# BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

## MARCH, 1944

# A III—PHYSIOLOGY. BIOCHEMISTRY. ANATOMY

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## **BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS**

## A III-Physiology. Biochemistry. Anatomy.

MARCH, 1944.

#### I.-GENERAL ANATOMY AND MORPHOLOGY.

Effects of parathyroid hormone and calcium gluconate on skeletal tissues of mice. M. Silberberg and R. Silberberg (Amer. J. Path., 1943, 19, 839-863).—In mice receiving adequate dietary Ca, parathyroid hormone promotes the hypertrophy, calcification, and dis-integration of the growing epiphyseal cartilage without stimulating its proliferation; it intensifies the formation of bone by stimulating Its proliferation; it intensifies the formation of bone by stimulating osteoblastic proliferation. Subsequently, increased resorption of cartilage and bone causes an accelerated onset of epiphyseo-diaphyseal union. Parathyroid hormone thus promotes the changes characteristic of skeletal ageing. In old mice increased calcification of the inactive epiphyseal cartilage is associated with or followed by increased formation of bone. Ca gluconate also promotes the ageing of the growing epiphyseal cartilage by increasing disintegra-tion, calcification, and ossification. Resorptive processes however tion, calcification, and ossification. Resorptive processes, however, are temporarily inhibited in both young and adult mice. The effect of Ca gluconate is less marked and of shorter duration than that of parathyroid hormone. Combined administration of parathyroid hormone and Ca gluconate does not intensify the ageing effect exerted on the growing cartilage by each substance alone. (12 C. J. C. B. photomicrographs.)

Age factor in response of bone tissue to alizarin dyes and mechanism of dye fixation. N. Ercoli and M. N. Lewis (Anat. Rec., 1943, 87, 67-78).—One intravenous injection of 20-30 mg. per kg. of alizarin-red S caused bone coloration in growing mice. Adults required 2—3 times this amount. The anatomical zones of color-ation are described. It is suggested that fixation occurs by a process of adsorption between Ca phosphate and dye anions. The higher dosage required for adult animals depends on anatomical and physical conditions of the bones. W. F. H.

Two cases of fibrous dysplasia of bone. H. A. Brown (*Clin. Proc.*, 1943, 2, 157—159).—2 cases are described with unilateral involve-ment. In 1 case there was a raised serum-phosphatase, otherwise blood chemistry was normal. P. C. W.

Repair of cranial defects with tantalum. R. H. Pudenz (J. Amer. Med. Assoc., 1943, 121, 478—481).—Ta was successfully used to fill up cranial defects experimentally produced in cats. It is non-corrosive, non-absorbable, malleable, and is not harmful to tissues and did not integra with accurate accuration of hermul. and did not interfere with normal regeneration of bone. It is used in plates 0.02 in. thick. C. A. K.

Two cases of bilateral superior venæ cavæ, one draining a closed coronary sinus. M. S. Prows (Anat. Rec., 1943, 87, 99-106).—Two cases of persistent left superior venæ cavæ in man are described. In one case the coronary sinus was closed, necessitating a reversal of blood flow. The other presented an anomalous left superior vena cava entering the right atrium through a large opening, and a complete bisymmetrical azygos venous system. W. F. H. complete bisymmetrical azygos venous system.

Hypertrophic arthritis of hip. M. H. Sawyer and R. K. Ghormley (Surgery, 1941, 9, 381-393).—19 specimens were studied. The initial degeneration occurs in the cartilage, and is characterised by forillation, pitting, cell degeneration, and increased calcification of the degeneration envilopment matrices and shows little the deeper matrix; marginal cartilage proliferates and shows little degeneration. As the cartilage is worn away the exposed bone becomes eburhated with thickening of the sub-chondral plate and university to the sub-chondral plate and subjacent trabeculæ by intramembranous ossification. The The value of the endochondral type. The marrow is replaced by fat or loose fibrous tissue, which sometimes dedifferenti-ates into osteoid tissue. The synovial membrane is invaded by fibrous tissue with increased bload average. No avidence was found forous tissue with increased blood supply. No evidence was found that arterio-sclerosis is a cause of osteo-arthritis. No collections of ymphocytes such as are characteristic of infectious arthritis were hnuoi P. C. W.

Paralysis of serratus anterior following glandular fever. H. C. Saksena (Brit. Med. J., 1943, II, 267).—Case report. I. C.

Congenital defect of skin in a newborn infant. J. L. Rogatz and H. B. Davidson (*Amer. J. Dis. Child.*, 1943, 65, 916—919).—The congenital defect of the skin affected the scalp and extremities. С. Ј. С. В.

Macrosomia, cardiac hypertrophy, erythroblastosis, and hyper-plasia of islands of Langerhans in infants born to diabetic mothers. H. C. Miller and H. M. Wilson (*J. Pediat.*, 1943, 23, 251-266). Cardiac enlargement was demonstrated by roentgenography in 10 infants born to mothers with diabetes mellitus. The cardiac enlargement was marked during the first few days after birth, but disappeared at 6 weeks. 18 infants born to mothers with diabetes were found on postmortem study to have cardiac hypertrophy, excessive erythropoiesis in the liver, and hyperplasia of the islands of Langerhans. These findings were observed more frequently in infants who weighed over 3900 g. at birth than in those who weighed C. J. C. B.

Method for quantitative morphologic analysis of tissues. H. W. Chalkley (J. Nat. Cancer Inst., 1943, 4, 47-53).—The relative area of tissue components is measured in fixed and stained tissue under the microscope. The method depends on the no. of times which points (marked in the eyepiece) appear to fall on the component under examination in several hundred microscope fields. E. B.

#### II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Fate of unfertilised ova in albino rat. R. J. Blandau (Anat. Rec., 1943, 87, 17-27).-Unfertilised ova remain within the uterine 1943, 87, 17—27).—Unfertilised ova remain within the are cornua until the end of the succeeding period of heat. They are climinated by being washed out of the vagina towards the end of heat. Ova from two ovulations may be recovered at the same W. F. H.

Embryology in war-time Britain. J. D. Boyd (Anat. Rec., 1943, 7, 91-97).—A review. W. F. H. 87, 91-97).-A review.

Temperature effect on grade of intersexuality in Daphnia longi-spina. K. K. Sanford and A. M. Banta (Genetics, 1941, 26, 166).— Animals kept at low temp. produced young more highly intersex there there hapt at higher temp. L. G. G. W.

shown that the infundibular region of the neural tube induces the formation of Rathke's pocket and is necessary for early epithelial lobe development; further, the early epithelial lobe reciprocally influences the saccus infundibuli and its differentiation into a H. L. H. G. posterior lobe.

Suppression of polydactyly in domestic fowl by low temperature. P. D. Sturkie (J. Exp. Zool., 1943, 93, 325-346).—Subjection to low temp. of chick embryos genetically homozygous and heterozygous for polydactyly resulted in varying degrees of suppression of the polydactyly. Suppression in heterozygotes was about twice that in homozygotes. Embryos were most sensitive at 3 days' development; complete suppression was obtained in 96% of hetero-zygotes at 2 and 3 days. The amount of suppression was, in general, zygotes at 2 and 3 days. The amount of suppression was, a duration proportional to the duration and intensity of the temp., but duration H. L. H. G.

Regeneration of lateral line nerve of Amblystoma from different nerve fibre sources. P. Weiss and J. B. Cummings (Anat. Rec., 1943, 87, 119-125).—The experiments indicate that the no. of fibres in the regenerated portion of the lateral line is independent of the no. of fibres produced by the proximal stump. Hypoglossal nerve and spinal ganglion transplants employed provided a source in excess of the lateral line nerve, but there was no increase in the yield of peripheral fibres. A small lateral line nerve stump when supplied from a larger lateral line nerve contains fewer fibres than would be regenerated in the latter's own stump. The no. of regenerated fibres in the peripheral stump of the lateral line tends to approach the normal quota but never exceeds it. Thus, the size of the peripheral stump limits the vol. of fibre regeneration. The small and relatively const. fibre complement of the urodele lateral line nerve is recommended as a standard object for nerve regener-ation studies. W. F. H.

Effects of denervation and amputation of hind limbs in anuran tadpoles. O.E. Schotté and M. Harland (J. Exp. Zool., 1943, 93, 453-158 493).—After denervation of one hind limb of *Rana* tadpoles, both hind limbs were amputated at similar levels. Experimental results were studied histologically in all cases. No regeneration occurred and no blastema is formed in a completely denervated limb; either (i) after initial dedifferentiation and minor resorption the limb becomes stabilised and inactive, or (ii) dedifferentiation may continue with massive resorption of whole limb segments. In the latter cases regeneration may start from a level proximal to the amputation if innervation of the limb becomes re-established. Results of experiments carried out on limbs at a very early stage of morphogenesis were inconclusive. H. L. H. G.

Amputation level and regeneration in limbs of late Rana clamitans tadpoles. O. E. Schotté and M. Harland (J. Morph., 1943, 73, 329— 364).—Regeneration was studied after amputation at different levels of the hind limbs of R. clamitans tadpoles of 50—90 mm. length. There is a regeneration gradient in the limb, the crit. level being in the shank (tibia-fibula); regeneration always occurs after amputation distal to this level, never if the amputation is proximal. Histological observations are recorded and the possible factors influencing regenerative activity are discussed. The presence or absence of regeneration is independent of the degree of skeletal differentiation at any particular level in the limb. H. L. H. G.

Experimental study of development of larval olfactory organ of Rana pipiens. R. S. Cooper (J. Exp. Zool., 1943, 93, 415-452).----By transplanting the olfactory placode in embryos of R. pipiens it was found that for complete development of the nasal organ (up to the 20-mm. stage) the mesectoderm which normally surrounds the olfactory placode must be included in the transplant. Development is independent of the presence of the telencephalon. Observations are made on the formation of the choanal canal and the choanal folds. H. L. H. G.

Time of response to temperature in wing development of aphids. F. A. Shull (*Genetics*, 1941, **26**, 168). L. G. G. W.

**Respiratory metabolism during development in two species of**  *Amblystoma.* H. S. Hopkins and S. W. Handford (*J. Exp. Zool.*, 1943, 93, 403—414).—The rate of  $O_2$  consumption at comparable stages of development was investigated in *A. punctatum* and *A. tigrinum.* The results are tabulated. H. L. H. G.

Migration and localisation of an animal parasite within the host. M. S. Ferguson (J. Exp. Zool., 1943, 93, 375—402).—Experimental studies were carried out to investigate the factors determining the migration and localisation of the cercarize of the trematode Diplostomum flexicaudum in Salmo irideus and Pimephales promelas. The cercarize move rapidly via the blood vessels of the body to the optic vessels, thence through the iris to the lens, where development into metacercariae takes place. The lens is essential for the survival of the cercarize, but if the lens is removed they still migrate to the eye although not in such large nos. The presence of the eye, though lensless, is necessary for successful migration. H. L. H. G.

Heavy water and mutations, S. Zamenhof and M. Demerec (Genetics, 1943, 28, 96).—Sub-lethal doses of heavy water introduced into Drosophila larvæ by injection or feeding caused no increase in the mutation rate. L. G. G. W.

**Proteolytic enzymes and mutations.** S. Zamenhof (*Genetics*, 1943, 28, 96).—Sub-lethal doses of trypsin and pancreatin injected into *Drosophila* larva caused no increase in the mutation rate in the individuals surviving the treatment. L. G. G. W.

Effect of reduction in numbers of ommatidia on brain of Drosophila melanogaster. M. E. Power (J. Exp. Zool., 1943, 94, 33-72).— Histological examination of the brain in mutant stocks of Drosophila with reduced eyes showed that (1) the vol. of hypoplasia in the optic glomeruli is proportional to the no. of centripetal nerve fibres, (2) the hypoplasia is limited to the glomeruli of the affected side. The data indicate that the facet-reducing genes do not act primarily on the brain but that the hypoplasia is a secondary result of the lessened no. of visual fibres entering the glomeruli. H. L. H. G.

#### III.-PHYSICAL ANTHROPOLOGY.

Studies in physical development of negroes. II. Weight. N. Michelson (Amer. J. phys. Anthrop., 1943, [ii], 1, 289–300; cf. A., 1943, III, 860).—Average birth wt. of negroes born in New York was the same for the different seasons of the year. The birth wt. is smaller than that of whites. Negro infants under dietary regime (Department of Health) showed an increase in wt. and stature as compared with corresponding age groups investigated 2 decades prior. The increment pattern for wt. is very similar for whites and negroes reared on the same dietary regime. W. F. H.

**Correlation of body proportions in mature mice of the genus** *Peromyscus.* F. H. Clark (*Genetics*, 1941, **26**, 283-300).—Species and sub-species of the genus *Peromyscus* differ greatly in body proportion, tail length being the most variable character. Many of the differences are due to special size factors and there is only a low

correlation between tail, body, foot, femur, mandible, and skull length, condylczygoma, and skull width. L. G. G. W.

The M, N types of Chinese from Canton. O. E. Alley and W. C. Boyd (*Amer. J. phys. Anthrop.*, 1943, [ii], 1, 301—304).—The results of M, N and blood grouping tests on 101 individuals are presented. The % of N found is lower than in European or Japanese populations. The data support the idea that groups of Mongoloids exist, or existed, having distinctly low vals. of N. W. F. H.

Triploidy (and haploidy) in the newt, Triturus viridescens, induced by refrigeration of fertilised eggs. R. B. Griffiths (Genetics, 1941, 26, 69—88).—Of 100 larvæ derived from fertilised eggs exposed to temp. of  $0-3^{\circ}$ , 80 were triploid, 10 diploid, and 10 haploid. Refrigeration commencing immediately after laying and continued for at least 5 hr. was necessary to induce triploidy. Over 90% of the triploid larvæ were dwarfed. L. G. G. W.

Effects of pentaploidy on development of newt, Triturus viridescens. G. Fankhauser (Genetics, 1941, 26, 150).—A pentaploid newt larva at first developed normally but after 4 weeks accumulation of fluid in the body began and increased up to the 6th week when the larva was fixed. The larva was of normal size but its cells were abnormally large. L. G. G. W.

#### IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Theory of amœboid movements. N. Rashevsky (Bull. Math. Biophysics, 1943, 5, 95—98).—The principle of max. energy transformation (A., 1943, III, 680) is applied in the derivation of expressions giving the probability of occurrence of a pseudopod of a given size and duration in function of other physical consts. of the amœba. F. O. H.

Mathematical biophysics of cell division. N. Rashevsky (Bull. Math. Biophysics, 1943, 5, 99-102).—A new fundamental equation, based on the principle of max. energy exchange (A., 1943, III, 680), is applied to elongation and constriction of a cell. The derived equations are applied to an ideal case, viz., elongation without constriction of a cell. F. O. H.

Elasmobranch kidney. I. Structure of renal tubule of spiny dogfish (Squalus acanthias). R. T. Kempton (J. Morph., 1943, 73, 247—264).—Injection of single renal tubules in the living animal shows that no "special segment" exists in S. acanthias. The tubules which lie in close association with the neck segment (which had been described as forming a "special segment" between the neck and proximal segments) form in fact the most distal segment of the tubule. It appears therefore that there is no special correlation of tubular structure with the particular function of urea reabsorption in this species. H. L. H. G.

Supravitally stained Golgi apparatus. I. Its cycle in tectibranch mollusc, Navanax inermis. L. G. Worley and E. K. Worley (J. Morph., 1943, 73, 365-399).—By supravital staining with methylene-blue the Golgi apparatus was observed in the living animal throughout its early development. The chromophil part of the apparatus is stained dark blue; the chromophobe part and the mitochondria are but slightly stained or not at all. During cleavage of the egg the apparatus is in the form of minute chromophil granules or small spherical vesicles with a pale centre and a chromophil periphery thickened locally to form a crescent; the granules enlarge to form vesicles. This small vesicular or "resting" stage persists until the end of gastrulation, when the vesicles enlarge and elaborate within themselves fatty droplets or albuminous yolk spheres, or both. The fat droplets are discharged in the trochophore, the protein yolk in the early veliger stage. The Golgi body then becomes a homogeneous irregular chromophil mass which breaks up into droplets; the droplets develop pale vesicular centres, thus completing the cycle. This multiplication of Golgi elements is independent of cytoplasmic division. Other than those mentioned, the many varieties of form which have been described for the Golgi apparatus appear only in fixed or desiccated material. Reasons are given for believing that the appearances observed are not due to any effect of the vital stain on the material. H. L. H. G.

Intracellular lipin, mucoid, and glycogen of the vaginal epithelium of guinea-pig. C. L. Tribby (Anat. Rec., 1943, 86, 425-451).— Four epithelial zones are described, viz., superficial bordering on the lumen, transitional, prickle-cell, and basal. Intracellular mucoid is restricted to superficial epithelial cells and its elaboration is at a max. during procestrus. Intracellular glycogen is present in the superficial and prickle-cell zones and its max. concn. is reached during procestrus. Lipin occurs in the superficial, transitional, and prickle-cell zones and is most abundant during procestrus and cestrus. Hæmatoxylin staining material is found in the superficial zone during procestrus. The occurrence of lipin during procestrus and cestrus and the high glycogen content at procestrus may indicate a cellular depression. Regeneration of epithelium takes place from persisting basal layers. W. F. H. Cytogenesis of corticoadrenal cells in the cat. R. M. Wotton and R. L. Zwemer (Anat. Rec., 1943, 86, 409-416).—Corticoadrenal gland cells appear to be derived from indifferent cells in the capsule of the gland. Various morphological cell types observed are regarded as different stages in the life history of the same cell. New oci of gland cell formation may be identified from the orientation of the mitochondria and Golgi material in the cells of the adrenal capsule. The distribution of these cell components is also associated with the metabolic activity of differentiation and secretion.

W. F. H.

Adrenal lipins of mice with high and low mammary gland tumour incidences. E. M. Vicari (Anat. Rec., 1943, 86, 523-543).—High incidence of mammary gland tumour was associated with a small amount of adrenal cortical lipin (Sudanophil material) and low incidence of mammary gland tumour with relatively high lipin content. The lipin-free area was slightly greater in females of six inbred strains studied. Whether the lipin-free area is equiv. only to the X-zone or to more than the X-zone is discussed. Theelin injections increased the width of the Sudanophil zone in both sexes, Theelin hypertrophied the X-zone in the female, and induced the formation of lipin droplets in the X-zone of the female. It is suggested that the factors involved in the control of adrenal lipins may involve an interaction of certain endocrine secretions. W. F. H.

Compatibility of rat and mouse cells in mixed tissues cultures. M. Harris (Anat. Rec., 1943, 87, 107-117).-In all cultures, adjacent rat and mouse fragments (heart, spleen, and kidney) fused to form a single composite structure, stable over periods ranging up to 36 days. Polymorphonuclear leucocytes, lymphocytes, and fibroblasts migrated out normally from explants and there was no evidence of any attraction towards foreign cells present. It is concluded that the cells of both species are physiologically compatible *in vitro*. The results are discussed in the light of current concepts of antagon-W. F. H. ism in transplanted tissues.

Effects of homologous tissue extracts on rate of epithelisation. A. Nettleship (Amer. J. clin. Path., 1943, 13, 349-351).—Wounds on the outer surface of the rabbit's ear healed in 12-14 days. Certain tissue extracts, and normal saline, caused these areas to epithelise in 10-12 days. Skin and thyroid tissue extracts when injected at the 10—12 days. Skin and thyroid disate called 7—8 days. wound site caused complete epithelisation in 7—8 days. C. J. C. B.

Uses of the Feulgen reaction in cytology. II. New techniques and special applications. B. B. Hillary (*Bot. Gaz.*, 1940, 102, 225— 235).—Applications of the "squash" technique to studies of chromosome structure are described. Methods for examining the piper scill for demonstrations the chicamete and the individuality minor coil, for demonstrating the chiasmata and the individuality of chromosomes in forms having diffuse stages, are described. The Feulgen stain stains only the chromonema and not the matrix of the chromosome. A. G. P.

Controllable silver stain for nerve fibres and nerve endings. L. H. Ungewitter (Stain Tech., 1943, 18, 183-186) .- Paraffin sections of mammalian nervous tissues fixed in alcoholic chloral hydrate were impregnated with Protargol, reduced in Elon-quinol, and then placed in aq. AgNO<sub>3</sub>. With further reduction in the same developer good impregnation in peripheral nerve endings, plexuses, and ganglia, as well as central nervous system, was obtained. K. C. R.

Rapid silver stain for nerve fibres in formol-fixed paraffin sections of human spinal cord and medulla. J. F. A. McManus (*J. Path. Bact.*, 1943, 55, 503-505).--The technique utilises a chloral hydrate-AgNO<sub>3</sub> solution and allows the rapid demonstration of the nerve fibres in human spinal cord and medulla. C. J. C. B.

Blood and malaria parasite staining with eosin-azure-methylene-blue methods. R. D. Lillie (Amer. J. Publ. Health, 1943, 33, 948-951).—After trials with different batches of dyes, it is considered essential that spectrographic control be exercised during the manufacture of the dyes if the staining effects are to be satisfactory. For Wright's stain initial absorption max. of 650-666 m $\mu$ . are required. C. J. C. B.

Chlorazol-black E as a stain for root-tip chromosomes. J. E. Conn (Stain Tech., 1943, 18, 189—192).—Chromosomes in root-tips of Allium, Zea, Vicia, and Zebrina, fixed in Bouin's fluid, were stained in 1% aq. chlorazol-black E. K. C. R.

Acetone and methanol in Romanowsky staining of tissues. R. D. Lillie (Stain Tech., 1943, 18, 195).—Acetone and methanol accelerate staining if added to Romanowsky solutions. K. C. R.

Corrosive sublimate fixing solution of yolk-laden amphibian eggs. V. R. Gregg and W. O. Puckett (Stain Tech., 1943, 18, 179-180). Eggs with jelly intact are fixed in a solution containing HgCl<sub>2</sub>, formaldehyde, and acetic acid. The jelly is removed by shaking in water and washing in NaOCl and the eggs are dehydrated and embedded in paraffin wax from xylol. K. C. R.

New fixative for animal tissues. M. A. Cleverdon (Science, 1943, 87, 168).—The composition recommended is picric acid 5, iso-propanol 55, acetone 30, glacial acetic acid 5, 40% formalin 5%. After fixation, two washings with isopropanol and three with disparies and the second dioxan are given, and infiltration is effected with 1:2 dioxan-C2 (A., III.)

paraffin followed by 3 changes of pure paraffin. Picric acid is removed by alcoholic  $NH_3$  before staining. E. R. R.

Locating iodine in tissues autographically. C. P. Leblond (Stain Tech., 1943, 18, 159-164).—The radioactive isotopes <sup>130</sup>I and <sup>131</sup>I after intravenous injection were localised in the thyroids of various animals by placing unstained paraffin sections of the frozen-dried or Bouin-fixed glands in contact with photographic emulsions. The in the colloid. K. C. R.

Handling small objects in bulk for cytological preparations. K. W. Cooper and H. Ris (Stain Tech., 1943, 18, 175-176).—Small K. W. Cooper and H. Ris (Stain Lech., 1945, 16, 110-110). objects may be placed by a pipette within emptied cocoons of poncrine or camponotine ants. The pupal cases, being freely permeable, are easily dehydrated and sectioned serially after paraffin or paraffin-collodion embedding. K. C. R.

#### V.—BLOOD AND LYMPH.

Liver extirpation and implantation in *Amblystoma* embryos with particular reference to blood formation.—See A., 1944, III, 90.

Hæmatology of peripheral blood and bone marrow of dog. van Loon, B. B. Clark, and D. Blair (J. Lab. clin. Med., 1943, 28, 1575-1579).--A summary and statistical analysis of the data on the peripheral blood hæmatology of 81 dogs and differential cell counts of rib and femur marrow preps. from 8 dogs are given.

C. J. C. B. stem. F. R. Action of specific stimulators on the hæmatopoietic system. Miller and D. L. Turner (Amer. J. med. Sci., 1943, 206, 146-158).-Extracts of urine prepared as described (A., 1941, 11, 553) were injected into guinea-pigs, rats, and rabbits. Extracts from cases of myeloid leukæmia led to a myeloid reaction; extracts from lymphoid leukæmia caused a lymphoid reaction. A theory of causation of leukæmia in man is propounded. (20 photomicrographs.)

C. J. C. B. Apparent differences between erythrocytes of white and negro subjects. J. D. Helm and M. H. Jacobs (*J. Cell. Comp. Physiol.*, 1943, 22, 43-50).—Red cells of negroes are more resistant than those of whites to hæmolysis by 0.3M-thiourea or hypotonic NaCl solution. Resistance was still greater in a negro with sickle-cell anæmia. V. J. W.

Permeability of [red] blood corpuscles. G. Hevesy (5 Nordiske Kemikermode, 1939, 233-234).—Administration of <sup>12</sup>KCl and <sup>24</sup>NaCl to rabbits showed that the interchange of K between red corpuscles and plasma is slow (3% after 24 hr.), but of Na is very rapid. Administration of <sup>32</sup>PO<sub>4</sub>" showed that in red corpuscles the rate of formation and breakdown is adenosine triphosphate > di-phosphoglycerate  $\gg$  phosphatide. About 3% of gastrocnemius-muscle-K is replaced by plasma-<sup>42</sup>K in 1 hr., but thereafter the increase is very slow. About 0.3% of frog muscle "acid-sol." (adenosine triphosphate, diphosphoglycerate, etc.) P is replaced by (adenosine triphosphate, diphosphoglycerate, etc.) P is replaced by plasma-<sup>33</sup>P in 1 hr., but 20% of the "acid-sol. P" mols. are renewed per hr.; the breakdown and formation thus take place almost entirely intracellularly. The renewal of phosphatides and nucleo-proteins in frog muscle is very slow (about 0.0025% in 4 hr.).

M. H. M. A.

Mechanism of cozymase synthesis in human erythrocyte : comparison of roles of nicotinic acid and nicotinamide. P. Handler and H. I. Kohn (J. Biol. Chem., 1943, 150, 447-452).—The synthesis of cozymase by red blood cells is stimulated *in vivo* and *in vitro* by both nicotinic acid and its amide; the acid is at least 3 times as effective; the cells are freely permeable to both. The enzymic decomp. of cozymase after hæmolysis is inhibited by the amide but not by the free acid (this is also true of the enzyme system in rat tissues). Cozymase synthesis by the crythrocyte is not a reversal of the process of decomp. E. C. W.

Role of iron in anæmia during scurvy. B. de M. Braganca and K. C. Saha (Ann. Biochem. Exp. Med., 1943, 3, 47-54).-During the development of scurvy in guinea-pigs there is a decrease in food and Fe intake but an Fe balance is maintained. There is no change in hepatic Fe or in excretion of hæmin-Fe. During the anæmia of scurvy the plasma-Fe is reduced by 30-50%. P. C. W.

Onyalai (tropical hæmorrhagic disease) : gynæcological aspects. B. Gilbert (J. Obstet. Gynaec., 1943, 50, 437-439).—Onyalai is a hæmorrhagic disease of the nature of acute thrombocytopenia. One symptom may be bleeding from the genital tract. P. C. W.

Erythroblastosis and congenital syphilis in new-born infant. J. L. Henderson and A. R. Macgregor (J. Obstet. Gynaec., 1943, 50, 427– P. C. W.

Hæmatological changes in epidemic dropsy. P. C. Sen Gupta and L. E. Napier (*Indian J. Med. Res.*, 1940, 28, 197-206).— Anæmia of orthochromic and normocytic or slightly macrocytic type is produced in epidemic dropsy; the marrow is not hyper-plastic. The anæmia is not due to increased blood destruction, but to dentestion of blood formation. The redimentation entry to depression of blood formation. The sedimentation rate, is

increased. Total leucocyte count and differential count are normal, but there is a "shift to the left" of polymorphonuclears.

S. E. M.

Macroscopic blood typing: modification of the method of Thalhimer and Myron. S. W. Sappington (J. Lab. clin. Med., 1943, 28, 1752-1757).—The use of blood diluted with 2% NaCl solution is recommended. C. J. C. B.

Significance of erythrocytic pseudoagglutination. R. D. Barnard (J. Lab. clin. Med., 1943, 28, 1568-1571).—The term pseudoagglutination is restricted to a phenomenon observed in erythrocytes acted on by lipolytic hæmolysins. Criteria are set up for its distinction from rouleaux and from sp. hæmagglutination. Toluene, high concess. of glucose, and anti-Rh factor action produce a pseudoagglutination, which also appears spontaneously in stored whole blood. Stored blood samples which show positive serologic tests for syphilis are more resistant to spontaneous pseudoagglutination and hæmolysis than serologically negative bloods. C. J. C. B.

Physiological intravascular hæmolysis of exercise. Hæmoglobinæmia and hæmoglobinuria following cross-country runs. D. B. Gilligan, M. D. Altschule, and E. M. Katersky (*J. clin. Invest.*, 1943, 22, 859-869).—Hæmoglobinæmia was observed in 5 of 11 young athletes who ran  $2\cdot6-2\cdot8$  miles, in 5 of 11 athletes who ran  $4\cdot5-5\cdot1$  miles, and in 18 of 22 men who ran  $26\cdot2$  miles. Hæmoglobinuria was observed in 1 of these athletes on 3 occasions after 5-mile runs. Hæmoglobinæmia and hæmoglobinuria disappeared in a few hr. after the end of the run, and the amount of blood destroyed was small. The plasma-bilirubin was elevated after the marathon run. The red cell fragility was normal after the  $2\cdot6-5\cdot1$ -mile runs and in every instance after the marathon run. C. J. C. B.

In-vivo conglutination of erythrocytes following intravenous administration of gelatin solutions. R. E. Miller and J. M. Little (J. Cell. Comp. Physiol., 1943, 22, 127-130).—Injection of 3-7%solutions of gelatin in saline caused agglutination of mouse red cells which were directly observed in the liver and on the internal surface of the scrotum. The clumps were flexible and caused no interference with blood flow. There is complete return to normal in 24 hr. V. J. W.

Occurrence of a double zone phenomenon in antihuman tissue serum. A. Nettleship (J. Lab. clin. Med., 1943, 28, 1572-1575).— Because of optimal precipitin conditions, it was possible to discover, in the minor antibody group of duck antihuman kidney serum, a double zone phenomenon. The substances of higher mol. wt. (the globulins) combine in the zone of lower dilutions; the albumins (lower mol. wt.) combine in the higher dilutions: C. J. C. B.

Comparison of Cutler and Westergren red cell sedimentation methods. J. M. Scott (Amer. J. clin. Path. Tech. Sect., 1943, 7, 83-95),—There is no simple relationship between the results obtained by the Cutler and the Westergren sedimentation methods. In simultaneous tests the Westergren sedimentation is slower than the Cutler during the first half hr., after which time it is faster.

Colloid-osmotic hemolysis. W. Wilbrandt (*Helv. Physiol. Pharm.* Acta, 1943, 1, C80-81).—Na cholate, Na taurocholate, Na oleate, and a series of synthetic washing materials cause hæmolysis by a colloid-osmotic effect. A. S.

Production of *Rh* antiserum by inoculation of guinea-pigs with human erythrocytes. F. W. Gallagher and L. R. Jones (*Proc. Soc. Exp. Biol. Med.*, 1943, 53, 119—120).—Inoculation of guinea-pigs during 3 months with cells from a *Rh*-positive, group *O*, type *MN* subject produced a serum which, when absorbed with *Rh*-negative, group *O*, type *MN* cells (cf. *J. Immunol.*, 1943, 46, 9) distinguished between *Rh*-positive and -negative human cells of all groups. V. J. W.

Behaviour of cholesterol and lecithin towards (I) normal hæmolytic serum, (II) hæmolytic immune serum. J. S. Lee and C. Tsai (Quart. J. Exp. Physiol., 1943, 32, 233-238, 239-247).—I. Cholesterol inhibits the hæmolytic action of normal serum of man, ox, sheep, goat, dog, pig, and some types of rabbits towards a variety of mammalian red blood cells; serum of only a black type of rabbit possessed hæmolytic activity which was inhibited by cholesterol. The inhibitory effect of cholesterol is due to complement inactivation as with lecithin. Lecithin reinforces amboceptor activity in the absence of complement. The complement inactivation by cholesterol and lecithin is reversible; when the complement is destroyed by heat, the anti-hæmolytic potency of cholesterol and lecithin can be recovered quantitatively.

II. Sera of rabbits, goats, and dogs, immunised with dog cells, dog cells, and rabbit cells respectively, antagonise the anti-hæmolytic action of cholesterol or may accelerate hæmolysis. The specificity of this anti-cholesterol effect is shown by the fact that it acts only in the presence of sp. antigen and complement; the effect is not related to the agglutinating property of the immune serum. A. S. **Protective action of serum against natural hæmolysin.** J. S. Lee and C. Tsai (*Quart. J. Exp. Physiol.*, 1943, 32, 249—254).—The inhibiting action of rabbit serum on the hæmolytic action of dog serum or rabbit corpuscles increases after destruction of its complement by heating. Rabbit serum may hæmolyse rabbit cells after sensitisation of the cells by heated dog serum. Fresh or heated rabbit serum reduces or abolishes the sensitising action of dog serum, due to the existence of a thermostable anti-sensitising factor in rabbit serum. The observations are explained by the presence of an anti-complementary factor (cholesterol and allied substances) and an anti-sensitising factor; their exact nature is unknown. A.S.

**Preserved complement.** P. Fugazzotto (J. Lab. clin. Med., 1943, 28, 1614—1618).—To preserve the complement 80 mg. of NaCl and an excess (40 mg.) of pulverised  $H_3BO_3$  were added per c.c. of serum. Complement preserved by the method described retains its activity for 3—4 months. C. J. C. B.

**Observations based on a large series of complement titrations.** M. E. Koons (*J. Lab. clin. Med.*, 1943, 28, 1743—1745).—The care of guinea-pigs, especially diet, is essential to the production of high-titre complement. Complement kept in a frozen state was highly satisfactory when not over 3 weeks old. C. J. C. B.

Arterial and venous plasma-prothrombin time in man. S. Shapiro (*J. Lab. clin. Med.*, 1943, 28, 1596–1598).—The times are not significantly different. C. J. C. B.

**Pressor and depressor substances from kidney.** R. Jonnard and M. R. Thompson (J. Amer. Pharm. Assoc., 1943, 32, 260—278).— Previous work is reviewed (99, references). Various hypotensive extracts of pig's kidney were fractionated and the fractions tested for the effect on arterial blood pressure (dog, cat) and on e.c.g. The substance or substances responsible for prolonged hypotension have the following characteristics : (a) solubility in water, alcohol, acetone, dichloroethylene, (b) presence of phenolic OH and tryptophan group, (c) absence of histidine, reducing properties, and sterol, lipin, or phospholipin group, (d) destructive oxidation by plant phenolase, (e) low mobility in electrophoresis, (f) isoelectric point between pH 5-0 and 7-0, (g) incapacity to traverse ultrafilters. The observations indicate presence of complex mols. or large aggregates of mols., which are responsible for the slow rate of absorption and prolonged action after injection. The pharmacological properties of the heart are not sp. During destructive oxidation by plant phenolase, renin (hyportensive principle) yields an unstable, strongly hypotensive substance; these two reactions proceed independently in mixtures of renin and hypotensive extracts, indicating absence of *in-vitro* chemical antagonism or reciprocal neutralisation. The possible rôle of hypotensive factors and renin in the pathogenesis of hypotension of renal origin is discussed. F. O. H.

Pharmacology of two water-soluble vitamin-K-like substances. J. J. Smith, A. C. Ivy, and R. H. K. Foster (J. Lab. clin. Med., 1943, 28, 1667—1680).—Na<sub>4</sub> 2-methyl-1: 4-naphthaquinol diphosphate hexahydrate (N-123) and 2-methyl-1: 4-naphthaquinol Na bisulphite complex (MNSS) were studied for vitamin-K activity and pharmacological effects. In bile duct-obstructed rats or rats made deficient in prothrombin by dictary means (30% petrolagar in powdered Purina dog chow) 2—4  $\mu$ g. per rat shortened the prothrombin clotting time. Per unit of wt. MNSS is more active, but on a mol. wt. basis N-123 was 40% more potent. The LD<sub>50</sub> in rats for N-123 is 610 mg. per kg. and for MNSS is 175 mg. per kg. by subcutaneous injection. The chronic administration of 100 mg. per kg. of N-123 in rats resulted in no pathological changes. In rabbits, doses of N-123 above 100 mg. per kg. caused an "aplastic" anæmia which was sometimes fatal. Mice, rabbits, and rats developed a yellow to orange-brown pigmentation of the fur in 1—3 weeks following medium to large doses of either substance. This pigmentation remained for months with slow fading. C. J. C. B.

Heparin and the influence on toxicity of digitaloids, Congo-red, cobra venom, and other drugs. D. I. Macht (Ann. int. Med., 1943, 18, 772—791).—Purified heparin preps. of high potency are very resistant to heat, ultra-violet rays, and exposure to X-radiation and Ra emanations. Massive doses of heparin have no toxic effects on circulation, respiration, kidney, liver, or central nervous system. The anticoagulant effect on intramuscular or intraperitoneal injection is negligible. Intravenous administration exerts a thromboplastic effect for 1 hr.; the anticoagulant effect on intramedullary injection, in cats and rabbits, is prolonged on suspension of heparin in oils or emulsions. Previous intravenous heparinisation of cats lowers the toxicity of ouabain, digitalis, cobra venom, or Congo-red. Large doses of heparin, in guinea-pigs sensitised with horse serum, prevent, or reduce the violence of, anaphylactic shock. Aq. solutions of heparin of 1: 20,000—1: 80,000 exert an auxin-like effect on root growth of Lupinus albus seedlings. A. S.

Analyses of blood plasma of chicks deficient in vitamin-K. F. Maltaner and W. R. Thompson (Arch. Biochem., 1943, 2, 49-54).— There was no difference in body wt., plasma-inorg. P, lipin-P, or

Ca between chicks fed on a vitamin-K-deficient diet (3rd to 8th week) and controls. E. R. S.

Clinical observations on effect of 3:3'-methylenebis-(4-hydroxycoumarin). L. R. Wasserman and D. Stats (Amer. J. med. Sci., 1943, 206, 466—474).—The oral administration of the drug (dicoumarin) usually produces a marked fall (after a 24—72-hr. latent period) in the prothrombin content and prolongation of the coagulation time of the blood. Transfusions of fresh blood do not arrest the hæmorrhagic tendency due to dicoumarin. Several instances were observed in which embolism, thrombosis, or progression of existing venous thrombosis occurred despite a low blood-prothrombin induced by dicoumarin. Symptomatic improvement in the 10 cases of occlusive peripheral vascular disease was not observed during a 3-month period with low prothrombin owing to dicoumarin administration. C. J. C. B.

Rôle of kephalin and thromboplastin in coagulation of vitamin-Kdeficient chick plasma. F. Maltaner and E. Maltaner (Arch. Biochem., 1943, 2, 37-47).—Chicks (4-6 weeks) maintained normal growth when fed on a vitamin-K-deficient diet, but showed hæmorrhagic symptoms and depigmentation of the tissues. Carotene and 2-methyl-1: 4-naphthaquinone did not restore the pigment, but the coagulability of the blood returned to normal. Plasma from deficient chicks remained fluid indefinitely, was not clotted by treatment with kephalin and CaCl<sub>2</sub>, but was clotted by further additions of mammalian serum. No prothrombin activity was produced in normal chick serum by treatment with kephalin and CaCl<sub>2</sub> or breast-muscle extract. Kephalin and breast-muscle extracts play different parts in clotting. E. R. S.

Photo-electric observation of blood coagulation. A. von Muralt (Helv. Physiol. Pharm. Acta, 1943, 1, C66-68).—The apparatus is described. A. S.

Blood coagulation and sodium chloride concentration. H. Weitnauer, W. Grüning, and E. Wöhlisch (*Biochem. Z.*, 1941, 307, 325-329).—In recalcified oxalated ox plasma, the optimum [NaCI] for coagulation by CaCl<sub>2</sub> is 0.5%, this val. being, in the main, independent of the Ca<sup>\*\*</sup> concn. Higher and lower [NaCl] increase coagulation time. There is no optimum [NaCl] for the coagulation time of fibrinogen solutions to which a const. amount of thrombin is added : the coagulation time and [NaCl] increase in parallel. In the complete coagulation system, NaCl affects the phase of thrombin production only. W. McC.

Detrimental effect of frequent transfusions in treatment of a patient with hemophilia. F. L. Munro and H. W. Jones (Amer. J. med. Sci., 1943, 206, 710—713).—In the case reported only some of the many blood or plasma transfusions given reduced the coagulation time. In the refractory phases the hæmophilic plasma retarded the clotting of normal blood. Transfusion of normal blood, by supplying thromboplastin, causes temporary improvement. Subsequently, the plasma-antithromboplastin returns not only to its previous level but to one higher than existed before the transfusion. As a result of this a second transfusion has less effect that the first. With time, the abnormally elevated antithromboplastin returns to its initial level and at this point a transfusion again becomes effective. C. J. C. B.

Fibrinogen deficiency as factor in hæmorrhagic disease. E. C. Allibone and H. S. Baar (*Arch. Dis. Childh.*, 1943, 18, 146—153).— A case of congenital fibropenia and one of transient afibrinogenia are described and the literature is reviewed. C. J. C. B.

Blood examinations in pregnancy. L. Meyer-Wedell (J. Obstet. Gynaec., 1943, 50, 405—416).—Of 87 unselected pregnant women (untreated with Fe) 43 bad anæmia. In the anæmic women the red cell count and hæmoglobin concn. fell in parallel fashion during the first 6 months of pregnancy; in the last 3-month period there was regeneration of red cells and a further fall in hæmoglobin. In pernicious anæmia and anæmia due to vitamin-C deficiency there was a decrease in red cell count and size before labour. 10 cases of anæmia due to -C deficiency are described with a blood picture similar to that in scurvy but no clinical symptoms. P. C. W.

Target cells [in blood] in postvaccinal [yellow fever] jaundice. I. J. Greenblatt and G. Kaplan (J. Amer. Med. Assoc., 1943, 122, 806— 607).—Target cells (up to 40% of red cells) were found in the peripheral blood of 22 cases of postvaccinal jaundice. 75% of cases showed increased resistance to hypotonic NaCl solution.

C. A. K. Post-traumatic diminution of bleeding time. A. Fleisch and J. Posternak (*Helv. Physiol. Pharm. Acta*, 1943, 1, 199-204).—Uniateral or bilateral extirpation of the sympathetic in the neck, including the superior cervical ganglion, does not change the posttraumatic diminution of the bleeding time in the rabbit's ear.

Local thrombocyte deficit in vascular stasis of extremities. M. T.-R. Maynard and N. Hollinger (J. Amer. Med. Assoc., 1943, 121, 1194-1199).—In diseases with vascular stasis of the extremities there is thrombocytopenia in the capillary blood of the affected region. C. A. K. **Purpura during pregnancy.** C. W. F. Burnett and I. Klass (J. Obstet. Gynaec., 1943, 50, 393-404).-68 cases are collected from the literature and reviewed; only 4 were of true essential thrombocytopenic purpura. 1 further such case is reported in detail.

P. C. W. Transfusion unit in 700-bed hospital; annual survey of over 3500 administrations of blood and plasma (dried). L. A. Erf and H. W. Jones (Ann. int. Med., 1943, 19, 1-27).—The Kahn or Wassermann tests were positive in 1-8% of 3800 donors. 2869 blood transfusions were followed by reactions in  $3\cdot2\%$ ; 695 infusions of dried plasma were followed by reactions in 0.14%. The reactions were classified as chill with and without fever, urticaria, and incompatibilities. Pyrogenic reactions were most frequent. The use of cellulose tubing instead of rubber tubing is recommended in the administration of intravenous fluids. Under field conditions, the use of dried plasma (16 g. in 40 c.c. of distilled water) is particularly convenient. Infusion into the intrasternal or intratibial marrow cavities became necessary where intravenous administration was impossible. The processing of cadaver blood for dried plasma or albumin is advocated. A. S.

Concentrated red cell transfusions. R. S. Evans (J. Amer. Med. Assoc., 1943, 122, 793-796).-44 transfusions with conc. red cells in 5% plasma are reported and 4 cases are described in detail. The incidence of reactions was not greater than with ordinary blood transfusions. C. A. K.

Fatal blood transfusion reaction apparently due to Rh factor. N. C. Newton and A. H. Tebbut (*Med. J. Austral.*, 1943, II, 109— 110).—Death followed transfusion probably owing to the development of anti-Rh immune serum following a transfusion 12 days previously. F. S.

Red cell transfusions in anæmia. H. L. Alt (J. Amer. Med. Assoc., 1943, 122, 417-419).—Red cell suspensions in isotonic saline were effectively used to combat anæmia in a case of chronic lymphatic leukæmia, given at monthly intervals. They were also used in other cases. C. A. K.

Jaundice 1 to 4 months after blood or plasma transfusions. P. B. Beeson (J. Amer. Med. Assoc., 1943, 121, 1332–1334).—7 patients received blood transfusions and 3 in addition had pooled plasma transfusions. 1-4 months later they developed signs and symptoms of catarrhal jaundice. C. A. K.

Milk bottle as blood transfusion flask. L. W. Diggs (Amer. J. clin. Path. Tech. Sect., 1943, 7, 101-107).—Its use in a blood bank is described. C. J. C. B.

Transfusion therapy of acute hæmolytic anæmia of newborn. A. S. Wiener and I. B. Wexler (Amer. J. clin. Path., 1943, 13, 393-401).—The treatment of acute hæmolytic anæmia of the newborn by transfusions of Rh-negative blood is outlined and 8 illustrative cases are presented. The problems presented by atypical cases due to sensitisation to factors other than Rh or due to multiple sensitisation are mentioned; transfusion with washed mother's erythrocytes suspended in compatible plasma is suggested.

C. J. C. B. Splenectomy for hæmolytic anæmia. O. H. P. Pepper and J. H. Austin (J. Amer. Med. Assoc., 1943, 122, 870-871).—A patient who had had splenectomy 28 years previously for severe hæmolytic anæmia was in excellent health, and had a normal blood count except for the presence of a small no. of Howell-Jolly bodies.

C. A. K. Localised "agnotogenic" (of unknown origin) xanthomatosis of spleen with splenomegaly and anæmia. M. L. Dreyfuss and E. H. Fishberg (*Amer. J. med. Sci.*, 1943, 206, 458-465).—A case of primary xanthomatosis of the spleen associated with splenomegaly (due to foam cells) and anæmia in a non-diabetic child is described. The lipins chiefly increased were lecithin, kephalin, and total cholesterol. C. J. C. B.

**Control of polycythemia vera by venesection.** L. E. Hines and W. C. Darnall (*Amer. J. med. Sci.*, 1943, 206, 434-438).—The excess of circulating erythrocytes was determined; at weekly or bimonthly intervals 20-250 c.c. of blood were removed to maintain a normal total cell vol. or some anæmia. 2 patients treated by this method for more than a year have remained free from symptoms.

C. J. C. B. Erythroblastosis fætalis in one of twins. D. H. Kariher (J. Amer. Med. Assoc., 1943, 122, 943—944).—One of double ovum twins died of erythroblastosis fætalis (hæmolytic disease of newborn). He was Rh-positive, whereas his healthy twin was Rh-negative. The father was Rh-positive, the mother Rh-negative. Anti-Rh isoantibody was found in the mother's serum. C. A. K.

Familial erythroblastic anæmia; thalassæmia—Cooley's anæmia. A. C. van Ravenswaay, K. H. Schnepp, and C. Moore (J. Amer. Med. Assoc., 1943, 122, 83—86).—Case report. C. A. K.

Specific gravity of fish blood during rapidly developed anoxia. B. A. Westfall (J. Cell. Comp. Physiol., 1943, 22, 177–186).—After 1 hr. of anoxia the sp. gr. of gold-fish blood and the red cell count are markedly reduced. Sp. gr. of plasma is unaltered. Fe and blood in the gills are more than doubled as compared with controls. v. J. W.

L. E. Napier and C. R. Das Gupta (*Indian Children and adolescents. L. E.* Napier and C. R. Das Gupta (*Indian J. Med. Res.*, 1940, 28, 207— 224).—The blood-hæmoglobin of Indian boys was 11.5 g.-% at the age of 5 years, 13.5 at 16 years, and reached the adult level (15%) only at 25 years. The % of Indian girls was the same as that of boys up to the age of 11 then toos more slowly to the adult level (15%) Hæmoglobin standards in Indian children and adolescents. up to the age of 11, then rose more slowly to the adult level (12.5). S. E. M.

Fate of hæmoglobin in *Rhodnius prolixus* (Hemiptera) and other blood-sucking arthropods.—See A., 1944, III, 118.

Ferritin. VI. Conversion of inorganic and hæmoglobin-iron into ferritin-iron in animal body. Storage function of ferritin.-See A., 1944, III, 130.

Reduction of methæmoglobin by ascorbic acid. Q. H. Gibson (*Biochem. J.*, 1943, 37, 615-618).—The more rapid reduction of ferricyanide- than of nitrite-methæmoglobin by ascorbic acid is due to the catalytic effect of ferrocyanide, not to a chemical difference between the preps. of methæmoglobin. Fe and Cu salts also act as catalysts in the reduction, which is a bimol. reaction.

P. G. M.

Treatment of agranulocytosis with sulphadiazine. N. Nixon, J. F. Eckert, and K. B. Holmes (Amer. J. med. Sci., 1943, 206, 713-721).-3 cases of severe agranulocytosis due to sulphadiazine were treated successfully with larger doses of sulphadiazine. The agranulocytosis occurred during the course of acute infections (scarlet fever in 1 case and primary atypical virus pneumonia in 2 cases). Each patient had received moderate doses of sulphadiazine for 2 or more weeks prior to the onset of bone marrow depression. C. J. C. B.

Blood changes during treatment with sulphanilamide and its derivatives. N. G. Markoff (Schweiz. med. Wschr., 1943, 73, 656-662) .- A review. A. S.

Reaction of leukæmic patients to sulphonamides. E. L. Amidon (J. Lab. clin. Med., 1943, 28, 1691-1696).-4 cases of leukæmia are presented, which showed a drop in the total circulating lymphocytes, and some temporary clinical improvement, after the administration of sulphanilamide and sulphathiazole (1 g. every 4 hr.) C. J. C. B.

Effect of leukocytosis-promoting factor on growth of cells in bone marrow. V. Menkin (Amer. J. Path., 1943, 19, 1021-1027).—The leukocytosis-promoting factor from an inflammatory exudate injected into the blood stream of dogs had a sp. growth effect on the myeloid elements of the bone marrow, accompanied by an increase in the megakaryocytes. (2 photomicrographs.)

Distribution of doses of radioactive phosphorus in leukæmic patients.—See A., 1944, III, 120.

Criteria of life and death in human pus cells. R. E. H. Simpson (Brit. J. exp. Path., 1943, 24, 218-223).—When 1% aq. methyleneblue is added to fresh pus, dead cells stain immediately, the nucleus intensely, and the cytoplasm to the same degree as the medium; degenerating cells show varying degrees of nuclear staining and no cytoplasmic staining; healthy cells are unstained F. S.

Estimation and control of post-operative dehydration. B. W. Seaman and E. Ponder (J. clin. Invest., 1943, 22, 673-685).—After major surgical procedures, the post-operative fall in hæmoglobin concn. is often greater than would be expected from the amount of blood lost at operation; this may be due partly to inhibition of hæmoglobin formation. After partial gastrectomy and partial colon resection, the plasma-protein concn. falls to a greater extent than would be expected from the blood loss. C. J. C. B.

Rôle of the extracellular fluid in maintenance of normal plasma volume. J. V. Warren, A. J. Merrill, and E. A. Stead, jun. (*J. clin. Invest.*, 1943, 22, 635-640).—The plasma-protein concn. was reduced in dogs by injuring the capillaries of 2-4 extremities for 5-6 hr. by arterial orchysical Active release of the tempinate the dominant arterial occlusion. After release of the tourniquets, the dogs were given large vols. of physiological saline solution, intravenously. The infusion maintained the circulation at a normal level, and there was a continued loss of plasma into the extremities. If the saline infusion was stopped in the first few hr. after the release of the tourniquets, the plasma vol. decreased rapidly, and circulatory insufficiency developed. If the saline infusion was continued until the animal developed sufficient generalised ædema no further hæmoconen. was noted, although the circulating protein was still 50% or more below the original level. The plasma vol. was either normal or moderately reduced; at this time, the circulation and arterial pressure were normal. Uninjured anæsthetised animals who received large amounts of physiological saline solution intravenously developed generalised ordema but showed less decrease in total circulating protein than did the injured animals. The moderate fall which occurred in circulating plasma-protein was not accompanied by a decrease in plasma vol. C. J. C. B.

Fractionation of serum- and plasma-proteins by salt precipitation in infants and children. Changes (1) with maturity and age; (2) in

glomerulonephritis; (3) in nephrosis. M. Rapoport, M. I. Rubin, and D. Chaffee (J. clin. Invest., 1943, 22, 487-497).—The serumand plasma-protein fractions, separated by  $Na_2SO_4$  and  $PO_4'''$  pre-cipitants, were studied in premature infants, full-term newborn infants, older infants, and young children. Blood-fibrin was const. at all ages, and equal to adult vals. The total serum-protein vals. rise with increasing maturity with a proportionately greater increase in globulin. In children with glomerulonephritis, plasma-fibrin was elevated during the acute stage of the disease and returned to normal with healing. In the chronic phase, there is persistent elevation of fibrin. In acute glomerulonephritis, there is a lowering of serum-albumin and an increase in y-globulin. In the chronic stage of the disease, both serum-albumin and -globulin are reduced. Plasma-fibrin was elevated during the active phase of lipoid nephrosis while the total protein and serum-albumin were reduced and the serum-globulin was normal or slightly elevated. The reduction of total serum-albumin in the nephrotic and in the nephritic patient is due to a decrease in a labile subfraction of the albumin.

[Food-]proteins and blood formation. M. Damodaran and P. K. Vijayaraghavan (*Current Sci.*, 1943, 12, 115-116; cf. Yeshoda, A., 1943, III, 83).—The erythrocyte and hæmoglobin contents of the blood of young rats rendered severely anæmic with phenylhydrazine are restored to the normal vals. within 15 days by a diet containing 5% of casein or ovalbumin as sole protein. Restoration takes 25 days when wheat-gluten is the sole protein. W. McC.

Effect of concentrated solutions of human and bovine serumalbumin on blood volume after acute blood loss in man. J. T. Hoyl, J. G. Gibson, C. A. Janeway, A. Schwachman, and L. Wojcik (*J. clin. Invest.*, 1943, 22, 763—773).—Conc. solutions of human and cryst. bovine albumin were injected into normal subjects after removing 10—20% of the blood vol. Each g. of albumin drew 17.4 c.c. of fluid into the circulation in 1 hr. in 11 subjects (range 22.9 - 24 c.o.) This is group a company with the vol. expected 13.2-24 c.c.). This is in good agreement with the val. expected from in vitro studies of the osmotic pressure of human and bovine serum-albumin; 25 g. of albumin thus add to the circulation a vol. of fluid equiv. to 450 c.c. of circulating plasma or 500 c.c. of citrated plasma. Serum- and urinary K vals. were not increased. No C. J. C. B. harmful effects were observed.

Blood in cholera. I. Technical methods. II. Certain chemical constituents. K. S. Malik and C. L. Pasricha (Indian J. Med. Res., 1940, 28, 291-299, 301-307).-I. Blood constituents were determined in venous blood from cholera patients.

II. Concn. of blood constituents from 17 patients in the acute stage of cholera varied considerably. There was an increase in cell vol., hæmoglobin, urea, non-protein-N, total plasma, fibrin and globulin fractions, inorg.  $PO_4^{\prime\prime\prime}$ , and glucose. S. E. M.

Serum-lipins. I. Interrelations in normal persons. II. Inter-relations in patients with thyroid disease. III. Interrelations in patients with diseases of the kidneys. J. P. Peters and E. B. Man (J. clin. Invest., 1943, 22, 707-726).—I. The normal range of variation of all lipin fractions was great: 107-320 mg.-% for cholesterol,  $6\cdot1-14\cdot5$  mg.-% for lipin-P, and  $0-17\cdot8$  m-equiv. per l. for fatty acids of free fat. Similar vals. are obtained in male and female adults, obese adults, or children. The ratio of cholesterol to lipin-P is more const. (S.D.  $\pm 12\%$ ). The ratio varies directly with cholesterol concn. The ratio of free to total cholesterol varied from 0.24 to 0.32. Free fat is not correlated with cholesterol or lipin-P. 0.24 to 0.32. Free fat is not correlated with cholesterol or lipin-P.

II. Although cholesterol rises when the thyroid gland is removed and falls when active thyroid preps. are given, normal concns. of cholesterol may be found in the serum of patients with hyper-thyroidism or with thyroid deficiency, because the level to which cholesterol falls or rises is related to the normal cholesterol concn. of the affected subject. The ratios of free to total cholesterol and of cholesterol to lipin-P are not affected in thyroid disorders. The latter ratio, within the normal range of cholesterol, is the same for nation with normal, excessive, or deficient thyroid activity, varying with the concn. of cholesterol. As cholesterol falls below this range in hyperthyroidism, the ratio diminishes as it does in malnutrition. As cholesterol rises above this range, the ratio rises to describe a continuous curve. There is no relation between the height of cholesterol and the level of neutral fat in the serum.

III. Serum-cholesterol is often raised in patients with renal disease, characterised by œdema and hypoproteinæmia, whether they have a true nephrotic syndrome or not. The partition of cholesterol is not regularly altered in these conditions. Both cholesterol and lipin-P fall when the renal disease clears up or when renal failure develops. They may also fall during exacerbations or other complications that interfere with feeding and impair nutrition. Neutral fat is usually elevated when there is hypercholesterolæmia. In a group of patients with arterial disease and hypertension, without evidence of antecedent renal disease, the concns. and proportions of cholesterol, lipin-P, and neutral fat were normal. C. J. C. B.

Plasma-vitamin-A during pregnancy. O. Bodansky, J. M. Lewis, and M. C. C. Lillienfeld (*J. clin. Invest.*, 1943, 22, 643-647).—The mean val. of the plasma-vitamin-A concn. in 70 women, 6 months pregnant or less, was 105.4 i.u. per 100 c.c. (S.D. 23.2 i.u.). The

C. J. C.

mean val. in 62 cases in the 3rd trimester of pregnancy was 91-1 units % (S.D. 26.2 i.u.). The mean val. of the plasma-carotene during the 6th, 7th, and 8th months ( $145.9 \ \mu g.-\%$ ) was significantly higher than that for the first 5 months ( $11.9 \ \mu g.-\%$ ); the decrease in the plasma-A in the 3rd trimester is attributed to storage in the fætal liver and utilisation by the fætal tissues. C. J. C. B.

feetal liver and utilisation by the literat disects. In the literated of scorbutic guinea-pigs. A. Hegyi and P. Kézdi (*Biochem. Z.*, 1941, 307, 257-263).—F.p. determinations show that the molar concn. of electrolytes in blood decreases in the early stages of the disease but increases considerably after the 18th day. The alkali reserve undergoes similar changes, rising above the normal val. in the later stages after decreasing in the earlier. The changes are attributed to increased biological oxidations brought about by scorbutic activation of the thyroid gland. W. McC.

Effect of barbiturates on serum-choline-esterase. F. Schütz (J. Physiol., 1943, 102, 259-268).—The choline-esterase activity of serum (before breakfast) is unaffected by a large single dose of phenobarbitone or phenylmethylbarbituric acid, but is decreased by their prolonged administration. The decrease is probably due to actual diminution in the concn. of enzyme and not to an inhibitor, because (1) the drugs have no *in vitro* inhibitory effect, (2) dialysis of serum does not change its activity, (3) the rate at which the rate of enzyme-substrate reaction diminishes reveals no third factor. Various transient conditions (*e.g.*, convulsions, lack of sleep, overventilation) are also excluded. The results are possibly connected with the lowered serum-choline-esterase activity, and with the sensitisation by some narcotics of the frog rectus abdominis. Plotting rate of hydrolysis against different quantities of serum shows that enzyme content is reduced to 22% of normal. A formula is suggested to give relative concn. of enzyme from observed rate of hydrolysis.

#### VI.—VASCULAR SYSTEM.

Prediction of heart weight in man. H. Gray and E. Mahan (Amer. J. phys. Anthrop., 1943, [ii], 1, 271-287).—The method employed was to take the log of heart wt. against the log of body wt. It was applied to 5789 hearts, and the calculations converted to ordinary linear equations. This log/log relation whereby the log of heart wt. is expressed as a linear function of the log of body wt. is considered the best approximation to heart wt. W. F. H.

Rhythmic property of human heart [effect of carotid sinus stimulation]. M. H. Nathanson (Arch. int. Med., 1943, 72, 613—626).— Prolonged cardiac standstill following mechanical stimulation of the carotid sinus nerve is more likely to be produced in patients of advanced age than in young people; it occurred in only 6 women and more than 100 men. In 40 subjects giving cardiac arrest, there was evidence of coronary disease of the anginal type in 34. The rhythmic efficiency of ectopic centres of the human heart, after sinoauricular activity is eliminated by vagal stimulation, is low. Sympathetic influences affect mainly ventricular, parasympathetic mainly auricular, foci. Digitalis increases, atropine and quinidine abolish, vagal inhibition of the human heart. Quinidine and acetylβ-methylcholine antagonise the increased ventricular rate produced by adrenaline. A. S.

Effects of bile salts on action potentials of frog's sinus venosus. L. Asher and N. Scheinfinkel (*Helv. Physiol. Pharm. Acta*, 1943, 1, C74—75).—The action potentials of the isolated sinus venosus of the frog's heart are diminished and slowed down by bile salts. Ringer's solution had no effect. A. S.

Effect of *l*-ascorbic acid and related compounds and of hydrogen peroxide on isolated heart of frog. O. Krayer, R. P. Linstead, and D. Todd (*J. Pharm. Exp. Ther.*, 1943, 77, 113—122).—When  $HCO_3'$ buffer (pH 7.5—7.8), saturated with 95%  $O_2$  and 5%  $CO_2$  and containing *l*-ascorbic acid or *d*-isoascorbic acid, was perfused through the isolated frog heart, the height of contractions first increased, then gradually decreased with an increase in rate, and finally the ventricle stopped in systole. This effect was due to the appearance of  $H_2O_2$  in the course of dehydrogenation of *l*-ascorbic acid or of *d*-isoascorbic acid in the buffer and not directly to the ascorbic acid compounds. G. P.

Influence of thyroid, dinitrophenol, and swimming on glycogen and phosphocreatine level of rat heart in relation to cardiac hypertrophy. W. B. Shelley, C. F. Code, and M. B. Visscher (Amer. J. Physiol., 1943, 138, 653—658).—Glycogen and phosphocreatine were present in low concn. in the hypertrophied heart of the rat fed desiccated thyroid. The degree of hypertrophy and glycogen loss was proportional to the size of the daily dose and the length of period of administration. Subcutaneous dinitrophenol failed to produce increases in heart wt. or change in cardiac glycogen. Young rats swimming 3.3 hr. daily for 2 months showed moderate cardiac hypertrophy. Cardiac glycogen determined in rats 1—24 hr. after swimming was normal or elevated and in rats fasted and rested 24 hr. after swimming was twice normal. T. F. D.

Cardiac arrest by action of potassium. C. A. Finch and J. F. Marchand (*Amer. J. med. Sci.*, 1943, 206, 507—520).—2 cases of fatal K poisoning are described. In 1 there was a spontaneous rise of serum-K to 8.85 m-equiv. per l. and a further elevation to 10.50 after an oral dose of 4.5 g. of KCl. The other had been given large therapeutic doses for 5 days. In each there was renal failure with acute uræmia and oliguria; recurrent nausea and retching; episodes of bradycardia unaccompanied by symptoms of cardiac failure or changes in blood pressure; a sudden ascending flaccid quadriplegia without paralysis of the trunk or disturbance of speech or mental functions; e.c.g. changes including elevated T waves, absent P waves, intraventricular block, and terminal irregularities of the rhythm; arrest of the heart in diastole prior to the cessation of respiration. C. J. C. B.

Anuria following manual removal of placenta and blood transfusion; irregular heart action cured by potassium administration. R. A. E. Magee (J. Obstet. Gynaec., 1943, 50, 448–452).—A case is described in which 4 days' anuria followed manual removal of the placenta and blood transfusion; blood-creatinine rose to  $4 \cdot 4$  mg.-%. Prolonged intravenous therapy resulted in recovery of renal function though myocardial failure developed. The latter symptom was cured by K therapy and was probably due to K deficiency caused by the prolonged intravenous NaCl treatment. P. C. W.

Standardisation of electrocardiographic nomenclature. A. R. Barnes, L. N. Katz, S. A. Levine, H. E. B. Pardee, P. D. White, and F. N. Wilson (*J. Amer. Med. Assoc.*, 1943, 121, 1347-1349).— Special article with detailed recommendations about labeling of e.c.g. records.

Standardisation of precordial leads. A. R. Barnes, H. E. B. Pardee, P. D. White, F. N. Wilson, and C. C. Wolferth (J. Amer. Med. Assoc., 1943, 121, 1349-1351).—Recommendations on the use of multiple precordial leads are put forward, and the indications for their use are discussed. C. A. K.

Angiocardiography. H. K. Taylor and T. McGovern (J. Amer. Mcd. Assoc., 1943, 121, 1270-1276).-70% diodone (diodrast) was injected intravenously in 100 persons with and without cardiovascular disease and X-rays were used to show up the chambers of the heart and the large vessels. Reactions to the injection were frequent but mild, the chief effect being a sharp, transient fall of blood pressure. C. A. K.

**Congenital heart block.** T. C. Jaleski (*Amer. J. med. Sci.*, 1943, **206**, 449-453).-2 cases are reported. The first, which was studied for 4 years, was an otherwise healthy adult. The second case, which was followed from birth, had had no cardiac symptoms except for some syncopal attacks; the patient has had two normal pregnancies without any serious cardiac disturbance. C. J. C. B.

Thyrotoxicosis as sole cause of heart failure. W. B. Likoff and S. A. Levine (Amer. J. med. Sci., 1943, 206, 425-433).—There were 39 cases of heart failure among the 78 "cardiacs" with thyrotoxicosis and 21 instances of definite congestive failure among the 331 "non-cardiacs." Therefore thyrotoxicosis is not infrequently the sole cause of congestive heart failure. Congestive failure was more likely to occur in the female sex, with increasing age, when the thyrotoxic state lasted longer, and when auricular fibrillation was present. C. J. C. B.

Pulmonary tuberculosis-like symptoms in acute and chronic congestion due to mitral stenosis. A. Alder (*Schweiz. med. Wschr.*, 1943, 73, 530-532).--2 cases of mitral stenosis with the radiological appearance of pulmonary tuberculosis are reported. One patient showed typical pulmonary ordema on slight exertion. A. S.

Bell thrombus in left auricle. D. M. Spain (Ann. int. Med., 1943, 19, 144-146).—A case is reported. A. S.

Legal aspects of heart disease and electrocardiogram. J. E. F. Riseman and H. W. Smith (Ann. int. Med., 1943, 19, 81-106). A. S.

Acute traumatic heart disease. R. V. Lee, N. T. Ussher, and G. H. Houck (*Amer. J. med. Sci.*, 1943, 206, 722-725).—A case of myocardial contusion with recovery is reported. The symptoms, clinical course, and electrical deviations are similar to those of acute myocardial infarction. C. J. C. B.

Relationship between pulmonary and coronary circulation. C. Kroetz (Schweiz. med. Wschr., 1943, 73, 321-327).—A review.

Carotid sinus syndrome. S. L. Zimmerman (J. Lab. clin. Med., 1943, 28, 1548—1555).—3 cases of carotid sinus syndrome, 2 of the vagal type and 1 of the depressor type, are reported. In all 3, the presence of the syndrome was easily established. In 2, the history revealed the precipitating factor to be an abnormal or sudden movement of the head and neck. In the 3rd, the patient learned that he could avoid such an attack by holding his head still between his hands. C. J. C. B.

Reflex vaso-motor responses of paw of cat. C. B. Downman, A. F. Goggio, B. A. McSwiney, and M. H. C. Young (*J. Physiol.*, 1943, 102, 216-227).—Decreases in vol. similar to those occurring in human extremities occur reflexly in the paw of the cat after auditory, cutaneous, and visceral stimuli (optical recording from plethysmograph, carrying rubber membrane and mirror). Responses result also from stimulation of (1) the central end of many afferent nerves and roots, (2) the peripheral end of local mixed nerves and appropriate anterior roots, (3) appropriate sympathetic ganglia. The reflexes are abolished by removal of ganglia; they are independent of changes in systemic blood pressure and are not abolished by local circulatory arrest (except when the tourniquet is within or very near the plethysmograph) or by curare. Central summation (spatial) occurs, and the approx. central reflex time suggests a long path, though this is below the superior colliculi. Participation of adrenaline is excluded by (1) adrenalectony, (2) short latent period. The depth of anæsthesia influences the response. W. H. N.

**Conduction of impulses in arterial wall.** M. Monnier (*Helv. Physiol. Pharm. Acta*, 1943, 1, 249–264).—Rings of arteries, connected by a small bridge of arterial wall, were suspended in Ringer's solution. Distension and sudden diminution of tension in the proximal ring is followed by contraction which is transmitted through the connecting bridge to the distal arterial ring; sometimes the distal muscle ring responded when the proximal ring did not react to stimulation. The sensitivity of the prep. is increased by addition of minute concns, of adrenaline to the suspension fluid. Optimum transmitted effects were obtained by exposing the proximal ring transles is reduced at low temp. (25°) and increased at body temp. Responses were still obtained on preps. kept for 7 days at 4°. A. S.

Dermofluorometer : instrument for objective measurement of fluorescence of skin and organs and objective determination of circulation time and capillary permeability. K. Lange and S. E. Krewer (J. Lab. clin. Med., 1943, 28, 1746—1751).—The instrument shines a blue light on the skin and any fluorescence is recorded by a photo-tube. It is used as follows. In a darkened room, several test spots of the body to be examined are touched with the instrument and the "background" deflexion is noted. The instrument is then attached to the spot at which the circulation time is to be observed. 10 c.c. of a 5% fluorescein solution are injected intravenously and the time elapsing between the beginning of the injection and the initial deflexion is measured : this equals the circulation time to this area. A mouthpiece made from lucite can be used to determine the circulation to the lips or gums if this is preferred to visual observation. Subsequently, all test spots are touched with the instrument, and the deflexions of the photometer are read. From the results thus obtained "background" readings are subtracted to obtain abs. fluorescein vals. Thus a curve is obtained for each area of the body surface which indicates how much blood and, with it, fluorescein is reaching this district per unit time. I skin unit is the deflexion caused by an alkaline fluorescein solution of 1 : 30,000,000 in a cuvette of 5 mm. depth, the glass of which shows no absorption for the exciting light. The exact location of a vascular stenosis can be determined with this device, and capillary permeability can also be determined. C. J. C. B.

Objective methods to determine the speed of blood flow and their results (fluorescein and acetylene). K. Lange and L. J. Boyd (Amer. J. med. Sci., 1943, 206, 438-448).—The appearance of fluorescein in the lips under a special long-wave ultra-violet light can be used to determine the circulation time (cf. preceding abstract). In 212 normal adults the fluorescein circulation time was 15-20 sec., generally  $15-17\cdot5$  sec.; the time is longer in older patients. Work and fever shorten the circulation time. The time to conjunctiva, lips, rectum, and foot is 10, 15, 18, and 23 sec. respectively. In congestive right heart failure 92% (123 patients) show a prolonged circulation times. Pure bronchial asthma, with a normal time, can be differentiated from cardiac asthma, with a prolonged time. Hyperthyroidism is associated with a shortened time. Anæmia shortens the time when the red cell count falls below 3.5 million per cu. mm. Inhalations of acetylene can be used to determine the time which elapses until all blood in rapid circulation has passed the lungs at least once (" slowest circulation time"). The patient breathes a 6% acetylene-air mixture from a Douglas bag. The expired gas is separated and sufficient amounts are drawn into a small rubber bag by Simonson's apparatus. Every 20 sec. a new bag is filled. The samples of gas thus received are then analysed for acetylene gives the ordinate of a curve, the abscissa of which is represented by the time. 24 normals had the " slowest circulation time" of  $2\frac{1}{2}-3\frac{1}{2}$  min. 10 cases of thyrotoxicosis showed slowest circulation times of  $1\frac{1}{2}-2$  min. while patients in cardiac failure have times up to 6 min. Work reduces the " slowest circulation time" to  $\frac{2}{3}$  of the normal.

Duplicate measurements of circulation time with saccharin method. K. H. Esser and K. Berliner (Ann. int. Med., 1943, 19, 64-69). Duplicate determinations of the circulation time with the saccharin method were made in 60 patients; the time interval between the tests was 1 hr. Identical results were obtained in only 6 cases; in 54 cases differences from 1 to 143% were found; the differences were greatest in patients suffering from congestive heart failure. The differences in the duplicate determinations were smallest when the tests were done under "basal" conditions. A. S.

Clinical studies on inco-ordination of circulation, as determined by the response to arising. I: Starr (J. clin. Invest., 1943, 22, 813-826).—The response of the circulation when the subject arose, as determined by the ballistocardiograph, was employed as a test of the ability to adapt the cardiac output to the needs of the moment. In 75 healthy persons, this physiological adjustment is largely accomplished by the vasomotor mechanism and the cardiac output changes little. In many of 150 sick persons, the circulation changes more and variably. Generally, the circulation is unduly increased on arising; many weakened patients cannot stand without involutary muscular movements of the lower extremities. Such movements are always called forth in persons subject to fainting before they collapse, and they seemed designed to support the circulation. Their presence suggests inadequacy of the vasomotor and other circulatory responses to maintain blood pressure. C. J. C. B.

Significance of blood-pressure readings in general surgical work. H. Dodd (*Brit. Med. J.*, 1943, II, 811—813).—The Moot-McKeffon cardiac index (pulse pressure : diastatic pressure) is described and its prognostic val. indicated. Some factors affecting the blood pressure at and after operations are described. I. C.

Gunshot wound of innominate artery. G. F. Langley (Brit. Med. J., 1943, II, 711-712).—Spontaneous arrest of hæmorrhage occurred after a gunshot wound of the bifurcation of the innominate artery. Traumatic spasm of the common carotid artery resulted in rapidly progressive contralateral hemiplegia. I. C.

Progressive cerebral ischæmia. T. H. Howell (Brit. Med. J., 1943, II, 746).—A no. of cerebral symptoms occurred in 27 senile patients and were accompanied by a progressive fall of blood pressure. It is suggested that these symptoms were due to progressive cerebral ischæmia. I. C.

Effect of diethylstilbœstrol on blood pressure of normal and hypophysectomised rats. J. H. Leathem and V. A. Drill (*Amer. J. Physiol.*, 1943, 139, 17-20).—Systolic blood pressure, after stilbœstrol injections, rose gradually in normal rats and fell in hypophysectomised rats, whose level was already 30% below normal. T. F. D.

Syphilitic aneurysm of cœliac artery. T. C. Laipply (Amer. J. med. Sci., 1943, 206, 453-457).—A case report of saccular syphilitic aneurysm of the cœliac artery complicated by bleeding into the intestinal canal by way of the pancreatic duct. The signs and symptoms simulated acute cholecystitis. C. J. C. B.

Occlusions of abdominal aorta; study of 16 cases of saddle embolus and thrombosis. N. E. Reich (Ann. int. Med., 1943, 19, 36—59).—2 out of 16 patients recovered by recanalisation. The occlusion was due to embolism in 7 cases (women), all of them having auricular fibrillation. Emboli in other arteries were found in 6 of these 7 cases (renal 3 times, pulmonary 3, cerebral 2, splenic, superior, and inferior mesenteric arteries once each). 6 patients showed thrombo-arteriosclerosis of the aorta (average 62 years, as to 43 years in the embolic group; 5 males). There was 1 case of abdominal aneurysm with mural thrombosis and 1 case developing from bilateral iliopsoas abscesses and septic thrombosis of capillaries in the periaortic tissues. The diagnosis was correct in 10 cases. Symptoms and findings in order of frequency were temp. and colour changes, pain, absence of pulsations, weakness or paralysis of extremities, loss of sensation and reflexes. Failure in diagnosis was due to rapid antemortem formation of complete occlusion with no time for the development of the characteristic symptoms. The average period of life after occlusion was 10 days. In 2 additional cases saddle embolus was due to syphilitic aortitis and to embolism from mural thrombus of myocardial infarction. A. S.

Venipuncture dummy. H. Balikov (Amer. J. clin. Path. Tech. Sect., 1943, 7, 108–111).—A rubber tube under towelling is used to teach students venepuncture. C. J. C. B.

Neurocirculatory asthenia. L. F. Bishop and R. W. Kimbro (J. Amer. Med. Assoc., 1943, 122, 88).—Case report. C. A. K.

Venipuncture in presence of edema. S. O. Schwartz (J. Lab. clin. Med., 1943, 28, 1629).—Pressure is exerted by the thumb over the antecubital space for 30—60 sec., producing pitting. In the bottom of the resulting "pit" the antecubital veins stand out very prominently, since the edema fluid has been expressed not only from the overlying tissues but from the tissues surrounding the veins as well. C. J. C. B. Pulmonary transudates and exudates. C. K. Drinker and M. F. Warren (J. Amer. Med. Assoc., 1943, 122, 269-273).—A lecture. C. A. K.

Acacia in renal cedema. H. J. Lehnhoff and M. W. Binger (J. Amer. Med. Assoc., 1943, 121, 1321-1325).—The successful use of acacia in 12 cases of cedema of renal origin is described.

C. A. K.

Capillary permeability in traumatic shock. D. Engel and E. Forrai (J. Physiol., 1943, 102, 127-139).—" Permeability" was assessed by infusing a dye into the jugular vein of cats and measuring its rate of appearance in fluid perfused through the knee joints. An increased rate of appearance of the dye follows crushing of the same leg and may last for 5 hr.; the rate then becomes subnormal. There is no increased rate on crushing other limbs. W. H. N.

Etiology and treatment of shock. J. C. Meakins (Canad. Med. Assoc. J., 1943, 49, 21-28).-A general review. C. J. C. B.

Liver principle effective against shock from burns. M. Prinzmetal, O. Hechter, C. Margoles, and G. Feigen (J. Amer. Med. Assoc., 1943, 122, 720-723).-Mice and rats were shocked by immersion in water at  $60-75^{\circ}$  for 10-15 sec. Pretreatment with commercial liver extracts reduced the mortality rate considerably and in those animals that died prolonged survival time. The active principle is not the antianæmic factor, is relatively thermostable, is not destroyed by aëration at high temp, is water-sol, and is pptd. from aq. solution by acctone or ethanol. Liver therapy is only occasionally effective when given after the onset of shock. Injections of 0.9% NaCl solution before or after the burns were also effective against shock. Adrenocortical hormones, thiamin and other vitamins were ineffective. C. A. K.

Intensive serum therapy of burn shock. D. L. Presman, M. Janota, R. E. Weston, S. O. Levinson, and H. Necheles (*J. Amer. Med. Assoc.*, 1943, 122, 924—928).—Detailed studies of 2 cases of severe burns involving 45 and 50% of the body surface respectively suggest that the vol. of human serum required is 50 c.c. for every 1% of body surface burned given at once, followed by 20—30 c.c. for every 1% during the 1st 24 hr. and another 20—30 c.c. for every 1% in the 1st 72 hr. Crystalloid fluids should not be given during the 1st 24 hr. Blister fluid has a protein concn. of 70—80% of the plasma-proteins; the albumin content was fairly const., the globulin content was variable. C. A. K.

Shock in fever therapy treated with blood plasma. A. M. Pruce (J. Amer. Med. Assoc., 1943, 121, 935).—Case report. C. A. K.

Pectin solution in shock. F. W. Hartman, V. Schelling, B. Brush, and K. W. Warren (J. Amer. Med. Assoc., 1943, 121, 1337—1342).—Pectin solutions should be prepared by multiple filtration and heating at 200° for 15—18 hr.; solutions should be water-clear, have viscosity of 2—4 at 38°, an osmotic pressure of 45—70 mm. Hg, and mol. wt. 60,000-75,000. 0.75% solution was effective in animals in replacing blood loss, and its use in 125 human cases of operative or traumatic shock was successful in restoring blood vol. and blood pressure to normal. C. A. K.

**External temperature and shock.** K. G. Wakin and W. D. Gatch (J. Amer. Med. Assoc., 1943, 121, 903–907).—Rabbits, guinea-pigs, dogs, and rats were shocked by intestinal stripping or limb trauma and subsequently exposed to environmental temp. ranging from  $5^{\circ}$  to 55°. The average survival time was greatest at 35°, and cooling and overheating were both shown to be harmful. The physiological mechanisms are discussed. C. A. K.

Experimental therapy of burns and shock. S. M. Rosenthal (U.S. Publ. Health Repts., 1943, 58, 1429-1436).—A simplified procedure is described for the production of traumatic shock in mice under uniform conditions by the tourniquet method. With this technique the max. mortality results 2-3 hr. after the application. In 127 mice the mortality vas 95% after 2 hr. When the tourniquet is applied for longer than 5 hr. a sharp reduction in mortality occurs; with 8 hr. only 20% of the mice died, and when the bands remained on for 24 hr. no deaths from shock occurred. Isotonic solutions of NaCl or other Na salts given orally, intraperitoneally, or intravenously are highly effective in reducing the mortality from traumatic shock. Mouse serum by mouth is more effective than intravenously. The effect of serum on mortality is due to its electrolytic content; a protein-free ultrafiltrate of mouse serum was as active as the original serum in reducing the mortality from traumatic shock. C. G. W.

Standardised method for producing shock in dogs by bleeding. R. A. Cleghorn, J. B. Armstrong, and A. D. McKelvey (*Canad. Med. Assoc. J.*, 1943, **49**, 355–362).—65 dogs were bled rapidly to lower blood pressure in 15 min. to 70 mm. Hg. The pressure was maintained below this level by appropriate subsequent bleeding for another 75 min. A single dose of pentothal Na was used to obtain narcosis during cannulation and the initial bleeding. The amount of blood removed was 3.7% of the body wt., or 43% of the blood vol. Death and survival were closely correlated with the blood pressure level at the end of the bleeding period expressed as a % of that at the outset. Only in dogs having a final blood pressure of 40--56% of the initial pressure was the outcome in doubt. Those having lower pressures died; those having higher pressure lived. The abdominal viscera were pale in dogs dying shortly after the end of the bleeding period. In dogs dying later congestion and hæmorrhage of the mucosa in the gastro-intestinal tract and adrenal cortex were found. The adrenal cortex was stained by the blue dye T 1824. C. J. C. B.

Effect of different environmental temperatures on the survival of dogs after severe bleeding. R. A. Cleghorn (*Canad. Med. Assoc. J.*, 1943, 49, 363—366).—The mortality at 4 different temp. in dogs bled as described in the preceding abstract was as follows: 18% at  $72^{\circ}$  F., 38% at  $52^{\circ}$  F., 45% at  $85^{\circ}$  F., and 93% at  $95^{\circ}$  F. The higher mortality in the dogs at  $52^{\circ}$  compared with those at  $72^{\circ}$  F. is attributed to the increased O<sub>2</sub> requirement. The still higher mortality at  $85^{\circ}$  F. is attributed to the marked vasodilatation. The still higher mortality at  $95^{\circ}$  F. is ascribed to vasodilatation + increased insensible water loss due to panting; the mortality rate is reduced by administering water. C. J. C. B.

Effect of hæmorrhagic shock on concentrat on of renin and hypertensinogen in plasma in unæsthetised dogs. L. Dexter, H. A. Frank, F. W. Haynes, and M. D. Altschule (*J. clin. Invest.*, 1943, 22, 847—852).—Unanæsthetised dogs were shocked by the removal of 4-5% of the body wt: of blood. The concn. of hypertensinogen in plasma markedly decreases in severe hæmorrhagic shock, but not in nephrectomised animals; the diminution in shocked dogs with intact kidneys is attributed to the presence of excessive amounts of renin. Transfusion of 4-5% of body wt. of whole blood with normal titre of hypertensinogen did not increase the plasma-hypertensinogen concn., presumably owing to its conversion into hypertensin by the large amount of circulating renin. The renal humoral pressor mechanism is regarded as a compensatory measure, to maintain normal blood pressure after hæmorrhage; it functions inadequately, however, owing to the inability of the organism to maintain the plasma-hypertensinogen level. C. J. C. B.

Effects of hypotension due to hæmorrhage and of blood transfusion on renal function in dogs.—See A., 1944, III, 116.

Arteriolar lesions in hypertension : study of 350 consecutive cases treated surgically. Estimation of the prognostic value of muscle biopsy. P. P. Foa, N. L. Foa, and M. M. Peet (J. clin. Invest., 1943, 22, 727—740).—The ratio of the thickness of the wall to the diameter of the lumen (W/L) of the arterioles in skeletal muscle was computed from data obtained by direct measurement of the blood vessels in biopsy material in 350 consecutive cases of arterial hypertension. All the patients were subsequently submitted to supradiaphragmatic splanchnicectomy and lower thoracic sympathetic ganglionectomy and followed for 9 months to 7 years after the operation. Patients with more severe thickening of the arteriolar wall had more severe symptoms, and showed poorer therapeutic results and greater mortality. C. J. C. B.

Renal blood vessels in hypertension. B. Castleman and R. H. Smithwick (J. Amer. Med. Assoc., 1943, 121, 1256-1261).—Renal biopsies were performed in 100 hypertensive patients during splanchnic nerve resections, and the degree of vascular disease was estimated histologically. 28% showed no or insignificant vascular diseases and a further 25% only mild changes, so it is concluded that renal vascular disease, leading to renal ischaemia, is probably not the cause of essential hypertension in man. C. A. K.

**Hypertension in people over 40.** A. M. Master, H. H. Marks, and S. Dack (J. Amer. Med. Assoc., 1943, **121**, 1251–1256).— Reliable blood pressure readings were obtained in 14,849 subjects over 40. From these records and from the age distribution of the population of the U.S.A. in 1940 it was calc. that 41% of males and 51% of females over 40 would have blood pressures of 150/90 mm. Hg or over. At 50, there would be 50% males, 62% females; at 60, 60% males, 70% females; at 70, 66% males and 74% females, with blood pressures of 150/90 or over. Mild or moderate hypertension is so common that it is suggested that the limits of normal blood pressure above 40 should be raised. C. A. K.

Hypertensive toxæmia of pregnancy. L. Dexter, S. Weiss, F. W. Haynes, and H. S. Sise (J. Amer. Med. Assoc., 1943, 122, 145-152):—A summary of work published in detail in the book "Preeclamptic and Eclamptic Toxæmia of Pregnancy" by L. Dexter and S. Weiss (1941). C. A. K.

Renin substrate from ox serum. O. Schales, M. Holden, and S. S. Schales (*Arch. Biochem.*, 1943, 2, 67-71).—Renin substrate is pptd. by 30-41%-saturation of ox serum with  $(NH_4)_2SO_4$  at pH 6.8. It is not an euglobulin. E. R. S.

#### VII.—RESPIRATION AND BLOOD GASES.

Modified Christie method for residual air measurements. R. A. Izzo and H. Chiodi (Amer. J. med. Sci., 1943, 206, 190-197). C. J. C. B. Influence of posture on pulmonary volume and alveolar gas tensions. I. F. S. Mackay (J. Physiol., 1943, 102, 228–238).—Tilting the passive human subject from the vertical to positions beyond the horizontal increases the alveolar  $CO_2$  tension and vice versa. The effect is diminished by eliminating the gravitational shift of blood to and from the legs by bandages or tourniquets, and is probably due to changes in the vol. of blood to which the lung gases are exposed. Graduated voluntary increase in respiration by the subject combined with analyses showed that the greater pulmonary ventilation sometimes seen when vertical could not account for the fall in  $CO_2$  tension. W. H. N.

Lung volume and its subdivisions in upright and recumbent positions in patients with congestive failure. Pulmonary factors in genesis of orthopnœa. M. D. Altschule, N. Zamcheck, and A. Iglauer (*J. clin. Invest.*, 1943, 22, 805—812).—No increase in the degree of pulmonary congestion was demonstrated in recumbency in orthopnœic patients. A cephalad shift of the diaphragm occurs in recumbency; this causes changes in respiration and circulation, which increase dyspnœa. The complexity of interrelated factors which are related to the genesis of the orthopnœa of congestive failure is discussed. C. J. C. B.

**Respiratory activity of superior laryngeal nerve.** C. Petitpierre (*Helv. Physiol. Pharm. Acta*, 1943, 1, 325—329).—Rhythmic discharge of action potentials was observed in the afferent fibres of the superior laryngeal nerve (increase during inspiration, decrease during expiration) in rabbits made dyspnæic by unilateral or double phrenicotomy. Cats do not show this phenomenon. The potentials depend on the state of contraction in the elevator muscles of the larynx. A. S.

Interpretation of pneumogram tracings following alteration of breathing by stimulation of vagal afferents. O. A. M. Wyss (*Helv. Physiol. Pharm. Acta*, 1943, 1, 301-324).—Previous findings on the effects of afferent vagal stimulation in rabbits and cats are discussed. A. S.

Respiratory changes following stimulation of afferent phrenic fibres. E. Grandjean (*Helv. Physiol. Pharm. Acta*, 1943, 1, 205– 220).—Stimulation of the central end of the cut phrenic nerve in cats and rabbits with condensor discharges of different frequencies, sinusoidal a.c., and inducted current produces variable changes in respiration. Similar results were obtained following centripetal stimulation of the crural or median nerve. The response of an animal to sensory nerve or afferent phrenic stimulation is always identical. The results are interpreted as effects of painful stimuli. A. S.

Upper respiratory tract and proprioceptive respiratory reflexes. C. Petitpierre (*Helv. Physiol. Pharm. Acta*, 1943, 1, 167—176).— Variations of pressure in the upper respiratory tract of cats (-40 to +160 mm.  $H_2O$ ) produce reflex changes in respiration which originate in the larynx; these pressure variations were beyond physiological range. Electrical stimulation of the recurrent laryngeal and of the peripheral end of the superior laryngeal nerve produced no effect on respiration; respiratory changes were observed following stimulation of the central end of the superior laryngeal nerve. A. S.

Hyperplasia of pulmonary alveolar epithelium in disease. E. T. Bell (Amer. J. Path., 1943, 19, 901-907).—A case of extensive diffuse epithelisation of the alveoli of the human lungs is described. (6 photomicrographs.) C. J. C. B.

Pulmonary alveolar lining under various pathologic conditions in man and animals. E. F. Greever, K. T. Neubuerger, and C. L. Davis (Amer. J. Path., 1943, 19, 913—927).—The lining of the pulmonary alveoli was studied in man and animals. There was no evidence of continuous "alveolar epithelium" in normal adult lungs; scattered septal cells were occasionally seen. Epitheliumlike lining cells were found in various spontaneous pathological conditions. (16 photomicrographs.) C. J. C. B.

Histology of isolated perfused lung. O. A. Trowell (Quart. J. Exp. Physiol., 1943, 82, 203-212).—The lungs (dogs) were perfused with heparinised blood under negative pressure ventilation for  $3\frac{1}{2}$ —7 hr. The main histological findings were : alveolar exudate, distension of periarterial lymphatics, and ædema of arterial walls; periarterial and peribronchial hæmorrhage; collections of polymorphs in the small pulmonary blood vessels; dilatation of bronchi and bronchioles; vascular congestion of bronchial walls (except when the outflow drained from the open pulmonary veins). The alveolar walls, bronchial epithelium, and vascular endothelium were normal; there was no pulmonary vascular congestion. Edema and periarterial and peribronchial hæmorrhage can be produced by many procedures damaging the lungs (e.g., irritant gases, rapid decompression to  $\frac{1}{6}$  atm.). The changes are attributed to increased capillary permeability and also lymphatic obstruction. The pulmonary changes described in the heart-lung prep. were not found in the isolated perfused lung. The normal control lungs of dogs showed more connective tissue in the bronchial walls than those of rats, mice, guinea-pigs, rabbits, monkey, or man. The bronchial glands

have large lumina with flattened secreting cells; the bronchial epithelium often contains large fat droplets. The alveolar ducts are prominent owing to their greater length and well-developed muscular wall. Alveolar macrophages contain much C; there were foci with lipin-filled enlarged macrophages (" foam cells "), free in the alveoli or in the alveolar wall. Paraffin sections show an artifact shrinkage space around the arteries which was not present in celloidin sections. A. S.

Survey of methods of artificial respiration. B. D. Ross (J. Amer. Med. Assoc., 1943, 122, 660-663).—A survey of various methods used in 933 cases. C. A. K.

Human response to flying stress. I. Neurosis in flying personnel. II. Foundations of confidence. C. P. Symonds (*Brit. Med. J.*, 1943, II, 703-706, 740-744).—Lectures on the psychological effects of flying and of danger in combatant personnel. I. C

Pulmonary insufficiency; its various types. P. H. Rossier and H. Méan (Schweiz. med. Wschr., 1943, 73, 327-332).--A lecture, based on studies of gaseous exchanges in various clinical types of respiratory insufficiency. A. S.

**Carbon dioxide by inhalation as an expectorant.** A. L. Banyai and A. V. Cadden (*Amer. J. med. Sci.*, 1943, **206**, 479–486).—When a mixture of 10% CO<sub>2</sub> and 90% O<sub>2</sub> is administered by the closed method, through a B.L.B. mask, or by the open method, through a glass tube, it is tolerated by the patients well and is a most efficient expectorant. The relief obtained by the inhalations is marked; spells of strenuous, exhausting coughing are prevented and thereby rest is secured for the patients and the lungs; an unproductive cough is transformed into a useful one and directly after inhalation the amount of expectorated sputum is increased and its character changes from a heavy, thick, and tenacious type into a thinner, serous, and more watery kind; the use of expectorant drugs and narcotics can be reduced. C. J. C. B.

Diagnosis of lipoid pneumonia by aspiration biopsy. L. Nathanson, D. Frenkel, and M. Jacobi (*Arch. int. Med.*, 1943, 72, 627– 634).—10 patients with a history of taking liquid paraffin for many years showed ræntgenograms suggestive of lipoid pneumonia. In 5 patients material aspirated from the lungs contained typical lipoid macrophages. The infiltration as a rule involved the lower lobes of both lungs, especially of the right. The mesial portion of the right lower lobe was the earliest site of involvement. The processes varied from patchy infiltration to dense consolidation with fibrosis, showing little change over long periods. A. S.

#### VIII.—MUSCLE.

Effect of atropine on atrophy and neuromuscular regeneration. B. Lazere, J. D. Thomson, and H. M. Hines (*Proc. Soc. Exp. Biol. Med.*, 1943, 53, 83-84).—Injections of 10—15 mg. of atropine sulphate per 100 g. into rats did not retard atrophy of denervated muscle or accelerate neuromuscular regeneration. It did not affect creatine concn. or  $O_2$  utilisation *in vitro* of denervated or control muscles but caused a loss of wt. in the latter (cf. Fischer, A., 1943, III, 307). V. J. W.

Muscular activity and choline-esterase. P. G. Croft and D. Richter (J. Physiol., 1943, 102, 165-169).—The choline-esterase of serum acts on certain simple aliphatic compounds; that of the red cells does not; both are inhibited by eserine. A separate aliesterase of red cells is not inhibited by eserine. Warburg estimations based on these facts show that the source of increased serum-choline-esterase following brief exercise is the red cells. Patients with effort syndrome gave the same results as normal persons. Adrenaline, ergotamine, histamine, overbreathing, underbreathing, and rebreathing were without effect on serum-choline-esterase. Local circulatory stasis increased it, but neither qualitatively nor quantitatively at the expense of the red cells. The increase paralleled the serum-protein concn. and is attributed to concn. of plasma. The increase of exercise was determined by a general, not a local, shift, but the shift could not be produced by incubation of corpuscles of oxalated blood with  $PO_4^{\prime\prime\prime}$ ,  $SO_4^{\prime\prime}$ , CI',  $CO_2$ , choline, lactate, ascorbate, glutathione, lecithin, or cholesterol or by sub-hæmolytic exposures to lysolecithin. W. H. N.

Thymectomy for myasthenia gravis. M. Nellen (Brit. Med. J., 1943, II, 778-779).—Case report, with recovery after thymectomy in two stages. No prostigmin was necessary 16 months after operation. I. C.

Effect of ergotamine tartrate and neosynephrin hydrochloride on work capacity of human muscle. G. C. Kotalik, G. L. Maison, and C. Pfeiffer (*Amer. J. med. Sci.*, 1943, 206, 503—506).—The work capacity of a group of trained subjects was not significantly altered. C. J. C. B.

Effect of low-potassium diet and deoxycorticosterone acetate on cation content of erythrocytes and muscle of rat.—See A., 1944, III, 130.

#### IX.—NERVOUS SYSTEM.

Rate of regeneration of peripheral nerves in man. H. J. Seddon, P. B. Medawar, and H. Smith (*J. Physiol.*, 1943, 102, 191-215).— The rate of regeneration was estimated by the rate of functional reactivation of muscles in the order of their known anatomical innervation, by Tinel's sign (in cases of suture only), by rate of returning sensibility, and by analysis of results of others. New measurements of distances between fixed bony points and the entry of motor nerves into muscles are given. The average rate of recovery of all nerves studied was  $1.5\pm0.2$  mm. per day after suture and  $1.4\pm0.1$  mm. per day after lesions not requiring suture. Although over moderate intervals the rate of recovery is a linear function of time, a few prolonged studies, together with analysis of all results, show that the rate of regeneration must diminish with time and that it may be at first as high as 3 mm. per day. This agrees with the high rates found in rabbits, where times and distances are comparable only with the stages in man which are earliest and most difficult to observe. Numerous variables and mathematical considerations influencing the interpretation of results are discussed at length. W. H. N.

Sodium and potassium balance in squid nerve axoplasm. H. B. Steinbach and S. Spiegelman (*J. Cell. Comp. Physiol.*, 1943, 22, 187-196).—Isolated axons (A., 1941, III, 341) immersed in seawater lose K and gain Na. The same result follows immersion in any low-K and high-Na solution, and in high-K and low-Na solutions they gain K and lose Na. V. J. W.

Chemical mediator of nervous effects. Action of acetylcholine and its enzyme in controlling nervous activity. B. Mendel (*Canad. Chem.*, 1943, 27, 608-612).—A review of the evidence for the existence of two separate choline-esterases : pseudo-choline-esterase which is only active with high concn. of substrate and acts on many non-choline esters, and true choline-esterase which acts at low substrate concn. and is sp. for choline esters. The latter is responsible for the destruction of acetylcholine in the body. Methods for distinguishing the two forms and assaying them are also reviewed. P. C. W.

Effect of glutamic acid on the formation of acetylcholine.—See A., 1944, III, 129.

Formation of chemical substances in peripheral nerves following artificial and natural stimulation. N. Scheinfinkel (*Helv. Physiol. Pharm. Acta*, 1943, 1, 149—166).—Electrical or reflex stimulation of frog's sciatic nerves, dipping into an eserinised suspension fluid, releases a substance with an acetylcholine-like negative inotropic effect on the frog's heart; this is prevented by ligature of the nerve. The effect is more marked on a hypodynamic heart or after ultraviolet irradiation of the suspension fluid; the effect on the heart is annulled by atropine. The rabbit's vagus, containing pulmonary afferents, releases an acetylcholine- and an adrenaline-like substance. Aneurin inactivates acetylcholine, even in the presence of eserine.

A. S.

Endoneurial ædema in constricted nerve. P. Weiss (Anal. Rec., 1943, 86, 491-522).—Rat and chicken nerves subjected to chronic Constriction exhibited persistent ædema in the endoneurial spaces proximal to the compressed zone. Evidence is presented to show that the ædema resulted from damming up of fluid normally present in the endoneurial space. The fluid is neither of vascular nor of irritative origin. It has a sp. significance in nerve regeneration inasmuch as it forms a growth medium for outgrowing sheath cells and nerve sprouts and it also has antifibrotic properties. W. F. H.

Responses to electrical stimulation of single sensory units of skin. -See A., 1944, III, 106.

Electrical skin resistance in peripheral nerve injuries. C. P. Richter and D. T. Katz (J. Amer. Med. Assoc., 1943, 122, 648).— By use of the electrical skin resistance test the area of sympathetic innervation of the ulnar nerve was mapped out in normal subjects after injection of procaine into the nerve at the elbow, and in patients with ulnar nerve injuries. The test is useful in assessing results of treatment. C. A. K.

Treatment of sciatica. A. Hurst (Brit. Med. J., 1943, II, 773-775).—A review. I. C.

Differential diagnosis of chronic sciatic pain. W. P. H. Jackson (Brit. Med. J., 1943, II, 776-778).—The causes of sciatica in young people can be grouped into three main classes: ruptured intervertebral disc, fibrositis, and neurosis. Three types of pain correspond to these actiological factors: neural pain, referred pain, and functional pain. I. C.

Hematoporphyrinuric neuritis. L. A. Golden (Amer. J. med. Sci., 1943, 206, 474-479).--A case report. C. J. C. B.

Tick paralysis. A. G. De Sanctis and P. A. di Sant'Agnese (J. Amer. Med. Assoc., 1943, 122, 86-88).—Ataxia and ascending flaccid paralysis occurred in a girl of 3 years who was bitten by a dog tick (Dermacentor variabilis). Removal of the tick from the head led to rapid recovery. C. A. K.

C 3 (A., III.)

Peripheral neuritis in pernicious anæmia. J. B. Dynes and S. W. Norcross (J. Amer. Med. Assoc., 1943, 122, 586—588).—21 of 92 cases of pernicious anæmia showed signs of peripheral neuritis + subacute combined degeneration of the cord, 22 patients had subacute combined degeneration only, and 49 patients had no neurological signs. Nervous complications usually responded to large doses of liver extract and vitamin-B. C. A. K.

Accommodation and autorhythmic mechanism in single sensory fibres. R. Granit and C. R. Skoglund (*J. Neurophysiol.*, 1943, **6**, 337—348).—The repetitive discharge in response to slowly rising linear stimuli was recorded in the cat with the aid of micro-electrodes from cutaneous and muscular afferents. Single fibres could be isolated by placing the micro-electrode on the dorsal roots. Stimulus form and nerve response are pictured simultaneously by a double cathode-ray oscillograph and it is possible to measure the sensory accommodation curves directly and correlate them with the properties of the iterative discharge. S. CR.

**Responses to electrical stimulation of single sensory units of skin.** G. H. Bishop (*J. Neurophysiol.*, 1943, **6**, 361–382).—Single sensory spots in the skin of man can be stimulated by high-voltage, lowcurrent spark discharges, without mechanical deformation of the skin. "High" spots of extreme sensitivity to electric stimulation are surrounded by areas of lower sensitivity; such an area appears as a unit in the sense that any stimulus within it is referred to the same locus. Prick has a much lower threshold than touch except on the balls of the fingers. Tactile endings associated with hair shafts can be differentiated from other tactile endings. Low-intensity, high-frequency stimulation of prick endings can cause itch without prick. Itch also followed as an after-effect of slowly repeated stimuli, each of which causes an initial sharp prick. The same sensory spot can give either touch, prick, itch, or sharp pain, all below threshold for ordinary touch endings. The action of sensory endings is discussed. S. CR.

New æsthesiometer. Comparison of threshold of touch and taste perception at Lauterbrunnen and Jungfrangoch. E. Grandjean and A. Fleisch (*Helv. Physiol. Pharm. Acta*, 1943, 1, C59-G0).—The threshold vals. for touch and taste perception at Jungfraujoch were lower than in the valley; that of touch was reduced to 60% of the Lauterbrunnen val. A. S.

Basis for repetitive activity in phrenic motoneurones. R. F. Pitts (J. Neurophysiol., 1943, 6, 439-454).—The repetitive discharge of phrenic neurones, in the cat, which characterises normal inspiratory activity may be explained in terms of a balance between the degree of excitation of those neurones, and their rates of recovery of excitability to the continued delivery of impulses from the inspiratory pathways. S. CR.

Morphological features of spinal cord in rabbit, with special refer-ence to production of artifacts. O. A. Trowell (Quart. J. Exp. Physiol., 1943, 32, 213-231).—The artifacts, which were not found in spinal cords similarly exposed of rats, guinea-pigs, cats, dogs, goats, or monkeys, occurred principally in the upper thoracic and upper lumbar regions. They were (1) large discrete swellings on the posterior surface of the cord with large underlying cavities, due to spontaneous herniation of cord substance through small accidental dural tears; the posterior part of the dura is tightly stretched and exerts a direct pressure on the cord, obliterating the subarachnoid space, the dural pressure being accentuated by the usual flexed position of the upper part of the vertebral column at post-mortem examinations; the cord substance is softer in the upper lumbar regions than elsewhere, perhaps due to quant. differences in the proportions of white matter, myelin, neuroglia, and pia mater at different levels; (2) multiple small cracks in the cord substance; their precise cause was not determined. 2 methods are described for histological fixation of the cord without opening the vertebral canal. The central canal varies at different levels in the rabbit's cord. A few small spherical cavities in the white matter of the rabbit's brain and spinal cord were frequently observed. A. S.

Hand and foot patterns of low electrical skin resistance : their anatomical and neurological significance. C. P. Richter, B. G. Woodruff, and B. E. Eaton (J. Neurophysiol., 1943, 6, 417—424).— The sharply defined areas of low electrical skin resistance that are normally found on the hands and feet were studied under such conditions as cold, heat, sleep, excitement. The areas contracted or expanded in regular patterns and it is suggested that they may represent cortical or subcortical patterns of the distribution of sympathetic nerves to the extremities. S. Cr.

Glycogen content of various parts of central nervous system of dogs and cats at various ages. A. Chesler and H. E. Himwich (Arch. Biochem., 1943, 2, 175—181; cf. Kerr, A., 1937, III, 19).— Analyses of the cortex (freed as far as possible from white matter), caudate nucleus, thalamus, corpora quadrigemina, medulla oblongata, and cord of cats and dogs at birth, 5—8 weeks old, and when full grown show that the glycogen contents of the cortex and caudate nucleus decrease progressively and those of the cerebellum, medulla oblongata, and cord increase with age. In cats, the proportions of

glycogen in the thalamus and quadrigemina decrease, whilst in dogs the proportion in the thalamus increases slightly and the proportion in the colliculi remains unchanged. The changes are correlated with others in the form and functions of the central nervous system. W. McC.

Analysis of potential sources in optic lobe of duck and goose. L. O'Leary and G. H. Bishop (J. Cell. Comp. Physiol., 1943, 22, 73-87) .- Stimulation by single shocks of the optic nerve causes a series of post-synaptic potentials in the opposite optic lobe which can be explored by a needle electrode. The curve relating p.d. to depth in tectum has a negative max. in the cellular layers and a positive max. centrally to them. This p.d. is assignable to the dendrites of cells post-synaptic to optic tract axons. The responses of these axons are masked by the larger potentials of the cellular layers. Neurones which are post-synaptic to the large rapidly-conducting optic tract fibres are superficial to those post-synaptic to slower fibres. A needle electrode placed between the two sets gives a response which appears conducted, but is in fact due to successive responses of the different layers. V. J. W.

Effects on electrencephalogram (e.e.g.) of chronic lesions of basal ganglia, thalamus, and hypothalamus of monkeys. M. A. Kennard (J. Neurophysiol., 1943, 6, 405-415).—In monkeys chronic lesions of the subcortical nuclei produce changes in the e.e.g. although lesions restricted to cortical fiscular cause no such change. Lesions of the basal ganglia might cause permanent alteration in the e.e.g., together with functional changes and epilepsy detectable by e.e.g. Lesions of with functional changes and epilepsy detectable by e.e.g. the thalamus cause slowing of rate and frequent high slow rounded waves; lesions of the hypothalamus cause slowing of rate and diminution of amplitude. The results are contrasted with those of sleep which causes increased amplitude and an intensified normal S. CR. pattern.

Nature of paresis following lateral cortico-spinal section in monkeys. B. W. Cannon, L. E. Beaton, and S. W. Ranson, jun. (J. Neuro-physiol., 1943, 6, 425-429).—Interruption of the lateral corticospinal tract in the spinal cord results in a paresis that is more prominent in the lower than in the upper extremity, and that is more pronounced in the distal than in the proximal muscle groups. There is no evidence of inhibitory fibres the interruption of which might cause spasticity in this tract. S CR

Stimulation and destruction of brachium conjunctivum. I. Experimental effects. S. Bürgi (*Helv. Physiol. Pharm. Acta*, 1943, 1, 359–380).—Stimulation of the isthmus region of the brachium conjunctivum in non-anæsthetised cats, using the technique of Hess, produced tonic contractions of the ipsilateral side of the body (hemi-kinesia); there was, occasionally, irradiation to the contralateral side. Electrocoagulation produced ipsilateral ataxia, swaying gait, and falling towards the side of the lesion. There was good recovery following the acute effects. Additional findings were pupillary dilatation, respiratory changes, and salivation in the course of the A. S. stimulation experiments.

**Hypothalamus and regulation of body temperature.** W. A. Stoll (*Helv. Physiol. Pharm. Acta*, 1943, 1, 329–357).—The average rectal temp. of intact cats was 38.7° in the morning and 38.9° in the evening. On exposure to external temp. up to  $40^\circ$ , an increase in body temp. of  $0.5 - 1.0^\circ$  occurred within 20-30 min., whereas exposure to cold for several hr. lowered the temp. only by 0.5°. In 3 cases, stimulation of the mamillothalamic tract produced increases in body temp. Temp. regulation was completely destroyed after bilateral electrocoagulation of portions in the anterior and middle hypothalamus; polkilothermia was preceded in 2 cases by marked hyperthermia. A certain measure of restitution of temp. regulation, though always incomplete, was observed in some animals. A. S.

Blood-sugar changes following focal destruction of hypothalamic regions. W. Bloch (*Helv. Physiol. Pharm. Acta*, 1943, 1, 177-181).—The range of fluctuation of blood-sugar vals. in cats after coagulation of median hypothalamic areas (between columna fornicis descendens and mammillothalamic tract) was wider than in normals. There was no correlation between destruction of certain hypothalamic regions and blood-sugar regulation. A. S.

Hypothalamic bulimia. M. Brügger (Helv. Physiol. Pharm. Acta, 1943, 1, 183-198).—Electrical stimulation, using Hess' technique, of the substantia grisea of the 3rd ventricle, on both sides in close vicinity to Vicq d'Azyr's bundle, produces marked bulimia in cats. In only 2 cases was bulimia produced by stimulation of the septum pellucidum, superior to the anterior commissure. There were some-times additional signs of "affective defence reaction." A. S.

Acetylcholine level of rat cerebral cortex under conditions of anoxia and hypoglycæmia. J. H. Welsh (J. Neurophysiol., 1943, 6, 329—336).—Methods of extraction and assay of free and total acetylcholine in the rat's cerebral cortex are compared. Low atm. pressure for 1-2 hr. decreases the level of free or total acetylcholine; this can be prevented by a previous administration of pro-stigmine. A greater decrease in level is caused by insulin hypo-glycamia. These decreases may account for the decrease in cortical excitability in anoxia and hypoglycæmia. S. CR.

Relation of area 13 on orbital surface of frontal lobes to hyper-activity and hyperphagia in monkeys. T. S. Ruch and H. A. Shenkin (*J. Neurophysiol.*, 1943, 6, 349-360).—Bilateral ablation of area 13 of the orbital surface of the frontal lobe produced marked hyperactivity of immediate onset. It is manifest by long-continued methodical pacing or running of a regular stereotyped character. Other motor activities suffer reduction; there is a wt. loss and only a slight increase in food intake. S. CR.

Action of high concentrations of carbon dioxide in [strychnine] convulsions. H. Moussatche (Anais Assoc. Quim. Brasil, 1943, 2, 80-83).—Convulsions induced by the action of strychine on the motor cortex are depressed by breathing air containing 18% of CO2; in some cases the convulsions became more evident after cessation F. R. G. of the inhalation.

Electroencephalographic response to overventilation and its relation to age. F. A. Gibbs, E. L. Gibbs, and W. G. Lennox (*J. Pediat.*, 1943, 23, 497-505).—The electroencephalograms of 2281 normals 1943, 23, 497-500).—The electrochcephalograms of 2201 homas and of 1107 epileptic patient were studied with reference to the increase in amplitude and the decrease in frequency of brain waves which occurs with 100 deep breaths. In both groups the incidence of a big response falls abruptly with increasing age until the 35th year, after which the decline is negligible. The incidence of big responses in patients with epilepsy is greater than in the normal group in all ages but this difference is greatest during adolescence. C. J. C. B.

Isolation of phenyl-lactic and phenylpyruvic acids from urine in phenylpyruvic imbecility. E. A. Zeller (*Helv. Physiol. Pharm. Acta*, 1943, 1, C85-86).—Phenylpyruvic acid and its hydrazone and phenyl-lactic acid were found in the urine of 2 patients suffering from phenylpyruvic imbecility. A. S.

Anxiety states in the Navy. G. V. Stephenson and K. Cameron (Brit. Med. J., 1943, II, 603-607).--A review. I. C.

Psychiatric examination in subdural hæmatoma. W. D. Abbott, F. O. Due, and W. A. Nosik (J. Amer. Med. Assoc., 1943, 121 739-741).—Careful psychiatric examination, especially the Shipley. 1943, 121. Hartford Retreat test, showed intellectual impairment in 9 of 10 cases of subdural hæmatoma due to blast, despite a negative neuro-C. A. K. logical examination.

Cerebral injuries by mechanical violence. S. A. Levinson (Amer. J. clin. Path., 1943, 13, 402-421).—A review of 1437 cases.

symptoms were more impressive than clouded consciousness and intellectual loss. The incidence of headache did not differ from that in adults. § of the cases were fit for discharge after 2 weeks' treat-ment in hospital. The post-concussional syndrome was observed in 10% of the cases; its incidence depended to a large extent on environmental factors. Irritability was the most common aftereffect. Persistent behaviour disorders were rare. C. J. C. B.

Action of salts on abdominal ganglia of crayfish. C. L. Prosser (J. Cell. Comp. Physiol., 1943, 22, 131-145).--E.m.f. changes in the ventral nerve cord show that increased K first stimulates and then depresses ganglionic activity. The depressant action is antagon-ised by Ca, but the excitant action is not. Decreased K or increased Ca stimulates when applied shortly after isolation, but after 30 min. it depresses In the series Co K Bb, NH, Li Na, the ions to the it depresses. In the series Cs, K, Rb, NH4, Li, Na, the ions to the left act like high K and those to the right like low K. Mg and Sr resemble Ca. Cl', Br', and NO<sub>3</sub>' have no effect. Acetate and I' are weak stimulants. Tartrate, SO<sub>4</sub>", citrate, and CNS' are strong stimulants. V. J. W.

Choline-esterase at nerve terminations in sphincter pupillæ of turtle. P. B. Armstrong (*J. Cell. Comp. Physiol.*, 1943, 22, 1-19).--The reactions of this muscle to acetylcholine are the same as those of complete and the three terms and the same as those of ganglion cells. Threshold conen. for contraction is 1 p.p.m. and max. response is given to 0.1%, which ultimately causes paralysis. Contraction was reduced but not completely abolished by 0.1% atropine. Curare abolishes indirect excitability but the muscle can still be excited directly. The effects of acetylcholine or of indirect electrical stimulation are potentiated by eserine. These reactions contrast with those found in the salamander (A., 1943, III, 17). V. J. W. V.

Action potential and enzyme activity in electric organ of Electrophorus electricus. II. Phosphocreatine as energy source of action potential. D. Nachmansohn, R. T. Cox, C. W. Coates, and A. L. Machado (J. Neurophysiol., 1943, 6, 383–396; cf. A., 1943, III, 793).—Breakdown of phosphocreatine and formation of lactic acid as a result of the discharge were determined on the electric organ of E. electricus. The energy supplied by these two chemical processes was compared with the electrical energy released. The reactions appeared to be identical with those which are the source of energy S. CR. in muscle contraction.

Quantitative protein determination in cerebrospinal fluid. I. Abelin (Schweiz. med. Wschr., 1943, 73, 332-334).-Determinations

of the total protein and globulin content of c.s.f. by Kjeldahl's method and Kafka's sedimentation method show poor agreement (e.g., total protein Kjeldahl 79.75, Kafka 22.0 mg. per 100 c.c.). A. S.

#### X.—SENSE ORGANS.

Anthropology of eye. W. M. Krogman (*Ciba Symposia*, 1943, 5, 1607-1616).—A general account of the racial variations of the pigmentation and external features of the eye and its adnexa.

History of human eye. G. L. Walls (Ciba Symposia, 1943, 5, 1586-1606).—A general review of the evolution of the various types of vertebrate eye with special reference to the human eye. K. T.

Visual physiology of the cinema. G. H. Bell (Brit. Med. J., 1943, II, 669-671).—A review. I. C.

Eye examination of preparatory-school boys. A. E. Sloane and J. R. Gallagher (Amer. J. Ophthal., 1943, 26, 1076-1083).—The results of two routine annual surveys of over 700 preparatory-school boys are described, the history and a no. of simple tests being undertaken by two technicians and a more detailed investigation by the ophthalmologist, who then referred some cases for further examination. The results are tabulated, and the necessity of allowing the ophthalmologist to select the referred cases and to assess such symptoms as headaches, red eyes, and blurred vision is emphasised. I. H. A.

Indications and contraindications of chemotherapy in ophthal-mology. A. Brückner (Schweiz. med. Wschr., 1943, 73, 644-647). Local administration of sulphonamides is indicated in certain inflammatory conditions of the conjunctiva and marginal ulcers of the cornea. Oral chemotherapy was successful in gonoblennorrhœa of newborn infants and adults, trachoma, ulcers, perforating injuries, and cellulitis in the vicinity of the orbit. A. S.

Sodium sulphathiazole deoxyephedrine in epidemic keratoconjunctivitis. H. S. Gradle and G. H. Harrison (J. Amer. Med. Assoc., 1943, 122, 743).-Na sulphathiazole deoxyephedrine was effective in cases of epidemic keratoconjunctivitis, reducing the acute phase to 3-7 days. phase to 3-7 days. A. K.

Some new choline esters with cycloplegic and mydriatic action. K. C. Swan and N. G. White (*Proc. Soc. Exp. Biol. Med.*, 1943, 53, 164-166).—Replacement of NH<sub>2</sub> of carbamylcholine by waterinsol. amines gave products with surface-active mols. which paralysed the sphincter indis of the rabbit, as well as the ciliary muscle in man. A no. of such compounds were synthesised, the most valuable being di-n-butylcarbamylcholine, which has an activity equal to that of homatropine with a shorter duration. V. J. W.

Bilateral congenital coloboma of upper lids : case report. W. B. Potter (Amer. J. Ophthal., 1943, 26, 1087-1089).—The case of a Mexican boy of 4 years each of whose upper lids presented a coloboma involving about half its width is reported; both corneæ showed nebulæ, that in the right eye being denser and associated with pannus. Apart from moderate myopia the eyes were otherwise normal. A good cosmetic result was obtained by operation. The embryology of the condition is discussed. J. H. A.

Muscle balance and its importance in selection of air crew: T. B. Travers (Med. J. Austral., 1943, 30, 123).—It is important for pilots to have good muscle balance. The cerebral process of fusion brings about final perfection of eye movements which are the cause of false judgments if hindered. Fusion can be improved by "orthoptic training." Airmen with defective colour vision are unsuitable for flying duties. P. G.

Evaluation of binocular muscle balance. D. D. S. Stewart (Brit. J. Ophthal., 1943, 27, 477-483).—A method is described for estim-D. D. S. Stewart (Brit. ating the dynamic ocular equilibrium for distance, involving the use of a pair of 7D prisms bases out in a hand spectacle frame, a spring mount with a thin handle designed to take a single trial lens, and a specially constructed distance fixation target. The amount of uncorrected " deviation from orthophoria compatible with "euphoropsia" varies from patient to patient, and should be treated if causing symptoms. J. H. A.

Convergence tests. J. I. Pascal (Amer. J. Ophthal., 1943, 26, 967-969).—In estimating convergence in the U.S. Forces, the official method is to determine the angle of convergence from a formula which involves measuring the near-point and the interpupillary distance. A simpler method would be to disregard both the interpupillary distance and the angle of convergence, and to standard-ise the convergence power by measuring the near-point of convergence only. J. H. A.

Eye as an image-forming mechanism. K. N. Ogle (J. Opt. Soc. Amer., 1043, 33, 506-512) .- Measurements of differences in image size of two eyes are used to indicate the origin of anisometropias. About 30% of cases are thought to be due to axial errors of eyeball-length, 30% errors in the refractive system, and 40% mixed. K. J. W. C.

Dioptic apparatus of lateral ocelli. V. G. Dethier (J. Cell. Comp. Physiol., 1943, 22, 115-126).—The results of optical analysis of the crystal lenses from the ocelli of *Isia isabella* A. & S. are given and the potential visual capacity of the ocellus as a unit is described. Analyses of cryst. lenses have shown that the focal length is 0.028 mm. while that of the ocellus as a whole is 0.020 mm. The dioptric apparatus forms minute real inverted images which are focussed on to the retinal elements. The prime function of the ocellus is to con-centrate the light. In insects possessing simple eyes vision is the sum total of the capacities of all ocelli operating jointly. P. G.

Epithelial regeneration in living eye. I. Mann (Brit. J. Ophthal., 1944, 28, 26–40).—Sliding or migration of healing epithelium has been shown in rabbit eyes. The slide can be produced by simple trauma or chemical injury, its shape being determined by the shape and position of epithelial loss on conjunctiva or cornea. The rate and shape of slide are not influenced by the nature of the injury. The sliding of a pigmented limbus after trauma can be distinguished from pigment proliferation after chemical stimuli and from pigment migration without epithelial loss in vitamin-A deficiency. P. G.

Corneal-vascularisation problems. D. Vail and K. W. Ascher (Amer. J. Ophthal., 1943, 26, 1025-1045).—Concentric collaterals are engorged segments of the pre-existing limbal network, lying not in the cornea but in the conjunctivo-scleral wedge which overlaps the corneal periphery. They are best seen by retro-illumination, and occurred in 13.3% of a series of persons with manifest or sub-clinical avitaminosis, and in nearly half a series of 69 eye outpatients selected at random in another clinic. All the first group showed signs of chronic conjunctivitis, and any kind of long-standing conjunctival engorgement may induce the formation of concentric collaterals, which are therefore not characteristic of any particular type of vitamin deficiency. J. H. A.

Experimental corneal ulcers. J. M. Robson (Brit. J. Ophthal., 1944, 28, 15-25) .- Many types of organisms may produce corneal ulcers in man. Pyocyaneous ulcers are uncommon, but are very severe when they occur. Such lesions may be treated with sulphapyridine or sulphonamide. Pneumococcal ulcers are the most important in human eyes. Local application of penicillin is the best treatment, although Na sulphacetamide is also successful. Staphylococcus aureus is uncommon in human corneal ulcers but common in the rabbit. Treatment with local application of penicillin produced very striking results; Na sulphacetamide was also helpful. Hæmolytic streptococcus is uncommon in human corneal tissue and treat-ment with penicillin is successful. Tuberculous lesions may be found (a) with bovine strain producing ulcers, (b) with human type producing more benign lesions.

Return of vision in transplanted adult salamander eyes after several days of refrigeration. L. S. Stone (*Proc. Soc. Exp. Biol. Med.*, 1943, 54, 44-45).-59 enucleated adult *Triturus viridescens* eyes were kept at 0-8° in sterile Ringer's solution for periods varying from 2 to 14 days and then transplanted into freshly denuded orbits. The best temp. for preserving the cells of the eye alive over long periods was between 4° and 6°. Eyes kept at this temp. for 3 days and then transplanted recovered vision at the end of 3 months. P. G.

Factors controlling lens regeneration from dorsal iris in adult Triturus viridescens eye. L. S. Stone (Proc. Soc. Exp. Biol. Med., 1943, 54, 102-103).—If a piece of the dorsal iris from a normal or lentectomised eye is transplanted into a freshly lentectomised host eye, a new lens will develop from the graft. Grafts placed in an eye possessing a normal lens show no regeneration. The presence of a regenerating lens from an iris up to 25 days after lentectomy does not inhibit or prevent the regeneration of a lens from dorsal iris tissue in the neighbourhood. P. G.

Anoxia cataract. J. G. Bellows and D. Nelson (Proc. Soc. Exp. Biol. Med., 1943, 54, 126-127).—Anoxia produces lens opacities in rats independently of air pressure. The lactic acid content of the aqueous humour in eyes of decompressed animals was 3-4 times as high as in animals under normal pressure. Decompression also caused hyperæmia of the iris and some opacity of the lens. P. G.

Aniseikonia. A. M. Hicks (Arch. Ophthal., 1943, 30, 298-311).-200 consecutive patients whose symptoms of "eye-strain" had not been relieved by correction of refractive errors or muscle imbalance were examined with the eikonometer; it was found that 86 of these had 1% or more of image size-difference, of whom 39 (or about 1 in 5) reported lessening or complete relief of symptoms while wearing iseikonic lenses. Of 16 patients who tried temporary cor-rection for aniseikonia without relief of symptoms, only 4 had 1.5% or more of size-difference. Such an amount of size-difference is infrequent in the average run of patients, and its correction if present is likely to relieve symptoms in a fair percentage of cases. J. H. A.

Reply to criticisms of aniseikonia. W. B. Lancaster (Amer. J. Ophthal., 1943, 26, 943-960).—Criticisms of the use of the author's eikonometer are answered. Experiments show that fusion of the central binocular target by the peripheral retina can be maintained when the patient is actually fixing the surrounding arrows, and that

the readings so obtained are really measurements of aniseikonia and not of heterophoria or anisophoria. The problem of image sizedifference produced by asymmetric convergence is discussed, and six detailed case reports which demonstrate that cure of symptoms obtained by correction of aniseikonia is not simply due to suggestion are given. J. H. A.

Visual phenomenon related to binocular triplopia. H. M. Burian (Amer. J. Ophthal., 1943, 26, 1084—1086).—Binocular triplopia (uniocular diplopia) occurs in some convalescents from operation for concomitant quint in whom there has been abnormal retinal correspondence. A case of divergent strabismus with myopia is described in whom when the eyes were associated the retinal correspondence was normal, but when they were dissociated with the Maddox rod a latent "false macula" gave the mental impression that the red light was on the side of the white light opposite to that at which it was actually seen by the true macula. J. H. A.

**Pigmentary degeneration of retina and nerve type of deafness.** W. A. Sirles and H. Slaughter (*Amer. J. Ophthal.*, 1943, 26, 961— 966).—12 cases of retinitis pigmentosa are described of which 6 showed varying degrees of nerve-deafness on audiometric examination. It is suggested that a common germ-plasm defect is present in the neuroepithelial part of the retina and the neuroepithelial elements of the inner ear, viz., the organ of Corti and maculas of the utricle and saccule. J. H. A.

Senile and other pigmentary changes in retinal ganglion cells. A. Loewenstein and I. S. McGregor (*Brit. J. Ophthal.*, 1943, 27, 486—495).—Examination of the retina in bulk, either unstained or stained with scarlet-red, showed that the cytoplasm of the glial and ganglion cells of the retinal periphery contains fatty droplets in diabetic and hypertensive retinopathy, glaucoma, iridocyclitis, and old age. In those conditions, also, the cytoplasm of the large ganglion cells stained diffusely brownish-yellow with scarlet-red, but there was no quant. relationship between this staining and the fatty droplet content. Senile retina, unstained and cleared in glycerin, reveals in the cytoplasm of the ganglion cells a sulphuryellow pigment analogous to that found in senile and diseased brain, probably a lipin precursor. J. H. A.

Histopathological changes in retina and late changes in visual field in acute methyl alcohol poisoning. I. S. McGregor (Brit. J. Ophthal., 1943, 27, 523-543).—Histological examination of the eyes of four cases of acute methyl alcohol poisoning, using both hæmalumeosin and examination in bulk after staining with scarlet-red showed no changes in the retinal ganglion cells which could be specifically attributed to the poison, since the fatty changes present have also been observed in other conditions. The optic nerve was normal when stained by the usual methods. Four cases, which had been blind in the acute stage, were examined a year later and found to show, in varying combinations, normal vision or abs. or relative central scotomata. These findings suggest that the poison acts on the central fibres of the nerve, and this view is supported by a study of the literature. J. H. A.

Retinal burns from solar eclipse. A. D'Ombrain (Med. J. Austral., 1943, 30, 179).—Report of two cases. P. G.

Eclipse blindness. (A) J. W. Barrett, (B) E. V. Pockley (*Med. J. Austral.*, 1943, 30, II, 287, 327).—(A) Reply to previous case reports of eclipse blindness. Duration of exposure necessary to cause the damage is not yet known. Probably it is very short, and there is no recovery.

(a) Reply to previous letters, with an additional case report. The only preventive measure is heavily smoked glasses. P. G.

Case of congenital high myopia with fundus changes. H. Elwyn and W. S. Knighton (*Amer. J. Ophthal.*, 1943, 26, 969).—Case report of a female child of 8 months, who had about -22D. of myopia in each eye, with advanced choroidoretinal changes and a posterior staphyloma. There was no family history of the condition.

Intensity-e.m.f. relationships of electroretinogram of beetles possessing a visual diurnal rhythm. V. J. Wulff and T. L. Jahn (J. *Cell. Comp. Physiol.*, 1943, 22, 89-94).—These curves are very complex and cannot be described briefly. They indicate that there is no direct correlation between e.m.f. and concn. of photoproducts. Differences between the dark- and light-adapted eye become less with decreased illumination, and, at 10 times the threshold, may be absent. V. J. W.

Theory and measurement of visual measurements. IX. Flicker relations within fovea. W. J. Crozier and E. Wolf (J. Gen. Physiol., 1943, 27, 119–138).—Flicker response contours (frequency against log intensity) for a square image subtending  $0.602^{\circ}$  on the fovea are single probability integrals for white and for five different spectral regions and with different light-time fractions in each cycle.

K. J. W. C. Factors in human visual resolution. G. L. Walls (J. Opt. Soc. Amer., 1943, 33, 487—505).—A summary of work on visual acuity for single and double lines and dots, vernier and stereo-acuity, with a good bibliography. K. J. W. C. Single judgment test for red-green discrimination. Le G. H. Hardy (J. Opt. Soc. Amer., 1943, 33, 512-514).—A series of enamelled metal chips is used, of varying tints, under standard artificial daylight; the subject moves a pointer to the chip which seems to him redder in a pair. K. J. W. C.

**Evolution of colour vision.** G. L. Walls (J. Appl. Physics, 1943, 14, 161-165).-Colour vision in different groups of animals is regarded as an adjunct to high visual acuity and only as such possesses survival val. E. N. W.

Human senses, especially sight and colour vision. J. H. Shaxby (Mem. Manchester Phil. Soc., 1943, 85, 83–95).—It is suggested that colour sensation evoked by light of a particular  $\lambda$  depends on the no. of electrons which are concerned in building up the invariable energy of a nerve action current packet. Intensity is judged by impulse frequency. No triplicity is required.

E. N. W. Bilateral metastatic carcinoma of choroid. A. J. Bedell (Arch. Ophthal., 1943, 30, 25-37).—Report of a case of mammary carcinoma removed surgically in 1934. Metastatic deposits in both eyes were observed from August, 1938, till death in November, 1939. The diagnosis of metastatic mammary carcinoma was confirmed histologically. The literature of ocular metastases is reviewed. A. GL.

Rupture of aneurysm of circle of Willis. J. N. Grear, jun. (Arch. Ophthal., 1943, 30, 312—319).—A case is reported of bilateral papillædema and subhyaloid hæmorrhage in the right eye, in which the diagnosis of ruptured intra-cranial aneurysm was confirmed post-mortem. Blood was demostrated in the sheath of the optic nerve and anterior to the retina, but there was no evidence of any continuity between the two; the intraocular hæmorrhage was apparently derived from the central retinal vein, which was much dilated in the eye but collapsed where it lay in the nerve-sheath.

Use of sulphanilamides in oto-rhino-laryngology. E. Lüscher (Schweiz. med. Wschr., 1943, 73, 619-623).—A lecture. A. S.

Cholesteatoma of external auditory meatus. F. Altmann and J.G. Waltner (*Arch. Otolaryngol.*, 1943, **38**, 236—240).—Report of a case of cholesteatoma following superficial bone sequestration after periostitis (scarlet fever). Cholesteatoma is the result of ingrowth of the squamous epithelium of the external canal into the cavity due to bone necrosis and the subsequent formation of a keratinising cyst. A. GL.

Occupational conditions of ear and nose in airmen. N. E. H. Box (Med. J. Austral., 1943, 30, 126–127).—Airmen in flight are exposed to great variations in atm. pressures. The Eustachian tube opens every few hundred feet during ascent, allowing equalisation to occur between intertympanic and atm. pressures. Muscular action is unable to open the tube if atm. pressure exceeds 80-90 mm. Hg above the intratympanic pressure. In catarrhal and flying types of "vacuum" headache the frontal sinus is most often affected. The symptoms of otitis baratrauma are pain and deafness. If airmen return to flying before an attack of acute otitis baratrauma has subsided they are likely to develop chronic forms, in which every flight brings pain and progressive irritation in the ear. Occupational deafness is due to inner ear lesions caused by long exposure to intense noise, and earplugs or headphones are sufficient protection.

Device for detecting simulated unilateral deafness. L. K. Pitman (J. Amer. Med. Assoc., 1943, 121, 752-753).—Description of apparatus and technique. C. A. K.

Effect of rotation stimulation of vestibular apparatus on facial expression and ears in rabbits. R. Sanchez-Calvo and M. Monnier (*Helv. Physiol. Pharm. Acta*, 1943, 1, 381—387).—The rotation was carried out at a rate of 12 times in 8 sec. In the post-rotatory phase, movements of the animal's whiskers, eyebrows, and cars occurred in the same direction as the slow component of the ocular nystagmus. The vestibular stimulation produces an irradiation into the motor nucleus of the facial nerve. A. S.

#### XI.-DUCTLESS GLANDS, EXCLUDING GONADS.

Relation of endocrine glands to body weight in growing and mature New Zealand white rabbits. H. H. Kibler, A. J. Bergman, and C. W. Turner (*Endocrinology*, 1943, 33, 250-256).—Statistical analyses of the relation between body wt. and wt. of thyroid, adrenals, and gonads in immature and mature rabbits are given. For animals under 2500 g. the ratio of thyroid and adrenal wt. to body wt. decreases as body wt. increases. For heavier animals the ratio of gonad wt. or adrenal wt. to body wt. increases with body wt. increase. P. C. W.

Low-fat diet and thyroxine in acne conglobata and perianal pyoderma. R. L. Sutton and M. M. Marks (J. Amer. Med. Assoc., 1943, 121, 1344—1347).—A patient with over 10 years' history of acne conglobata and perianal pyoderma was completely relieved after 50 days on a low-fat diet + thyroid extract. C. A. K. Thiourea and thiouracil in hyperthyroidism. E. B. Astwood (J.Amer. Med. Assoc., 1943, 122, 78—81).—Thiourea (2 g. daily) or thiouracil (0-4—1-0 g. daily) was given to 3 patients with hyperthyroidism, 1 of carcinoma of the thyroid, and 4 non-thyroid cases for 5—30 days. There were no toxic signs but, as shown later on, the period of 5—10 days in the hyperthyroid cases was too short for therapeutic benefit. 3 further cases of hyperthyroidism were treated for up to 2 months with 1—2 g. of thiourea or 0-2—1 g. of thiouracil daily. Symptomatic improvement occurred during the 2nd week of treatment, the basal metabolic rate fell to normal, and the blood-cholesterol rose, and this improvement was maintained for 2 months in 2 cases. Temporary cessation of therapy led to a relapse. There was no thyroid enlargement. One patient had a maculopapular rash and signs of myxcedema with thiouracil, and another developed non-fatal agranulocytosis with thiouracil. C. A. K.

Production of experimental goitre in Rana pipiens tadpoles by cabbage feeding and methyl cyanide. J. R. Borland (J. Exp. Zool., 1943, 94, 115—144).—Cabbage-fed tadpoles undergo metamorphosis before spinach-fed controls; the process is further hastened by the addition of methyl cyanide (acetonitrile) to the diet. Methyl cyanide produces great acceleration of metamorphosis in spinachfed controls. While cabbage feeding causes some degree of hyperactivity of the thyroid gland, methyl cyanide gives rise to changes resembling those seen in the gland in exophthalmic goitre. These effects are prevented by the administration of I. H. L. H. G.

Experimental goitre. IV. Effect of di-iodotyrosine and thyroxine on goitrogenic action of *Brassica* seeds. H. D. Purves. V. Pituitary function in relation to goitrogenesis and thyroidectomy. W. E. Greisbach and H. D. Purves (*Brit. J. exp. Path.*, 1943, 24, 171-173, 174-184).-IV. *dl*-Thyroxine in daily doses of  $3 \cdot 0 \mu g$ . per 100 g. abolished thyroid hyperplasia, induced by feeding rats on rape-seed diet. I and di-iodotyrosine were equally effective on the basis of I content in moderating the rape-seed diet effect but did not abolish its action even in large doses. The positive goitrogenic agents act by interfering with the synthesis of thyroxine by the thyroid cells. V. The thyrotropin concn. in serum of rats fed on *Brassica* seed

V. The thyrotropin concn. in serum of rats fed on *Brassica* seed diets is raised to the same level as that induced by thyroidectomy. The thyroid hyperplasia produced by such diets is entirely due to the increased secretion of thyrotropin by the pituitary. Thyroidectomy in rats maintained on a diet not containing meat meal causes a great reduction in the thyrotropin concn. of the pituitary and an almost complete disappearance of acidophil substance, whereas with the addition of meat meal there is only a moderate reduction of thyrotropin and acidophil substance. Goitrogenesis by the rape-seed diet is also accompanied by varying degrees of reduction of pituitary thyrotropin and acidophil substance. This supports the view that the effect of goitrogenic diet, like thyroidectomy, is secondary to impairment of thyroxine synthesis. (6 photomicrographs.)

Basal metabolism of albino rat fed on goitrogenic diet. V. I. E. Whitehead (*Brit. J. exp. Path.*, 1943, 24, 192—195).—The  $O_2$  consumption of albino rats fed on the goitrogenic principle of *Brassica* seeds lay within normal limits. The diet itself contained no factor inhibiting the action of injected thyroxine on the peripheral tissues of the thyroidectomised rat. It is concluded that the hyperplasia produced by these seeds is not accompanied by increased thyroxine secretion. F. S.

Interrelationship of pancreatic diabetes with endocrine glands in toad. C. Dosne (*Endocrinol.*, 1943, 33, 224—228).—A method of sub-total pancreatectomy in toads is described. Prolonged diabetes succeeded such an operation in the winter, but pancreatic regeneration was rapid in the summer. The animals may survive for 40 days. Simultaneous hypophysectomy prevents the appearance of diabetes; injection of anterior pituitary tissue produces hyperglycamia. Such injections do not produce hyperglycamia in intact toads, showing that the pancreas is strongly anti-diabetogenic. Adrenalectomy diminishes diabetic symptoms, which reappear when anterior pituitary tissue is injected. Thyroidectomy has no effect on pancreatic diabetes. P. C. W.

Addison's disease complicated by hyperthyroidism. G. A. Perera and D. D. Parker (J. Amer. Med. Assoc., 1943, 122, 669-671).--Case report. C. A. K.

Effect of vitamin-E-free diet on adrenal cortex. E. Tonutti (Z. Vitaminforsch., 1943, 13, 1--9).—When rats are maintained on a vitamin-E-free diet, changes occur in the adrenal cortex that resemble those produced after thyroidectomy or castration. Zones poor in fat are formed, in which the cells atrophy. In the inner part of the cortex, there is formation of fibrous connective tissue with a pronounced histochemical reaction for Fe. In the outer part of the cortex, there is atrophy of the glomerular zone with fibrous connective tissue between the reduced cells of the capsule. There is no difference between the reflect on either sex. The -E-free diet causes serious damage to germ cells and the thyroid gland; production or secretion of gonadotropic hormones by the anterior pituitary gland is also affected. J. N. A.

Cholesterol metabolism of adrenal cortex. I. Abelin (*Helv. Physiol Pharm. Acta*, 1943, 1, C81-83).—The cholesterol content of adrena cortex is diminished by 25% or more several hr. after feeding with sucrose, glucose, galactose, or malt extract; this is prevented by simultaneous administration of corticosterone. Injection of an anterior pituitary extract in rats fed with carbohydrates almost completely abolished the cholesterol content of the cortex. Thyroxine diminished (by 30-40%), administration of thymus and ether, CHCl<sub>3</sub>, or numal increased, the cortex-cholesterol Anæsthesia does not alter the cholesterol content of thymus. A. S.

Effect of removal of adrenal glands on animal metabolism. O. E. Helve (Biochem. Z., 1940, 306, 343-398).-134 rats (experimental group) were adrenalectomised. 20 others (control group) were not operated on. The experimental animals lost wt. and died in convulsions 4-18 days after operation. In what follows, the results from the experimental animals are compared with those for the normal group unless otherwise stated. The blood-sugar, muscle-glycogen, and muscle-lactic acid were variable, and in some individuals very low, but the acid-sol. P of blood was the same. The creatinephosphoric acid of muscle was somewhat lower, the inorg. P higher, and the pyrophosphate, hexose phosphate, diphosphoglyceric acid, and total acid-sol. P about the same. The phosphoglyceric acid, and total acid-sol. P about the same. The phosphorylating powers of muscle, liver, and intestinal mucosa were similar. Residual N in blood and muscle was greater, but the sol. protein of muscle showed no difference. Serum-Na was lower, -CI the same, -Ca and -Mg higher, and -K considerably higher. In muscle, the N content was lower, but there were no differences in mineral salt content. SO<sub>4</sub>" in serum and total S in muscle showed little differences. The water content was higher. The output of urine was increased, particularly in the last few days of life, but the Na. Ca, K, and inorg. P content of the urine showed no differences. When tap water (5% of the wt. of the animal) was given by stomach tube, the experimental animals eliminated more Na, Cl, K, and inorg. P than the controls, but the total output of urine was the same. With aq. NaCl in place of water, the urinary output of the experimental animals was markedly less than that of the controls, and the amounts of Na, Cl, K, and inorg. P excreted in the urine were 2-3 times lower. E. C. W.

Elimination of lactoflavin in normal and adrenalectomised animals under various conditions. L. Laszt and L. D. Torre (Z. Vitamin-forsch., 1943, 13, 77-101).--Normal rats excrete 24.6 and 55.6  $\mu g.$  of lactoflavin daily in the urine and faces, respectively, whilst the corresponding vals. for adrenalectomised rats are 42.67 and  $66\cdot 2 \ \mu g$ . After subcutaneous injection of  $350 \ \mu g$ . of lactoflavin into normal and adrenalectomised rats, most of the excess is excreted in the urine during the first  $3\cdot 5$  hr. After 24 hr., the normal rats have excreted  $44\cdot75\%$  and the adrenalectomised rats 78% of the injected lactoflavin. There is little difference between the fæcal excretions. After peroral administration of 350 µg. of lactoflavin, urinary excretion is much slower, but more extensive, in normal than in adrenal ectomised rats. After peroral administration of 125  $\mu$ g, of lactoflavin to normal rats, 64.2% is absorbed in 2–2.5 hr., whilst absorption is very much slower in adrenalectomised rats. Administration of cortin or pituitary extracts restores the rate of excretion of lactoflavin in adrenalectomised rats to the normal val. After subcutaneous injection of lactoflavin into normal and adrenalectomised rabbits, the amounts excreted during 24 hr. are 18.3-54 and 48-78.5%, respectively. After repeated injection into adrenal-ectomised rabbits, the amount of lactoflavin excreted decreases; this is not observed in rats. After subcutaneous injection of lactoflavin into normal rats the amount excreted increases with increase of external temp., whilst the converse holds for adrenalectomised J. N. A. rats.

Influence of adrenal cortical deficiency on histamine content of rat tissues. P. B. Marshall (*J. Physiol.*, 1943, 102, 180—190).— Histamine content of whole body, small intestine, cæcum, large intestine, liver, kidney, striated muscle, and skin of 259 adrenalectomised rats showed statistically a significant increase over sham-operated litter-mate controls; the content of whole gut and stomach was not increased. The increases in lung, heart, spleen, and blood were invalidated by the test of the method (added histamine) which was applied to all tissues. The results confirm the possibility that cortical secretion, either directly or through histaminase, destroys histamine. W. H. N.

Chronic adrenal deficiency and its effects on responses of isolated rabbit intestine. M. Vogt (J. Physiol., 1043, 102, 239-257).— Rabbit intestine is a convenient tissue for testing for possible generalised disturbances of carbohydrate metabolism and abnormal responses to drugs such as might accompany chronic adrenal deficiency. This condition was surgically induced in 50% of 61 rabbits (30% died immediately and 20% survived indefinitely); the spontaneous activity of the longitudinal muscle of the excised jejunum in glucose-free Tyrode's solution was almost normal, though the circular coat often showed abnormal spasmodic rhythmic contractions. Like normal gut these preps. utilised glucose and pyruvate, the former enabling the use of lactate and restoring both spontaneous contractility and lost responses to drugs to the longitudinal coat. The response of the longitudinal coat to drugs was normal, but the circular coat failed to react to some drugs acting on Auerbach's plexus (A., 1944, III, 193)—chiefly lactate and escrine, rarely hypertonic solutions or nicotine. Its reaction to KCl and muscarine (directly-acting) was normal. In adrenal deficiency, Auerbach's plexus gradually loses its excitability to drugs in the same order as in exposure to cold, and this is probably secondary to impaired circulation. W. H. N.

Effect of low-potassium diet and deoxycorticosterone acetate on cation content of erythrocytes and muscle of rat.—See A., 1943, III, 130.

Acute effect of water-soluble deoxycorticosterone glucoside in adrenal cortex insufficiency. R. Meier (*Helv. Physiol. Pharm. Acta*, 1943, 1, C63-64).—The severest symptoms of cortex insufficiency in adrenalectomised dogs are abolished by intravenous or subcutaneous injections of a water-sol. deoxycorticosterone glucoside prep. within 24-48 hr.; the first signs of improvements appear within 20-30 min. of the injection. A. S.

Effect of deoxycorticosterone and cortin on working capacity of adrenalectomised animals using Ingle's technique. I. Working capacity. II. Chemical investigations. W. Vögtli (*Helv. Physiol. Pharm. Acta*, 1943, 1, 393—405, 407—420).—I. The diminished working capacity of rats immediately following adrenalectomy is due to non-sp. surgical shock because sham operations had the same effect. Cortin or deoxycorticosterone restore the normal working capacity because they cure the condition of shock. Cortin is more quickly effective than deoxycorticosterone.

II. Freshly operated animals showed signs of hæmoconcn. as evidence of surgical shock which does not differ from the findings in sham-operated rats. Similar findings were made with regard to blood-sugar vals., liver-glycogen, blood-lactic acid, and plasma-K. During prolonged muscular work signs of adrenal cortex insufficiency superimpose themselves on the effects of surgical shock. Marked adrenal insufficiency develops in the course of several days. Cortin restores quickly, deoxycorticosterone more slowly but for longer duration, the blood chemistry to normal. A. S.

Effect of testosterone and allied compounds on mineral, nitrogen, and carbohydrate metabolism of a girl with Addison's disease. N. B. Talbot, A. M. Butler, and E. A. McLachlan (J. clin. Invest., 1943, 22, 583-593).—In an 8-year-old girl with moniliasis, Addison's disease, and idiopathic hypoparathyroidism, the administration of methyltestosterone or testosterone propionate, in addition to maintenance doses of deoxycorticosterone acetate and NaCl, resulted in a gain in body wt. decreased urinary excretion of N, K, and Na, and a marked fall in serum-K. No changes in fasting blood-sugar concns. were noted. Administration of anhydrohydroxyprogesterone or of methylandrostenediol decreased urinary N excretion but did not induce a prompt gain in body wt. Methyltestosterone therapy did not prevent the development of symptoms of acute adrenal cortical insufficiency when deoxycorticosterone acetate was withdrawn; testosterone propionate relieved the patient of all signs of acute adrenal insufficiency after discontinuation of deoxycorticosterone acetate. The marked lowering in serum-K while the patient was receiving testosterone was not associated with clinical evidences of muscular weakness or paralysis but the patient benefited, and gained in wt., height, strength, and endurance. C. J. C. B.

Effect of adrenaline and aminophyllin on blood pressure fluctuations in bronchial asthma.—See A., 1944, III, 134.

Chronic pulmonary osteoarthropathy; dyspituitarism as probable cause. B. M. Fried (*Arch. int. Med.*, 1943, 72, 565-580).—4 cases of chronic pulmonary osteoarthropathy in patients with bronchiogenic carcinoma are reported. There were marked acromegalic symptoms, in 1 patient also splanchnomegaly, marked clubbing of fingers and toes, pronounced eosinophilic hyperplasia of the anterior pituitary, tumour metastases or adenomata in the adrenal cortex, hirsutism in a female, and atrophy of the testes in a male patient. A. S.

Chromophobe adenomata of hypophysis. G. G. Lennon (J. Obstet. Gynxc., 1943, 50, 369—371).—6 symptomless chromophobe adenomata were found in 50 pituitaries post-mortem. P. C. W.

Irradiation of spleen and pituitary for control of puberal bleeding. I. I. Kaplan (J. Amer. Med. Assoc., 1943, 121, 1199–1201).—Case report, review, and discussion. C. A. K.

**Evaluation of growth hormone treatment.** A. A. Strauss and E. H. Waten (*J. Pediat.*, 1943, 23, 421-429).—Methods of demonstrating growth increments are discussed. C. J. C. B.

Fulminating meningococcic infection (Waterhouse-Friederichsen syndrome). P. A. Herbut and W. E. Manges (Arch. Path., 1943, 36, 413-422).—Report of 4 cases. (3 photomicrographs.)

C. J. C. B. Action of sodium chloride on pituitary. H. Selye and C. E. Hall (Anat. Rec., 1943, 86, 579-583).—The substitution of conc. NaCl solutions for drinking-water over a period of several weeks produces definite changes in the hypophysis of the albino rat. The organ becomes swollen and numerous mitotic figures appear in the posterior lobe tissue. Many of the cells in the middle lobe degenerate and this lobe decreases in size. Increases in the fluid content of the hypophyseal cleft and in the no. and size of anterior lobe basophils were less constantly found. W. F. H.

Effects of iodine and of thyrotropin on cervical sympathetic and vagal ganglia in guinea-pigs. S. Brock (West. J. Surg. Obstet. Gynec., 1941, 49, 447—448).—Injection of thyrotropin in ganglionectomised guinea-pigs does not produce the thyrotoxic symptoms seen in normal pigs. In normal guinea-pigs injected with thyrotropin the ganglia become hyperæmic and fibrosed with shrinkage of the ganglion cells; ganglionectomy is impossible as the animals die in crisis. I administration inhibits the above effects and when given alone causes enlargement of the ganglion cells. P. C. W.

Assay of thyrotropic activity by the cell height response in guineapigs. W. E. Griesbach and H. D. Purves (*Brit. J. exp. Path.*, 1943, 24, 185—192).—Thyroid acinar cell heights were measured by projection of histological sections on a screen at a magnification of 1000 and the use of a transparent scale. Treatment with thyroxine or I increased the cell height response to thyrotropin except with high doses of thyrotropin. Such treatment also diminished the thyroid wt. response to thyrotropin because of the colloid loss offsetting the effect of cell hypertrophy. F. S.

Inhibiting effect of adrenocorticotropic hormone on growth of male rats. H. M. Evans, M. E. Simpson, and C. H. Li (*Endocrinol.*, 1943, **33**, 237-238).—Increase in body wt. in normal and castrated male rats was inhibited by injection of pure sheep adrenocorticotropin. The inhibition did not occur in adrenalectomised rats. P. C. W.

Hormonal effects on growth in children. R. S. Finkler and G. M. Cohn (*Arch. Pediat.*, 1943, 60, 362—379).—125 children with growth retardation, hypothyroidism, hypogenetalism, and cryptochidism were treated. 14 of 24 children treated with thyroid extract and 5 of 21 children treated with anterior pituitary growth extracts showed some growth acceleration. 37 of 59 children treated with chorionic gonadotropin showed an increased rate of growth. Most of the children showed an improvement in genital development, muscular tone, and self-assurance. Testosterone propionate was administered to 21 children; 18 showed a growth acceleration above the normal expectation. No untoward effects were observed in any of the children treated. C. J. C. B.

Effect of pituitary growth hormone on glycosuria of fed partially depancreatised rats. W. Marx, E. Anderson, C. T. O. Fong, and H. M. Evans (*Proc. Soc. Exp. Biol. Med.*, 1943, 53, 38-39).-Purified growth hormone (A., 1943, III, 391) caused glycosuria in partly depancreatised rats which received 75 c.c. of 20% sucrose solution in 24 hr. as sole food and drink. It had no significant effect on normal rats on the same dict. V. J. W.

Modifications in methods for precipitation and assay of increased amounts of pituitary gonadotropic substances in urine. P. H. Smith, F. Albright, and E. Dodge (*J. Lab. clin. Med.*, 1943, 28, 1761– 1766).—In the method for the assay of increased amounts of pituitary gonadotropic substances in the urine the pptn. of those substances with alcohol is superior to pptn. with tannic acid. 8 vols. of alcohol is better than 4. As a test animal, the mouse is more sensitive than the rat, and as a test organ, the uterus is preferable to the ovary. C. J. C. B.

Cardiac action of posterior pituitary extract in physiological doses, in normal dog, and after partial and complete denervation of heart. M. E. Sawyer and G. H. Ettinger (*Canad. J. Res.*, 1943, 21. D. 311—323).—Unanæsthetised dogs were given intravenous infusions of posterior pituitary extract in physiological saline (10 pressor units per 500 ml.,  $2-2\frac{1}{2}$  units per hr.) for periods of 30—120 min. and the effects on the heart rate and blood pressure recorded. The procedure produces a max. slowing of the rate to 50% of normal with a rise of 10—30 mm. pressure. Max. inhibition is still produced after bilateral sympathectomy. Atropine abolishes the inhibition in both cases. Bilateral vagotomy decreases, bilateral sympathectomy and unilateral vagotomy do not affect, the max. inhibition. After total denervation of the heart pituitary extract produces no effect on the heart and the characteristic effects on the c.g. are abolished. P. C. W.

Influence of vitamin-D and parathyroid hormone on healing of bone fractures.—See A., 1944, III, 92.

#### XII.—REPRODUCTION.

Deposition of fat in shell of birds' eggs. I. J. Pritzker (Completend. Acad. Sci. U.R.S.S., 1941, **31**, 258-260).—The superficial layer of normal dried egg shells contains protein 9.7 and fat  $6\cdot53\%$ , compared with 2.65 and 11.9% respectively in those with a fatty layer. In the surface layers of fatty shells 70% of the normal protein content is displaced by fat, which constitutes more than

80% of the total org. material. Org. material constitutes 11.6% of fatty shells, as compared with 5.9% of normal dried shells. P. G. M.

Fertility in sheep. R. B. Kelley and H. E. B. Shaw (Counc. Sci. Ind. Res. Australia, 1944, Bull. 166, 28 pp.).—Estrous records were made of Australian Merino and other strains in areas ranging through 24° of latitude. In all cases there was an annual breeding season separated by a period of anœstrus. Breeding seasons were in late summer, autumn, or early winter without relation to the latitude. Reduction in fertility results if an arbitrarily selected period for mating does not agree with physiological œstrus; œstrous period should be determined for each flock by observation of a small sample. There are genetically controlled differences in the sexual behaviour of different strains; thus Merinos have long breeding seasons, Dorset Horns have an early onset of œstrus, and Border Leicesters have a short breeding season. Individual differences among the sheep of a single strain are probably hereditary and provide means for selective breeding of strains with early or late breeding seasons. P. C. W.

Benign lesions of cervix. F. B. Block (Amer. J. med. Sci., 1943, 206, 794-805).—A crit. review. C. J. C. B.

Decidual reactions in Fallopian tubes. I. L. Tilden and R. Winstedt (Amer. J. Path., 1943, 19, 1043—1051).—Decidual tissue was present in one or both tubes in 17 of 144 post-partum sterilisations. 67% of the patients showing a tubal decidual reaction were Hawaiians or part Hawaiians; this may be related to the high incidence of ectopic gestation in Hawaii. (7 photomicrographs.) C. J. C. B.

Prostigmine in delayed menstruation. H. Carapetyan (J. Amer. Med. Assoc., 1943, 122, 81-83).—Prostigmine was injected in 1-mg. doses daily for 1-3 days in women with delayed menstruation. In 18 pregnant women (Aschheim-Zondek test positive) there was no response, but in 21 non-pregnant cases (Aschheim-Zondek test negative) menstrual bleeding of normal type was induced within 7-72 hr. The action of prostigmine is attributed to hyperæmia of the uterus. The use of the drug is safe, but it is of no val. in amenorrhœa due to organic diseases or endocrine deficiencies. C. A. K.

Fate of a-cestradiol and of cestriol injected into a human male subject. J. Schiller and G. Pincus (Arch. Biochem., 1943, 2, 317-321; cf. A., 1942, III, 233; A., 1943, III, 648).—After intramuscular injection of cestriol diacetate there is a very large increase in the activity of the strong phenolic (cestriol) fraction of the urine collected for 6 days after injection. 56.6% of the activity is recovered in this fraction. After a single injection of a-cestradiol, the activities of all the phenolic fractions increase markedly; the increases are greatest during the first 48 hr. and decline in the next 48 hr. Increased activity due to cestradiol (1·0), cestrone (2·7), and cestriol (5·4%) is obtained. It is concluded that cestriol is not converted into cestrone or cestradiol *in vivo*, that cestrone and a-cestradiol are interconvertible, and injection of both leads to urinary excretion of cestriol also. 50% of injected cestriol is excreted in the urine, and 90% of injected cestrogen is unaccounted for by urinary recoveries after injection of cestrone and a-cestradiol. The course of cestrogen conversion in the male may be similar to that in the human female and in most mammals. J. N. A.

Excretion of cestrogens. IV. Effect of Verairum viride on urinary estrogens in pre-eclampsia. O. W. Smith, G. V. Smith, and A. G. Gauld (Amer. J. Obstet. Gynec., 1943, 45, 23-28; cf. A., 1944, III, 110).—Injection of V. viride, of cestrogen and progesterone, or of estrogen, progesterone, and adrenal cortical extract had similar temporary effects on a case of pre-eclampsia. There was a marked increase in cestroid excretion, a reappearance of cestrogen in the urine, and a decreased cestradiol excretion. The ratio of estrogenic potency of urinary extracts prepared by Zn-HCl hydrolysis to that of extracts prepared by acid hydrolysis was decreased. There was no significant change in the vol. of urine excreted. The results are interpreted as due to a diminished rate of cestrogen degradation. P. C. W.

Stilbœstrol in carcinoma of prostate.—See A., 1944, III, 122.

Anti-mitotic action of cestrogenic substances.—See A., 1944, III, 92.

Two new methods of staining vaginal smears.—See A., 1944, III, 93.

Excretion of keto-steroids and cestrogens in urine of sheep [in pregnancy]. W. K. Whitten (Austral. J. Exp. Biol., 1943, 21, 187-190).—The urine of two ewes carrying ram lambs contained 17-keto-steroids throughout pregnancy and also cestrogens in the last month of pregnancy. The concn. of keto-steroids is of the same order as that in the urine of normal women. W. McC.

Synergism between vitamin-E and folliculin [cestrogen]. L. Deutsch and N. Csillag (Z. Vitaminforsch., 1943, 13, 55–58).—The effect of folliculin in ovariectomised rats is increased by simultaneous injection of vitamin-E. J. N. A.

Intrasplenic injection of estrogens and their esters. A. Segaloff (*Endocrinol.*, 1943, 33, 209-216).—The effects of various natural estrogens and their esters were studied in rats after injection into a transplanted spleen separated from the portal circulation, into a spleen *in situ*, or subcutaneously. Some were more effective in the former than in the latter injection sites, and of others the reverse was true. Extensive inactivation of estrogen occurs in the liver, though the degree of inactivation varies with different estrogens. Esters of a-estradiol are partly absorbed unchanged from the spleen accurs in the liver, the activation in the 17-hydroxyl position, protects a-estradiol from hepatic inactivation. P. C. W.

Stilbestrol therapy. A. R. Abarbanel, H. Aranow, and M. J. Goodfriend (J. Amer. Med. Assoc., 1943, 121, 1123-1130).—A review of the clinical uses of stilbæstrol based on 700 cases. Discussion. C. A. K.

Copper-induced pseudopregnancy facilitated by pretreatment with cestrogen. A. Dury and J. T. Bradbury (Amer. J. Physiol., 1943, 139, 135-138).—Intravenous Cu acetate (0.1 ml. of 1% solution) induces pseudopregnancy in rats if injected at cestrus but not at metcestrus or dicestrus unless pretreated with cestrone. Pretreatment with cestrone makes it possible to induce ovulation and pseudopregnancy in the ancestrous rabbit by Cu acetate injection. T. F. D.

Mode of administration and effect of progesterone. K. Miescher and P. Gasche (*Helv. Physiol. Pharm. Acta*, 1943, 1, 287–299).— Daily subcutaneous injections of 10  $\mu$ g. of œstradiol in 0.5 c.c. of sesame oil were started 10 days after ovariectomy in rabbits; after 6 days progesterone or anhydrohydroxyprogesterone was given for 5 days subcutaneously, perlingually, or by stomach tube. Effective subcutaneous total concns. were 0.6 mg. of progesterone and 3 mg. of the anhydro-compound. Progesterone, up to 100 mg., was inert when given into the stomach, but effective (12.5 mg.) on lingual administration. Positive effects with the anhydro-compound (12.5 mg.) were obtained on perlingual and intragastric administration. Better effects were obtained when the daily dose was given in 5 portions (10 mg. on lingual administration of progesterone, 5 mg. with the anhydro-compound on lingual and 4 mg. on intragastric administration). Better effects were obtained with propylene glycol and 98% alcohol than with 60% alcohol as solvents. A. S.

Effect of progesterone on guinea-pig uterus. J. Ader and G. H. Bell (J. Physiol., 1943, 102, 9P).—Progesterone lowers the reactivity to oxytocin of the non-pregnant as well as the pregnant guinea-pig uterus. Progesterone-treated non-pregnant uteri varied greatly in their spontaneous activity. W. H. N.

Report on treatment in 38 cases of cryptorchidism with chorionic and pituitary gonadotropin and testosterone. F. E. Harding (J.*Pediat.*, 1943, 23, 451-461).—Cryptorchidism without mechanical obstruction may be corr. with hormonal therapy. The testes descended in 76% of the patients treated. C. J. C. B.

Use of South African clawed frog (Xenopus) as an assay animal for gonadotropic hormones. A. I. Weisman and C. W. Coates (J. Lab. clin. Med., 1943, 28, 1631-1633).-25 gonadotropic r.u. produced ovulation and external extrusion of eggs in Xenopus.

C. J. C. B.

Recovery of injected chorionic gonadotropin from rabbit urine. A. A. Salmon and E. C. Hamblen (*Endocrinol.*, 1943, 33, 257— 259).—Following the intravenous injection of 600 i.u. of chorionic gonadotropin in each of 6 rabbits, 5.7% of the total was recovered from the urine during the first 96 hr. No gonadotropin was recovered later. P. C. W.

Effects of pituitary gonadotropins on cestrual phenomena in ewes. E. J. Warwick and L. E. Casida (*Endocrinol.*, 1943, 33, 169—173).— Ewes were injected subcutaneously with 4 daily doses of folliclestimulating extracts of sheep pituitary powder, followed by an intravenous injection of luteinising or unfractionated extract. In 35 ewes injected during the follicular phase of the cycle, during the 12th—17th day after the start of heat, cestrus occurred sooner and lasted longer (2·24 days instead of 1·48 days) than normally. Superovulation was produced in all cases. Similar treatment of 5 ewes during the luteal phase (3—9 days after the beginning of cestrus) and of 9 ewes during ancestrus resulted in cestrous behaviour in only one case. Ovulation occurred in all cases. P. C. W.

Gonadotropins on human ovary. E. Rydberg and K. Pedersen-Bjergaard (J. Amer. Med. Assoc., 1943, 121, 1117).—Patients with amenorrhœa (mostly secondary) were treated by intramuscular injections of 3000 i.u. of serum-gonadotropin daily for 5 days, followed by 3 injections of 1500 i.u. of chorionic gonadotropin. In responsive cases menstruation occurs about 10 days after the last injection. Urine studies showed excretion of estrogens and pregnanediol in response to the gonadotropins. 'C. A. K.

Hormone production by placental cells maintained in continuous culture. G. E. S. Jones, G. O. Gey, and M. K. Gey (*Johns Hopkins Hosp. Bull.*, 1943, 72, 26—38).—Placental cells, mainly the Langhans cells, produce chorionic gonadotropin under conditions found in continuous tissue cultures and may retain this capacity for as long as 6 months in culture. It has not been possible to demonstrate that placental cells can produce æstrogen under similar circumstances. T. F. D.

**Excretion of gonadotropic hormone by prepuberal and adolescent** girls. H. R. Catchpole and W. W. Greulich (*J. clin. Invest.*, 1943, 22, 799—804).—The daily urinary excretion of gonadotropic hormone of 12 girls of age  $4\frac{1}{2}$ —14 years was determined over 30 consecutive days. The youngest girls excreted no or little hormone. In preadolescent girls, hormone appears more frequently, and in larger amounts. With increasing quantities irregular fluctuations in day by day amounts became evident. Gonadotropic hormone output was related more to developmental status than to chronological age.

C. J. C. B.

Maintenance of pregnancy in white rat. F. N. Zeiner (Endocrinol., 1943, 33, 239-249).—Operative procedures devised to reduce trauma allow pregnancy to continue for 108 hr. (max. 187 hr.) following ovariectomy in 13-14-day pregnant rats; trauma hastens abortion. Pregnancy was prolonged by injection of 2 mg. of progesterone at the time of castration, followed by 10 i.u. of cestrogen daily. The increased duration of pregnancy was not due to an excess of placentæ. Some embryos were probably killed by pressure of the uterine wall after the operation. P. C. W.

Parturition in the mare. J. G. Wright (*J. comp. Path.*, 1943, 53, 212-219).—Observations on normal gestation and parturition in 8 Suffolk mares (9 parturitions). E. G. W.

Pseudohermaphroditism in twins. A. Rhodes (Arch. Pediat., 1943, 60, 529-536).—Report of a case. C. J. C. B.

Case of pseudohermaphroditism [with adrenal cortex hyperplasia]. E. Solomons (J. Obstet. Gynaec., 1943, 50, 363-365).—A case is reported due to bilateral hyperplasia of the adrenal cortex which started in fœtal life. P. C. W.

Personality changes after substitution therapy in preadolescent eunuchoidism. J. Kasanin and G. R. Biskind (J. Amer. Med. Assoc., 1943, 121, 1317-1319).-7 patients with preadolescent eunuchoidism were treated by subcutaneous insertion of pellets of testosterone propionate or methyltestosterone. In addition to the anatomical and physiological changes produced by androgen therapy there were marked psychological effects, e.g., greater feeling of security, greater emotional stability, and removal of anxiety. Before treatment some of the patients had fairly normal sexual feelings towards the opposite sex, and none of them was homosexual. By comparison 15 homosexuals had normally developed gonads, suggesting that homosexuality is of psychological origin. C. A. K.

Effects of coloured illumination on sexual activation of male starling. J. W. Burger (J. Exp. Zool., 1943, 94, 161–168).—When male starlings were exposed to various parts of the visible spectrum, only  $\lambda$  between 0.58 and 0.68  $\mu$ . were effective in stimulating the production of sperm. H. L. H. G.

H. L. H. G.

Transportation of human spermatozoa by airplane for artificial insemination. F. I. Seymour, A. Koerner, and D. Costom (J. Amer. Med. Assoc., 1943, 122, 174-175).—Successful results are reported. C. A. K.

Constancy of androgen concentration in urine. F. Hollander, B. Kriss, E. Klempner, and R. T. Frank (*Endocrinol.*, 1943, 33, 217-223).—The urinary androgens were biologically assayed in consecutive 3-day samples from 9 normal subjects (2 men and 7 women) during 1 month. In 3 of the subjects the fluid intake was varied. The concn. of androgen per l. of urine is const., while the daily output varied with the urine output. P. C. W.

#### XIII.—DIGESTIVE SYSTEM.

Congenital atresia of œsophagus. W. Calvert (Brit. Med. J., 1943, II, 645—646).—Case report. I. C.

Evidence that body irritations or emotions retard gastric evacuation, not by producing pylorospasm but by depressing gastric motility. J. P. Quigley, H. J. Bavor, M. R. Read, and B. L. Brofman (*J. clin. Inwest.*, 1943, 22, 839—845).—9 dogs were provided by the method of Meschan and Quigley (A., 1938, III, 400) with permanent cannulæ giving access to the gastric and duodenal lumina. 3 balloons in tandem fashion were arranged to record the motor activity of the pyloric antrum, sphincter, and duodenal bubb. Emotions and noxious stimuli did not produce pylorospasm but inhibited the entire sphincter region and retarded gastric evacuation owing to decreased antral peristalsis. The delayed evacuation was not due to pylorospasm; in fact, it developed in spite of the pyloric relaxation. C. J. C. B.

Gastric digestive secretions in infancy and childhood. I. J. Wolman (Amer. J. med. Sci., 1943, 206, 770-794).—A crit. review.

C. J. C. B. C. J. C. B. C. J. C. B. (Amer. J. digest. Dis., 1943, 10, 121-123).—A personal experiment. Gastric acidity was increased during a period of re-alimentation after fasting. N. F. M.

Acute dilatation of stomach. R. D. MacRae (Brit. Med. J., 1943, II, 579).—Case report; spinal anæsthesia proved helpful. I. C.

Dyspepsia : an investigation. H. Edwards and W. S. C. Copeman (Brit. Med. J., 1943, II, 640-642).—A statistical investigation of Army cases. I. C.

Chronic seasickness. R. S. Schwab (Ann. int. Med., 1943, 19, 28-35).—50% of 115 naval personnel suffering from chronic seasickness severe enough to necessitate hospitalisation showed abnormalities of the gastro-intestinal tract on mucosal relief studies and gastroscopic examination. The main findings were chronic superficial gastritis; signs of marked irritability of the pylorus and duodenum with pylorus spasm, marked increase in gastric secretion (also fasting), increase in gastric rugæ and loss of peristalsis, persisted in some patients for 3-4 weeks. 2 types are distinguished: type I with a history of other motion sickness (bus, trains, etc.) and type II where seasickness occurs in rough weather. Subjects of type I become very sick at sea, show low efficiency, and lose considerable body wt.; they should be put on shore duties. Neuroses were found in 74% of this group, and in 24% of group II. A. S.

Secretion of aminopolypeptidase from pyloric and duodenal mucosa of cat after injection of secretin. G. Agren (*Arkiv Kemi, Min., Geol.*, 1943, 16, B, No. 6, 10 pp.; cf. A., 1943, III, 682).—Intravenous injection of cryst. secretin into cats stimulates secretion of a digestive juice by the upper duodenal and distal pyloric mucosa. The secretion contains aminopolypeptidases and dipeptidases, a proteolytic enzyme with optimum pH 2—3, and possibly intrinsic factor. R. L. E.

Pancreatic function and disease in early life. Pancreatic enzyme activity and the cœliac syndrome. S. Farber, H. Schwachman, and C. L. Maddock (*J. clin. Invest.*, 1943, 22, 827-838).—Patients with idiopathic cœliac disease, non-tropical sprue, idiopathic steatornhœa, or that form of the cœliac syndrome associated with malrotation of the bowel show no pancreatic achylia. Pancreatic enzyme activity concn. in the duodenal contents is normal, and greater than in pancreatic fibrosis. Selective trypsin deficiency is described in a boy with normal lipolytic and amylolytic activity. Surgical removal of 70-80% of the pancreas of infants suffering from hypoglycemia and convulsions caused reduction.in enzyme activity but did not produce pancreatic insufficiency. C. J. C. B.

Factor in pancreatin which influences growth of tissues in vitro. J. N. Davidson and C. Waymouth (J. Physiol., 1943, 102, 8P).— Ribonuclease prepared from pancreatin contains a factor influencing culture growth absent from cryst. ribonuclease. The factor can be extracted with phenol, and is stable to heat in slightly acid but not in slightly alkaline solution. It contains N 13.6%, P 2.0%, arginine and tyrosine. Amino-N is 13% of total N before and 58.7% after acid hydrolysis. W. H. N.

Jejunal intussusception. E. P. Scott (J. Pediat., 1943, 23, 565-567).—Report of a case in 6-day-old infant. C. J. C. B.

Variations in ileocæcal valve : factors underlying incompetency. -See A., 1944, III, 89.

Effect of atropine on absorption of vitamin-A. F. J. Ingelfinger, R. E. Moss, and J. D. Helm, jun. (J. clin. Invest., 1943, 22, 699– 705).—Atropine sulphate delays the appearance of vitamin-A in the plasma after -A has been placed in the small intestine of human subjects. Some of this delay is produced by an inhibition of the pancreatic and biliary secretions. C. J. C. B.

Effect of atropine, strychnine, and quinine on absorption of glucose, fructose, xylose, and arabinose from guinea-pig intestine. A. Roy and P. B. Sen (Ann. Biochem. Exp. Med., 1943, 3, 1-8).—Atropine  $(0\cdot1\%)$  reduces the absorption of all sugars from the intestine of the guinea-pig by 28-36%. Quinine  $(0\cdot2\%)$  increases the rate of absorption of glucose (46%) but not of the other sugars. Strychnine  $(0\cdot02\%)$  has no effects on the absorption rates. The absorption of glucose is 26% faster from the ileal than from the duodenal end of the intestine. The average rate of glucose absorption is 140, and of xylose 100, mg. per m. of intestine per hr.  $4\cdot5-5\cdot4\%$  solutions of the sugars were used. Experiments show that these effects are due to an increased phosphorylation of glucose in the presence of quinine, a decreased phosphorylation of glucose and fructose in the presence of atropine, and to effects on intestinal motility and tone. The latter are depressed by atropine, increased by quinine in the presence of glucose but not in the presence of other sugars, and unaffected by strychnine. P. C. W. Effect of quinine on [intestinal] absorption of fat. A. Roy and P. B. Sen (Ann. Biochem. Exp. Med., 1943, 3, 9–14).—The intestinal absorption of fat was studied in fasted rats by the direct injection of fat + lipase + bile salts or of fatty acids into a segregated portion of the ileum. Addition of quinine to the injected solution reduced the absorption of fat by 23% and of fatty acid by 9%. Analysis of faces from rats given 50–100 mg. of quinine per kg. daily intravenously or 50 mg. per kg. daily by mouth showed no effect of the intravenous administration but a rise in fat excretion when the quinine was given orally. Experimental analysis shows that quinine decreases the rate of hydrolysis of fat but has no effect on the re-synthesis in the mucosa. P. C. W.

Site of action of drugs causing stimulation of the circular coat of rabbit's intestine. M. Vogt (J. Physiol., 1943, 102, 170–179).— Experiments are preliminary to an analysis of abnormal responses following adrenalectomy. Suspension of excised intestine in glucosetree Tyrode solution selectively reduces the responses of the longitudinal coat to drugs. The stimulating actions of NaCl and lactate resemble that of the vagus in the intact animal in that they persist after sufficient atropine to abolish the effect of parasympathomimetic drugs, and are predominantly on the circular coat. They probably act therefore on Auerbach's plexus, though large doses of atropine inhibit them. Nicotine enhances their action but paralyses in larger doses. The action of NaCl is attributed to the 20% increase in tonicity of the medium, which, if produced instead by lactose or sucrose, has the same effect. The action of lactate ion is not dependent on tonicity. The KCl also has a powerful action which is directly on the muscle, not being abolished by large doses of atropine or paralytic doses of nicotine. If the intestine is allowed to disintegrate at 1° it loses its response first to lactate and NaCl and last to KCl in accordance with their postulated site of action, and in good agreement with drugs of known action (escrine, nicotine, muscarine) with which they were compared. (Cf. A., 1944, III, 186.) W. H. N.

Gastrointestinal tract and liver. F. C. Mann (J. Amer. Med. Assoc., 1943, 121, 720-722).—A review. C. A. K.

Hyperbilirubinæmia in gastrointestinal disease. T. A. Johnson and H. L. Bockus (J. Amer. Med. Assoc., 1943, 121, 729-733).—A lecture. C. A. K.

**Hydraulic abdominal concussion.** L. S. Auster and J. H. Willard (J. Amer. Med. Assoc., 1943, **121**, 995—999).—15 cases of hydraulic abdominal concussion due to under-water explosions are described. The abdomen is compressed and sea-water is forced in through the amus: after about  $\frac{1}{2}$  hr. the hypertonic fluid causes cramps and bowel movements followed by dehydration. Operations in some cases showed small multiple subserosal and mucosal intestinal hamorrhages, but perforation of the colon was rare. C. A. K.

**Chemical constituents of stool of cholera patients.** H. Ghosh and R. K. Chakraborty (*Indian J. Med. Res.*, 1940, **28**, 309–313).— Stools of 31 cholera patients were very alkaline, contained an average of 443 mg.-% of NaCl, 0.95% of protein, and considerable  $NH_3$ ,  $PO_4^{\prime\prime\prime}$ , S, and  $CO_3^{\prime\prime}$ . All samples contained occult blood. S. E. M.

Familial polyposis of colon. M. T. Friedell and E. G. Wakefield (J. Amer. Med. Assoc., 1943, 121, 830).—7 cases are reported.

Gross hæmorrhage from rectum. C. J. Drueck (Amer. J. digest. Dis., 1943, 10, 144-147).—A clinical lecture. N. F. M.

#### XIV.-LIVER AND BILE.

Isolated cell nuclei of normal rat liver. A. L. Dounce (J. Biol. Chem., 1943, 151, 221-233; cf. A., 1943, III, 517).—Cell nuclei prepared at pH  $3\cdot 8-4\cdot 0$  contain much denatured protein but retain nucleic acid and protein, and probably enzymes, better than those prepared at pH  $6\cdot 0$ - $6\cdot 2$ . Decxyribonucleic acid may be present in loosely or firmly bound combination. Absorption spectra of Some of the nucleic acid fractions are given. Cytochrome c is present in low concn. in liver cell nuclei, glycogen only in traces if at all. R. L. E.

Assimilation of glucose and galactose in liver. H. W. Kosterlitz and C. M. Ritchie (*Biochem. J.*, 1943, 37, 618—622).—Feeding of galactose to rats causes the appearance of glucose 1-phosphate and galactose 1-phosphate in the liver in ratio of 1:3.5. The rate of conversion of galactose 1-phosphate into a yet unknown metabolite is not less than that of galactose phosphorylation, as shown by the non-accumulation of the ester. The mechanism of the conversion of galactose into glucose in the liver is discussed. P. G. M.

Liver function, pulse rate, and temperature of hyperthyroid dogs.— See A., 1944, III, 107.

Hæmophilia and blood-prothrombin content; vitamin-K determination and liver function test.—See A., 1944, 111, 96.

Methylation of nicotinamide by rat's liver in vitro.—See A., 1944, III, 130.

Liver extirpation and implantation in *Amblyostoma* embryos with particular reference to blood formation.—See A., 1944, III, 90.

Rôle of carboxy-labelled acetic, propionic, and butyric acid in production of liver-glycogen.—See A., 1944, III, 130.

Rôle of liver in metabolic destruction of quinine.--See A., 1944, III, 136.

*d-Amino-acid oxidase, uricase, and choline oxidase in normal rat liver and in nuclei of normal rat liver cells.* T. H. Lan (*J. Biol. Chem.*, 1943, 151, 171-175).—There is more uricase in liver cell nuclei than in whole liver tissue. *d-Amino-acid oxidase is present in the nuclei, but its co-enzyme only in whole tissue. Choline oxidase is present in whole liver tissue but not in the nuclei.* R. L. E.

Influence of pregnancy on quinine oxidase of rabbit liver.—See A., 1944, III, 138.

Effect of pyridoxine and other B vitamins on production of liver cancer with p-dimethylaminoazobenzene.—See A., 1944, III, 119.

Influence of liver therapy on uveal tract disease.—See A., 1944, III, 104.

#### XV.—KIDNEY AND URINE.

Nuclear inclusions in kidneys of Australian opossums maintained under laboratory conditions. E. W. Hurst, B. T. Cooke, J. Mawson, and P. Melvin (*Austral. J. Exp. Biol.*, 1943, 21, 149—152).—The inclusions, which in their early stages resemble those of many virus diseases, developed under hygienic conditions, within about 3 weeks, in opossums but not in laboratory rabbits, guinea-pigs, mice, or rats. Similar inclusions were found in the kidneys of wild rats but not in those of wild opossums. Attempts to prevent introduction of an infective agent with food or bedding and to diminish appreciably the frequency of development of the inclusions by changing the diet were unsuccessful. W. McC.

Fluorescent granules at glomerular pole of human kidney.—See A., 1944, III, 92.

Purification of renin.—See A., 1944, III, 99.

Diverticulum of urinary bladder.—See A., 1944, III, 90.

N-Methylnicotinamide, a metabolite of nicotinic acid in the urine.— See A., 1944, III, 130.

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

Distribution of water, nitrogen, and electrolytes in skin. L. Eichelberger, C. W. Eisele, and D. Wertzler (J. Biol. Chem., 1943, 151, 177—189; cf. C., 1944, Part 2).—Analyses are recorded of blood and skin from normal, pregnant, and hypertensive dogs. Dry fatfree skin contains about 54% of connective tissue. There is probably some Cl' in the cells of skin tissue. The skin acts as a reservoir for extra fluid, since after injection of isotonic solutions of NaCl into hypertensive dogs the % of water in the skin was 10% above normal. R. L. E.

Ichthyopterin, blue fluorescent substance of fish skin.—See A., 1944, II, 84.

Selective permeability of skin capillaries.-See A., 1944, III, 99.

Effect of temperature on longevity, reproduction, and growth in aphids. C. A. Lawson (*Genetics*, 1941, 26, 159).—Adult aphids in the dark have a longer life and reproduce more rapidly at 20° than at higher temp. Reproduction is stopped at 30—40°. Offspring of parents kept at 28° mature more slowly than those of parents kept at 23°. L. G. G. W.

Effectiveness of cold and heat as triploidy-inducing agents in salamanders. G. Fankhauser and R. C. Watson (Genetics, 1943, 28, 74).—Exposure of salamander eggs to temp. of  $0-4^{\circ}$  for 5-24hr. produces 44—80% of triploid larvæ. High-temp. ( $32\cdot4-37\cdot2^{\circ}$ ) treatment also caused the production of some triploid larvæ.

Storage and interaction of water-soluble vitamins in Malpighian system of *Periplaneta americana*, L.—See A., 1944, III, 125.

Chemical identification of gene-controlled pigments in Platypoecilus and Xiphophorus and comparisons with other tropical fishes. H. B. Goodrich, G. A. Hill, and M. S. Arrick (Genetics, 1941, 26, 573— 586).—In addition to melanin, the carotenoids (probably existing as esters) zeaxanthin, violaxanthin, and lutein and also erythropterin have been identified in P. maculatus, X. helleri, Oryzias latipes, Macropodus opercularis, Colisa Ialia, C. fasciata, and Betta splendens. L. G. G. W.

Animal colour changes and their neurohumors. J. H. Parker (Quart. Rev. Biol., 1943, 18, 205-227).--A review. J. D. B.

Osmotic regulation and faunas of inland waters. L. C. Beadle (Biol. Rev., 1943, 18, 172-183).—A review. J. D. B. Some physical chemical properties of biologically active molecules. J. H. Schulman (*Trans. Faraday Soc.*, 1943, 37, 412-417).--A review. Examples are given to show how biological activity of lipins is changed by association with other lipins or proteins. V. J. W.

Conversion of lutein in a boric acid-naphthalene melt.—See A., 1944, II, 76.

#### XVII.—TUMOURS.

Biocatalysts in cancer tissue. III. Succinic dehydrogenase and cytochrome oxidase. W. C. Schneider and V. R. Potter. IV. Enzyme-virus theory regarding carcinogenesis. V. R. Potter (*Cancer Res.*, 1943, 3, 353-357, 358-361).—III. Succinic dehydrogenase and cytochrome oxidase were determined in 7 normal rat tissues and 10 kinds of experimental tumours. The  $Qo_2$  vals. were lower in tumour tissues than in normal. Vals. in tumour tissue were const. regardless of ætiology whereas those of normal tissues varied. Liver tumours had  $\frac{1}{4}$  of the succinic dehydrogenase activity and  $\frac{1}{4}$  the cytochrome oxidase activity of normal liver. Homogenisation of the tissue in water increased the cytochrome oxidase activity. This procedure had no effect on succinoxidase activity.

IV. A theory of carcinogenesis is proposed that cancer may be the result of a competition between an enzyme X and a "cancer virus," the latter being derived from the former by the action of carcinogenic agents. The identification of enzyme X is considered to be of prime importance in the solution of the cancer problem. Some of the hypothetical properties of enzyme X are compared with the observed properties of succinic dehydrogenase. F. L. W.

Fluorescence studies of carcinogens in skin. I. Histological localisation of 20-methylcholanthrene in mouse skin after a single application. W. L. Simpson and W. Cramer (*Cancer Res.*, 1943, 3, 362-369).—The distribution of methylcholanthrene in mouse skin during the first 10 days after a single application of the carcinogen was studied by ultra-violet fluorescence microscopy in frozen section, by histological examination of frozen sections stained with Sudan IV and of parafin sections. Similar fluorescence and histological studies were made of normal mouse skin. Immediately after application the bulk of the carcinogen appears in the sebaceous glands and keratin layer. The carcinogen is here dissolved in the sebum and in free lipins respectively; the fluorescence in this state is blueviolet. The epidermis has a crust of undissolved methylcholanthrene with a yellow-green fluorescence. Subsequent changes are: (a) degeneration and disappearance of sebaceous gland cells accompanied by excretion of sebum containing methylcholanthrene into the hair follicles and then on to the epidermis, (b) epilation, and (c) flaking off of keratin soaked with sebum containing the carcinogen. The carcinogen does not seem to be taken up directly by epithelial cells. In the subcutaneous tissues fat cells take up methylchol-anthrene and then lose it. After 6—10 days fluorescence due to the carcinogen has disappeared from all parts of the skin.

Spectrochemical study of cestrogen-induced mammary cancer in mice. I. Chemical preparation of tissue and analysis by spectrophotometry. L. A. Strait, E. L. McCawley, and I. H. Perry. II. Distribution of triphenylethylene in mamma and in mammary cancer induced by this cestrogen. I. H. Perry, L. A. Strait, and E. L. McCawley (*Cancer Res.*, 1943, **3**, 370–377, 378–384).—I. The absorption spectrum of triphenylethylene was measured. A spectrochemical method for the assay of this hydrocarbon in tissues and a chemical extraction method to minimise background absorption are described.

F. L. W.

II. Spectrographic study was made of 22 mice with cancer of the mamma resulting from repeated treatment with triphenylethylene. The hydrocarbon was not found in the cancer itself. It was present in appreciable amounts in the remaining hyperplastic tissue of the same animal if this was excised within 3 days of the last dose but not if excised after 7 days. The œstrogen was not found in previously untreated mamma 2—3 days after a single œstrogenic dose. Extracts of tumours showed a characteristic absorption; extracts of hyperplastic precancerous mamma showed new absorption bands in 5 out of 18 cases. F. L. W.

Incidence of a carcinogenic factor in the livers of cancer, noncancer, cirrhotic, and negro patients. P. E. Steiner (Cancer Res., 1943, 3, 385-395).—Extractions and tests of carcinogenicity were made with 67 human livers in 896 mice. A carcinogenic factor was present in livers from both cancerous and non-cancerous patients. Induced sarcomas occurred in 2.9% of all mice surving 6 months. 14 extracts of 67 tested were carcinogenic. The first tumour occurred in 6 months. 8 extracts from 37 cancer patients tested and 6 of 30 non-cancerous extracts were carcinogenic. Carcinogenic activity in the extracts was not related to any special site or type of tumour. The incidence of the carcinogenic factor was the same in all age groups, in both sexes, in whites and negroes, and in cirrhotic aud non-cirrhotic livers. F. L. W.

Possible mode of action of benzpyrene as typical carcinogen. F. Weigert (*Trans. Faraday Soc.*, 1943, 37, 418-419).--Production

of tumours by benzpyrene may be due to its change in the tissues into an unstable blue-fluorescent substance which readily changes into a green-fluorescent substance. This conversion stimulates the change of a normal into a malignant cell. V. J. W.

Effect of rate of freezing on survival of fourteen transplantable tumours of mice. G. D. Snell and A. M. Cloudman (*Cancer Res.*, 1943, **3**, 396-400).—Immersion of small pieces of transplantable tumour in *iso*pentane or freon 11 at room temp. for 30 min. did not reduce the % of takes. Most transplantable tumours frozen by direct immersion in *iso*pentane at  $-75^{\circ}$  (1-2 sec.) were more severely damaged than the same tissues frozen by slower methods. Preservation is simply achieved by corking a small piece of tumour in a sterile tube and dropping it directly on solid CO<sub>2</sub> in a thermos flask. Some tumours did not survive any method of freezing tried. F. L. W.

**Rapid test for tumour growth inhibitors.** D. Laszlo and C. Leuchtenberger (*Cancer Res.*, 1943, **3**, 401-409).—Inhibition is judged by comparing tumour sizes and wts. of mice bearing sarcoma 180 after a period of 48 hr. of growth. The groups are matched as to initial size of tumours. Extracts of various moulds and brewer's yeasts were tested by this method. F. L. W.

**Deoxyribonucleic acid content of isolated nuclei of tumour cells.** A. L. Dounce (*J. Biol. Chem.*, 1943, **151**, 235-240; cf. A., 1944, III, 193).—The nuclei isolated from Walker carcinosarcoma 256 at pH 3 with 1.6% aq. citric acid have about the same content of deoxyribonucleic acid as the nuclei of normal liver cells. The results on nuclei isolated from hepatoma 31 with 4% aq. citric acid are probably too high; these nuclei appear to have much lower nucleic acid content than those of normal cells. Nuclei of bird erythrocytes and fish spermatozoa, are much richer in deoxyribonucleic acid than any of the liver or tumour tissues studied. R. L. E.

Diplochromosomes in a goldfish tumour. J. J. Biesele (Cancer Res., 1943, 3, 411-412).—The chromosomes in an ovarian tumour of a goldfish had an average vol. double that in a healing skin wound and in non-germinal cells of a normal ovary. The max. no. of nucleoli was 4 in the normal nuclei and 8 in the cancerous. The chromosomes of the goldfish tumour are therefore diplochromosomes. F. L. W.

Influence of cross-suckling on the incidence of mammary cancer in high- and low-cancer strains of mice. L. Dmochowski and W. E. Gye (Brit. J. exp. Path., 1943, 24, 223-226).—Foster nursing of high-cancer RIII females by females of S low-cancer strain reduced the incidence of mammary cancer in RIII females from 83% at an average age of 8.5 months to 6.6% at an average of 9.3 months. Foster nursing of S females by RIII females increased the incidence of mammary cancer in S females from less than 1% at an average of 19 months to 29.6% at an average age of 15.2 months. F. S.

**Chemistry and cancer** (Angew. Chem., 1940, 53, 337-372).—This symposium comprises review articles, which should be consulted in the original, by A. Dietrich on the nature and origin of cancer (pp. 337-341, 8 figs.), W. Schulemann on the present position of the subject (pp. 342-345), A. Butenandt on the newer contributions of biological chemistry to the cancer problem (pp. 345-352), H. v. Euler on enzyme chemistry in cancer research (pp. 352-355), K. Hinsberg on chemical methods employed in diagnosis (pp. 356-362, 3 figs.), H. Lettré on the uses of tissue culture in the chemical investigation of cancer (pp. 363-368, 6 figs.), and E. Gross on cancer as an occupational disease (pp. 368-372). A. H.

Nearer causes of cancer. P. Rous (J. Amer. Med. Assoc., 1943, 122, 573-581).-A lecture. C. A. K.

Nomenclature of hormone-producing tumours of ovary. H. Burrows (J. Obstet. Gynaec., 1943, 50, 430-432).—The terms arrhenoblastoma and granulosa-cell tumour should be discarded. The term arrhenoma should denote androgen-producing tumours, theeloma should denote those producing cestrogen irrespective of their location or histological appearance. P. C. W.

**Castration for carcinoma of prostate; report of 15 treated cases.** E. Smith and J. T. MacLean (*Canad. Med. Assoc. J.*, 1943, 49, 387-391).—Surgical castration in patients with carcinoma of the prostate gives spectacular improvement in most cases. There is frequently complete relief of pain within 48 hr., improved appetite, a gain in wt., and an increase in the red blood cell count. The primary tumour may decrease in size. In 2 of the patients with symptoms of prostatic obstruction, castration alone caused the symptoms of obstruction to disappear. The elevated "acid" serum phosphatase may indicate the presence of metastatic carcinomatous lesions before they are demonstrable roentgenologically. C. J. C. B.

Removal of secreting tissue of testis for malignant melanoma of choroid with extensive metastases. W. P. Herbst (J. Amer. Med. Assoc., 1943, 122, 597).—Case report. The patient died 6 weeks after operation but metastatic lesions had previously regressed. No autopsy. C. A. K.

Mammary cancer and the menopause. E. K. Dawson (Edinb. Med. J., 1943, 50, 721-736).—A lecture. (44 photomicrographs.) H.S.

Fibroma of ovary with ascites and hydro-thorax. A. Gild (J. Obstet. Gynæc., 1943, 50, 440-442).-A case is described and discussed. P. C. W.

Cellular changes in lymph nodes of experimental mice with special reference to plasma cell development.-See A., 1944, III, 97.

Changes in thymus with special reference to myasthenia gravis.-Sec A., 1944, III, 101.

#### XVIII.---ANIMAL NUTRITION.

Growth, ageing, chronic diseases, and life span in rats. [Dietary factors.]—See A., 1944, III, 128.

Dietary and physique of aboriginals in Santal Parganas, a district of Bihar. K. Mitra (*Indian J. Med. Res.*, 1940, 28, 117-132).-The diet of aboriginals in the district, the Santals and Paharias, was insufficient in quantity and was particularly deficient in proteins. The dict of the Paharias was also deficient in vitamin-A and -C.

S. E. M.

Diet and nutritional status of women in a low-income pouplation group. J. C. Winters and R. E. Leslie [with M. A. Eppright] (J. Nutrition, 1943, 26, 443-458).—The average daily calorie intake was  $\frac{1}{2} - \frac{2}{3}$ , the intakes of thiamin, nicotinic acid, and riboflavin slightly more than  $\frac{1}{3}$ , and the protein, Ca, and P  $\frac{1}{2}$  the amount recommended as adequate by the National Research Council and the pantothenic acid intake was  $\frac{1}{4}$  the amount recommended by Williams. Seasonal and racial variations were slight. No extreme cases of deficiency were observed and all cases do not show the same degree of deficiency on similar intakes. This together with failure to observe underweight as a result of the low calorie intake indicates that the recommended allowances may have been placed too high. H. G. R.

Computation of rations for energy requirements of animals and practical means to be adopted in order to ensure that said requirements are covered. A. M. Leroy (Int. Rev. Agric., 1943, 34, 113-137T).—For the most economical production of meat or milk, the ratio of the output energy (energy of the ration used in elaboration of growth tissues, reserve fats, and milk) to the metabolism energy (fraction of energy in ration not utilised in the above manner) must be as high as possible. H. G. R.

Bread. I. Mixed war-time bread. I. Abelin (Z. Vitaminforsch., 1943, 13, 207-217).—Bread made from flour containing wheat 70%, rye 20%, and barley 10% is of higher biological val. for rats than that made from pure wheat flour, when adequate vitamin supplements are given. P. G. M.

Nutritive value of protein. I. Effect of processing on oat-protein. R. A. Stewart, G. W. Hensley, and F. N. Peters, jun. (J. Nutrition, 1943, 26, 519-526).—No impairment of protein quality is caused by precooking the oat flour by the drum-dried process or by toasting of an extruded oat flour product. Considerable damage to the protein quality is caused by processing by means of the explosion technique. H. G. R.

Amino-acids. III. Reversibility of plasma-amino-acid retention during recovery from dietary hypoproteinæmia in the dog. E. Goettsch, J. D. Lyttle, W. M. Grim, and P. Dunbar (*J. Biol. Chem.*, 1943, 151, 149—152).—Hypoproteinæmia, produced in the dog by a low-protein diet, resulted in progressive retention of injected retention of the planet of the second se a-amino-acids by the plasma, apparent after 7 days. On restoration of protein (as casein) to the dict, the lag in plasma clearance disappeared equally rapidly. E. C. W.

Abrine [relation to cataract]. W. M. Cahill and G. C. Kotalik (J. Nutrition, 1943, 26, 471-476; cf. A., 1939, II, 40).—Abrine does not prevent accumulation of fat in the livers of rats fed a diet deficient in labile methyl groups but will prevent development of cataract in rats on a tryptophan-deficient diet. The inclusion of abrine in the latter diet promotes the growth of the animals but is not equiv. to that induced by a comparable amount of tryptophan.

#### H. G. R.

Influence of previous diet on preferential utilisation of foodstuffs. I. Fasting ketosis and nitrogen excretion as related to fat content of the preceding diet. S. Roberts and L. T. Samuels (*J. Biol. Chem.*, 1943, 151, 267-271).—Adult rats forcibly fed on a high-fat diet for 3-6 weeks and then footad immediately chemed latertury for 3-6 weeks and then fasted immediately showed ketonuria, blood ketosis, and fatty livers. Rats fed on high-carbohydrate diets and similarly treated showed no such effects. Fasting ketosis is considered to be a result of preferential metabolism of fat continuing after dietary fat is withdrawn. R. L. E.

Fat oxidation in experimental animal diets.---See A., 1944, III, 130.

Availability of calcium and phosphorus in cereals. K. V. Giri Indian J. Med. Res., 1940, 28, 101-111; cf. A., 1938, III, 673).-In diets containing cereals as source of Ca and P, 68% of Ca was

"available" for rats in ragi, 89% in cambu, 84% in cholam. 58% of P was "available" in ragi, 74% in cambu, 67% in cholam, 64% in rice. Ragi is, however, richer in Ca and P than the other cereals and contains them in optimum ratio. Ragi, supplied in suboptimal amounts, gave availability of Ca 84-88, of P 70-79%. S. E. M.

Development of cobalt deficiencies in sheep. J. E. Bowstead, P. Sackville, and R. D. Sinclair (*Sci. Agric.*, 1942, 22, 314-325) .- Sheep maintained for a long period on dry rations (nonlegume hay, oats, minerals) developed a nutritional deficiency which was corr. by supplements of Co. Affected ewes produced small weak lambs and insufficient milk and had weak-fibred fleeces. The Co content of the ration used was less than that reported in "bush-sick" pasturage in New Zealand. A. G. P.

Fluorosis and dental caries on Tyneside. R. Weaver (Brit. Dent. J., 1944, 76, 29-40).—Examination of the teeth of 500 children aged 5 and 500 aged 12 in South Shields where the F content of the water supply is 1.4 p.p.m. shows that, despite similar climatic, social, and economic conditions, the incidence of caries in the permanent teeth of the 12-year-olds is only 56% of that in 500 children aged 12 in North Shields where the F content of the water supply is less than 0.25 p.p.m. The condition of the teeth of these children and of 500 children aged 5 in N. Shields shows that there is no correlation between mottling, nutrition, and incidence of caries and that the higher F content of the water in S. Shields does not signi-ficantly delay cruption of permanent teeth. The factor, possibly F, responsible for the diminution in the incidence of caries in S. Shields preferentially affects the incisors. W. McC.

#### Vitamins.

Vitamins and food. H. von Euler (5 Nordiske Kemikermode, 1939, 133-142).—A review. M. H. M. A.

Vitamin-rich food made from by-product yeast .-- See B., 1944, III. 31.

Evaluation of synthetic vitamins and hormones. M. Guggenheim (Z. Vitaminiforsch., 1943, 13, 139-141).—It is stressed that there are no differences in constitution, chemical and physical properties, and physiological and therapeutic actions between the natural and the corresponding synthetic hormones and vitamins. J. N. A.

Changes in vitamin content during life of worker honey-bee. M. H. Haydak and A. E. Vivino (Arch. Biochem., 1943, 2, 201-207).—The thiamin, riboflavin, pyridoxine, and nicotinic, panto-thenic, and ascorbic acid contents of whole bees (larvæ, pupæ, emerging bees, adults) and of their heads, thoraces, abdomens, and digestive tracts are recorded. Parts (e.g., heads) containing glands are usually richer in the vitamins than those consisting chiefly of are usually richer in the vitamins than those consisting chicary are muscle; with all stages of metamorphosis, the content decreases with age. The contents (except those of nicotinic acid) in the thoracic muscles are two or three times as great as those of some W. McC.

Effect of commercial clarification on vitamin content of honey.-See B., 1944, III, 30.

Resorption of carotene and vitamin-A from placenta. W. Neu-weiler (Z. Vitaminforsch., 1943, 13, 275-280).-Transmission of both carotene and vitamin-A from mother to foctus is much reduced by the placental barrier. P. G. M.

Treatment of experimental renal hypertension with vitamin-A concentrates.—See A., 1944, III, 100.

Influence of hepatic function on metabolism of vitamin-A .-- See A., 1944, III, 114.

Fluorescence of vitamin-A.—See A., 1944, II, 76.

Contents of B-vitamins in autolysed tissues. L. D. Wright, J. R. McMahan, V. H. Cheldelin, A. Taylor, E. E. Snell, and R. J. Williams (Univ. Texas Publ., 1941, No. 4137, 38-60).—The proportions of B-vitamins in various tissues (e.g., liver, kidney) of animals (e.g., rat, ox, pig) are recorded. W. McC.

Changes in *B*-vitamin content of tissues during development. R. J. Williams, A. Taylor, and V. H. Cheldelin (*Univ. Texas Publ.*, 1941, No. 4137, 61-66).—The *B*-vitamin contents of the liver, heart, and brain of rats and chicks at three stages (embryo, weanling rat and day-old chick, and maturity) are recorded. W. McC.

Influence of vitamin deficiency and various methods of nutrition on histidine metabolism. S. Edlbacher and G. Viollier (*Helv. Chim. Acta*, 1943, 26, 1978–1992).—Further investigation of the increased enzymic degradation of histidine in the  $B_1$ -avitaminotic organism shows that there is an increase in the fission by urocaninase parallel to the behaviour of histidase and arginase in  $B_1$ -avitaminosis. Corresponding with the increased histidase behaviour of the livers, the histidine elimination quota after loading is diminished if vitamin- $B_1$  is deficient. After loading,  $B_2$ - and  $B_6$ -avitaminotic rats show the same behaviour as beri-beri rats. The observed increase in the utilisation of histidine is regarded as a consequence of disturbance of the intermediate carbohydrate metabolism. A

diet poor in protein or free from fat has no influence on the degrad-ation of histidine *in vivo*. This is true also of deficiency of -E. H. W.

Effect of deprivation of vitamin-B complex on intestinal absorption in dogs.—See A., 1944, III, 114.

Effect of cooking with and without sodium bicarbonate on thiamin, riboflavin, and ascorbic acid content of peas.-See B., 1944, III, 28.

Recovery of the B-vitamins in wheat milling. Vitamin-B-complex factors in rice and its milled products. Riboflavin in products of commercial rice milling and thiamin and riboflavin in rice varieties. Influence of processing on the thiamin, riboflavin, and niacin [nico-tinic acid] content of rice.—See B., 1944, III, 27.

Vitamin requirements of *Torula cremoris*. Vitamin deficiencies of fifty yeasts and moulds.—See A., 1944, III, 143.

Growth factor requirements of clostridia.-See A., 1944, III, 146.

Riboflavin and thiamin interrelationships in rats and in man. shrinkage of the liver accounts for a large proportion of the riboflavin appearing in the urine. H. G. R.

Effect of thiamin, riboflavin, or pyridoxine deficiency on the intestinal absorption of galactose in the rat. J. R. Leonards and A. H. Free (J. Nutrition, 1943, 26, 499-508).—The rate of intestinal absorption of galactose of normal rats is 66% greater than that of thiamin-deficient and 12% greater than that of pyridoxine-deficient animals whereas riboflavin deficiency has no effect on the rate.

H. G. R.

Changes in B-vitamin content [of chick embryonic tissues] during development. A. Taylor, H. K. Mitchell, and M. A. Pollack (Univ. Texas Publ., 1941, No. 4137, 67-87).—Thiamin, pantothenic acid, riboflavin, and nicotinic acid, injected before incubation into hen's eggs, do not affect the relative size of the liver of the chick embryo but increase the relative size of the brain. Thiamin and panto-thenic acid also increase the hæmoglobin content of its blood and pantothenic acid and riboflavin decrease the relative size of its heart. Similar effects are produced by supplementing the diet of the hens with pantothenic acid, which also improves hatchability

W. McC.

**Excretion of vitamin-B**, in urine of newborn. W. Neuweiler (Z. Vitaminforsch., 1943, 13, 280-286).—Oral administration of vitamin- $B_1$  to the newborn results in its excretion in the urine, but it is mainly stopped by the placental barrier on administration to the mother. P. G. M.

Aneurin pyrophosphate content of animal tissues. H. G. K. Westenbrink, E. P. S. Parvé, and H. J. Thomasson (Z. Vitaminforsch., 1943, 13, 101–111).—Data are given for the amounts of subscription of the state of the state of nutrition of the state of nutrition of phosphate content of organs is affected by the state of nutrition of phosphate content of organs is affected by the state of nutrition of the sta the organism except in the case of the frog, where there is very little effect. The amount present in human liver and kidney is very low compared with that in animals; of all the human organs the heart contains most aneurin pyrophosphate. In most animals except the pig, there is not much difference between the amounts present in liver, kidney, and heart muscle. Spleen, adrenals, pancreas, thymus, and sexual organs in general contain less aneurin pyro-phosphete then de liver bidgered best the statement of the statement. phosphate than do liver, kidney, and heart; only rat testicles have a high content of the vitamin. The amount present in lungs is always small except in the pig, where the content is comparable with that in other organs. The nervous system in man, and especially in the pig, is very low in aneurin pyrophosphate. Comparison between the pig and other animals shows that pig skeletal muscles contain an exceptionally large amount of aneurin pyrophosphate, and there is a very marked difference in the amounts present in skeletal and smooth muscle. . N. A.

Thiamin in lake waters and aquatic organisms. G. E. Hutchinson (Arch. Biochem., 1943, 2, 143-150).—Unfiltered lake waters contained  $0.03-1.2 \mu g$ . of thiamin (7-39% non-filterable) per l. The contents of thiamin in solution and in the dry season were subject to seasonal variations. No accumulation of vitamin in the hypolimnion occurred at the end of stagnation. If half or more of the dissoluted the provide the provided the provi dissolved thiamin were available to planktonic algæ, the concn. is possibly biologically significant. Aquatic invertebrates are rich in thiamin. In summer, the biotin content of one lake water was approx.  $3 \times 10^{-3} \,\mu\text{g}$ , per l. W. McC. approx.  $3 \times 10^{-3} \mu g$ . per l.

Thiamin content of Canadian hard red spring wheat varieties .---See B., 1944, III, 26.

and four fungi. Production of thiamin by Actinomyces.—See A., 1944, III, 142.

Effect of thiamin and niacin on growth of Jack-pine seedlings.— See A., 1944, III, 155.

Urinary porphyrin excretion in cases of stomatitis of dietetic origin. R. Passmore, T. Sommerville, and M. Swaminathan (Indian J. Med. Res., 1940, 28, 113-115).—Porphyrin excretion in cases of vitamin-B2-complex deficiency was normal. S. E. M.

Oro-genital syndrome in avitaminosis. Effect of treatment with  $B_2$  (complex) vitamins. K. Mitra (*Indian Med. Gaz.*, 1943, 78, No. 7, *Reprint*, 20 pp.).—The clinical symptoms, angular stomatits, glossitis, and scrotal dermatosis, are cured or relieved by the administration of riboflavin or preps. rich in vitamin- $B_2$ . Nicotinic acid alone is of insignificant val. but acts as a suitable adjunct to H. G. R. riboflavin.

Natural occurrence of riboflavin deficiency in eyes of dogs .-- See A., 1944, III, 103.

Nicotinic acid content of tissues of monkeys fed on wheat, maize, and rice diets. M. Swaminathan (Indian J. Med. Res., 1940, 28, 91-99; cf. A., 1939, III, 288).--"Total" nicotinic acid was determined colorimetrically with CNBr and aniline, using norit instead of Pb acetate for decolorisation of the tissue extracts (made with hot dil. HCl). The pH optimum of the reaction is 7—9, not influenced by the presence of buffer and inorg. salts. "Free" nicotinic acid or amide was separated from "bound" nicotinic acid (present in " Free " co-enzyme) by pptn. of the latter with alcohol or acetone. "Free nicotinic acid was determined directly in the filtrate, "bound" nicotinic acid in the ppt. after hydrolysis with HCl. The nicotinic acid contents of liver, muscle, and brain of monkeys fed on whole maize diets were lower than those of monkeys fed on whole wheat, but higher than on milled rice. Nicotinic acid is, therefore, no less "available" in maize than in rice. S. E. M.

N-Methylnicotinamide, a metabolite of nicotinic acid in the urine. Methylation of nicotinamide by rat's liver in vitro .- See A., 1944, III, 130.

Synthesis of pyridoxine by a "pyridoxineless" X-ray mutant of Neurospora sitophila. J. L. Stokes, J. W. Foster, and C. R. Wood-ward, jun. (Arch. Biochem., 1943, 2, 235—245; cf. Beadle and Tatum, A., 1942, III, 267).—The mutant, which does not grow in a medium containing NH<sub>4</sub> tartrate as N source unless pyridoxine is added more according to a down begins a converted account of pyridoxine is added, grows normally and synthesises normal amounts of pyridoxine if NH4-N is supplied as N source and the pH is adjusted to 5.8-7.3 (max. growth at 6.2-7.3). Aneurin largely, but not complately, replaces pyridoxine in the nutrition of the mutant. The mutant, and also the parent organism, require biotin for growth. W. McC.

Experimental temperatures and B-vitamin requirements : riboflavin and pyridoxine. C. A. Mills (Arch. Biochem., 1943, 2, 159– 162; cf. A., 1943, III, 498).—At  $90-91^{\circ}$  F. and 70% R.H., the pyridoxine (2—4 mg. per kg. of food), riboflavin, inositol, and *p*-aminobenzoic acid requirements of rats are approx. the same as at 68° F., but at the lower temp. approx. 33% more food is con-sumed than at the higher. The nicotinic acid requirement for the cure of canine blacktory is approx. cure of canine blacktongue is approx. the same at both temp. Hence requirements of *B*-vitamins for growth and health are the same at both temp. except that, at the higher temp., the aneurin requirement is doubled and that of choline increased 7-fold.

W. McC Effect of pyridoxine and other B vitamins on production of liver cancer with p-dimethylaminoazobenzene.-See A., 1944, III, 119.

Vitamin activity of  $\gamma$ -hydroxypropylamide of  $\alpha\gamma$ -dihydroxy- $\beta\beta$ -diwhat activity of  $\gamma$ -nydroxypropylamide of  $\alpha\gamma$ -dihydroxy- $\beta\beta$ -ar-methylbutyric acid and other derivatives of pantothenic acid. H. Pfaltz (Z. Vitaminforsch., 1943, 13, 236-249).—Daily oral adminis-tration of 100  $\mu$ g. of pantothenic acid is effective in the prevention of achromotrichia of black rats.  $\alpha\gamma$ -Dihydroxy- $\beta\beta$ -dimethyl-butyr- $\gamma'$ -hydroxypropylamide is as effective as pantothenic acid both orally and percutaneously. The corresponding  $\gamma'$ -hydroxy- $\alpha'$ -methylpropylamide is only slightly active, and the  $\beta'$ -hydroxyethyl-amide and  $\gamma$ -aminobutyric acid derivatives are inactive. P. G. M. amide and y-aminobutyric acid derivatives are inactive. P. G. M.

Nature of *Eimeria nieschulzi* growth-promoting potency of feeding stuffs. III. Pantothenic acid. Nutritional requirements of *Colpoda* duodenaria.—See A., 1944, III, 143.

Oxidation of p-aminobenzoic and anthranilic acids by specifically adapted enzymes of a soil bacillus.-See A., 1944, III, 145.

Value of biotin, folic acid concentrate, and liver extract in the diet of rats fed with succinylsulphathiazole. B. Ransone and C. A. Elvehjem (J. Biol. Chem., 1943, 151, 109-115).—Liver extract and a folic acid concentrate, fed at levels equal in terms of Streptococcus lactis activity, were approx. equal in their power to counteract the effects (decreased growth rate and leucopenia) of sulphasuxidine. The potency of the folic acid concentrate was not affected by autoclaving at neutrality, but autoclaving in acid destroyed it. Biotin

given with the folic acid concentrate or liver extract increased the growth rate; xanthopterin with biotin did not. E. C. W.

Existence of specific dietary essentials for the guinea-pig. G. J. Mannering, M. D. Cannon, H. V. Barki, C. A. Elvchjem, and E. B. Hart (J. Biol. Chem., 1943, 151, 101–107).—In addition to two factors present in linseed oil meal (cf. Woolley, A., 1942, III, 703) a third factor is needed, present in spray-dried grass juice and in the fraction of aq. liver extract pptd. by 70% alcohol and solubilised by enzyme action. This factor is destroyed by autoclaving with acid but not with alkali. Aëration has little effect, and the factor could not be extracted with ether. It is probably not, however, identical with folic acid. E. C. W.

Vitamin-C and its importance in illness of gastro-intestinal tract. W. Bloch (Z. Vitaminforsch., 1943, 13, 111-139).—Nearly 500 determinations of ascorbic acid in patients with gastro-intestinal disturbance show that there is no deficiency of vitamin-C, but it is essential that the diets should contain adequate amounts of -C. A deficiency over a long period of time is dangerous. -C has no sp. effect on illnesses of the stomach or intestine but it acts as a general tonic and favours the healing processes. J. N. A.

Optimum requirements of vitamin-C of persons living on a Bengali diet. N. M. Basu and G. K. Ray (Indian J. Med. Res., 1940, 28, 133-143).—Optimum requirement was determined by giving large doses of vitamin-C till saturation was reached, then reducing the dose to 25-50 mg. per day so that approx. 30% was excreted. This dose plus -C present in the diet is the optimum requirement. The actual daily requirement was 44 mg., the daily intake necessary to keep this level was 66 mg. S. E. M.

Normal human requirements for ascorbic acid and certain of its metabolic relationships. H. J. Purinton and C. Schuck [with M. K. Ade, A. Cole, P. H. Schmeidicke, and S. J. Miller] (J. Nutrition, 1943, 26, 509—518).—A requirement of more than 100 mg. daily (determined by the saturation test dose administered intravenously) was obtained for subjects under 25 years whereas for women between 25 and 50 years the val. was less than 100 mg. The ascorbic acid requirement is related to the basal metabolic rate. A correlation exists between the hæmoglobin in the blood and the ascorbic acid content of the plasma and between the ascorbic acid retention and citric acid excretion. H. G. R.

Ascorbic acid requirements of school-age girls. V. M. Roberts, M. H. Brookes, L. J. Roberts, P. Koch, and P. Shelby (*J. Nutrition*, 1943, 26, 539-547).—62-72 mg. of ascorbic acid is an adequate allowance for girls of 6—12 years when blood levels of 0.7 mg. per 100 c.c. and the excretion of 50% of a 300-mg. test dose in 24 hr. are used as criteria of a satisfactory state of nutrition. H. G. R.

Vitamin-C requirements of sick children. P. Rohmer, N. Bezssonoff, and R. Sacrez (Z. Vitaminforsch., 1943, 13, 18-36).—The c.s.f. of a healthy child contains approx. 7.5 mg.-% of vitamin-C. Seven children with whooping cough and one with pleurisy required 10-25 mg. of -C per kg. per day to maintain the -C content of the c.s.f. at its normal level. When the kidneys eliminate at least 40% of the ingested -C, the level of the c.s.f. is maintained at its normal val., whilst a decrease in the amount of -C in the c.s.f. always corresponds to a decrease in the amount of -C excreted in the urine.

I. N. A.

Assessment of vitamin-C nutrition in man. F. T. G. Prunty and C. C. N. Vass (*Biochem. J.*, 1943, 37, 623-629).—The plasmaascorbic acid level in man is a satisfactory index of the nutritional state with respect to the vitamin, provided that the subject has not been subjected to a higher level of intake during the previous 30 days. The saturation level is 0.8 mg. compared with an adequate nutritional level of 0.4 mg. per 100 c.c. A daily intake of at least 70 mg. is probably required to maintain the latter, and 100 mg. the former, level. P. G. M.

Effect of cestradiol on urinary excretion of ascorbic acid in dog.— See A., 1944, III, 109.

Decomposition of vitamin-C by bacteria.—See A., 1944, III, 146.

Vitamin-C content of Mexican vegetables. F. Giral and C. S. Alvarez (*Ciencia*, 1943, 4, 66-69).—Ascorbic and dehydroascorbic acids are determined for a no. of species. F. R. G.

Vitamin-C content of fresh and dried vegetables.—See B., 1944, 111 29.

Variations in ascorbic acid content of cow peas at different times of day.—See A., 1944, III, 154.

Calcium and phosphorus metabolism in the chick. II. Relative antirachitic effectiveness of vitamin- $D_2$  and  $-D_3$  and dihydrotachysterol administered parenterally. E. W. McChesney (J. Nutrition, 1943, 26, 487-498; cf. A., 1944, III, 42).—The weekly requirements of the chick of vitamin- $D_3$ ,  $-D_2$ , and dihydrotachysterol are 24, 850, and 6 units orally in corn oil, 9, 150, and 6 intramuscularly in propylene glycol, and 9, 110, and 10 intravenously.  $-D_3$  is somewhat better absorbed from the digestive tract than  $-D_2$ . H. G. R. Influence of vitamin-D and parathyroid hormone on healing of bone fractures.—See A., 1944, III, 92.

Vitamin-E in neurology. J. Couperus (Z. Vitaminforsch., 1943, 13, 193-207).—The tocopherol content of both normal human serum and that of neurological patients (Nov. to May) is 0.33-1:12 mg. per 100 c.c. Serum-tocopherol rises to a max. 6 hr. after oral administration of 300 mg. of dl-a-tocopherol acetate, and falls to normal in 24 hr., but free tocopherol does not appear in the serum after intramuscular injection. Neither c.s.f. nor urine contains tocopherol, and creatinuria is unaffected by its administration. The vitamin has no therapeutic effect on muscular dystrophy or amyotrophic sclerosis. P. G. M.

Activity of a-tocopherol against sterility and testicular degeneration in rats on vitamin-E-poor diets. C. Engel and L. H. Bretschneider (Z. Vitaminforsch., 1943, 13, 58–77).—dl-a-Tocopherol is active in preventing testicular degeneration caused by deficiency of vitamin-E, but it has no effect on fertility, and additional treatment with gonadotropic hormones is also unsuccessful. When administered prophylactically, dl-a-tocopherol may prevent sterility in male rats on -E-deficient diets, and 0.6 mg. daily maintains fertility in 90—100% of the animals and prevents loss in wt. of the testes. There are no differences between the wt. curves of normal and -E-deficient rats. J. N. A.

Effect of vitamin-E therapy on central nervous system in amyotrophic lateral sclerosis.—See A., 1944, III, 102.

Hæmophilia and blood-prothrombin content; vitamin-K determination and liver function test.—See A., 1944, III, 96.

See also Section XIX.

#### XIX.—METABOLISM, GENERAL AND SPECIAL.

Reactions of sodium sulphide with tissues. C. V. Smythe (Arch. Biochem., 1943, 2, 259–268).—The amount of  $O_2$  consumed by extracts and slices of rat's liver or kidney containing added Na<sub>2</sub>S is equal to, or greater than, the sum of the amounts consumed by the tissues and the aq. Na<sub>2</sub>S separately, much of the Na<sub>2</sub>S being converted into S, SO<sub>4</sub>", and polythionate. Na<sub>2</sub>S inhibits  $O_2$  consumption by slices of rat's brain and increases aerobic glycolysis. Anaerobic glycolysis of brain is inhibited also but much less readiy than is the respiration. Brain tissue inhibits oxidation of Na<sub>2</sub>S. W. McC.

**Production of eysteine from methionine by liver slices.** N. F. Floyd and G. Medes (*Arch. Biochem.*, 1943, 2, 135—141).—Liver pulp aërobically deaminates added methionine but does not affect its S content. Deamination and removal of S occur when liver slices are used, a small proportion of cysteine being produced at the same time. This proportion is not increased by adding serine, glycocyamine, or cysteinesulphinic acid. The slices produce much smaller proportions of cysteine from homocystine + choline, no cysteine being produced from homocysteine alone. W. McC.

Metabolism of ischæmic kidney. I. Respiration and oxidase activity.--See A., 1944, III, 116.

Lactation activity, chemical composition, and *in-vitro* metabolism of rat mammary tissue.—See A., 1944, III, 112.

Relation of food consumption, hypophysis, and adrenal cortex to serum-albumin metabolism in the rat.—See A., 1944, III, 108.

**Biological synthesis of purines and pyrimidines.** F. W. Barnes, jun., and R. Schoenheimer (*J. Biol. Chem.*, 1943, **151**, 123-139).--Rats and pigeons on an adequate diet were given about 15% of their total N intake in the form of either urea or NH<sub>4</sub> citrate marked with excess of radioactive <sup>18</sup>N. N fed as NH<sub>8</sub> was quickly incorporated into purines and pyrimidines of the internal organs and into urea and allantoin for excretion. The isotope levels of purines and pyrimidines were so alike as to suggest an identity of metabolic processes. NH<sub>8</sub> is probably a normal intermediate in the synthesis of both, and protein-N must be continually used for these purposes. The pigeon cannot utilise urea for purine synthesis, and neither arginine nor histidine is an intermediate; arginine is an essential amino-acid for bird nutrition. E. C. W.

Mercapturic acids. II. Formation of *l*-phenylmercapturic acid from phenyl-*l*-cysteine *in vivo*. S. H. Zbarsky and L. Young (*J. Biol. Chem.*, 1943, **151**, 217—219).—*l*-Phenylmercapturic acid, m.p.  $141-142^{\circ}$ ,  $[a]_{27}^{er}-22^{\circ}$  in EtOH, has been isolated from the urine of rats following the administration of phenyl-*l*-cysteine in the diet. In three instances the amounts were 30, 29, and 38% respectively of the phenyl-*l*-cysteine ingested. H. W.

Mercapturic acid synthesis in animals. XIII. Relationship between growth inhibition in rats by bromobenzene and mercapturic acid synthesis. J. A. Stekol (Arch. Biochem., 1943, 2, 151-157; cf. A., 1937, III, 173, 175).—Following administration of bromobenzene, the urinary excretion of p-bromophenylmercapturic acid by rats on a diet containing caseinogen as source of cysteine and methionine shows that the loss of wt. that results from ingestion of bromobenzene is due to inability to meet the demand for cysteine required to detoxicate the bromobenzene. When cystine is incorporated in the diet, lost wt. is regained although the rate of excretion of the mercapturic acid increases greatly. The results confirm the conclusions of White and Jackson (A., 1935, 1533). W. McC.

Glutamine as source of urinary ammonia.—See A., 1944, III, 117.

Nitrogen and fat metabolism in infants and children with pancreatic fibrosis.—See A., 1944, III, 113.

Antagonism of lipocaic to pituitary in fat metabolism.—See A., 1944, III, 108.

Influence of various organs on steroid metabolism.—See A., 1944, III, 110.

<sup>1</sup> Nature of hyaline material in the pancreatic islands in diabetes mellitus:—Sec A., 1944, III, 114.

Observations with <sup>32</sup>P of changes in acid-soluble phosphates in liver coincident with alterations in carbohydrate metabolism.—See A., 1944, III, 115.

A., 1944, III, 115. Phosphate exchange in resting cardiac muscle as indicated by radioactive studies. IV. R. F. Furchgott and E. Shorr [with G. Brewer] (J. Biol. Chem., 1943, 151, 65-86).—The uptake of radioactive  $PO_4^{('')}$  ( $PO_4^{('')}$ ) by the inorg.  $PO_4^{('')}$ , creatine- $PO_4^{('')}$ , and adenyl pyrophosphate fractions of dog cardiac muscle slices when exposed in vitro to  $*PO_4^{('')}$  is determined. Total tissue inorg.  $PO_4^{('')}$ consists of two fractions, viz., a readily diffusible (probably extracellular), and a poorly diffusible or "bound," fraction (probably intracellular). Extracellular  $PO_4^{('')}$  rapidly comes into equilibrium with \*PO<sub>4</sub>"' in the medium. The sp. activity of the intracellular is always considerably less than that of the extracellular  $PO_4^{('')}$ , and is independent, in part, on the extent of metabolism. At 2°, extracellular is exchanged directly with intracellular inorg.  $PO_4^{('')}$ , whilst the sp. activity of the labile  $PO_4^{('')}$  of the adenyl pyrophosphate fraction is 70-80% of this val. The adenyl pyrophosphate fraction, however, is only partly adenosine triphosphate. When the terminal  $PO_4^{('')}$ of the adenosine triphosphate is liberated by a Mg-free enzyme prep. from lobster muscle, it has the same sp. activity as that of creatine-  $PO_4^{('')}$  and intracellular inorg.  $PO_4^{('')}$ . That part of the adenyl pyrophosphate fraction that does not consist of adenosine triphosphate may be mainly adenosine diphosphate. The equality in the sp. activities of intracellular inorg.  $PO_4^{('')}$ , creatine- $PO_4^{('')}$  and intracellular inorg.  $PO_4^{('')}$ , creatine- $PO_4^{('')}$ , and intracellular inorg.  $PO_4^{('')}$ , creatine- $PO_4^{('')}$ , and intracellular inorg.  $PO_4^{('')}$ , creatine- $PO_4^{('')}$ , and iterminal  $PO_4^{('')}$  of adenosine triphosphate of excised cardiac muscle when incubated with  $*PO_4^{('')}$  agrees with modern concepts regarding the coupling of oxidation and phosphorylation in tissue.

J. N. A. Relation of endocrine system to regulation of calcium metabolism.— See A., 1944, III, 106.

Metabolism of acenaphthene in rats. L. H. Chang and L. Young (J. Biol. Chem., 1943, 151, 87-91).—When acenaphthene is administered orally to rats naphthalic anhydride is found in the urine. Since the 5-membered ring in acenaphthene undergoes fission in the rat and the acenaphthene structure forms an integral part of the cholanthrene mol., it is possible that the 5-membered ring of cholanthrene or methylcholanthrene undergoes fission in the animal body. J. N. A.

Fæcal excretion of polycyclic hydrocarbons following their administration to rats. L. H. Chang (J. Biol. Chem., 1943, 151, 93— 99).—After oral administration of naphthalene to rats, none of the hydrocarbon is present in the fæces. After ingestion of a diet containing 1% of the following hydrocarbons, the mean recoveries of the hydrocarbons from the fæces are : phenanthrene, acenaphthene 6, 3: 4-benzpyrene 42, methylcholanthrene 67, chrysene 79, anthracene 83, and 1: 2: 5: 6-dibenzanthracene 90%. When 0-1 g. of each hydrocarbon suspended in starch solution is administered by stomach tube, the amounts excreted in the fæces are in the same order, but slightly greater. J. N. A.

Urinary excretion of acid-decomposable hydrocarbon precursors following administration of polycyclic hydrocarbons.—Sce A., 1944, III, 120.

#### XX.—PHARMACOLOGY AND TOXICOLOGY.

Sulphanilamidoindazoles.—See A., 1944, II,

Histochemical method for demonstrating presence of sulphonamides in tissues. G. M. MacKee, F. Herrmann, R. L. Baer, and M. B. Sulzberger (*J. Lab. clin. Med.*, 1943, 28, 1642).—The tissue is fixed with formalin and tested with Ehrlich's p-dimethylaminobenzaldehyde reagent; sulphonamides give a yellow or orange stain. C. J. C. B.

Rapid method for determining the sulphonamide drug of choice. R. J. Atwell, R. P. Sexton, and M. A. Poston (*J. Lab. clin. Med.*, 1943, 28, 1620—1623).—The various biological fluids are grown in broth containing varying amounts of the different sulphonamides and the growth after 18 hr. is assessed. C. J. C. B. Adsorption of sulphanilamide, sulphathiazole, and p-aminobenzoic acid. M. Hartmann and J. Druey (*Schweiz. med. Wschr.*, 1943, 73, 558—560).—The adsorption of sulphathiazole on inorg. adsorbents at alkaline reaction is more marked than that of p-aminobenzoic acid; the position is reversed at acid pH. Sulphanilamide or sulphathiazole can replace p-aminobenzoic acid in adsorbates.

Methods of pharmacological evaluation of sulphanilamide and its derivatives. R. Meier (Schweiz. med. Wschr., 1943, 73, 560-563).--A discussion. A. S.

Development of therapy in medicine with sulphanilamide and its derivatives. R. Hegglin (Schweiz. med. Wschr., 1943, 73, 564– 567).—A review. A. S.

Sulphonamide therapy. O. Merkelbach (Schweiz. med. Wschr., 1943, 78, 662-667).—Crit. review of indication, contraindication, and complications of sulphonamide therapy. A. S.

Nomenclature and survey of sulphonamides in therapeutic use. J. Druey (Schweiz. med. Wschr., 1943, 73, 667-669). A. S.

Sulphonamide bibliography. O. Merkelbach (Schweiz. med. Wschr., 1943, 73, 670-684). A. S.

Effect of sulphonamides on cellular respiration. A. Fleisch, F. Nicod, and C. Reymond (*Helv. Physiol. Pharm. Acta*, 1943, 1, 275—286).—The  $O_2$  uptake of pulped rat's muscle, liver, or kidney is diminished at an alkaline and increased at an acid pH. Optimal vals. were obtained with pH 7-5 at the end of the experiment. Sulphathiazole and other sulphonamides depressed  $O_2$  consumption; the depressant effect of HCN is intensified by sulphonamides. The depressant action of HCN and of the sulphonamides is prevented by methylene-blue. A. S.

Status of oral use of sodium sulphonamides. Council on Pharmacy and Chemistry (J. Amer. Med. Assoc., 1943, 121, 1008).—Evidence for the val. and safety of Na sulphonamides by mouth is incomplete. C. A. K.

Sulphathiazole and staphylococcus antitoxin in experimental staphylococcic infection. E. Steinfield, M. Brylawski, and C. B. Nash (*J. Lab. clin. Med.*, 1943, 28, 1544—1547).—Sulphathiazole given orally prolonged the life of mice infected with *Slaph. aweus* and prevented the occurrence of abscesses in most animals. The mean survival time of animals treated with sulphathiazole was 13 days. The mean survival time of those treated with serum only was 6.5 days, which was the same as in controls. C. J. C. B.

Therapy with sulphonamide compounds for patients with liver damage. O. L. Peterson, E. Deutsch, and M. Finland (Arch. int. Med., 1943, 72, 594-612).—13 patients with acute hepatitis, 14 with portal cirrhosis, 5 with biliary cirrhosis, 4 with liver damage following chronic congestive cardiac failure, and 1 with diffuse carcinomatosis were treated with sulphonamide because of pyogenic infections; the average total dose of sulphathiazole or sulphadiazine was 44 g.; those treated with both drugs received an average total of 56 g. Several tests of hepatic function (hippuric acid, bromsulphalein, prothrombin tests; urinary urobilinogen and bile) were made before and after chemotherapy. In the patients with acute hepatitis associated with bacterial infections, chemotherapy invariably improved liver function parallel with the improvement of the underlying infection. Hepatic dysfunction was not aggravated by chemotherapy in patients with chronic liver damage; there was some improvement in cases in which bacterial infection was adding to the hepatic injury. Severe toxic effects of chemotherapy other than direct injury to the liver were unusually frequent in patients with portal cirrhosis (twice as common after sulphathiazole as after sulphadiazine). Sulphadiazine is the drug of choice in bacterial infection of patients with liver damage. A. S.

Dosage and tolerance of sulphonamides in advanced age. A. L. Vischer (Schweiz. med. Wschr., 1943, 78, 647-649).-10 out of 39 patients over 60 years, treated with full doses of sulphathiazole, developed drug rashes. Circulatory and cardiac disturbances were not affected by the chemotherapy. A. S.

Sulphapyridine in malignant leukopenia. R. Heilig and S. K. Visveswar (J. Amer. Med. Assoc., 1943, 122, 591-594).-2 patients with very toxic urinary tract infections showed signs of malignant granulocytopenia (total white counts, 2600 and 1800 cells per cu. mm. with 4% and 18% of neutrophils). Both cases responded well to small doses of sulphapyridine. C. A. K.

Massive sulphadiazine dosage in subacute bacterial endocarditis. E. Hull, R. H. Bayley, and A. B. Holoubek (J. Amer. Med. Assoc., 1943, 122, 928—930).—4 patients with subacute bacterial endocarditis were given massive intravenous sulphadiazine therapy (30-40 g.). Gross hæmaturia occurred in all 4 cases, and 3 patients died, 1 with anuria. The 4th patient still had a positive blood culture. C. A. K.

Streptococcus viridans endocarditis and chemotherapy. G. Bickel (Schweiz. med. Wschr., 1943, 78, 580-583).—3 out of 15 patients suffering from S. viridans endocarditis were cured with sulpha-thiazole. Daily doses of 8 g. (for 4-5 days up to 12 g.) up to a total dose of 800-1200 g. in 6-8 months were given under strict

urinary and blood control. In the patients considered cured there was no recurrence 2, 19, and 22 months after discontinuing treatment. A. S.

Sulphonamide therapy in tonsillitis and complications (polyarthritis, nephritis). O. Gsell (Schweiz. med. Wschr., 1943, 73, 623—627).— The results of chemotherapy in cases of acute tonsillitis, Vincent's angina, infectious mononucleosis, malignant diphtheria, agranulocytic tonsillitis, post-tonsillitic lymphadenitis and septicarnia, rheumatic polyarthritis, and glomerulonephritis are discussed. 6 out of 45 patients with acute tonsillitis responding well to chemotherapy developed relapses within 4—10 days after body temp. had returned to normal; these relapses did nor respond well to renewed chemotherapy. A. S.

Experimental Clostridium welchii infection. I. Oral sulphonamide therapy (sulphanilamide, sulphapyridine, sulphathiazole, and sulphadiazine). L. R. Hac and M. L. Eilert (J. Infect. Dis., 1943, 78, 167—172).—The drugs were administered to mice in a wet drug-diet fed for 4 days before and 7 days after intramuscular inculation of diluted culture, the resulting blood levels being 11—20 mg.-%. Sulphadiazine gave a survival rate of 94%, sulphathiazole 83%, sulphapyridine 47%, and sulphanilamide 27%, compared with 13% in the untreated controls. F. S.

Statistical analysis of chemotherapy results in pneumonia. R. Staehelin (Schweiz. med. Wschr., 1943, 73, 549-552).—The mortality rate of lobar pneumonia in the years 1898 to 1939 was 23%, that during 1940—1942 13.5%. The corresponding figures in cases of bronchopneumonia are 33.1% and 11.1%. A. S.

Effect of chemotherapy on mortality from pneumonia in Glasgow. T. Anderson (*Brit. Med. J.*, 1943, II, 779-780).—Deaths from pneumonia have decreased from 29·1% in 1922—1938 to 20·5% in 1939—1941. Figures are presented, suggesting that sulphonamides are less effective in the treatment of pneumonia at the extremes of life. I. C.

Treatment of pneumococcal pneumonia with sulphapyrazine. J. M. Ruegsegger, N. L. Brookens, M. Hamburger, jun., and E. S. Grupen (Amer. J. med. Sci., 1943, 206, 323-327).—This drug is effective in the treatment of pneumococcal pneumonia; the mortality in 105 cases was 4%. The mortality among the 24 bacteræmic cases was 17%. Evidence of transient renal damage was found in 9% of the patients treated with 1 g. every 4 hr. 1 morbilliform rash and 1 instance of nausea and vomiting were attributed to sulphapyrazine. C. J. C. B.

Therapy of pneumonia with sulphanilamide and its derivatives. W. Löffler (Schweiz. med. Wschr., 1943, 73, 567-575).—The mortality rate of pneumonia during 1934-38 was 35%, from 1938 to January 1943 5·8%. Body temp. returned to normal within 72 hr. in 86·2% of 359 patients treated with sulphapyridine and in 62·1% of 121 patients under sulphathiazole. Parallel with the disappearance of fever was the return to normal of heart and respiratory rates, a decrease in the leucocytosis, reappearance of cosinophils, and a lymphocytosis. The disappearance of the pneumonic infiltration in the period up to 1938 took 1 week in 8·3, 2-3 weeks in 62·0, 4 weeks in 19·7, and more than 4 weeks in 10·0% of the cases; the corresponding figures after 1938 are 16·1, 73·1, 2·1, 8·7%. The increase in urinary NaCl excretion occurs as usual about the 12th day and antibody formation about the 7th—8th day. 4 preps. are recommended in order of anti-pneumonic efficacy: sulphapyridine, sulphathiazole, sulphadiazine, dimethylbenzoylsulphanilamide (Irgafen). If there is no response within 72 hr., the prep. should be changed and type-sp. serum therapy commenced. Recurrences are more frequent under chemotherapy. 119 out of 703 patients did not respond to chemotherapy (fever after 96 hr. or death after 48 hr. of full treatment); 36 patients suffered from other than pneumococcal pneumonia; chemoresistance of the pneumococci was suspected in 15 cases and proved *in vitro* in 6. 21 patients developed anuria, drug fever and rashes, agranulocytosis, or innenkörper anæmia. A. S.

Chemotherapy of pneumonias. L. Michaud (Schweiz. med. Wschr., 1943, 73, 575-580).—The effective blood concn. of dimethylbenzoylsulphanilamide (5-10 mg.-%) can be maintained with a daily oral dose of 2 g., following an initial dose of 3 g. (total dose 8 g.). The problems of pneumonia chemotherapy are reviewed. A. S.

Sulphadiazine in respiratory tract infections. H. A. Rusk and A. C. van Ravenswaay (J. Amer. Med. Assoc., 1943, 122, 495– 496).--15% of 317 patients with early respiratory tract infections developed atypical pneumonia after sulphadiazine administration, as compared with 14% of 314 patients who were given aspirin, phenacetin, and caffeine. Duration of fever and stay in hospital were similar in the 2 groups. C. A. K.

Comparative activity of sulphonamides against Klebsiella pneumoniæ (Friedländer's bacillus). C. L. Sesler and L. H. Schmidt (J. Pharm. Exp. Ther., 1943, 79, 117-126).—Sulphapyrazine and sulphadiazine were much more effective against experimental infections of mice with 4 strains of Kl. pneumoniæ than sulphapyridine, sulphathiazole, or sulphanilamide. In vitro, in beef heart broth containing neopeptone 2%, NaCl 0.5%, and defibrinated rabbit blood 2%, at pH 7.8, sulphathiazole was the most effective; sulphapyrazine, sulphadiazine, and sulphapyridine had approx. equal antibacterial action, and sulphanilamide was the least effective. In the synthetic medium of Sahyun with 0.1% of added casein hydrolysate at pH 7.6, sulphathiazole, sulphadiazine, and sulphapyrazine were the most active, sulphapyridine was less, and sulphanilamide the least active. G. P.

Clinical and bacteriological investigations of pneumococcal sulphanilamide resistance. A. Grumbach and R. Hegglin (Schweiz. med. Wschr., 1942, 72, 1369—1376).—62 strains of pneumococci were isolated from 36 patients. There was in all cases close agreement between clinical course of the pneumonia and *in-vitro* sensitivity to various sulphanilamide derivatives. There was close parallelism between increase in virulence of a strain and its increase in chemosensitivity; diminution of virulence increased the resistance of the strain to chemotherapy. A. S.

Sulphonamides in pneumococcal meningitis. H. L. Hodes, M. H. D. Smith, and H. J. Ickes (J. Amer. Med. Assoc., 1943, 121, 1334--1337).--60 patients with pneumococcal meningitis were treated with sulphapyridine (chiefly), sulphathiazole, sulphadiazine, and sulphapyrazine. 25 (42%) recovered, including 22% of those below 2 years old and 64% of those above 2 years old. Some cases also received intravenous serum, but its val. was not apparent.

C. A. K.

Chemotherapy of meningitis in adults. W. Pulver (Schweiz. med. Wschr., 1943, 73, 583-587).—The mortality rate of 74 patients, suffering from meningococcal meningitis treated with sulphapyridine (3) and sulphathiazole (71) was  $3\cdot 8\%$ , compared with 50% after serum therapy. Serum is recommended in those cases which do not respond to chemotherapy. The daily dose is 6-9 g. (in very severe cases), up to a total dose of 30-40 g. 1 patient with staphylococcal meningitis was successfully treated with intravenous and oral doses of soluseptasine. The problem of intrathecal administration of sulphonamides is discussed. A. S.

**Chemotherapy of meningitis in children.** E. Glanzmann (Schweiz. med. Wschr., 1943, 73, 587—590).—The mortality rate of children suffering from meningococcal meningitis and treated with sulphapyridine or sulphathiazole was 8 out of 20 infants between 3 weeks and 6 months, 6 out of 36 children between 1 and 6 years, and 1 out of 10 above 6 years. 10—20 c.c. of meningococcal serum are injected intramuscularly within the first 48 hr. A. S.

Use of sulphonamides in pædiatrics (except meningitis). G. Fanconi (Schweiz, med. Wschr., 1943, 73, 590-601).—The mortality rate of children suffering from pneumonia before chemotherapy was  $16\cdot3\%$  (1113 cases) and  $3\cdot9\%$  after the use of sulphapyridine or sulphathiazole (446 children). The occurrence of empyema in the first period was  $8\cdot2\%$  (mortality rate of  $41\cdot3\%$ ), after chemotherapy  $3\cdot1\%$  (mortality 14:3%). The mortality rate of pertussis pneumonia decreased from 19.6 to  $2\cdot2\%$ . The mortality rate of primary bronchopneumonia developing into pyopneumothorax fell from 25 to 10%, that of erysipelas in newborn infants from 50% to nil. Experiences in chemotherapy of pyodermias, infections of the urinary tract, vulvovaginitis, intestinal infections, actinomycosis, and lipoid nephrosis are discussed. The mode of administration of the drugs in children and untoward side actions are reviewed.

A. S. Sulphathiazole in pyuria of newborn. A. Florman and M. H. Bass (J. Amer. Med. Assoc., 1943, 122, 656-658).-3 successful cases are reported. C. A. K.

Sulphonamide treatment of urinary infections. E. Wildbolz (Schweiz. med. Wschr., 1943, 73, 639-644).—Sulphathiazole administration was unsuccessful in 3 out of 33 cases of acute inflammatory processes of the urinary tract, and in 75 out of 124 cases of urinary infection complicated by irreversible anatomical changes (e.g., prostatic hypertrophy or carcinoma, urolithiasis). A. S.

Use of sulphonamides in obstetrics and gynæcology, excepting gonorrhæa. T. Koller (Schweiz. med. Wschr., 1943, 73, 612-619).--A review. A. S.

Sulphadiazine prophylaxis in scarlet fever epidemic. R. F. Watson, F. F. Schwentker, J. E. Fetherston, and S. Rothbard (J. Amer. Med. Assoc., 1943, 122, 730-733).—Sulphadiazine in prophylactic doses of 1 g. daily helped to control an epidemic of scarlet fever due to group A type 19 hæmolytic streptococci at a U.S. naval station. Among several thousand men treated there were no major toxic effects. The frequency of other respiratory complaints was reduced. C. A. K.

Sulphathiazole prophylaxis for gonorrheea. J. A. Loveless and W. Denton (J. Amer. Med. Assoc., 1943, 121, 827–828).—During a 5-month period 1400 Negro troops were given 2 g. of sulphathiazole by mouth before leaving camp on pass for the evening. On return 2-4 g. more were given. The incidence of gonorrheea fell from 171 per 1000 yearly to 8 per 1000 and the chancroid rate fell from 52 per 1000 yearly to 6 per 1000. No toxic or allergic reactions were seen. C. A. K.

Sulphathiazole in chronic gonorrhœa in women. H. Strauss and I. Grunstein (J. Amer. Med. Assoc., 1943, 121, 1187-1190).-488 prostitutes with chronic gonorrhœa were treated with sulphathiazole, using 3 different schemes of dosage. 4 g. of sulphathiazole daily for 1 week gave an apparent cure rate of 95%. C. A. K.

Chemotherapy of male gonorrhœa. G. Miescher (Schweiz. med. Wschr., 1943, 73, 633-637).-A cure of acute male gonorrhœa in 90% of all cases was obtained with sulphathiazole  $(5 \times 1.0 \text{ g, per day}, 2-3 \text{ days})$ ; optimal results were seen when treatment was commenced in the beginning of the 2nd week of the infection. 48 out of 49 patients suffering from gonorrheic prostatitis and epididymitis were cured by one course of treatment. A. S.

Chemotherapy of gonorrhœa in women. E. Held (Schweiz. med. Wschr., 1943, 73, 637-639).—The results of sulphathiazole therapy (5.0 g. per day, per 4 days) in the treatment of female gonorrhœa are excellent. Local treatment was not given. A. S.

Penicillin in sulphonamide-resistant gonorrhœa. W. E. Herrell, E. N. Cook, and L. Thompson (J. Amer. Med. Assoc., 1943, 122, 289-292).—The in-vitro antibacterial action of penicillin against several strains of gonococci from sulphonamide-resistant patients inhibited the growth of organisms in a few hr. 3 sulphonamideresistant cases of gonorrhœa were successfully treated with peni-cillin. C. A. K.

Sulphathiazole and immune serum in typhoid fever. R. J. Hoag-land (J. Amer. Med. Assoc., 1943, 122, 653-656).—The administration of sulphathiazole or immune serum from previously inoculated persons had no effect on the clinical course, complications, mortality rate, or occurrence of carrier state in 59 patients with typhoid fever. C. A. K.

C. A. K. Sulphaguanidine and succinylsulphathiazole in acute bacillary dysentery (Flexner). C. J. Smyth, M. B. Finkelstein, S. E. Gould, T. M. Koppa, and F. S. Leeder (J. Amer. Med. Assoc., 1943, 121, 1325—1330).—Of 28 patients with acute bacillary dysentery (Flex-ner) 6 were given no sulphonamides; 4 of this group died. 10 were given sulphaguanidine; 8 recoyered rapidly, 1 died, and 1 was not improved till succinylsulphathiazole was given. 14 cases (including 1 from each of the above groups) were given succinyl-sulphathiazole; 1 patient died, but 11 cases responded rapidly. In 14 cases in which the stools were examined daily cultures became sterile in 12 after 3 days. Toxic symptoms were slight with both drugs but more marked with sulphaguanidine. Crystalluria occurred in 6 of the 10 patients who had sulphaguanidine, even though the the 14 patients who had succinylsulphathiazole, even though the latter had blood concns. usually below 1 mg.-%. C. A. K.

Prophylactic sulphaguanidine in bachlary dysentery. J. G. Soute (J. Amer. Med. Assoc., 1943, 122, 588-591).—A rapidly progressing epidemic of bacillary dysentery (Sonne) in a school for mentally defective children was abruptly stopped by oral administration of 0.5 g. of sulphaguanidine 3 times a day to all those not previously affected. There were no toxic effects. C. A. K. Prophylactic sulphaguanidine in bacillary dysentery: J. C. Scott

Succinylsulphathiazole in bacillary dysentery. T. L. Roberts and W. B. Daniels (J. Amer. Med. Assoc., 1943, 122, 651-653).-Succinylsulphathiazole had no effect on the clinical course in 89 of 225 soldiers with dysentery due to Shigella paradysenteriæ Boyd-88. This may have been due to the short course of the disease (4 days). The carrier rate was 2.6% in drug-treated and 18.2% in untreated C. A. K. cases.

Sulphaguanidine treatment of Shiga dysentery in New Guinea. J. J. Gard (Med. J. Austral., 1943, II, 188-190).-25 cases were treated satisfactorily with an average total dose of 152 g. given in an average of 13.5 days. F. S.

Bacterial contamination in sulphonamide ointments. C. V. Fisher, N. J. Accousti, and M. R. Thompson (J. Amer. Med. Assoc., 1943, 122, 855-858).—Experimental contamination of sulphonamide ointments (5%) with Staph. aureus, Strept. hamolyticus, Cl. tetani, or Cl. welchii was antagonised by inclusion of various oxidising agents in the oitments. Urea peroxide, up to 1%, was the most C. A. K. satisfactory.

Local application of sulphanilamide powder in radiotherapy. A. A. Charteris (*Brit. Med. J.*, 1943, II, 577-578).---Usefulness of acridine compounds and sulphanilamide powder is described.

Use of sulphathiazole in dental surgery. W. Hess (Schweiz. mcd. Wschr., 1943, 73, 649-653).-Iontophoresis of Na sulphathiazole in 20% solution into teeth produces therapeutically potent drug concns. in the root and bone. Oral administration of sulphathiazole is recommended in paradental abscesses, osteomyclitis, gingivitis, or stomatitis ulcerosa. Local application to dental wounds of Na sulphathiazole (20%) was beneficial. A. S.

Sulphonamides and purulent peritonitis. R. F. Mathers (Med. J. Austral., 1943, II, 85-87).—The intraperitoneal application of sulphanilamide was effective in 12 cases in which the peritoneum had been infected. F. S.

Intraperitoneal and rectal chemotherapy. A. Jentzer and A. Calame (Schweiz. med. Wschr., 1943, 73, 601-604).-Intraperitoneal

administration of prontosil powder or sulphathiazole solutions produced numerous adhesions in rabbits. There is a quick rise in blood-sulphathiazole concn., due to rapid absorption of the drug from the peritoneum. Neutralised sulphathiazole solutions are better absorbed from the rectum than alkaline preps. Irgamid is readily absorbed after rectal administration. A. S.

Effect of sulphathiazole on perforated acute appendicitis in children. M. Grob (Schweiz. med. Wschr., 1943, 73, 604-606).—In a pre-ceding period 104 out of 640 children with perforated acute appendiceding period 104 out of 640 children with perforated acute appendi-citis died (16·1%). After intraperitoneal administration of a sulphathiazole-boric acid powder (2·5—15·0 g. of the prep. = 0·5—3·0 g. of sulphathiazole) and oral chemotherapy the mortality rate decreased to 1·6%. 59% of these children had an eventless recovery within 3—4 days (previously 30·9%). Severe complic-ations (e.g., subphrenic abscesses) occurred in 4·8% (previously 20%), all of which were cured. Mechanical ileus was observed in 15·2% of the cases. There was no correlation between bacterio-logical findings and clinical course in 69 cases examined. A. S.

Chemotherapy (sulphonamides) in dermatology. P. Robert (Schweiz. med. Wschr., 1943, 73, 627-632). 4 out of 200 subjects who had never been treated with sulphathiazole showed marked skin hypersensitivity to local application of a sulphathiazole ointment. A. S.

Sulphathiazole rash and fever. G. Miescher (Schweiz. med. Wschr., 1943, 73, 521—530).—Erythema nodosum-like skin changes were observed in patients treated with sulphathiazole; the other sulphonamides never produce this eruption, but drug rashes of the scarlet, urticaria, or morbilli type. The sulphathiazole erythema may disappear even if chemotherapy is continued; subsequent administration of other drugs of the sulphonamide group does not produce erythema; there is no blood eosinophilia. There is a superficial and a deep type; the first type shows in the middle and upper parts of the cutis a dense zone of infiltration with neutrophil leucocytes and their debris, involving the walls of the vessels; there was no necrosis; there were no lymphocytes or organisms in the initial phase. The "deep" type shows diffuse cedema at the border between cutis and subcutis and diffuse leucocytic infiltration of all tissues; they contain gravulation needule compilier of history to define they contain granulation nodules consisting of histiocytes and leucocytes, sometimes masses of giant cells; the histology resembles that of erythema nodosum. Another type of sulphathiazole dermatitis is an exudative eczema of the papulo-vesicular type localised in the face, arms, hands, and calves, beginning within 12 hr. of commencing chemotherapy. This type, as is the crythema nodosum, is accompanied by fever.

Prevention of renal obstruction in sulphadiazine therapy. C. L. Fox, O. J. Jensen, and G. H. Mudge (J. Amer. Med. Assoc., 1943, 121, 1147-1150). -- 2 patients with subacute bacterial endocarditis were given massive doses of sulphadiazine (up to 30 g. daily). Renal complications from excretion of the drug in the urine were prevented, in spite of free urinary drug concess. up to 788 mg.-%, by administration of 10—20 g. of NaHCO<sub>3</sub> daily; the urinary pH was kept above 7.5, and the free and acetylated forms of the drug remained in solution. C. A. K.

Toxic reactions following sulphonamides. H. F. Dowling and M. H. Lepper (J. Amer. Med. Assoc., 1943, 121, 1190-1194).-Toxic reactions occurred in 29.4% of 508 patients treated with sulphapyridine, 11.8% of 321 patients given sulphathiazole, and 7.7% of 660 patients given sulphadiazine. Details of the incidence C. A. K. of various toxic effects are given.

Effect of sulphonamides on blood platelets. R. R. Kracke and E. W. Townsend (J. Amer. Med. Assoc., 1943, 122, 168-172). -2 fatal cases of thrombocytopenic purpura, following 16 g. of sulphathiazole + 6 g. of sulphapyridine in 1 case, and 10 g. of sulphathiazole in the other, are reported. Daily platelet counts in 61 patients receiving sulphathiazole showed slight depression on the 1st day of treatment and increase when the days was the product. C. A. K. and increase when the drug was stopped.

Thrombocytopenic purpura following sulphathiazole and sulpha-diazine. R. W. Hurd and R. F. Jacox (J. Amer. Med. Assoc., 1943, 122, 296-298).-2 case reports. C. A. K.

Toxicity of paredrine-sulphathiazole suspension. M. C. O'Donnell (J. Amer. Med. Assoc., 1943, 122, 298) .- Intranasal application of paredrine-sulphathiazole suspension produced headache, nausea, C. A. K. vomiting, and chill with subnormal temp. in 2 cases.

Membranous pyelitis following sulphonamides. P. Adams (J. Amer. Med. Assoc., 1943, 122, 419-423).-In 2 cases a calcareous radiopaque membrane developed in the renal pelvis in association with a small ureteral calculus, which formed following administra-tion of sulphathiazole and sulphadiazine respectively. C. A. K.

Agranulocytosis following succinylsulphathiazole. S. A. M. John-son (J. Amer. Med. Assoc., 1943, 122, 668-689).—A fatal case of acute agranulocytosis followed administration of 159 g. of succinyl-sulphathiazole in 17 days. Blood-sulphathiazole levels were too C. A. K. low to be read.

Fatal bullous dermatitis following sulphadiazine. S. I. Greenberg and A. L. Messer (*J. Amer. Med. Assoc.*, 1943, **122**, 944).—Case report of patient who received 49 g. of sulphadiazine in 8 days. C. A. K.

Toxic effects of atabrine and sulphadiazine in growing rats. C. I. Wright and R. D. Lillie (U.S. Publ. Health Repts., 1943, 58, 1242— 1250).—Extremely heavy dosage of atabrine arrests growth and lowers food consumption in rats; the results are not prevented by riboflavin. At autopsy the rats show pigment cell infiltration of the intestinal mucosa, lymph nodes, spleen, and liver, interstitial and exudative monocytic pneumonia, focal myocarditis and myositis, and often portal thrombi and hepatic infarcts. A moderate splenic hæmosiderosis and a heavy non-ferrous pigmentation of the epithelium of renal glomeruli and medullary tubules are also present. With less, but still heavy, dosage of 30 mg. per kg. the changes are much diminished. Sulphadiazine, alone or in conjunction with atabrine, produces a late growth arrest but little pathological change. C. G. W.

Mechanism of action of chemotherapeutics. H. Staub (Schweiz. med. Wschr., 1943, 73, 552—558).—The literature with regard to the mode of action of atoxyl, salvarsan, tryparsamide, sulphonamides, pantothenic acid, salicylic acid, guanidine, and boric acid is discussed. A. S.

Carbarsone treatment for *B. coli* infections. M. D. Young and R. Burrows (U.S. Publ. Health Repts., 1943, 58, 1272-1273).— Carbarsone, in courses totalling either 5 or 10 g. in 10 days, was given to 6 cases of balantidiasis. After one or two such courses of treatment, the infections were eradicated as shown by repeated posttreatment examinations, some of which extended over a 4-year period. A seventh infection, which received less carbarsone than the other six, also disappeared. Carbarsone is effective in the treatment of *B. coli* infections. C. G. W.

Thiobismol in induced malaria. M. D. Young, S. B. McLendon, and R. G. Smarr (J. Amer. Med. Assoc., 1943, 122, 492-494).-- $0\cdot1-0\cdot2$  g. of thiobismol (Na Bi thioglycollate) inhibited P. vivax parasites when given 16-28 hr. after the last paroxysm, *i.e.*, when they were half grown. Older or younger parasites were not affected. In this way a quotidian fever (due to 2 broods of parasites) could be converted into a tertian, which is more suitable in neurosyphilitic patients. The drug had a general depressant but no selective action against P. malariæ and was ineffective against P. falciparum.

C. A. K.

Attempts to find new antimalarials.—See A., 1944, II, 56.

Antibacterial effects of quinones. W. D. Armstrong, W. W. Spink, and J. Kahnke (*Proc. Soc. Exp. Biol. Med.*, 1943, 53, 230—234).—Bactericidal and inhibiting effects of 13 quinones and quinols are tabulated and compared with those of sulphathiazole, phenol, 4-amino-2-methyl-1-naphthol, and penicillin. Several were much more active against strepto- than staphylo-coccus, and none was found to act on *E. coli*. In the staphylococcus tests 2-methyl-1: 4-naphthaquinone, 2: 6-dimethoxybenzoquinone, and the amino-naphthol were about equally effective and twice as active as 1: 4-naphthaquinone, but in the steptococcus tests 2: 6-dimethoxybenzoquinone, and the amino-naphthol were about equally effective and twice as active as 1: 4-naphthaquinone, but in the steptococcus tests 2: 6-dimethoxybenzoquinone stepto.

Chemical constitution and pharmacological action. V. J. W. (Trans. Faraday Soc., 1943, 37, 372-380).—The receptor theory is useful in considering the qual. relations of drug actions, but is less suitable for quant. work owing to vagueness of some conceptions involved. V. J. W.

Antagonism of drugs. J. H. Gaddum (*Trans. Faraday Soc.*, 1943, **39**, 323—332).—Antidotes act either by neutralisation or by competition. Reactions are discussed and compared with those taking place between enzyme and substrate. V. J. W.

Relations between *in-vivo* and *in-vitro* actions of chemotherapeutic agents. H. McIlwain (*Trans. Faraday Soc.*, 1943, 37, 359—366).— A review. *In-vitro* testing is held to be less likely to introduce errors than is testing on a host of a different species. V. J. W.

Phenomenon of "satellite zones" produced by Staphylococcus aureus on solid media. T. Packalén (Amer. J. Hyg., 1941, 33, B, 56-62).—Satellite hæmolytic zones are described as protruding or discrete circular areas surrounding the primary hæmolytic zone on blood agar plates inoculated with Staph. aureus. Experiments showed that hæmolysed blood, even when Seitz-filtered or dialysed for 3 days, and heated ascitic fluid, could be substituted for whole blood, and that various colloid substrates, e.g., tragacanth or coagulated serum, could be substituted for agar. Coagulated serum plates saturated with fresh serum showed satellite zones. The agent was present in Seitz filtrates from staphylococcal broth cultures incubated for 7 days in 20% CO<sub>2</sub>; it was thermostable, not identical with a- or  $\beta$ -staphylolysin, and resisted 2% phenol. Explanations for the phenomenon are discussed. B. C. H.

Method for investigation of action of antiseptics on growth of epithelial tissue. J. M. Robson (*J. Physiol.*, 1943, 102, 7<sup>p</sup>).— Brilliant-green and gentian-violet inhibit epithelial growth, acriflavine and proflavine have slight effect, sulphonamides none, on the æstrogen-stimulated vaginal epithelium of the mouse. The object is to assess their influence in repair processes (see also C., 1944, Part 1). W. H. N.

Effect of tyrothricin, gramicidin, and tyrocidine on culture of mammalian spleen. W. E. Herrell, D. Heilman, and R. P. Gage (*Amer. J. med. Sci.*, 1943, 206, 26-31).—The toxicity of the products of *B. brevis* is determined by their ability to inhibit the migration of macrophages from the normal rabbit's spleen in a medium composed of serum, plasma, and chick embryo extract; gramicidin was most toxic, tyrothricin next, and tyrocidine least toxic. The cytotoxicity of tyrothricin is mainly accounted for by its content of gramicidin. C. J. C. B.

Influence of sodium bisulphite on toxicity of adrenaline. R. K. Richards (J. Pharm. Exp. Ther., 1943, 79, 111–116).—The presence of NaHSO<sub>3</sub> (0·1–1·0%) in adrenaline solutions greatly increased their toxicity when injected subcutaneously or intramuscularly to rats, mice, rabbits, and dogs; the intravenous toxicity was unchanged. G. P.

Toxicology of fruits of Zanthoxylum acanthopodium, DC. K. N. Bagchi and H. D. Ganguly (Ann. Biochem. Exp. Med., 1943, 3, 35—38).—This Himalayan fruit contains a resinous substance which produces an intense tingling of the tongue due to an amide—possibly fagaramide. The fruit is not poisonous and contains no alkaloid or glucoside. P. C. W.

Pharmacology and toxicity of Alstonia alkaloids. P. Keogh and F. H. Shaw (Austral. J. Exp. Biol., 1943, 21, 183-186).—The actions of the mixed alkaloids of A. constricta on isolated animal intestine, uterus, heart, muscle, and circulation resemble those of quinine, as does their toxicity to mouse, rat, guinea-pig, cat, rabbit, and monkey. W. McC.

Action of carthamoidine. P. N. Harris, R. C. Anderson, and K. K. Chen (J. Pharm. Exp. Ther., 1943, 79, 133-135).—The median lethal dose of carthamoidine, an alkaloid of Senecio carthamoides, injected intravenously to mice, was  $68\cdot32\pm2\cdot44$  mg. per kg. It produced mainly periportal necrosis with hæmorrhages in the liver; it lowered the blood pressure of cats anæsthetised with ether, inhibited the isolated rabbit intestine, and stimulated the isolated guinea-pig uterus. G. P.

**Pharmacological actions of adenine-thiomethylpentose.** P. L. Ewing and F. Schlenk (*J. Pharm. Exp. Ther.*, 1943, **79**, 164—168).— Adenine-thiomethylpentose lowered the blood pressure of rabbits and caused relaxation of rabbit intestinal strips and contraction of isolated guinea-pig uterus; the first two effects were much weaker than, and the last effect was equal to, similar effects of adenosine. Adenosine deaminase did not attack adenine-thiomethylpentose. G. P.

Digitalis and some of its derivatives. H. Gold (Science, 1943, 97, 125-129, 150-153).—The nature of the action of digitalis and its glycosides is reviewed. E. R. R.

Comparison of pharmacological effects of somalin with those of related cardiac glucosides. R. Müller (*Helv. Physiol. Pharm. Acta*, 1943, 1, C88).—Somalin, obtained from the roots of *Adenium somalense*, Balf. fil., consists of digitoxigenin and cymarose, and is thus closely related to digitoxin and digilanid-*A*. The pharmacological effects of cardiac glucosides containing the same genin are similar. A. S.

Intramuscular quinidine in acute cardiac arrhythmias. M. I. Sturnick, J. E. F. Riseman, and E. L. Sagall (J. Amer. Med. Assoc., 1943, 121, 917—920).—A sol. prep. of quinidine suitable for intramuscular injection was made by adding antipyrine and urea to quinidine hydrochloride! It was successfully used in restoring normal rhythm in 5 cases of paroxysmal ventricular tachycardia, in 11 of 12 cases of auricular fibrillation, and in 3 cases of auricular tachycardia. It was ineffective in cases of nodal and sinoauricular tachycardia. There were no local reactions and no general toxic effects except mild diarrhœa in I case. The initial dose was 0.45—0.6 g, and in  $2\frac{1}{2}$  hr. C. A. K.

Digitalis in [heart failure with] normal rhythm. D. M. Lyon (Edinb. Med. J., 1943, 50, 746-753).—In 90% of 180 trials digitalis (both massive and "slow" methods of administration but in many cases short of full digitalisation) reduced the pulse rate, the reduction being proportional to the rate immediately before its administration (correlation coeff. 0.54). Initial ædema was present in only half the cases, but diuresis and clinical improvement were noted in the absence of any slowing of the pulse which was produced in all but 2 with an initial rate of over 90. H. S.

Phenothiazine as anthelmintic. W. N. Sisk (J. Amer. Med. Assoc., 1943, 122, 357-360).—Phenothiazine was effective in the treatment of threadworms in children and adults. Adult total dosage of 20-40 g. was too toxic but 12 g. was well tolerated though not quite so efficient. The drug had no effect on hookworm or trichuris infection and was of slight val. in ascaris infections when given in large doses. C. A. K. Use of phenanthridinium compound (No. 897) in treatment of Zebu cattle infected with Trypanosoma congolense. H. E. Hornby, S. A. Evans, and J. K. H. Wilde (J. comp. Path., 1943, 53, 269— 279).—Experience with Zebu cattle in Tanganyika naturally and experimentally infected with Tryp. congolense has shown that 7-amino-9-(p-aminophenyl)-10-methylphenanthridinium chloride is a valuable trypanocidal agent and can be given intramuscularly without serious local ill effects. A single intramuscular injection of 15 ml. of a 0.5% aq. solution per cwt. of body wt. may suffice : if relapse occurs the dose is repeated, followed, if necessary, by three intravenous injections (10 ml. of 1% aq. solution per cwt. body wt.) at weekly intervals. E. G. W.

Pharmacological properties of simple compounds of histamine with amino-acids. M. Rocha e Silva (J. Pharm. Exp. Ther., 1943, 77, 198-205).—Acetyldehydrophenylalanylhistamine, acetyl-dlphenylalanylhistamine, benzoyl-l-tyrosylhistamine, carbobenzyloxy-l-tyrosylhistamine, and carbobenzyloxy-l-leucylhistamine were synthesised. The histamine in these compounds is bound to the amino-acid residues by peptide bonds with carboxyl groups. All 5 compounds showed very slight or no pharmacological activity when tested on the blood pressure of the cat, on the isolated gut of the guinea-pig, on human skin, or on the intact guinea-pig; their hydrolysates, however, showed the characteristic effects of free histamine. These compounds are suggested as chemical models for bound histamine in tissues. (See also A., 1944, II, 83.)

Nitrous oxide anæsthesia. R. B. Gould (Brit. Med. J., 1943, II, 607-608).—The anæsthetic effect of  $N_2O$  is often produced only in the presence of anoxia.  $N_2O$  anæsthesia is therefore not so safe as supposed and its application should be limited. I. C.

Anæsthetic action of isopropenyl vinyl ether. J. C. Krantz, jun., C. J. Carr, A. G. Horney, and W. E. Evans, jun. (J. Pharm. Exp. Ther., 1943, 79, 179—185).—This ether (propethylene ether) has an anæsthetic potency by inhalation approx. equal to that of  $CHCl_3$ ; it was tested on the mouse, rat, dog, rhesus monkey, and on one man. A partial pressure of 4% of the ether in the inhalation mixture was necessary to induce surgical anæsthesia in mice. The anæsthetic index (ml. per kg. producing respiratory arrest/ml. per kg. producing surgical anæsthesia) of propethylene ether was 4·32 in dogs; the blood pressure of dogs decreased and blood-acetone increased during anæsthesia, but it had no effects on the e.c.g., on bromosulphalein liver-function test, on plasma-CO<sub>2</sub>-combining power, on blood-urea and blood-clotting time, or on the histological appearances of the organs of the test animals. The physical characteristics of propethylene ether are: b.p. 55°,  $d^{30}$  0·786, v.p.<sup>25</sup> 256 mm., solubility 0·4 ml. per 100 ml. of water at 25°. In acid solution propethylene ether decomposes into acetaldehyde and acetone. A mixture of 2% of the ethereal vapours with 98% of O<sub>2</sub> will explode if ignited.

G. P. Refrigeration anæsthesia in skin grafting. H. E. Mock (J. Amer. Med. Assoc., 1943, 122, 597—598).—Application of icebags to the skin for 2 hr. produced local anæsthesia in 27 cases adequate for taking skin grafts. C. A. K.

Nature of local anæsthesia. K. V. Thimann (Arch. Biochem., 1943, 2, 87-92).—The theory is advanced that the structures of the known local anæsthetics are of a general form resembling the structure of acetylcholine and that they compete with acetylcholine for the receptive substance at nerve endings. E. R. S.

Anæsthesia in severely wounded patients. H. K. Beecher (J. Amer. Med. Assoc., 1943, 121, 899-903).—For major operations on severely wounded patients ether is the best single agent, though intravenous barbiturates are useful for procedures up to  $\frac{1}{2}$  hr. Spinal anæsthesia is poorly tolerated. C. A. K.

Continuous caudal anæsthesia. R. C. Adams, J. S. Lundy, and T. H. Seldon (J. Amer. Med. Assoc., 1943, 122, 152-158).—Description of technique and discussion of advantages and disadvantages. C. A. K.

**Continuous caudal anæsthesia in obstetrics.** J. M. Siever and L. H. Mousel (J. Amer. Med. Assoc., 1943, 122, 424-426).—Continuous caudal anæsthesia was successfully used in 300 obstetric cases. Adrenaline should be added to the initial injection.

Continuous drip caudal anæsthesia in obstetrics. N. Block and M. Rotstein (J. Amer. Med. Assoc., 1943, 122, 582—586).—Caudal anæsthesia was produced in obstetric cases by continuous gravity procaine drip. Criteria for the extradural or intradural position of the needle are discussed. C. A. K.

Continuous administration of intravenous anæsthesia. F. W. Roberts and B. A. Sellick (*Brit. Med. J.*, 1943, II, 813-814).— Technical description of a new method. I. C.

Sciatic nerve injury from intramuscular injection of paraldehyde. F. G. Woodson (J. Amer. Med. Assoc., 1943, 121, 1343-1344).--2 cases are reported. C. A. K.

Recovery after 8 grams of barbiturates. C. J. France, M. Barnett, and F. F. Yonkman (J. Amer. Med. Assoc., 1943, 122, 173-174).-

A patient took 8 g. of a mixture of sol. pentobarbital and seconal. Recovery folowed administration of 0.477 g. of picrotoxin, 3 g. of septazol + caffeine with Na benzoate, plasma, and 5% glucosesaline. C. A. K.

Hydroindazolone derivatives as new analgesics. C. W. Picard, D. E. Seymour, and F. J. Dyer (*Quart. J. Pharm.*, 1943, 16, 264– 269; cf. A., 1944, II, 60).—I-Phenyl-2-methyltetrahydroindazolone is slightly more toxic (50%-lethal dose  $1\cdot 5\ \mu$ g. per g.) to rats and mice than is pyramidone. It does not produce convulsions, but is somewhat soporific. There are indications that after continued dosage the substance interferes with the blood picture. 2-Benzoyl-I-phenyltetrahydroindazolone is also without convulsive action. It is only slightly soporific and is much less toxic (50%-lethal dose approx. 5-0 mg. per g.) than is pyramidone or the 2-methyl compound. J. N. A.

New method for evaluation of drugs affecting the reaction of mice to pain stimulation. K. Kueter and R. K. Richards (*J. Lab. clin. Med.*, 1943, 28, 1585—1590).—The mice are stimulated through their feet in a closed box connected to a tambour. After control runs, the drug to be tested is given. C. J. C. B.

Relation of length of carbon chain to primary and functional toxicities of alcohols. H. Welch and G. G. Slocum (J. Lab. clin. Med., 1943, 28, 1440—1445).—Human and rat leucocytes are equally susceptible to the primary toxic action of the alcohols; the toxicity for the series ethyl alcohol to hexyl alcohol increases with mol. wt. approx. in the geometric progression  $1:3:3^2:3^3:3^4:3^3$ . The acute oral toxicity to rats of the first 4 primary alcohols increases with increase in mol. wt.; amyl, hexyl, and heptyl alcohols decrease in toxicity with increase in mol. wt. Rat leucocytes are more susceptible than human leucocytes to the primary toxic action of acid and neutral solutions of acetic acid and the chloroacetic acids. Aq. solutions of the four acids were toxic for leucocytes in approx. equimol. concns. Neutralised solutions of the 4 acids were toxic for leucocytes in the same concons. The acute oral toxicity to rats of acetic acid and the chloroacetic acids bears no relation to mol. wt., since monochloroacetic acids 40 times more toxic than the other members of the series. C. J. C. B.

Demerol (Pethidine). R. C. Batterman and C. K. Himmelsbach (J. Amer. Med. Assoc., 1943, 122, 222-226).—A review.

C. A. K.

Detoxicating effect of p-aminobenzoic acid [on drug actions]. S. Markees and V. Demole (*Helv. Physiol. Pharm. Acta*, 1943, 1, 241—247).—The mildly depressant effect on the central nervous system of subcutaneously given papaverine hydrochloride ( $0\cdot 1-0\cdot 15$  g. per kg.) is grossly potentiated by sulphapyridine ( $1\cdot 5-2\cdot 5$  g. per kg.); sulphathiazole ( $2\cdot 5$  g. per kg.), and sulphanilamide ( $1\cdot 5$  g. per kg.); the mice become comatose within 20—40 min., sometimes interspersed with tonic-clonic convulsions. There is a high mortality rate (up to 68%). This effect is almost completely prevented if, simultaneously with papaverine, Na p-aminobenzoate ( $1\cdot 25$  g. per kg.) is given. The sulphonamides did not potentiate the narcotic effects of morphine, narcotine, or cocaine, nor did p-aminobenzoic acid have any effect; there were also no changes in the effects of acetylcholine, atropine, BaCl<sub>2</sub>, or histamine on isolated organs in the presence of sulphonamides or p-aminobenzoic acid. The papaverine-potentiating effect was also produced by phenylalamine, leucine, proline, histidine, glycine, and di-iodotyrosine. A. S.

Anti-uranic substance—V-factor—which protects kidney from action of uranium and alters its excretion. F. Vacirca (Z. physiol. Chem., 1943, 278, 169—174).—U poisoning in rats and guinea-pigs (but not in rabbits) is counteracted by subcutaneous administration of formalin-treated filtrate from cultures of diphtheria bacilli (not cultures of tetanus bacilli). The administration of the filtrate is effective in the period 48 hr. before to 8 hr. after administration of U. Sometimes increased resistance to U conferred by the filtrate persists for 15—20 days. The filtrate increases the rate of urinary excretion of U and decreases its rate of accumulation in the kidney. Within limits, there is direct proportionality between the amount of filtrate and the dose of U counteracted. The action of the filtrate is counteracted by administering diuretics and anti-diuretics. The urine of treated animals is not an antidote to U poisoning. Poisoning by substances other than U is not counteracted by the filtrate. Extract of kidney but not that of other organs acts like the filtrate. Vitamins-A, -B, -C, and -D<sub>2</sub> do not counteract U poisoning.

Aminophylline and related xanthine derivatives. N. H. Boyes (J. Amer. Med. Assoc., 1943, 122, 306-309).—Review of present status. C. A. K.

Effects of narcotics and benzedrine on metabolic processes in central nervous system. J. H. Quastel (*Trans. Faraday Soc.*, 1943, 37, 348—359).—O<sub>2</sub> uptake by brain tissue is decreased by narcotics in proportion to their potency. Benzedrine does not increase O<sub>3</sub> uptake but lessens the effect of tyramine or *iso*amylamine, which normally diminish it. V. J. W. Blood-brain barrier and cerebrospinal find in Association Soc., of sleeping-sickness drugs. E. M. Lourie (Trans. Faraday Soc., V. J. W.

Chemical structure of arsenicals and drug resistance of trypano-somes. H. King (Trans. Faraday Soc., 1943, 37, 383-387).-Arsenicals can be divided into 3 groups: (I) those having water-sol. Na salts; (II) those devoid of markedly polar or hydrophilic groups, and taken up at a lipin-water interface so that the arsenoxide is at the water interface; (III) those in which both ends of the mol. are involved in the fixation so that it lies flat on the adsorbing surface. It is only in the last group that drug resistance is found.

G. P.

Kapharsen in congenital syphilis. G. D. Astrachan and V. A. Cornell (J. Amer. Med. Assoc., 1943, 121, 746-752).—Mapharsen was serologically effective in 25 of 45 cases of late congenital syphilis and in 7 of 10 early cases. 5 cases with interstitial keratitis were improved. The drug should be used alternately with Bi, and frequent blood counts and liver function tests should be areformed. frequent blood counts and liver-function tests should be performed, though mapharsen is less toxic to children than adults. The dose should not exceed 0.75 mg. per kg. C. A. K.

Physico-chemical properties of arsphenamines in relation to distribution and retention in the tissues, F. B. Rodman and H. N. Wright (J. Pharm. Exp. Ther., 1943, 79, 140-163).—Arsphenamine and neoarsphenamine were separated into crystalloid and colloid fractions by dialysis and were injected intravenously to rats. The crystalloid fractions penetrate the tissues rapidly, they have a greater curative effect and are less toxic, and are eliminated from the body more rapidly than either the whole undialysed compound or the colloid fractions. The latter penetrate the tissues also rapidly but they are retained even longer than the whole compound. Arsphenamine has a distinctive affinity to the liver and neoarsphenamine to the kidney. Neoarsphenamine is retained by all tissues, except by the blood and gastro-intestinal tract, to a greater extent than arsphenamine, regardless of its physico-chemical state.

Acute nephrosis following mapharsen and fever therapy of early syphilis. E. W. Thomas, G. Wexler, M. Schur, W. Goldring, and N. Eggleston (J. Amer. Med. Assoc., 1943, 122, 807-809).-48 patients with early syphilis were given 280 mg, of mapharsen (in 4 injections in 2 days) + fever therapy. 4 patients developed signs of acute renal damage with anuria and N retention, but no ædema or hypertension. C. A. K.

Effect of tungsten metal diets in rat. F. W. Kinard and J. van de Erve (*J. Lab. clin. Med.*, 1943, 28, 1541–1543).—The feeding of 2%, 5%, and 10% W metal over a period of 70 days is without marked effect on growth in rats. C. J. C. B.

Clinical toxicology of thallium. A. O. Gettler and L. Weiss (Amer. J. clin. Path., 1943, 13, 422-429).—A clinical review. С. Ј. С. В.

Elimination of administered zinc in pancreatic juice, duodenal iuice, and bile in dogs as measured by its radioactive isotope (\*\*Zn).
 M. L. Montgomery, G. E. Shelline, and I. L. Chaikoff (*J. Exp. Med.*, 1943, 78, 151-159).—The excretion of intravenously injected minute amounts of radioactive Zn was studied in dogs with pancreatic and/or biliary and/or duodenal fistulæ. Up to 11% of the injected Zn was excreted in the pancreatic juice within 14 days; the max. excretion in the bile was 0.4% (of the injected amount) in 8 days; 7-8% was found in the intestinal juice obtained from a duodenal hon within 11 days. loop within 11 days. Max. deposits of radio-Zn were found in the liver (0.34%-per g.) and pancreas (0.28% per g.) 8 hr. after the injection; the max. amount of radio-Zn found in the whole pancreas at a single interval (8 hr.) was 3.1%. A. S.

Zinc peroxide for wound therapy. J. S. Toal (Quart. J. Pharm., 1943, 16, 179-183).—The literature is discussed. Attempts to prepare ZnO<sub>2</sub> identical with that used by Meleny (cf. Hoyle *et al.*, A., 1942, III, 711) are described. The nearest approach is the product obtained when ZnO is treated with H2O2. After drying at 150° for 4 hr. it contains 48.0% of ZnO<sub>2</sub> and when ZnO<sub>2</sub> used by water behaves similarly, but not identically, to the ZnO<sub>2</sub> used by Meleny. This "unstable" ZnO<sub>2</sub> after heating to 150° retains its activity for several weeks. If sterilisation at 150° is omitted, the material decourted detectors and is convenient for hespital use material does not deteriorate and is convenient for hospital use, where it should be first heated to 150°. The prep. is described of a "stable" ZnO, which has a high O content and loses only a small amount of its available O when heated to 150°. J. N. A.

Absorption and excretion of methyl salicylate administered by nunction. R. Beutner, B. Calesnick, E. Powell, and L. Bortin U. Lab. clin. Med., 1943, 28, 1655-1663).—The absorption and excretion of cutaneously applied methyl salicylate was tested in 83 individuals and the findings compared with those derived from the oral administration of acetylsalicylic acid. The vals. obtained show that cutaneously applied methyl salicylate exerts a systemic action. C. J. C. B.

Creatinuria caused by poisoning with tri-o-cresyl phosphate and the free of vitamin-E. H. Bloch and A. Hottinger (Z. Vitaminforsch., 1943, 12, 0, 10). 1943, 13, 9-18).-After oral administration (0.18 g. per kg.) of

tri-o-cresyl phosphate to rabbits, severe general toxic effects occur with diarrhœa, oliguria, and loss of appetite and wt. and sometimes paralysis and death. There is pronounced creatinuria, the extent of which depends on the degree of poisoning. Prophylaxis or early treatment with dl-tocopheryl acetate prevents or decreases the creatinuria and the clinical symptoms. J. N. A.

Bromidism after prostigmine bromide for myasthenia gravis. J. M. Nielsen (J. Amer. Med. Assoc., 1943, 122, 496).—A patient with myasthenia gravis took 240 mg. of prostigmine bromide by mouth daily. She developed nervous signs of bromide intoxication, the blood-bromide concn. being 225 mg.-%. C. A. K.

Cyanide detoxication in dogs and rabbits as measured by urinary by this constrained by the second se parallels that following CNS' injection. The conversion of CN' into CNS' is much less efficient in dogs. P. C. W.

Acute sodium fluoride poisoning. W. L. Lidbeck, I. B. Hill, and J. A. Beeman (J. Amer. Med. Assoc., 1943, 121, 826–827).—Accidental poisoning with NaF occurred in 263 patients in a hospital, cockroach powder (90% NaF) having been added instead of powdered milk to scrambled eggs. 47 patients died, and the symptoms were severe vomiting and diarrhœa and general collapse with respiratory and circulatory failure, death occurring usually in 2-4 hr. In some cases who recovered or died after 18-24 hr. there were paralysis of the muscles of deglutition and carpopedal spasm. Autopsy in 3 cases showed ædema and hyperæmia of the stomach, duodenum, and first part of the jejunum, general visceral congestion, and dilatation of the right heart. The cooked eggs contained  $3\cdot 2-13\%$ of NaF. C. A. K.

Mechanism of mustard gas poisoning. E. Rothlin, R. Jürgens, and T. Devrient (*Helv. Physiol. Pharm. Acta*, 1943, 1, C89-90).--Intravenous (1.5 mg. per kg.), subcutaneous (3 mg.), and oral (22 mg.) administration of the median lethal dose of mustard gas kills the augmals in the "1st critical phase" (2nd—4th day); there was no "2nd critical phase" with pronounced gastro-intestinal atonia. Ergotamine, effective in phosgene poisoning, had no prophylactic or curative action, neither had pituitrin, atropine, glutathione, or A. S. cysteine.

Environmental temperature and drug action in mice. K. K. Chen, R. C. Anderson, F. A. Steldt, and C. A. Mills (*J. Pharm. Exp. Ther.*, 1943, 79, 127–132).—The median lethal dose (LD<sub>50</sub>) of diaminodiphenyl sulphone given orally to mice kept in an air-conditioned room at 20° was 382 mg, per kg. and at 40° 49.8 mg, per kg. Insulin intravenously was 80 times as effective in producing convulsions at 40° as at 20°. Harmine hydrochloride intravenously was approx, twice as toxic at 40° as at 20°. There was suggestive evidence that Na sulphapyridine, Na sulphathiazole, strychnine sulphate, picrotoxin, tutin, aconitine hydrobromide, and scopol-amine hydrobromide were slightly more toxic at 40° than at 20°. The lethal dose of sulphanilamide was not influenced by changes in environmental temp. G. P.

Effect of environmental temperature on toxicity of 2 : 4-dinitro-phenol in mice. G. J. Fuhrman, F. W. Weymouth, and J. Field, 2nd (*J. Pharm. Exp. Ther.*, 1943, **79**, 176—178).—LD<sub>50</sub> of dinitrophenol for mice kept at 6° was 35.7 mg. per kg., at 25° 30.9 mg. per kg., and at 40° it was helow 8.22 mg. per kg. G. P.

Therapy of cat opisthorchosis with hexachloroethane. N. N. Plotnikov (Comp. rend. Acad. Sci. U.R.S.S., 1941, 31, 514-516). Plotnikov (Comp. rend. Acad. Sci. U.R.S.S., 1941, 31, 514—516).— In infestation with Opisthorchis felineus, hexachloroethane, ad-ministered orally in doses (preferably single doses) of 1.86—2.03 g. per kg., kills 85-5—100.0% of the parasites; complete freedom of the faces from parasites and eggs is achieved in 11—12 days. In man, a dose of 0.53 g. per kg. has no detrimental effect. The sub-stance is eliminated through the lungs. W. McC.

Principles of insecticidal action as guide to drug reactivity-phase distribution relationships. H. Hurst (Trans. Faraday Soc., 1943, 37, 390-411) .- A discussion on the penetration of the cuticle of the blow-fly larva by drugs, and especially on its dependence on the presence in the medium of a "carrier" such as kerosene.

Presence in the inclum of a carrier such as kelosene. V. J. W. Pharmacology of carbon disulphide. R. W. McKee, C. Kiper, J. H. Fountain, A. M. Riskin, and P. Drinker (J. Amer. Med. Assoc., 1943, 122, 217-222).—Animal and human experiments showed that saturation of the body with  $CS_2$  vapour occurs in 30-60 min. The elimination of retained free  $CS_2$  occurs mostly in the first 30 min. but continues for 3-8hr. Of the retained vapour 8-13% is excreted in expired air, 0.5% in urine, and none in faces. The remaining 85-90% of CS<sub>2</sub> is converted into inorg. sulphates and org. S compounds which are excreted in the urine. In-vitro manometric experiments show that CS2 can cause 10% inhibition of succinic oxidase but does not affect other enzyme systems.

C. A. K.

**Paraffin wax for burns.** R. C. Pendleton (J. Amer. Med. Assoc., 1943, 122, 414—417).—Paraffin wax incorporating sulphanilamide powder was applied by spray to cases of burns. It relieves pain and diminishes shock, no debridement is necessary, and no dressings are used. It can be applied to any part of the body. C. A. K.

Dependency of anion on associated cation in distribution and excretion of halides in body. W. L. Lipschitz (*Exp. Med. and Surg.*, 1943, 1, 171—180).—Alcohol-sol. halides added to protein solutions were partially pptd. with the protein by alcohol; this was not prevented when large vols. of alcohol were used. All the halide was, however, removed by repeated extraction with alcohol. The order of pptn. was  $Cl > Br \gg I$ ; the effect of cations on Cl retention by protein was Ca = Sr > Mg > Na. The amount of Cl pptd. depended on the type and amount of protein and on the ratio of cation to protein. At a const. concn. of CaCl<sub>2</sub>, the ratio of % Cl pptd. to concn. of protein was const. With a const. concn. of protein, increasing concn. of CaCl<sub>2</sub> produced increased abs., but smaller relative, pptn. of Cl.

External use of cod-liver oil. Council on Pharmacy and Chemistry (J. Amer. Med. Assoc., 1943, 121, 759-761).—A review.

C. A. K.

Inhalation therapy. Committee on Public Health Relations of New York Academy of Medicine (J. Amer. Med. Assoc., 1943, 121, 755-759).—Techniques of administration of  $O_2$ ,  $CO_2$ , Hc, adrenaline, and neosynephrin by inhalation are described. C. A. K.

#### XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

#### Measuring eye flash from arc welding.—See A., 1944, III, 103.

Symposium on scientific proof and relations of law and medicine. Scientific proof and relations of law and medicine. H. W. Smith. Clinical approach to alleged traumatic disease. L. Brahdy and S. Kahn. Problems of proof in claims for recovery for dermatitis. L. Schwartz. Circulatory deficiency in extremities in relation to medico-legal problems : arteriosclerotic deficiency (including diabetes); thromboangiitis obliterans; Buerger's disease. J. Homans. Medical facts that can or cannot be proved by Roentgen-ray. S. W. Donaldson. Criminal interrogation with lie detector; 8 years' experience by Michigan State Police. L. Snyder. Legal-medical aspects of blood tests to determine intoxication. M. Ladd and R. B. Gibson. Certain medical and legal phases of eugenic sterilisation. A. Myerson. Medical and social factors in crime. A. W. Stearns. Compulsory vaccination and sterilisation; constitutional aspects. T. R. Powell. Traumatic psychoses. F. G. Ebaugh and H. W. Brosin (Ann. int. Med., 1943, 18, 450-490, 491-499, 500-517, 518-534, 535-550, 551-563, 564-579, 580-598, 599-605, 637-646, 666-696).

#### XXII.—RADIATIONS.

Measurement of radiation for medical purposes. W. V. Mayneord (Proc. Roy. Inst., 1942, 32, 336-343).—A lecture.

Absorption of ultra-violet radiation by the abdominal wall of Drosophila melanogaster. E. Durand, A. Hollaender, and M. B. Houlahan (Genetics, 1941, 26, 149).—The abdominal wall of D. melanogaster showed little (20–30%) absorption of light of  $\lambda$  4358—2480 A. but below this absorption rose rapidly and reached 90% at 2144 A. L. G. G. W.

Accuracy and reproducibility in induction of tumours with ultraviolet radiation.—See A., 1944, III, 122.

Use of radium in conduction deafness.—See A., 1944, III, 105.

**Comparative studies of cytological effects of neutrons and** X-rays. N. H. Giles, jun. (Genetics, 1943, 28, 398-418).—Neutrons and X-rays both induce chromosomal rearrangements in Tradescantia but for equal total doses of ionisation the former are more efficient. Neutrons of low are more efficient than those of high average energy in inducing chromosome rearrangement. In Drosophila X-rays are more efficient than neutrons in inducing sex-linked lethal mutations. L. G. G. W.

Effects of Roentgen rays on cell-virus associations in virusinduced rabbit papillomas and fibromas.—See A., 1944, III, 121.

#### XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

#### XXIV.—ENZYMES.

Action of substances which influence circulation on enzymes. B. Schär-Wüthrich (*Helv. Chim. Acta*, 1943, 26, 1836—1855).—The iminazolines, privine, otrivine, and priscol, in this order, restrict the monoamine oxidase in substrate—inhibitor ratio of about 1:1,

the diamine oxidase 1:10, and serum-choline-esterase, 1:100. Priscol inhibits the choline-esterase of human brain more powerfully that that of serum, otrivine restricts both enzymes equally, whereas privine is less potent towards brain than to serum-esterase. The inhibitory actions on choline-esterase shown by iminazolines and eserine are competitive and irreversible but are distinguished quantitatively and in onset of action. Simultaneous use of both inhibitors does not give more than an additive result and with low concns. the restriction is less marked. It appears therefore that there is a difference in the mode of action of the two classes; a possible action at the enzyme mol. is discussed. H. W.

Inactivation of enzymes as cause of death in bacteria.—See A., 1944, III, 144.

Enzymic debridement in local treatment of burns.—See A., 1944,. III, 117.

Nature and biological significance of isocitric dehydrogenase. E Adler (5 Nordiske Kemikermøde, 1939, 247–249).—isoCitric acid is dehydrogenated to oxalosuccinic acid by an apodehydrogenase specifically combined with codehydrogenase-II in presence of Mn" (less well with Mg"), the reaction proceeding to completion. Oxalo succinic acid then decomposes spontaneously to a-ketoglutaric acid and CO<sub>2</sub>. In animal tissue and yeast a-ketoglutaric acid can be further converted (by reduced codehydrogenase-II and diaphorase-II) into succinic acid, or by reduced codehydrogenase-II in presence of NH<sub>4</sub>" into glutamic acid (glutamic apodehydrogenase-codehydro genase-II holoenzyme), and thence by transamination into other amino-acids; in higher plants glutamic apodehydrogenase is codehydrogenase-I-sp. and a different mechanism must obtain. The above mechanism links carbohydrate, via citric acid, *isocitic* acid, and a-ketoglutaric acid, to protein. M. H. M. A.

Biocatalysts in cancer tissue. II. Inhibition of the succinoxidase system by tumour extracts.—See A., 1944, III, 119.

Metabolism of ischæmic kidney. I. Respiration and oxidase activity.—See A., 1944, III, 116.

Magnetic properties of crystalline horseradish peroxidase and its derivatives.—See A., 1944, III, 138.

Effect of cytochrome oxidase inhibitors on the formation in vitro of thyroxine and di-iodotyrosine by thyroid tissue with radioactive iodine as indicator. H. Schachner, A. L. Franklin, and I. L. Chaikoff (J. Biol. Chem., 1943, 151, 191—199).—CN', azide, S'', CO, and strongly anaërobic conditions inhibit the combination of inorg. I into di-iodotyrosine and thyroxine. This reaction is probably associated with oxidation by the cytochrome-cytochrome oxidase system. R. L. E.

Reversible conversion of myoglobin into cytochrome.—Sce A., 1944, III, 100.

Action of blood poisons on catalase. G. Seide (*Biochem. Z.*, 1941, 308, 175—186).—The effect on the activity of catalase of substances which form methæmoglobin and verdohæmochromogen is determined.  $3 \times 10^{-9}$ m-aniline,  $5 \times 10^{-5}$ m-phenylhydroxylamine, and  $4 \times 10^{-5}$ maminophenol cause 50% inhibition of catalase activity, whilst  $10^{-4}$ m-phenylhydroxylamine produces 75% inhibition.  $10^{-6}$ m-Aminophenol effects 30% increase in the activity of the enzyme.  $10^{-3}$ m-Nitrosobenzene in 2% aq. alcohol causes 35% inhibition and there is no increase after several hr.  $5 \times 10^{-3}$ m-Sulphanilamide produces 20% inhibition and after 17 hr. this is increased to approx. 40% J. N. A.

Effect of hormones on contraction of striated muscle and on choline-esterase activity.—See A., 1944, III, 100.

Fixation of earbon dioxide and production of succinic acid by a cell-free enzyme preparation of Escherichia coli. G. Kalnitsky, H. G. Wood, and C. H. Werkman (Arch. Biochem., 1943, 2, 269–281).—Succinate, lactate, acetate, formate, and CO<sub>2</sub> are produced from pyruvate by the prep. Experiments in which <sup>13</sup>C is employed show that <sup>13</sup>CO<sub>2</sub> is fixed in the CO<sub>2</sub>H of the succinate produced. Added CH<sub>3</sub>·<sup>13</sup>CO<sub>2</sub>H is converted into succinic acid containing <sup>13</sup>C exclusively in the carboxyl groups. When hydrogenylase is absent, the formate produced is not derived from CO<sub>2</sub> of the medium by reduction. W. McC.

Purification and properties of enzyme in rat's liver that produces hydrogen sulphide from cysteine. J. M. Lawrence and C. V. Smythe (Arch. Biochem., 1943, 2, 225-234; cf. A., 1942, III, 408).—The activity of the enzyme is increased 10—15-fold by treating the aqextracts (physiological salt or PO<sub>4</sub>'''-Ringer's solution) with CHCl<sub>3</sub>. pptg. at  $-5^{\circ}$  with acetone, washing at  $-5^{\circ}$  with ether, drying in a vac. (dry material stable for very long periods), dissolving in water, PO<sub>4</sub>''' buffer, or saline solution, adsorbing on Ca<sub>3</sub>(PO<sub>4</sub>)<sub>3</sub>. gel, and eluting with glycerol or aq. Na  $\beta$ -glycerophosphate. The activity is increased or maintained by glycerol and by low concas. or inorg. salts, decreased or destroyed by dialysis, electrophoresis, higher concns. of inorg. salts, KCN, NaHSO<sub>3</sub>, carbonyl reagents (e.g., phenylhydrazine), As<sub>2</sub>O<sub>3</sub>, and thiol compounds (e.g., glutathione, d-cysteine, a-amino- $\beta$ -thiolbutyric acid), and unaffected or only slightly diminished by amino-acids (e.g., alanine, methionine) and substances (e.g., CO, NaN<sub>3</sub>, thiourea) that inhibit reactions catalysed by heavy metals. The inhibition produced by Na thiolacetate is competitive. W. McC.

Protective properties of a-antitoxin and antihyaluronidase occurring in *Cl. welchii* type *A* anti-serum.—See A., 1944, III, 148.

Mechanism of enzyme action. XXI. Intermediary phases in enzymic breakdown of *dl*-alanine by *Fusarium lini*, Bolley.—See A., 1944, III, 141.

Depolymerases for yeast- and for thymus-nucleic acids in normal and neoplastic tissues.—See A., 1944, III, 121.

Distribution of enzymes in cells and tissue. K. Linderstrøm-Lang (5 Nordiske Kemikermøde, 1939, 143—171).—A review. Unpublished work by Holter and Lindahl is described. In the developing egg of Paracentrotus lividus peptidase is distributed equally throughout all the cells until the pluteus stage, when it becomes conc. (81—82%) in the ectoderm. Similarly the rates of respiration of the animal and vegetative halves of the early gastrula stage are equal and are equally inhibited by Li. M. H. M. A.

Proteases and peptidases of liver. V. N. Orechovitsch, A. S. Konikova, A. A. Tustanovski, B. G. Schomin, and N. A. Brisker (Compt. rend. Acad. Sci. U.R.S.S., 1941, 31, 482-483).—Cathepsin, prepared from ox-liver by a slight modification of the method of Fruton and Bergmann (A., 1939, III, 1009), hydrolyses peptides (diglycylglycine, *l*- and *dl*-leucylglycine, glycylglycine) at pH 4-1 in presence and absence of cysteine; the action is inhibited by iodeacetate. No hydrolysis occurs at pH 7-8. Glycerol extracts cause hydrolysis in presence and absence of cysteine at pH 7-8 but mone at pH 4-1. The results suggest the existence of "acid" and "alkaline" dipeptidases, the alkaline dipeptidases only being sol. in glycerol. W. McC.

Vegetable proteases. III. Activity of mexicain. M. Castañeda, M. R. Balcazar, and F. F. Gavarron (*Ciencia*, 1943, 4, 71-73).— The activity of crude mexicain (A., 1943, III, 427) from the latex of *Pileus mexicanus* is greater than that of purified asclepain or crude papain (cf. Winnick *et al.*, A., 1940, III, 534). F. R. G.

Serologic and anaphylactic reactions of the cathepsins of normal and neoplastic tissues.—See A., 1944, III, 122.

Cereal amylases; significance of the component concept. Enzymes in malting and brewing.—See B., 1944, III, 25.

Amylolytic degradation of starch.—See A., 1944, II, 73.

Blood-diastase in mumps.—See A., 1944, III, 97.

Inhibition in enzyme systems. I. H. von Euler and L. Ahlström (Arkiv Kemi, Min., Geol., 1943, 16, B, No. 16, 8 pp.).—2, 5, and 10 mg. of Na salicylate in presence of 400 mg. of apozymase cause 15.8, 41.5, and 79.0% inhibition respectively of apozymase fermentation. The % inhibition is less the greater is the amount of cozymase in the system. Salicylaldehyde behaves similarly to Na salicylate, and in presence of 1 mg. of the aldehyde and 15, 20, 60, and 90  $\mu$ g. of cozymase the % inhibition is 66.7, 21.4, 7.6, and 4.6 respectively. Acetylsalicylic acid is considerably less effective, and smaller concns. of cozymase are needed to annul its inhibiting action. 6 mg. of pantothenic acid has no effect on the inhibition caused by 5 mg. of Na salicylate, whilst p-aminobenzoic acid augments the effect of Na salicylate. Similarly to pyridine-3-sulphonic acid, Na salicylate inhibits fermentation by living yeast, and it inhibits decomp. of pyruvic acid by ætiozymase and cocarboxylase, but the effect is smaller than on the fermentation in the apozymase system. Na salicylate also inhibits growth of brewers' bottom yeast, Monilia candida, and Torula utilis. Intramuscular injection of 35 mg. of Na salicylate into rats causes a very slight increase in blood-pyruvic acid 1—2 hr. after injection. Nicotinylsalicylamide also causes an increase which returns to normal in approx. 24 hr. Injection of 35 mg. of Na salicylate into a rat with Jensen sarcoma causes a 30% decrease in blood-pyruvic acid. J. N. A.

Crystalline muscle phosphorylase. I. Preparation, properties, and mol. wt. A. A. Green and G. T. Cori. II. Prosthetic group. G. T. Cori and A. A. Green. III. Kinetics. C. F. Cori, G. T. Cori, and A. A. Green. IV. Formation of glycogen. G. T. Cori and C. F. Cori (J. Biol. Chem., 1943, 151, 21-29, 31-38, 39-55, 57-63).-I. The prep. of cryst. phosphorylase (cf. A., 1942, III, 419) from back and leg muscles of rabbits is described. The method involves extraction of the ground muscle with water at 0°, dialysis of the extract followed by removal of an isoelectric ppt. at pH 5-8, pptn. with 1.7M-(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> at pH 6-8, and dialysis of the dissolved ppt. against a cysteine-glycerophosphate buffer at pH 6-8 and 0°. The crystal that separate when most of the (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> has been removed are redissolved in cysteine-glycerophosphate at 30°, and crystallisation is effected at 0°. The isoelectric pptn. removes approx. 11% of protein but causes only slight loss of phosphorylase activity. Approx. 2% of the extracted proteins consists of enzyme protein, and approx. 60% of the extracted enzyme is obtained cryst. The yield of cryst. enzyme is 40—80 mg.-%. Cysteine considerably increases the solubility of the enzyme in dil. salt solutions, whilst glutathione and KCN are less effective. Recryst. phosphorylase has 60—70% of the activity obtained in presence of adenylic acid. Sedimentation and diffusion data (by J. L. Oncley) indicate that the mol. wt. of the enzyme is  $34-40 \times 10^4$ .

II. Two forms of phosphorylase are isolated from muscle, viz., form-a, a cryst. englobulin, which has 60-70% of its full activity in absence of adenylic acid and form-b, which is more sol. and amorphous and is active only in presence of adenylic acid. Dilution, washing with cold, dil. aq. salt, dialysis, low or high pH, or high temp. within the range in which the enzyme is not irreversibly denatured does not cause -a to lose the activity shown in absence of adenylic acid. In presence of adenylic acid, both forms have the same activity per mg. of enzyme. Heating at 52° and pH 6.8 for 3 min. almost completely inactivates the enzyme, but the prosthetic group is still attached to that part that survives this treatment. Form-a is converted into -b by incubation with an enzyme that also occurs in rabbit muscle and is removed by isoelectric pptn. at pH 5.9. During this conversion, the prosthetic group is lost. This enzyme, which is also present in spleen, possesses proteolytic activity. Conversion of -a into -b has no effect on phosphorylase activity in presence of adenylic acid, but there is complete loss of activity in its absence. The same result is produced by incubation with trypsin or chymotrypsin at pH 6. Carboxypeptidase, ribonuclease, and adenylic deaminase have no effect on -a. Conversion of -b into -a is not effected by addition of adenylic acid under various conditions of pH or temp., and in absence or presence of reducing agents. The activity of -a from which the prosthetic group has been completely removed by trypsin is fully restored by addition of adenylic acid, indicating that a firm linking between adenylic acid and protein is not essential for enzymic activity. It is concluded that -a contains adenylic acid in a prosthetic group which can be removed enzymically. This is supported by the presence of 0.03% of pentose in -a, whilst -b contains no pentose. The material removed by the action of trypsin gives a pentose reaction, but is not adenylic acid. Resting muscle contains mainly -a, whilst previously stimulated muscle contains

mainly -b, indicating an *in-vivo* action of the accompanying enzyme. III (cf. A., 1940, III, 932). The reaction catalysed by phosphorylase is formulated : glucose 1-phosphate + terminal glucose units ⇒ maltosidic chain units + inorg. PO<sub>4</sub>". The terminal glucose units are the end groups of the highly branched glycogen mol. Without addition of glycogen, no reaction to the right occurs, with low concns. reaction does not attain equilibrium, with intermediate concns. it is a second-order reaction, whilst with high concns. it is of the first order. It is suggested that glycogen enters into reaction to the right and that polysaccharide synthesis consists in lengthening of the sidé-chains of glycogen by addition of glucose units in 1 :4 glucosidic linking. 1 mg. of phosphorylase-a has activity of 3500 units at pH 6.7 and 30°, corresponding to a turnover no. of 4 × 10<sup>4</sup> glucose 1-phosphate mols. per mol. of enzyme per min. Activity units are based on determination of first-order velocity coeff. at const. pH, in presence of a reducing agent and 1% of glycogen or 0.0016M-glucose 1-phosphate. In absence of the reaction is of zero order. Although the ratio inorg. P: 1-ester-P varies considerably at equilibrium with pH, the ratio of the bivalent ions of these two acids remains const. at approx. 2. The optimum pH of the reactions is between 6.3 and 6.9. The energy of activation is 25,000 g.-cal. per mol. at 15-25°, and the rate of reaction increases up to 39° and decreases sharply at 43° owing to inactivation of the sphorylase if myokinase is absent. High concn. of inosic acid has a weak effect. Glucose is a competitive inhibitors with respect to glucose 1-phosphate, whilst phloridzin, (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, and Na β-glycerophosphate are non-competitive inhibitors. 2 mols. of phloridzin and 1 mol. of the reaction are unaffected by addition of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> is annulled by small amounts of adenylic

IV. When muscle phosphorylase acts alone, it converts glucose 1-phosphate into a polysaccharide that closely resembles the amylose fraction of natural starch and consists of an unbranched chain of glucose residues in 1:4-linking. In presence of a supplementary enzyme prepared from heart or liver, phosphorylase forms a polysaccharide that resembles glycogen. It is suggested that formation of a branched type of polysaccharide (glycogen in animals, and amylopectin in plant tissues) depends on the action of two enzymes. The nature of the supplementary enzyme is unknown. J. N. A.

Alkaline phosphatase level in urine in relation to renal injury.— See A., 1944, III, 117.

Disappearance of phosphatase from hydronephrotic kidney.—See A., 1944, III, 116.

#### XXY.—FUNGI. MICRO-ORGANISMS. IMMUNOLOGY. ALLERGY.

Advance in phylogenetic position in the cryptogams as indicated by their fats. J. B. McMuir (*Lloydia*, 1943, **6**, 155-156).—Data on the fats of five fungi and bacteria suggest that fats with the highest mol. wt. and highest I vals. are produced by the plants highest in the evolutionary scale and that fats produced at low temp. have higher I vals. than those produced at high temp. L. G. G. W.

Soil fungi of the paddy fields of Bengal. I. Fungi of an unmanured paddy field of Chinsurah agricultural farm. P. N. Ghatak and T. C. Roy (*J. Indian Bot. Soc.*, 1939, 18, 113-127).—A list, with brief descriptions of 23 soil fungi. L. G. G. W.

Dibasic tetracarbon acids as intermediate compounds in the biochemical oxidation of hexoses to oxalic acid. V. S. Butkevitsch and A. A. McInikova (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **39**, 155—158).—*Aspergillus niger* grown on a glucose substrate transforms glucose into oxalic acid, smaller amounts of fumaric, succinic and malic acids, and unidentified substances. The C<sub>4</sub>-acids probably are then broken down to oxalic acid as the ratio of oxalic acid formed to oxalic acid consumed increases with the age of the culture. I. I. B.

Influence of carbon dioxide on response of Aspergillus niger to "trace" elements. R. A. Steinberg (*Plant Physiol.*, 1942, 17, 129—132).—In most cases the restriction of growth of A. niger resulting from exclusion of  $CO_4$  from the environmental atm. was increased by deficiency of Fe, Zn, and Cu, and further increased by deficiency of Ga. Exclusion of  $CO_2$ , but not of trace elements, lowered the yield by 41% when N was supplied only as NO<sub>3</sub>, and by 83% with N as urea and not at all with NH<sub>4</sub>NO<sub>3</sub>. Trace elements are probably concerned in assimilation of  $CO_4$  by the mould.

A. G. P. Some factors influencing the utilisation of inorganic nitrogen by the root rot fungus. P. J. Talley and L. M. Blank (*Plant Physiol.*, 1942, 17, 52-68).—In media containing  $NH_4$  as sole N source *Phymatotrichum omnivorum* produces greater acidity than when N is supplied as  $NO_3'$ . Addition of  $CaCO_3$ ,  $MgCO_3$ , or  $Na_2CO_3$  to  $NH_4$ -media improves the growth of the organism.  $NH_4$  has no direct toxic effect. In  $NO_3'$ -media growth is influenced by the K/Mg balance. Ca may be substituted for Mg to some extent and Na for K. Utilisation of  $NH_4$  is favoured by high Mg, high P, high Ca (or Na), and high  $SO_4''$  (or Cl') concns. in media.  $NO_2'$ can serve as sole N source without toxic effects. A. G. P.

Importance of growth-promoting substances in the metabolism of *Pythium indigoferæ*, Butler. R. K. Saksena (*J. Indian Bot. Soc.*, 1941, 20, 183—189).—*P. indigoferæ* in culture requires a supply of N in the form of peptone or hydrolysed peptone. When the only source of N is amino-acids or  $NH_4NO_3$ , thiamin does not, whereas addition of yeast, casein, or lentil extracts does, induce growth.

L. G. G. W. **Turbidimetric studies on penicillin inhibition.** J. W. Foster and B. L. Wilker (J. Bact., 1943, 46, 377–389).—Contrary to results with the plate method (*ibid.*, 187), the same amount of penicillin was required to effect a 50% inhibition of the growth of Slaph. aureus H in nutrient broth at pH 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, and 8.0. The presence of glucose and other sugars in the medium caused irregular breaks in the inhibition curves, probably by alteration or inactivation of penicillin which occurred when sterile penicillin and glucose broth solutions were kept before inoculation. Penicillin inhibits by prolongation of generation time and not by selection of resistant cells. It is most stable at pH 4.8—7.9. A short-time (3—5 hr.) turbidimetric assay accelerated by forced ačration is described. F. S.

Chemotherapeutic effect of esters of penicillin. Cytotoxic and antibacterial activity of gramicidin and penicillin.—See A, 1944, III, 131.

Anti-fungal substances from moulds. I. Patulin (anhydro-3hydroxymethylenetetrahydro-1: 4-pyrone-2-carboxylic acid), a metabolic product of *Penicillium patulum*, Bainier, and *Penicillium ex*pansum (Link), Thom. W. K. Anslow, H. Raistrick, and G. Smith (J.S.C.I., 1943, 62, 236-238).—Patulin, previously obtained from *Penicillium patulum*, Bainier, is now shown to be a metabolic product of the apple-rot organism, *P. expansum* (Link), Thom. It completely inhibits the growth of various species of *Pythium* (the cause of damping-off disease of seedlings) at dilutions of approx. 1: 400,000.

Action of chloroform or toluene on yeast-catalase.—See A., 1944, III, 139.

Minor sterols of yeast. XII. Hydrogenation of sterols.—See A., 1944, II, 78.

Freezing points of living and dead myxomycetes. P. M. Gehenio (Biodynamica, 1941, 3, 347-352).—The dead protoplasm of Physarium polycephalum had f.p.  $-0.37^{\circ}$  and the living protoplasm  $-0.25^{\circ}$  (range  $-0.15^{\circ}$  to  $-0.35^{\circ}$ ). L. G. G. W.

Reactions of the plasmodium *Physarum polycephalum* to physicochemical changes in the environment. B. J. Winer and A. R. Moore (*Biodynamica*, 1941, 3, 323—345).—The plasmodium has an osmotic pressure which varies with that of the medium in which it is grown and the f.p. of the plasmodium is always about 0.187° lower than that of the medium but plasmodia with very different f.p. will fuse. 0.01M-Na citrate is toxic to the plasmodium but is antagonised by CaCl<sub>2</sub> and MgCl<sub>2</sub>. Small pieces of plasmodium  $(1 \times 0.25 \text{ mm.})$  form a membrane at the cut surfaces and in a short while (5 min.) show protoplasmic streaming. The plasmodium is negatively geotropic. L. G. G. W.

Trypanosoma cruzi infection and reticulo-endothelial blockade in rats. N. Denison (Amer. J. Hyg., 1943, 38, 178—184).—Using 3 groups of rats a comparison was made between the course and effect of T. cruzi infection, reticulo-endothelial blockage with an inert dye, trypan-blue, and the two conditions existing in the same animal. Gross signs of infection were negligible in the 3 groups and there was no significant loss of wt. Trypanosomes were found in the peripheral blood stream only as a transient infection 20-26days after inoculation; after 34 days the incidence had decreased. Post-mortem examination showed little evidence of infection although organisms were recovered from the spleens of some of the infected animals killed after 48 and 70 days but not after 90 days. Cultures from the animals which were blocked were sterile. The blood picture showed chronic infection with a slight leucopenia and a moderate lymphocytosis and monocytosis. Serum from infected animals lysed the organism from culture in a dilution of  $\frac{1}{6}$ ; when the reticulo-endothelial system was blocked as well, lysis was slower and the titre of the serum was reduced. B. C. H.

Effect of biotin deficiency on duration of infection with Trypanosoma lewisi in rat.—See A., 1944, III, 126.

Cell metabolism of malaria parasite in relation to mode of action of antimalarial drugs. R. Christophers (*Trans. Faraday Soc.*, 1943, 37, 333—338).—Isolated malarial parasites utilise glucose *in vitro* but continue to take up O<sub>2</sub> after glucose is exhausted. O<sub>2</sub> uptake is inhibited by antimalarial drugs, of which the antimalarial potency is associated with their basic character and correlated with their pH const. V. J. W.

Form of Plasmodium gallinaceum present in the incubation period of the infection. H. E. Shortt, K. P. Menon, and P. V. Seetharama Iyer (Indian J. Med. Res., 1940, 28, 273-278). S. E. M.

Wassermann reaction. V. Complement. S. D. S. Greval, S. N. Chandra, and B. C. Das (*Indian J. Med. Res.*, 1940, 28, 257–272).-New methods are described of comparing different samples of complement with regard to optimum reaction and titre, of adjusting complement of optimal reaction, but not of optimal titre, of adjusting the results in the test proper by the help of titrated controls. S. E. M.

Alcohol-preserved tissue-cultivation medium.' Preparation and use in cultivation of Nyctotherus cordiformis. E. C. Nelson (Amer. J. Hyg., 1943, 38, 185—192).—Tissues were preserved in 95% alcohol and finely pulverised after hardening. From the standard stock solution containing 1 g. of tissue per 10 ml. of solution 3 types of medium were possible: whole tissue medium containing sol. and insol. material; the alcohol-sol. and liquid fraction, and the insol. fraction. N. cordiformis obtained from a 50-day-old culture of frog rectal medium and accompanied by Trichomonas augusta was kept under continuous cultivation for an additional 455 days in frog liver medium. Nyctotherus cultivated in whole frog liver, frog-liver extract, and in frog-liver residue media lived without subculture for 189, 155, and 21 days respectively with peak populations of 2200 and 370 ciliates per tube for the first two media and only slight population increase for the last. Media prepared from 10 different tissues of the frog were compared for cultivation of Nyctotherus. Stomach, liver, and kidney gave the best results; lung was half as effective for multiplication but cultures were as long-lived as the first three. Intestine, spleen, muscle, ovary. and brain produced small populations although cultures were longlived. Heart medium showed poor growth and short life. B. C. H.

[Anti-]protozoal activity of phenols. N. N. Melnikov, A. M. Avetesian, and M. S. Rokitzkaja (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **31**, 123-124).—Data are given for the phenol and mol. phenol coeffs. of a series of chlorinated phenols, *p*-substituted phenols, and alkyl- and aryl-chlorophenols using *Paramecium caudatum* as test organism. An increase in the no. of Cl in the phenol mol. increases is effectiveness against *P. caudatum*. There is a pronounced increase in activity in passing from phenol to tetra- and penta-chlorophenol. The least and most active compounds are 2:4:6-tri- and tetra-chlorophenol respectively. Various substituents in the *p*-position to the hydroxyl group increase the activity of phenol, except the nitro- and sulpho-groups which cause a decrease. A more active compound is usually obtained when the *p*-H is replaced by a hydrocarbon radical. The activity of alkyl-

phenols is increased by increase in mol. wt. of the alkyl radical. The increase is particularly marked with p-benzylphenol. Alkyland aryl-chlorophenols are much more active than the corresponding compounds which contain no halogen. It is concluded that the mechanism of the action of phenolic compounds on *P. caudatum* is similar to that on other bacteria, and that certain bacteria and protozoa have pellicles which are similar in constitution and composition. J. N. A.

Preparations of phenylmercuric benzoate and their bactericidal value. B. Baron and H. G. DeKay (*J. Amer. Pharm. Assoc.*, 1943, 32, 294—298).—The growth of *Staph. aureus* and *Eberthella typhi* is inhibited by phenylmercuric benzoate (in aq. media or ointments) in conces. down to 1: 6000. The zone of inhibition on agar plates is increased by using org. solvents (especially alcohol-acetone mixtures) in place of water as solvent of the benzoate; with certain types of ointment bases, however, water is more effective than are org. solvents. F. O. H.

Comparison of methods used for evaluating bactericidal properties of mercurial compounds. B. Heinemann (J. Amer. Pharm. Assoc.,1943, 32, 298—301).—Various Hg preps. were tested by (a) the Shippen re-transfer technique, (b) subculturing in plain broth, and (c) subculturing in thiolacetate medium. The results indicate that some "neutralising" medium, e.g., that used in (c), should be used, methods (a) and (b) giving unduly high results for the lethal activity of the preps. owing to the non-climination of their high bacteriostatic properties. F. O. H.

Bacteriostatic action of euflavine and proflavine dressings on pathogenic organisms in blood. R. M. Savage (Quart. J. Pharm., 1943. 16, 164—171).—The method of testing and assessing the results when gauzes containing 0.1% of proflavine or euflavine are immersed in blood infected with Clostridium tetani, Cl. welchii, Cl. ædematiens, Cl. ædematis-maligni, and Streptococcus pyogenes is described. With varying amounts of gauze and blood, bacteriostasis and, in many cases, bactericidal action occur except at the extreme limits. The activities of the two antiseptics agree with the more favourable results in the literature. Euflavine gauze is slightly superior to proflavine gauze of the same concn. There is no great disadvantage due to adsorption of the dye on the cotton. Cl. tetani and S. pyogenes in blood are controlled with 1% euflavine gauze, whilst 1% proflavine gauze is effective against Cl. tetani, but not so active against S. pyogenes. Cl. ædematis-maligni is more resistant, but is controlled by the 5 and 10% gauzes. Cl. welchii is well controlled, but the results with Cl. ædematiens are inconclusive because of the erratic cultural behaviour of the organism.

J. N. A. Mechanism of disinfection of bacteria by water-soluble bactericides. Effect of concentration of bactericide. D. P. Evans and A. G. Fishburn (Quart. J. Pharm., 1943, 16, 201-207).—It is suggested that the mechanism consists of two stages, viz., adsorption of the bactericide on the surface of the organism, followed by pptn. of the active protein in the surface of the bactericide probably occurs fairly rapidly, and it is assumed that adsorption on bacteria is similar, relatively, to that on C. Reaction between the bactericide and cellular protein only occurs after the necessary activation and to produce death several active centres (protein mols. + their requisite no. of adsorbed bactericide mols.) must react and cause pptn. of the protein. If in a population of bacteria of uniform resistance it is assumed that the reactivity of the active centres is the same for all organisms, then the rate of killing will be determined by the no. of active centres required to react and the distribution of these amongst the population. For a given organism and bactericide, these should not alter and, therefore, the true shape of the curve logarithm of survivors/time should be the same for all concns. of the particular bactericide. It is assumed that with monohydric phenols reaction with the protein involves the hydroxyl group and that substituents such as methyl and Cl modify the reactivity. Hence the statistical requirements for the killing of a given type of organism should be the same for phenol, cresols, xylenols, and chlorocresols, and the shape of the log survivors/time curve should be the same for each of these bactericides. For any given concn. of phenolic bactericide (below 1%), the order of increasing wt. adsorbed by lg. of C is approx. the order of increasing bactericidal activity as determined by the Rideal-Walker test. J. N. A.

Bactericidal action of propylene glycol vapour on micro-organisms suspended in air.—See A., 1944, III, 133.

Relationship of bactericidal potency to length of fatty acid radical of certain quaternary ammonium derivatives.—See A., 1944, III, 133.

Variations in strain of *B. lactis aerogenes* accompanying its adaptation to change of medium. R. M. Lodge and C. N. Hinshelwood (*Irans. Faraday Soc.*, 1943, 37, 420-424).—Changing the culture medium for a slow-growing strain caused changes of growth which indicate that cell reactions responsible for elongation, division, and removal of growth inhibitors undergo adaptation independently and at different rates. V. J. W.

Effects of resorcinol and of *m*-cresol on growth of *B. lactis aerogenes*. G. H. Spray and R. M. Lodge (*Trans. Faraday Soc.*, 1943, 37, 424—431).—High concns. act by delaying start of multiplication. The bacteria during growth can neutralise the effects of resorcinol, but not of *m*-cresol. In 0.07% *m*-cresol the organisms elongate but do not divide. V. J. W.

Adaptation of *B. lactis aerogenes* to growth in presence of sulphonamides. D. S. Davies and C. N. Hinshelwood (*Trans. Faraday Soc.*, 1943, 37, 431-444).—Increasing concus. of sulphanilamide or sulphaguanidine increase "lag" and reduce growth rate. After 30 passages through sulphonamide-containing media in immunity may develop which is attributed to enzymes producing a sulphonamide antagonist. V. J. W.

Characteristics of butyric acid bacteria from olives. J. R. Gililland and R. H. Vaughn (J. Bact., 1943, 46, 315–322).—Of 50 saccharolytic, butyric anaërobes isolated from samples of malodorous olives, 19 were Clostridium beijerinckii, 13 were Cl. bifermentans, 10 were Cl. fallax, 7 were Cl. butyricum, and 1 was Cl. acetobutylicum. All caused deterioration of olives when suitable conditions of growth were maintained in olive brines. Resistance to NaCl and to acidity was variable. Cl. acetobutylicum was most resistant to NaCl and Cl. multifermentans and Cl. fallax were most tolerant to low pH. All the cultures grew better in glucose media near pH 7, and with less than 1.0% of NaCl. F. S.

Metabolism of Clostridium tetani. M. J. Pickett (J. Biol. Chem., 1943, 151, 203–209).—Washed cells of Cl. tetani dehydrogenate histidine, methionine, serine, threonine, and aspartic and glutamic acids, but not 12 other amino-acids. Histidine is fermented, giving  $CO_2$ , NH<sub>3</sub>, and acetic and butyric acids. Malic acid is slowly fermented to  $CO_2$ , ethyl alcohol, acetic, butyric, and succinic acids. R. L. E.

Electrolytic control of oxidation-reduction potential and the study of anaërobiosis. M. E. Hanke and Y. J. Katz (Arch. Biochem., 1943, 2, 183-200).—An electrolytic method and apparatus for controlling the oxidation-reduction potential of aq. solutions are described. With the apparatus,  $E_h$  of bacterial cultures is maintained const. without addition of any extraneous material. The limiting  $E_h$  for initiation of growth of Bacteroides vulgatus and Cl. sporogenes is 0.150 v. at pH 6.6 and approx. 15 mv. more negative at pH 7.0 and 6.2. These so-called oligate anaërobic organisms grow in a continuous current of air (B. vulgatus consumes O<sub>2</sub> when growing in air) when the oxidation-reduction potential is kept sufficiently negative,  $E_h$  being the limiting factor. W. McC.

Mutation of *Phytomonas stewartii* by X-ray irradiation. R. E. Lincoln and J. W. Gower (*Genetics*, 1942, 27, 441-462).—The mutation rate in the bacterium *P. stewartii* is increased by X-ray irradiation of such an intensity that only 0.001% of the individuals survive 25 min. treatment. Survival during treatment follows a simple exponential function. The X-ray-induced mutations are similar in kind to those occurring spontaneously. L. G. G. W.

Dihydroxyacyl derivatives of  $\beta$ -alanine and *l*-leucine from tunnyfish liver [nutritional requirements of *Streptobacterium plantarum*]. --See A., 1944, III, 124.

Isolation, potency determination, nature, and ultracentrifugal and electrophoretic analysis of the hæmorrhage-producing fraction from Serratia marcescens culture filtrate.—See A., 1944, III, 122.

Infections and vitamins. H. Seidenstücker (Z. Vitaminforsch., 1943, 13, 294-312).—A review of the relations between vitamins and immunity, allergy, intestinal flora, bacterial growth, and chemotherapy. P. G. M.

Intestinal parasites of mental patients. R. Burrows (Amer. J. Hyg., 1943, 38, 293-305). B. C. H.

Occurrence of the aerogenes group of coliform organisms in fæces and its significance in water analysis. T. N. S. Raghavachari and P. V. Scetharama Iyer (Indian J. Med. Res., 1940, 28, 55-60).— Specimens of fresh fæces from healthy human subjects contained B. aerogenes cloacæ to the extent of 7%, most of which grew at  $44^{\circ}$ in the McConkey broth test. S. E. M.

Clostridium botulinum in samples of Calcutta soil. C. L. Pasricha and G. Panja (Indian J. Med. Res., 1940, 28, 49-54).—From 4 out of 8 samples of garden soil from Calcutta pure cultures of CL. botulinum (type A strains) were isolated. Cl. botulinum grows well aërobically in blood clot or in mashed cabbage medium and produces potent toxin. S. E. M.

Viability of meningococcus in the cool room. Dharmendra. (Indian J. Med. Res., 1940, 28, 43–48).—35 strains of meningococci, on pigeon blood-agar or semi-solid serum-agar, were stored at  $37^{\circ}$ or at 3.5— $8.5^{\circ}$  and then tested for viability. At  $37^{\circ}$ , the no. of viable strains decreased gradually after the first week; none was

viable after 8 weeks on serum-agar or 10 weeks on pigeon blood-agar. In the cool room most strains lived for about 5 weeks: 6 strains (belonging to group II, Griffith) were more resistant, surviving for 27 weeks on serum-agar and for 31 weeks on pigeon blood-agar. 37° was better than cool room temp. for storage on serum-agar for all S. E. M. except the resistant strains.

Field study of alum-precipitated combined pertussis vaccine and diphtheria toxoid for active immunisation. P. L. Kendrick (Amer. J. Hyg., 1943, 38, 193-202).—Combined alum-pptd. diphtheria J. Hyg., 1945, 35, 195-202). Combined anti-pitt. diplication of the second and pertussis vaccine was tested in 1326 preschool children in comparison with a control group of 1511 children. 30,000 million H. pertussis organisms were given in 3 injections over a period of 5 weeks. The first dose consisted of 1 ml. of plain pertussis vaccine; the second, after 1 week, of 1 ml. of combined diphtheria-pertussis antigen; the third was a similar dose given after 4 weeks' interval. Diphtheria antitoxin titres in immunised children showed a good response to the diphtheria toxoid in the children showed a good response to the diphtheria toxoid in the combined antigen; opsonocytophagic, agglutination, and complement fixation tests indicated response to H. pertussis. The incidence of pertussis in the inoculated group was 0.9 attack per 100 person-years compared with 10.4 for the control group. Attacks among vaccinated children were milder than among controls. B. C. H.

Site of antibody formation in rabbits following intracutaneous injections of pneumococcus or of streptococcus vaccine. P. F. de Gara and D. M. Angevine (*J. Exp. Med.*, 1943, 78, 27–39).—The antibody response showed 3 phases: (1) 5–12 days following a single injection of pneumococcal or streptococcal vaccine, high antibody titres were found in extracts from the site of injection, spleen, bone marrow, and liver, and occasionally in the regional lymph nodes; the titre of circulating antibodies was low; (2) after 2-4 weeks, there were only slight differences in the antibody titres of blood and organs; skin extracts from the injected site showed high vals.; (3) later still, the serum titre decreased more rapidly than the titres from spleen, bone marrow, and injected skin extracts. Similar results were obtained following repeated intracutaneous vaccine injections in rabbits; during the first phase, antibodies were not found in extracts from the site of injection into the skin, nor in lymph nodes. The titre in kidney, anterior stomach wall, and are injected skin was parative or very low and non-injected skin was negative or very low. A. S.

Pneumococcal corpuscular swelling reaction studied with electron Pheumococcal corpuscular swelling reaction studied with electron microscope. S. Mudd, F. Heinmets, and T. F. Anderson (*J. Exp. Med.*, 1943, 78, 327-332).—Electron micrographs show that the pneumococcal capsule is a gel of low density outside of and closely applied to the bacterial cell wall. The thickness and density of this capsular gel are greatly increased by homologous immune rabbit serum; this increase may exceed 25 times the thickness of the surface deposit caused by rabbit immune serum on the cell walls and flagella of homologous non-capsulated bacteria. Homologous immune serum permeates the capsular gel: sp. antibodies combine immune serum permeates the capsular gel; sp. antibodies combine with the capsular polysaccharide; non-sp. serum components are secondarily adsorbed to or combined with the sp. antigen-antibody complex. The low antibacterial titres of pneumococcal antisera are explained by the permeation of the capsule by antiserum and the high combining capacity of pneumococcal carbohydrate with antibodies. A. S. A. S.

**Taxonomic relationships in the genus** Proteus. R. Rustigian and C. A. Stuart (Proc. Soc. Exp. Biol. Med., 1943, 53, 241-243).-On the ground of cultural characters it is suggested that type 33111 of "atypical enteric organisms of Shigella group" previously examined (J. Bact., 1943, 45, 198) should be re-named Proteus entericus and is identical with Shigella retigeri, and that the species hydrophilus, ichthyosmius, and pseudovalerici should not be included in the Proteus genus V I W v. J. W. Proteus genus.

Virulence of tularemia as related to animal and arthropod hosts. R. G. Green (*Amer. J. Hyg.*, 1943, 38, 282-292). B. C. H.

Food poisoning. Bacterial toxins and infections. C. B. Gunther (Amer. J. Pharm., 1943, 115, 317-325).—A review of salmonella, streptococcus, and staphylococcus food poisoning, including methods of laboratory diagnosis. H. G. R.

Early lesions of experimental endocarditis lenta. W. J. MacNeal, M. J. Spence, and A. E. Slavkin (*Amer. J. Path.*, 1943, 19, 735– 740).—Following the intravenous injection of large amounts of Str. viridans into rabbits, the bacteria are taken up extensively by phagocytosis by the endothelial cells of the endocardium and of the intima of the aorta and coronary arteries. The bacteria also lodge in the myocardial capillaries either by direct endothelial phagocytosis in the myocardial capitaries either by direct endomenal phagooytosis of streptococci or by arrest of sluggish leucocytes containing the bacteria. After phagocytosis many bacteria are destroyed without production of recognisable persistent structural changes, while particularly on the heart valves, the included bacteria survive, multiply, and initiate the pptn. of elements from the blood to give rise to the vegetations of endocarditis. (13 photomicrographs.)

C. J. C. B.

Reactions in skin and in internal organs of rabbits sensitised with streptococcus vaccine and their relationship to antibodies. P. F. de Gara and D. M. Angevine (J. Exp. Med., 1943, 78, 135-150).-Homologous vaccine was injected into abdominal organs of rabbits after different intervals following sensitisation by a single or by repeated intracutaneous injections of heat-killed pneumococci type I or of formalin-killed hæmolytic streptococci (strain AB). Local inflammation with or without necrosis was observed in liver and spleen of most animals; injections into the kidney and into the anterior wall of the stomach caused hæmorrhagic lesions, frequently with slight or moderate inflammation and, rarely, with necrosis. There was no correlation between the skin and organ reactions of animals sensitised with killed pneumococci or streptococci, or between those reactions and serum antibody titre. Allergic reactions occurred in organs with a high antibody titre (liver and spleen) and were absent in the stomach or kidney (titre low or negative).

Salmonella isolated in Florida during 1942. M. M. Galton and A. L. Quan (Amer. J. Hyg., 1943, 38, 173-177).—The following Salmonella were isolated from routine blood and fæces examinations: Bact. typhimurium; Bact. derby; Bact. sandiego; Bact. choleræ suis; Bact. litchfield; Bact. hartford; Bact. montevideo; Bact. oranienburg; Bact. sendai; Bact. anatum; Bact. give; Bact. minnesota; Bact. poona; Bact. bonariensis of Monteverde; Bact. florida. No one type prevailed although group C organisms predominated. B. C. H.

Salmonella infections in man. Analysis of 1000 cases bacterio-logically identified by the New York Salmonella Centre. E. Selig-mann, I. Saphra, and M. Wassermann (Amer. J. Hyg., 1943, 38, 226-249). B. C. H. mann, I. 9 226-249).

226-249). B. C. H. **Components of antigenic complex of** Salmonella typhimurium. G. G. Freeman (Addendum : A. G. Ogston) (Biochem. J., 1943, 37, 601-614).—The crude antigen was obtained in 6.9% yield by tryptic digestion of the dried organisms. 97.6% of the antigenic material was recovered after fractional pptn. from 0.1N-acetic acid solution with alcohol in 60% concn. It was further purified by 3 fractionations from aq. solution at 23-35% concn. of (NH<sub>4</sub>)<sub>2</sub>SO, Aq. (opalescent) solutions gave a ppt. with phosphotungstic acid positive reactions for tyrosine and carbohydrate, a weak positive reaction for arginine, and a negative histidine reaction. By hydrolysis with 0.1N-acetic acid at 100° the following fractions were obtained: sp. polysaccharide 69.8%,  $[a]_{20}^{20} + 105^{\circ}$ ; conjugated protein 5.9%,  $[a]_{20}^{20} - 22 \pm 4^{\circ}$  in 0.1N-NaOH, N : P ratio 7 : 1; lipin fraction 3.9%; alcohol residue fraction 8.4%,  $[a]_{20}^{40} + 15^{\circ}$ . The sp. polysaccharide is non-antigenic and yields 9.3% of reducing sugars by hydrolysis with N-H<sub>2</sub>SO<sub>4</sub> at 100°, from which d-glucose 31%, d-galactose 19%, and d-mannose 21.5% are obtained. Tryptic digestion of the conjugated protein liberates only 17.7% of the total N in 14 days, as compared with 50.6% from formic acid-HCl hydrolysis in 4-8 hr. Fractional degradation of the antigenic complex by dil. NaOH solutions or extraction by phenols yields a non-antigenic undegraded polysaccharide which forms acid-sol. complexes with the conjugated protein and horse serum-albumin. This complex formation is polysaccharide which forms acid-sol. complexes with the conjugated protein and horse serum-albumin. This complex formation is confirmed by ultracentrifugal examination, which also shows approx. P. G. M. 70% of the antigen to be homogeneous.

Tuberculin protein. Preparation from non-synthetic medium. G. E. Shaw (Quart. J. Pharm., 1943, 16, 196-200).—A peptone medium suitable for the prep. of pptd. tuberculin protein is de-scribed. The prep. of the protein and a method for production of the protein as a dry powder by pptn. with acctone are described. This powder is readily sol. in water without the aid of alkali, and its potency is equal to that of international standard old tuberculin when tested by the method laid down by the Medical Research when tested by the method laid down by the Medical Research J. N. A. Council (Memo. M. 15).

Significance of amino-groups for oxidation of various compounds by cholera vibrio. F. Bernheim (Arch. Biochem., 1943, 2, 125– 133).—The uptake of  $O_2$  and production of  $CO_2$  by amino-acids, dicarboxylic acids, and carbohydrates in presence of V. comma are recorded. V. comma and Escherichia coli contain approx. twice as many reactive NH<sub>2</sub>- as carboxyl groups and V. comma contains 24% more reactive NH<sub>2</sub>-groups than does E. coli. Low concns. of formaldehyde and HNO<sub>2</sub> inhibit oxidation of pyruvate by V. comma and less readily, by E. coli. HgCl<sub>2</sub> acts in the same way. HNO<sub>2</sub> acts only in acid solution. The oxidation of asparagine by V. comma is more sensitive to inhibition by phenylhydrazine than is its oxidation by E. coli. The protein of V. comma, but not that of E. coli, is stained deep orange by Nessler's reagent; no staining of *E. coli*, is stained deep orange by Nessler's reagent; no staining occurs after treatment with  $HNO_2$ . Alkaline  $NaNO_2$  has no effect on the staining. The results suggest that certain NH<sub>2</sub>-groups are necessary for the enzyme that catalyses the oxidation of pyruvate W. McC. by V. comma.

Capillary tubes for the distribution of individual doses of bacterio-phage. C. L. Pasricha and M. N. Lahiri (*Indian J. Med. Res.*, 1940, 28, 321-322).--A bunch of 50 capillary tubes, one end scaled, is placed in a test-tube and filled with bacteriophage by vac. Each tube contains the adequate amount of 0.25 a.s. of bacteriophage. Each tube contains the adequate amount of 0.25 c.c. of bacteriophage. S. E. M.

Disaggregation of chicken cholera virus. E. Weineck (Kolloid-Z., 1943, 103, 159-161).—Amino-acids (1% glycine and 0.5% sarcosine) cause a disaggregation of the virus in N. (e.g., NaCl) solution. A. J. M.

Factors determining the severity of poliomyelitis in Macaca mulatta. F. J. Moore and J. F. Kessel (Amer. J. Hyg., 1943, 38, 323--344). B. C. H.

Herpetic infection in mice. I. Passive protection against virus inoculated intranasally. II. Pathways of invasion of central nervous system after intranasal instillation of virus in suckling mice. III. Visceral lesions in suckling mice. G. P. Berry and H. B. Slavin (J. Exp. Med., 1943, 78, 305-313, 315-320, 321-326).-I. Passive immunity, acquired from immune mothers or induced by adminis-tration of immune rabbit serum in suckling mice, produced a high degree of resistance against herpetic infection following intranasal inoculation of the virus. Antibodies were received from the mother mainly in the milk and were demonstrated in the blood of 2-weeksold mice; natural immunity rapidly declined when suckling was interrupted. Herpes virus was not recovered from the foctus of immune or non-immune infected mothers.

II. The virus, on intranasal instillation in suckling mice, reached the central nervous system via the trigeminal and olfactory pathways.

III. Intranasal instillation produced widespread systemic effects. The lungs are affected by aspiration. There was evidence of blood-borne infection in the liver, spleen, and, less frequently, in the adrenals and bone marrow; there were signs of renal infection and lymph nodes contained herpetic inclusion bodies. The central nervous system is not infected via the vascular route. (Photomicrographs.) A. S.

Influence of humidity on survival of influenza virus in air. C. G. Loosli, H. M. Lemon, O. H. Robertson, and E. Appel (*Proc. Soc. Exp. Biol. Med.*, 1943, 53, 205-206).—Virus suspensions sprayed into the air of a room with R.H. 80-90% were no longer infective into the air of a room with R.H. 30-50 , note the room min., and at after 1 hr., at 45-55% infection was present after 70 min., and at 17-240 ofter 24 hr. V. J. W.

Adsorption of influenza virus on cells of respiratory tract. G. K. Hirst (J. Exp. Med., 1943, 78, 99-109).—The reaction between influenza virus and cells of the excised and perfused ferret lung was studied. Pulmonary cells rapidly adsorbed large amounts of intratracheally inoculated virus; after a short interval, the cells began to release the virus, and in the case of influenza B the release was 75% complete after 5 hr. In that period, the Lee strain was more completely released than the PR8 strain. After the release of virus, the cells were incapable of adsorbing virus as before. After destruction of the mouse-infecting capacity of the virus by heat or formalin, the virus was adsorbed by the cells but not released. The interaction between influenza virus and pulmonary cells closely resembles that between influenza virus and avian red cells. Inluenza virus was readily adsorbed by the lung in the living ferret and could at first be eluted (after perfusion and excision of the lung) but in a short time virus could not be released by this method; free virus could not be demonstrated in the living ferret until 24 hr. after inoculation, the destruction of a sp. receptor substance may be a necessary preliminary in the parasitism of susceptible cells by influenza virus. A. S.

Immunological response to influenza virus infection measured by complement fixation test. Relation of complement-fixing antigen to virus particle. W. F. Friedewald (J. Exp. Med., 1943, 78, 347-366).—The test uses influenza immune sera and virus antigens obtained from the allantoic fluid and a photoelectric densitometer. The factor responsible for the increased hæmolytic activity of complement was found in human and animal sera and in allantoic fuid of young chick embryos; it requires the presence of com-plement and haemolysin, resists heating at 100° for 2 hr., and is dialysable. A complement-fixing agent intimately associated with the virus particle was found in allantoic fluid or mouse lung preps.; it sediments in the high-speed centrifuge at the same rate as the hæmagglutinin and infective particle, and is adsorbed by lowl red cells and eluted from the cells on keeping at room temp.; it cannot be separated from the virus by repeated washings in the centrifuge or repeated adsorptions with red cells; the hæmagglutinin and the complement-fixing antigen fibres remain proportional; the antigen shows a high degree of strain-specificity with PR8, W.S., and swine ferret antisera and little or no strain specificity with human sera. A sol. antigen is also present in influenza virus preps. which can be separated from the virus particle by centrifuging; it is not adsorbed by red cells, reacts in lower titre with ferret antisera, and shows less strain-specificity in cross complement-ination tests. Allantoic fluid virus preps. contain much less of the foll antisera the strain specificity in cross of the sol. antigen than mouse lung extracts. A. S.

Yield of rabies virus in chick embryo. B. Sigurdsson (J. Exp. Med., 1943, 78, 341-345).—Rabies virus was intracerebrally introduced in 8-day-old chick embryos and the virus activity of pools of embryos was assayed after incubation at  $35-36^{\circ}$  for different periods. The virus reached a titre of  $10^{-5\cdot5}-10^{-6\cdot5}$  in 5-6 days and remained at that level until the 9th day of infection. The virus invades the embryo after inoculation of the chorio-allantoic membrane. A. S.

Susceptibility of domestic fowls to a strain of rabies virus obtained from a jackal. N. Veeraraghavan and G. L. C. Philipsz (Indian J. Med. Res., 1940, 28, 81-90). S. E. M.

Behaviour of 17D yellow fever virus in rhesus monkeys. Relation to substrain, dose, and neural or extraneural inoculation. J. P. Fox and H. A. Penna (Amer. J. Hyg., 1943, 38, 152-172).—Observations made on 477 rhesus monkeys inoculated intracerebrally in the routine control of individual lots of vaccine were analysed with respect to the substrain and dose of 17D virus. Data for 8 groups of monkeys inoculated with different substrains of 17D virus revealed significant differences in the occurrence of circulating virus, immune response, onset and duration of febrile reactions, and in the incidence of encephalitic reactions. Larger inocula were followed by an earlier appearance of circulating virus, serum antibodies, and of febrile reaction which was of shorter duration. Large subcutaneous inoculations resulted in suppression of circulating virus while antibodies could be demonstrated by the 7th day; with small doses virus appeared in the circulation after 6 or 7 days and serum antibodies after 11 days although subsequent titres were higher compared with larger inocula. Intracerebral inoculations produced a larger amount of circulating virus and a higher level of antibodies in the serum (see A., 1944, III, 152). B. C. H.

Comparative study of two strains of vaccinia virus. C. G. Pandit and R. Sanjiva Rao (Indian J. Med. Res., 1940, 28, 71-80).-Two C. G. Pandit strains of vaccinia virus, one the routine strain, the other a fresh strain from smallpox material, were identical in antigenic and immunological properties. S. E. M.

Origin of epidemic virulence. M. R. Zelle and J. W. Gowen enetics, 1940, 25, 140-141). L. G. G. W. (Genetics, 1940, 25, 140-141).

Pictorial presentation of antigen and antibody relations. P. Sawin, C. A. Stuart, and K. M. Wheeler (*J. Heredity*, 1943, 3 179-188). L. G. G. W. 34, 179-188).

Cellular antigens in cattle blood. C. Stormont and R. W. Cumley (J. Heredity, 1943, 34, 35-44). L. G. G. W.

Immunochemistry. VII. Isolation from hog gastric mucin of immunochemistry. VII. Isolation from hog gauge is specificity. polysaccharide-amino-acid complex with blood group A specificity. W. T. J. Morgan and H. K. King (Addendum : R. A. Kekwick) (*Biochem. J.*, 1943, 37, 640—651).—Commercial gastric mucin is suspended in saline or water saturated with  $CO_2$  for several days. The viscous suspension (approx. 1%) is centrifuged and the residue washed 4 times. The main extract, together with the conc. washings, is tracted with  $SO_2$ . The 4 substance separate sharply washed 4 times. The main extract, together with the colic, washings, is treated with anhyd.  $Na_2SO_4$ . The *A*-substance separates sharply at 27–30% concn. of  $Na_2SO_4$ . After 2 or 3 pptns. the aq. solution is dialysed at 0° until free from  $SO_4''$  and freeze-dried. An altern-ative method of prep., involving initial extraction with 90% phenol, is also described. The undegraded *A*-substance inhibits sp. iso-agglutination and hæmolysis of sheep cells by sp. anti-*A* rabbit immune serum; its relationship to the virulence-enhancing agent in crude gastric mucin is discussed. Solutions possess considerable viscosity and form an elastic gel on addition of borate buffer at pH 8.5, but this property is lost even on slight degradation of the A-substance, e.g., by heating with formamide, whilst the power of inhibiting hæmolysis of sheep cells is even slightly increased. of inhibiting hamolysis of sheep tens is even sharely induced Component amino-acids are completely liberated by hydrolysis with 6n-HCl at 100°. The max. amino-acid-N val. is 2.2%, and hexos-amine-N 2.3%. Reducing substances total 52%, 27% being due to hexosamine and 25% to galactose. Tyrosine and cysteine are absent. P. G. M.

Attempts to obtain better results with the bacterial antigen ("vac-cine ") therapy of low-grade chronic ("focal ") infection. Possible errors of usual methods. M. H. Stiles, C. Berens, W. B. Rawls, and G. H. Chapman (*J. Lab. clin. Med.*, 1943, 28, 1447—1455).—A review of possible errors of tehnique. C. J. C. B.

Antigenic properties of native and regenerated horse serum-albumin.—See A., 1944, III, 97.

Electrophoresis and antibody-nitrogen determinations of a cold hæmagglutinin.—See A., 1944, III, 94.

Serologic and anaphylactic reactions of the cathepsins of normal and neoplastic tissues .- See A., 1944, III, 122.

#### XXVI.—PLANT PHYSIOLOGY.

Permeability of the wall of the xylem vessel. T. Ekambarum and V. K. Kamalam (J. Indian Bot. Soc., 1940, 19, 231-234).—Cut shoots of *Tecoma stans* placed in 10% aq. acctic acid show killing of the cells adjoining the xylem vessels in the stem and in cells near the vein of the leaf. With  $\rm KNO_3$  the cells first killed are those near the vein endings in the mesophyll of the leaf. Of the chemicals

tried some cause one and some the other type of killing. The vessel walls may not be equally permeable to all inorg. solutes. , L. G. G. W.

Hydrophytes, xerophytes, and halophytes and the production of alkaloids, cyanogenetic and organic sulphur compounds. J. B. McNair (Lloydia, 1943, 6, 1--17).—The electrical conductivity of the sap of hydrophytes is lower than that of halophytes. The average  $SO_4$  content of hydrophytes is less than the average val. for halophytes. Many families contain both hydrophytes and species producing org. S compounds but only one hydrophyte (Nasturitum officinale) produces a volatile org. S compounds. Hydrophytes rarely produce alkaloids. The amphibious Polygonum amphibium produces more than ten times as much alkaloid when growing on land than in water. Halophytes and xerophytes often produce alkaloids. Hydrophytes and xerophytes often produce alkaloids. Hydrophytes and xerophytes often and plants growing in water produce less HCN than when grow on land or in moist soil rich in  $NO_3$ . A no. of halophytes and xerophytes produce HCN.

Water relations of plant cells. III. Respiration of plasmolysed tissues. T. A. Bennet-Clark and D. Bexon (New Phytol., 1943, 42, 65—92).—Discs cut from beetroot tissue show when immersed in water an increasing respiration rate which rises to about 4 times the initial rate after 300 hr. Immersion of the discs in expressed sap (even when diluted) causes a rapid increase in the respiration rate. This increase occurs when the sap has been boiled and filtered or autoclaved, and cannot be due to enzymes or micro-organisms. Treatment of tissue discs with aq. sucrose, glucose, and many inorg. salts has no effect on the respiration rate but the ether-sol. constituents of the sap show the stimulating effect, which is probably due to org. acids and their salts. Malate, citrate, and ascorbate all show this effect. Plasmolysis of beet tissue causes a rapid rise in respiration followed by a steady fall to a const. val. (lower than that of tissue in water) attained after 30—60 min. Plasmolysis causes a concn. of cell contents (malate etc.) but decreases the area of the vacuolar boundary and hence the diffusion of malate etc. from the vacuolar boundary and hence the diffusion sis lowed down and the respiration rate falls. Externally supplied malate reaches the enzyme system of unplasmolysed cells readily and so increases the respiration rate. L. G. G. W.

Relations between water intake and oxygen supply in living plant tissues. II. Tensility of the cell wall. L. Brauner and L. Brauner (Rev. Fac. Sci. Istanbul, 1943, 8, 30-75).—The total extensibility (T) and the plastic tensility (P) of cylinders of potato tuber in water increased to a max. at 10 hr. in both aërobic and anaërobic conditions. The change was more rapid aërobically, the differences for T and P being 12.8% and 13.4% at 20 hr. T, P, and elasticity (E) were pHdependent, following a max. curve. T and E were highest at pH 7, P at pH 6. All 3 were lowest at pH 8. From pH 4 to 7 the curves of water absorption and T were similar. The effect of salts (KCl, LiCl, CaCl<sub>2</sub>, MgCl<sub>2</sub>) depended on the valency and the hydration of the cation in low concn., and on the concn. of the solution in high concn. The first effect was positive or negative according to whether the hydration or the discharge factor predominated. The second effect always reduced tensility. F. S.

**Transpiration of a leaf from its measurable stage to leaf fall.** P. Parija and B. Samantarai (J. Indian Bot. Soc., 1939, **18**, 65— 77).—Transpiration of *Helianthus annuus* and *Datura alba* leaves is measured by introducing the leaf at an early stage of its development into a "leaf chamber" with the leaf still attached to the plant, and passing a current of dry air through the chamber. At first the transpiration of the leaf rises and then remains steady, after which it declines until leaf fall. Although the experimental leaf is kept in the chamber with dry air, alteration of the humidity of the air around the other leaves of the plant affects the transpiration of the enclosed leaf. L. G. G. W.

Effects of some chemically inert dusts on transpiration rate of yellow Coleus plants. E. W. Beasley (Plant Physiol., 1942, 17, 101-108).—Dusts (clay, talc) applied to leaves affect transpiration only by increasing the night loss of water: this occurs only when very fine dusts are applied to the underside of leaves while the stomata are open. The particles probably prevent complete closure of stomata. The smaller particles have the greater effect and the more tender leaves show the greater response. Hardy field plants are not much affected. A. G. P.

**Respiration of developing Jonathan apples.** S. T. Shaw (*Plant Physiol.*, 1942, **17**, 80—90).—The rate of respiration of young growing apples was high during the period immediately following fruit-setting and then diminished progressively with advancing growth. Differences in respiration rate between individual apples measured on the same day were considerable. Use of sections of fruit led to erroneous results, the rate of  $O_2$  consumption being increased by about 60% due to additional surface exposed and wounding. The R.Q. decreased from May (0.84) to June (0.46), subsequently increasing in July (0.92). These vals. were not greatly affected by use of sections. A. G. P.

Function of ascorbic acid in respiration of potato. W. F. H. M. Mommaerts (Z. Vitaminforsch., 1943, 13, 250–259).—Ascorbic acid appears to be stored in the potato tuber and to be concerned in sprouting but, whereas addition of the vitamin initially increases  $O_2$  consumption by potato slices, it does not appear to act as a respiratory catalyst in the resting tuber. No ascorbic acid oxidase and no bound ascorbic acid are detectable. P. G. M.

Effect of salts and other substances on respiration of *Elodea* canadensis. R. F. Jones (New Phytol., 1943, 42, 127-138).--Mineral salts temporarily stimulate the respiration rate of *Elodea* but addition of carbohydrate does not prevent a final decrease in that of *Elodea* kept in the dark. Asparagine does prevent this decrease, which may be due to the maintenance of a N balance in the plant so that protein degradation does not exceed protein synthesis. L. G. G. W.

Nature of the reserve food in seeds and their resistance to high temperatures. P. Parija and P. Mallik (*J. Indian Bot. Soc.*, 1940, 19, 223-230).—Resistance of seeds to high temp. is positively correlated with their oil content and with the thickness of the seed coat. L. G. G. W.

Influence of soil temperature on development of colonial bent grass. I. H. Stuckey (*Plant Physiol.*, 1942, **17**, 116—122).—Colonial bent grass, Kentucky bluegrass, and timothy were grown with roots maintained at three different and the tops at the same temp. Higher temp. ( $26.7^{\circ}$ ) accelerated maturation of the roots long before any extensive ramification had occurred. Roots of colonial bent grass grown in soil at 10° were still immature when those grown at  $26.7^{\circ}$  were dead and distintegrated. A. G. P.

Inheritance and physiology of efficiency in iron utilisation in soya beans. M. G. Weiss (*Genetics*, 1943, 28, 253-268).—Soya bean varieties differ in their ability to grow in calcareous soils. In culture experiments with a solution low in Fe varieties with efficient Fe utilisation make normal green growth. "Inefficient" varieties developed chlorosis just as they do when grown in calcareous soils. "Inefficient" varieties have a higher total, but a lower sol., Fe content than efficient ones. The efficient varieties also have a higher pH in the cell sap and a higher K content. L. G. G. W.

Differences in growth limitation of certain plants by magnesium and minor element deficiencies. A. L. Sommer and A. Baxter (*Plant Physicl.*, 1942, 17, 109—115).—Of crops examined maize was the least and *Crotalaria* the most affected by Mg deficiency. *Crotalaria* was not sensitive to deficiencies of minor elements. Turnips were severely affected by lack of minor elements but showed symptoms of Mg deficiency of Mg was greater than to that of minor elements. Cotton was equally affected by shortage of minor nutrients and of Mg. In peanuts Mg deficiency suppressed nut formation much more than top growth; minor nutrients had a relatively small influence. A. G. P.

Absorption and accumulation of rubidium bromide by barley plants. Localisation in the root of cation accumulation and of transfer to the shoot. F. C. Steward, P. Prevot, and J. A. Harrison (*Plant. Physiol.*, 1942, 17, 411-421).—A longitudinal gradation in the accumulation of cations (K, Rb) is demonstrated in attached barley roots, the highest concn. being at the apex. Plants grown without access to external salts accumulate a greater concn. of Rb<sup>\*</sup> than of Br' from aërated aq. RbBr; Br' accumulates principally in leaf shoots. Br' moves more rapidly than Rb<sup>\*</sup> from root to shoot. After transfer of plants to a RbBr-free solution the shoot depletes the roots of the salts previously absorbed, notably Br'. Accumulation of Rb by excised roots proceeds for a short time only.

A. G. P.

Sulphur content of seeds and seed weight in relation to effects of sulphur deficiency on growth of sunflower plants. S. V. Eaton (*Plant Physiol.*, 1942, 17, 422-434).—Sunflower plants grown in S-deficient nutrient solution were small and produced smaller and fewer seeds per head than did those receiving adequate S. The % of S in seeds and their % germination were the same in both cases. Seed size affected growth of roots more than that of tops. S deficiency affects tops more than roots. A. G. P.

Weekly absorption of nitrate by young, bearing orange trees grown out of doors in solution cultures. H. D. Chapman and E. R. Parker (*Plant Physiol.*, 1942, 17, 366—376).—Data for a 3-year period are recorded. The rate of intake of  $NO_3$ ' by the trees was min. in Jan.-Feb. (California) and max. in late spring, summer, and carly winter. Rapid intake of  $NO_3$ ' was associated with periods of active root growth, and rapid water intake with active top growth. The absorption of  $NO_3$ ' from the nutrient was relatively greater than that of water. Root growth ceased from Jan. to May and recommenced only after the spring flower and leaf cycle was completed. A. G. P.

Varietal differences and inheritance of vitamin-A and -C in potatoes. F. W. Dove, E. F. Murphey, and R. V. Akeley (Genetics, 1943, 28,

72-73).-Two wild varieties of potato had a lower ascorbic acid content than American and German commercial varieties. Plants high in ascorbic acid tend to give offspring with high or medium ascorbic acid vals. Ascorbic acid content was not related with tuber size, shape, eye depth, starch content, or earliness but pink-skinned and pink-eyed varieties gave lower vals. than white-skinned varieties. Two varieties high in vitamin-A were low in -C, but yellow flesh is associated with both high and low ascorbic acid vals. L. G. G. W..

Effect of potassium iodide on ascorbic acid content and growth of tomato plants. R. H. Hageman, E. S. Hodge, and J. S. McHargue (*Plant Physiol.*, 1942, 17, 465-472).—In sand-cultured tomato plants addition of KI (4-100 p.p.m. of I) to the nutrient lowered the ascorbic acid content of the plants. With 16 p.p.m. of I plant injury (loss of green colour, necrosis of leaf edges, leaf curl, death) was considerable. The intake of Mn and Cu was increased by the I treatment to extents relatively greater than that of any other A. G. P. nutrient.

Effect of saline substrate on hourly levels of carbohydrates and inorganic constituents of barley plants. H. G. Gauch and F. M. Eaton (*Plant Physiol.*, 1942, 17, 347-365).—Effects on sand-cultured barley of the addition of Cl' 100 and SO<sub>4</sub>." 200 m-equiv. per l. to the nutrient solution of each node. The relative dry wts. of control, Cl<sup>-</sup> and SO<sub>4</sub> "-treated plants were 100, 61, 43 and their water contents 90.6, 86.8, and 85.7% respectively. Treatment with SO<sub>4</sub>" increased the S and lowered the Cl intake of the plants whereas Cl' treatment increased the Cl without affecting the SO," content of the plants. The carbohydrate contents of control, Cl'- and SO4"treated plants were: reducing sugars 16.9, 16.6, 15.5, sucross 48-2, 80.6, 91.1, total sugars 65.1, 97.2, 106.6 mg. per 10 g. fresh wt. and starch 1.0. 1.2, 1.5% of dry matter respectively. A. G. P.

Inheritance of a cyanogenetic glucoside and its hydrolysing enzyme in white clover. S. S. Attwood and J. T. Sullivan (Genetics, 1943, 28, 69) .- Inbred lines of white clover exist which give uniform positive or negative results in the picric acid test for cyanogenetic glucoside. Clover plants do not necessarily contain both the glucoside and its hydrolysing enzyme. L. G. G. W.

Colour pattern and doubleness in Petunia flowers. H. B. Creighton (Genetics, 1943, 28, 72).—In some diploid Petunias the flowers at midsummer contain only small amounts of white whilst in autumn half the corolla may be white. The colour pattern is not influenced by deficiencies of N, P, K, S, Mg, Ca, Fe, Zn, or B, but high N and K appear to increase the amount of coloured corolla tissue. Different photoperiods have no influence on the amount of colour in the flowers. L. G. G. W. flowers.

Effect of external factors on tomato pigments as studied by chrom-atographic methods. F. W. Went, A. L. LeRosen, and L. Zech-meister (*Plant Physiol.*, 1942, 17, 91-100).—The carotenoid content of tomato leaves remains substantially const.; that of ripe fruit varies widely in accordance with external and internal factors and the physiological condition of the plant. Conditions favouring fruit development are associated with low lycopene and carotenoid contents in the fruit. Poor growth conditions favour high lycopene concens. Detached tomatoes ripened at 33° produce no lycopene but all other pigments are formed normally. Lycopene is formed in detached fruits stored at and below 26.5° (optimum 19°) even when the fruit has been previously kept for a considerable time at  $33^{\circ}$ . External conditions have little influence on the  $\beta$ -carotene Á. G. P. content of the fruit.

Effect of drought on production of plant pigments. W. A. Beck (*Plant Physiol.*, 1942, 17, 487-491).—In pot-cultured sunflower seedlings plasmolysis of cells caused by extreme drought prevented the production of chlorophyll but not that of carotenoids. Saturation of the soil with water restricted the formation of all pigments, chlorophyll being affected more than xanthophyll or carotene. In pigment formation light and temp. are major factors; drought is of only secondary importance. A. G. P.

Culture of albino maize. H. A. Spohr (*Plant Physiol.*, 1942, 17, 397–410).—Albino maize was maintained for several months by feeding with sucrose; the normal no. of leaves were formed and also staminate and pistillate inflorescences. In the leaves of such plants starch was formed in the dark. Similar results were obtained when glucose but not when glycerol was used as org. A. G. P. nutrient.

Effects of radiant energy in relation to etiolation. J. P. Biebel (*Plant Physiol.*, 1942, 17, 377-396).—Responses of kidney bean and maize to radiation in the red-orange, red, and infra-red regions (6200-11000 A.) are recorded. Chlorophyll formation increased with the no. of cycles of irradiation up to 144 cyles daily. Albino and green maize were similarly affected. Temp. did not affect the magnitude of the spence. magnitude of the response. Leaves and growing points of the plants were the most affected by irradiation. The hypocotyls of irradiated and control beans contained similar total amounts of auxin but irradiated hypocotyls were smaller and actual concns. of auxin in them were correspondingly higher. A. G. P.

Effects of radiation on pollen grain development, differentiation, and germination. P. C. Koller (*Proc. Roy. Soc. Edin.*, 1943, B, 61, 398-429).—A 360-r. X-ray dose at 16-24° suppresses the beginning of prophase, reducing the rate of change from one to two nuclei in *Tradescantia* pollen grains. The "prophase-suppressing" effect is at a max. 3 hr. after irradiation and lasts 2 hr. The duration of metaphase was increased to 3 hr. and prolongation at this stage was observed 48 hr. after irradiation. While all stages of mitosis are retarded the effect on metaphase is the most marked. X-Rayinduced genic unbalance within the generative or vegetative nucleus suppresses differentiation but does not kill the pollen grain. Germination is suppressed when the vegetative nucleus is undersized, or when it is accompanied by a supernumerary nucleus. Failure of germination suggests that irradiation induced either gene-mutation or interchange in the chromosomes of the vegetative nucleus.

W. F. H. Physiology of rice. II. Photoperiodic responses in one variety of winter paddy. S. M. Sircar (*J. Indian Bot. Soc.*, 1942, 21, 41–50).—The winter variety of rice, Bhasamanik, when grown under short (8 hr.) days exhibited no reduction in vegetative growth or grain yield and showed an increased no. of tillers as compared with the "long-day" plants. Short days induced early "earing."

L. G. G. W

Effects of daylight and temperature on growth and flowering of some florist crops. K. Post (Cornell Univ. Agric. Exp. Sta. Bull., 1942, No. 787, 70 pp.).—Details of methods for the artificial illumination of flowering plants are given. Conditions (notably temp. and period of illumination) favouring growth and flower-bud formation in numerous species are recorded. A. G. P.

III, 361).—The formation of blossoms in H. niger is initiated by inhibiting respiration with an atm. of N<sub>2</sub> during periods of darkness, the periods of daylight being short. This result supports the view that, under long-day conditions, photo-synthesis provides material for respiration and production of blossoms whilst under short-day conditions, material which would otherwise be available for production of blossoms undergoes dissimilation. When this dissimilation is prevented by inhibition of respiration, blossoms are produced under short-day conditions also. W. McC.

Effect of light intensity and temperature on the growth of Azolla filiculoides. G-ud-D Ahmad (J. Indian Bot. Soc., 1941, 20, 213-226).—Satisfactory growth of A. filiculoides in culture occurred in the absence of added org. matter. At low light intensity root growth was poor and over a limited range of vals. light and temp. limit the growth simultaneously. At low, medium, and high light intensities max. growth occurred at 21°. L. G. G. W.

Effect of a mixture of two parts of blue-violet rays and one part of white light on the formation of carbohydrates in leaves. R. E. Cooper and R. R. Ullal (J. Indian Bot. Soc., 1940, 18, 139-143).-Two parts of blue light and one of white light reduced the rate of carbohydrate synthesis in green leaves as compared with white light alone of equal intensity. L. G. G. W.

Variation in the photosynthetic rate in Elodea. C. V. Iyengar Krishna (J. Indian Bot. Soc., 1942, 21, 167—172).—When Elodea assimilates in either diffuse or bright sunlight periods of rapid and slow photosynthesis alternate. The latter are probably due to fatigue. L. G. G. W.

Effect of anthocyanin pigment on the rate of photosynthesis in Eranthenum spp. P. Sen (J. Indian Bot. Sci., 1940, 19, 147— 166).—Anthocyanin-containing leaves of Eranthenum spp. show a higher rate of photosynthesis than green leaves in spite of a lower content of chlorophyll. The coloured leaves have a higher internal terms that the green energy of C with the spine of temp. than the green ones. L. G. G. W.

Photochemical action in plants. I. Respiration of entire *Pistia* plants in light. II. Photosynthesis in leaves at different temper-atures. R. Shri. III. Influence of visible light on rate of respir-ation of some coloured flowers. R. Shri and B. L. S. Brij. IV. ation of some coloured howers. A. Shiri and B. L. S. Bill. 17. Effect of violet and ultra-violet radiations on plant respiration. R. Shri (J. Indian Bot. Soc., 1940, 19, 19—32, 91—98, 99—104, 105— 112).—I. Illumination increases the respiration rate of shoots but not of roots of *Pistia* at relatively high temp. (27°). At 20° light has little effect on the shoot. There is a photochemical stage in the shoots but not in the roots where pigments which might absorb light argument. light energy are absent. II. With leaves of *Eugenia jambolana* in artificial light, after allow-

ing for the effect of light in respiration it is found that  $Q_{10}$  for real assimilation is 2.16 at 20—30°, and 1.75 at 25—35°. III. Flowers of *Nerium* and *Bougainvillea* (both rich in carotenoids or anthocyanins) but not those of *Canna* (with a low content of interview) but their particular to light.

pigments) have their respiration rate increased by exposure to light.

The effect of the illumination continues for some hr. after removal to darkness.

IV. Exposure of excised leaves of *Eugenia jambolana* to ultraviolet light (8 and 10 min. at an interval of 2 hr. to direct light at a distance of 3 ft. from an atm. Hg-vapour lamp) depressed the rate of respiration. The content of reducing sugars in the leaves was unaffected. L. G. G. W.

Mechanism of photosynthesis. N. N. Ovtschinnikov (Compt. rend. Acad. Sci. U.R.S.S., 1941, 31, 163-164).—The catalase in etiolated leaves is less active than that in green leaves, and the two enzymes differ in their activation energy. This shows that the catalases concerned in photosynthesis and respiration are not identical. Willstätter and Maquenne's hypothesis of the participation of peroxides in photosynthesis is indirectly confirmed. I. N. A.

Comparison of colchicine treatment with a glycerin base and a water base. O. J. Eigsti and L. Schnell (*Genetics*, 1943, 28, 73).— 1% colchicine in glycerin is more effective than a 1% aq. solution in inducing tetraploidy in *Vinca rosea*. L. G. G. W.

Range of concentrations and number of applications of colchicine effective for the induction of polyploidy in *Vinca rosea*. O. J. Eigsti and B. Tenney (*Genetics*, 1943, 28, 73-74).—Five applications of 1% colchicine in glycerin produced more polyploids (10%) than fewer treatments and/or more dil. solutions. L. G. G. W.

Effect of colchicine on nuclear and cytoplasmic phases of cell division in the pollen tube. O. J. Eigsti (*Genetics*, 1940, 25, 116). L. G. G. W.

Periclinal and total polyploidy in peaches induced by colchicine. H. Derman (Genetics, 1941, 26, 147). L. G. G. W.

Periclinal and total polyploidy in cranberries induced by colchicine. H. Derman and H. F. Bain (Genetics, 1941, 26, 147-148). L. G. G. W.

**Comparative** study of fruit development in diploid and tetraploid eucurbits. E. E. Sinnott, A. F. Blakeslee, and A. Franklin (*Genetics*, 1941, 26, 168—169).—Colchicine-induced tetraploids of *Cucurbita* and *Lagenaria* show in the young fruit larger cells than in the corresponding diploids and this larger cell size is maintained. Cell no. is reduced in the fruits of the tetraploid plants to about half that of the diploids. L. G. G. W.

**Colchicine-induced tetraploidy in** *Delphinium cardinale.* G. A. L. Mehlquist, C. O. Blodgett, and L. Bruscia (*J. Heredity*, 1943, 34, 187–192).—Seeds of *D. cardinale* germinated after treatment with aq. colchicine yielded a small no. of polyploids with flowers, pollen, and stomata larger than normal. Tetraploids were later than diploids in flowering, were fertile, and yielded larger seeds.

**Production of polyploidy in** Allium with p-dichlorobenzene. M. A. Carey and E. S. McDonough (J. Heredity, 1943, 34, 238-240).— The roots of 4-day-old Allium seedlings exposed to p-dichlorobenzene vapours were stunted and polyploid. L. G. G. W.

Apomixis and sexuality in *Poa*. A. Müntzung (*Hereditas*, 1940, 26, 115–190).—No significant relation between chromosome no. and contents of crude protein and crude fibre, sol. carbohydrates, and crude fat and ash in *P. pratensis* was found. L. G. G. W.

Minor elements and plant growth. W. E. Brenchley (*Biol. Rev.*, 1943, 18, 159-171).—A review of the effects of B, Cu, I, Mn, Mo, Se, Zn, As, Ba, Cd, Cr, Co, Pb, Li, Ni, Rb, Sr, Tl, and V on plant growth. J. D. B.

Minor elements in tomato nutrition.—See B., 1944, III, 22.

Influence of vitamin- $B_1$  on growth of Agrostis tenuis and Brassica alba. D. G. Clark (*Plant Physiol.*, 1942, 17, 137-140).—Vitamin- $B_1$  had no significant effect on the growth of either species.

A. G. P.

Effect of vitamin- $B_1$  on growth of rice. C. E. Minarik (*Plant Physiol.*, 1942, 17, 141–142).—Vitamin- $B_1$  had no beneficial effect on the growth of rice. A. G. P.

Effects of growth-regulating chemicals on opening of vegetative and floral buds of peach and pear. J. W. Mitchell and F. P. Cullinan (*Plant Physiol.*, 1942, 17, 16-26).—Emulsions of naphthylacetic acid in lanolin hastened the opening of peach flower buds when applied in the early swelling stage. Naphthylacetamide had a similar effect on one but not on a second variety. Fully swollen buds were unaffected. Indolyl-butyric and -acetic acids had no effect unless repeated applications were made. Treatment during dormancy injured flower buds. Naphthylacetic acid retarded the development of vegetative buds of peach. None of the substances examined affected pear flower buds. A. G. P.

Growth of Azolla filiculoides in mineral solution without addition of "Auximone." G-ud-D Ahmad (J. Indian Bot. Soc., 1941, 20, 285—292).—Extracts from yeast or bacterised peat added to mineral culture solution increase the growth of *A. filiculoides* although it can grow satisfactorily without these additions.

L. G. G. W. New fixative for plant smears. B. N. Singh, S. Sampath, and R. K. Bansal (*J. Indian Bot. Soc.*, 1939, **18**, 107-112).-2-5% aq. Na U acetate is recommended for fixing pollen mother cell smears. 2 hr. fixing is followed by 1 hr. washing and hardening in alcohol. L. G. G. W.

Use of Cellophane in pollen tube technique.—See A., 1944, III, 93. See also B., III, 1.

#### XXVII.—PLANT CONSTITUENTS.

Effects of pretreatment on determination of organic acids in plant tissues. T. C. Broyer, T. L. Isaacs, and F. G. Viels (*Plant Physiol.*, 1942, **17**, 69–79).—Freshly expressed sap of macerated barley roots is representative of the whole solution present in the roots in respect of quantity and nature of org. acids. Stored frozen roots yield a similar sap by direct expression. Treatment of tissues with conc. aq. NaOH causes decomp. of sugars and the production of acids not originally present in the roots. A. G. P.

Distribution of fumarase in plant tissues. H. Bodur (*Rev. Fac. Sci. Istanbul*, 1942, 7, A, 113—117).—Data are given for the amounts of fumarase present in seeds, fruits, and leaves of various plants. The largest amounts are present in apples and plums. The enzyme is absent from leaves except in *Aloe arborescens* and *Mesembry-anthenuum*. Distribution of the enzyme appears to be irregular; it may occur in one, and be absent from another closely related, species. J. N. A.

Nature of tea polyphenol oxidase. Preparation and properties of crystalline horseradish peroxidase. Comparison of milkweed, horseradish, and turnip peroxidases.—See A., 1944, III, 139.

a-Amylase [and]  $\beta$ -amylase [of barley]. J. Blom (5 Nordiske Kemikermode, 1939, 244—246).—a-Amylase is determined by measurement of the rate of reduction of  $\eta$  of starch solution, a- $+\beta$ -amylase by the rate of formation of reducing sugars from starch, and  $\beta$ -amylase directly in the same way after inactivation of a-amylase by acidifying to pH 3.5. Ungerminated barley contains no a-amylase, which, however, forms rapidly in the first few days of germination. The total  $\beta$ -amylase content of barley remains const. during malting, but the ungerminated grain contains it mainly in a combined form whence it is set free by proteolytic enzymes during germination. M. H. M. A.

Karakin, glucoside of Corynocarpus lævigata.—See A., 1944, II, 73.

Proteins of plant leaves. J. W. H. Lugg (J. Proc. Austral. Chem. Inst., 1943, 10, 258-267).—A lecture. Work on the nature and composition of the various leaf-proteins is reviewed. R. H. H.

Application of Neurospora sitophila to assay of pyridoxine in tomato plants. J. Bonner and R. Dorland (Arch. Biochem., 1943, 2, 451-462).—See C., 1944, Part 1. Distribution of pyridoxine in the tomato plant is similar to that of aneurin, riboflavin, and pantothenic acid. There is a gradient in pyridoxine concn. from apex to base, with higher concn. in the younger leaves and in the top of the stem than in older leaves and in the base. Pyridoxine appears to accumulate above a girdle made by steaming the base of a young tomato plant at the second node, and it also appears to accumulate on the distal side of a girdle made by steaming the petiole of a mature leaf of a young plant. J. N. A.

Baicalein from seeds of Oroxylum indicum, Vent. C. R. Mchta and T. P. Mehta (*Current Sci.*, 1943, 12, 274—275; cf. A., 1939, III, 884. —Baicalein,  $C_{15}H_{10}O_5$ , a 5:6:7-trihydroxyflavone, m.p. 265—266°, has been isolated from the seed oil of O. indicum, Vent. P. G. M.

Hypericin and a non-fluorescent, photosensitive pigment from St. John's wort (Hypericum perforatum). R. C. Betty and V. M. Trikojus (Austral. J. Exp. Biol., 1943, 21, 175–182).—When extracts (org. solvents) of young shoots are prepared in the dark or in subdued artificial light and purified under the same conditions by adsorption on  $CaCO_3$ , a fluorescent (hypericin) and a non-fluorescent pigment, which becomes fluorescent on exposure to daylight, are obtained. A red-fluorescent pigment is obtained when the extraction is carried out in daylight. This pigment differs pharmacologically from, and is more toxic to rats than, the non-fluorescent pigment before and after its transformation by light. W. McC.

Isolation of photosensitising agents from buckwheat.—See A., 1944, III, 137.

Chlorophyll d, a green pigment of red algæ.—See A., 1944, II, 85.

Berberine content of Coscinium fenestratum (Colebr.).-See A., 1944, II, 87.

Ergot alkaloids .- See A., 1944, II, 86.

Alkaloids of fumariaceous plants.-See A., 1944, II, 87.

#### 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.	0/
ampere	. amp.	electron-volt(s)	e.v.	potential difference	p.d.
Angström unit .	. A.	equivalent	equiv.	precipitate	. ppt.
anhydrous	. anhyd.	feet, foot	ft.	precipitated .	pptd.
approximat-e, -ly .	. approx.	for example	6.9.	precipitating	note.
aqueous	. aq.	freezing point .	f.D.	precipitation .	pptn.
Assignor) in patent	titles ( Assr.	gallon(s),	gal.	preparation	Drep.
Assignees only .	. Assee.	gram(s)	£.	qualitative	oual.
atmosphere, -es, -ic .	. atm.	horse power	h.p.	quantitative .	quant.
atomic	. at.	hour(s)	hr.	recrystallised	recryst.
atomic weight	. at. wt.	hydrogen-ion concentration	[H']	refractive index	. 12
boiling point	. b.p.	inch(es)	in.	relative humidity	R.H.
British thermal unit .	. B.Th.U.	inorganic	inorg.	respiratory quotient	R.O.
calculated	. calc.	insoluble.	insol.	revolutions per minute	T.D.M.
Calorie (large)	. kgcal.	kilogram(s)	kg.	Roentgen unit	т.
calorie (small)	. gcal.	kilovolt(s)	kv.	saponification value	sap, val.
candle power	. c.p.	kilowatt(s)	kw.	second(s) (time only)	sec.
centimetre	. cm.	litre(s)	1.30	tsecondary	SEC.
cerebrospinal fluid .	. c.s.f.	maximum	max.	soluble .	sol.
coefficient	. coeff.	melting point	m.p.	specific	SD.
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	. COTT.	milligram(s)	mg.	tertiary.	tert.
critical	. crit.	millilitre(s)	ml.	vacuum	vac.
crystalline	· }cruct	millimetre(s)	mm.	value	val.
crystallised (adjective	only) for yst.	millivolt(s)	my.	vapour density .	v.d.
cubic centimetre(s) .	. C.C.	minimum	min.	vapour pressure .	v.p.
cubic metre(s)	. cu.m.	minute(s)	min.	viscosity	. 7
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	. p, d.	normal .	N.	wave-length	. λ
dilute	. dil.	number	no. ·	weight .	wt.
direct current	. d.c.	organic .	OTP.	and the second state of the second	

† 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,  $Pr^a$ ; *iso*propyl,  $Pr^\beta$ ; *n*-butyl, Bu<sup>a</sup>; *iso*butyl, Bu<sup>β</sup>; *tert*.-butyl, Bu<sup>γ</sup>; phenyl, Ph; acetyl (CH<sub>3</sub>·CO), Ac; benzoyl (C<sub>6</sub>H<sub>5</sub>·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  $\gamma$ ).

The following symbols are used except in Section A., III : >, greater than;  $\gg$ , much greater than;  $\Rightarrow$ , not greater than (and <,  $\ll$ ,  $\lt$  conversely);  $\propto$ , (is) proportional to;  $\sim$ , of the order of, or approximately.

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

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