoma, vascular disease, or accident, or to intracranial tumours. Many of these scotomata will be missed unless quant. methods of perimetry, and particularly campimetry, are carefully used. Partial hemianopic lesions are not uncommon, may occur without serious illness, give rise to vague complaints, and may not require distant visual acuity.

A. J. B. G.

Eye tissues cultivated in vitro.—See A., 1944, III, 389.

Bilateral ptosis and atypical slant eyes associated with unilateral syndactyly, adactyly, and brachyphalangy. D. V. Giri (*Proc. Roy. Soc. Med.*, 1944, 37, 360—361).—This syndrome occurred in a male aged 18 whose father had slant eyes and whose mother had ptosis. An elder and a younger brother of the patient show no abnormality and there is no evidence of heredity in the parental pedigrees.

A. J. B. G.

Solar kerato-conjunctivitis associated with amblyopia. C. Berens and P. T. McAlpine (*Amer. J. Ophthalm.*, 1944, 27, 227—231).—Two brothers exposed to C arc lamps for three 15-min. periods in 48 hr. developed a superficial punctate keratitis with vision reduced to hand movements and the visual fields to a small temporal crescent. There was gradual recovery in the course of 11 days both of vision and of visual fields. The effect of infra-red rays on the retina is discussed and reference is made to eclipse blindness. It is thought that the above changes in the visual fields and the temporary amblyopia were due to thermal action of the arc lamp.

M. G. M.

Ariboflavinosis as probable cause of vernal conjunctivitis. L. Castellanos (*Arch. Ophthalm.*, 1944, 31, 214—216).—The symptoms of vernal conjunctivitis are described; it usually attacks males in childhood or adolescence in the hot weather. It is suggested that the condition is due to riboflavin deficiency, owing either to more rapid destruction of vitamins by ultra-violet rays, or to a greater need during the hot season. Riboflavin and milk were prescribed during hot weather and produced improvement in 10—15 days. Local treatment was indicated only if the condition became acute.

M. G. M.

Newer concepts of eye strain. E. E. Poos (*Eye, Ear, Throat*, 1944, 23, 107—110, 115).—Eye strain is prevalent and often reflects the general health of the patient. A carefully taken history is therefore essential. Treatment includes the correction of refractive errors and of anomalies of muscle balance, and attention to the general health and regime.

A. J. B. G.

Strabismus and its correction. O. B. Nugent (*Eye, Ear, Throat*, 1944, 23, 139—144).—Concomitant squint can be divided into three groups, early cases in the young, usually corrigible with glasses only; longer standing cases with developed amblyopia and false projection in whom orthoptic training and possibly operation is necessary; and older cases in whom orthoptic treatment is of little val. and operation is indicated. A technique for recession operations involving the use of an adjustable control suture is described.

A. J. B. G.

Rational basis for cross cylinder tests. J. I. Pascal (*Amer. J. Ophthalm.*, 1944, 27, 280—281).—Cross cylinder tests are most reliable when the eye is balanced, i.e., is as hypermetropic in one meridian as it is myopic in the other. This condition can be achieved by concurrent use of the duochrome test, and maintained by using correcting cross cylinders as well as testing cross cylinders.

A. J. B. G.

Radian methods in ophthalmic calculations. J. I. Pascal (*Eye, Ear, Throat*, 1944, 23, 144—148).—The radian method allows angular calculations to be made without recourse to trigonometrical tables, and in the measurement of large angles it gives more accurate results than the more generally used tangent relation.

A. J. B. G.

Practical ophthalmic test which furnishes quantitative data. A. E. Sloane and J. R. Gallagher (*Arch. Ophthalm.*, 1944, 31, 217—222).—

This test is suitable for large groups such as schools and can be carried out in a few min. by a technician after a short period of training. It records monocular and binocular visual acuity: (a) without glasses, (b) with glasses if worn, (c) with +1.50 D sph. over each eye or added to glasses if worn. In addition heterophoria for near and distance is noted. On the basis of the quant. findings cases are automatically referred for specialist examination, as also are those quantitatively normal who have symptoms of "eye-strain" in general anamnesis. About 14% of 797 schoolboys failed to pass the test for various reasons and the results of the technicians' examination agreed closely with those of the ophthalmologist. The test may be employed to grade persons as to their visual capacity.

A. J. B. G.

Problem of myopia. G. S. Pendse (*Indian J. Ophthalm.*, 1944, 5, 11—13).—The nineteenth-century mechanical conception of myopia does not satisfactorily meet all the facts, and treatment based on it has done little to reduce the incidence of the disease. The author argues that a statistical survey covering the various factors, social, familial, and personal, may be of help and a suggested "Information chart" is appended.

A. J. B. G.

Myopic families. K. N. Shukla (*Indian J. Ophthalm.*, 1944, 5, 1—5).—Pedigrees of families over two or three generations showing the incidence of myopia when one or both grandparents or parents were myopic.

A. J. B. G.

Moulded contact lenses made of plastics. W. N. M. Girling (*Northw. Med.*, 1944, 43, 17—19).

E. M. J.

Congenital opacities of cornea. E. H. Theodore (*Arch. Ophthalm.*, 1944, 31, 138—143).—Six cases, including two sisters, are described, in which patients were born with corneal opacities associated with anterior synechia and other developmental defects. The condition is illustrated with photographs and drawings. The various theories as to its developmental cause are discussed. Two cases of cousins which support Peter's theory are described, but the author thinks that most of his cases confirm Collins and Seefelder's theories and only one confirms Peter's theory. One case in which there is aphakia and pseudoglioma as well as the other defects presents a more difficult problem as congenital aphakia is rare.

M. G. M.

Simple method for early diagnosis of abnormalities of pupillary reaction. H. J. Stern (*Brit. J. Ophthalm.*, 1944, 28, 275—276).—Description of a method of making the pupil contract which does not affect the syphilitic pupil and can, therefore, be used in the diagnosis of this condition.

M. G. M.

Innervation of iris of albino rabbit in relation to function and pupillary abnormalities in man. O. R. Langworthy and L. Ortega (*Medicine*, 1943, 22, 287—361).

E. M. J.

Influence of alcohol on pupillary light reflex in man. C. R. Skoglund (*Acta Physiol. Scand.*, 1943, 6, 94—96).—Pupillary contractions were recorded with a film camera. 15 ml. of 50% alcohol given on an empty stomach dilates the pupil proportionally to the blood-alcohol by 10% for a max. concn. of 1.3:1000. The const. val. for a pupillary reflex contraction varied with the initial width of the pupil.

P. G.

Pigment freckles of iris (benign melanomas); their significance in relation to malignant melanoma of uvea. A. B. Reese (*Amer. J. Ophthalm.*, 1944, 27, 217—226).—Of 300 patients with "normal" eyes 48% had freckles (benign melanomas) on the anterior surface of the iris. The condition was noted in microscopic sections of 19 eyes in which malignant melanoma was present in the uveal tract. The difference between the two kinds was one of degree, varying from a small accumulation of pigment to one spreading through the whole thickness of the iris, causing it to swell. Photomicrographs illustrate the variations. The author failed to differentiate the two types clinically but thought it significant that freckles appeared on the iris of the eye excised for malignant melanoma but not of the normal in three cases examined. The melanomas are considered to be manifestations of the multiple origin of the tumour although they might be implantation growths. A case is described in which a presumably benign iris melanoma increased in size and coincidentally three freckles appeared on the iris, suggesting active growth of the main lesion. A malignant melanoma at one site with benign melanoma at other sites seems to be the bridge between the localised malignant melanoma and the diffuse malignant melanoma.

M. G. M.

Experimental studies on fatigue of accommodation. I. C. Berens and S. B. Sells (*Arch. Ophthalm.*, 1944, 31, 148—159).—The results of a partial analysis of 12 experiments on fatigue of accommodation using an ophthalmic ergograph are recorded. Data are the near points of accommodation for 57 subjects at 10 ft.-candles before and after each ergograph experiment. Differences between the initial and final near points are shown to be statistically significant and it is concluded that recession of the near point is due to fatigue of accommodation resulting from periods of exercise on the ergograph. Both eyes manifest fatigue even when only one works and the other is occluded, though the effect is more marked in the working eye.

A. J. B. G.

Pseudoaphakia fibrosa. J. W. Harned (*Arch. Ophthalm.*, 1944, 31, 253).—A case is described in which a child developed nystagmus and strabismus at a few weeks old. A white irregular plaque was seen in the pupil with strands extending to the periphery. The defect was thought due to degenerative changes occurring in the lens during the 5th week of embryonic life and not to a primary aphakia. M. G. M.

Experimental production of diabetic cataract in rat. V. G. Foglia and F. K. Cramer (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 218—219).—Cataracts were produced in male white rats by partial pancreatectomy. When 5% of the pancreas remained the lesions appeared from 50 days onward. No lesions appeared for 200 days when 20% was left. The degree of the cataract was found to be in direct relation to the level of fasting blood-sugar. R. H. K.

Cataract produced by anoxia. J. Bellows and D. Nelson (*Arch. Ophthalm.*, 1944, 31, 250—252).—When rats were subjected to reduction of O_2 pressure in a steel chamber, 50% of the dead animals and 10% of the survivors developed a cataract which gradually regressed when the animals were put in the fresh air. The lactic acid content of the aqueous was four times the normal in the cataract eyes but the pH was unaltered. The histologic changes in the lens are described and also the ocular changes as observed with the slit lamp. The opacity lay in the superficial layers of the lens cortex, began anteriorly, and spread to the periphery; occasionally complete cataract formed. M. G. M.

Studies on developmental pathology. I. Morphogenesis of hereditary type of microphthalmia in chick embryos.—See A., 1944, III, 386.

Genetics of retinoblastoma. A. D. Griffith and A. Sorsby (*Brit. J. Ophthalm.*, 1944, 28, 279—293).—The incidence of retinoblastoma at the Royal Eye Hospital was investigated and the results show that the tumour is still rare. Genetic behaviour of retinoblastoma is dealt with and data are given in support of the view that it may occur as a sporadic affection with unaffected sibs. The mode of inheritance is discussed. The incidence of the bilateral type appears to be higher in genetic retinoblastoma than in the sporadic cases and the possibility of a histologically distinct hereditary type is suggested. M. G. M.

Juvenile macular exudative choroiditis (juvenile dixiform degeneration of macula—Junius). F. H. Adler and H. Scarlett (*Arch. Ophthalm.*, 1944, 31, 144—147).—Three cases are described with fundus drawings. All the patients were young, healthy adults and all complained of gradual decrease in central vision of one eye within a few weeks. The vision eventually improved very slightly. The lesions described were oval and pigmented surrounded by small haemorrhages. There was no evidence of inflammation in any part of the eye and no choroidal exudate. The differential diagnosis of the following diagnostic possibilities is described: (1) acute macular choroiditis, (2) tuberculous lesions, (3) haemorrhagic macula, (4) degeneration of macula, (5) malignant melanoma. The condition is probably due to choroidal or sub-choroidal haemorrhage but no histological evidence is available. M. G. M.

Tests charts representing variety of visual tasks. M. Luckiesh (*Amer. J. Ophthalm.*, 1944, 27, 270—275).—The usual statement that visual acuity for normal eyes reaches a max. at 10 ft.-candles assumes testing with black objects on a white background, i.e., at maximal contrast. Such a method has gross limitations when applied to everyday seeing. By photography, with different degrees of fogging of the prints, 4 charts giving different degrees of brightness contrast were produced. Normal persons tested on these show that reducing the brightness contrast necessitates a large increase in the level of illumination in order that normal vision may be obtained. This increase under certain conditions may have to be to levels of 100—1000 ft.-candles to obtain 100% visual efficiency. A. J. B. G.

Incidence of colour-vision weakness. R. C. Gray (*Nature*, 1944, 153, 667).—As the result of observations on 138 medical students by means of the Ishihara test combined with the observations of previous investigators, it is concluded that colour vision weakness is unconnected with race and that deuteranomaly and protanomaly are independently inherited defects. E. N. W.

Ishihara test for colour blindness. R. W. Pickford (*Nature*, 1944, 153, 656—657).—On the basis of a comparison between the results of testing 87 subjects with the Rayleigh equation and by means of the Ishihara test, it is concluded that the Ishihara test is unsatisfactory in that it fails to separate accurately the different groups of colour-blinds, does not determine the extent of colour blindness, and does not consistently pick out red-green-weak subjects. E. N. W.

Comparison of Ishihara and American Optical Company series of pseudisochromatic plates. R. H. Harris (*Arch. Ophthalm.*, 1944, 31, 163—164).—For colour vision testing of American aviation candidates the Ishihara plates appear preferable because they are less time-consuming, more thorough in elimination, and less readily accessible for colour defectives to learn by heart before the examination. A. J. B. G.

Case of neurofibroma of choroid. P. D. Trevor-Roper (*Brit. J. Ophthalm.*, 1944, 28, 177—180).—Description of a case of neurofibroma arising in one of the ciliary nerves in a girl aged 3½ years. There is no evidence of Recklinghausen's disease in the patient or in her family. A. G. L.

Eye and nerve symptoms in connexion with cranial chordomata. E. Gotfredson (*Acta Ophthalm.*, 1943, 21, 224—236).—The embryological factors and pathology of chordomata are briefly described and an ophthalmological survey is presented of the author's case and of 24 others collected from the literature. The max. incidence is at about 30 years; only about half show growth in the nasopharynx, and eye signs eventually develop in about ½ of the cases. In 20% a sixth nerve paresis is the first symptom. Other oculomotor palsies, reduced vision, field changes, general symptoms of increased intracranial pressure, trigeminal neuralgia, facial palsy, and pyramidal signs also occur. Diagnosis is usually established in life only by biopsy. A. J. B. G.

Disintegration and restoration of optic recognition in visual agnosia. A. Adler (*Arch. Neurol. Psychiat.*, 1944, 51, 243—259).—A careful clinical observation of a woman aged 22 suffering from visual agnosia due to damage of the occipital cortex by CO fumes. The fundamental disturbance consists of an inability to perceive the whole, the "Gestalt," visually. This resulted in an inability to read, to copy letters and geometric figures, and to recognise pictures or objects on short exposure. Writing is unimpaired. P. G.

Terminal stages in development of human stapes. B. J. Anson, E. W. Cauldwell, and A. F. Reimann (*Ann. Otol., etc., St. Louis*, 1944, 53, 42—53).—A detailed description, based on sections and models, of the final development of the human stapes from the beginning of ossification (20-week fetus) to maturity (cf. A., 1943, III, 387, 642). The stapes becomes adult in histological structure and general configuration in about 31½ weeks. K. T.

Otosclerosis. H. Brunner (*Laryngoscope*, 1943, 53, 736—742).—A general account of the author's experience of this disease. Although the proportion of men to women showing deafness due to otosclerosis is 1:1.8, the proportion showing pathological conditions of the temporal bones was 1:0.75. Although otosclerosis does not always result in ankylosis of the stapes (which can also be due to other causes) it is suggested that this condition is present in over 40% of cases of otosclerosis. Unilateral otosclerosis, although rare, can exist. Although pregnancy sometimes has a deleterious effect on the progress of otosclerosis, this is not always the case. It seems that either otosclerosis is influenced by the inconst. and accessory features of pregnancy (e.g., endocrine, vasomotor, or psychological disturbances) or there are different types of otosclerosis one or more of which are not affected by pregnancy. K. T.

Functional pathology of ear. I. Some aspects of treatment in progressive congenital deafness. F. Kobrak (*J. Laryngol. Otol.*, 1943, 58, 439—452).—It is suggested that congenital deafness sets up a vicious circle: cochlear nerve degeneration—hyperactivity of the tympanic muscles—high labyrinthine pressure—secondary cochlear lesions. An attempt was made to break the circle by altering the metabolism of the tympanic muscles by treatment with Ca and P, yeast, and aspirin, alone or in combination. Aspirin should be used with the greatest care because although salicylates may improve the condition of the tympanic muscles they seem to be definitely harmful to a cochlear nerve which is in any way abnormal. Many case reports. K. T.

Cochlear microphonics. P. Kellaway (*Arch. Otolaryngol.*, 1944, 39, 203—210).—The evidence in favour of the view that the Wever and Bray effect is not due to action potentials in the auditory nerve but to a response of the cochlea originating in the hair cells of the organ of Corti is collected and reviewed. It is suggested that the cochlear potentials are generated by the piezoelectric effect created by the distortion of the hair cells when the sound wave impinges on the tympanic membrane. Although the cochlear response is not thought to stimulate the auditory nerve or to have any functional significance, its presence can, within limits, be used as an index of hearing since it is dependent on an intact and functioning cochlea. K. T.

Functional examination of hearing. A. Lewy and S. L. Shapiro (*Arch. Otolaryngol.*, 1944, 39, 264—273).—Review of the literature for 1942 and 1943. K. T.

Estimation of percentage loss of hearing. H. A. Carter (*J. Acoust. Soc. Amer.*, 1943, 15, 87—90).—A description of five useful methods of estimating % hearing loss. In addition the standard procedure recommended by the Council on Physical Therapy as a basis for estimating loss in industrial cases is described in detail. K. T.

Genetic principles and inheritance of deaf-mutism. J. M. Odiorne (*Ann. Otol., etc., St. Louis*, 1944, 53, 153—158).—Criticism of work by Christoph (cf. A., 1944, III, 105) in which he denied that the deafness in the family he described was inherited according to the Mendelian law. It is pointed out that if both the parents in this family were heterozygous for the recessive gene for deaf-mutism they would themselves be normal while having some deaf-mute

children (as was the case). The proportion of children who were deaf was rather high in this family but this may occur where the sample is so small.

K. T.

Storage of trypan-blue in internal ear of rat.—See A., 1944, III, 450.

Microphonic effect of teleost labyrinths and its biological significance. Y. Zotterman (*J. Physiol.*, 1943, 102, 313—318).—The microphonic effect of the saccule was studied in surviving preps. of the labyrinth of the pike and the burbot. Exploration with a microelectrode suggests that the effect is generated in the macula. It may act as a generator potential discharging impulses in the nerve fibres. Rotation with the ampulla leading gives a burst of impulses in the nerve from the posterior semicircular canal. Rotation in the opposite direction gives no response, but there is an after-discharge on cessation of movement.

W. H. N.

Effect of age in touch perception. H. Ronge (*Acta Physiol. Scand.*, 1943, 6, 343—352).—10 individuals between 12 and 76 years were examined. The area of skin which was tested with an aesthesiometer normally had no hair. The optimal threshold and the no. of touch spots decrease with increasing age in a ratio comparable to the decrease of Meissner's corpuscles. The author, however, stresses that this relationship is not a proof of the theory that Meissner's corpuscles are responsible for the sensation of touch.

P. G.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Glands and gland products. I. Endocrine glands of South Indian animals. B. B. Dey, P. S. Krishnan, and M. Giriraj (*Current Sci.*, 1944, 13, 35—36).—The form of the pituitary, thyroid, and adrenals in common slaughterhouse animals is described and illustrated. The glands are all lighter than those of the corresponding species in Europe. The proportion of medullary tissue is higher in cattle adrenals than in those of sheep or pigs. The ratio of anterior pituitary to posterior pituitary is 1.5 for pig glands, 2.5 for cattle glands, and 10 for sheep glands. Figures are given for the ascorbic acid content of the adrenals and pituitary, adrenaline content of the adrenals, and I content of the thyroids.

P. C. W.

Preservation of glands. III. Preservation of thyroid glands. B. B. Dey, P. S. Krishnan and M. Giriraj (*Current Sci.*, 1944, 13, 9; cf. A., 1944, III, 536).—There is no appreciable loss of thyroxine-I or of org. I in cattle or sheep thyroids stored for 2 days at 0°, stored for 1 month at —7°, or kept for 2 years at room temp. after desiccation.

P. C. W.

Depression of basal metabolism by the brown fatty tissue of hibernating hedgehogs and by prolan.—See A., 1944, III, 489.

Hormones in *Drosophila* development.—See A., 1944, III, 448.

Liver insufficiency in toxic goitre and its treatment. C. R. Schmidt, W. S. Walsh, and V. E. Chesky (*Surg. Gynec. Obstet.*, 1941, 73, 502—515).—55% of 207 thyroidectomised patients showed impaired liver function as measured by hippuric acid secretion. The degree of insufficiency was related more closely to the duration and intensity of thyrotoxicosis than to the type of goitre, but was not correlated with basal metabolic rate. The diminished glucose tolerance in thyrotoxic patients is restored to normal 5 days after bilateral thyroidectomy. Methods of treatment for hepatic insufficiency are discussed.

P. C. W.

Metabolism of radio-iodine in thyroids of rats exposed to high or low temperatures. C. P. Leblond, J. Gross, W. Peacock, and R. D. Evans (*Amer. J. Physiol.*, 1944, 140, 671—676).—¹³¹I with a half-life of 8 days was prepared as NaI with some inactive NaI as carrier. Doses of 0.2 µg. or 5 µg. of ¹³¹I were given to rats and I uptakes by thyroids used as indications of activity of the gland. Exposure of rats to 0—2° for various periods of time produced a thyroid stimulation which was doubtful after 1—3 days, definite after 7 days, max. at 26 days (at which time the fixation of ¹³¹I was 2.7 times that of the controls), but absent after exposure for 40 days. Separation of the I fractions of the thyroid at various times indicated that the turnover of thyroxine and the excretion of iodised products was increased to about twice normal. Exposure of rats to heat (32—34°) lessened thyroid activity. This decrease could be observed as early as 1 day after the beginning of the exposure and persisted for at least 26 days. This reduction in activities, however, was slight whether I fixation, thyroxine turnover, or excretion of iodised products was considered.

T. F. D.

Behaviour of radio-iodine in resting and stimulated thyroids. C. P. Leblond (*Anat. Rec.*, 1944, 88, 285—290).—15 hr. following an injection of 2 µg. of radioactive I to rats, the colloid in thyroids stimulated with pituitary extract contains more radio-I than in the case of controls. Hypophysectomy produces a considerable reduction in the amount of radio-I fixed in colloid. Basophilic follicles in stimulated glands always contain less radio-I than

acidophilic follicles. It is concluded that the "turnover" and excretion of I take place more rapidly in basophilic follicles.

W. F. H.

Increased resistance to anoxia after thyroidectomy and after treatment with thiourea. C. P. Leblond (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 114—116).—Thyroidectomy or substitution of 1% thiourea for drinking water increases resistance of rats to anoxia in fed animals. Resistance is equally lowered by fasting in all cases. It is lessened by administration of thyroxine or dinitrophenol.

V. J. W.

Toxicity of thiouracil in normal and thyroidectomised rats. A. E. Meyer, M. B. Collins, and D. Marine (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 221—222).—There is no difference between normal and thyroidectomised rats in sensitivity to thiouracil. Severe toxic symptoms were caused by 1 mg. per kg. per day and consisted mainly of hæmorrhagic congestion of most organs.

V. J. W.

Effects of hypotonic solutions on living thyroid gland.—See A., 1944, III, 449.

Thyroid gland. I. Structure, extent, and drainage of "lymph sac" of the thyroid gland (*Felis domestica*).—See A., 1944, III, 445.

Nature of Graves' disease with special reference to its ophthalmic component.—See A., 1944, III, 460.

Hepatorenal failure in Waterhouse-Friderichsen syndrome [adrenal hæmorrhage]. B. A. Marangoni and C. V. D'Agati (*Amer. J. med. Sci.*, 1944, 207, 385—393).—2 cases of the Waterhouse-Friderichsen syndrome with survival periods of 80 and 88 hr. respectively and in which death is ascribed to hepatorenal failure are described. They were characterised clinically by renal failure and pathologically by hepatic necrosis and glomerular and tubular changes.

C. J. C. B.

Adrenal cortex and blood pressure response to carbon arc irradiation. J. S. Graham (*Amer. J. Physiol.*, 1943, 139, 604—611).—Dogs were irradiated with a C arc lamp, on shaved portions of the abdomen, using a dosage of 40 g.-cal. per sq. cm. The lamp emitted 0.82 g.-cal. per sq. cm. per min. with a distribution of 5—6% ultra-violet, 29—31% luminous, and 63—66% infra-red. Falls in systolic and diastolic blood pressure occurred averaging 16% and 23% respectively in normals and 16% and 63% in bilaterally adrenalectomised animals. Red blood cells were reduced by 7% in normals and 8% in adrenalectomised animals. The fall in blood pressure and reduction in red cells could be prevented in normals and diminished in adrenalectomised animals by administration of deoxycorticosterone acetate or adrenal cortical extract. There were no significant changes in blood-sugar or in plasma-K.

T. F. D.

Effect of adrenalectomy on absorption of short-chain fatty acids and their triglycerides. L. A. Bavetta (*Amer. J. Physiol.*, 1943, 140, 44—46).—Inhibition of fat absorption resulting from adrenalectomy in rats occurs with octoic acid and is evident with decioic acid but not with trihexoin, Na hexoate, or octoin. This indicates that the adrenals may play an active rôle in the absorption of the longer-chain fatty acids but not the lower acids such as butyric. Differences in the absorption rates of the longer-chain fatty acids by normal and adrenalectomised animals are probably due to the capacity of normal animals to remove fatty acids from the intestine at a much faster rate.

T. F. D.

Effect of 17-hydroxy-11-dehydrocorticosterone on growth of young adrenalectomised rats. M. H. Kuizenga, J. W. Nelson, and D. J. Ingle (*Amer. J. Physiol.*, 1943, 139, 499—503).—Daily injection of 0.125—1.0 mg. of 17-hydroxy-11-dehydrocorticosterone to 4-week-old male adrenalectomised rats maintains and supports growth. Adrenal cortex extracts containing this and other steroids can be assayed for their complete cortical hormone activity by the survival-growth test.

T. F. D.

Adrenals and hypophysis in carbohydrate metabolism of eviscerated rat. J. A. Russell (*Amer. J. Physiol.*, 1943, 140, 98—106).—Glucose requirements for maintaining blood-sugar levels in control eviscerated rats were reduced by 40% by previous treatment of the animals with saline anterior pituitary extracts. In eviscerated hypophysectomised rats the greater glucose requirements and the rate of fall of blood-sugar when no glucose was given were reduced by anterior pituitary and adrenal cortical hormone treatment but not by deoxycorticosterone acetate. The loss of muscle-glycogen which occurs in untreated hypophysectomised eviscerated rats, and which is prevented by anterior pituitary extract, was only partly affected by adrenal cortical extract. Adrenalectomised rats which were maintained by NaCl administration, but not those maintained by deoxycorticosterone acetate, required more glucose than controls for maintenance of blood-sugar levels after evisceration. The blood-sugar fell more rapidly than normal in these rats when no glucose was given, but muscle-glycogen did not change. Increased peripheral carbohydrate requirements of hypophysectomised rats are thus probably not the result of diminished adrenal function, and the pituitary and adrenal glands may affect carbohydrate metabolism by different means.

T. F. D.

Output of cortical hormone by mammalian adrenal gland. M. Vogt (*J. Physiol.*, 1943, 102, 341—356).—In the venous effluent of

the adrenal of the dog, cat, goat, rabbit, and pig, the equiv. of 0.6 g. (limits 0.26—2.0) of adrenal tissue is passed out per min. per kg. body wt. A 10-kg. dog may produce in 1 day the equiv. of 17,300 g. of gland or 230 ml. of commercial extract. Neither blood pressure nor flow affects min. output. The hormone is rapidly destroyed, being undetectable in blood from other parts of the body. Its disappearance, which is not retarded by absence of the liver, spleen, gastro-intestinal tract, or kidneys, is probably due to a general ability of tissues to destroy it. The survival of batches of young rats exposed to cold was used for assay (cf. Selye and Schenker, A., 1939, III, 378).

W. H. N.

Polyuria produced by deoxycorticosterone acetate. C. A. Winter and W. R. Ingram (*Amer. J. Physiol.*, 1943, 139, 710—718).—Injection of 2.5—10 mg. daily of deoxycorticosterone acetate produces in the normal dog a syndrome resembling mild diabetes insipidus, and in the dog in which experimental diabetes insipidus has been produced by pituitary stalk section leaving the anterior lobe intact, an increase in severity of symptoms. Pitressin only partly controls the deoxycorticosterone polyuria even in large doses. Reduction of protein intake, while NaCl is kept const., reduces the polyuria in normals but the change in urine vol. is less marked than when the experiment is performed on a diabetes insipidus dog. Creatinine clearances (urine/plasma vals.) show that deoxycorticosterone acetate reduces the tubular absorption of water while larger doses increase glomerular filtration in dogs but not in normal or diabetes insipidus cats. In the latter, neither the severity of the diabetes insipidus nor the dosage of pitressin required to relieve it was increased.

T. F. D.

Cortin-like material in urine, active in muscle work test. R. A. Shipley, R. I. Dorfman, and B. N. Horwitt (*Amer. J. Physiol.*, 1943, 139, 742—744).—Normal male human urine contained an ethylene dichloride-extractable component, possessing certain properties of adrenal cortical hormones, which was active on subcutaneous injection into rats, causing an increase in performance in the muscle work test.

T. F. D.

Ineffectiveness of adrenal cortex preparations in treatment of experimental shock in non-adrenalectomised dogs. W. W. Swingle, R. R. Overman, J. W. Remington, W. Kleinberg, and W. J. Eversole (*Amer. J. Physiol.*, 1943, 139, 481—489).—Neither adrenal cortical extract nor deoxycorticosterone acetate proved beneficial in treating dogs shocked by (1) constriction of both hind limbs with tourniquets, (2) trauma to muscle masses of both hind limbs, and (3) venous occlusion of one hind limb. The ability of natural and synthetic cortical preps. to increase the resistance of the adrenalectomised animal to circulatory stress procedures, and to revive the animal from circulatory collapse, depends on restoration of metabolic processes in the tissues concerned. There is no evidence that a derangement of carbohydrate metabolism is concerned in the shocked intact animal whose adrenal glands are functional.

T. F. D.

Adrenal alterations in filtrate factor deficient rats. E. P. Ralli and I. Graef (*Amer. J. Physiol.*, 1944, 140, 713—719).—Rats were fed diets deficient in filtrate factors of vitamin-B. One group received the deficient diet without nicotinic acid or choline; other groups received nicotinic acid and/or choline. In the first two groups half received a low NaCl intake, in all other groups NaCl *ad lib.* Greying of fur, dermatitis, and superficial hæmorrhages of the skin occurred to varying extents. Lipid depletion of adrenal cortex occurred in animals on deficient diets not supplemented with nicotinic acid or choline, and the incidence of necrosis and atrophy increased when these substances were added to the diet.

T. F. D.

Endocrine factors in water diuresis and intoxication. R. Gaunt (*Trans. New York Acad. Sci.*, 1944, 6, 179—187).—Adrenalectomised rats show a diminished or absent diuretic response to orally-administered water. The failure is due to diminished intestinal absorption in the early days after adrenalectomy and to this factor is added renal dysfunction later. The rise in hæmatocrit vals. and fall in plasma-protein are greater in adrenalectomised rats in water intoxication than in normal rats in a similar condition; the fall in plasma-Cl is less. The symptoms of water intoxication are largely due to loss of extracellular Cl, by excretion in normal rats and by shift into the unabsorbed fluid in the intestine in adrenalectomised rats. Administration of cortical extracts overcomes the inhibition of diuresis in the first few days after operation but is less effective later; 17-hydroxy-11-dehydrocorticosterone is more effective than deoxycorticosterone acetate. In hypothyroidism the diuresis response and resistance to water intoxication in rats are increased; this effect is abolished by adrenalectomy. Adrenalectomy also abolishes most of the inhibition of normal water diuresis seen in hypophysectomised rats.

P. C. W.

Insulin resistance. J. Lerman (*Amer. J. med. Sci.*, 1944, 207, 354—366).—The blood from 6 patients with insulin resistance was examined for the presence of insulin antibodies by the ring precipitin method and the Prausnitz-Kustner test. 2 showed a positive precipitin test and 4 a positive Prausnitz-Kustner test.

C. J. C. B.

Immunologic studies in insulin resistance. F. C. Lowell (*J. clin. Invest.*, 1944, 23, 225—231).—A case of resistance to insulin, associated with a high degree of allergy to insulin, is reported. The resistance was sp. in that human insulin caused a markedly greater fall in the blood-sugar than cryst. insulin. A method for demonstrating neutralisation of insulin by serum obtained from insulin-resistant subjects is described. Tests on sera from two insulin-resistant patients showed that the presence of insulin-neutralising activity was associated with resistance to insulin. It is concluded that insulin resistance may occur on an immunological basis and may be associated with the presence in the serum of a neutralising antibody for cryst. insulin; under certain circumstances, this antibody may exhibit species specificity; the insulin-neutralising and the skin-sensitising antibodies are distinct.

C. J. C. B.

Effect of fasting and dehydration on blood-sugar response to injected insulin in chick. D. F. Opydyke (*Amer. J. Physiol.*, 1943, 139, 563—568; cf. A., 1943, III, 24).—The blood-sugar of 30—40-day-old chicks rose from 144 to 175 mg. per 100 ml. of blood, on fasting from 14 hr. to 72 hr. respectively. Dehydration, by withholding water, slightly augmented this rise. Neither fasting alone nor fasting plus dehydration affects the insulin-sensitivity of the chick.

T. F. D.

Influence of atmospheric temperature on reaction of rabbits to insulin. J. M. Johlin (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 122—124).—Rabbits were fasted for 18 hr., and then given insulin (0.375 unit per kg.). Blood-sugar was determined each hr. for the next 7 hr. Those which were most sensitive developed convulsions when they were kept at 33° or 20° throughout, but did not do so if they were kept at 33° during the fasting period and at 20° during the experimental period. It is suggested that owing to "over-ventilation at 33° the rabbits would be subject to an uncompensated acidosis at 20° until the kidneys had restored the acid-base balance to a normal state," and that this acidosis increases their resistance.

V. J. W.

Experimental diabetes produced by alloxan. W. L. Hard and C. J. Carr (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 214—216).—Administration of alloxan (100 mg. per kg.) to rabbits caused the usual degenerative changes in the pancreatic islets. There were also areas of degeneration in the adrenal medulla. Hepatic fat and glycogen remained normal.

V. J. W.

Concretions in anterior pituitary of human embryo and newborn. A. Plaut and E. Galenson (*Amer. J. Path.*, 1944, 20, 223—230).—Colloid concretions are a const. finding in the anterior pituitary lobe and in the pars intermedia of the human fetus and newborn. Most of the concretions disappear in the first postnatal months. Large calcific bodies are sometimes found in the anterior lobe of the adult. It is believed that the concretions in the fetus are formed under the influence of maternal hormones. (21 photomicrographs.)

C. J. C. B.

Preservation of glands. II. Preservation of pituitary glands. B. B. Dey, P. S. Krishnan, and M. Giriraj (*Current Sci.*, 1943, 12, 319—321; cf. A., 1944, III, 93).—Glands transported at -80° contain more ascorbic acid on arrival at the laboratory than those transported at -15° or at 0°. The ascorbic acid is rapidly destroyed during storage at 0°; 25% is lost in 2 days and 66% in 4 days. When stored at -7° only 20% of the ascorbic acid is lost during 2 weeks. The ascorbic acid rapidly disappears after thawing the glands. The anterior pituitary contains more ascorbic acid than the posterior pituitary.

P. C. W.

Production of hypothalamic obesity in rats already displaying chronic hypopituitarism. A. W. Hetherington (*Amer. J. Physiol.*, 1943, 140, 89—92).—Ten hypophysectomised rats had not attained or had barely surpassed their preoperative wts. after 11 weeks and were considered to be in a state of chronic hypophysial insufficiency. Within 3—4 weeks after production of hypothalamic lesions by the Horsley-Clarke technique they displayed rapid fat deposition. Fat depots are still able to store fat in response to hypothalamic damage even after hypophysectomy. Hypothalamic disorder rather than the hypophysis is the likely cause in the production of obesity since neither total nor partial hypophysectomy produces adiposity.

T. F. D.

Diuretic action in man of "old" post-pituitary extract. J. Marks (*J. Physiol.*, 1943, 102, 12p—13p).—A single sample of a commercial extract of posterior pituitary prepared in 1931 caused unusual diuretic responses when injected 11 years later in man, diuresis being accompanied by greatly increased Cl output.

W. H. N.

Antagonism between posterior pituitary lobe and insulin. L. Wislicki (*J. Physiol.*, 1943, 102, 274—280).—Pituitrin and pitressin, but not pitocin, cause a transitory hyperglycæmia in the rabbit and also inhibit the hypoglycæmia caused by a small subcutaneous dose of insulin. Pituitrin is more potent than equiv. quantities of pitressin and pitocin given simultaneously. Intravenous or large subcutaneous doses of insulin are not antagonised by pituitrin.

W. H. N.

Vasopressin-inhibiting power of blood during pregnancy and nature of principle concerned. E. Werle and A. Kalvelage (*Biochem. Z.*, 1941, 308, 405—412).—The blood of normal men and women inhibits vasopressin. This activity is increased in pregnant women, the increase commencing at 2 months, persisting until parturition, and returning to normal 3 weeks post partum (cf. Schockaert and Lambillon, A., 1935, 1171). The foetal blood has a normal content. Urine of pregnancy like normal urine is only slightly inhibitory. The active principle therefore does not diffuse through placenta or kidney. The inhibitory factor appears to be an enzyme of optimum pH 7.0. A principle (not identical with vasopressin) that increases blood pressure occurs in the serum of persons suffering from eclampsia, cancer, tuberculosis, or hepatic cirrhosis. F. O. H.

XII.—REPRODUCTION.

Acid-soluble phosphorus in developing hen's egg. O. E. Kugler (*J. Cell. Comp. Physiol.*, 1944, 23, 69—75).—The albumin contains very little acid-sol. P, and its amount is proportional to wet wt. of albumin throughout incubation. In the yolk this ratio is only present during the last week. In the embryo + membranes, wet wt. increases faster than acid-sol. P during the first 9 days and more slowly afterwards. Half way through incubation large amounts of acid-sol. P, originating in the yolk, appear in the embryo.

V. J. W.

Blue chromo-protein of eggs of goose-barnacle. E. G. Ball (*J. Biol. Chem.*, 1944, 152, 627—634).—Eggs of *Lepas anatifera* and *L. fascicularis* contain a blue, water-insol. pigment, probably a carotenoid-solution compound, similar to ovoverdin, which is sol. in dil. salt solutions and is pptd. by $(\text{NH}_4)_2\text{SO}_4$ (42% saturation). Mild heating or acidification in presence of $(\text{NH}_4)_2\text{SO}_4$ reversibly changes the colour to red presumably because of dissociation of the compound. The same change, attributable to the same cause, occurs in the developing eggs. Processes (e.g., addition of acid, alkali, or alcohol; heating) which denature the protein also cause the colour change but the reaction is irreversible and a red water-insol. compound similar in properties to xanthophylls is pptd. A water-sol. red compound is produced irreversibly when the blue pigment is acidified in presence of $(\text{NH}_4)_2\text{SO}_4$ (25% saturation), the concn. of this salt being then increased until the solution is half-saturated.

W. McC.

Control of ovulation in cow. J. Hammond, jun., and P. Bhattacharya (*J. Agric. Sci.*, 1944, 34, 1—15).—Results of injecting extract of horse pituitary or pregnant mare serum gonadotrophin into cows and heifers at various stages of the ovarian cycle with and without simultaneous removal of the corpus luteum are reported, the wts. of corpus luteum, ovaries, and uteri being recorded. 1500 or 5000 i.u. of hormone, administered at intervals from 5 days before to 3 days after removal of the corpus luteum, produced up to 30 ovulations. Several multiple births (twins and triplets) occurred in a small no. of cows left to calve after treatment. Mechanisms involved and possible applications are discussed on the basis of the findings.

W. McC.

Action of steroid hormones in ovipositor test. I. Different actions of oestrogen-, androgen-, and progesterone-like hormones; possible differentiation between these groups. J. J. Duyvené de Wit (*Biochem. Z.*, 1941, 309, 297—303).—Different types of curves showing the relation between growth of the ovipositor of small female carp with time are obtained when oestrogenic, androgenic, and progesterone type substances respectively are present in the water. The three groups are easily differentiated by this test. Corticosterone and deoxycorticosterone behave like progesterone. J. N. A.

Overt and masked actions of [sex] steroids. E. Clarke and H. Selye (*Amer. J. Physiol.*, 1943, 139, 99—102; cf. A., 1943, III, 811).—A mixture of const. proportions of progesterone and α -oestradiol causes vaginal cornification in spayed rats at low but not at high concns. The effect is explained by a certain degree of folliculoid activity of all hormonally active steroids. A. S.

Synthesis of substances with very high oestrogenic activity.—See A., 1944, II, 217.

Mammary and testicular tumours in male mice of various strains following oestrogen treatment.—See A., 1944, III, 481.

Spontaneous primary hepatomas in mice of strain C3H. III. Effect of oestrogens and testosterone propionate on their incidence.—See A., 1944, III, 478.

Fate of D.B.E., $\alpha\alpha$ -di-(*p*-ethoxyphenyl)- β -phenylbromoethylene, in the body. J. M. Robson and M. Y. Ansari (*J. Pharm. Exp. Ther.*, 1943, 79, 340—345).—D.B.E., an oestrogen, was administered in sesame oil by stomach tube to ovariectomised mice and rabbits. Less than 50% of the given dose could be recovered from the body 24 hr. after the administration, but elimination was not complete by 3 weeks. The highest concn. of this oestrogen was found in the body fat, from which it was more slowly eliminated than from the rest of the body. D.B.E. was not destroyed during incubation with liver-brei at 39° for 5 hr. G. P.

Oestrogens in dysuria and incontinence after the menopause. S. H. Geist and U. J. Salmon (*J. Mt. Sinai Hosp.*, 1943, 10, 208—211).—12 cases of dysuria and 8 of urinary incontinence in post-menopausal women of 49—71 years of age and showing oestrogen deficiency on vaginal smear examination were given 10,000—20,000 r.u. of oestradiol benzoate (progyon B) or 5 mg. of oestradiol dipropionate (Diovoclyn) thrice weekly. 10 cases of dysuria and 6 of incontinence improved considerably within 2—3 weeks, accompanied by progressive oestrogenic effects in vaginal smears. They remained symptom-free for 3—17 weeks following discontinuation of medication and responded again to further treatment. Recurrence of symptoms was associated with signs of oestrogen deficiency in vaginal smears. Doses of 4000 r.u. or 1 mg. had no effect. E. M. J.

Elevation of uterine β -glucuronidase activity by oestrogenic hormones. W. H. Fishman and L. W. Fishman (*J. Biol. Chem.*, 1944, 152, 487—488).—Ovariectomy reduces the β -glucuronidase activity of the mouse uterus. Injection of oestrogens, but not of glucuronidogenic substances other than oestrogens, increases the glucuronidase activity of the uterus in ovariectomised mice.

R. L. E.

Reaction of urinogenital system of immature salamander to pregnenolone. G. S. Saunders and R. Rugh (*J. Exp. Zool.*, 1944, 95, 1—20).—Small doses of the hormone were fed for a short period to *Amblystoma punctatum* 4 months after metamorphosis. Body growth was stimulated. Spermatogenesis was suppressed. The ovaries were the same size as in the controls but oogenesis was stimulated. Wolffian ducts remained unaffected. Mullerian ducts of both sexes increased in size and showed histological differentiation approximating to that of the normal adult female. H. L. H. G.

Quantitative test for follicle-stimulating hormone in urine as diagnostic aid. H. F. Klinefelter, F. Albright, and G. C. Griswold (*J. clin. Endocrinol.*, 1943, 3, 329—345).—Dialysed or non-dialysed alcohol ppts. of morning urine specimens were tested for follicle-stimulating hormone by seeing whether they would increase the wt. of the uterus in immature mice. Urine from normal men and women contained per 24 hr. 6.6—53 m.u. and 6.6—26 m.u. respectively. In 10 cases of acromegaly the excretion was low in 7, normal in 2, and high in 1. All of 14 cases of panhypopituitarism had excretion rates below 6.6. 2 cases of primary amenorrhoea showed low excretion. 9 cases in which there was no evidence of any oestrogen production had normal excretion of follicle-stimulating hormone; reasons for this are discussed. P. C. W.

Histology and cytology of human and monkey placenta, with special reference to trophoblast.—See A., 1944, III, 447.

Luteinised granulosa cell tumour of ovary (luteoma).—See A., 1944, III, 481.

Functional supernumerary mammary glands. J. V. Schwind (*Northw. Med.*, 1943, 42, 195).—A 23-year-old woman seen after the birth of her third child had 2 supernumerary breasts and nipples in both axillae and one over the right costal margin. Milk was expressed from all. E. M. J.

Physiology of mammalian epididymis and spermatid. I. Collery (*Proc. Roy. Irish Acad.*, 1944, 49, B, 213—223).—Sperm withdrawn from different levels of the epididymis of the dog show the middle piece bead to become attached to the rear of the head in the upper levels of the epididymis and to move posteriorly to its final position at the junction of the middle piece and the tail during passage through the epididymis. The middle piece bead is apparently composed of the "complex granules" shed from the apices of the epididymal cells in the hypersecretory stage. Examination of frozen sections and teased fragments of the epididymis of guinea-pigs did not show any cilia attached to the epididymal cells and these are regarded as fixation artifacts. The sperm were seen to be burrowing into the epithelium in teased fragments of the head of the epididymis and this is presumably when the middle piece bead becomes attached. The sperm may be motile before the attachment of the bead but do not have forward propulsive capacity. P. C. W.

Corpus luteum in *Rhinobatus granulosus*.—See A., 1944, III, 449.

Spontaneous testicular tumours in mice. Testicular changes in mice of the A strain after long-continued injections of pregnant mare serum.—See A., 1944, III, 479.

Testis in vitamin-E-deficient guinea-pigs. A. M. Pappenheimer and C. Schogoleff (*Amer. J. Path.*, 1944, 20, 239—243).—Muscular dystrophy developed in guinea-pigs on a vitamin-E-deficient diet before the appearance of testicular degeneration. Early degenerative changes were first noted in the testicles after 130 days on the diet, and advanced degeneration was present after 175 days. (4 photomicrographs.) C. J. C. B.

Protracted effect of single dose of *dl*- α -tocopherol acetate on testes of rats on vitamin-E-deficient diet. H. Kaunitz, A. M. Pappenheimer, and C. Schogoleff (*Amer. J. Path.*, 1944, 20, 247—254).—Administration of a single dose of 0.5 or 1.0 mg. of *dl*- α -tocopherol acetate to the offspring of vitamin-E-depleted mother rats delays the onset

and retards the course of postpubertal testicular degeneration. Administration of 5 mg. on the 15th day produces a greater protective effect. Administration of 1 mg. on the 6th—8th day is without effect and given on the 29th—30th day affords less protection than when given on the 15th day. (8 photomicrographs.) C. J. C. B.

Plasma coagulation and fibrinogenolysis by prostatic fluid and trypsin. C. Huggins and V. C. Vail (*Amer. J. Physiol.*, 1943, 139, 129—134).—The prostatic secretion of normal dogs clots firmly oxalated beef and rabbit's plasma and a mixture of fibrinogen and prothrombin, but does not coagulate fibrinogen alone or prothrombin-free plasma. The clot in the presence of heparin is a flocculant ppt. Dog prostatic fluid does not coagulate human plasma. The action of prostate secretion is stable for months at 4°. It does not disappear on prolonged dialysis against tap water or on heating at 60° for 30 min. but is destroyed at 70°. Human prostatic fluid does not coagulate oxalated plasma. Many proteolytic properties of dog prostatic fluid resemble those of pancreatic trypsin; it has a greater activity, even in low dilution, in destroying plasma-fibrinogen; trypsin does not possess this effect. Dog prostatic fibrinogenase is similar to but not identical with trypsin. The chief proteolytic enzyme of human prostatic fluid is fibrinolysin. A. S.

XIII.—DIGESTIVE SYSTEM.

Electrical energy output of resting stomach determined by shunting its potential. W. S. Rehm (*Amer. J. Physiol.*, 1943, 139, 1—8).—The potential of the resting body of the dog's stomach *in situ* with a secretion of gastric juice of less than 1 c.c. per hr. was shunted through electrodes which had approx. the same resistance as the stomach. Currents of 67.8—276 ma. per sq. cm. were recorded continuously. There is no maintained depolarisation of the potential on withdrawing currents of this magnitude. A. S.

Production of acetic, propionic, and butyric acids in alimentary canal. J. Barcroft, R. A. McAnally, and A. T. Phillipson (*Proc. Biochem. Soc.*, 1944, 38, xxviii).—In the horse, pig, and rabbit the amount of acetic acid is greatest in the cæcum, and in the sheep the concn. in the cæcum is only exceeded by that in the reticulum and rumen. Vals. (in g.) for total amount of volatile acids in the cæcum and colon are: sheep 7.9—9.1, horse 249—355, pig 2.3—8.7, and rabbit 0.21—0.67. Variations in concn. of volatile acids in different parts of the large intestine are similar in all these species. Only the pig, and in greater degree the sheep, contain appreciable concns. in the stomach, and they disappear before reaching the abomasum. The low concn. of volatile acids in the small intestine and the high concn. in the large intestine indicate their production in the latter. P. G. M.

Absorption of acetic, propionic, and butyric acids from alimentary canal. J. Barcroft, R. A. McAnally, and A. T. Phillipson (*Proc. Biochem. Soc.*, 1944, 38, xxix).—The concn. of volatile acids in the blood draining parts of the gut is higher than the general blood level. The rate of absorption of Na salts from the sheep's rumen is in the order acetate > propionate > butyrate. The blood draining the rumen has a higher proportion of acetic acid than the rumen contents. P. G. M.

Digestion in ruminants. R. A. McAnally and A. P. Phillipson (*Biol. Rev.*, 1944, 19, 41—54).—A review. J. D. B.

Senile changes in pancreas of rats and of man with special regard to similarity of locule and cavity formation.—See A., 1944, III, 449.

XIV.—LIVER AND BILE.

Effect of fasting on protein content of liver. H. W. Kosterlitz and I. D. Cramb (*J. Physiol.*, 1943, 102, 18p).—The large loss of liver-protein (20%) after a 24-hr. fast is paralleled by a loss of phospholipin-P and nucleoprotein-P (not necessarily from nuclei). "Stored protein" therefore forms a structural part of the cytoplasm. W. H. N.

Adenosinetriphosphoric acid in the liver. G. P. Toropova (*Biochimica*, 1942, 7, 32—42).—The presence of adenosine triphosphate has been demonstrated in the liver. Large amounts (0.45—0.60 mg. of labile phosphate and 0.035—0.06 mg. of $\text{NH}_4\text{-N}$ per g. of tissue) are found in samples of liver tissue taken from living rabbits or rats, taking care to disturb the animals as little as possible. The content of the liver is reduced by killing the animals by a blow on the head or by sensation of pain, but is not affected by taking repeated samples of the liver. It is not affected by insulin but adrenaline causes a decrease associated with an increase in inorg. phosphate. Breakdown of adenosine triphosphate under influence of adrenaline probably participates in the mechanism of glycogen mobilisation. H. G. R.

Shock. III. Role of liver and hepatic circulation in metabolic changes during hæmorrhagic shock in rats and cats. IV. Oxygen consumption of liver and kidney tissue from rats in hæmorrhagic shock.—See A., 1944, III, 397.

Insulin and phosphate changes of blood, muscle, and liver.—See A., 1944, III, 407.

Liver-catalase activity of pregnant mice and of mice bearing growing embryonic implants.—See A., 1944, III, 416.

Effect of diet on the vitamin-A content of bovine foetal liver. Vitamin-A storage and factors that affect the liver.—See A., 1944, III, 421.

Folic acid, biotin, and pantothenic acid deficiency and liver storage of various vitamins in rats fed succinylsulphathiazole in highly purified rations.—See A., 1944, III, 424.

New aid in control of hæmorrhage in severe damage to the liver. R. E. Kinsey (*Arch. intern. Med.*, 1944, 73, 131—137).—5 cases of acute yellow atrophy of the liver with hæmorrhagic tendencies occurred in 663 cases of intrahepatic jaundice. 4 of the patients were given transfusions of blood from donors who had received vitamin-K, with remarkable effect in controlling the bleeding tendencies. C. J. C. B.

Effect of cyanide, fluoride, and magnesium on serum-phosphatase activity during hepatic damage.—See A., 1944, III, 432.

Hereditary acholuric jaundice in rat.—See A., 1944, III, 393.

Bilirubin and bile salts in jaundice. R. Ottenberg (*J. Mt. Sinai Hosp.*, 1943, 9, 937—954).—A review. E. M. J.

Method for collection of bile from human patients with choledochostomy tubes. J. A. Layne and G. S. Bergh (*Surgery*, 1941, 10, 563—566).—By application of gentle suction (—12 cm. H_2O) to choledochostomy tubes of patients the entire bile output can be collected. Only patients with a T choledochostomy tube are suitable. The apparatus for the maintenance of continuous and const. suction is described. G. P.

XV.—KIDNEY AND URINE.

Renal physiology [between two wars]. H. W. Smith (*J. Mt. Sinai Hosp.*, 1943, 10, 41—58).—A review. E. M. J.

Role of renal innervation in renal tubular function. N. S. R. Maluf (*Amer. J. Physiol.*, 1943, 139, 103—108).—A dog's kidney was transplanted to the femoral region by anastomosing the renal and femoral vessels and exteriorisation of the bladder and ureteral orifices. The amounts of water and Cl reabsorbed per unit vol. of glomerular filtrate (inulin or creatinine clearances) were identical in the intact and denervated transplanted kidneys during diuretic and antidiuretic urine flows. There were identical ratios of inulin and phenol-red clearances in both kidneys. Differences in the rate of water or crystalloid excretion of the intact and denervated kidney are due to differences in glomerular circulation and not to differences in tubular function. A. S.

Excretion of arsenic by the Malpighian tubes of *Galleria mellonella*, *Tenebrio molitor*, and *Rhodophora florida*. L. L. Rattou (*J. Agric. Res.*, 1943, 67, 411—415).—Rates of absorption of AsO_3^{+++} by the Malpighian tubes of the three insect species indicate that the Malpighian system is concerned in the elimination of As from the blood but its function in relation to susceptibility to As poisoning is not clear. A. G. P.

Effects of unilateral nephrectomy in treatment of hypertension. W. Sensenbach (*Arch. intern. Med.*, 1944, 73, 123—130).—Only 5 of the 75 recorded cases of hypertension were cured by nephrectomy. $\frac{1}{2}$ of the patients had a fall in blood pressure to normal levels but had been followed for less than 2 years when reported. $\frac{1}{2}$ had a reduction in blood pressure but remained hypertensive, while in $\frac{1}{2}$ the blood pressure was unchanged or increased. The most common pathologic condition in the removed kidney was chronic pyelonephritis. C. J. C. B.

Shock. IV. Oxygen consumption of liver and kidney tissue from rats in hæmorrhagic shock.—See A., 1944, III, 397.

Hæmolysins in urine. E. Ponder (*J. Physiol.*, 1943, 102, 16p).—90% of normal urines are hæmolytic, and bacterial cultures can always be grown from them. $\frac{2}{3}$ are accounted for by *B. coli communis*, $\frac{1}{3}$ almost completely by *Streptococcus hæmolyticus* or *B. proteus*, and the remainder by unidentified bacteria. W. H. N.

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

Pathogenesis of dental caries. P. Pincus (*Brit. Dent. J.*, 1944, 78, 231—239).—Evidence is submitted showing that the chemico-parasitic theory of the ætiology of caries is untenable and an outline of a bacterial theory is given. Bacteria capable of attacking enamel without the aid of acid occur in the mouth and are found in carious lesions. Such bacteria produce lesions resembling those of caries. W. McC.

Effectiveness of urea and of synthetic detergents in reducing activity of human dental caries. R. M. Stephan and B. F. Miller

(*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 101—104).—Regular brushing of the teeth with dil. solutions of Zephiran, or 45% urea, retarded progress of existing caries and lessened incidence of new lesions.

V. J. W.

Effect of cell-growth-activating tissue extracts, locally applied, on experimental skin wounds. L. Doljanski and E. Auerbach (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 112—113).—The extracts previously described (A., 1939, III, 1024; 1940, III, 4) failed to accelerate healing of skin wounds of rats.

V. J. W.

Temperature effects on *Daphnia* populations. D. M. Pratt (*Biol. Bull.*, 1943, 85, 116—140).—Populations of *D. magna* were kept in 50 c.c. of pond water, which was renewed every other day, and with excess of food (*Chlorella*). At 25°, birth rate varies inversely, and death rate directly, with population density; delay in the expression of these effects causes the population size to oscillate. At 18°, birth rate varies inversely with, and death rate is little affected by, population density; the population size is stabilised after an initial peak. The relative plankton densities in polar and tropical waters are discussed.

G. P. W.

Centrifugal and osmotic pressure effects in sea-urchin eggs. E. B. Harvey (*Biol. Bull.*, 1943, 85, 141—150).—The effects of centrifuging *Arbacia* eggs at various osmotic pressures are described and briefly compared with those of varying the centrifugal force. With low osmotic pressure, or low force, the egg breaks into a light half and a much smaller heavy half into which the heavy granules are well segregated. With high osmotic pressure, or high force, the egg breaks more readily, the light half is smaller than the heavy, and the granules are not so well segregated. The nucleus swells in hypotonic, and shrinks in hypertonic, sea water to a greater relative extent than the rest of the egg.

G. P. W.

[Osmotic pressure effects in] sea urchin eggs.—See A., 1944, III, 521.

Stimulation of larval emergence in *Heterodera schachtii*, Schmidt, by certain concentrations of silver compounds. A. E. W. Boyd (*Ann. Appl. Biol.*, 1943, 30, 161—163).—Treatment of cysts of *H. schachtii* for short periods with 0.001% aq. Ag proteinate increased the no. of larvae emerging when the cysts were in contact with root excretion. Prolonged treatment had toxic effects. Treatment of cysts with tap water also caused some increase in emergence.

A. G. P.

Glutamine in animal tissues. D. L. Ferdman, S. R. Frenkel, and A. I. Silakova (*Biochimia*, 1942, 7, 42—58).—Glutamine, which may have been split from a complex during manipulation, has been isolated from animal tissues, including the brain and heart muscle. The tissue content depends on the physiological state of the animal; it is higher during hibernation than after awakening, and is decreased in the skeletal muscles during fasting.

H. G. R.

Vanadium in ascidians. D. Bertrand (*Compt. rend.*, 1942, 215, 477—478).—All or almost all ascidians (16 families tested) contain V, of which only a small proportion occurs in the blood. The content is of the order of 1 g. per kg. in dried phlebobranchs. In the dried stolidobranchs and aplousobranchs the content is usually of the order of 40 mg. per kg.

W. McC.

Molybdenum in animals. D. Bertrand (*Compt. rend.*, 1942, 215, 590—592).—The average Mo content per kg. in invertebrates was 2 mg. and in vertebrates 0.8 mg. (dry wt.). Exceptional vals. were 136 mg. in *Plumatella fungosa*, 13.4 mg. in mussels without shell, and 740 mg. in *Ascidia mentula* without tunic.

F. S.

Cyclitol (mytilitol) of mussels and related substances.—See A., 1944, II, 219.

Technique for production of hypothermia in albino rats. R. M. A. G. Ware, and F. H. Schultz (*Cancer Res.*, 1943, 3, 839—840).

—Hypothermia may be induced in albino rats by wrapping the thorax and abdomen of the rat with adhesive tape tightly enough to decrease the frequency and amplitude of the respiratory movements and exposing the animal to a low environmental temp.

F. L. W.

XVII.—TUMOURS.

Effects of lowered body temperature on methylcholanthrene fibrosarcomas in rats. R. M. Hill, E. K. Rutledge, A. G. Ware, F. H. Schultz, and W. H. Livingston (*Cancer Res.*, 1943, 3, 841—848).

—Intermittent hypothermia (mean body temp. 25—36°) produced 2—3 times a week did not retard the growth of methylcholanthrene fibrosarcomas in the thigh muscles of rats. Only 2 of 9 rats undergoing continuous hypothermia (mean body temp. 21—32°) showed growth of fibrosarcomas; in 5 of the rats tumour size decreased by more than 30%. Intermittent hypothermia (mean body temp. 25—30°), produced daily, depressed the rate of growth of fibrosarcomas in 5 of 6 rats. Tumour growth was more retarded when the hypothermia was severe (mean body temp. 20—24°). It is suggested that the retardation in tumour growth is the result of the combined effects of hypothermia and hypo-oxya.

F. L. W.

Oestrogen administration to aged female monkeys with no resultant tumours. E. T. Engle, C. Krakower, and C. D. Haagensen (*Cancer Res.*, 1943, 3, 858—866).—Five aged female rhesus monkeys (*Macaca mulatta*) were treated with α -oestradiol administered either as crystals or pellets implanted subcutaneously at intervals of 5 or 6 weeks during a period of 24—28 months. The total amount given was 575—825 mg. Histological alterations occurred in the mammary glands of 2 monkeys. Cystic changes occurred in the ducts, which were dilated to many times their normal diameter. The lining epithelium was normal with no papillary or other proliferation. The acini of the glands of all the monkeys were normal. Cystic and glandular hyperplasia of the endometrium was present in 2 animals. The cervix uteri of all animals showed extensive squamous-cell metaplasia. No neoplastic changes occurred in any of the organs examined.

F. L. W.

Genetic analysis of the induction of tumours by methylcholanthrene.

VI. Epidermoid carcinomas and associated tumours in mice of the F_4 — F_7 generations of the *NH* descent. W. H. Williams and L. C. Strong (*Cancer Res.*, 1944, 4, 11—17; cf. A., 1943, III, 819).—Tumours developed in approx. 80% of *NH* mice injected subcutaneously at 60 days of age with 1 mg. of methylcholanthrene in 0.1 ml. of sesame oil. In 694 tumour-bearing animals the frequency of tumour types in descending order was: fibrosarcoma, epidermoid carcinoma, mammary carcinoma, and bronchiogenic carcinoma. The epidermoid growths were all squamous-cell carcinomas. These were present in 34.7% of tumour-bearing animals and occurred earlier than other types. In animals showing only skin tumours the latent period was 115 days and 84.7% of the neoplasms were evident prior to 150 days after injection. For the total group of fibrosarcomas the latent period was 180 days and 50.5% appeared within 150 days. The occurrence of epidermoid carcinomas was greater in *NHO* mice than in other strains of mice or other rodents treated with methylcholanthrene.

F. L. W.

Progesterone treatment of uterine and other abdominal fibroids induced in the guinea-pig by α -oestradiol. A. Lipschütz and M. Maas (*Cancer Res.*, 1944, 4, 18—23).—Abdominal fibroids produced in female guinea-pigs in the course of 80 days by subcutaneous implants of α -oestradiol ceased growing when progesterone was subsequently implanted and allowed to act for 34—52 days. During the progesterone period there was also a considerable regression of existing fibroids. There was a decrease in large abdominal fibroids per animal of 81% in 5—7½ weeks under the influence of progesterone.

F. L. W.

Microscopic structure of oestrogen-induced uterine and other abdominal fibroids treated with progesterone. A. Lipschütz and J. Schwarz (*Cancer Res.*, 1944, 4, 24—30; cf. preceding abstract).—Abdominal fibroids induced in guinea-pigs by α -oestradiol and subsequently subjected to the simultaneous action of progesterone were compared with fibroids which had undergone regression due to withdrawal of oestrogen. The structure of those still present 34 to 53 days after the beginning of progesterone treatment was similar to that of tumours after withdrawal of oestrogen. In both cases the fibroblasts disappeared from the periphery and the tumour was transformed into a uniform mass of hyalinised collagenous tissue with small scattered nuclei.

F. L. W.

Effect of testosterone propionate on the adrenals and on the incidence of mammary cancer in the *RIII* strain of mice. J. Heiman (*Cancer Res.*, 1944, 4, 31—34).—In female *RIII* mice treated with testosterone propionate the incidence of mammary cancer was reduced from 52.2% to 19.4%. Brown degeneration of the adrenals was reduced from 80.9% to 56.6% in tumour-free mice, while in treated mice showing tumours the brown degeneration was not reduced.

F. L. W.

Vitamin-A and the toxic action of dibenzanthracene on the tissues. A. Goerner and M. Goerner (*Cancer Res.*, 1943, 3, 833—838).—The high mortality resulting from intraperitoneal injection of rats with 15 mg. of 1:2:5:6-dibenzanthracene was lowered by administration of vitamin-A. Animals treated with -A increased in wt. in contrast to those treated with the hydrocarbon alone. The destructive action of the hydrocarbon on the liver cells was decreased by injection of -A. Injection of -A did not prevent the depletion of hepatic -A brought about by the hydrocarbon but it hastened the return of -A to the liver.

F. L. W.

Free choice dietary study of tumour-bearing rats. W. M. Cahill, W. F. Dunning, and A. H. Smith (*Cancer Res.*, 1943, 3, 830—832).—The growth of mammary adenocarcinoma (*R* 2426) in rats did not alter the appetite of the animals for any particular unmixed dietary ingredient. It is concluded that the structural and energy-providing materials required by this growing neoplasm do not differ from those required by the rest of the rat body.

F. L. W.

Effect of pyridoxine on tumour growth. B. E. Kline, R. P. Rusch, C. A. Baumann, and P. S. Lavik (*Cancer Res.*, 1943, 3, 825—829).—When the Flexner-Jobling carcinoma was implanted into rats partially depleted of pyridoxine, the % of takes was lower, the no. of regressions higher, and the size of the tumours smaller than in control animals receiving the same no. of calories. Similar

effects were observed in mice with the Yale carcinoma I and with a fibrosarcoma originally induced by ultra-violet light. The production of skin tumours in mice painted with methylcholanthrene was retarded on a diet low in pyridoxine. Pyridoxine deficiency had less effect on the production of sarcomas by subcutaneous injection of methylcholanthrene. F. L. W.

Influence of egg white and avidin feeding on tumour growth. C. J. Kensler, C. Wadsworth, K. Sugiura, C. P. Rhoads, K. Dittmer, and V. du Vigneaud (*Cancer Res.*, 1943, 3, 823—824).—Feeding a diet rich in egg white and avidin to mice bearing spontaneous mammary carcinoma had no favourable effect on the course of the disease. The successful takes and subsequent growth of the Flexner-Jobling carcinoma and of mouse sarcoma 180 were not inhibited by a diet containing a high level of egg white. F. L. W.

Prothrombin concentration in the plasma of normal and leukaemic rats. E. Sturm (*Cancer Res.*, 1944, 4, 35—36).—Whole plasma from leukaemic rats with pronounced liver involvement and hæmorrhagic tendency shows little difference in prothrombin time from normal plasma. A large deviation from normal is shown when the leukaemic plasma is diluted 1 : 1 and 1 : 2 with saline and compared with normal plasma similarly diluted. The results indicate that a plasma-prothrombin deficiency exists in transmissible rat leukaemia associated with extensive leukaemic infiltration of the liver and spontaneous hæmorrhages. F. L. W.

d-Amino-acid oxidase, uricase, and choline-oxidase in the livers and in isolated liver cell nuclei of rats bearing transplanted tumours. T. H. Lan (*Cancer Res.*, 1944, 4, 37—41).—A tumour of liver origin (hepatoma 31) depleted the apoenzyme of d-amino-acid oxidase more than its coenzyme in the livers of rats bearing this tumour. Liver-uricase and -choline-oxidase were also lowered. Walker rat carcinosarcoma 256 did not lower d-amino-acid oxidase, uricase, or choline-oxidase in the livers of rats bearing the tumour. Hepatoma 31 lowered the activity of d-amino-acid oxidase and of uricase in isolated nuclei of liver cells of rats bearing this tumour. No choline-oxidase activity was detected in isolated liver nuclei of rats bearing transplanted tumours or in nuclei from normal rat liver. F. L. W.

d-Amino-acid oxidase, uricase, and choline-oxidase in two transplanted rat tumours and in isolated nuclei of tumour cells. T. H. Lan (*Cancer Res.*, 1944, 4, 42—44; cf. preceding abstract).—Transplants of hepatoma 31 and the nuclei isolated from them showed only 3% of the d-amino-acid oxidase apoenzyme activity of normal liver tissue. Addition of the coenzyme increased activity to 12% of normal. Transplants of the hepatoma contained only 5% of the uricase activity of normal liver. Nuclei from these transplants contained the same amount of uricase as the whole tumour tissue. Choline-oxidase could not be detected in transplants of the hepatoma or in nuclei isolated from them. d-Amino-acid oxidase, uricase, and choline-oxidase could not be detected in Walker carcinosarcoma 256 transplants. F. L. W.

Specific injurious action of alloxan on pancreatic islet cells and convoluted tubules of the kidney. Comparative study in the rabbit, dog, and man. Attempted chemotherapy of insulin-producing islet cell carcinoma in man. A. Brunschwig and J. G. Allen (*Cancer Res.*, 1944, 4, 45—54).—Alloxan injected intravenously into rabbits produced sp. necrosis of islet cells in the pancreas and epithelium of the convoluted tubules of the kidneys. Similar effects were observed in dogs but the islet cells in these animals did not show the extensive coagulation necrosis observed in rabbits. Diabetes mellitus and uræmia occurred in dogs. Following the injection there was a brief period of hyperglycæmia followed by a short hypoglycæmia; after 48 hr. hyperglycæmia was again present and persisted for varying intervals. The islet cells appeared to be more sensitive to alloxan in some animals which showed hyperglycæmia and little or no uræmia. 200—500 mg. per kg. was fatal to dogs in 1 hr. to 6 days. After 100—160 mg. per kg. animals sometimes survived with transitory diabetes and with or without transitory impaired kidney function. Four human patients with carcinomatosis, one with an insulin-producing islet cell carcinoma of the pancreas, received intravenous alloxan. In the patient with the islet cell carcinoma injections of 600 mg. to 1 g. per kg. abolished attacks of hyperinsulinism for 10—20 days. In the other 3 patients doses larger than those given to rabbits and dogs affected the blood-sugar in only one instance. The human subject is much more resistant to alloxan than the dog or rabbit. F. L. W.

Metaplasia of the bronchial epithelium in rats following application of benzpyrene. T. F. Thornton and W. E. Adams (*Cancer Res.*, 1944, 4, 55—59).—Metaplasia of bronchial epithelium was produced by 3 : 4-benzpyrene applied to a bronchial fistula in adult white rats of both sexes. Within 1 week a pseudotransitional epithelium developed which changed to a stratified squamous type by the end of 8 weeks. In some cases pearl formation was produced. Although the hydrocarbon was applied thrice weekly for 100 days no tumours were observed. F. L. W.

Sarcoma-producing factor extractable from transplantable rat fibrosarcomas. P. M. Aptekman, H. D. King, and M. R. Lewis

(*Cancer Res.*, 1943, 3, 858—857).—Benzene extracts were prepared from transplanted spindle-cell and mixed cell rat sarcomas and from the livers of rats bearing these tumours. The fatty extracts were injected into young rats of an inbred albino strain showing 100% susceptibility to grafts of these tumours. Sarcomas developed at the site of injection in 5 of the 28 rats injected with tumour extracts and in 2 of 24 rats injected with liver extracts. In addition to these 7 sarcomas, 1 adenoma arose at the site of injection of tumour extract and 1 carcinoma at the site of injection of liver extract. F. L. W.

Heterologous transplantation of embryonic mammalian tissues. H. S. N. Greene (*Cancer Res.*, 1943, 3, 809—822).—Rabbit embryos were readily transplanted to the anterior chamber of the eye or to the testis of other rabbits or guinea-pigs. The resulting growths resembled teratomas and could be transmitted serially. Human and mouse embryonic material were transplanted to the eyes of rabbits and of guinea-pigs. Organ transplants in both homologous and heterologous species underwent differentiation and resembled mature structures. Human heart, lung, brain, stomach, intestine, and kidney were successfully transplanted but not liver or organs of internal secretion. F. L. W.

Genetic character of neoplastic cells as determined in transplantation experiments : somatic mutation theory. J. Furth, M. C. Boon, and N. Kaliss (*Cancer Res.*, 1944, 4, 1—10).—The transplantation pattern of neoplastic cells arising in pure line mice and their hybrids varies greatly while that of normal tissue is uniform. Tumours induced in the inbred lines *Ak* and *Rf* take well in their hybrids and may take in both inbred lines or only in the line of origin. Tumours induced in the hybrids take well in hybrids but may take well, poorly, or not at all in either parental line. Tumours arising spontaneously in *Ak* or *Rf* are transplantable to *F₁* hybrids but not to the unrelated line. Neoplasms arising in hybrids usually grow well in the hybrids and in one of the lines but not in the other. Spontaneous and induced leukaemia arising in the high-leukaemia stock *Ak* take well in *Ak* mice and fairly well in the unrelated *C3H* strain in which leukaemia is extremely rare. Leukaemias arising in hybrids between these two stocks take well in the hybrids and fairly well in both parental stocks. Similar relations exist between *Ak* and *C3H* mice with regard to transplantability of neoplasms other than leukaemia. F. L. W.

Retention of radioactive phosphorus in leukaemic patients. S. Warren (*Cancer Res.*, 1943, 3, 872—876).—The retention of radioactive P when given intravenously to leukaemic patients is relatively const., amounting to 75% of the original dose on the 3rd day and 52% on the 5th day. The rate of excretion of ³²P in these patients does not vary with dose nor with the clinical condition. A blood dyscrasia of undetermined nature gave abnormally rapid excretion rates. The amount of ³²P lost in the faeces is negligible. F. L. W.

Rhabdomyosarcoma. Rat tumour 92, Institute of Cancer Research, Columbia University, New York. W. H. Lewis (*Cancer Res.*, 1943, 3, 867—871).—Rat tumour 92, Institute of Cancer Research, Columbia University, originally a chondrorhabdomyosarcoma, lost the chondrogenous part after a few rat transfers and years later the muscle elements also disappeared. Malignant cells, from a tumour without muscle, after 3—6 months' cultivation in roller tubes produced pure colonies of cells which on inoculation into rats gave tumours with few to many muscle giant cells. After 400—600 days' cultivation the cells produced tumours but no giant cells. The malignant cells, probably myoblasts, regained on cultivation and then lost their ability to form giant cells. The living malignant cells in hanging-drop cultures and from tube cultures were essentially alike. F. L. W.

Cerebral angiography.—See A., 1944, III, 456.

Adrenal rest tumour of ovary. Adrenal-like ovarian tumour associated with Cushing's syndrome. Reaction of pituitary gland in hamster to treatment with oestrogens.—See A., 1944, III, 465.

Benign and malignant testicular tubular adenoma in female.—See A., 1944, III, 472.

Diagnostic value of pancreatic function tests in 47 surgically treated cases.—See A., 1944, III, 474.

Metabolism of 1 : 2-benzanthracene in mice and rats.—See A., 1944, III, 489.

XVIII.—ANIMAL NUTRITION.

Diet surveys in the Central Provinces and Berar. P. D. Bhawe (*Indian J. Med. Res.*, 1941, 29, 99—104).—The diet of 70 families of industrial workers in the Central Provinces was a "poor rice-eaters' diet," deficient in protein, fat, vitamin-A and -B₂ complex. 25—30% of the 6000 children who were examined suffered from deficiency diseases : phrynoderma, xerophthalmia, and stomatitis. S. E. M.

Nutritional deficiencies and dental caries in Northern India. C. D. M. Day (*Brit. Dent. J.*, 1944, 76, 143—147).—Examination of

200 very poorly nourished boys (average age 14.33 years) brought up on extremely deficient and unbalanced but unsophisticated diets in which cereals preponderated showed that 49% were caries-free, the average no. of cavities per mouth being only 1.56. No correlation between the incidence of caries and that of rickets (43.5% had rickets), dental hypoplasia, gingivitis, salivary calculus, or dental plaques was found but where caries was pronounced there was almost always a history of chronic sepsis, tuberculosis, or repeated attacks of fever. Vitamin-A deficiency was not accompanied by increased susceptibility to caries. The physical nature of the diet and the maintenance of the traditional diet are held to be very much more important in preventing caries than is dietary adequacy. W. McC.

Dietetic, dental, and bacteriological study of 50 institutional inmates. R. Whyte (*Brit. Dent. J.*, 1943, 75, 247—255, 273—281, 301—309).—Boys aged 7—15 living in an Institution in Scotland were randomly divided into groups of 22 and 19. One group was given 2 oz. of sweets daily, the other acting as control. The groups were interchanged at 2-monthly intervals so that each group had 2 periods of administration and 2 of withholding. A clinical dental inspection was carried out before and after each period. Incidence of caries was expressed numerically as the "average caries figure" (A.C.F.). A bacteriological examination of the saliva was made and its pH measured. There was a markedly greater increase in A.C.F. after periods of administration than after periods of withholding. There was no relation, however, between the bacteriological findings and either the caries data or the consumption of sweets, nor between the pH of the saliva and the A.C.F. E. C. W.

Growth, reproduction, and lactation in rats maintained through four generations on highly purified diets. L. J. Vinson and L. R. Ceredo (*Arch. Biochem.*, 1944, 3, 389—397).—Rats of two different strains were raised on several highly purified diets. Excellent growth through four generations compared favourably with growth of controls kept on Purina dry chow. Mothers lost wt. during lactation and regained wt. after separation from the young. Brewers' yeast was beneficial in preventing this loss in wt. E. R. S.

Yeast in nutrition. F. A. Wilson (*Int. Sugar J.*, 1944, 46, 154—156).—Relatively mild vitamin-B-complex deficiency is common in Mauritius. B_1 is a sp. in the prevention and treatment of the common tropical macrocytic anaemia. In Mauritius such low blood counts as 650,000 red cells per c.c. can be raised to the normal 5 million with a few weeks' treatment with liquid distillery yeast, while the % of haemoglobin may be raised from 30% to the normal in the same period. Yeast has also been used successfully in gastro-intestinal constipation and skin affections; its vitamin content varies widely according to the method of its production. 1—3 oz. are usually well tolerated. J. P. O.

Clinical and biochemical study of cow's milk and honey as sole diet for adult humans. M. H. Haydak, A. E. Vivino, J. J. Boehrer, O. Bjorndahl, and L. S. Palmer (*Amer. J. med. Sci.*, 1944, 207, 209—218).—5 healthy individuals aged 22—44 years were put on a daily diet consisting of a mixture of 1 quart of pasteurised milk with 100 g. of light honey. A solution containing 65 mg. of ascorbic acid and 1 mg. of thiamin was added daily. There were 2 control and test periods lasting about 1 month each. The diets were adequate to sustain life but not to prevent deficiency symptoms. C. J. C. B.

Planning nutrition studies involving canned foods. Part to be played by food supplies in safeguarding nutritional values. Definitions and standards of identity for food.—See B., 1944, III, 115.

Effect of dietary composition on pancreatic enzymes.—See A., 1944, III, 412.

Conditions affecting digestibility and metabolisable energy of feeds for cattle. E. B. Forbes, R. W. Swift, J. W. Bratzler, A. Black, E. J. Thacker, C. E. Franch, L. F. Marcy, R. F. Elliott, and H. P. Moore (*Pennsylvania Agric. Exp. Sta. Bull.*, 1943, No. 452, 34 pp.).—The metabolisable energy of common feeding stuffs calc. as gross energy less the energy of the excreta (corr. for increased body wt.) and of methane is compared with vals. obtained by use of Axelsson's factors for the various nutrient constituents. The latter give generally satisfactory results although the factor for ether extract is too high for low-C—low-energy ether-sol. org. acids of silage. Timothy hay was richer in all digestible nutrients than was lucerne hay. The digestible nutrients and metabolisable energy of maize were 25% higher when fed with lucerne than when with timothy. Combinations of feeding stuffs affect digestibility vals. through the action of intestinal organisms which utilise food nutrients and are then digested by the animal. Lucerne- H_2PO_4 and -molasses silage contained more than $\frac{1}{3}$ (fresh basis) of the nutriment of lucerne hay. The silages had the same gross energy (dry matter basis) as the hay, were more digestible, and had higher metabolisable energy vals. The digestible nutrient content and metabolisable energy of lucerne- H_2PO_4 silage were only slightly increased by addition of powdered limestone. A. G. P.

Environmental temperature and protein requirement. C. A. Mills (*Arch. Biochem.*, 1944, 3, 333—336; A., 1944, III, 486).—For optimal growth, rats require a slightly higher proportion of protein in the food at 33° than at 20°, as well as requiring more thiamin and choline (cf. A., 1943, III, 498), but the total daily protein intake is less at 33° than at 20° and equally good growth occurs. 0.2% of cystine in the food reduces the amount of protein required for optimal growth at both temp. to the same level. E. R. S.

Protein hydrolysates in intravenous alimentation. W. E. Gaunt (*Nutr. Abst. Rev.*, 1944, 13, 501—507).—Intravenous administration of protein digests can be advantageously used after operation, hæmorrhage, or burns, particularly for regeneration of tissues, although it is not quite so effective as administration of plasma in the initial treatment. Protein digests (e.g., casein), which are deficient in certain essential amino-acids, can be made adequate by addition of the appropriate synthetic acids. Enzymic digests are preferable to acid digests in that no amino-acid is destroyed, but require several days' digestion as against 6—24 hr. for acid hydrolysates. A combination of acid hydrolysates, which lack only tryptophan, with alkaline hydrolysates, which lack methionine and cystine, may prove useful. A 2.5—10% protein hydrolysate with 10% of glucose is a suitable concn. for administration at the rate of 200—600 c.c. per hr. It is preferable to prepare the amino-acid and glucose solutions separately, and to administer them together after filtration and autoclaving to remove pyrogens; this avoids the tendency to caramel formation. P. G. M.

Protein deficiency in surgical patients. K. A. Meyer and D. D. Kozoll (*Surg. Gynec. Obstet.*, 1944, 78, 181—190).—Hypoproteinæmia was common among 278 surgical patients, being most frequent in cases of bleeding peptic ulcer, cancer of the alimentary tract, intestinal fistula, and bowel obstruction. The hypoproteinæmia was usually aggravated by surgery but could be improved by intensive blood, plasma, and/or amino-acid transfusions. Whole blood transfusions were more effective than plasma transfusions. P. C. W.

Effect of dietary protein on urea clearance and arterial blood pressure in chronic hypertension.—See A., 1944, III, 413.

Effect of dietary protein on the clearances of diodrast and inulin by the kidney in chronic hypertension.—See A., 1944, III, 414.

Physiological factor in food metabolism [calcium in bread]. I. Harris and C. E. Vernon (*J. Physiol.*, 1943, 102, 20—21p.).—Substances, e.g., P, other than phytin in brown bread can cause a negative Ca balance by other means than preventing Ca absorption. Compared with white bread, national wheatmeal bread without added Ca causes an increased loss of Ca by the urine. W. H. N.

Possible value of non-toxic concentrations of fluorine in prevention of deafness from otosclerosis and fibrosis.—See A., 1944, III, 405.

Response of rats maintained on diets fumigated with methyl bromide. H. C. Spencer, V. K. Rowe, E. M. Adams, and D. D. Irish (*Food Res.*, 1944, 9, 11—18).—Rats maintained for 1 year on diets fumigated with 2 or 6 lb. of methyl bromide per 1000 cu. ft. and having an average Br content of 26.2 and 63.7 mg. per 100 g. or on diets containing 0.1% of NaBr exhibit normal wt. gains and show no evidence of intoxication or nutritional deficiency. H. G. R.

Significance of protein level in synthetic diets. T. F. Zucker and L. Zucker (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 136—139).—The delayed growth observed by McIntire *et al.* (A., 1944, III, 422) in rats on a synthetic diet + B factors, and curable by liver extract, does not occur if dietary casein is raised from 20.9 to 27.9%. V. J. W.

Vitamins.

Sulphanilamide acetylation as influenced by various chemicals and by vitamin deficiencies.—See A., 1944, III, 427.

Vitamin-A nutrition of a rural population in Middle Tennessee. J. B. Youmans, E. W. Patton, W. R. Sutton, R. Kern, and R. Steinkamp (*Amer. J. Publ. Health*, 1944, 34, 368—378).—The test of dark adaptation and the concn. of vitamin-A in the blood indicated a degree of deficiency in a large proportion of the population comparable with that suggested by the dietary intake. Nevertheless symptoms of deficiency were very rare. C. J. C. B.

[Vitamin-A and] ectoparasite resistance. L. Kartman (*J. Econ. Entom.*, 1943, 36, 372—375).—In laboratory tests with rats experimentally infested with lice, vitamin-A-deficient animals receiving 3 μ g. of carotene in "Wesson Oil" per week showed an average infestation of 1451.4 lice per rat; rats given the curative dose (10 μ g. of carotene three times weekly) averaged 28.2 lice, against 12.5 lice for control animals. Rats kept on -A-free diets till death had about 120 times more lice than controls. The relation between sp. dietary factors and ectoparasite resistance is discussed. A. A. M.

Vitamin-A content of Indian fish-liver oils. B. N. Majumdar (*Indian J. Med. Res.*, 1941, 29, 95—98; cf. De, *et al.*, A., 1938, III,

285).—The average content of vitamin-A in 25 samples of shark-liver oil was 10,000; in 4 samples of sawfish-liver oil, 12,000 i.u.

S. E. M.

Absorption of vitamin-A in chronic ulcerative colitis.—See A., 1944, III, 412.

Vitamin-A levels in maternal and foetal blood plasma.—See A., 1944, III, 394.

"Cyclisation" of vitamin-A and allied compounds.—See A., 1944, II.

Stability of added carotene on solid carriers. E. Bickoff and K. T. Williams (*Ind. Eng. Chem.*, 1944, 36, 320–323).—Added carotene in 1-g. pellets of carrier (rice bran, oat, potato, or wheat flour) undergoes destruction to the extent of 50–87% in 30 days at 37°. The extent is diminished by adding 25% of oil (especially oil containing natural anti-oxidant, e.g., maize, cottonseed) and anti-oxidant (e.g., quinol, diphenylamine), and using low concns. of carotene. The loss of carotene in 4 months at 37° from rice bran containing approx. 25% of mineral oil is reduced from 98% to 20% by adding 0.5% of diphenylamine. W. McC.

Water-soluble vitamins in sweat. F. Sargent, P. Robinson, and R. E. Johnson (*J. Biol. Chem.*, 1944, 153, 285–294).—Free ascorbic acid, thiamin, riboflavin, and the fluorescent pigments F_1 and F_2 of Najjar and Holt were not detected by chemical methods in fresh, human sweat. Dehydroascorbic acid occurred in 50% of the samples in amounts not exceeding 0.2 mg. and nicotinic acid in the majority of samples at less than 0.1 mg. per 100 ml. Thiamin cannot be detected by biological assay in sweat conc. in vac. so as to stabilise the thiamin. Sweat is not a significant factor in depleting the body's stores of water-sol. vitamins. H. G. R.

B-vitamins in germinating seeds.—See A., 1944, III, 441.

Effect of massive doses of thiamin on fertility and lactation in mouse. L. R. Cerecedo and L. J. Vinson (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 139–140).—No harmful effects were produced by daily intake of 625–750 μ g. of thiamin. (Cf. Perla, A., 1938, III, 129.) V. J. W.

Acidosis the chief cause of avian polyneuritis. R. Lecoq (*Compt. rend.*, 1942, 215, 510–512).—Polyneuritis, produced in pigeons by diets deficient in vitamin- B_1 , is accompanied by acidosis (great decrease in alkali reserve of plasma). Acidosis and polyneuritis (but not death from B_1 -avitaminosis) are prevented by adding sufficient Ca gluconate, Na_3 citrate, Na_2HPO_4 , or $NaHCO_3$ to the deficient diet. W. McC.

Development of cardiac lesions in thiamin-deficient rats.—See A., 1944, III, 396.

Growth of spinal ganglia in plasma from vitamin- B_1 -deficient chickens.—See A., 1944, III, 400.

Vitamin- B_1 deficiency and attempts to produce poliomyelitis in white rats.—See A., 1944, III, 438.

Alcoholic fermentation of *Rhizopus suinus* and specificity of action of aneurin and its constituents.—See A., 1944, III, 433.

Vitamin- B_1 content of the millets *Eleusine coracana*, *Sorghum vulgare*, whole wheat, and rice stored underground. R. Passmore and A. R. Sundararajan (*Indian J. Med. Res.*, 1941, 29, 89–94).—*Eleusine coracana* (ragi) and *Sorghum vulgare* (cholam) had average vitamin- B_1 contents of 4.2 and 3.5 μ g. per g. respectively. The B_1 content of whole wheat was 3–4 μ g. per g., not influenced by the use of natural manure or artificial fertiliser. Rice stored underground for 2 months lost $\frac{2}{3}$ of its B_1 content on milling, while parboiled rice only loses $\frac{1}{3}$ on milling. The storage is, therefore, ineffective for the preservation of B_1 . B_1 was determined by the thiochrome method. S. E. M.

Thiamin content of vegetables. Effect of commercial canning.—See B., 1944, III, 114.

Riboflavin in the nutrition of the horse. P. B. Pearson, M. K. Sheybani, and H. Schmidt (*Arch. Biochem.*, 1944, 3, 467–474).—Horses were fed experimental rations containing varying amounts of riboflavin, which is a dietary essential for the horse. 44 μ g. of riboflavin per kg. of body wt. per day was adequate for horses. Urinary excretion is closely correlated with intake of riboflavin. Less than 0.03 mg. is excreted per day when the intake is 9.4 μ g. of riboflavin per kg. of body wt., but approx. 1.5 mg. per day is excreted with an adequate intake. There is no consistent relation between riboflavin content of blood and intake of riboflavin. E. R. S.

Ocular signs of riboflavin deficiency.—See A., 1944, III, 404.

Effect of nicotinic acid intake on co-enzyme I content of chick tissues. E. G. Anderson, L. J. Teply, and C. A. Elvehjem (*Arch. Biochem.*, 1944, 3, 357–362).—Tissue-nicotinic acid and co-enzyme I levels are correlated with the nicotinic acid level of the diet. Dietary nicotinic acid levels are correlated with liver-nicotinic acid levels, but the liver-co-enzyme I level can be increased only slightly by increasing the dietary nicotinic acid. Co-enzyme I in heart and brain is unaffected by the nicotinic acid intake. Nicotinic acid

contents of tissues determined microbiologically are compared with those calc. from the co-enzyme I contents. E. R. S.

Effect of washing and cooking on the nicotinic acid content of raw and parboiled rice. M. Swaminathan (*Indian J. Med. Res.*, 1941, 29, 83–88).—Raw milled rice loses 60% of its nicotinic acid content, while parboiled (i.e., steamed in the husk) milled rice loses only 12%. Washed parboiled rice contains, therefore, 4 times as much nicotinic acid as raw milled rice (2.8 and 0.65 mg. per 100 g. respectively). Nicotinic acid was determined, by the CNBr-aniline method, in the washing and cooking water after clarifying with Pb acetate. S. E. M.

Influence of pantothenic acid on susceptibility to pneumonia (with note on mechanism of action of sulphapyridine in pneumococcal pneumonia). H. D. West, M. J. Bent, R. E. Rivera, and R. E. Tisdale (*Arch. Biochem.*, 1944, 3, 321–324).—Albino rats were more susceptible to type I pneumococcus than litter mates deficient in pantothenate. Pantothenate is inhibited by sulphapyridine and not available to the pneumococcus (for which it is essential) in infected animals treated with sulphapyridine. E. R. S.

Effect of biotin deficiency on course of *Plasmodium lophura* infection in chicks. A. O. Seeler, W. H. Ott, and M. E. Gundel (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 107–109).—Results of Trager (A., 1944, III, 46) are confirmed. V. J. W.

Utilisation of biotin and biotin methyl ester by *Lactobacillus casei*. See A., 1944, III, 435.

Effect of ascorbic acid on chick growth when added to purified rations. G. M. Briggs, jun., T. D. Luckey, C. A. Elvehjem, and E. B. Hart (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 130–134).—Addition to the purified ration previously used (A., 1943, III, 754) of 100 mg.-% of ascorbic acid or of 0.5 mg.-% of *p*-aminobenzoic acid caused a slight increase in growth. V. J. W.

Influence of pyrophosphate on the oxidation of vitamin-C. P. V. Krishnamurthy and K. V. Giri (*Indian J. Med. Res.*, 1941, 29, 71–82; cf. A., 1938, III, 822).— P_2O_5 (0.8–1%) protected vitamin-C against oxidation by Fe^{++} , norite, and Cu-albumin complex at pH 5.6 and 37°. It also prevented oxidation of added -C in urine, but it did not protect -C against oxidation by ascorbic acid oxidase at pH 5.6. This difference makes it improbable that the enzyme is a Cu-protein compound. Oxidation of the vitamin was measured manometrically by the O_2 uptake. S. E. M.

Ascorbic acid saturation test. J. J. Engelfried, and M. A. McWilliam (*J. Lab. clin. Med.*, 1944, 29, 324–328).—Satisfactory results can be obtained with a 200-mg. saturation test. Since the max. rate of excretion, after oral administration, occurs during the 3rd, 4th, 5th, and 6th hr. a 4- or 6-hr. saturation test is satisfactory; hourly specimens are not necessary. An adequate-C diet is indicated by a urinary excretion of 20 mg. or more of -C in 4 hr. or 30 mg. or more in 6 hr. C. J. C. B.

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

Plasma-vitamin-C levels in women during menstrual cycle.—See A., 1944, III, 394.

Normal variations in blood-ascorbic acid in dairy cattle.—See A., 1944, III, 394.

Ascorbic acid content of tumours and homologous normal tissues.—See A., 1944, III, 416.

Preparation of crystalline ascorbic acid from walnut extracts. B. N. Bukin and I. N. Garkina (*Biochimia*, 1942, 7, 59–65).—Impurities are removed from conc. aq. extracts of unripe walnuts by treatment with ethanol followed by an ethanol-ethyl acetate mixture. 20% of the ascorbic acid may be pptd. in a cryst. form by the addition of a mixture of methanol and light petroleum and the mother-liquor may be further worked up to give a good quality concentrate. H. G. R.

Vitamin-C content of white and red cabbage at various seasons.—See A., 1944, III, 443.

Loss of ascorbic acid during cooking of fresh and dried cabbage. Comparison of ascorbic acid content of stored peas, beans, and parsley dried by various domestic methods.—See B., 1944, III, 114.

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

Dietary factor, essential for guinea-pigs. II. Creatine excretion of animals on diet deficient in this factor and in vitamin-E. W. J. van Wagtenonk, V. Schocken, and R. Wulzen (*Arch. Biochem.*, 1944, 3, 305–310; cf. A., 1943, III, 756).—Deficiency of a substance present in raw cream produces in guinea-pigs a characteristic stiffness of the wrists but has no effect on the creatine excretion. Avitaminosis-E produces a muscular dystrophy accompanied by creatinuria. These symptoms develop simultaneously and independently from combined deficiency of both factors, resulting in a greater degree of paresis than that produced by deficiency of one factor. E. R. S.

Effect of caecotomy and succinylsulphathiazole on vitamin-K synthesis.—See A., 1944, III, 392.

Vascular fragility as influenced by various agents. I. Experimental method. Effects of substances related to vitamin-P. G. J. Majovski, A. J. Lesser, H. C. Lawson, H. O. Carne, and C. H. Thienes (*J. Pharm. Exp. Ther.*, 1944, 80, 1—7).—When normal mice, fed on a full diet, are suddenly exposed to low atm. pressure (70 mm. Hg), hæmorrhages occur in their lungs and they die within 15–60 sec. Crude hesperidin obtained from oranges, and a water-sol. fraction of lemon peel, afforded protection to mice against this hæmorrhage for 2–4 hr. after administration. Purified hesperidin had no protecting effect. G. P.

Nature of vitamin-P. Effect of catechin on capillary resistance. J. Lavollay and J. L. Parrott (*Compt. rend.*, 1942, 215, 496–498).—Substances having vitamin-P activity increase capillary resistance, inhibit autoxidation of adrenaline *in vitro*, and prolong its action on isolated organs. Catechin, which acts thus and also prolongs the action of adrenaline on the nictitating membrane of cat, is the most active -P compound so far known. W. McC.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Factors influencing temperature regulation of birds. W. C. Randall (*Amer. J. Physiol.*, 1943, 139, 58–63).—The body temp. of the barred-rock chick increases from the incubator temp. (38–39°) to 41° 10 days after hatching; it then approaches and remains within the limits of the diurnal variations of the adult bird. The chick is capable of panting or shivering at or shortly after hatching but it cannot maintain body temp. until several days after hatching. The development of temp. regulation is correlated with increasing metabolism, stabilisation of central temp. control, and transition from down feathers to the adult type of plumage. Reflex shivering can be evoked through the skin receptors and shivering can be elicited by cooling of brain centres; reflex panting could not be produced and central panting only slightly. When exposed to cold, muscle tremors, vasoconstriction, increased breathing and heart rate were observed; if exposure is continued these responses progressively decline; shivering ceases at 20°, breathing at 15°, but contractions of the heart still occurred at temp. below 10°. The threshold for panting was not altered at high environmental temp. at great humidity but severe hyperthermia developed rapidly; the average lethal temp. of fowls was 47°. A. S.

Influence of serum-chloride concentration on oxygen consumption of dogs. C. Cohn and S. Soskin (*Amer. J. Physiol.*, 1943, 139, 80–83).—The O₂ consumption of normal, depancreatised, or completely eviscerated dogs was temporarily increased by the administration of NaCl; it was abnormally low in NaCl-depleted animals and restored to normal by returning the blood-NaCl concn. to normal. The effect is mainly due to the effect of Cl⁻, as shown in salt replacement experiments using Na₃PO₄ or LiCl. In NaCl-depleted animals a sharp rise in blood-lactic acid levels was observed. A. S.

Rate of oxygen consumption and anaerobic glycolysis of nuclei of chicken erythrocytes.—See A., 1944, III, 390.

Effect of pH and certain electrolytes on metabolism of ejaculated spermatozoa.—See A., 1944, III, 411.

Shock. II. Rôle of peripheral tissues in metabolism of protein and carbohydrate during hæmorrhagic shock in rats. III. Rôle of liver and hepatic circulation in metabolic changes during hæmorrhagic shock in rats and cats. IV. Oxygen consumption of liver and kidney tissue from rats in hæmorrhagic shock.—See A., 1944, III, 397.

Amino-acid degradation and serum-proteins.—See A., 1944, III, 382.

Conversion of *d*-glutamic acid into pyrrolidonecarboxylic acid by the rat. S. Ratner (*J. Biol. Chem.*, 1944, 152, 559–564).—*dl*-Glutamic acid containing ¹⁵N and D on the α- and β-C atoms was fed to adult male rats. 75% of the *d*-acid was excreted complete with its ¹⁵N in an unidentified form. Some *d*-glutamic acid containing ¹⁵N was identified in the urine, and also *d*-pyrrolidonecarboxylic acid. R. L. E.

Carotenoid metabolism. IV. Effect of vitamin-A intake on the carotenoid and vitamin-A content of eggs, liver, blood, and body fat of hens.—See A., 1944, III, 422.

Glucosidolipin of the spleen. J. Polonovski (*Compt. rend.*, 1942, 315, 443–445).—The isolation from the spleen of a child suffering from Gaucher's disease of a *cerebroglucoside*, m.p. 185°, [α]_D²⁰ –11.3° in pyridine, is described. It is hydrolysed by *N*-HCl to glucose (fermentable by brewer's yeast and giving a phenyllosazone, m.p. 206°) and an amide which is hydrolysed to sphingosine and fatty acids, principally lignoceric acid. It is hydrogenated (Pt-black) to a *dihydrocerebroside*, m.p. ~188°, [α]_D²⁰ –2.6°, hydrolysed by 3*N*-HCl to glucose and *lignoceryl dihydrosphingosine*, converted by acid into lignoceric acid and dihydrosphingosine (hydrobromide, m.p. 260°). H. W.

Obesity; its nature and treatment. W. C. Cutting (*Chem. Products*, 1944, 7, 49–51). P. C. W.

Influence of various chemicals and vitamin deficiencies on excretion of glucuronic acid in rat. G. J. Martin and W. Stenzel (*Arch. Biochem.*, 1944, 3, 325–331).—Dihydroxyacetone, glycerol, lactic, succinic, malic, and adenylic acids, cysteine, and tyrosine increase glucuronic acid excretion in rats. Pyruvic, acetic, glycollic, tartaric, fumaric, citric, saccharic, and nucleic acids, histidine, cystine, glycine, and alanine do not. There is increased glucuronic excretion in riboflavin deficiency, but decreased excretion in deficiency of pantothenate, thiamin, pyroxidine, vitamin-A, -D, or -E. Sulphanilamide increases the excretion slightly, sulphathiazole markedly, and sulphadiazine has no effect; sulphaguanidine fed chronically results in decreased excretion. E. R. S.

Glucose tolerance of fasted and insulinised chicks. D. F. Opydyke (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 119–122).—Glucose tolerance of normal chicks resembles that of mammals. After 24–72 hr. fasting, the return of blood-sugar to normal is prolonged, and injection of 20 units of insulin, before or during the fasting period, causes hyperglycæmia which is still increasing at 80 min. after glucose administration. V. J. W.

Oxidation of fructose by brain *in vitro*. J. R. Klein (*J. Biol. Chem.*, 1944, 153, 295–300).—Oxidation of fructose by cat brain *in vitro* is accompanied by phosphorylation, following the same pattern as the oxidation of glucose and supporting the hypothesis that brain cells are impermeable to fructose *in vivo*. H. G. R.

Blood-ketone bodies in relation to carbohydrate metabolism in muscular exercise.—See A., 1944, III, 394.

Effect of excessive dietary sodium and potassium on carbohydrate metabolism of normal rats.—See A., 1944, III, 420.

Metabolism of phosphate and carbohydrate in extracts of human muscle and brain. G. D. Greville and H. Lehmann (*J. Physiol.*, 1943, 102, 357–361).—Breakdown of adenosine triphosphate occurs, but not after heating the extract to 100° and not in the absence of Ca⁺⁺. Mg⁺⁺ inactivates the latter. Phosphorylation of glycogen occurs. An equilibrium between hexose diphosphate and triose phosphate is shown, and the equilibrium point is shifted by changes of temp. There is equilibrium, shifted by changing pH, between creatine phosphate and adenosine triphosphate. W. H. N.

Copper metabolism and requirement of young women.—See A., 1944, III, 420.

Pattern of normal water drinking in dogs. E. A. Robinson and E. I. Adolph (*Amer. J. Physiol.*, 1943, 139, 39–44).—Water is drunk when the body is depleted of water by about 0.5% of the body wt., the amount drunk being proportioned to water deficit of the body though no water absorption has time to occur before drinking ceases. A. S.

Phenol. V. Distribution, detoxification, and excretion of phenol in mammalian body. W. B. Deichmann (*Arch. Biochem.*, 1944, 3, 345–355).—Rabbit and rat tissues contain no free or conjugated phenol. Phenol is found in urine, mostly conjugated. When phenol is administered to animals it rapidly penetrates into the tissues, and severity of intoxication is directly related to the concn. of free phenol in blood and tissues. Phenol is removed from the body by excretion, oxidation, and conjugation, the last two processes starting before the appearance of symptoms of poisoning. The distribution of the dosage among these three processes varies with the dose and the animal species treated. During the first 24 hr. after oral administration of half a lethal dose to rabbits, 59–88% is excreted, approx. half as free phenol, $\frac{1}{4}$ conjugated with sulphonic acid, $\frac{1}{8}$ conjugated with glucuronic acid, and $\frac{1}{8}$ conjugated with unidentified acids; 10–38% is destroyed; 2–5% remains in the carcass and traces are found in the faeces and breath. During the first few hr. after oral administration of an approx. lethal dose to rabbits, 41–55% is destroyed and 44–55% is present in the carcass approx. 4 hr. after ingestion; after 2 $\frac{1}{2}$ hr. most of the phenol is free, and after 6 hr. most of it is conjugated; approx. 3% is excreted in 4 hr., mostly conjugated phenol, in the urine and traces in the breath and the faeces, free and conjugated. 4 hr. after administration of a sub-lethal dose of phenol to a rat, 46–82% is destroyed and 18–53% remains in the carcass. After a dose of 0.2 g. of phenol per kg., most of the phenol in the carcass is conjugated, and after a dose of 0.4–0.6 g. of phenol per kg. most of it is free. Traces of free and conjugated phenol are excreted in urine and faeces. E. R. S.

XX.—PHARMACOLOGY AND TOXICOLOGY.

Effectiveness of penicillin on *Listerella*. E. J. Foley, J. A. Epstein, and S. W. Lee (*J. Bact.*, 1944, 47, 110–111).—Seven strains of *Listerella* grew freely in 40 times the concn. of penicillin necessary to inhibit completely the growth of representative streptococci and staphylococci. F. S.

Therapeutic action of penicillin on *Spirochæta recurrentis* and *Spirillum minus* in mice. E. M. Lourie and H. O. J. Collier (*Ann. trop. Med. Parasit.*, 1943, 37, 200—205).—250 units of penicillin cleared the blood of *Sp. recurrentis* in 24 hr., an effect equal to that of 1 mg. of neoparsphenamine. Against *Sp. minus* 10 units of penicillin cleared the blood (= 1—2 mg. of neoparsphenamine) and 1000 units effected cure. F. S.

Mode of action of sulphonamides. R. J. Henry (*Bact. Rev.*, 1943, 7, 175—262). F. S.

Mode of action of sulphonamides. S. W. Lee and E. J. Foley (*J. Amer. Pharm. Assoc.*, 1944, 33, 82—84).—The effect of sulphathiazole on the growth of *E. coli* in presence of one or more of *p*-aminobenzoic acid, adenine, and urea at 20—44° indicates that the sulphonamide causes local damage (denaturation) to certain sulphonamide-receptive parts of the enzyme mosaic. Potentiators or inhibitors are absorbed and either protect the enzyme from the sulphonamide or enhance its activity according to whether they occupy positions the same as, or different from, those occupied by the sulphonamide. F. O. H.

Absorption rate of sulphanilamide from pleural and peritoneal cavities and gastrointestinal tract of dogs. H. B. Haag, C. R. Spealman, and H. M. McCue (*Surgery*, 1941, 10, 572—575).—Sulphanilamide is equally well absorbed from all three sites. G. P.

(A) Experimental basis for treatment of *Hæmophilus influenzae* infections. (B) Treatment of *H. influenzae* infections and of meningococci and pneumococci meningitis. H. E. Alexander (*Amer. J. dis. Child.*, 1943, 66, 160—171, 172—187).—(A) The protective capacities of sulphanilamide, sulphadiazine, and antibody singly and of sulphadiazine + antibody were compared against lethal type B *H. influenzae* infections in mice. Protection afforded by sulphadiazine or antibody separately was superior to that of sulphanilamide, and their combination was superior to either used alone.

(B) The susceptibility of the meningococcus to the action of sulphadiazine justifies its use alone in this type of meningitis, unless the patient fails to show a prompt response. Added antibody is necessary only for some young infants and for patients of other age groups with overwhelming infections. The intravenous route alone is recommended for administration of antibody. C. J. C. B.

Action of sulphonamides on toxins of agents of lymphogranuloma-psittacosis group. G. Rake and D. M. Hamre (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 90—91).—Sulphamerazine has no effect on any of these toxins or on the "early" deaths caused by them, but it prevents completely the "later" deaths caused by the agent of mouse pneumonitis, although not those due to feline pneumonitis. V. J. W.

Treatment of *Pasteurella pestis* infection in mice. R. L. Phillips and L. H. Barnes (*J. Franklin Inst.*, 1943, 235, 94—97).—The survival rate of mice infected with *P. pestis* was increased from 5—10% to 80—90% by feeding 20—28 mg. of sulphadiazine per day, and to 74% by 40 mg. of sulphathiazole per day; 20 mg. of succinylsulphathiazole daily had no effect. F. S.

Sulphonamides in dentistry. O. F. Brown (*Brit. Dent. J.*, 1944, 76, 269—271).—A review. W. McC.

Pathological changes in sulphadiazine intoxication. E. F. Geever (*Amer. J. med. Sci.*, 1944, 207, 331—341).—3 fatal cases of streptococcal infection are described with autopsy findings. All of them received sulphadiazine treatment (49—60 g. over 10—14 days). In 2 patients who developed a drug eruption, severe fatty metamorphosis of the liver and moderate focal fibrinoid necrosis of the spleen and mesenteric lymph nodes were observed. The third patient showed no skin eruption, no necrosis of spleen or lymph nodes, and only mild fatty alterations were encountered in the liver. A skin eruption during sulphadiazine treatment is thus of serious significance. (4 photomicrographs.) C. J. C. B.

"Drug fever" accompanying second courses of sulphathiazole, sulphadiazine, and sulphapyridine. H. F. Dowling and M. H. Lepper (*Amer. J. med. Sci.*, 1944, 207, 349—353). C. J. C. B.

Production and treatment of granulocytopenia and anæmia in rats fed sulphonamides in purified diets.—See A., 1944, III, 455.

Recent advances in search for synthetic antimalarials. W. W. Carlson (*J. Amer. Pharm. Assoc.*, 1944, 33, 97—106).—A review of recent antimalarials (mainly quinine, atebrin, and plasmoquin), including biological aspects of the malarial parasite, biological assay of antimalarials, and relationship between structure and schizonticidal activity (80 references). F. O. H.

Toxicity of atabrine. I. Acute effects of massive doses in rat. J. V. Scudi, V. C. Jelinek, and S. Kuna. II. Influence of diet on effects of repeated doses. J. V. Scudi and M. T. Hamlin (*J. Pharm. Exp. Ther.*, 1944, 80, 144—149, 150—159).—I. 22—48% of rats fasted for 12—36 hr. died 30—60 min. after oral administration of 450 mg. per kg. (50% of L.D. 50) of atabrine, while normal rats survived. This dose of atabrine produced liver necrosis, severe irritation of the gastro-intestinal tract resulting in flow of fluid into

the stomach and intestines and diarrhoea, marked hæmoconcn., loss of plasma-HCO₃' and -Cl', prolongation of prothrombin time, retention of bromsulphalein, and increase in plasma-fibrinogen concn.

II. Rats maintained on a low-protein, or a low-protein and high-fat, or a high-protein and high-fat diet and receiving 45 mg. per kg. of atabrine per day for 3, 7, and 24 days lost wt., their activity was depressed, their pelage became dishevelled, they developed diarrhoea, and their whiskers became encrusted with porphyrin-like material. Rats receiving the same doses of atabrine but kept on a high-protein and low-fat diet maintained their wt. and remained in good condition. Dogs kept on a stock diet and given 25—50 mg. per kg. of atabrine per day lost 10—17% of their body wt. in 3—6 weeks; their plasma-fibrinogen increased, blood-urea, -non-protein N, and -cholesterol decreased. 5—10 mg. per kg. of atabrine per day had no such effects. The increase in plasma-fibrinogen levels after atabrine was more rapid in protein-depleted dogs than in animals kept on stock diet. The prothrombin time, icteric index, serum-bilirubin, urinary urobilin, and liver function tests showed no deviation from normal either in rats or in dogs after prolonged treatment with these doses. G. P.

Nutrition and tolerance to atabrine. D. M. Hegsted, J. M. McKibbin, and F. J. Stare (*J. Nutrition*, 1944, 27, 141—148).—Atabrine is non-toxic to the rat at levels of 25 mg. per kg. of body wt. per day, but at 40—60 mg. per 100 g. of ration growth is retarded by 20—30%, fur is discoloured, and the animals become unkempt; these changes are not affected by the addition of various vitamins, yeast, or protein. The addition of 40 mg. of atabrine per 100 g. of diet decreases further the reduced growth on a riboflavin- or protein-deficient diet but does not affect that due to vitamin-A deficiency. The chick is 3—4 times as tolerant of atabrine as is the rat. H. G. R.

4:4'-Diamidinodimethylstilbene in treatment of *Trypanosoma congolense* in cattle. J. Carmichael and F. R. Bell (*Ann. trop. Med. Parasit.*, 1943, 37, 145—146).—Single doses of 2.5—5.0 mg. per kg. cleared the peripheral blood and 10 mg. was curative but the therapeutic index was very small. F. S.

Therapeutic action of various compounds in mice infected with *Trypanosoma congolense*. J. D. Fulton and W. Yorke (*Ann. trop. Med. Parasit.*, 1943, 37, 152—157).—Of a no. of drugs tested, including Sb compounds, the most active were 7-amino-9-(*p*-aminophenyl)-10-methylphenanthridinium chloride and 4:4'-diamidinodimethylstilbene. F. S.

Unimpaired susceptibility of *Trypanosoma rhodesiense* to arsenicals after intensive treatment by mepacrine. E. M. Lourie and H. O. J. Collier (*Ann. trop. Med. Parasit.*, 1943, 37, 205—210).—Intensive treatment by mepacrine both *in vivo* and *in vitro* of a strain of *T. rhodesiense* did not increase resistance to mepacrine or arsenicals. F. S.

Comparison of biological action of Bayer 7802 (AC) and corresponding I.C.I. synthetic product. J. D. Fulton (*Ann. trop. Med. Parasit.*, 1943, 37, 164—173).—Both substances freed the peripheral blood from *Trypanosoma cruzi* in mice but neither cured the infection. No difference was found in the biological action of the two substances. F. S.

Antibacterial and toxic action of acridine derivatives. J. Ungar and F. A. Robinson (*J. Pharm. Exp. Ther.*, 1944, 80, 217—232).—3:8-Diaminoacridine and 5-aminoacridine hydrochlorides are bactericidal in high dilutions against Gram-positive cocci and spore-bearing anaerobes, and in lower dilutions against Gram-positive and Gram-negative bacilli. Blood and serum decrease slightly their activity *in vitro*. They do not neutralise staphylococcal hæmolysin or diphtheria toxin *in vitro*. The bactericidal effect of acriflavine is more rapid against staphylococcus than that of 3:8-diaminoacridine, but its action is slower against *B. coli* and *B. proteus*. 5-Aminoacridine was the least effective of the compounds. The intraperitoneal L.D. 50 of acriflavine was 65, of 3:8-diaminoacridine monohydrochloride 300, and of 5-aminoacridine hydrochloride 70 mg. per kg. Proflavine in 1:10,000 concn. reduced the *in-vitro* phagocytosis of staphylococci by 24%, while 3:8-diaminoacridine and 5-aminoacridine hydrochloride had no such effect in this concn. The latter two compounds, applied either in solution or in powder form to experimental wounds, were less harmful than acriflavine or proflavine, although they slowed down the healing. The physical and chemical properties of 3:8-diamino- and 5-aminoacridine hydrochlorides are described. G. P.

Toxicity of phenol and of *o*-, *m*-, and *p*-cresols for experimental animals. W. B. Deichmann and S. Witherup (*J. Pharm. Exp. Ther.*, 1944, 80, 233—240).—The toxicity of phenol given orally to rabbits was the same whether it was given in concn. or in dil. solutions. The rate of absorption of phenol from the skin depends on the area exposed and not on the concn. of the applied solution. The approx. intraperitoneal and subcutaneous L.D. 50 of phenol for rabbits was 0.62 g. per kg. and the intravenous L.D. 50 was approx. 0.18 g. per kg. 10-day rats are more susceptible to phenol than adult animals. The comparative toxicity of phenol, *o*- and *p*-cresol is in the same range; *m*-cresol is the least toxic of the

compounds. Soap and water are as effective as 50% ethanol in removing phenol from the skin (cf. A., 1942, III, 756). G. P.

Clinical and bacteriological study of phemerol as skin antiseptic. W. E. Brown, M. F. Gunderson, P. Schwartz, and V. M. Wilder (*Surg. Gynec. Obstet.*, 1944, 78, 173—180).—Small culture plates were placed on both sides of the abdomen which had been treated with different skin antiseptics. Phemerol (1:500) was more effective than cresol-mercurials (Novak's solution of mercurin), merthiolate, or tincture of soap and alcohol; it had the same efficacy as I. Phemerol is unaffected in its action by sweating and does not cause skin irritation or interfere with wound healing. P. C. W.

Pharmacological action of nitric ester of choline perchlorate. C. J. Carr, F. K. Bell, W. E. Evans, jun., and J. C. Krantz, jun. (*J. Pharm. Exp. Ther.*, 1944, 80, 171—175).—This ester, $\text{NO}_2\text{O}\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{NMe}_3\cdot\text{ClO}_4$, has m.p. 188—189°. 2 drops of a 1% solution instilled into the conjunctival sac of rabbits produced myosis, which was abolished by atropine. It has a depressor potency one half that of acetylcholine; its action on the smooth muscle of the frog pylorus is similar to that of the latter compound. The nitric ester is not hydrolysed by serum-choline-esterase. Its L.D. 50 (1 hr.) for rats was 2.5 mg. per 100 g. G. P.

Choline esters with atropine-like action. K. C. Swan and N. G. White (*J. Pharm. Exp. Ther.*, 1944, 80, 285—288).—Di-*n*-butyl-carbamylcholine chloride is a surface-active compound and has bactericidal properties; in 0.2—0.5% concn. it promptly sterilises a 24-hr. broth culture of hæmolytic staphylococci or streptococci. 5—10% solutions instilled into the mammalian eye produce mydriasis and paresis of the ciliary muscles and recession of the near point of accommodation. In birds, in which the iris muscles are of the skeletal type, it does not produce mydriasis. Homatropine and the new compound are synergistic in their action on the iris. Its action is short and its effect is greater on accommodation than on the pupil (cf. A., 1944, III, 181). G. P.

Cardiovascular actions of amines related to adrenaline. J. D. P. Graham (*Quart. J. Pharm.*, 1944, 17, 19—29).—The effects of β -phenyl-, p -methoxyphenyl-, α -methoxy- α -dimethoxyphenyl-, and phenylthienyl-ethylamine, tyramine, ephedrine, pholedrine, β -phenyl- and 3:4-dimethoxy-4-diphenyl-isopropylamine, and phenylbutenylamine on the isolated cat and rabbit heart, perfused rabbit ear, blood pressure, limb vol., and nictitating membrane of the spinal cat are determined. At 1:50,000 all the amines except α -methoxy- α -dimethoxyphenylethylamine have a sympathomimetic action on the cat heart. They differ from adrenaline in degree and duration of their stimulant effect, and in their almost complete inactivity on rabbit heart. 1 μ g. per kg. of the same amines increases the carotid blood pressure of spinal cats whilst there is a variable effect on rabbit blood pressure. 1 mg. per kg. of some of the amines increases the pressor effect of adrenaline without affecting the duration of its action, whilst others depress the effect. With 1 mg. per kg. the pressor action of adrenaline is generally decreased. Most of the amines have no constrictor effect on vessels of the cat limb whilst they usually increase the constrictor action of adrenaline. 1 μ g. per kg. of most of the amines has a slight constrictor effect on the perfused rabbit ear, whilst with 10 μ g. per kg. all have some degree of action except phenylthienylethylamine. None consistently potentiates the effect of adrenaline. Only the dimethoxydiphenyl-isopropylamine in 1- μ g. dose causes slight contraction of the nictitating membrane. Larger doses of the other amines cause some contraction. Injection of any of the amines except α -methoxy- α -dimethoxyphenylethylamine causes alteration in the shape of the curve of blood pressure response to injected adrenaline. J. N. A.

Effect of barbiturates on choline-esterase in different tissues. F. Schütz (*J. Physiol.*, 1943, 102, 269—273).—The prolonged administration of barbiturates, but not a single large dose, reduced the concn. of choline-esterase in serum, spinal cord, and striped muscle of guinea-pigs, but not in the brain. The fall in all tissues where it was seen started at the same time. (Cf. Stedman and Russell, A., 1938, III, 10.) W. H. N.

Effects of posterior pituitary extract, oxytocin (pitocin), and ergonovine hydracrylate (ergotrate) on uterine, arterial, venous, and maternal effective placental pressures in pregnant humans. R. A. Woodbury, W. F. Hamilton, B. E. Abreu, R. Torpin, and P. H. Fried (*J. Pharm. Exp. Ther.*, 1944, 80, 256—263).—The uterine pressure (intrauterine pressure—abdominal pressure), the effective placental arterial pressure (maternal arterial pressure—uterine pressure), and maternal venous pressure were measured with a differential manometer (cf. *Physiol. Abs.*, 1937, 22, 264) in human subjects during parturition. 0.66 oxytocic unit of posterior pituitary extract given subcutaneously, or a sublingual dose of 0.05 mg. of ergotrate, increased the intensity and frequency of uterine contractions. In hyper-reactive cases these doses may result in prolonged uterine contractions, and larger doses produce uterine tetany and reduce the effective placental arterial pressure and cause asphyxia of the foetus, especially if the maternal arterial pressure is low. This danger is greater with oxytocin than with whole posterior pituitary extracts. Pituitary and ergot preps. may increase the

uterine tension to 500 g. per sq. cm. of the cross-sectional area of the uterine wall. The calc. tension which tends to rupture the uterus was 700 g. per sq. cm. G. P.

Veratrum alkaloids. V. Effect of veratridine and cevine on circulation of anaesthetised dogs. G. K. Moe, D. L. Bassett, and O. Krayer (*J. Pharm. Exp. Ther.*, 1944, 80, 272—284).—Veratridine injected intravenously to 15—19-kg. dogs in doses of 0.02—0.14 mg. produces a rapid fall in blood pressure and in heart and respiratory rates. These effects are partly mediated through afferent fibres in the vagus. The fall in blood pressure results partly from bradycardia and partly from peripheral vasodilatation. The latter is neurogenic in origin and not the result of direct action of veratridine on the arterial wall. After vagotomy 0.5—1.0 mg. of veratridine causes an increase in blood pressure and heart rate. Cevine lacks the characteristic effects of veratridine (cf. A., 1943, III, 586; 1944, III, 279). G. P.

Comparison of some ergot alkaloids. II. Action on temperature regulation in mouse and rabbit. A. C. White (*Quart. J. Pharm.*, 1944, 17, 1—7; cf. A., 1944, III, 360).—Intravenous injection of suitable doses of ergotoxine, ergosine, ergotamine, ergosinine, ergometrine, isoergine, and ergine into mice causes decrease in rectal temp. Ergotamine, ergotamine, and the lysergic acids are inactive in the doses employed. Ergotoxine, ergotamine, and ergosine affect the rectal temp. of rabbits similarly but there is considerable variation in the type of response; large doses generally increase the temp. Ergosine and ergometrine are both more active than are the *d*-isomerides. isoErgine gives a mixed response but is slightly more active than ergine. The lysergic acids are only slightly active. Ergotamine potentiates the intravenous toxicity of acetylcholine in mice much less than it does the apnoea-producing action of acetylcholine in dogs. J. N. A.

Influence of temperature on action of digitoxin and potassium on striated muscle [of frog]. S. A. Guttman (*J. Pharm. Exp. Ther.*, 1944, 80, 126—131).—The frog's double sartorius was repeatedly exposed *in vitro* to 1:10⁶ concn. of digitoxin in Ringer's solution or to excess of K (5—10 times the amount present in Ringer's solution) at varying temp. Twitch tension of the muscle was recorded every 5 min. After lowering the temp. from 27° to 17°, the time necessary for the development of 50% reduction in twitch tension after exposures to digitoxin was nearly doubled (*Q*₁₀ of about 2), whereas with excess of K this time was the same at 27° and at 17°. A mode of action of digitoxin is postulated. G. P.

Digitoxin-binding power of serum- and of tissue-proteins of rabbit. G. Fawaz and A. Farah (*J. Pharm. Exp. Ther.*, 1944, 80, 193—198).—Digitoxin in 1:10⁶ concn. in rabbit's serum applied to the isolated frog heart during the cold season was without toxic effects. The protective power of the serum was due to the binding of digitoxin by the serum-albumin. Serum-globulin and extracted proteins of heart, liver, and striated muscle of rabbit had no digitoxin-binding power. The digitoxin could be quantitatively recovered from its combination with serum-albumin after denaturing the latter with cold alcohol. G. P.

Cellulose acetate phthalate as an enteric coating. H. C. Hodge, H. H. Forsyth, jun., and G. H. Ramsey (*J. Pharm. Exp. Ther.*, 1944, 80, 241—249).—Cellulose acetate phthalate is a suitable coating for enteric capsules as it withstands the action of gastric juice but the coating disintegrates in the intestines. G. P.

Chronic toxicity of cellulose acetate phthalate in rats and dogs. H. C. Hodge (*J. Pharm. Exp. Ther.*, 1944, 80, 250—255).—Large amounts of cellulose acetate phthalate fed daily to rats and dogs for one year had no toxic effects. G. P.

β - and ψ -Santonins: influence on *Ascarides lumbricoides*. E. Baldwin (*Pharm. J.*, 1943, 151, 22).— β -Santonin has not more than 20% of the anthelmintic potency of santonin. ψ -Santonin is inactive. R. L. E.

1-*n*-Alkylcyclopentanol and their derivatives.—See A., 1944, II, 218.

Explosion hazard in anaesthesia. S. D. Miller (*Nebraska Sta. Med. J.*, 1944, 29, 9—11).—A review. E. M. J.

Caudal anaesthesia with novocaine. L. E. Moon and J. B. Christensen (*Nebraska Sta. Med. J.*, 1943, 28, 376—378).—Report of 3500 cases. E. M. J.

Alkalised injections of procaine for regional anaesthesia. D. H. Geard (*Pharm. J.*, 1943, 151, 43).—0.5 and 1.0% solutions of procaine hydrochloride for use as regional anaesthetics have the disadvantages that the acidity of the solution causes pain, the relatively transient action necessitates re-injection before the end of a major operation, and there is a slow decomp. on storage. The prep. of alkaline 0.5 and 1.0% solutions of procaine from which these disadvantages are absent is described. The procaine and alkalis solutions are prepared separately and mixed immediately before use. Na phosphate is used as the alkali. J. N. A.

Concentration of paraldehyde in blood following administration during labour. H. L. Gardner, H. Levine, and M. Bodansky

(*Amer. J. Obstet. Gynec.*, 1940, 40, 435—439).—The concn. was determined in parturient women $\frac{1}{2}$ —16 hr. after the administration of 30 ml. of paraldehyde in 60 ml. of olive oil by mouth or rectum. Max. concn. was attained 2—4 hr. after the administration and was 12—24 mg.-% when given rectally and 11—33 mg.-% when given by mouth. Complete amnesia was experienced in all patients in whom the concn. rose above 20 mg.-% and in some of those with lower maxima. The concn. in the cord blood was approx. equal to that in the maternal blood. P. C. W.

Effect of cocaine on urinary excretion of phenol. C. Torda (*J. Pharm. Exp. Ther.*, 1943, 77, 274—276).—5 mg. of phenol and 15 mg. of cocaine per kg. followed by 2 mg. of cocaine per kg. 2-hourly for 24 hr. were injected subcutaneously into fasting cats. Cocaine alone did not modify the daily phenol excretion. Cocaine cats eliminate injected phenol in free but not in conjugated form, indicating that cocaine inhibits the enzymic processes involved in the esterification of phenols *in vivo*, and that adrenaline may be inactivated *in vivo* by esterification of the phenol ring. A. S.

[Acute and chronic toxicity of] 5- Δ^2 -cyclopentenyl-5-allylbarbituric acid (cyclopal). M. J. Vander Brook and G. F. Cartland (*J. Pharm. Exp. Ther.*, 1944, 80, 119—125).—The oral L.D. 50 of cyclopal was 205 mg. per kg. for rats and 105 mg. per kg. for dogs. The dose producing anaesthesia in 50% of animals (A.D. 50) was 75 mg. per kg. for rats and 27 mg. per kg. for dogs. The L.D. 50/A.D. 50 ratio of cyclopal is very similar to that of pentobarbital in both rats and dogs. Rats receiving A.D. 50 and dogs receiving A.D. 100 of cyclopal or of pentobarbital 3 times a week for 23—28 weeks remained in good health and their organs showed no pathological changes. In the chronic experiments both rats and dogs became slightly refractory to cyclopal and slightly more susceptible to pentobarbital. Not more than 2.5% of the administered L.D. 50 of cyclopal or of pentobarbital was excreted in the urine of dogs. G. P.

Action of morphine on central nervous system of cat. A. Wikler (*J. Pharm. Exp. Ther.*, 1944, 80, 176—187).—In the intact cat 2—5 mg. of morphine per kg. intravenously caused disintegration of adaptive responses associated with depression rather than with stimulation of the nervous system. 10—15 mg. of morphine per kg. had delayed stimulant action ("startle response," muscle twitches, and spontaneous running). In acute decorticate and hypothalamic cats 2—5 mg. of morphine per kg. depressed or abolished the skeletal motor components of "sham rage" and the righting reflexes. Larger doses in these cats had but a short depressant effect followed by augmentation of running movements. In acute decerebrate cats extensor rigidity and labyrinthine reflexes were not altered by morphine, but delayed stimulant action was observed $\frac{1}{2}$ —1 hr. after the injection of the drug. In acute and chronic spinal cats the flexor and extensor reflexes were markedly depressed, while the knee and ankle jerks were either not affected or they were slightly augmented by intravenous morphine. It is concluded that the action of morphine on the somatic central nervous system of the cat consists of (a) selective depression and (b) delayed excitatory effects. G. P.

Fate of morphine sulphuric ether. F. W. Oberst and E. G. Gross (*J. Pharm. Exp. Ther.*, 1944, 80, 188—192).—2.5—12.5% of the administered drug is excreted in the urine of dog and man in free and 26—55% in bound form. It does not produce euphoria or relieve pain or withdrawal symptoms in morphine addicts. G. P.

Analgesic action of pethidine (ethyl 4-phenyl-1-methylpiperidine-4-carboxylate) hydrochloride. G. Woolfe and A. D. Macdonald (*J. Pharm. Exp. Ther.*, 1944, 80, 300—307).—A method is described for the evaluation of analgesics: analgesia was assumed when mice placed on a hot plate (55—70°) failed to show signs of discomfort in 30 sec. The analgesic effects of morphine, diacetylmorphine, codeine, and pethidine hydrochloride were compared. Pethidine hydrochloride (G.B.: "Dolantin"; U.S.A.: "Demerol"; Germany: "Dolantin") possesses $\frac{1}{4}$ — $\frac{1}{2}$ the analgesic potency of morphine hydrochloride against mild pain stimuli (55°), but it is ineffective against severe pain (60—65°). G. P.

Relative toxicity of ethyl and isopropyl alcohols as determined by long-term rat feeding and external application. L. L. Boughton (*J. Amer. Pharm. Assoc.*, 1944, 33, 111—113).—Ethyl and isopropyl alcohol (5% in water) were taken by rats in daily amounts equiv. to 2.1 and 1.87 c.c. per kg., respectively. This resulted in diminished fluid consumption, loss in wt., noisy breathing, and sluggishness; all these symptoms rapidly disappeared after withdrawal of the alcohol. The death rate was unaffected. No harmful effects could be detected on application of 50% aq. solutions to the skin of test animals. The data show that isopropyl alcohol is only slightly more toxic internally than is ethyl alcohol. F. O. H.

Present status of analeptics. L. W. Hazleton (*J. Amer. Pharm. Assoc.*, 1944, 33, 65—73).—Following a discussion of the mechanism of analeptic action, recent investigations on picrotoxin, metrazol, strychnine, coramine, caffeine, sympathomimetic amines, and CO₂ are reviewed. F. O. H.

Pharmacology of mercury. II. Distribution of mercury in mice following administration of hydrophilic mercury and calomel ointments. T. H. Maren, J. A. Epstein, and W. C. Hand (*J. Amer. Pharm. Assoc.*, 1944, 33, 91—95; cf. A., 1944, III, 135).—In mice subcutaneously injected with Hg or Hg₂Cl₂ ointments of the water-sol. type, high concns. of Hg may be built up gradually in the kidney and liver without permanent disability. With Hg ointments, the increase in concn. was almost entirely confined to the kidney, whilst with Hg₂Cl₂ ointments the concn. also increased in liver and spleen. The level of Hg in the tissues was very irregular and tended to diminish at times in the injection period that varied with the tissue. Mice receiving Hg₂Cl₂ ointments had concns. of Hg in the brain, kidney, liver, spleen, and blood greater than those in mice receiving Hg ointments. In mice injected subcutaneously 35 days previously with a single dose of Hg₂Cl₂ or Hg ointment, no Hg was detected at the site of injection or in the internal organs; the mice appeared to be normal. The high concns. of Hg found in liver and spleen were not associated with toxic symptoms. F. O. H.

Treatment of two cases of infantile leishmaniasis with stilbamidine. S. Susskind (*Ann. trop. Med. Parasit.*, 1943, 37, 158—164).—Two severe cases were cured by the administration of a large amount of the drug over a considerable period without ill effects. F. S.

Toxic effects of saturated and unsaturated halogenated hydrocarbons in white rats and in white mice. B. E. Abreu, S. H. Auerbach, J. M. Thuringer, and S. A. Peoples (*J. Pharm. Exp. Ther.*, 1944, 80, 139—143).—Halogenated hydrocarbons (propanes and propenes) when inhaled in anaesthetic doses for 30 min. each day for a week cause haemorrhages in the lungs, and when injected subcutaneously produce degeneration in the liver. G. P.

Chronic oral toxicity of selenium. O. G. Fitzhugh, A. A. Nelson, and C. I. Bliss (*J. Pharm. Exp. Ther.*, 1944, 80, 289—299).—Se fed to rats in a grain (wheat and maize) diet in concns. of 3—40 p.p.m. produced toxic effects. 70—94% of the rats receiving a diet which contained 10—40 p.p.m. died within 8 weeks. Selenide was half as toxic as Se. Se in concns. of 3—7 p.p.m. in the diet produced chronic toxic effects: retardation of growth, diminished food consumption, and pathological changes in organs especially in the liver. In 70% of rats surviving longer than 3 months cirrhosis of the liver had developed. Among 53 rats with liver cirrhosis surviving for 18 months or longer, 11 developed liver-cell carcinomata of low-grade malignancy and 4 a marked adenomatous hyperplasia of the liver. Rats dying during the first 3 months of Se feeding showed a subacute type of liver damage. Female rats were more susceptible than males (cf. A., 1944, III, 39). G. P.

Lethal action of benzyl benzoate, dimethylthianthren ("mitigal"), and tetraethylthiuram monosulphide ("tetmos") on scabies-producing mites, *Notoedres* sp. and *Sarcoptes scabiei* var. *hominis*, when tested *in vitro*. R. M. Gordon and K. Unsworth (*Ann. trop. Med. Parasit.*, 1943, 37, 195—199). F. S.

Study of oils used for intramuscular injections. W. E. Brown, V. M. Wilder, and P. Schwartz (*J. Lab. clin. Med.*, 1944, 29, 259—264).—Sesame seed and maize oil did not produce sensitivity on injection; cottonseed and peanut oil produced reactions. Using accumulation of leucocytes, formation of oil cysts, and deposition of fibrin as criteria of reaction in muscle, sesame and maize oil are superior to peanut and cottonseed oil for intramuscular injection; they are more suitable physically and chemically for this purpose, more quickly absorbed from tissue, less antigenic, and less irritating to tissue. C. J. C. B.

Heterogeneous nature of curare and its pharmacodynamic properties. L. Lapique (*Compt. rend.*, 1942, 215, 393—396).—When a solution of curare is made alkaline or treated with 70—80% alcohol, material (paracurare) which causes convulsions in frogs remains in solution, whilst narcotic material (orthocurare) is pptd. The curare from Venezuela and upper Orinoco (packed in gourds) is chiefly orthocurare, whilst that from Ecuador (packed in bamboo tubes) is paracurare. The curare from upper Amazon, Peru, and Brazil is mixed. Orthocurare facilitates the Türk reflex of the frog's leg whilst paracurare inhibits it. W. McC.

Are the total physiological effects of aconite due to atisine? Raymond-Hamet (*Compt. rend.*, 1942, 215, 247—248).—Extracts of *Aconitum heterophyllum* exhibit a hypertensive and vasoconstrictor effect not observed with atisine. H. G. R.

Age of animals and drug action. K. K. Chen and E. B. Robbins (*J. Amer. Pharm. Assoc.*, 1944, 33, 80—82).—Injection of histamine, aconitine, morphine, ephedrine (all as salts), Na sulphapyridine, Na propylmethylcarbonylallylbarbiturate, picrotoxin, and senecionine into guinea-pigs, mice, and rats of various ages shows that an age effect often occurs but that the effect is characteristic of the drug and is dependent on the route of injection. F. O. H.

Direct peripheral vaso-constrictive action of dried venom of *Bufo bufo*. Raymond-Hamet (*Compt. rend.*, 1942, 215, 448—450).—The flow of blood in the femoral vein of dogs is greatly diminished by injecting a solution of the dried venom in physiological aq. NaCl,

the effect being much greater and more prolonged than that of bufotenin although this is one of the most active constituents of the venom. W. McC.

Use of histamine in allergic conditions. W. N. M. Girling (*Northw. Med.*, 1943, 42, 196—197).—Report of 120 cases. E. M. J.

Serum-sickness and analogous drug reactions [in sulphonamide therapy]. W. T. Longcope (*Medicine*, 1943, 22, 251—286).—A review. E. M. J.

Casein in local treatment of burns and wounds. R. M. Curtis and J. H. Brewer (*Arch. Surg., Chicago*, 1944, 48, 130—136).—The most satisfactory prep. forming a pliable film was casein 30 g., Na lauryl sulphate 4 g., 50% Na lactate 10 c.c., NaOH 0.7 g., and water 140 c.c., sterilised by autoclaving. F. S.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

(A) **Use of glycol vapours for bacterial control in large spaces.**
(B) **Inflammability characteristics of propylene glycol and triethylene glycol in liquid and vapour form.** E. Bigg, B. H. Jennings, and S. Fried (*Amer. J. med. Sci.*, 1944, 207, 361—370, 370—375).—(A) The production and maintenance of glycol vapour in adequate concns. in large spaces is readily attainable. Some means of air agitation is desirable to insure uniform distribution. Concns. of 0.2 mg. of propylene glycol per l. and 0.005 mg. of triethylene glycol per l. are necessary for immediate killing of air-borne organisms. Lower concns. may suffice to control air-borne disease. Maintenance of humidities in the region of 40% is necessary.

(B) In the vapour-phase concn. required for air sterilisation, propylene and triethylene glycol offer no fire or explosive hazard. The addition of 20—30% of water to these substances greatly reduces the possible fire hazard produced by their presence in storage of vaporising devices. C. J. C. B.

Prevention and treatment of lesions caused by chromates, dichromates, and chromic acid. A. R. Wilkerson (*J. Amer. Leather Chem. Assoc.*, 1944, 39, 90—96).—Safety regulations are described. Cr ulcers are treated with HgCl₂ (0.05% solution) until the edges have separated from the healthy tissue. Subsequently they are washed daily with HgCl₂ (0.1% solution), painted with antiseptic dye (e.g., Gentian Violet 2—5%), and dressed with skin salve. Healing may be accelerated by the use of thymol iodide or by 2—10 min. exposure to rays from an ultra-violet lamp on alternate days. Tincture of I must not be used. Ocular burns are treated with argyrol and/or acriflavine and castor oil. Only 2 or 3 employees per 1000 are susceptible to Cr dermatitis. Cr^{VI} can cause ulcers only if a point of entrance is found in a cut, burn, or otherwise irritated epidermis. D. P.

Contact dermatitis from use of lacquer on hair. T. S. Saunders (*Northw. Med.*, 1944, 43, 19).—Report of 4 cases. E. M. J.

XXII.—RADIATIONS.

Protoplasmic viscosity and sensitivity to X-rays. K. M. Wilbur and R. O. Recknagel (*Biol. Bull.*, 1943, 85, 193—200).—Increase in the external Ca and Mg concns. decreased the viscosity of *Arbacia* eggs but had no effect on their sensitivity to X-rays. Isotonic K citrate increased viscosity but produced only a slight inhibition of X-ray action. Doses of X-rays which markedly affected cell division produced no change of viscosity. G. P. W.

Effect of ultra-violet radiation (Knott technique) on bacteria and their toxins suspended in human blood and appropriate diluents. G. P. Blundell, L. A. Erf, H. W. Jones, and R. T. Hoban (*J. Bact.*, 1944, 47, 85—96).—Under the conditions of the Knott hæmo-irradiator ultra-violet irradiation had a slight bactericidal action on bacteria suspended in buffered peptone water or broth, but no effect on toxins in blood. In saline it had a slight detoxifying action on tetanal and diphtheria toxin, but none on staphylococcal or scarlatinal toxin. F. S.

Effect of X-rays on erythrocytes.—See A., 1944, III, 390.

Effect of X-rays on rate of egg-laying in *Drosophila melanogaster*, race Kalyan.—See A., 1944, III, 408.

X-Ray sensitivity of first meiotic prophase and metaphase in *Habrobracon* eggs.—See A., 1944, III, 388.

Influence of irradiation-killed cells on tumour growth.—See A., 1944, III, 416.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Ageing effects in egg-white. F. V. von Hahn (*Kolloid-Z.*, 1941, 98, 353—354).—Old egg-white solutions foam more easily than fresh egg-white but the latter foam is more highly dispersed. Their

surface tensions are identical. The viscosity-temp. curve for old egg-white solution is horizontal, except for a sharp max. at 61° corresponding with coagulation. For fresh egg-white solution the curve in general falls with increase in temp., showing two max. at 53—57° and 61°, and gradually approaches the curve for old egg-white on ageing. J. H. BA.

XXIV.—ENZYMES.

Nature of carbon monoxide inhibition of biological nitrogen fixation. E. R. Ebersole, C. Guttentag, and P. W. Wilson (*Arch. Biochem.*, 1944, 3, 399—418).—The theory of inhibition of enzyme reactions is treated mathematically and its applications worked out. The procedure developed is applied to the analysis of CO inhibition of N₂ fixation by *Azotobacter vinelandii*, using the micro-respirometer method. This inhibition is primarily non-competitive, and there is an accompanying competitive inhibition, e.g., greater affinity of CO for nitrogenase than for the nitrogenase-N₂ complex. The non-competitive type is the most important quant. inhibition. E. R. S.

Schardinger enzyme in biological iodinations. A. S. Keston (*J. Biol. Chem.*, 1944, 153, 335—336).—Formation of organically-bound radioactive I is induced by the addition of substrates for the Schardinger enzyme to milk in presence of radioactive I⁻. It is inhibited by thiourea but not by catalase. H. G. R.

Mode of action of lipoxidase. A. K. Balls and M. W. Kies (*J. Biol. Chem.*, 1944, 153, 337—338).—The anaerobic reduction of 2:6-dichlorophenol-indophenol by crude soya-bean extract is independent of its lipoxidase activity. The reaction does not require unsaturated fat and destruction of the lipoxidase does not completely destroy the ability of the extract to reduce the dye. H. G. R.

Antibacterial action of xanthine-oxidase system.—See A., 1944, III, 439.

Quantitative incidence of carbonic anhydrase and functional levels of central nervous system.—See A., 1944, III, 401.

Effects of dorsal root section on choline-esterase concentration in spinal cord of cats.—See A., 1944, III, 400.

Distribution of choline-esterase in bovine retina.—See A., 1944, III, 404.

Toxicity of atebirin [inhibition of choline-esterase].—See A., 1944, III, 428.

Purified prothrombin and thrombin: stabilisation of aqueous solutions. W. H. Seegers (*Arch. Biochem.*, 1944, 3, 363—374).—The proportion of thrombin remaining after 48 hr. heating at 50° in the presence of various sugars was determined. The max. protective action of glycerol is obtained with a concn. of 75% (65% remaining). 68% sucrose solution gives 97% protection. Other sugars protect thrombin and their methylglycosides are more active. Prothrombin solutions are not stabilised as readily as thrombin solutions. E. R. S.

Pepsin content of gastric juice.—See A., 1944, III, 412.

Effect of dietary composition on pancreatic enzymes.—See A., 1944, III, 412.

Kinetics and temperature quotient of β -glucosidase. G. K. Schipitzina (*Biochimia*, 1942, 7, 1—12).—Synthesis of β -glucosides cannot be expressed by ordinary kinetic equations unless the opposite reaction is taken into account. Alcohols with branched chains depress the velocity of synthesis. *iso*Propyl alcohol or increasing concns. of glucose increase the Q_{10} val. H. G. R.

α - and β -Amylase in wheat flour.—See B., 1944, III, 111.

Enzyme system of phosphorylation coupled with respiration. S. J. Davidova (*Biochimia*, 1942, 7, 13—24).—The enzymic system of respiratory phosphorylation in muscle tissue does not depend on the presence of intact cells, since phosphorylation coupled with oxidation of succinic acid occurs in an extract of crushed heart muscle. The system needs co-enzymes, especially adenine nucleotides. Oxidation of succinate can proceed without simultaneous phosphorylation, but phosphorylation without oxidation is not observed. H. G. R.

Phosphatases of intestinal mucosa. J. Roche, S. de Laromiguière, and A. Laurens (*Compt. rend.*, 1942, 215, 495—496).—The intestinal mucosa of dog is very rich in phosphomonoesterase and pyrophosphatase, which are adsorbed by kaolin at pH 4.5 and redissolved by elution at pH 9. Further purification is achieved by pptn. with 70% acetone, after which the pyrophosphatase is partly eliminated by adsorption on cholesterol at pH 4.5 and the monoesterase obtained by elution at pH 9. The two enzymes have max. stability at pH 5—6. At pH 9.2 and 58° they lose all activity in 10 min. The monoesterase attacks β - more readily than α -glycerophosphate, the optimum pH being 9.2. It is activated by Mg⁺⁺, amino-acids, and (slightly) ascorbic acid and inhibited, in varying

degree, by SH compounds (cysteine, glutathione), corresponding disulphides, KCN, F⁻, and oxalate. The pyrophosphatase, which has max. activity at pH 7.8, is activated by Mg⁺⁺ and by low concns. of KCN. Higher concns. of KCN, SH compounds, and ascorbic acid inhibit the pyrophosphatase. The mucosa also contains a phosphodiesterase (max. activity at pH 8.7) and an adenylypyrophosphatase which are activated by Mg⁺⁺. The adenylypyrophosphatase is inhibited by SH compounds. The inhibitors probably act by forming complexes with metal of the co-enzymes. Since the capacity of the monoesterase for activation and inactivation is not affected by purification it follows that the oxidation-reduction equilibria in which ascorbic acid and SH compounds participate indirectly affect the hydrolysis of phosphates and pyrophosphates in the intestinal mucous membrane. W. McC.

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

Preparation of calcium D-altronate.—See A., 1944, II, 212.

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

Synthesis of lignin-like complexes by fungi. L. A. Pinck and F. E. Allison (*Soil Sci.*, 1944, 57, 155—161).—The proportion of lignin-like substance (non-N fraction resistant to 72% H₂SO₄) in the mycelium of 8 genera of fungi averaged: *Cladosporium* 21, *Helminthosporium* 19, *Humicola* 8, *Alternaria* 7, *Aspergillus* 6, *Melarrhizium* 4, and *Gliocladium* 2% of the dry matter (40—45°). Black or brown colour in the fungi is associated with high proportions of lignin complexes. Of the sucrose supplied to cultures, *Cladosporium*, *Helminthosporium*, and *Gliocladium* converted 40—50% and other organisms 25—30% into cell material when grown under optimum conditions. The C/N ratio of the fungi was 10.7—22.4, average 15.3. Organisms producing much lignin develop on decaying vegetation at or near the soil surface. A. G. P.

Moulds in relation to asthma and vasomotor rhinitis. M. B. Morrow and E. P. Lowe (*Mycologia*, 1943, 35, 638—653).—A review with an extensive bibliography. L. G. G. W.

Fungistatic and fungicidal effects of various substances. P. A. Maplestone and N. C. Dey (*Indian J. Med. Res.*, 1941, 29, 23—49).—20 chemicals and dyes were tested for fungistatic and fungicidal activity against 4 species of fungi common in Calcutta (*Epidermophyton floccosum*, *Achorion violaceum*, *Microsporium audouinii*, and *A. actoni*) and a strain of *Staphylococcus aureus*. Phenolic disinfectants were of low fungistatic and fungicidal val. Dyes of the malachite-green series were fungistatic up to 1:100,000—200,000, fungicidal up to 1:10,000—40,000. Merfenil was fungistatic up to 1:100,000—200,000 (except 1:20,000 against *Achorion actoni*), and fungicidal 1:50,000 for short time of action of the dye on the fungi, or 1:100,000—200,000 for long time. S. E. M.

Antibiotic substances: production by micro-organisms; nature and mode of action. S. A. Waksman (*Amer. J. Publ. Health*, 1944, 34, 358—364).—A lecture. C. J. C. B.

Aspergillus flavus. II. Production and properties of a penicillin-like substance, flavacidin. C. M. McKee, G. Rake, and C. L. Houck (*J. Bact.*, 1944, 47, 187—197; cf. A., 1944, III, 140).—The biological characteristics of flavacidin and penicillin are similar: both are highly active against Gram-positive organisms and relatively inactive against Gram-negative bacilli; both protect mice in equal degree against pneumococcus infection; both are highly sol. and hence are readily absorbed after parenteral inoculation and are quickly excreted by the kidneys; cultures resistant to the action of penicillin are resistant also to flavacidin but not to other antibiotic substances: and enzyme active against penicillin is active also against flavacidin but not against other antibiotic substances. F. S.

Antibacterial properties of crude penicillin. Absorption of penicillin from stomach.—See A., 1944, III, 427.

Environmental and genetical variations in yield and colony size of commercial yeasts.—See B., 1944, III, 110.

Vitamin requirements of lactose-fermenting and certain other yeasts. M. Rogosa (*J. Bact.*, 1944, 47, 159—170).—The strains of *Saccharomyces cerevisiae* tested required exogenous inositol, thiamin hydrochloride, pyridoxine hydrochloride, Ca d-pantothenate, and biotin for early, rapid, and optimal growth. β-Alanine, but not the lactone portion of the pantothenic acid mol., was utilised as a precursor for pantothenate. Pimelic acid was not utilised as a precursor for biotin. External sources of pantothenic acid, biotin, and, with one strain, thiamin hydrochloride were crit. factors for growth. Exogenous choline chloride, riboflavin, nicotinic acid or its amide, folic acid, and p-aminobenzoic acid were not crit. factors for optimum growth. Lactose-fermenting yeasts differed in requiring nicotinic acid or nicotinamide and not pyridoxine for optimal

growth, and in thiamin hydrochloride being a crit. factor for growth for many strains. None of the yeasts tested grew in a medium free from vitamins during incubation for 68 hr. F. S.

Action of antiseptics on yeasts. J. A. Reboul (*Compt. rend.*, 1942, 215, 553—554).—When *Saccharomyces ellipsoideus* was exposed to 1/300—1/1600 of CuSO₄, the relationship between surviving organisms and time gave an exponential curve. With dilutions of 1/16,000 the curve was sigmoidal and asymptotic, almost approaching the time axis. With dilutions of 1/80,000 the asymptote was on the level of a 30—40% survival of the organisms. This shows that the yeast can become accustomed to the antiseptic and thus become resistant to its action. F. S.

Resistance of trophozoites and spores of mealworm gregarines to low temperatures. T. von Brand and J. A. Morris (*Biodynamica*, 1943, 4, 75—80).—Gregarine trophozoites tolerated, for at least 3 months, temp. of 20° and dry gregarine spores survived 5—6 days' exposure to -78.8°, 2 hr. exposure to 190°, or 6 successive alternate 24-hr. exposures to -78.8° and 37.5°. L. G. G. W.

Immunisation against malaria: increased protection by vaccination of ducklings with saline-insoluble residues of *Plasmodium lophurae* mixed with bacterial toxin. H. R. Jacobs (*Amer. J. Trop. Med.*, 1943, 23, 597—606). F. S.

Interpretation of paradoxical reactions in serology of syphilis. R. L. Kahn (*Nebraska Sta. Med. J.*, 1943, 28, 276—279). E. M. J.

Modification of N.N. medium for cultivating *Trypanosoma cruzi*. N. Tom (*Amer. J. Trop. Med.*, 1943, 23, 615—616).—After the addition of 0.2% of agar and 1/3 vol. of fresh defibrinated rabbit blood to autoclaved infusion broth with 1% peptone, the medium is inspissated and sterilised at 15 lb. for 20 min. F. S.

Sexual isolation and mating types in *Paramecium*.—See A., 1944, III, 388.

Antibacterial action of surface-active cations. E. I. Valko and A. S. DuBois (*J. Bact.*, 1944, 47, 15—25).—The antibacterial action of surface-active cations as in zephiran and cetylpyridinium bromide was reversed by detoxication with a high-mol. anion as in Na dodecyl sulphate (Duponol PC). The action of acriflavine was also reversed by the same anion. The antibacterial behaviour of surface-active cations is in agreement with that of toxic metallic ions and dye cations. F. S.

Bactericidal and bacteriostatic action of crystal-violet. C. E. Hoffmann and O. Rahn (*J. Bact.*, 1944, 47, 177—186).—Above a concn. of 2.5 p.p.m. crystal-violet acts like a disinfectant, killing the bacteria in logarithmic order and proportionately to the concn. of dye. The dye is more toxic to young than to old cells and its toxicity increases only slightly with an increase in pH. The disinfectant action is due to combination of the dye with indispensable cell constituents. At lower concns. the dye does not give a logarithmic survivor curve and is not influenced by cell age, pH, or the dye concn. In this range the dye produces an abnormally long lag period succeeded by normal multiplication. The bacteriostatic effect of crystal-violet is due to its property of poisoning the potential in a range unfavourable for cell multiplication. F. S.

Bactericidal activity of some di(hydroxyphenyl)alkanes. B. Heine-mann (*J. Lab. clin. Med.*, 1944, 29, 254—258).—23 di(hydroxyphenyl)alkanes were tested for bactericidal activity. In general, they exhibit increased killing action, *in vitro* against *S. aureus*, with increasing length of the alkyl chain. The susceptibility of *E. typhosa* is max. with the n-butyl derivative. Generalisations true of other series of phenols, regarding the relation of bactericidal activity to chemical structure, were valid for the series of compounds tested. C. J. C. B.

(A) Use of developing chick embryo as method of testing antibacterial effectiveness of wound disinfectants. T. W. Green and J. M. Birkeland. (B) Action of detergents on staphylococcal infections of chorio-allantois of the chick embryo. T. W. Green (*J. infect. Dis.*, 1944, 74, 32—36, 37—40; cf. A., 1943, III, 343).—(A) Penicillin and the cationic detergents ceepryn, cetamium, C.Y.B., zephiran, and phemerol, when applied for 6 days after infection of the chorio-allantoic membrane with *Staphylococcus aureus*, were highly effective therapeutically. I, phenol, azochloroamide, metaphen, and merthiolate were ineffective.

(B) All but 3 of 17 cationic detergents were therapeutically effective whereas none of the anionic detergents tested was active. Replacement of Cl or Br by I in several compounds decreased therapeutic activity. Variation in the length of the C chain (12—18) in the alkyl groups of a homologous series of compounds had no effect on therapeutic activity. In several instances there was no correlation between *in vitro* and *in vivo* antibacterial activity. F. S.

Demonstration of sulphonamide inhibitor production by bacteria on agar containing sulphonamide. R. M. Pike and A. Z. Foster (*J. Bact.*, 1944, 47, 97—105).—Heavy inocula of bacteria producing

extracellular sulphonamide-inhibitor on agar containing sulphonamide made possible the growth of lighter dispersed inocula of the same or another strain which would otherwise be inhibited.

F. S.

Counterstain for acid-fast bacilli.—See A., 1944, III, 390.

Growth requirements of photosynthetic bacterium *Rhodospirillum rubrum*. S. H. Hutner (*Arch. Biochem.*, 1944, 3, 439—444).—*R. rubrum* has been grown in light and in darkness on a medium containing glucose, glutamate, biotin, and mineral salts only. Glucose may be replaced by *dl*-lactate, acetate, butyrate, or succinate.

E. R. S.

Microbiological aspects of riboflavin. I. Introduction. II. Bacterial oxidation of riboflavin to lumichrome. J. W. Foster (*J. Bact.*, 1944, 47, 27—41).—*Pseudomonas riboflavimus* nov. sp. is described. This organism oxidises riboflavin to lumichrome stoichiometrically according to the reaction: $C_{17}H_{20}O_4N_4 + 5 \cdot 5O_2 \rightarrow C_{17}H_{10}O_4N_4 + 5CO_2 + 5H_2O$. Some characteristics of the reaction are described.

F. S.

Utilisation of fixed nitrogen by *Azobacter* and influence on nitrogen fixation. C. K. Horner and F. E. Allison (*J. Bact.*, 1944, 47, 1—14). Of 35 org. N compounds, including amino-acids, purines, pyrimidines, amines, and amides, only urea, aspartic acid, asparagine, adenine, and glutamic acid were assimilated by *A. chroococcum* B-8 and C-4 and *A. vinelandii* V-1 and B-6 in the absence of N. Except urea they are less readily utilised than inorg. NH_4 salts, NO_2^- , and NO_3^- . Guanine, allantoin, cytosine, and uramil supported some growth after prolonged incubation. In air with optimal Mo consumption of free N predominated in the presence of adenine and was about equal to the utilisation of asparagine or nitrate when present. There was little or no N fixation in the presence of NH_4 salts. The decrease in N fixation corresponded closely to the amount of fixed N utilised. The relative availability and probable occurrence of fixed N compounds in soils are such that they would be unlikely to retard N fixation by *Azobacter*.

F. S.

Aerobic decomposition of cellulose by thermophilic bacteria. H. C. Murray (*J. Bact.*, 1944, 47, 117—122).—Cultures attacking filter-paper at 60° under aerobic conditions were readily obtained from soil and ruminant faeces. Saturation of the atm. with water was necessary for optimum growth and growth was inhibited by several anaerobic methods.

F. S.

Assimilation of dicarboxylic acids by *Pseudomonas saccharophila*. D. E. Bernstein (*Arch. Biochem.*, 1944, 3, 445—458).—Half the mol. of succinic, fumaric, or *l*-malic acid is assimilated by young cultures of *Ps. saccharophila*, and half oxidised. Fumaric and malic acids are utilised at the same rate. Old cultures produce pyruvic acid, which later disappears, at low pH; in neutral or slightly alkaline buffers the Q_{O_2} decreases, and the two stages appear to be concurrent. Oxalacetic acid is not decarboxylated anaerobically, but is decarboxylated aerobically with utilisation of twice the expected amount of O_2 , and no pyruvic acid is produced. The extent of assimilation of dicarboxylic acids is decreased less than that of other substrates by 2:4-dinitrophenol. Unusually high concns. of malonate are required for effective inhibition of succinic acid oxidation. At these concns. oxidation of fumarate is markedly inhibited, that of pyruvate to a smaller extent. The synthetic mechanism is relatively insensitive to malonate inhibition.

E. R. S.

Active immunisation against anthrax with a non-virulent, activated vaccine. G. Ramon, A. Boivin, and R. Richou (*Compt. rend.*, 1942, 215, 498—500).—Anthrax virus rendered non-virulent by treatment with formaldehyde is activated with alum. The activated material (if desired, after sterilising at 55° for 45 min.) confers immunity to anthrax on guinea-pigs, rabbits, and sheep.

W. McC.

Oral aciduric organisms. R. Whyte (*Brit. Dent. J.*, 1943, 74, 309—316).—A study of acid-tolerant organisms isolated from saliva by culture at pH 5.0 showed that *Bacillus acidophilus* is not a single organism but a group of organisms, closely related in morphology, biochemical reactions, and acid-producing properties, for which the name "aciduric group" is proposed. *B. acidophilus* *odontolyticus* could not be differentiated from other oral aciduric organisms.

E. C. W.

Influence of certain purines, pyrimidines, and pterins on synthesis of "folic acid" by *Aerobacter aerogenes*. L. D. Wright and H. R. Skeggs (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 92—95).—Addition of 5—200 µg. of xanthopterin to 200 ml. of culture medium reduced significantly the production of folic acid by this organism but did not affect growth. Other substances tried had no effect.

V. J. W.

Mechanism of colour production in *Escherichia coli* cultures containing sulphonamides. R. J. Stravinski, W. F. Verwey, and J. L. Ciminera (*Arch. Biochem.*, 1944, 3, 369—374).—Coloured substances are produced by *E. coli* when grown on synthetic media in the presence of sub-inhibitory amounts of sulphonamides of low bacteriostatic activity, or of highly active sulphonamides with added

p-aminobenzoic acid. Colours are produced by addition of sulphonamides to fully-grown cultures or acidified $NaNO_2$. The colours arise from diazotisation of the sulphonamide and subsequent coupling with itself in the presence of acid and NO_2^- produced by the organisms. Colours are obtained only with sulphonamides containing a free *p*-amino-group.

E. R. S.

Medium for determination of citrate utilisation by colon bacteria. W. B. Christensen (*J. Lab. clin. Med.*, 1944, 29, 306—307).—The following medium was satisfactory: $(NH_4)_2SO_4$ 1.0 g., $MgSO_4$ 0.2 g., KH_2PO_4 or K_2HPO_4 1.0 g., Na citrate (Merck U.S.P.) 3.0 g., NaCl (Merck) 5.0 g., agar 20.0 g., phenol-red 0.012 g., distilled water 1000 c.c. The medium is heated to dissolve the agar, and the reaction adjusted to pH 7. The medium is tubed and sterilised at 15 lb. pressure for 20 min. and allowed to solidify in the form of slants. The fresh medium has a pale yellow-orange colour. If a liquid medium is desired, the agar is omitted. Organisms which utilise citrate as a sole source of C produce, within 24 hr. on the solid medium, a yellow colour in the butt and an intense violet colour on the slant. Organisms which fail to utilise citrate leave the medium unchanged.

C. J. C. B.

Occurrence of slow-reducing coliform organisms in milk.—See B., 1944, III, 112.

Nutritional requirements of *Clostridium thermosaccharolyticum*. F. M. Clark and W. R. Mitchell (*Arch. Biochem.*, 1944, 3, 459—466).—The composition of a hydrolysed casein medium, on which N.C.A. strain 3814 of this organism grows well and produces measurable acidity, is given. Thiamin, biotin, and *p*-aminobenzoic acid are essential; nicotinic acid and Ca pantothenate stimulate growth slightly. Cocarboxylase can replace thiamin, but the thiazole fraction of the thiamin mol. only partly replaces the thiamin requirement, and the pyrimidine fraction not at all.

E. R. S.

Comparative study of the materials suitable for cultivation of *Clostridia*. H. D. Vera (*J. Bact.*, 1944, 47, 59—65).—Clear liquid and solid thioglycollate media capable of growing *Clostridia* were prepared from enzymic digests of various materials. Of plant materials soya-bean meal, digested by papain or pepsin, was the best, followed by peanut and cottonseed meals. Satisfactory animal sources were tryptic casein digest, eggs (papaic digest), and blood (digested with trypsin).

F. S.

Massive infection with intestinal anaerobic organisms as cause of intrapulmonary hæmorrhage.—See A., 1944, III, 396.

Gonococcus. I. Constituents of cell. II. Properties of antigenic fraction isolated from cell-free gonococcal broth supernatants. H. E. Stokinger, H. Ackerman, and C. M. Carpenter. III. Quantitative agglutination reactions of *Neisseria* with special reference to *N. gonorrhæa*. H. E. Stokinger, C. M. Carpenter, and J. Plack (*J. Bact.*, 1944, 47, 129—139, 141—147, 149—157).—I. Dried gonococci contained carbohydrate 5—9%, lipin 10—14%, and nucleoprotein 60—65%. Volatile and non-volatile matter constituted an additional 13—18%. P-containing constituents, chiefly nucleic acid and phospholipin, were reduced to half their max. val. between the 3rd and 6th day of cultivation. There were no such changes in the N components, notably protein, certain amino-acids, nitrogenous lipin, and amino-sugar. Two nucleoprotein fractions were isolated and analysed, a relatively insol. liponucleoprotein containing approx. 25% of bound lipin, and a minor lipin-free sol. nucleoprotein which constituted the major part of the gonococcal cell. The recovered lipin was separated into several cryst. and non-cryst. substances, some of which were identified as a lecithin, a cephalin, and a sphingomyelin. There was no type-sp. polysaccharide.

II. A protein-like fraction, possessing toxic and antigenic properties, was separated from broth cultures of *N. gonorrhæa* after removal of the cells. Its destruction by proteolytic enzymes, reversible loss of complement-fixing activity after treatment with protein denaturants, its behaviour in sp. antisera, and chemical analysis indicated that the fraction was a protein degradation product from the nucleoprotein of the cells. The major component of the purified fraction consisted of mols. with similar electrophoretic behaviour and antigenic activity. The minor component was rich in carbohydrate and non-antigenic.

III. The immunological interrelationships of *Neisseria* were measured by a quant. agglutination technique. At pH 5.0 the solubility of certain antigenic constituents of the gonococcal cell was minimised and the max. amount of agglutinin was recovered. 9 strains of *N. gonorrhæa* showed no evidence of distinct types or groups. There was a closer immunological relationship between certain strains of *N. intracellularis* and *N. gonorrhæa* than among certain strains of the latter.

F. S.

Solid medium for transportation of delayed gonococcus cultures. N. Hirschberg (*J. Lab. clin. Med.*, 1944, 29, 314—318).—The medium consists of proteose-agar No. 3 (Difco) 4.5% plus additional agar to make a final concn. of 2%, gelatin 4%, Nile-blue A 0.24%, and chocolate blood 20%. The medium is smooth, easy to penetrate with a swab, and supports the growth of the gonococcus luxuriantly.

44 specimens from cases of acute gonorrhœa diagnosed by positive smear and culture were mailed to the laboratory. The immediate control cultures of the 44 cases were positive, and 31 of the delayed cultures were positive, 2 after 2, 20 after 3, 6 after 4, and 3 after 5 days in the mail.
C. J. C. B.

Cultivation *in vitro* of *B. lepræ* with thiamin (vitamin- B_1) culture medium. W. L. Loving (*Amer. J. trop. Med.*, 1943, 23, 593—596).—*B. lepræ* was grown in a nutrient agar medium to which was added cysteine, cholesterol, tryptophan, and 0.1—1.0% of thiamin.
F. S.

L type of growth in cultures of a hæmolytic para-influenza bacillus. L. Dienes (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 142—144).—L-type growth was observed in a strain cultured from a normal throat. It resembled that previously described for *Streptobacillus moniliformis* and *Bacteroides funduliformis*.
V. J. W.

Meningococcal endocarditis in immunised horses. J. K. Miller (*Amer. J. Path.*, 1944, 20, 269—276).—14 of 110 horses under immunisation with the meningococcus developed endocarditis; multiple arterial and venous thrombi were frequently found at autopsy. The initial stage in the development of the endocarditis is oedema and swelling of the valvular endothelium with wrinkling, roughening, and finally desquamation of endothelial cells. This leads to inflammatory cellular reaction and a reparative process, or to thrombosis and localisation of bacteria that culminates in the advanced ulcerative vegetation.
C. J. C. B.

Purpuric lesions in meningococcal infections. W. G. Bernhard and A. C. Jordan (*J. Lab. clin. Med.*, 1944, 29, 273—281).—Meningococci were demonstrated in smears from the purpuric lesions in 27 of 40 cases of meningococcal infections. On culture, the organisms were isolated in 35. In 2 cases, this offered the only bacteriological diagnosis. Positive c.s.f. cultures were obtained in 25 cases of meningitis showing clear fluids with normal chemical constituents.
C. J. C. B.

Resistance of meningococci to drying. C. P. Miller and D. Schad (*J. Bact.*, 1944, 47, 71—77).—Meningococci dried on glass beads, wood, and cotton fabrics remain viable and virulent at room temp. for 7—10 days. Survival was shortened at 37° and prolonged at 6—10°. Meningococci subjected to dehydration by suspension in saturated solutions of KCl, NaCl, and NH_4Cl were viable up to 30, 24, and 3 hr. respectively.
F. S.

Germicidal action of daylight on meningococci in dried state. C. P. Miller and D. Schad (*J. Bact.*, 1944, 47, 79—84).—Meningococci dried in films on glass, wool, and cotton fabric were killed by direct sunlight within a few hr. even when protected against overheating. They were also killed within 30 hr. by diffuse daylight passing through two layers of window pane glass. In red light they survived almost as long as in the dark.
F. S.

Pertussis toxin-antitoxin neutralisation technique. M. E. Roberts and A. G. Ospeck. Pertussis antitoxin: its relationship to protection in actively and passively immunised mice and rabbits. A. G. Ospeck and M. E. Roberts (*J. infect. Dis.*, 1944, 74, 14—21, 22—31).
F. S.

Behaviour of virulent and avirulent *P. pestis* in normal and immune experimental animals. E. Jawetz and K. F. Meyer (*J. infect. Dis.*, 1944, 74, 1—13).
F. S.

Cross-protective reaction between moccasin venom and endotoxin of *Salmonella typhimurium*. P. A. Zahl and S. H. Hutner (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 134—136).—Mice immunised with moccasin venom become immune to lethal doses of *S. typhimurium* toxin and vice versa.
V. J. W.

Arabinose-fermenting bacterium of lactose-negative, mannitol-negative *Shigella* group. W. B. Christensen and G. H. Gown (*J. Bact.*, 1944, 47, 171—176).
F. S.

Antihæmolysin level in patients treated with staphylococcus toxoid. A. B. Longacre (*Surgery*, 1941, 10, 576—591).—By repeated injections of staphylococcal toxoid (pepsin-digested filtrate of staphylococcal culture) the antihæmolysin titre of the serum of 32 patients out of 35, with various chronic staphylococcal infections, was raised from 0.5—1 to 2—14 units. Several of the patients thus treated showed an immediate improvement.
G. P.

Comparative value of human plasma and human whole blood for testing the coagulating power of staphylococci. G. H. Chapman (*J. Bact.*, 1944, 47, 211).—Clots of whole blood appeared earlier (average 80 min.) than did those of plasma (average 100 min.). 2 of 78 cultures clotted plasma but not whole blood and 5 cultures clotted whole blood but not plasma.
F. S.

Isolation of pathogenic staphylococci from faeces. G. H. Chapman (*J. Bact.*, 1944, 47, 211—212).—When 0.10 ml. of 0.10% K tellurite (prepared from an unheated 5.0% solution that has been kept for a few days) is spread over the surface of alkaline bromothymol-blue agar (cf. Chapman *et al.*, A., 1938, III, 77) very few organisms grow except pathogenic staphylococci.
F. S.

Variation of group C hæmolytic streptococci. H. E. Morton and H. E. Sommer (*J. Bact.*, 1944, 47, 123—128).—Smooth and dwarf colony variants of a strain of group C hæmolytic streptococci fermented lactose and trehalose, but not sorbitol and mannitol. The mucoid variant fermented sorbitol and mannitol. Antigenic specificity was maintained.
F. S.

Progressive disappearance of reducing substances from the skin of guinea-pigs in experimental tuberculosis. G. Rullier (*Compt. rend.*, 1942, 215, 549—551).—The amount of reducing substance in the skin was estimated by determining the time taken to decolorise 2:6-dichlorophenol-indophenol after the intradermal injection of 0.025 c.c. of an aq. solution of the dye containing 2 mg. per 4.9 c.c. In normal guinea-pigs the dye faded in 10—15 min. but after infection with human tubercle bacilli the time of fading increased rapidly to 120 min. on the 24th day.
F. S.

Effects on experimental tuberculosis of 4:4'-diaminodiphenyl sulphone. W. H. Feldman, H. C. Hinshaw, and H. E. Moses (*Amer. J. med. Sci.*, 1944, 207, 290—305; cf. A., 1944, III, 359).—4:4'-Diaminodiphenyl sulphone inhibits or prevents experimental tuberculosis of guinea-pigs; continuous prolonged administration yields cumulative benefits not attained in short-term experiment. The drug is not excessively toxic for guinea-pigs in the dose used. (13 photomicrographs).
C. J. C. B.

Cold hæmagglutination reactions in tuberculosis. R. S. Siffert and B. Krautman (*J. Lab. clin. Med.*, 1944, 29, 270—272).—Cold isohæmagglutination and autohæmagglutination tests were performed on 82 tuberculosis patients. In none of those showing a positive cold isohæmagglutination reaction was a high titre noted. The cold isohæmagglutination test may be of val. in the differential diagnosis of some forms of early tuberculosis from atypical pneumonia.
C. J. C. B.

Biochemistry of *Vibrio cholerae*. I. Growth methods. R. W. Linton and R. K. Jennings. II. Influence of environmental factors on growth. R. K. Jennings and R. W. Linton (*Arch. Biochem.*, 1944, 3, 419—427, 429—438).—I. Max. growth of vibrios is obtained with a medium consisting of inorg. salts, glucose, and dil. tryptic digest of casein. When the medium is aerated max. growth occurs in 24 hr. After removing the vibrios the medium can be readily freed from inorg. material and casein digest, leaving bacterial products of high mol. wt. in pure form.

II. The optimal concn. of glucose is 0.3%, and the best growth takes place in the range of pH 8.0—6.0, though the range tolerated is pH 9.9—5.5. $(\text{NH}_4)_2\text{SO}_4$ in the medium has max. buffering action at approx. pH 9, and this enables the cultures to make good growth initially, growth being finally terminated by the acidity from the fermentation of glucose. Dialysed peptone is better than casein digested with trypsin but the latter is more suitable if vaccines, antigenic fractions, or polysaccharides are required. Aeration improves growth, not by its mechanical effect nor by removing volatile inhibitors, but by providing the appropriate concn. of dissolved gases; air mixed with 5% of CO_2 was more efficient than air alone.
E. R. S.

Bacteriophage development for *Streptococcus cremoris* at various temperatures.—See B., 1944, III, 113.

Production in horse of serum conferring immunity to the virus of foot and mouth disease. G. Ramon, E. Lemétayer, and P. Minguet (*Compt. rend.*, 1942, 215, 479—480).—Suspension of virus from guinea-pig, with or without previous treatment with formaldehyde and heat, is mixed with 2% of CaCl_2 , alum, or tapioca and subcutaneously injected into the horse. The blood of a treated horse neutralises the virus *in vitro* and renders guinea-pigs immune to the disease.
W. McC.

Acquired cellular resistance to equine encephalomyelitis virus. R. W. Schlesinger, P. K. Olitsky, and I. M. Morgan (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 272—273).—Vaccination of guinea-pigs or rabbits with formalin-inactivated Western virus increased their resistance to this but not to Eastern virus, but, after recovery from an injection of 1—1000 lethal doses of Western virus, they were resistant to Eastern virus and to the virus of vesicular stomatitis. Similar results were found in mice, and all are believed due to increased cellular resistance and not to development of antibodies.
V. J. W.

Neurotropic virus infections in Chicago, 1939—1941. Nine cases of lymphocytic choriomeningitis. A. Milzer (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 279—282).—Out of 75 patients suffering from neurotropic virus infections, 9 were found by neutralisation and complement-fixation tests to have lymphocytic choriomeningitis.
V. J. W.

Serological relationships within the poliomyelitis group of viruses. C. W. Jungeblut (*Amer. J. Publ. Health*, 1944, 34, 269—264).—Cross-neutralisation tests between two mouse-adapted strains of human poliomyelitis virus and Theiler's virus of mouse encephalomyelitis and corresponding antiviral immune sera revealed overlapping reactions of various degrees between the three viruses. The overlapping reactions in some instances were reciprocal, in others

non-reciprocal in character. Different results were obtained with intracerebral and intraperitoneal methods of testing, the former giving evidence of group-sp., the latter of strain-sp., virus inactivation. C. J. C. B.

Inhalatory route for prophylaxis and treatment of experimental influenza. I. Distribution of inhaled material. II. Immune serum in prophylaxis and treatment. W. R. Lyons (*Amer. J. med. Sci.*, 1944, 207, 40—47, 47—60).—I. An atomiser is described which can produce a fine-particle mist with high efficiency in terms of vol. of atomised liquid per unit vol. of air delivered. India ink and radioactive CrPO_4 were used as indicators in experiments on monkeys and mice to compare the inhalatory method and the intranasal route. The superiority of the inhalatory method with respect to distribution and penetration of both materials was established.

II. High-titre horse immune serum or its globulin fraction, administered either by intranasal inoculation or by inhalation, protected mice against subsequent intranasal infection with influenza virus. The degree of protection conferred increased with the time of exposure to the globulin spray. Atomisation of solutions through nebulisers of the type employed results in a distillation effect, which must be taken into consideration in quant. estimates of inhaled materials. Whole immune plasma was superior to any individual globulin fraction in protective power for mice. Treatment of mice with horse immune serum intranasally, or globulin by inhalation, reduces the lung lesions. The necessity for early treatment is confirmed. The val. of repeated treatments in lessening the severity of the experimental disease is definitely established, the lung lesions decreasing as the no. of treatments is increased. Neutral mixtures of immune serum and active virus did not produce an active immunity in mice. Mice subjected to repeated intranasal inoculations of a formolised virus showed considerable immunity when tested 10 days after the last inoculation. Immunity failed to develop in mice receiving concurrent intranasal serum treatments along with the formolised virus. C. J. C. B.

Experimental human influenza. Personnel of Naval Laboratory Research Unit No. 1. (*Amer. J. med. Sci.*, 1944, 207, 306—314).—24 human volunteers exposed to a fine spray of F-99 egg virus for 1—12 min. showed no clinical symptoms of influenza. Five "A" type strains of virus were isolated from 5 suspected cases of influenza by direct egg inoculation. Methods using hamsters and mice for direct isolation proved negative on the same samples. One of these strains, TI 2A, was used for infection of a second series of volunteers. Of 17 subjects exposed 6—12 min. 4 exhibited symptoms of influenza, 6 were suggestive, while the remainder showed no reactions. The blood counts revealed no changes. The 4 definite cases all had low initial antibody titres. All but one of the 17 test subjects showed some antibody rise as a result of the inhalation. The exception had the highest initial antibody titre of the group. An "A" type virus was isolated from one of the definite cases. No other attempts at isolation were made in this group. C. J. C. B.

Immunity in human subjects artificially infected with influenza virus, type B. T. Francis, jun., H. E. Pearson, J. E. Salk, and P. N. Brown (*Amer. J. Publ. Health*, 1944, 34, 317—334).—Inhalation of finely dispersed type B influenza virus by human subjects resulted in a high incidence of mild clinical infection. 4 months later 24 of the same subjects received a second inhalation of the same virus. Fever, symptoms, and serological responses were noted a second time. The illness was milder in the majority of previously infected individuals than in controls inoculated at the same time. Few were refractory to reinoculation. C. J. C. B.

Protective effect of vaccination against induced influenza-A. T. Francis, jun., J. E. Salk, H. E. Pearson, and P. N. Brown (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 104—105).—Vaccination with inactivated allantoic fluid of infected hens' eggs gave protection for about 4 months in human subjects against intranasal inoculation with influenza-A virus. V. J. W.

Protective effect of vaccination against induced influenza-B. J. E. Salk, H. E. Pearson, P. N. Brown, and T. Francis, jun. (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 106—107).—The same mixed vaccine (see above) gave protection against influenza-B for rather longer than against -A. V. J. W.

Chronic equine encephalitis. H. H. Noran (*Amer. J. Path.*, 1944, 20, 259—265).—A case report. (3 photomicrographs.) C. J. C. B.

Purification, sedimentation, and serological reactions of murine strain of SK poliomyelitis virus. J. Bourdillon (*Arch. Biochem.*, 1944, 3, 285—297).—A method for purification of virus extracted from mouse brain, with min. loss of activity, is described. The sedimentation rate of the prep. is 60—130 S, depending on concn., which suggests a mol. wt. of approx. 10^7 . The electrophoretic mobility of the unpurified virus is 2.0×10^{-5} at pH 7.1, ionic strength 0.2, and 5.3×10^{-5} at pH 8.4, ionic strength 0.1. The purified prep. gave positive precipitin reactions with rabbit serum

prepared against infected mouse brain, and doubtful or negative reactions with serum prepared against normal brain. Positive reactions were given with sera from humans and animals convalescing from infection by various strains of poliomyelitis virus, while control sera were usually negative. E. R. S.

Heat-inactivation of murine strain of SK poliomyelitis virus. J. Bourdillon (*Arch. Biochem.*, 1944, 3, 299—303).—The rate of thermal inactivation of partly purified virus, at pH 7.2 and with 0.1% of glycine, approx. corresponds at 49.5° with a unimol. reaction and deviates from it at 56.5° . The energy of activation of the reaction is approx. 10^5 g.-cal. per mol. E. R. S.

Influence of level of thiamin intake on susceptibility of mice to poliomyelitis virus. A. F. Rasmussen, H. A. Waisman, C. A. Elvehjem, and P. F. Clark (*J. infect. Dis.*, 1944, 74, 41—47).—In mice fed diets deficient in thiamin there was a lower incidence of infection to murine strains of poliomyelitis virus than in mice fed a similar diet with optimum thiamin. Some thiamin-deficient survivors, when subsequently given adequate thiamin, became paralysed after a prolonged incubation period. F. S.

Primary atypical pneumonia. Commission on Acute Respiratory Diseases, Fort Bragg, N.C. (*Amer. J. Publ. Health*, 1944, 34, 347—358).—A general review. C. J. C. B.

Primary atypical pneumonia. R. J. Needles and P. D. Gilbert (*Arch. intern. Med.*, 1944, 73, 113—123).—Report of 125 cases with autopsy observations in 1 fatal case. The picture is one of interstitial pneumonitis. The general symptomatology indicates that the cause is the group of virus-rickettsia agents. C. J. C. B.

Primary atypical pneumonia, aetiology unknown. II. J. H. Dingle, T. J. Abernethy, G. F. Badger, G. J. Buddingh, A. E. Feller, A. D. Langmuir, J. M. Rueggesser, and W. B. Wood, jun. (*Amer. J. Hyg.*, 1944, 39, 197—268; cf. A., 1944, III, 511).—The epidemiology of atypical pneumonia as it occurred under conditions of army life was studied at Camp Claiborne, Louisiana, during 1941—42. Epidemic and endemic occurrence, communicability and mode of spread, and factors influencing susceptibility and resistance were especially considered. The attack rate was highest in the summer and reached a peak of 88 cases per 100,000 in July, 1941. This was regarded as an epidemic; the endemic rate showed an average of 28 cases per 100,000. Observations were consistent with the hypothesis that atypical pneumonia is an acute infectious disease communicable by contact from person to person and that unrecognised cases and inapparent infections act as effective means of transmission. Susceptibility appeared to be low; there was little evidence regarding predisposing factors and duration of immunity was unknown. An appendix tabulates the detailed results of routine sputum and pharyngeal cultures. B. C. H.

Epidemiology of atypical pneumonia and acute respiratory disease at Fort Bragg, North Carolina. Commission on Acute Respiratory Diseases, Fort Bragg, N.C. (*Amer. J. Publ. Health*, 1944, 34, 335—345).—There was a close epidemiological association between atypical pneumonia and common respiratory disease. The 10:1 ratio of respiratory admissions to cases of atypical pneumonia was maintained both among new recruits suffering a high incidence of respiratory disease and among seasoned men in whom the incidence was low. It is thus suggested that atypical pneumonia may be a severe manifestation of the same sp. infection or infections which produce common respiratory illnesses. C. J. C. B.

Inhibition of growth of typhus rickettsiae in yolk-sac by penicillin. D. Greiff and H. Pinkerton (*Proc. Soc. Exp. Biol. Med.*, 1944, 55, 116—119).—3 doses of 325 Oxford units, injected into the yolk-sac, markedly inhibited growth of mouse typhus rickettsiae in hens' eggs. V. J. W.

Artificial immunisation of mice against infection with dwarf tape-worm *Hymenolepis nana* var. *fraterna*. J. E. Larsh, jun. (*Amer. J. Hyg.*, 1944, 39, 129—132).—Serial injections of freshly prepared adult-worm antigen of *H. nana* var. *fraterna* produced a well-defined immunity in mice. Protection could be transferred from treated mothers to offspring but the degree of resistance was less than that following the mothers' infection. B. C. H.

Relation between splenectomy and resistance of old mice to infection with *Hymenolepis nana* var. *fraterna*. J. E. Larsh, jun. (*Amer. J. Hyg.*, 1944, 39, 133—137).—5-month-old white mice deprived of their spleens at an early age were more susceptible to initial infection with *H. nana* var. *fraterna* than control mice. Increased susceptibility was associated with anaemia. B. C. H.

Complement-fixation in leprosy with antigens prepared from various acid-fast bacilli. Dharmendra and R. Bose (*Indian J. Med. Res.*, 1941, 29, 7—21).—Complement-fixation tests done with sera from 112 cases of leprosy and 58 other diseases, and with antigens prepared from 6 different acid-fast bacilli, including the so-called leprosy bacilli, did not give proof that any of the cultures are the

real cause of the disease. Sera diluted 1 in 5 fixed complement with all 6 antigens, in 60–80% of bacteriologically positive and 22% of negative leprosy cases, and in all cases of leishmaniasis. 21% of Wassermann-positive and 30% of leucoderma sera fixed complement with some, but not all, antigens. Sera diluted 1 in 25 fixed complement only in leprosy and kala-azar cases. S. E. M.

Protection against endotoxins of Gram-negative bacteria conferred by immunisation with heterologous organisms. P. A. Zahl and S. H. Hutner (*Amer. J. Hyg.*, 1944, 39, 189–196).—Groups of 100 mice were immunised by 5 intraperitoneal inoculations with crude endotoxins prepared from *Bact. typhimurium*, *Bact. shiga*, and *Sp. rubrum*. Suspensions of the organisms grown in liquid media were conc. and then dried with acetone and ether. 7 days after the last inoculation an injection was given of one of the three organisms. Protection was demonstrated against both homologous and heterologous endotoxins. It is suggested that a thermostable toxin occurs in Gram-negative bacteria accompanied by at least two types of sp. antigen. B. C. H.

Human serum-albumin as stabilising agent for Schick toxin. G. Edsall and L. Wyman (*Amer. J. Publ. Health*, 1944, 34, 365–366).—For adequate protection of diluted diphtheria toxin, 0.05% albumin is insufficient, 0.1% adequate, 0.2% better. Where phenol is used as a preservative, concns. of albumin as high as 0.2% have failed to prevent deterioration in phenolised Schick toxin incubated at 37° for 24 hr. Several batches of Schick toxin stabilised with albumin showed no significant deterioration after exposure to 41° for 24 hr. No significant differences were observed in Schick toxin prepared with 3 different lots of albumin or with 2 different lots of toxin. Tests of albumin-diluted Schick toxins, according to the League of Nations standardisation, have shown no significant differences from peptone-diluted toxin. C. J. C. B.

Influence of neuro-hormonal regulations on anaphylaxis and allergy. J. Harkavy (*J. Mt. Sinai Hosp.*, 1944, 10, 565–574).—A review. E. M. J.

Allergy as factor in thrombosis.—See A., 1944, III, 392.

Atmospheric pollen. I. Daily census of pollens at Cardiff, 1942. H. A. Hyde and D. A. Williams (*New Phytol.*, 1944, 43, 49–61).—Atm. pollen determined by the gravity method is present only in March–September and three seasonal phases occur of tree, grass, and dicotyledon herbaceous pollen in that order; of the grains identified 93.5% were derived from anemophilous plants. Very large deposits of grass pollen occurred in June and July but *Rumex* and *Plantago* pollen (suspected as possible causes of allergic disease) were never present in large quantities. Heavy deposits of *Urtica* pollen occurred. L. G. G. W.

XXVI.—PLANT PHYSIOLOGY.

Investigation of plant nutrition by artificial cultures. D. I. Arnon and D. R. Hoagland (*Biol. Rev.*, 1944, 19, 55–67).—A review. J. D. B.

Importance of oxygen in the nutrient substrate for plants: ion absorption. L. P. Pepkowitz and J. W. Shive (*Soil Sci.*, 1944, 57, 143–154).—The intake of K, Ca, and P by water-cultured tomato and soya-bean plants was directly related to the $[O_2]$ of the substrate, max. absorption being associated with 8 p.p.m. (tomato) and 16 p.p.m. (soya-bean) of O_2 in the nutrient. On clear dry days absorption of Ca and P was notably high; that of K was less definitely affected. A. G. P.

Effect of storage conditions on viability of tobacco seed. R. R. Kincaid (*J. Agric. Res.*, 1943, 67, 407–410).—Seed stored in the laboratory was nearly all dead in 3 years; that stored in rubber-stoppered vials (original moisture not exceeding 5.3%) showed only a small % germination after 8 years. Storage over $CaCl_2$ resulted in not less than 79% germination after 10 years. A. G. P.

Ascorbic acid content of 39 varieties of snap beans. P. H. Heinze, M. S. Kanapaux, B. L. Wade, P. C. Grimball, and R. L. Foster (*Food Res.*, 1944, 9, 19–26).—The ascorbic acid content of the spring harvest is greater than that of the autumn though the same relative order between varieties occurs, the uniformity being more pronounced in dwarf than in tall varieties. No correlation between the ascorbic acid content of the leaves and pods is observed at the time of harvesting though some correlation occurs in that of the leaves at the flowering stage and the pods. H. G. R.

XXVII.—PLANT CONSTITUENTS.

Hydrolysis of cystine and the fractionation of sulphur in plant tissues. M. D. Thomas and R. H. Hendricks (*J. Biol. Chem.*, 1944, 153, 313–325).—Leaf tissue is hydrolysed by mild alkaline digestion with MgO in presence of a Cd salt, when hydrolysis is nearly complete

in 12–20 hr. After acidification 66–78% of the S is evolved as H_2S , 6–19% as SO_2 , and 4–9% is oxidised to SO_4^{2-} , depending on the wt. of cystine digested, lower yields with larger samples being due to formation of stable org. compounds during the evolution process. Iodometric titration of the evolved gases is recommended as a method of analysis. Nearly all the S is accounted for as S' (including SO_3^{2-}) and SO_4^{2-} , when the CdS is filtered off and oxidised, the amount being equiv. to the reduction of the S-S. Pyruvic acid has been isolated as one of the main products of hydrolysis and is due to deamination of cystine with production of S' . The S of lucerne leaves has been partitioned into “labile” or “cystine” S, SO_4^{2-} , and sol. and insol. org. S. H. G. R.

Water-soluble polysaccharide from perennial rye-grass pasture. R. J. McIlroy (*New Zealand J. Sci. Tech.*, 1943, 25, B, 64–66).—The isolation from the mature grass of a water-sol. polysaccharide containing galactose and glucose structural residues and 30% of ash ($CaSO_4$) is described. In aq. solution the carbohydrate showed $[\alpha]_D^{20} +40^\circ$ and reduced Fehling's solution. A. G. P.

Nature of carotenes in lucerne. A. R. Kemmerer and G. S. Fraps (*J. Amer. Chem. Soc.*, 1944, 66, 305–306).—“Neo- β -carotene” and “carotenoid X” from lucerne are shown to be neo- β -carotene B and U, respectively, by chromatography, absorption spectra, isomerisation, and biological examination. R. S. C.

Isolation of carotene from sweet potatoes.—See B., 1944, III, 114.

Alkaloids of Leguminosae. I. Survey of legumes for alkaloids. II. Common broom, *Cytisus scoparius*, Link, and other species containing sparteine only. III. “Tree lucerne,” *Cytisus proliferus*, L. IV. Spanish broom, *Spartium junceum*, Lam. V. Laburnum and gorse (*Laburnum* and *Ulex*) species. VI. Common blue lupin, *Lupinus angustifolius*, L. VII. “Tree lupin,” *Lupinus arboreus*, Sims. E. P. White (*New Zealand J. Sci. Tech.*, 1943, 25, B, 93–98, 98–102, 103–105, 105, 106–108, 109–112, 113–114).—I. The results of an examination of approx. 130 species of legumes for alkaloid content are tabulated. Many plants not previously investigated contained common alkaloids of the legumes, including sparteine, cytisine, anagryne, and lupanine isomerides, whilst both new and unidentifiable alkaloids were isolated (for description see later parts).

II. The distribution of sparteine in *C. scoparius* is determined and compared with that in European broom. Sparteine in the plant is mostly in the tops; the seeds contain only a trace. The sparteine contents of *Cytisus* and allied species are tabulated.

III. The tops of *C. proliferus* contain 0.05% (on dry wt.) of alkaloid, mainly *l*- and *dl*-sparteine. The seeds contain approx. 0.2% of alkaloid, from which only *dl*-calycotomine (a new alkaloid from the seeds of *Calycotome spinosa*, to be described in Part XII) could be isolated.

IV. Spanish broom grown in New Zealand does not contain sparteine but high concns. of cytisine occur throughout the plant, particularly in the seeds.

V. The presence of cytisine in the tops and seeds of *Laburnum* species is confirmed; the alkaloid also occurs in gorse seed and flower parts but not in the rest of the plant. The *Laburnum* seeds contained a smaller amount than that reported for European plants.

VI. The green parts and seed of several strains of blue lupin grown in New Zealand contain *d*-lupanine. During the life period of the plant, there is a progressive movement of alkaloid from core to cortex, to the top of the plant, to flower parts and pods, and finally to the seeds.

VII. The tops and seeds of the tree lupin are relatively rich in alkaloid, mainly *l*-sparteine with smaller amounts of *d*-lupanine. F. O. H.

Determination of the total alkaloids in the Russian variety of celandine, *Chelidonium majus*. V. M. Rodionov and J. S. Schidlovskaja-Ovtschinnikova (*J. Appl. Chem. Russ.*, 1943, 16, 152–154).—The total alkaloid content of the roots and leaves of Russian celandine, extracted by the method of Schenck and Graf (B., 1937, 618), was determined by conductometric titration; results on the air-dried material averaged 2.51% for roots and 1.09% for leaves. V. B.

Alkaloids in *Adenocarpus intermedius*.—See A., 1944, II, 207.

XXVIII.—NEW BOOKS.

Importance of yeast for nutrition. J. C. Somogyi (*Z. Vitaminforsch., Beiheft No. 4*, 1944, 110 pp.).—This monograph presents a useful review of the properties and constituents of yeast (including *Torula utilis*) which are of val. in human and animal nutrition. The following aspects are considered: histology, org. and inorg. constituents, vitamin content, culture, determination of biological val. of protein, feeding experiments with dried yeast. Attempts to increase the vitamin-B₁ content are described and the prep. and nutritive vals. of yeast extracts are also discussed. J. H. B.

LIST OF ABBREVIATIONS ETC. USED IN ABSTRACTS.

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

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

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

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

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

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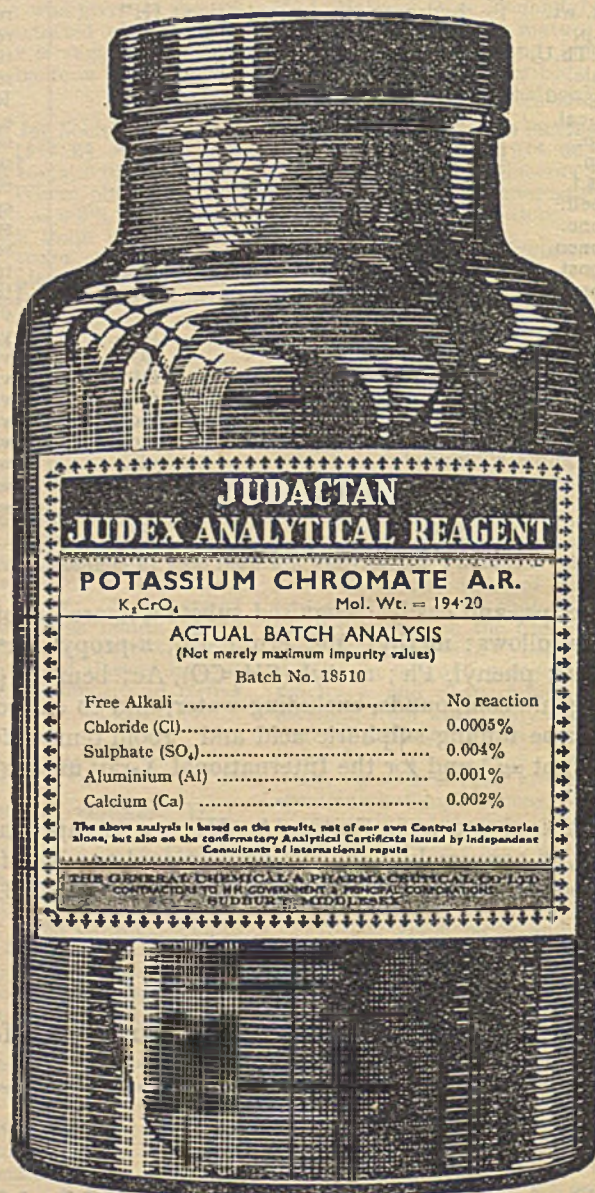
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