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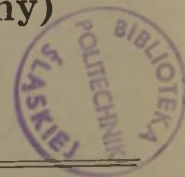
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SEPTEMBER, 1943.



I.—GENERAL ANATOMY AND MORPHOLOGY.

Lungs of Cetacea, with special reference to harbour porpoise (*Phocaena phocaena*). G. B. Wislocki (*Anat. Rec.*, 1942, **84**, 117—123).—The lung histology is identical with that of other porpoises and dolphins. The specialised system of myoelastic sphincters constituting a "valvular segment," involving the smallest bronchiolar passages, is described. It is concluded that a specialised valvular segment is characteristic of the lungs of porpoises and dolphins, in contrast to whales, the lungs of which do not exhibit this feature.

W. F. H.

Lymphatics of parietal tunica vaginalis propria of man. L. Allen (*Anat. Rec.*, 1943, **85**, 427—433).—A lymphatic plexus comparable to the subserous plexuses of the diaphragm and costal pleura occurs in the parietal tunica vaginalis. Like the obliteration of the proximal portion of the processus vaginalis, the lymphatic plexus is peculiar to man. An hypothesis is advanced that there is an interrelationship between the late establishment of the lymphatic drainage of the sacculus vaginalis and the late and variable obliteration of the proximal portion of the processus vaginalis which may explain the most frequent congenital defects of this region.

W. F. H.

Vascular couples of hind-gut in *Petromyzontia*. E. W. Baxter and G. G. Robinson (*Proc. Zool. Soc., London*, 1943, **112**, B, 138—146).—A vascular couple is a composite vessel made up of an afferent (arterial) vessel lying within an efferent vessel. The petromyzonts are characterised by the possession of such vessels in their hind-guts and an account is given of the structure and distribution of such vessels in *Petromyzon*.

J. D. B.

Anatomy and histology of swordfish pituitary. R. E. Lee (*Biol. Bull.*, 1942, **82**, 401—412).

G. P. W.

Assessing physical condition of children. N. C. Wetzel (*J. Pediat.*, 1943, **22**, 82—110).—By plotting data on height, wt., and age on a "grid" (cf. *J. Amer. Med. Assoc.*, 1941, **116**, 1187) it is possible to separate the individual effects of these different physical attributes and to assess each item by itself, or to combine one with another to reconstruct a graphic picture of physical progress. The resulting curves can be compared at a glance with the "grid" standards; no computations are necessary.

C. J. C. B.

Misconception about the "springiness" of longitudinal arch of foot: mechanics of arch of foot. P. W. Lapidus (*Arch. Surg., Chicago*, 1942, **46**, 410—421).—The human foot is a rigid lever. The apparent arching of the foot is due to its trussed structure by which the bones bear the compression stresses and the ligamentous structures the tensile stresses. Idiopathic flat foot is most probably a congenital and often a hereditary malformation.

F. S.

Maffucci's syndrome (dyschondroplasia with hæmangiomas). A. Carleton, J. St. C. Elkington, J. G. Greenfield, and A. H. T. Robb-Smith (*Quart. J. Med.*, 1942, **11**, 203—228).—The association of dyschondroplasia (Ollier) with vascular hamartomas (cavernous hæmangiomas and phlebectasia) was first described by Maffucci in 1881. The dyschondroplasia affects mainly the growing ends of bones with an overgrowth of cartilage which does not ossify, and also the metaphysis with hyperplastic islands of cartilage. The phalanges of hands and feet are predominantly involved but also the limbs with resulting curved deformities. The condition develops between birth and puberty, and becomes stationary soon after 20. The dilated veins and bluish tumours on the limbs are hæmangiomas, and the occurrence of sweating in one case suggested a possible relationship with glomangioma. 18 cases and 4 doubtful cases are reviewed, and 2 new cases described. The cartilage changes must be distinguished from diaphysal aclasis (hereditary multiple exostosis) and there is no evidence of heredity. The cartilage changes are not secondary to vascular changes, but they are clearly coincidental and probably due to a common genetic defect. (38 figs.)

R. K.

Reaction of orbital tissues in experimental exophthalmos following removal of Harder's gland. Retrobulbar tissues in experimental exophthalmos in guinea-pigs.—See A., 1943, III, 559.

Oviduct and egg transport in albino rat.—See A., 1943, III, 561.

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K (A. III.)

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Hæmopoiesis in chorionic villi of placenta of platyrrhine monkeys. G. B. Wislocki (*Anat. Rec.*, 1943, **85**, 349—363).—Erythropoiesis was observed in dilated blood vessels of the chorionic villi of the marmoset and other platyrrhine monkeys. The thin-walled, dilated vessels in the villi are of the nature of venous sinuses or sinusoids. Basophilic, free stem-cells in those vessels differentiate into red blood cells, and appear to originate from swollen endothelial cells lining the sinusoids. In addition angioblasts appear to differentiate directly from mesenchyme in places where the walls of the sinusoids are incomplete. The mode of red blood cell formation resembles closely hæmopoiesis in the blood vessels of the yolk sac. Erythropoiesis appears after the establishment of the circulation and disappears towards the end of pregnancy.

W. F. H.

Blastocyst of *Martes pennanti*. R. K. Enders and O. P. Pearson (*Anat. Rec.*, 1943, **85**, 285—287).—The uteri of two fishers (*M. pennanti*) killed in Jan. and Feb. contained unimplanted blastocysts. The blastocyst is similar in general appearance to that of the marten (A., 1943, III, 155). The most conspicuous feature is the thick (14.4 μ) zona pellucida. The composition of the inner cell mass is compared with that of the marten. Since blastocysts are found in Jan. and Feb. following copulation the previous April or May, and as there is no evidence of delayed ovulation or fertilisation, it is probable that in the fisher unimplanted blastocysts exist for a period of 9 or more months.

W. F. H.

Thymus IV in pig. M. C. Godwin (*Anat. Rec.*, 1943, **85**, 229—243).—The fourth pouch in the pig, serially homologous with the third, is variable in its appearance and may be absent on one or both sides. It forms definite thymus in late foetal stages. Thymus IV is found in the subepithelial tissue near the dorsolateral edge of the thyroid cartilage. Sometimes a partial thymic development occurs in that part of the fourth pouch which remains in the epithelium in the dorsolateral wall of the laryngopharynx.

W. F. H.

Growth of avian ovum. A. L. Romanoff (*Anat. Rec.*, 1943, **85**, 261—267).—The rate of growth of ova is essentially the same in pheasant, quail, chicken, and duck. The shape is slightly elongated and pointed towards the sharp end of the egg. There is a depression at the animal pole. Concentric stratifications of the ovum closely correspond to successive sizes of ova found in the functioning ovary. Following the discharge of ova the ovarian follicles are completely reabsorbed.

W. F. H.

Oviduct, foetal membranes, and placentation in *Hoplodactylus maculatus*. M. M. M. Boyd (*Proc. Zool. Soc., London*, 1943, **112**, A, 65—104).—A detailed description of the early development and foetal membranes (including the allanto-placenta) in this lizard.

J. D. B.

Segmentation of head of *Ichthyophis glutinosus*. L. S. Ramaswami (*Proc. Zool. Soc., London*, 1943, **112**, B, 105—112).—A description of the development of the head region, with special reference to the head somites, in this apodan Amphibian.

J. D. B.

Embryology of vertebrate pigment cells. I. Amphibia. G. P. du Shane (*Quart. Rev. Biol.*, 1943, **18**, 109—127).—A review.

J. D. B.

Effect of Röntgen irradiation of sperms on embryonic development of albino rat. M. Hensen (*J. exp. Zool.*, 1942, **91**, 405—433).—Details are given of effects of X-radiation (100—3000 r.) on testis and sperms of the rat. Doses of 100 to 500 r. do not sterilise and male rats so treated and mated within a week to normal females had offspring which were normal in appearance and litter numbers only slightly less than controls. The survival rate, however, was about 50% of that of the controls. Matings of these males a month or more after irradiation resulted in litters of normal survival val. Males irradiated with 1000 r. when mated with normal females gave litters of approx. $\frac{2}{3}$ normal size and increasingly poor survival vals. were obtained from matings of the first three weeks. No litters were produced from subsequent matings. No litters were obtained from males subjected to 3000 r. Details are given of the histological changes in the testes following these dosages.

J. D. B.

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Extra-epidermal and supernumerary lenses in association with cyclopean eyes in *Amblystoma* embryos. F. Sperling (*Anat. Rec.*, 1943, 85, 413—425).—During Harrison's stage 14, the anterior end of the medullary plate was lifted as a flap, the archenteron roof removed, and the flap replaced. 10 lenses originated from the dorsal rim of the iris, 6 from the retina, and 34 from the inner layer of the epidermis. In controls in which the operation was performed without removing the roof of the archenteron 8 lenses originated from the iris and 27 from the epidermis. Four cases, in the first series, exhibited supernumerary lenses. None of the controls showed this phenomenon. Six cases among experimental specimens had eyes for which there was no lens. No cases occurred in which a lens was not associated with an eye. W. F. H.

Developmental control of pars intermedia of hypophysis by brain. W. Etkin (*J. exp. Zool.*, 1943, 92, 31—47).—Transplants of pituitary primordia, with or without varying amounts of neighbouring brain tissue of embryos of *Rana pipiens*, were made into hypophysectomised hosts at young tadpole stages. The results indicate that control of pars intermedia activity and growth is normally effected by inhibitory impulses brought to the hypophysis through the hypothalamic-hypophyseal nerve tracts. The effectiveness of the control by isolated parts of the brain indicates that the mechanism is not purely reflex in character. J. D. B.

Changes in iris pigmentation in metamorphosing amphibian larvae. R. B. Barden (*J. exp. Zool.*, 1943, 92, 171—197).—An experimental study, on a no. of salamander species, of the development of pigmentation in the irises of normal and transplanted eyes. The results indicate a parallelism between the development of pigmentation in the amphibian eye and that of the eye of *Drosophila* as established by Ephrussi and Beadle. J. D. B.

Enzymes in ontogenesis: choline-esterase in developing *Melanoplus differentialis* eggs. T. A. Tahmisian (*J. exp. Zool.*, 1943, 92, 199—213).—A description of the distribution of choline-esterase in the egg and during early development in the grasshopper. The enzyme is of embryonic origin and a close correlation exists between its appearance and neuroblast differentiation. It is suggested that choline-esterase may be an inductor of nervous tissue. Acetylcholine is found during post-diapause development but is absent earlier. J. D. B.

Distribution of dipeptidase in salamander gastrula. G. E. Pickford (*J. exp. Zool.*, 1943, 92, 143—170).—A preliminary study of the proteolytic enzymes in the salamander gastrula, using micro-methods which are fully described. Glycerin extracts of the gastrula split *l*-leucylglycine more readily and *dl*-alanylglycine much more readily than glycylglycine. The *d*-isomeride of *dl*-alanylglycine is not hydrolysed. Peptidase indices of ventral ectoderm, dorsal lip, and yolk endoderm from early gastrulae were in proportions of 100:42.3:6.2. J. D. B.

Restitution of tail in early chick embryo. E. Zwilling (*J. exp. Zool.*, 1942, 91, 453—463).—Removal of the entire tail primordium in chick embryos of 17—27 somites results in absence of tail. When a portion of the primordium remains there is restitution of the tail in a large % of the cases which is examined on the basis of totipotency of the cells of the tail thickening. Deletion of all or part of the primitive streak from 11—14-somite embryos may result in tail restitution, probably as a consequence of continued tissue movements. Earlier stages are not within range of analysis by the technique used. J. D. B.

Boundaries of differentiation of cephalic imaginal discs in *Drosophila*. L. Birmingham (*J. exp. Zool.*, 1943, 91, 345—363).—Using the Ephrussi-Beadle technique, eye-antennal imaginal discs were transferred to the body cavity of similar larvae. At the time of emergence of the adults the implants were dissected out and examined for the extent of their differentiation. The results of such observations, and evidence from abnormal development, are taken to indicate that the cephalic discs have a predetermined differentiation. J. D. B.

Inactivation of fertilizin by radiations. C. B. Metz (*Biol. Bull.*, 1942, 82, 446—454).—X-Rays or ultra-violet light convert sea-urchin fertilizin into an inactive form, which no longer agglutinates sperm but combines with it and abolishes its response to untreated fertilizin. The mechanism of inactivation is probably a splitting of the fertilizin mol. into "univalent" fragments. G. P. W.

Self-sterility in ascidians. T. H. Morgan (*Biol. Bull.*, 1942, 82, 455—460).—The egg membrane in ascidians (*Ciona*, *Styela*) selectively blocks the entry of sperms from the same individual, to prevent self-fertilisation; the block is more complete in *Ciona* than in *Styela*. G. P. W.

Regeneration after fission in sea cucumbers. F. R. Kille (*Biol. Bull.*, 1942, 83, 55—66).—Transverse fission frequently occurs in *Holothuria parvula*. Both halves regenerate at about the same rate. The entire reproductive system remains in the anterior half. The posterior half regenerates a new reproductive system after all other systems have been reconstituted, the germ cells apparently arising from the mesenterial epithelium. G. P. W.

Chemical factors and regeneration in *Tubularia*. A. Goldin (*Biol. Bull.*, 1942, 82, 243—254, 340—346).—Regeneration in *Tubularia crocea* is accelerated by raising the O₂ concn. and slowed or stopped by lowering the O₂ concn. or the pH (with CO₂, HCl, citrate-PO₄ buffers, or the acid metabolites of the hydroid itself). G. P. W.

Temperature gradients and silkworm development. C. M. Williams (*Biol. Bull.*, 1942, 82, 347—355).—Diapausing pupae of *Samia walkeri* and *Telea polyphemus* were inserted into partitions so that one end protruded into a warm chamber (25—30°) and the other into a cold (3—5°). Termination of diapause occurred simultaneously in both ends, evoked apparently by a centre in the anterior end. Thereafter, the two ends developed at highly different rates. G. P. W.

Mating types in ciliate protozoa. R. F. Kimball (*Quart. Rev. Biol.*, 1943, 18, 30—45).—A review. J. D. B.

Temperature and wing-modifying genes in *Drosophila melanogaster*. M. H. Harnly (*Biol. Bull.*, 1942, 82, 215—232).—In nine genotypes (including some new mutants) the phenotypes were found to vary with the temp. experienced during a restricted thermolabile stage in development. This stage is the late larval period in the case of genes modifying the general wing form, and the pupal period in the case of genes causing minor modifications in venation. G. P. W.

Physical basis for genetic resistance to mouse typhoid. J. W. Gowen and M. L. Calhoun (*Proc. Nat. Acad. Sci.*, 1943, 29, 144—149).—Using *Mus musculus* as host and *Salmonella typhimurium* as disease-causing organism a mouse population has been segregated into six different breeding groups characterised in part by their resistance to this organism. The different breeding groups have been studied from the point of view chiefly of the cellular constituents of the blood and it is shown that the nos. of leucocytes in general, or nos. of particular kinds of leucocytes, play an important part in the immune phenomena controlled by the genetic constitution of the host. J. D. B.

Breeding for low fecundity in the fowl with the aid of the progeny test. W. F. Lamoreux, F. B. Hutt, and C. O. Hall (*Poultry Sci.*, 1943, 22, 161—169).—Egg production in a low-fecundity strain of white Leghorns remained essentially unchanged after 22 years of mass selection for low production. The progeny test was applied during the next 5 years and resulted in a significant decrease in the no. of eggs laid. The low production was entirely due to an increase in the age at maturity. Comparison of low- and high-fecundity strains provides evidence that genetic selection among fowl (given similar food and care) can account for differences of several hundred % in egg production. W. F. H.

III.—PHYSICAL ANTHROPOLOGY.

Skull of midget from Peru. A. Hrdlička (*Amer. J. phys. Anthrop.*, 1943, [ii], 1, 77—82).—The skull was obtained from the Chilca burial grounds and is probably that of a female about 16—17 years old. Except for size the skull is unquestionably normal; its cranial capacity is 490—495 c.c. The dimensions of the specimen and comparisons with the means of similar determinations on 6 ordinary adult female Chilca skulls are given. A noteworthy feature is the relatively large dental arch. W. F. H.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Differential growth in ovaries and genital tract near time of ovulation in rats treated with colchicine. E. Allen, T. B. Thomas, J. G. Wilson, and D. A. Hession (*Amer. J. Anat.*, 1943, 72, 291—337).—Large follicles just before ovulation exhibited moderate mitotic division in cumulus, granulosa, and theca. Division continued in cells of former cumuli, extruded with ova at ovulation, as they passed through the proximal part of the uterine tubes. The walls of the corpora were collapsed after ovulation and cells of the inner layers showed a lowered rate of mitosis. At this stage mitosis was rapid in the outer luteal wall. Recent corpora exhibited moderate cell division of inner luteal cells and rapid cell division in the outer zone of the wall. A coincident wave of mitosis occurred in the uterine glands. Mitosis in basal layers of the vagina is low near the time of ovulation and is doubled 22 hr. later. The differential rates of growth are correlated with hormonal stimuli from the ovaries and anterior pituitary operating at these times. W. F. H.

Senile changes in liver of mouse and cat, with special reference to similarity of nuclear alterations. W. Andrew, H. M. Brown, and J. B. Johnson (*Amer. J. Anat.*, 1943, 72, 199—221).—Most conspicuous and const. changes are in the nuclei of hepatic cells. Numerous giant nuclei containing multiple nucleoli occur in senile livers. Intranuclear inclusion bodies are characteristic of senility in a small %. Periportal infiltrations of connective tissue cells and lymphocytes are conspicuous in senile livers. The character and amount of hepatic connective tissue are unaltered in old age. W. F. H.

Histophysiological study on activity of stellate cells of frog liver.—See A., 1943, III, 565.

Calcium and ageing. I, II. A. I. Lansing (*Biol. Bull.*, 1942, 82, 385—391, 392—400).—I. When leaves of *Elodea canadensis* are electrically stimulated, Ca leaves the cell cortex and crystallises as oxalate in the vacuole. The amount so appearing, per unit of cell surface, increases with age of leaf. The hypothesis is that senescence is due to increase of Ca in cell surfaces; this lowers permeability, and so favours accumulation of toxic metabolites in the cells.

II. Ca was identified by the alizarin and gypsum reactions on incinerated sections. Its amount increases with age in the sarcolemma and striations of the toad's gastrocnemius (*Bufo fowleri*), and in many situations, including the cell membranes, in a planarian (*Phagocata* sp.) and a rotifer (*Euchlanis dilatata*). Intensity of staining with Ehrlich's hæmatoxylin is correlated with Ca content.

G. P. W.

Leprosy from histologic point of view. G. L. Fite (*Arch. Path.*, 1943, 35, 611—641).—A review.

C. J. C. B.

Effects of cold and colchicine on mitosis in newt. H. N. Barber and H. G. Callan (*Proc. Roy. Soc.*, 1943, B, 131, 258—271).—Application of cold (3°) or colchicine (1% solution) to the epidermal cells of the newt larva arrests mitosis in metaphase. Both agents cause complete suppression or abnormal development of the spindle. Spermatogonia and spermatocytes always show complete suppression of the spindle during cold treatment. Chief differences observed are due to the greater degree of spindle suppression produced by colchicine and to the retardation of all cell processes produced by cold. Relapsed tetraploid cells are more common after colchicine treatment. Both agents exaggerate swelling of the epidermal cells during anaphase. The inactivation effects may be explained by surface changes in centrosomes or centromeres which prevent them orienting or breaking the spindle mols.

P. C. W.

Cell movements in healing of micro-wounds in vitro. K. M. Wilson and R. Chambers (*J. exp. Zool.*, 1942, 91, 265—285).—Injuries to one or a few cells in sheets of chick intestinal epithelium growing *in vitro* were produced by means of micro-needles and the injury and repair reactions are described in detail. The filling in of the gap is associated with rearrangements of uninjured cells neighbouring the injured region. The time required for wound closure varied from 45 min. to 3 hr.

J. D. B.

Ammoniacal solutions of silver [become explosive on keeping]. C. S. Smith (*J. Path. Bact.*, 1943, 55, 2, 227—228).—Ammoniacal solutions of Ag should be used as soon as possible after prep. and any excess immediately thrown away. In no circumstances should they be stored or kept in bottles, as they may become explosive after varying periods of time owing to formation of Ag₂N.

C. J. C. B.

V.—BLOOD AND LYMPH.

Action on hæmopoietic system of monkeys of drugs of the sulphonamide group administered in therapeutic doses.—See A., 1943, III, 584.

Shape transformations in nucleated erythrocytes. E. Ponder (*J. Exp. Biol.*, 1942, 19, 215—219).—The shape of camel, pigeon, turtle, frog, and carp erythrocytes has been studied under various conditions. Shape seems to depend on the surface structure in higher vertebrates and on an organised cytoplasm in the lower.

G. P. W.

Red-cell surface. E. Ponder (*J. Exp. Biol.*, 1942, 19, 220—231).—A quant. study of sphering by lecithin, with a discussion of the structure of the cell surface.

G. P. W.

Morphologic, physiologic, chemical, and biologic distinction of megaloblasts. O. P. Jones (*Arch. Path.*, 1943, 35, 752—775).—A crit. review.

C. J. C. B.

Erythrocyte in aged male and female. B. Newman and S. Gitlow (*Amer. J. med. Sci.*, 1943, 205, 677—687).—50 males and 50 females over 65 years of age were examined. The vals. in males and females respectively were: hæmoglobin 9.7—15 g.-% and 9.5—16 g.-% with means of 12.65 and 11.7 g.; red blood counts 3.3—5 and 3.2—5.2 million per cu. mm.; vol. of packed cells 35—52.2% and 26—52%; reticulocyte counts 0.14—1.8% and 0.18—1.26%.

C. J. C. B.

Finger puncture method for sedimentation rate. A. Weisz and L. M. Taran (*J. Pediat.*, 1943, 22, 565—569).—33 of 52 rheumatic children had normal sedimentation rates. The Cutler micro-finger-tip method is recommended as a substitute for any of the other methods when repeated determinations are necessary because of its simplicity, practicability, and accuracy.

C. J. C. B.

Improved method for determining sedimentation rate of red blood corpuscles. F. Rappaport (*J. Lab. clin. Med.*, 1943, 23, 746—748).—To avoid variation due to temp. a thermos flask arrangement is used.

C. J. C. B.

Simple rack and tubes for determining sedimentation rate. J. M. Hayman, jun., and F. A. Rose (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 29—31).

C. J. C. B.

Acceleration of hæmolysis in relation to chemical structure. III. The C₁₀ alcohols. E. Ponder (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 602—603).—Saponin hæmolysis is accelerated in descending order by decanol, tetrahydrogeraniol, citronellol, and geraniol.

V. J. W.

Effects [on blood] of repeated intravenous injections of lecithin in rabbits. E. H. Tompkins (*Arch. Path.*, 1943, 35, 695—712).—Repeated intravenous injections of lecithin caused: a generalised infiltration of macrophages containing lipins and fragments of erythrocytes which stained for Fe only after unmasking; an increase in the white blood cell count, due to increases in lymphocytes and monocytes; a decreased red cell count, hæmoglobin, hæmatocrit reading, and vol. index; decreased resistance and abnormal malleability of the erythrocytes, increased icteric index, and a normal colour index. These changes eventually are checked by increased erythropoiesis, decrease of the myeloid-erythroid ratios, and infiltrations of the characteristic macrophages; splenomegaly associated with massive infiltrations of the characteristic macrophages, hæmopoiesis, deposition of acidophilic bands about the peripheries of the Malpighian corpuscles, and depletion of the corpuscles and constriction and congestion of the sinusoids; infiltrations of young basophilic cells in the lymphoid tissues. (15 photomicrographs.)

C. J. C. B.

Blood group reactions in [umbilical] cord bloods of Indians, Calcutta, India. E. W. E. Macfarlane (*Amer. J. clin. Path.*, 1943, 13, 81—86).—187 umbilical cord bloods and 192 mother's bloods were grouped, chiefly of Bengalis. Of these babies 103 were homo-sp. with their mother's blood group and 84 were hetero-sp. Agglutinin *A* in the cord blood was less sensitive than *A* in the mother. Agglutinin *B* in 16 out of 40 cord bloods was as strong as the *B* in the mother. No agglutinin was found in a cord blood which was not also in the mother. $\frac{3}{4}$ of the group *O* babies of group *O* mothers had 1 or 2 agglutinins in the cord blood. Only 37% of the hetero-sp. babies who could have received one agglutinin from the mother showed any. Isoagglutinin α appeared twice as frequently as β in the cord bloods. Thus agglutinins that have a higher titre in the mother permeate the placental membranes better. Subgroups *A*₂ and *A*₂*B* each occurred in only 2% of the Indian population of Calcutta. Among 50 mothers in groups *A* and *AB* only 4 possessed *A*₂, while *A*₂ was found in 10 babies among 56 in groups *A* and *AB*. The sensitivities of *A*₁ and *A*₂ are sometimes so low at birth that stronger test serums than absorbed α ₁ are required to differentiate them with certainty in the cord bloods.

C. J. C. B.

Blood group frequencies in North Wales.—See A., 1943, III, 543.

Hæmolytic transfusion reactions; differential diagnosis: "dangerous universal donor" or intragroup incompatibility? A. S. Wiener and W. C. Moloney (*Amer. J. clin. Path.*, 1943, 13, 74—80).—A case is described in which the clinical data indicated that the hæmolytic reaction was due to intragroup incompatibility resulting from iso-immunisation in pregnancy, but in fact proved to have been caused by the use of a universal donor with high-titre iso-antibodies.

C. J. C. B.

Method for concentrating serum and plasma in Cellophane casings. R. E. Hoyt and M. Levine (*Amer. J. clin. Path.*, 1943, 13, 105—107).—A modification of Thalheimer's method (A., 1938, III, 360) is described.

C. J. C. B.

Rh factor in relation to jaundice of newborn infant (erythroblastosis foetalis). F. W. Gallagher, P. G. Danis, and L. R. Jones (*J. Pediat.*, 1943, 22, 171—174).—Only 9 of 20 mothers with icteric children were *Rh*-positive.

C. J. C. B.

Irregular isoagglutinins. I. Davidsohn (*J. Amer. Med. Assoc.*, 1942, 120, 1288—1292).—A review of α ₁ and α ₂ agglutinins, *Rh* antibodies, cold agglutinins, and bacterial agglutinins.

C. A. K.

Intravenous injection of pooled plasma or serum. W. Thalheimer (*J. Amer. Med. Assoc.*, 1942, 120, 1263—1267).—Studies on various samples of pooled human serums of all 4 blood groups showed that the agglutinin titre did not exceed 1:28. Mixture of a high agglutinin titre serum with blood showed agglutination when 1 part of serum was diluted with 79 parts of blood, but after storage overnight the agglutinins were absent from the supernatant plasma. Agglutinins are neutralised by agglutinogens present in red cells, plasma, and fixed tissue cells. All evidence suggests that pooled plasma or serum is safe for intravenous injection into subjects of any blood group.

C. A. K.

Sulphonamides for safe storage of blood and plasma. A. M. Lacy and M. Novak (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 19—21).—Plasma containing 0.2% of one of the sulphonamides may be stored in the liquid state for several months. It is just as effective as whole blood in the treatment of shock, burns, cerebral oedema, and hypoproteinæmia. Although there is a slow deterioration of prothrombin, complement, and fibrinogen, none of these elements is necessary in instances where plasma is indicated.

C. J. C. B.

Jaundice following administration of human blood products. H. V. Morgan and D. A. J. Williamson (*Brit. Med. J.*, 1943, I, 750—753).—Nine cases of jaundice are described; they developed 7—16 weeks after transfusion with serum and plasma and closely resembled hepatitis following inoculation against yellow fever and measles.

I. C.

Stomach in pernicious anæmia. A. J. Cox (*Amer. J. Path.*, 1943, 19, 491—497).—In 6 cases of pernicious anæmia the stomach showed almost complete replacement of the normal mucosal glands of the fundic type by abnormal, less differentiated glands. The pyloric zone was only slightly altered. No relationship could be found between the appearance of the stomach and the duration of the disease or of the treatment. The stomach from a well-studied case of long-standing sprue with fatal macrocytic anæmia showed no comparable changes. (6 photomicrographs.)

C. J. C. B.

Hypochromic anæmia following stomach resection. G. Hemmeler (*Schweiz. med. Wschr.*, 1942, 72, 670—672).—There was no increase in the non-hæmoglobin serum-Fe content following ingestion of 1 g. of Fe salt in patients after the Hofmeister-Finsterer stomach resections. The patients showed fasting gastric achylia but acid response to histamine injections; slight improvement of Fe absorption occurred on simultaneous administration of HCl; Fe absorption was normal if the Fe salt was given in combination with ascorbic acid (Ferro-Redoxon Roche).

A. S.

Treatment of pernicious anæmia with experimental proteolysed liver preparation. L. J. Davis, L. S. P. Davidson, D. Riding, and G. E. Shaw (*Brit. Med. J.*, 1943, I, 655—656).—A method is described for producing a whole-liver prep., by enzymic digestion of raw liver with papain. The prep., which proved palatable and readily assimilable, administered orally in daily doses corresponding up to 6 oz. of wet liver, was effective in the treatment of classical pernicious anæmia.

I. C.

Allergy to injectable liver extracts; clinical and immunological observations. S. M. Feinberg, H. L. Alt, and R. H. Young (*Ann. int. Med.*, 1943, 18, 311—322).—8 patients produced allergic reactions to injections of liver extract. Cutaneous and intracutaneous tests with various fractions of liver and other organs of several species show that the allergy is limited to a protein-free fraction associated with the antianæmic component.

A. S.

Refractory anæmia. II. Anæmias with hypocellular, normoblastic marrows. L. S. P. Davidson, L. J. Davis, and J. Innes (*Edinb. Med. J.*, 1943, 50, 355—377; cf. A., 1943, III, 464).—A study of 16 cases of which 4, described in detail, were secondary to hæmtoxins. Of 12 idiopathic cases 9 died within a few months; 3 survived over two years. A macrocytic anæmia with normoblastic marrow was found in many of the cases. The val. of sternal puncture in the diagnosis of hypoplastic anæmia is discussed.

H. S.

Anæmia in dogs from feeding onions. C. F. Schlotthauer and G. H. Berryman (*J. Amer. Vet. Med. Assoc.*, 1943, 102, 109—111).—Two dogs fed 20—200 g. of finely chopped raw onion daily developed anæmia after the third week: one dog died on the 150th day.

E. G. W.

Familial Mediterranean target-oval cell syndromes. W. Dameshek (*Amer. J. med. Sci.*, 1943, 205, 643—660).—5 Italian families described showed several syndromes of varying severity ranging from Cooley's erythroblastic anæmia to conditions with mild hypochromic anæmia, target, oval, and stippled cells, and decreased fragility. These syndromes, inherited usually as a Mendelian dominant, showed a high incidence of transmission in the offspring. In the few cases of Cooley's anæmia studied, both parents were affected with 1 of the milder types of syndromes. The fundamental inherited abnormality is a disturbance of hæmoglobin metabolism with the result that the nucleated red cells are unable to take on their normal complement of hæmoglobin. In consequence, thin and hypotonically resistant erythrocytes, target and oval cells are produced. Basophilic stippling and refractoriness to Fe therapy are probably concomitant abnormalities. The increased hæmolysis in the more severe cases may be due to the breakdown of unused hæmoglobin precursors.

C. J. C. B.

Blood volume of untrained normal dogs. D. D. Brunycastle and R. A. Cleghorn (*Amer. J. Physiol.*, 1942, 137, 380—383).—Plasma vol. was determined on 106 normal, untrained dogs (4.7—19.5 kg.). In terms of c.c. per kg. the plasma vol. was 31.8—64.6, cell vol. 21—49.2, and total blood vol. 60—107.5.

M. W. G.

Shock induced by hæmorrhage. III. Correlation of plasma-thiamin content with resistance to shock in dogs. W. M. Govier (*J. Pharm. Exp. Ther.*, 1943, 77, 40—49).—Condition of shock was produced in dogs anæsthetised by pentobarbital Na after repeated hæmorrhages. Resistance to shock was significantly greater in the animals with high plasma-thiamin levels. These dogs withstood more bleeding than the low-plasma-thiamin animals before developing severe hypotension. Previous administration of thiamin favours the tendency of a return of blood pressure to normal after hæmorrhage.

The incidence of intestinal hæmorrhage after bleeding is much greater in the dogs with low plasma-thiamin levels.

H. C. S.

Differentiation of fetal and adult human hæmoglobin. M. Helpfer and G. Strassmann (*Arch. Path.*, 1943, 35, 776—782).—The hæmoglobin of human fetuses and newborn infants is more resistant to the denaturing action of alkali than is that of adults. The denaturation time for the former with 1% NaOH is 1—3 hr.; for the latter, 5 min. The alkali-resistant form of hæmoglobin disappears from the blood of infants at 6 months. The marked alkali-resistance of the hæmoglobin of human fetuses and very young infants interferes with the Hoppe-Seyler alkali test for the detection of CO in blood, producing a false positive reaction; this test is useless with the blood of a newborn or young infant. In a case of acute CO poisoning of a 9 months pregnant woman found dead in a gas-filled room, CO was not detectable in the fetal blood although the maternal blood contained 65% of carboxyhæmoglobin. Decomposed and dried fetal blood can be differentiated from adult blood by the alkali test. Extracts of old blood stains which are brown may be differentiated by spectroscopic examination before and after the addition of alkali.

C. J. C. B.

Familial idiopathic methæmoglobinæmia. J. Deeny, E. T. Murdock, J. J. Rogan (*Brit. Med. J.*, 1943, I, 721—723).—Two cases of familial idiopathic methæmoglobinæmia are described, in which there was a permanent blue colour of the skin dating from birth. Ascorbic acid diminishes cyanosis and methæmoglobinæmia.

I. C.

Compound of methæmoglobin with thiocyanate. F. Jung (*Biochem. Z.*, 1940, 304, 37—41).—Methæmoglobin forms a compound with CNS' which can be called methæmoglobin-CNS. It belongs to the series of compounds which methæmoglobin forms with NaN₃, H₂S, and HCN, and is the most unstable of them, since it is decomposed by NaN₃, H₂S, or HCN. Its absorption spectrum is practically the same as that of methæmoglobin, which is in agreement with its instability, for with increase in stability of the compounds there is an increase in the shift away from the red end of the spectrum.

J. N. A.

New method of counting blood platelets. R. Sulzer (*Arch. Sci. phys. nat.*, 1942, [v], 24, Suppl., 191—194).—Blood is suitably diluted in aq. NaCl 0.6% and Na citrate 2.0%. A few drops of the diluted blood are emulsified in an equal vol. of medicinal paraffin with a collodion-coated glass rod. A small quantity of the emulsion is then mounted on a collodion-coated slide under a collodion-coated coverslip. The aq. phase consists of small flat droplets containing 200—400 erythrocytes in which the erythrocyte:platelet ratio is 10—20 in normal individuals. The normal val. of blood platelets is approx. 350,000 per cu. mm.

F. S.

Effect of removal of large part of the lymphoid system on weight of portion remaining in situ. M. L. Turner and V. E. Hall (*Anat. Rec.*, 1943, 85, 401—412).—Approx. half of organised lymphoid tissue in the white mouse was removed. Following the operation the remaining lymph nodes increased in wt. The increase amounted to 46% of their original wt. The increase is confined to those nodes lying central to the excised tissue. The data suggest the hypothesis that some substance in the lymph reaching a node normally maintains the size of that node. The substance is inactivated in this node and cannot influence the growth of more centrally situated nodes. If the more peripheral node be removed, the substance then causes increase in wt. of the more central nodes.

W. F. H.

Leucocytic index. L. A. Turley and J. T. McClellan (*Amer. J. clin. Path.*, 1943, 13, 87—95).—The leucocytic index (ratio of polymorphs to lymphocytes) is useful in prognosis of infectious diseases and in determining the optimal time for surgical procedures. A high or rising index indicates low resistance and a serious prognosis and a low or falling index the reverse.

C. J. C. B.

Potassium and carbohydrate metabolism of leucocytes. R. Pulver (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 43—45).—Washed horse leucocytes were suspended in an isotonic salt solution, containing 20 mg.-% of K, at 37°. On addition of glucose in 4.5% solution, the K and glucose content of the solution falls rapidly for 10 min., followed by a gradual rise in the K content over the pre-experimental level. The Na content was const. throughout.

A. S.

Blood picture of athletes as affected by intercollegiate sports. E. J. Farris (*Amer. J. Anat.*, 1943, 72, 223—257).—Emotional states before events produced lymphocyte counts of 39—60%. Experience in competition eliminated pre-contest lymphocytosis in a few cases. The lymphocyte count during various sports is detailed. The intensity of activity in competition, together with duration, produced a leucocytosis in all events. The degree of leucocytosis is dependent primarily on the intensity of activity. The increase in leucocytes gave an index of the severity of the sport and paralleled closely the rating of experts in athletics. The total no. of erythrocytes per cu. mm. increased in short-time events, and decreased in events of more than 25 min. duration.

W. F. H.

Pathological anatomy and pathogenesis of eosinophilic pulmonary infiltration. H. von Meyenburg (*Schweiz. med. Wschr.*, 1942, 72, 809—811).—4 cases with eosinophilic pulmonary infiltration showed up to 100% eosinophils in the infiltrations and numerous giant cells, and marked bone marrow and blood eosinophilia. Another case showed a marked eosinophilic epididymitis. 2 patients had *Ascaris* in the intestines. A. S.

Acute lymphatic leukaemia in childhood. D. Falkenstein and W. M. Fowler (*Amer. J. dis. Child.*, 1943, 65, 445—454).—61 cases are reviewed. The aleukæmic and the leukæmic forms of acute lymphatic leukaemia in childhood occur with equal frequency and are similar clinically except that the leukæmic form tends to be more acute and produce more pronounced lymphoid hyperplasia. The aleukæmic form is more difficult of diagnosis. Röntgen therapy of acute lymphatic leukaemia is effective in alleviating pressure symptoms due to enlarged glands but is of no val. or harmful in the absence of these symptoms. C. J. C. B.

Preparation of concentrates of specific substances from urine and faeces in leukaemia. D. L. Turner and F. R. Miller (*J. Biol. Chem.*, 1943, 147, 573—579; cf. A., 1942, III, 899).—Concentrates are prepared by successive extraction with ether and light petroleum, followed by a separation of the derived Pb salts. The lymphoid-active carbinol fraction is separated from the myeloid-active fraction by esterification. The lymphoid-stimulating factor is a hydroxy-acid, the myeloid factor being the corresponding keto-acid. R. L. E.

Monocytic leukaemia.—See A., 1943, III, 572.

Isolation of chromatin threads from resting nucleus of leukæmic cells. Histological changes preceding spontaneous lymphatic leukaemia in mice.—See A., 1943, III, 569.

Thromboplastic activity of brain and skin extracts. A. L. Copley (*Amer. J. Physiol.*, 1942, 137, 178—186).—The age of the rabbit up to 6 weeks has only a slight influence on the thromboplastic activity of their brains on human plasma. Over 3 months the age has no significant effect. In chickens plasma-prothrombin time is rapidly increased on keeping at room temp. The ratio of coagulation time of recalcified oxalated plasma to the prothrombin time was called "thromboplastin coeff." and used to estimate the activity of a given thromboplastic substance. Rabbit and chicken skin show thromboplastic activities to various degrees. Chicken brain and chicken skin have no activity with human plasma and are most active with chicken plasma. The trend of apparent species-specificity of thromboplastin is discussed. M. W. G.

Clotting action of rabbit-clotting globulin. R. M. Bird, B. McSwain, G. L. Kauer, jun., and F. Glenn (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 730—732).—This substance (Parfentjev, A., 1942, III, 89) clotted oxalated and heparinised dog's blood; 0.3 c.c. per kg. was lethal to dogs. Injections of 0.01—0.05 c.c. per kg. decreased clotting time as did 1—4 c.c. per kg. by mouth. Clotting activity was abolished by 0.1N-HCl. V. J. W.

Factors which influence activity of purified thrombin. W. H. Seegars and H. P. Smith (*Amer. J. Physiol.*, 1942, 137, 348—354).—Clotting time is inversely proportional to thrombin concn. Thrombin from bovine plasma does not clot pig plasma as effectively as bovine plasma, but purified fibrinogen of the 2 species is clotted with equal ease. Curves are given of the effects of temp., electrolyte concn., pH, and colloid content of the clotting mixture. Loss of clotting reactivity of fibrinogen preps. can be restored by adding acacia (2—6% in the clot mixture increases sensitivity 4-fold; large amounts depress the reaction rate). Optimum speed of clotting is observed throughout the zone of pH 6.8—8.5. M. W. G.

Stability of frozen thromboplastin extracts. H. Irving (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 26—27).—A Na oxalate extract of thromboplastin prepared by Quick's method retained its stability for 9 months if kept frozen, and thawed when needed for prothrombin determinations. The activity is retained even if the extract is separated from the brain residue. A satisfactory prep. can be obtained by a second extraction of the brain left from the 1st extraction. C. J. C. B.

Plasma clot tensile strength measurement: its relation to plasma-fibrinogen. A. I. Goldfarb, I. M. Tarlov, S. Bojar, and A. S. Wiener (*J. clin. Invest.*, 1943, 22, 183—189).—The tensile strength of clots formed from normal plasma varies within a narrow range. A correlation exists in man, monkeys, dogs, and rabbits between clot tensile strength and plasma-fibrinogen concn. The correlation coeff. was $+0.914 \pm 0.020$ in 30 determinations. C. J. C. B.

Species-specificity of thrombokinase. F. Koller and B. Soldati (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 26—29).—If a thrombokinase prep., obtained from human brain, is added in increasing concns. to human oxalate plasma, a min. coagulation time is reached which is not further shortened by increasing the thrombokinase concn. The greatest reduction in coagulation time is obtained by using human brain thrombokinase (10.5 sec.); the vals. for other brain thrombokinase preps. were: rabbit 13.5 sec., sheep and pig

27, 28, chick 36, guinea-pig 40, ox 41, horse 47. Rabbit's, guinea-pig's, and chick's oxalate plasma coagulation time is maximally reduced by their species-sp. thrombokinase preps.; this is not the case with horse, ox, pig, and sheep plasma. A. S.

Thrombocytopenic purpura caused by sulphonamide drugs.—See A., 1943, III, 584.

Vitamin-K requirements of the newborn. M. Toohey (*Arch. Dis. Child.*, 1942, 17, 187—197).—A simple bedside method for the estimation of prothrombin in infants is described. Estimations on 100 infants showed hypoprothrombinæmia during the first week of life without hæmorrhages. 2-Methyl-1:4-naphthaquinone in doses of 20 mg. to the mother before delivery and 5 mg. to the infant raise the prothrombin level to adult control levels. A single dose of 10 mg. to the infant does not prevent the fall in the prothrombin concn. Vitamin-K analogues given during labour are effective if given 2 hr. before delivery. C. J. C. B.

Hæmorrhagic disease of newborn. E. B. S. Scobbie (*Arch. Dis. Child.*, 1942, 17, 175—186).—A review of 146 cases. Of 51 cases treated by blood transfusion 3 died (5.9%); of 70 given subcutaneous blood alone, 12 died (17.1%); of 15 given vitamin-K alone, 1 died (6.6%). Blood transfusion is thus the most efficacious treatment, next comes -K, and last subcutaneous or intramuscular injection of blood. C. J. C. B.

Ivy bleeding time, serum volume index, and prothrombin content of blood in estimating bleeding tendency in jaundice. L. K. Ferguson, D. G. Calder, and J. G. Reinhold (*Surg. Gynec. Obstet.*, 1940, 71, 603—605).—The 3 measurements were made on the blood from 27 jaundice patients. The results were roughly parallel and the 2 simpler tests give a satisfactory indication of the bleeding tendency. P. C. W.

Clot retraction time in thrombophlebitis and pulmonary embolism. J. S. Hirschboeck and W. L. Coffey, jun. (*Amer. J. med. Sci.*, 1943, 205, 727—730).—In 9 out of 10 cases of pulmonary embolism, the clot retraction time was less than 10 min. (normal 24—35 min.). In the 10th case, the embolism occurred in a decompensated cardiac patient convalescing from a pelvic operation. C. J. C. B.

Hæmorrhagic sweet clover disease. XI. Hypoprothrombinæmia in rat induced by salicylic acid. K. P. Link, R. S. Overman, W. R. Sullivan, C. F. Huebner, and L. D. Scheel (*J. Biol. Chem.*, 1943, 147, 463—474).—Single doses of salicylic acid administered orally or intravenously to rats maintained on a diet low in vitamin-K induce a temporary hypoprothrombinæmia like that caused by 3:3-methylenebis-(4-hydroxycoumarin). This does not develop when the ration contains -K or is supplemented with 2-methyl-1:4-naphthaquinone or its sulphonate. The onset of prothrombinæmia is detected by changes in the prothrombin time of 12.5% plasma before those of whole plasma are observed; whole blood clotting time is usually unaffected when the reduction in the prothrombin level becomes detectable. Hæmorrhage does not appear unless the salicylic acid is administered over a period. H. G. R.

Accuracy of serum-protein estimations and of diurnal variations in their level. M. Dyson and G. Plaut (*Brit. Med. J.*, 1943, II, 6—7).—A difference of more than 0.25 g. obtained by the micro-Kjeldahl technique in the estimation of serum-protein level is significant, while with King's method differences must be greater than 0.4 g. to be significant. No great variation in serum-protein was found between 9 a.m. and 6 p.m. in 20 normal individuals. I. C.

Use of Kagan falling drop proteinometer. D. H. Atlas, L. Cardon, and J. Bunata (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 21—25).—Observations on the use of the Kagan proteinometer for over 4000 routine total protein determinations are described. When many serum-protein determinations are made with the same sample of proteinometer oil, the viscosity of the oil changes and may give vals. that deviate by as much as 1.9 g.-% when checked against a fresh sample of oil. C. J. C. B.

Acute hypoproteinæmia in surgical shock. R. Elman (*J. Amer. Med. Assoc.*, 1942, 120, 1176—1180).—A review, with case illustrations, of the occurrence of hypoproteinæmia in severe hæmorrhage, burns, intestinal obstruction, and general peritonitis. Treatment with plasma and hydrolysed protein is discussed. C. A. K.

Production of radioactive plasma-protein from amino-acids containing radioactive sulphur. A. M. Seligman and J. Fine (*J. clin. Invest.*, 1943, 22, 265—273).—A technique for the prep. of plasma-protein tagged with radioactive S, by the utilisation of dogs made hypoproteinæmic according to Whipple's technique and fed radioactive amino-acids, has been developed. From these dogs, the plasma, withdrawn and dialysed, provides a source of radioactive S-containing plasma-protein for use in any study involving the movement of plasma-protein into or out of the circulation. C. J. C. B.

"Lost plasma" in hæmorrhagic shock studied by use of radioactive plasma-protein. J. Fine and A. M. Seligman (*J. clin. Invest.*, 1943, 22, 285—303).—A method is described for preparing radioactive bromoprotein which when infused into normal dogs behaves like undenatured plasma-protein (e.g., protein containing radio-

active S). Radioactive proteins were given intravenously to normal dogs and dogs in hæmorrhagic shock, both with and without anaesthesia. Disappearance curves showed that the radioactive proteins left the circulation at the same rate in normal and shocked dogs and that dogs in shock from hæmorrhage do not lose plasma into tissues. Tissue analyses of radioactive protein in these dogs gave the same result. When the shocked dogs received intravenous infusions in the late or irreversible phase of shock, the radioactivity content of some tissues showed that plasma-protein was lost into some tissues. C. J. C. B.

Electrophoretic analyses of serum-proteins in diseases of liver. S. J. Gray and E. S. G. Barron (*J. clin. Invest.*, 1943, 22, 191—199).—Electrophoretic analyses of the serum-proteins yield lower albumin and higher globulin determinations, and consequently lower albumin-globulin ratios, than obtained by fractional pptn. The distribution of the serum-globulin fractions may be abnormal electrophoretically in spite of a normal albumin-globulin ratio on chemical analysis. An abnormality of 2 or more protein fractions was observed in all 30 cases of liver disease studied. The degree of abnormality depended on the severity of the disease. The most characteristic alteration of the serum-proteins in liver disease is a large increase in γ -globulin and decreased serum-albumin. These changes are seen most frequently and markedly in cirrhosis of the liver and next most frequently in the acute parenchymatous diseases. Significant increases in β -globulin were observed in all types of liver disease, but to a less degree and frequency than the γ -globulin changes. Abnormalities of the serum-proteins are less prominent in metastatic carcinoma of the liver. The serum-protein changes in liver disease result primarily from the inability of the liver to produce normal serum-proteins, rather than from external loss in the ascitic fluid. Jaundice alone does not produce serum-protein changes. C. J. C. B.

Viscous protein obtained in large amount from serum of patient with multiple myeloma. S. Shapiro, V. Ross, and D. H. Moore (*J. clin. Invest.*, 1943, 22, 137—142).—A large amount of viscous protein separated out on prolonged dialysis, against distilled water, of plasma from a patient with multiple myeloma. It contained 13.9% of N and, following hydrolysis, yielded 13.4% of reducing substance (as glucose). It coagulated at 64°. Electrophoretic examination of the plasma and serum showed a very large peak with a mobility of -1.9×10^{-6} cm. per sec. per v. per cm. (barbiturate buffer, pH 7.8, μ 0.05). This material had a mol. wt. of 162,000. It coagulated at 72° and did not redissolve when the temp. was raised to 100°. It is neither fibrinogen nor Bence-Jones protein. It may be a normal serum-globulin which reacts with another serum component to yield the viscous protein which settles out on freeing the plasma from salts by dialysis. C. J. C. B.

Quantitative fragility test in children. J. Cormick (*Arch. Dis. Child.*, 1942, 17, 227—234).—Quant. fragility tests carried out on normal children are comparable with those obtained in adults except in the first week of life, when there is decreased hæmolysis in the lower saline concns. and a tendency for hæmolysis to extend to the more conc. solutions. The test reveals alterations in erythrocyte fragility which would be overlooked by a qual. estimation. Cyanosis, with a rise in the blood- CO_2 , increases not only the degree of hæmolysis in the various saline dilutions but also the range of solutions in which hæmolysis occurs. C. J. C. B.

Hæmorrhax in blood dyscrasias. P. Freedman, S. Levine, and L. Solis-Cohen (*Amer. J. med. Sci.*, 1943, 205, 692—695).—One of the cases reported occurred in a hæmophilic and the other in essential purpura. C. J. C. B.

Post-scarlatinal thrombophlebitis migrans. J. V. Bates (*Brit. Med. J.*, 1943, I, 665).—A case of thrombophlebitis migrans occurred on the 25th day after scarlet fever. Sulphapyridine did not modify the condition; antiscarlatinal serum proved more efficient. I. C.

Diamine oxidase determination in serum during pregnancy, labour, and puerperium. R. Wenner and H. von Wattenwyl (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 49—51).—Serum-diamine oxidase increases between the 4th and 7th month of pregnancy, then decreases, and shows another peak in the 10th lunar month. The concn. diminishes during labour and is normal from the 5th day of puerperium. Individual variations are considerable. A. S.

Mercurimetric determination of chlorides in blood. A. Gold (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 28).—To 10 c.c. of Folin-Wu filtrate are added 0.3 c.c. of 2N- HNO_3 , 2 drops of 30% H_2O_2 (Superoxyl), and 4 drops of 1% diphenylcarbazone in abs. methanol; the solution is titrated with standard $\text{Hg}(\text{NO}_3)_2$ to a permanent violet colour. The 1% diphenylcarbazone in abs. methanol keeps at least 6 months if stored in the dark in a refrigerator. C. J. C. B.

Apparent fructose content of human extracellular fluid. R. S. Hubbard and E. Holley (*J. Lab. clin. Med.*, 1943, 23, 737—742).—Traces of a compound reacting with the resorcinol reagent were present in $\frac{2}{3}$ of 23 specimens from various body cavities. The amounts were smaller than those previously found in c.s.f. and were

derived from or in approx. equilibrium with similar substances in blood. Fermentation tests did not identify the compound definitely as fructose. C. J. C. B.

Distribution of diastase in serum, plasma, whole blood, and red blood cells. A. Bernhard and M. J. Rosen (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 575—576).—Vals. in 26 samples are tabulated. Those for plasma and serum are the same, and red cells contain none. V. J. W.

Fractionation of iodine in blood. M. Bruger and S. Møller (*J. Biol. Chem.*, 1943, 148, 77—83).—When the protein of whole blood is pptd. by methyl alcohol, heat and acetic acid, or tungstic acid, recovery of added thyroxine, di-iodotyrosine, and thyroglobulin from the coagulum is incomplete. When ZnSO_4 -NaOH pptn. is employed, the coagulum retains 88—109 and 89—107% of added thyroxine and thyroglobulin or di-iodotyrosine, respectively, together with some added inorg. I. The latter may be removed by washing with water, when 99—111% of added thyroxine is retained by the protein. Using this method, less than 15% of the total I of normal human blood was found to be in the inorg. form. Recovery of added thyroxine and di-iodotyrosine from whole blood by the Trevorror modification of Leland and Foster's method (A., 1939, III, 555) is unsatisfactory. H. G. R.

Blood iodine after thyroidectomy.—See A., 1943, III, 556.

Value of blood-iodine estimations in diagnosis of borderline hyperthyroidism. Serum-iodine fractions in hyperthyroidism.—See A., 1943, III, 557.

Determination of phospholipins in blood. A. D. Marenzi and C. E. Cardini (*J. Biol. Chem.*, 1943, 147, 371—378).—Total phospholipin is obtained by determination of the lipin-P, sphingomyelin by pptn. with Reinecke salt and determination of P in the ppt., and choline-phospholipins after hydrolysis (cf. A., 1943, III, 616); kephalin is then found by difference. Sphingomyelin reineckate is not pptd. in the pure condition from alcohol-ether extracts of plasma and sphingomyelin can only be determined from the P content of the ppt. Human plasma contains total phospholipin 203.74, choline-phospholipin 159.67, lecithin 126.78, kephalin 42.71, sphingomyelin 35.35, and choline 23.83 mg. per 100 c.c. H. G. R.

Quantitative relationship between β -hydroxybutyric acid and acetoacetic acid in blood and urine. I. E. Stark and M. Somogyi (*J. Biol. Chem.*, 1943, 147, 319—325).—The concn. of ketone bodies in the plasma is twice that in the corpuscles. β -Hydroxybutyric acid represents 80% of the ketone bodies in the plasma and acetoacetic acid one half or more (even up to 100%) in the corpuscles. The urine normally contains small amounts of both acetoacetic and β -hydroxybutyric acids, the ratio of the latter to the total ketone bodies being 0.67—0.87. The relationships are the same in diabetic as in normal persons provided that samples are obtained in the post-absorptive state and with preclusion of insulin action. H. G. R.

Effect of high-fat test meal on blood-cholesterol in normal and obese individuals.—See A., 1943, III, 580.

Sugar content of blood, lymph, and artificial peritoneal fluid following injection of insulin.—See A., 1943, III, 559.

In-vitro conservation of acetylcholine in whole blood.—See A., 1943, III, 585.

Choline-esterase activity of serum during stimulation of motor nerves. H. Salvestrini, F. Huidobro, and J. V. Luco (*Anal. Acad. Biol. Univ. Chile*, 1940, 3, 15—29).—In cats under dial, stimulation of the sciatic and crural nerves with currents of high frequency (240 per sec.) affects the choline-esterase activity of serum from the inferior vena cava. The serum changes follow variations of tension of the stimulated muscles: enzyme activity is greatly increased at the beginning of stimulation, rapidly falls, rises again, and eventually drops to a low val. Thus in the curve of the choline-esterase activity it is possible to recognise the five phases which have been described as characteristic of tensions recorded from muscles similarly stimulated. No changes of serum-choline-esterase activity were observed in non-stimulated animals, or on direct stimulation of denervated muscles, or with curarised muscle. I. C.

Serum-choline-esterase in pathological conditions. R. Croxatto and F. Huidobro (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 49—54).—The choline-esterase activity of blood is abnormal in some pathological conditions, but the variations are not characteristic of the type of disease. I. C.

New photometric method for determination of choline-esterase activity of serum. H. Croxatto, R. Croxatto, and F. Huidobro (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 55—65).—The choline-esterase activity of serum is measured photometrically by determining the pH variations in the enzymic system acetylcholine-serum, in a given time. I. C.

Serum-choline-esterase during excitation of abdominal vagus. F. Huidobro, F. Croxatto, R. Croxatto, and R. Donoso (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 67—73).—In cats under dial, stimulation

of the vagus below the origin of its cardiac branches for 2—5 min. increases by 7—15% the choline-esterase activity of venous blood from the splanchnic area. In adrenalectomised cats the increase is 26—30%. After atropine (1 mg. per kg.) stimulation of the vagus does not change the choline-esterase activity of blood.

I. C.

Variations of serum-choline-esterase during muscular contraction. H. Croxatto, R. Croxatto, F. Huidobro, and H. Salvestrini (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 106—110).—Stimulation of the sacral and lumbar plexuses in cats under dial increases choline-esterase activity of blood from the hind-limbs. Direct stimulation of a muscle decreases the choline-esterase activity of the blood from the hind-limbs. These phenomena are not due to stimulation of sympathetic fibres.

I. C.

Changes in serum-choline-esterase during sympathetic stimulation. R. Croxatto and F. Huidobro (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 121—124).—In normal or adrenalectomised cats there is no change in serum-choline-esterase activity of serum during stimulation of splanchnic nerves.

I. C.

Changes in serum-choline-esterase following excitation of vagus in neck. H. Croxatto, F. Huidobro, F. Sanhueza, and R. Croxatto (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 125—132).—In cats under dial (0.7 c.c. per kg.) with vagi cut in the inferior thoracic region below the heart and lungs, stimulation of peripheral end of the vagi in the neck lowers serum-choline-esterase by 26%. If both vagi are intact and the blood from the coronary sinus is excluded, stimulation of the vagi in the neck increases the choline-esterase activity of the blood flowing from the jugular veins, and decreases that from the coronary sinus. Atropine abolishes and adrenalectomy does not modify the effect of vagal stimulation. The fall of serum-choline-esterase is therefore due to the vagal effect on the heart.

I. C.

Cholesterolaemia in eviscerated preparation. H. Croxatto, R. Croxatto, and C. Cepeda (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 75—89).—In the eviscerated prep. with the ovaries *in situ*, blood-cholesterol level falls by 17% during an experimental period of 230 min. Prolan does not affect the action of the ovary on blood-cholesterol. The adrenals, thyroid, brain, and liver left *in situ* have no influence on blood-cholesterol; the kidney raises the blood-cholesterol level.

I. C.

VI.—VASCULAR SYSTEM.

Nervous regulation of crayfish heart. C. A. G. Wiersma and E. Novitski (*J. Exp. Biol.*, 1942, 19, 255—265).—The pace-maker of the heart of *Cambarus clarkii* is apparently a ganglion cell pool. The heart is controlled by accelerator and inhibitor nerves which are connected with special tracts in the subesophageal commissures. The accelerators are cholinergic; the inhibitors work through an unknown transmitter.

G. P. W.

Cardiac output of four freshwater fish. J. S. Hart (*Canad. J. Res.*, 1943, 21, D, 77—84).—The stroke output was determined by measuring the difference in the amount of blood in hearts ligated during systole and diastole. At body wts. of 500 g. the cardiac outputs of the catfish, bowfin, carp, and sucker per stroke were respectively 0.26, 0.22, 0.18, and 0.11 g. These outputs correlated inversely with the effect of CO₂ on the blood of the same species, and directly with the affinity of the blood for O₂ (Black, A., 1942, III, 581). (2 photomicrographs.)

F. S.

Congenital cardiac anomalies.—See A., 1943, III, 541.

Action of veratridine and cevine on isolated mammalian heart.—See A., 1943, III, 586.

Development of myocardial necrosis and absence of nerve degeneration in thiamin deficiency in pigs.—See A., 1943, III, 576.

Measurement of speed and duration of effect following oral and intramuscular administration of quinidine in man.—See A., 1943, III, 586.

Hot wire oscillograph blood pressure measurements in man. A. Müller (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 37—38). A. S.

Arterial blood pressure of developing chick. A. F. W. Hughes (*J. Exp. Biol.*, 1942, 19, 232—237).—Data for the period from the 6th day of incubation to the 5th day after hatching.

G. P. W.

Recording sphygmotonomograph : machine for continuous recording of systolic and diastolic arterial pressure in man. K. Lange (*Ann. int. Med.*, 1943, 18, 367—383).—The instrument contains a heated wire system (bolometer) to transform the puffs of air from a double-bag cuff into electrical currents; a simple mechanical contact device was found unsatisfactory for registering the diastolic pressure as it depends on the magnitude of the oscillations instead of on the steepness of the pressure rise in the system. The instrument is insensitive to sudden acceleration, and can be used to test pilots under flight conditions. The accuracy of the measurements was tested against the auscultatory method in 109 subjects, using a microphone instead of the stethoscope; the average difference for

K 2 (A., III.)

the systolic pressure was 0.06, for the diastolic pressure 4.0 mm. Hg. Records taken from both arms of the same subject are identical. Uninterrupted records were taken for 30 min. with partial arrest of the circulation without significant changes in the blood pressure. Many normal persons show Mayer—Traube—Hering pressure waves of about 30 sec. wave-length and 12 mm. Hg height under conditions of excitement or impaired breathing conditions. Even slight mental work or excitement may cause considerable rise in diastolic and systolic pressures.

A. S.

Electrical determination of pulse wave velocity. A. von Muralt (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 38—39). A. S.

Angiocardiography. H. M. Weber (*Amer. J. med. Sci.*, 1943, 205, 747—753).—A review. C. J. C. B.

Carotid sinus reflexes and convulsions. E. Gellhorn, L. Yesnick, M. Kessler, and H. Hailman (*Amer. J. Physiol.*, 1942, 137, 396—403).—In chloralosed cats and dogs lowering the carotid sinus pressure by clamping the carotids, tilting into "feet down" position, and amyl nitrite lead to an intensification of existing convulsions and reappearance of convulsions which have ceased for some time (from metrazol, strychnine, camphor, picrotoxin, coryamyrin, absinthe). Tilting into "head down" position abolishes or reduces convulsions. These effects were absent or reversed by bilateral vagotomy and denervation of the carotid sinuses. Depressor reflexes are intensified during convulsions, since postural changes produce smaller blood pressure changes in the convulsed than in the non-convulsed animal.

M. W. G.

Electrocardiography of normal guinea-pigs. B. F. Magalhães and A. Rocha (*Rev. Brasil. Biol.*, 1942, 2, 47—52).—The e.c.g. of normal guinea-pigs is very similar to the human; P is smaller in lead III, and may be bifid, diphasic, or inverted. Q appears more frequently in lead I, but is often absent. The duration of the ventricular complex is 0.014—0.034 sec. The S-T interval is ascending. T is negative in lead I in 20% of cases.

I. C.

Electrocardiographic investigations after physical exercise with gas masks. M. S. Meier (*Schweiz. med. Wschr.*, 1942, 72, 736—743).—Soldiers wearing gas-masks were subjected to brief severe and to longer moderate physical exercise. The e.c.g. did not show signs of O₂ lack or CO₂ excess although air hunger and cyanosis were often pronounced. Right auricular extrasystoles were frequently observed in the group doing severe work of short duration.

A. S.

Clinical fetal electrocardiography. A. J. Geiger, W. M. Monroe, and A. V. N. Goodyer (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 646—648).—Successful tracings were obtained in the 4th month of pregnancy by the amplifier method described by Hoff *et al.* for the chick embryo (A., 1939, III, 654).

V. J. W.

Paroxysmal auricular fibrillation in association with hiatus hernia. W. D. Stubenbord (*Ann. int. Med.*, 1943, 18, 406—409).—A case is reported.

A. S.

Position of heart and form of extrasystoles. L. Herve and F. Huidobro (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 43—48).—In dogs and cats electrodes were placed on the heart and extrasystoles elicited from the right or left ventricle, the organ being in normal position or displaced to the right or left. E.c.g. were recorded from the classical leads. With the pericardium intact and the thorax closed the only difference in the e.c.g. of extrasystoles elicited from the heart in normal or abnormal positions is a slight modification of T. If the thorax and the pericardium are open and the heart is displaced to the left, left ventricular extrasystoles show a positive R in lead I and a negative S in lead III. If the heart is displaced to the left, extrasystoles from the conus region of the right ventricle, give a negative S in lead I and a positive R in lead III. Extrasystoles from other points of the right ventricle give a positive S in lead I and a negative R in lead III.

I. C.

Acquired bicuspid aortic valves with retracted horizontal raphe. S. Koetsky (*Amer. J. Path.*, 1943, 19, 395—409). C. J. C. B.

Subacute bacterial endocarditis complicating patent ductus arteriosus. W. A. Winn, C. L. Hughes, and J. M. Sanders (*Ann. int. Med.*, 1943, 18, 242—250).—The infection was due to *a-haemolytic streptococci*. The patient recovered after combined sulphapyridine-heparin treatment.

A. S.

Cor pulmonale with bilateral aneurysms of pulmonary arteries, inter-ventricular septal defect, patent ductus arteriosus, and terminal Ayerza's syndrome. M. W. Johannsen and C. A. R. Connor (*Ann. int. Med.*, 1943, 18, 232—237).—Report of a case.

A. S.

Cardiac problems in war time. P. D. White (*Ann. int. Med.*, 1943, 18, 323—331).—A lecture. A. S.

Myxœdema heart ; pathological and therapeutic study. J. S. La Due (*Ann. int. Med.*, 1943, 18, 332—344).—Hydropic vacuolisation, loss of cross-striation, pyknotic nuclei, and irregularities in staining properties of the muscle fibrils (changes similar to those found in beri-beri hearts) are seen in myxœdema hearts. X-Rays showed a globular shaped heart. The e.c.g. showed extremely low potentials

(max. 0.2 mv.). Large doses of thiamin and vitamin-B concentrates were ineffective. A. S.

Heart in experimental thyrotoxicosis. E. D. Nora (*J. Lab. clin. Med.*, 1943, 28, 797—807).—Thyrotoxicosis in rabbits caused by feeding with thyroid extract resulted in parenchymatous and fatty degeneration, cellular invasion, and fragmentation of the heart muscle and fibrosis. Similar less marked changes were produced by hypertension after sino-aortic denervation. C. J. C. B.

Cardiac efficiency following acute coronary occlusion. A. M. Master, S. Dack, and H. L. Jaffe (*J. Amer. Med. Assoc.*, 1942, 120, 1271—1278).—Cardiac efficiency was studied in 202 cases of acute coronary occlusion 2—8 years after recovery. $\frac{1}{3}$ of cases had no symptoms or signs. Vital capacity, the 2-step exercise tolerance test, X-ray of heart, and e.c.g. are helpful in prognosis. C. A. K.

Thiamin deficiency and myocardial necroses. R. H. Follis, jun. (*Johns Hopkins Hosp. Bull.*, 1942, 71, 235—241).—Thiamin deficiency, together with vitamin-K deficiency, in rats did not produce the myocardial necroses which are characteristic of -K deficiency alone. Kidney changes characteristic of -K deficiency occurred in both -K- and -K- + -thiamin-deficient rats. Cardiac changes in thiamindeficient rats were absent, in contrast to other species. T. F. D.

Massive intramedullary infusions [i.e., into bone marrow]. E. A. Doud and J. E. Tytell (*J. Amer. Med. Assoc.*, 1942, 120, 1212—1213).—Case report. C. A. K.

Abdominal pain in pulmonary thrombosis. W. S. Middleton (*Ann. int. Med.*, 1943, 18, 345—349).—Excruciating lower abdominal and epigastric pain with collapse were observed in a patient with extensive thrombosis of the pulmonary arteries. There were no signs of vascular occlusion in the abdomen on post-mortem examination. A. S.

Intestinal bleeding after obstruction of inferior vena cava. W. Berblinger (*Schweiz. med. Wschr.*, 1942, 72, 869—870).—Intestinal hæmorrhages were found in 4 patients with thrombosis of the inferior vena cava. The rôle of anastomoses between inferior vena cava and superior and inferior mesenteric and the left renal and spermatic veins in the causation of these hæmorrhages is discussed. A. S.

New and simple method of subcutaneous ligation of varicose veins. B. W. Goldstone (*Brit. Med. J.*, 1943, I, 753—754).—A method for complete subcutaneous ligation of varicose internal saphenous veins is described. The treatment is ambulatory, complete at one sitting, and no incision is necessary. I. C.

Venography. J. Dougherty and J. Homans (*Surg. Gynec. Obstet.*, 1940, 71, 697—702).—Clinical study with illustrative examples of the val. of X-ray photographs of the veins of the extremities during the intravenous infusion of an org. I compound (Diodrast). P. C. W.

Lacarnol, padutin, and adenosinephosphoric acid [dilate blood vessels and] raise temperature in rabbit's muscle. L. Asher (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 6—7). A. S.

Vasodilating effects of nicotinic acid.—See A., 1943, III, 576.

Influence of alcohol on circulation.—See A., 1943, III, 589.

Separation of hypertensinogen and hypertensinase in ox serum. H. Croxatto and R. Croxatto (*Anal. Acad. Biol. Univ. Chile*, 1940, 3, 83—92).—Ox serum is treated with 1.5M-K phosphate (pH 6.3) by Page's method. The ppt. (A) is separated by filtration from the supernatant fluid (AA). AA is then treated with 2M-K phosphate. The ppt. (B) is separated by filtration from the supernatant (BB), B is then dialysed and filtered. The filtrate is pptd. with 1.5—2M-K phosphate. The ppt. (C) is dialysed free from PO₄^{'''}. B and BB are incubated at 30° with renin and the constrictor action is tested on a Trendelenburg prep. B is markedly constrictor owing to its hypertensinogen content, and BB inhibits the constrictor action of B, owing to its hypertensinase content. The hypertensinase in BB is destroyed by heating at 58°. C, A, and AA have a constrictor action when incubated with renin. I. C.

Surgical approach to hypertension. XI. Splanchnic resection, ganglionectomy, and anterior root section. XII. End results of sympathetic surgery and X-irradiation. F. M. Findlay (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 118—125, 244—252).—A review. P. C. W.

Effect of repeated pregnancies on rabbits with renal hypertension. L. V. Dill, C. E. Isenhour, J. F. Cadden, and A. Kuder (*Surg. Gynec. Obstet.*, 1941, 72, 38—47).—Repeated pregnancies in rabbits with hypertension produced by renal ischæmia had no effect on the blood pressure, albuminuria, or histological changes in the kidneys. The survival time of the hypertensive rabbits was reduced. In many cases fetal resorption occurred. P. C. W.

Cardiovascular effects of renin. O. Schales, S. W. Hoobler, and F. W. Haynes (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 720—723).—Injections of human renin in man caused a rise of blood pressure reaching a max. in 4—5 min. and returning to normal in 20—30 min.

Both systolic and diastolic levels were raised. Heart rate was slowed; there was a decrease of blood flow in the hand from 27 to 3 c.c. per min. per 100 c.c. of tissue but no change in forearm blood flow. Venous pressure rose by 8—83 mm. of water. V. J. W.

Effect of drugs on pulmonary and systemic arterial pressures in trained unanæsthetised dog. Renin, angiotonin, adrenaline, pitresin, parendrine, digitalis, acetylcholine, papaverine, histamine, amyl nitrite, and aminophyllin.—See A., 1943, III, 585.

Psychosomatic aspects of hypertension. E. Weiss (*J. Amer. Med. Assoc.*, 1942, 120, 1081—1086).—A review. C. A. K.

Pancreatic tissue extract (insulin-free) in treatment of peripheral vascular disease. C. Klein, G. Saland, and H. Zarrow (*Ann. int. Med.*, 1943, 18, 214—224).—Intramuscular injection of 3 c.c. of an insulin-free deproteinised pancreatic tissue extract in patients with arteriosclerosis obliterans lowered the calf muscle temp., without altering the skin surface temp.; it had no effect, within 30 min., on the claudication time (measured in ergometer experiments). 2 injections per week over 6—18 months improved the claudication time and resting pain, but had no effect on the vascularisation of the affected limbs. Untreated control cases showed equal improvement. The injections did not produce untoward effects. A. S.

Recognition of incipient thromboangiitis obliterans in young draftees. W. E. Jahsman, R. H. Durham, and N. P. Dallis (*Ann. int. Med.*, 1943, 18, 164—176).—Capillary microscopy in young people with incipient thromboangiitis obliterans reveals severe distortions, some capillaries showing a figure-of-eight tortuosity, others being rosette-shaped. Normally shaped capillaries show narrowing of the arterial side; some capillaries are visible only as very short partial loops ("nubbins"). The patients showed diminished vasodilatation in the extremities following immersion of one arm in a hot water bath. A. S.

Value of deoxycorticosterone acetate in treatment of peripheral vascular diseases. H. H. Sirota (*J. Clin. Endocrinol.*, 1943, 3, 141—147).—The beneficial effects of intravenous injection of hypertonic NaCl solution in cases of thromboangiitis obliterans and arteriosclerosis obliterans can within limits be duplicated by the injection of deoxycorticosterone acetate. A temporary fall in blood pressure and increase in local skin temp. were often observed. 20 cases are reported. P. C. W.

Vascular lesions of extremities. P. G. Flotow (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 333—340).—Analysis and discussion. P. C. W.

Treatment of hypertensive patient in pre-cardiac stage. N. Flaxman (*Amer. J. med. Sci.*, 1943, 205, 696—700).—A review. C. J. C. B.

Relationship between arteriosclerosis of renal artery and hypertension. J. R. Lisa, D. Eckstein, and C. Solomon (*Amer. J. med. Sci.*, 1943, 205, 701—703).—The difference in calibre between sclerotic vessels of hypertensive and non-hypertensive cases was insignificant. Only 2 instances were found simulating the Goldblatt kidney. The degree of cholesterol deposit bore no relationship to the calibre. The degree and extent of arteriolar sclerosis estimated from the histological examination of the kidneys was a better index of blood pressure readings than the calibre of the main renal arteries. C. J. C. B.

Arteriosclerotic gangrene: refrigeration prior to amputation. E. R. Haley (*Arch. Surg., Chicago*, 1943, 46, 518—524).—Report of 4 cases. F. S.

VII.—RESPIRATION AND BLOOD GASES.

Acoustic respirograph; method for study of respiration through graphic recording of breath sounds. S. Margolin and L. S. Kubie (*J. clin. Invest.*, 1943, 22, 221—224).—A direct-contact microphone of special type is placed against the neck in the vicinity of the trachea. Its electrical output is the resultant of a.c. of frequencies corresponding with those of the breath sounds. These currents are led to a vac.-tube amplifier which magnifies them to a val. sufficient to operate a direct-writing galvanometer. C. J. C. B.

Analysis of afferent respiratory vagal effects by interference stimulation. O. A. M. Wyss (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 21—23).—Synchronised central stimulation of both vagi with low frequency produces inspiratory effects, a synchronous stimulation expiratory effects, on the respiratory centre. A. S.

Origin of inflation and deflation pulmonary reflexes. M. Ham-mouda, Adli Samaan, and W. H. Wilson (*J. Physiol.*, 1943, 101, 446—459).—Excitation of afferents in the cervical vagus slows respiration, unless the nerve is cooled proximal to the electrodes to below 8°, when acceleration occurs. The effects are obtained from dissected pulmonary branches at the hilum, but not from cardiac branches. The slowing and acceleration of breathing following inflation and deflation of the lungs are unaffected by extirpation of the cardiac branches and exclusion of impulses from the pareties, but are abolished by section of the pulmonary branches. Re-

spiratory rhythm is modified by two sets of afferents originating exclusively in the lungs.
W. H. N.

Effect of high-altitude flying and low barometric pressure chamber on whooping cough. P. Lauener and E. Maeder (*Schweiz. med. Wschr.*, 1942, **72**, 819—821).—Several hundred children and adults suffering from whooping cough were taken up to 3500—4500 m. for periods of 40—60 min. A rapid cure or considerable improvement was seen in most cases.
A. S.

Chronic mountain sickness. A. Hurtado (*J. Amer. Med. Assoc.*, 1942, **120**, 1278—1282).—Variations in red cell count, hæmoglobin concn., and blood and plasma vol. were determined in 8 Indian subjects in Peru. The polycythæmia seen at high altitudes disappeared at sea level and symptoms were abolished.
C. A. K.

Drug prophylaxis against lethal effects of severe anoxia. G. A. Emerson and E. J. van Liere (*J. Lab. clin. Med.*, 1943, **28**, 689—706).—A standard technique for testing the effects of drugs on tolerance to anoxia is described. Certain cholinergic and sympatholytic agents have a prophylactic action while adrenergic and parasympatholytic agents increase the lethal effects. Other classes of autonomic drugs are without effect.
C. J. C. B.

Effect of variations in oxygen pressure on tumour transplants.—See A., 1943, III, 569.

Absorption of carbon dioxide in anæsthesia apparatus.—See A., 1943, III, 587.

Significance of carotid sinus reflex for effect of anoxia and CO₂ on convulsions. E. Gellhorn and L. Yesinick (*Amer. J. Physiol.*, 1942, **137**, 404—408).—Anoxia promptly abolishes chemically induced convulsions in the narcotised cat with carotid sinus nerves and vagi cut; it has no or slight effect on normal animals. CO₂ inhibits convulsions in normal animals but not after denervation of the carotid sinuses and bilateral vagotomy. This reversal is explained by the fact that variations in the tension of O₂ and CO₂ in the blood and tissues modify the depressor reflexes originating in the carotid sinus and arch of the aorta in opposite directions.
M. W. G.

Effect of methæmoglobin on equilibrium between oxygen and hæmoglobin. R. C. Darling and F. J. W. Roughton (*Amer. J. Physiol.*, 1942, **137**, 56—68).—In mixtures of methæmoglobin and ordinary hæmoglobin the O₂ dissociation curve is shifted to the left; as the methæmoglobin % increases the shape becomes more hyperbolic. This effect is quantitatively less than that produced by CO-hæmoglobin and is reversible. The shifts produced by CO-hæmoglobin and methæmoglobin are additive. The effect is due to the formation of compounds intermediate between reduced hæmoglobin and methæmoglobin, the conversion of one or more of the 4 Fe⁺⁺ in the hæmoglobin mol. into Fe⁺⁺⁺ leading to an increased affinity of the remaining Fe⁺⁺ atoms for O₂. The effect has been shown in solutions of ox and human hæmoglobin in 0.6M-PO₄^{'''}, with methæmoglobin made by ferricyanide, aerobic oxidation, or NO₂, or dog's whole blood during poisoning with NO₂.
M. W. G.

Continuously recorded alterations in buoyancy of anaesthetised dogs produced by various respiratory modifiers. H. C. Nicholson and R. H. Trimby (*Amer. J. Physiol.*, 1942, **137**, 136—142).—A method of recording respiration by continuous determinations of the buoyancy of anaesthetised dogs submerged in water is described. Vagotomy is followed by increase in inspiratory vol. of the lungs and a decrease in expiration, indicating that the vagus previously exerted a predominantly expiratory augmenting influence. If the pressure of liquid in the tank on the dog's chest is not compensated, resulting in excitation of pulmonary collapse receptors and removal of excitation from stretch receptors, these effects of vagotomy are reversed, indicating that under these conditions the intact vagus exerts a predominantly inspiratory augmenting influence. Saphenous nerve stimulation increases inspiratory and expiratory activity. CO₂ causes deeper inspiration and more complete expiration. Na₂CO₃ apnoea may occur at normal expiratory vol. or above depending on relative dominance of inspiratory or expiratory activity. Low O₂ results in increased inspiration but less emptying of the lungs on expiration. CN['] acts similarly, except that when the hyperpnoea is extreme a second phase of expiratory augmentation occurs. Hæmorrhage increases expiratory lung vol.
M. W. G.

Humidity and cockroach respiration. D. L. Gunn and C. A. Cosway (*J. Exp. Biol.*, 1942, **19**, 124—132).—The O₂ consumption of *Blattella orientalis* is unaffected by desiccation (25% wt. loss) but is slightly higher in moist air than in dry; this is partly due to the lower body temp. in dry air.
G. P. W.

Post-operative respiratory complications in service cases. H. M. Bird, S. D. Kilner, and D. J. Martin (*Brit. Med. J.*, 1943, **1**, 754—755).—The most important factor in the development of respiratory complications is the site of operation, operations on the abdominal wall being more likely to be followed by cough. Type of anaesthetic or endo-tracheal tubes have little bearing on the incidence of complications. Diminished ventilation of the lung is an important

factor; chest complications may be minimised by starting active movements as early as possible.
I. C.

Focal lipid granulomatosis of lung following instillation of iodised poppyseed oil. H. Brody (*Arch. Path.*, 1943, **35**, 744—749).—A case report. (7 photomicrographs.)
C. J. C. B.

Causation of pulmonary oedema in rats. E. Rothlin (*Verh. Ver. Schweiz. Physiol.*, 1940, **17**, 17—19).
A. S.

Incidence of bronchial asthma in white and negro. V. J. Derbes and H. T. Engelhardt (*Amer. J. med. Sci.*, 1943, **205**, 675—677).—Asthma is half again as common in whites as in negroes (150,000 whites and 144,000 negroes studied).
C. J. C. B.

Histamine iontophoresis and bronchial asthma. A. Dudan (*Schweiz. med. Wschr.*, 1942, **72**, 821—824).—Considerable success was obtained in 80% of patients suffering from bronchial asthma using repeated histamine iontophoresis.
A. S.

VIII.—MUSCLE.

Development of human motor end plate. F. Cuajunco (*Carnegie Inst. Washington, Contrib. to Embryol.*, 1942, **30**, 127—152).—A detailed account of the histogenesis of the muscle fibres and the motor end plate in the biceps brachii muscle of human foetuses from the 10th week to full term. At the 10th week the myoblasts are simple tubular structures without nerve connexions. Striations commence to appear and terminal twigs of nerve fibrils come in contact with the sarcolemma in the 11th week. In the 12th week connective tissue cells, believed to belong to the sheath of Schwann, form masses over and among the nerve fibrils which are penetrating the sarcolemma. Doyère's eminence appears at the 13th week and the connective tissue cells contribute to the formation of the plate by coalescence of their protoplasm and that of the muscle fibre to form a syncytium. The sarcolemma then develops over the eminence. The subsequent differentiation of this early ending to the mature type is described and the results, when considered in conjunction with observations of other workers on foetal movements, show a marked correlation between the structural development of the nerve and muscle and the contractions in the latter tissue. The presence of more than one plate in a muscle cell connected to different nerve fibres, probably indicating plurisegmental innervation, and of single plates receiving the terminations of more than one nerve fibre is recorded.
J. D. B.

Symptoms and neuro-muscular lesions in vitamin-E lack in adult rats. M. Monnier (*Verh. Ver. Schweiz. Physiol.*, 1941, **18**, 35—37).—The first symptoms were observed after 10½ months. Degenerative changes were found in skeletal muscles, often near the vessels. There was loss of cross-striation, necrosis, monocyctic infiltration of the fibres, endo- and peri-mysial fibrosis, and fatty degeneration. After 14 months and longer, there was motor ataxy, paresis of the hind limbs, disturbance of deep sensibility, sensory disturbances (loss of smell and hearing), exophthalmos, and urinary incontinence. There was degeneration of the tracts of Goll and Burdach, of anterior and lateral horn cells, demyelination of peripheral nerves, and more pronounced degeneration of the skeletal muscles.
A. S.

Heat production in frog's muscle on sympathetic stimulation. L. Asher and N. Scheinfinkel (*Verh. Ver. Schweiz. Physiol.*, 1940, **17**, 7—8).—Electrical stimulation of the sympathetic raises the temp. in frog's skeletal muscle. Similar observations were made in curarised muscle.
A. S.

Penetration of radioactive potassium in denervated muscle. C. P. Lyman (*Amer. J. Physiol.*, 1942, **137**, 392—395).—One week after the denervating operation the rate of penetration of radioactive K into the denervated gastrocnemius muscle of rats 2—9 min. after injection is twice that in controls. If the radioactive K remains in the body for 4 hr. there is less radioactive K in the denervated than in the normal muscle.
M. W. G.

Distribution of water and electrolytes between bloods, fluids, and skeletal muscle in pregnant dogs. A. Childs and L. Eicheberger (*Amer. J. Physiol.*, 1942, **137**, 384—391).—In late pregnancy skeletal muscle consists of an extracellular phase of 15% and an intracellular phase of 85% (as in non-pregnant dogs). After an increase in total body-water produced by intravenous injection of a large vol. of normal isotonic saline the degree of acute oedema in the muscle was the same as in non-pregnant dogs.
M. W. G.

Action of magnesium sulphate on skeletal muscles. J. V. Luco, R. Pichard, and F. Huidobro (*Anal. Acad. Biol. Univ. Chile*, 1940, **3**, 69—75).—MgSO₄ has a potentiating as well as a curarising action on muscles indirectly stimulated at 17 per sec.; it has a similar effect on denervated muscles stimulated by intra-arterially injected acetylcholine. It potentiates the action of curare and has varying effects after prostigmine.
I. C.

[Interpretation of] electric responses of tail pilomotor and nictitating membrane of cat. A. Rosenblueth and E. C. del Pozo (*Amer. J. Physiol.*, 1942, **137**, 263—279).—Injections of cocaine, veratrine, 933 F, or ergotoxine were used to separate out various

components in the electrograms, and to examine the relations between electric and mechanical events. 7 components which vary independently are shown in the pilomotor electrogram. Components 1—5 show no correlation in the mechanogram; 6 and 7 vary with contraction; 6 coincides with development of the mechanical response; 7 outlasts contraction and corresponds to recovery processes; 6 and 7 can be recorded from diphasic leads, proving they correspond to an asymmetric change in each muscular cell. In the membrane, as in the pilotors, 2 monophasic early components of opposite polarity, 1 and 2, occasionally follow each other without a break, suggesting a single diphasic wave. The rhythmic component is characteristic of the nerve-muscle prep. and never occurs in the pilotors; it consists of a series of waves recurring rhythmically 0.7—2.5 times per sec. and declining gradually in amplitude. Components 1 and 2 may develop in response to additional stimuli during the course of the rhythmic component. Electric responses persist in the pilotors after injections of ergotoxine but not in the nerve-muscle prep. M. W. G.

Effect of oral and parenteral administration of vitamin-E on creatinuria and symptoms of dystrophic rabbits. C. G. Mackenzie and E. V. McCollum (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 642—646).—Urinary creatine is decreased in vitamin-E-deficient rabbits by oral but not by intramuscular or subcutaneous administration of 20 mg. of *dl*- α -tocopherol. Injection of larger doses sometimes cures dystrophy and sometimes prolongs life without a cure. V. J. W.

Myasthenia gravis in child of 5 years. A. T. Lieberman (*J. Amer. Med. Assoc.*, 1942, 120, 1209—1211).—Acute fulminating myasthenia gravis developed in a negro boy aged 5 years. C. A. K.

Myasthenia gravis in infant born of myasthenic mother. F. L. Strickrook, R. L. Schaeffer, and H. L. Bergo (*J. Amer. Med. Assoc.*, 1942, 120, 1207—1209).—Case report. C. A. K.

Myotonia acquisita (Talma's disease). W. A. Nosik and E. W. Shannon (*Cleveland Clin. Quart.*, 1942, 9, 185—186).—A case of Talma's disease in a woman of 45 years is reported. There was no evidence of neuritis or polyneuritis. A. S.

IX.—NERVOUS SYSTEM.

Recovery of fibre numbers and diameters in regeneration of peripheral nerves. E. Gutmann and F. K. Sanders (*J. Physiol.*, 1943, 101, 489—518).—The peroneal nerve of rabbits was interrupted by crushing, by cutting followed by suture, and by cutting followed by repair with a length of grafted nerve. Only after the crush was the nerve fully reconstituted (250—300 days). Various levels of the nerve were examined, above and below the lesion, the relative proportions of fibres of different sizes at the various levels being observed at intervals. The relation of fibre diameters above and below the lesion suggests a flow of axoplasm from the proximal to the distal fibres, followed, after crushing, by a restoration of original size in both. After suture or graft, the proximal fibres do not recover their original diameter, nor do the distal ones achieve it. The frequency distribution curve of fibre size in the nerve also fails to return to normal in the peripheral stump after the last two procedures. Crude function (toe-spreading) recovers better than the anatomical result would suggest, but perfect function in man probably requires anatomical perfection, and it is suggested that the thickness of fibres may be important in the timing of impulses. Grafts with bottleneck Schwann tubes may be an obstacle to recovery of function. W. H. N.

Rate of regeneration of rabbit nerve. E. Gutmann, L. Guttman, P. B. Medawar, and J. Z. Young (*J. Exp. Biol.*, 1942, 19, 14—44).—In adults, axon tips appear in the peripheral portion 7.3 days after suture and 5.2 days after crushing, then advance along it at 3.5 mm. per day after suture and 4.4 mm. per day after crushing. Functional completion shows latent periods of 36 days after suture and 20 days after crushing, and rates of advance of 2.0 mm. per day after suture and 3.0 mm. per day after crushing. In young rabbits (1 month old), the axon tips advance at the same rate, delay in the scar is less, and the fibres mature more rapidly. G. P. W.

Nerve regeneration in rat following tubular splicing of severed nerves. P. Weiss (*Arch. Surg., Chicago*, 1943, 46, 525—547).—The sciatic nerve was cut and the severed ends were joined by fitting into a tight sleeve of fresh rat aorta. This provided a firm channel in which the nerve fibres regenerated in parallel courses without branching or forming neuromata. The fibres retained their topographic relations and fibrous ingrowth was prevented. F. S.

Transynaptic effect of neonatal axon section on bouton appearance about somatic motor cells. M. Schadewald (*J. comp. Neurol.*, 1942, 77, 739—748).—It is confirmed that bouton terminaux are absent about the anterior horn cells of the lumbosacral spinal cord in the newborn and young kitten. They appear in the trochlear and abducens nuclei by the 3rd postnatal week and in the lumbosacral anterior horn segments by the 4th week. Axonal section does not alter the time of appearance nor the no. appearing about somatic

motor cells the axons of which have been cut immediately after birth. J. D. B.

Wallerian degeneration and cell activity. M. Abercrombie and M. L. Johnson (*J. Exp. Biol.*, 1942, 19, 266—283).—"Activity" is the amount of outwandering of Schwann cells and fibroblasts in explants. In the peripheral stump of a severed rabbit nerve, it reaches a max. in pieces explanted on the 19th—25th days after section; this may therefore be the best time for suturing. G. P. W.

Development of myocardial necrosis and absence of nerve degeneration in thiamin deficiency in pigs.—See A., 1943, III, 576.

Treatment of tetany in severely traumatised newborn.—See A., 1943, III, 558.

Instrument for removing the spinal cord through foramen magnum. S. Lindsay (*Arch. Path.*, 1943, 35, 750—751). C. J. C. B.

Development and regression of reflexes, postures, and progression in the young macaque. M. Hines (*Carnegie Inst. Washington, Contrib. to Embryol.*, 1942, 30, 153—210).—A detailed account of the reflexes, posture, progression, and use of somatic musculature in the infant macaque during the last month of gestation and the first year of life. The results support the general conclusion that the development and regression through which these phenomena pass are an expression of differential maturation of the central nervous system, especially the cortex cerebri. There is an astonishing similarity, from the neurological point of view, in the order of development of all the functions studied in the macaque and in the human infant. J. D. B.

Dosage of liver extract in treatment of cord lesions associated with pernicious anaemia. R. Gottlieb (*Canad. Med. Assoc. J.*, 1943, 48, 420—421).—The dose of liver extract (Anahemin) necessary in 6 such cases to improve the cord symptoms was much larger than was required for the recovery from the anaemia alone. C. J. C. B.

Guillain-Barré syndrome ("infectious polyneuritis") and acute anterior poliomyelitis. G. A. Jervis and P. J. Strassburger (*Amer. J. Dis. Child.*, 1943, 65, 431—439).—The case described was clinically typical but post mortem the disease appeared to be acute anterior poliomyelitis. C. J. C. B.

Non-specific therapy in anterior poliomyelitis. S. Stone (*J. Pediat.*, 1943, 22, 142—153).—The administration of thiamin chloride intravenously or intramuscularly during the acute stage improved the general condition and lessened the severity of the paræsthesias. It was most effective when given during the height of artificial fever. Vitamin-E lessened the development of fibrositis, increased muscle tone in chronic patients, and helped muscle regeneration where the nerve supply was not completely destroyed. Artificial fever (102—105° F.) therapy was well tolerated during the acute and subacute stages of the disease and helped to reduce muscle tenderness, relieved vasospasm and muscle spasm, and improved the circulation of spinal cord and brain. When combined with -B and -E it rapidly improved symptoms in patients displaying progressive fibrositis. C. J. C. B.

Effect of infra-red heat on localised poliomyelitis and neuritis. J. A. Toomey (*J. Pediat.*, 1943, 22, 135—141).—After infra-red heat was given to 3 poliomyelitis patients with apparent complete paralysis of the facial muscles some voluntary movement took place for a little while. In 6 individuals with peripheral neuropathy, there was no improvement. C. J. C. B.

Primary sciatic neuritis. B. J. Alpers, H. S. Gaskill, and B. P. Weiss (*Amer. J. med. Sci.*, 1943, 205, 625—636).—The symptoms and signs of 55 cases are discussed. C. J. C. B.

Sensory type neurons in hypoglossal nerve. A. A. Pearson (*Anat. Rec.*, 1943, 85, 365—375).—Bipolar neurons which are regarded as sensory in function are described in the hypoglossal nerve of human fetuses of 4, 5, and 6 months of age. They were found in the intramedullary course of the nerve in the region of the hilus of the inferior olivary nucleus. W. F. H.

Sydenham's chorea. J. Schwartzman and L. Grossman (*Arch. Pediat.*, 1943, 60, 194—200).—Review and treatment of 62 cases. Vitamin-B₆, nirvanol, and typhoid-paratyphoid therapy gave the best results in that order. C. J. C. B.

Trigeminal neuralgia. Treatment by novocain injection of trigger zones. W. K. Livingston (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 205—211).—Infiltration of 2% novocain solution into the trigger zone of the face in 4 cases of trigeminal neuralgia gave relief lasting for weeks or months. The site of origin of the pain is discussed. P. C. W.

Effects of morphine and prostigmine on pain threshold.—See A., 1943, III, 588.

Effect of bone dysplasia (overgrowth) on cranial nerves in vitamin-A-deficient animals. E. Mellanby (*J. Physiol.*, 1943, 101, 408—431).—Experiments up to 6 months in duration on vitamin-A-deficient pups show that thickening of the dura mater and overgrowth of bone compress the cranial nerves in the foramina, particularly

at the internal opening, and lead to degenerative changes. Bony deformity may also cause lengthening of nerves and pressure on ganglia (*e.g.*, Gasserian); the former does not, but the latter does, contribute markedly to the degeneration. Possibly on this account, motor nerves are less affected; an unexplained differential susceptibility to pressure, seen even between *e.g.*, the two divisions of VIII, is also a probable factor. An additional primary effect of *-A* deficiency on the retina contributes to the effect on II. Other factors are increased intracranial pressure and interference with blood supply. Deformation is due to increase of cancellous tissue, and *-A* is regarded as a co-ordinator rather than stimulator of bone growth. W. H. N.

Extent of recurrent geniculo-calcarine fibres (loop of Archambault and Meyer) as demonstrated by gross brain dissection. A. T. Rasmussen (*Anat. Rec.*, 1943, 85, 277—284).—The history of gross brain dissection by teasing out fibre bundles is reviewed. Fibres, apparently originating in the region of the lateral geniculate body, may be followed anteriorly and laterally over the inferior horn of the lateral ventricle and then backward into the lower or horizontal part of the optic radiations. It thus appears that a considerable no. of geniculo-calcarine fibres are involved in the loop. W. F. H.

Probst's tract in cat. K. B. Corbin (*J. comp. Neurol.*, 1942, 77, 455—467).—The tract was studied in cats, using Swank's modification of the Marchi technique, after interruption of the mesencephalic root of the fifth nerve at different levels. It arises from the ventral quarter of the mesencephalic root, its cells of origin being scattered throughout the entire extent of the nucleus. No evidence was found suggesting an origin from the locus coeruleus. It descends to the level of the dorsal motor nucleus of the vagus and is closely related to the salivatory nucleus and the nucleus of the solitary tract. The relationship to these nuclei suggests a functional association concerned in masticatory, salivary, and gustatory reflexes. J. D. B.

Thalamus of sheep: cellular and fibrous structure. J. E. Rose (*J. comp. Neurol.*, 1942, 77, 469—523).—A detailed description of the thalamus in the sheep together with a statement of the possible homologies of the thalamic elements of the pig, rabbit, cat, and sheep. The results suggest that if the thalami of the pig and sheep are typical for the ungulates the phyletic status of these mammals is between the rodents and the carnivores. J. D. B.

Diencephalon of opossum. III. Thalamo-cortical projection. D. Bodian (*J. comp. Neurol.*, 1942, 77, 525—575).—The method of retrograde degeneration demonstrates that the elementary plan of the mammalian thalamo-cortical projection is clearly established in the opossum. Details are described and it is shown that localisation in respect to projection of sp. thalamic nuclei is precise. Contiguous thalamic nuclei tend to project to contiguous cortical fields and there is little neocortex which does not receive thalamic fibres. J. D. B.

Statistical analysis of effects of diencephalic stimulation. W. R. Hess (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 15—16). A. S.

Electroencephalographic studies: slow activity during hyperventilation in relation to age. W. T. Liberson and H. Strauss (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 674—676).—Slow activity (less than 7 cycles per sec.) is produced in children by hyperventilation but its amount decreases rapidly up to 15—18 years. The similar spontaneous activity in epileptics has a similar relation to age. V. J. W.

Cytoarchitecture of individual parietal areas in *Macaca mulatta* and distribution of efferent fibres. T. L. Peele (*J. comp. Neurol.*, 1942, 77, 693—737).—The cytoarchitecture and fibre connexions of the parietal areas were studied in 9 macaque monkeys. The boundaries are similar to those determined by Brodmann in *Cercopithecus*. A detailed description is given of the projection fibres from the various parietal sub-divisions and the significance of the projection system is discussed, a mechanism of sensitisation of sensory neurons being proposed for it. J. D. B.

Neuro-psychiatric manifestations of vitamin deficiencies.—See A., 1943, III, 574.

Disturbances in lipid metabolism and central nervous system.—See A., 1943, III, 579.

Measurement of depth of anaesthesia by studying the lingual-maxillary reflex. Convulsions [in children] during general anaesthesia.—See A., 1943, III, 587.

Conditioned reflex treatment of chronic alcoholism.—See A., 1943, III, 590.

Action on central nervous system of gonadal hormones tested with galvanic current. F. K. Köllensperger (*Biochem. Z.*, 1940, 304, 90—104).—Reversible phenomena are observed when a galvanic current is passed along the central nervous system of the frog; with the head to the anode there is narcosis, whilst with the head to the cathode there is a generalised tonal muscle cramp. Narcotics, hypnotics, and sedatives which act centrally have a synergistic effect on the narcotic effect, and the more effective is the drug the smaller is the current required to produce the reaction. Drugs which stimulate

the central nervous system increase the threshold of galvanic narcosis and decrease it for cramp. After injection of 2—5 mg. per kg. of a gonadal hormone, there is an immediate decrease in the narcosis threshold for up to 2 hr. This effect is independent of the hormone and of the sex of the frog, and the same effect is observed after injection of cholesterol. After such treatment a permanent effect gradually sets in, and a stronger current must be applied to produce galvanic narcosis in a frog which has had previous hormone treatment. Although the effect of gonadal hormones appears to be the same as that of drugs which have a paralysing effect on the central nervous system, they are not identical, for gonadal hormones only lower the threshold for galvanic narcosis without affecting that for cramp, whilst paralysing drugs in addition increase the threshold for galvanic cramp, and stimulating drugs increase the threshold for narcosis and decrease it for cramp. J. N. A.

Metabolism in perfused dog's head during sodium pentobarbital depression and metrazol stimulation. C. A. Handley, H. M. Sweeney, and B. T. Brookman (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 670—672).—Na pentobarbital causes a decreased utilisation of O₂ and glucose. On administration of metrazol utilisation returns to normal or beyond. V. J. W.

Action of diphenyloxalidinedione in brain respiration at varied temperature levels.—See A., 1943, III, 590.

Experiments with insulin shock therapy. A. Friedemann (*Schweiz. med. Wschr.*, 1942, 72, 916—920).—The total insulin dose required to produce coma can be considerably reduced (max. dose in men 120 units, in women 60) when 0.1—0.3 g. of a barbiturate is given simultaneously. Efforts to terminate the coma with large doses of coramin, pervitin, ascorbic acid, or aneurin were unsuccessful. To economise insulin in successive hypoglycæmic shocks the amount of sugar to terminate the coma is reduced to 40—100 g. of glucose in 100—250 c.c. of water intragastrically or per rectum. Short-lived awakening was obtained with intragastric administration of a 5% solution of 10—30 g. of pectin or 10 g. of gum acacia. Satisfactory results were obtained with 5—50 g. of lactose in 10—20% solution. A. S.

Effect of electric convulsive therapy on memory. J. Zubin and S. E. Barrera (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 596—597).—Memory of word-associations, specially learned for the purpose, is impaired by convulsive shock. Impairment is more marked for associations learnt on the same than for those learnt on the previous day. V. J. W.

Review of drastic shock therapies in treatment of psychoses. F. Ebaugh (*Ann. int. Med.*, 1943, 18, 279—296).—Technique, indications, contraindications, symptoms, and therapeutic success of insulin, metrazol, and electrical shock therapy in psychoses are reviewed. Insulin shock is the treatment of choice in schizophrenic conditions. Metrazol and electrical shock therapy have favourable results in affective disorders. Intravenous premedication with curare (10 mg. per 10 kg. body wt.) is recommended in metrazol and electrical shock cases. A. S.

Tuberous sclerosis with epilepsy. C. K. Good and J. Garb (*Arch. Dermat. Syphilol.*, 1943, 47, 197—215).—A patient with multiple symmetric naevi of face with tuberous sclerosis, epilepsy, and fibroma of the scalp is described. The father and 3 sisters had abnormal e.c.g. records. Serum-lipins were normal. C. A. K.

Newer knowledge of epilepsy. W. G. Lennox (*Ann. int. Med.*, 1943, 18, 145—153).—Electroencephalographic studies were made in 44 monozygotic and 12 dizygotic twins who were not subject to seizures and had not suffered from brain injuries. The records of similar twins are indistinguishable, those of dissimilar twins are unlike. 52% of the tracings obtained from 312 members of the epileptics' immediate family were abnormal, 11% doubtful, and 37% normal, showing a 20 times higher incidence of dysrhythmia in epileptic families than in the normal population. In 88 families, both parents of epileptics were tested; in only 9% were the records of both parents normal, in 27% both parents showed dysrhythmia. A. S.

Dilantin sodium and phenobarbital in [Negro] epileptics.—See A., 1943, III, 588.

Blood-guanidine level in migraine subjects. H. D. Palmer, D. B. Scott, and K. A. C. Elliott (*J. Lab. clin. Med.*, 1943, 28, 735—737).—No change was found in the concn. of guanidine derivatives in the blood of migraine patients previous to or during attacks, or in epileptics. C. J. C. B.

Reticulocytosis following ablation of frontal cerebral cortex. F. A. Mettler (*Arch. Surg., Chicago*, 1943, 46, 572—574).—In dogs an increase in reticulocytes of 3.8—7.1% followed removal of the frontal cerebral cortex but not other cortical operations. The reticulocytosis was not due to injury of subcortical nuclear areas or hæmoconcn. It was closely followed by a rise in gastric acidity (cf. Combs *et al.*, *Anat. Rec.*, 1936, 64, 9), suggesting a common cause. F. S.

Pathological states in dementia præcox as revealed in fatal case of picrotoxin medication. W. S. Davidson and O. Latham (*Med. J. Austral.*, 1943, I, 245—248).—Report of a case in which there were perivascular glioses, capillary obliterations, and olive glioses in the medulla. (4 photomicrographs.) F. S.

Physiological principles in head injury treatment. H. v. Briesen (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 284—293).—Discussion. P. C. W.

Personality structure and prognosis of alcohol addiction: a Rorschach study. O. Billig and D. J. Sullivan (*Quart. J. Stud. Alcohol*, 1942, 3, 554—573).—Analysis and discussion of 40 cases submitted to the Rorschach test. P. C. W.

Study of personalities of 289 abnormal drinkers. W. Fleeson and E. F. Gildea (*Quart. J. Stud. Alcohol*, 1942, 3, 409—432). P. C. W.

Amaurotic family idiocy. Neural mechanisms of vision.—See A., 1943, III, 554.

Lid retraction in toxic diffuse goitre.—See A., 1943, III, 553.

Number conception in fowls. H. Honigmann (*J. Exp. Biol.*, 1942, 19, 141—157).—Fowls were trained to peck every second grain from a row, even when the distances between the grains were unequal. G. P. W.

Injection of heavy water into cerebrospinal fluid space. K. Stern and T. E. Dancy (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 619—620).—Replacement of 2—22 c.c. of c.s.f. by physiological saline made up with D₂O caused no symptomatic change in 2 patients, but produced an increase in cells in the c.s.f., the cells at first being polymorphonuclear but lymphocytic after 2 days. V. J. W.

Psycho-galvanic reflex as autonomic test. W. Nagel (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 40—41). A. S.

Afferent nerves in walls of blood vessels. A. Fleisch and P. Weger (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 11—12).—Muscle contractions produced by electrical stimulation of the motor nerve in a dog's ischaemic isolated hind leg, connected to the body only via blood vessels (all cerebrospinal nerves are cut), elicit changes in systemic blood pressure, heart rate, and respiration. A. S.

Synaptic potentials and transmission in sympathetic ganglia. J. C. Eccles (*J. Physiol.*, 1943, 101, 465—483).—The stellate ganglion of the artificially respired cat under nembutal was used. Of the recording leads, the grid lead was from the cut end of a cardiac nerve, the earth lead from the conical projection giving rise to the cardiac nerves; it was just distal to the sharp boundary between ganglion cells and cardiac nerve. Curare blocks transmission, abolishing spikes, but a preganglionic volley sets up a "synaptic potential" which spreads decrementally along the postganglionic fibres, halving in about 1.2 mm. The cells are negative to the axons. It reaches a max. in 10—20 m-sec., decaying exponentially with successive half times of 40—60 m-sec. It is itself depressed by curare, and at a stage of curarisation at which spikes have just disappeared it is about 12% of spike height (this varies with the anatomical relations of the ganglion cells to the origin of nerve). It resembles a catelectronic potential, and is analogous to the end-plate potential of curarised muscle. The potentials of two preganglionic volleys sum, and the summed potential may initiate an impulse, though an accommodation-like process raises the threshold. This is very apparent with repetitive stimuli, when the spikes at first rising from a high summed potential soon cease to appear. Analysis of the potentials is compatible with the existence of a depolarising agent or synaptic transmitter, which has a brief intense action followed by a prolonged lesser action. A single agent subject to quick and slow processes of removal is more probable than two agents; its nature is not yet established. The evidence previously adduced for a "detonator response" can be reconciled with this conception. W. H. N.

Synthesis of acetylcholine in sympathetic ganglia and cholinergic nerves. W. Feldberg (*J. Physiol.*, 1943, 101, 432—445).—A synthesis of acetylcholine is made by incubated chopped sympathetic ganglia and cholinergic nerves (cat and sheep), but is impaired by too fine subdivision, e.g., grinding, and does not take place if the nerves (or in the ganglion, nerve-endings) have degenerated following section 48 hr. previously. Synthesis is not observed in sensory roots. The release of acetylcholine from tissue into extractive, after chopping, is an immediate stimulus to production, which seems aimed at restoring the original concn. in the tissue itself. The ganglionic content of acetylcholine depends on preganglionic nerve-endings which, it is calc., must carry a higher concn. than the rest of the preganglionic nerve. W. H. N.

Effect of nicotine on uterine responses to hypogastric nerve stimulation. D. Sheehan and J. S. Labate (*Amer. J. Physiol.*, 1942, 137, 456—458).—In the uterus of the monkey and of the bitch, nicotine (monkey 10 mg. intra-peritoneally, bitch 20 mg.) abolished the motor effect of hypogastric nerve stimulation. The inhibitory phase in the monkey was not affected by nicotine. The hypogastric nerves in the monkey contain preganglionic motor fibres and post-

ganglionic inhibitory fibres to the uterine musculature, in the bitch preganglionic motor fibres. M. W. G.

Changes in choline-esterase activity of superior cervical ganglion after section of preganglionic fibres. R. Croxatto, F. Huidobro, and J. V. Luco (*Anal. Acad. Biol. Univ. Chile*, 1940, 3, 7—10).—The choline-esterase activity of the superior cervical ganglion of cats is decreased by 40—60% 24—71 hr. after section of the preganglionic fibres. Later the choline-esterase activity remains const., being 20—40% below normal. I. C.

Choline-esterase activity during nervous stimulation. R. Croxatto, F. Huidobro, H. Salvestrini, J. V. Luco (*Anal. Acad. Biol. Univ. Chile*, 1940, 3, 11—14).—After stimulation of the sciatic and vagus of the cat *in vitro* in serum, there is no change in the choline-esterase activity of the serum. After stimulation of the post-ganglionic cholinergic fibres to the iris, the aqueous humour has, as before stimulation, no choline-esterase activity. After stimulation of the preganglionic fibres to the superior cervical ganglion, the choline-esterase activity of the latter is unaltered. I. C.

Action of pentamethylenetetrazole on superior cervical ganglion. H. Croxatto and O. Alonso (*Anal. Acad. Biol. Univ. Chile*, 1940, 3, 41—46).—In cats under dial (0.75 g. per kg., intraperitoneally) pentamethylenetetrazole (10—20 mg.) injected 5—30 sec. before, or during, electrical stimulation of the preganglionic fibres of the superior cervical ganglion or before intracarotid injection of 20—100 µg. of acetylcholine, annuls the contraction of the nictitating membrane. Pentamethylenetetrazole acts by depressing the ganglion. I. C.

Action of pentamethylenetetrazole on neuro-muscular synapses. H. Salvestrini, H. Croxatto, and O. Alonso (*Anal. Acad. Biol. Univ. Chile*, 1940, 3, 47—54).—In cats under dial or chloral + morphine, or decerebrated, pentamethylenetetrazole (10—20 mg.) has a short depressant action on the contraction of muscles stimulated indirectly by tetanising currents or by condenser discharges, and on muscle twitches produced by intra-arterial injection of acetylcholine. The depressant effect does not occur when denervated muscles are stimulated directly. I. C.

Action of pentamethylenetetrazole on crossed extensor reflex in frogs. J. Sepulveda and H. Croxatto (*Anal. Acad. Biol. Univ. Chile*, 1940, 3, 55—67).—Pentamethylenetetrazole potentiates the crossed extensor reflex in *Bufo gay*, and increases the excitability of the spinal cord in frogs during spinal shock. I. C.

X.—SENSE ORGANS.

Effects of bilateral optic enucleation on voluntary muscular activity of albino rat. L. G. Browman (*J. exp. Zool.*, 1942, 91, 331—344).—Eyeballs were removed from rats, of a 16-generation brother-sister inbred line, during their first day of life. The animals, and suitable controls, were placed in individual voluntary work-registering cages of the revolving drum type. A comparison of the activity records of the controls with those of the blinded animals leads to the conclusion that visible light acting on the albino rat with an intact optic mechanism exerts an inhibitory effect on voluntary muscular activity and that it does so by way of the retina. J. D. B.

Recessive sex-coupled nystagmus in four generations. O. Kaser (*Schweiz. med. Wschr.*, 1942, 72, 846—850).—13 male members of a family of 121 suffered from nystagmus. In addition, 3 male and 3 female subjects showed nystagmus in the end position. In 3 cases, there was a combination of nystagmus and uncontrollable head shaking. A. S.

Ochronosis of sclera and cornea with alkaptonuria. J. W. Smith (*J. Amer. Med. Assoc.*, 1942, 120, 1282—1288).—4 cases are reported and the literature is reviewed. C. A. K.

Grafts of cornea in rabbits. M. Ossandon (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 32—42).—Rabbit corneal tissue was grafted onto the corneas of other rabbits. A few days later, the graft had lost the anterior epithelial layer, was oedematous and infiltrated with leucocytes and vascularised; some corneal cells were necrotic and sensitivity was lost. Between the 10th and 36th day after the operation the corneal epithelium of the host spread and completely covered the graft and oedema disappeared; the newly formed vessels persisted and sensitivity was restored within 60 days. I. C.

Protein content of rabbit's aqueous humour following intravenous injection of *E. coli* toxin. C. Ayo and K. Meyer (*Proc. Soc. Exp. Biol. Med.*, 1942, 51, 130—132).—Culture filtrates of Gram-negative micro-organisms capable of producing the Schwartzman phenomenon produce in rabbits a primary reaction, characterised by irido-conjunctival hyperæmia and, on removal, coagulation of the aqueous humour. Intravenous injection of coli toxin produced a rise in protein content of the aqueous humour. Above 600 mg.-% protein the humour coagulated. The protein content of the secondary aqueous of toxin-treated animals was higher than that of normal

controls. A previous dose of coli toxin partially or completely prevented a rise in the protein content after the second injection.

P. G.

Return of vision after repeated transplantation of adult salamander eye. L. S. Stone and T. E. Farthing (*J. exp. Zool.*, 1942, **91**, 265—285).—In 177 operations adult *Triturus viridescens* eyes were grafted 1—4 times either by reimplantation or by transplanting to a new host. In most cases the eye regenerated the retina, lens, and optic nerve which degenerated after each operation. Following several operations (up to 4 in no.) 94 eyes showed return of vision. Failure of vision in a graft did not prevent its return when the eye was subsequently transplanted to new hosts.

J. D. B.

Ophthalmoscope in clinical medicine. A. M. Ramsay (*Brit. Med. J.*, 1943, **1**, 685—688).—A review emphasising the val. of ophthalmoscopic observations in general medicine.

I. C.

Comparative study of oxygen consumption of vertebrate retina, with special reference to nucleo-protoplasmic ratio. V. F. Lindeman (*Amer. J. Physiol.*, 1942, **139**, 9—16).—To study the respiratory activity of nerve cells in the retina of vertebrates, cytological measurements and O_2 consumption determinations were carried out on the following vertebrate retina: sucker, chub, shiner, frog, *Necturus*, toad, snake, tortoise, and alligator. The cell population of the different retinas was found to vary from 72,900 per mg. in *Necturus* to 925,000 per mg. in the shiner, with a good range of distribution between these extremes. The ratio of nucleus to protoplasm was approx. 1:10 in all cases, except in *Necturus*, alligator, and tortoise. No apparent correlation seemed to exist between the nucleo-protoplasmic ratios and the mean rate of O_2 consumption of the various retinas. This was interpreted to indicate that the whole protoplasmic mass contributed equally to the total metabolism of the cells.

P. G.

Case of right and left glioma retinae. G. Badir (*Bull. Ophthal. Soc. Egypt*, 1940, **33**, 94—98).—Description of a case in a boy of 10. The diagnosis was confirmed histologically for the left eye.

A. GL.

Case of left glioma of retina. M. Zaki (*Bull. Ophthal. Soc. Egypt*, 1940, **33**, 99—101).—Description of case in a girl aged 3.

A. GL.

Retinal pigment distribution in relation to a diurnal rhythm in compound eye of *Dytiscus*. T. L. Jahn and V. J. Wulff (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 656—660).—Retinal pigment distribution is correlated with light and dark adaptation, and is not dependent on the day phase and night phase changes which occur independently of darkness and illumination.

V. J. W.

Influence of visual diurnal rhythm on flicker response contours of *Dytiscus*. T. L. Jahn and V. J. Wulff (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 660—665).—The fusion threshold of electric responses to flicker at an intensity of 10,000 ft.-candles is at 60 c.p.s. during the day phase and 40 c.p.s. during the night phase. At min. light intensity threshold frequencies are much lower and the night phase threshold frequency slightly exceeds that of the day phase.

V. J. W.

Mechanism of temporal fusion effect of photic stimulation on electrical activity of visual structures. A. E. Walker, J. J. Woolf, W. C. Halstead, and T. J. Case (*J. Neurophysiol.*, 1943, **6**, 213—219).—In order to explain the fact that the resolving power in space of the mammalian visual system is high, but the resolving power in time is relatively low, the authors suggest that the primary phenomena of fusion are dependent on the max. rate at which the slowest element in the visual system can be reactivated from the periphery. This hypothesis permits an experimental approach but does not exclude the possibility of secondary mechanisms such as may be required to account for the phenomenon of flicker constancy. In experiments on *Macaca mulatta* it was found that at an intensity of 10 f.c. the optic nerve and the lateral geniculate body could be driven at a max. rate of 62 c.p.s. and 59 c.p.s. respectively. This rate is well above the max. crit. fusion frequency for man and probably also for the monkey. The striate cortex could be driven by intermittent photic stimulation at a max. rate of 34 c.p.s. A driving effect from the tectum mesencephali and from the optic radiation, but no determination of the max. rate, could be obtained. The findings indicate a fusion mechanism within the cortex which limits the resolving power in time of the primate visual system.

P. G.

Colour technique in industry. F. Birren (*Sight Saving Rev.*, 1943, **13**, 3—11).—Suggestions for the use of complementary colours rather than light and dark contrast to improve the visibility of a task, e.g., the painting of machinery tan as a contrast to steel or the use of blue to improve the visibility of brass and Cu. It is also suggested that yellow should be more extensively used as a danger signal because of the high sensitivity of the eye to this colour.

K. T.

Colour blindness. Anon. (*J. Amer. Med. Assoc.*, 1943, **122**, 377).—Referring to an alleged cure for colour blindness, devised by I. H. Lepper, an optometrist, it is emphasised that this method only teaches men to pass the particular colour vision test used by govern-

mental authorities and that the use of the word "cure" in relation to colour blindness should be avoided in this case.

P. G.

Effect of 180° rotation of the retinal field on visuomotor co-ordination. R. W. Sperry (*J. exp. Zool.*, 1943, **92**, 263—279).—The rotation of the retinal field (one or both eyes in 29 newts) resulted in a complete inversion and reversal of visual perception clearly manifest in erroneous reactions and various abnormal performances directly correlated with retinal rotation. It also produced a dorsoventral reversal in chromatophoric adaptation mediated through the eyes. The results persisted in all cases without any sign of inhibition or correction by central nervous reintegration. The results demonstrate an unadaptable rigidity of central nervous co-ordination mechanisms in the visuomotor system of urodeles comparable to the unadaptability of spinal organisation found in amphibians and rats.

J. D. B.

Nutritional degeneration of optic nerve in rats: relation to trypanamide amblyopia. W. McDermott, B. Webster, R. Baker, J. Lockhart, and R. Tompsett (*J. Pharm. Exp. Ther.*, 1943, **77**, 24—39).—Rats were maintained on synthetic diets with deficiency of vitamin-A, as well as of several components of the -B complex. These animals showed degeneration of the optic nerve, which was intensified by the concurrent administration of trypanamide. Rats on the same diet supplemented either with brewer's yeast or with all the available -B components together (thiamin, riboflavin, nicotinic acid, pyridoxine, Ca pantothenate, and choline) showed no optic nerve degeneration, whether or not they had received trypanamide. The deficiency responsible for the nerve atrophy was attributed to one or more of the known -B complex members of the -B complex, but not to pantothenic acid alone. Similar optic nerve lesions developed in other rats on the same diet with a deficiency of -A. In this case trypanamide did not increase the lesion, but it produced similar nerve degeneration in those animals on a low -A intake, though they showed no other signs of this deficiency. Those animals receiving adequate amounts of -A and -B complex showed no optic nerve changes with or without the trypanamide injections.

H. C. S.

Prevention of ear disability in industry. (Report of use of plastic mould.) D. A. McCoy (*J. Amer. Med. Assoc.*, 1943, **121**, 1330—1331).—A plastic ear mould was constructed as an ear stopper which not only eliminated intensive noise and stopped the entrance of foreign bodies, but is also said to be acceptable to the worker for long and repeated periods.

P. G.

Histopathologic considerations in treatment of Eustachian tube. J. B. Farrior (*Arch. Otolaryngol.*, 1943, **37**, 609—621).—The histological changes occurring in the Eustachian tube as a result of inflammation are described and illustrated by photomicrographs of material from 100 autopsies. The relation between inflammation of the Eustachian tube and middle ear disease is discussed and methods of treatment are suggested.

K. T.

Stapes, fissa antefenestrum, and associated structures in man. IV. From fetuses 75—150 mm. in length. B. J. Anson and E. W. Cauldwell (*Arch. Otolaryngol.*, 1943, **37**, 650—671).—A further description of the development of the stapedia region of the human middle ear, based on sections and reconstructions of some 22 foetal specimens, filling in a gap not covered in detail in earlier papers (cf. A., 1943, III, 287).

K. T.

Experiments on conduction of sound through cavity of middle ear. H. G. Kobrak (*Arch. Otolaryngol.*, 1943, **37**, 796—801).—Animal experiments are described which were designed to demonstrate that, although under most circumstances sound is conducted through the middle ear by means of the ossicular chain, "aërocochlear conduction," i.e., conduction through the air of the middle ear cavity, can occur.

K. T.

Lesions of conduction apparatus [ear]. H. B. Perlman (*Arch. Otolaryngol.*, 1943, **37**, 680—690).—An account and explanation of some of the cases in which the audiogram of a defective middle ear can be related to the actual lesion: thus, increase of the mass and resistance of the conducting mechanism (drum and ossicular chain) without alteration of tension such as is produced by fluid against the drum either in the external canal or in the middle ear (pus) causes loss of sensitivity to high frequencies first, while an increase in tension (stiffness) without change in mass or damping as when there is inequality of pressure across the drum will first affect the low frequencies. Any interference with the continuity of the ossicular chain depresses the sensitivity to all frequencies. No satisfactory explanation has yet been found for the special auditory sensitivity to tones between 1000 and 3000 c.p.s.

K. T.

Factors involved in development of otosclerosis. O. Benesi (*Laryngoscope*, 1943, **53**, 343—346).—It is suggested that otosclerosis may be due to the survival of the blood vessels of the cartilaginous zone of the otic capsule which are normally obliterated during development. Such a survival of these vessels might well lead to ossification in later life, a process which is envisaged as being slow at first but liable to acceleration by conditions such as puberty, pregnancy, and diseases accompanied by high temp. or disturbed metabolism.

K. T.

Prevention of traumatic deafness. W. H. Wilson (*Arch. Otolaryngol.*, 1943, **37**, 757—767).—Of 85 army recruits tested for auditory fatigue after being subjected to a fatiguing tone of 256 c.p.s. at 80 db. intensity for 5—8 min., 27 showed a rise in threshold. Of these 27, 21 showed a definite hearing loss on returning from the firing range where they had spent 2—3 days on a basic rifle and pistol training. These results indicate that people specially liable to an irreversible loss of hearing due to acoustic trauma can be detected because they show an abnormal degree of auditory fatigue. It was found that men suffering from middle ear disease were more susceptible to acoustic trauma than those with normal ears.

K. T.

Chronic progressive deafness, including otosclerosis and diseases of inner ear. G. E. Shambaugh and F. Wojniak (*Arch. Otolaryngol.*, 1943, **37**, 856—881).—A review of the literature for 1941 dealing particularly with acoustic trauma, the use of prostigmine in the treatment of deafness, and the fenestration operation.

K. T.

Treatment of tinnitus with prostigmine. F. Ysander (*Schweiz. med. Wschr.*, 1942, **72**, 793—794).—Satisfactory results were obtained with 10 injections of 0.5 mg. of prostigmine at 3—4 days' interval, followed by 3 tablets per day by mouth for several weeks.

A. S.

Incidence and permanence of tonal dips in children. W. E. Loch (*Laryngoscope*, 1943, **53**, 347—356).—When 1365 school children, 8—14 years of age, were examined with a Western Electric Co. 1-A audiometer it was found that tonal dips occur about three times as often in boys as in girls, that older children show more dips than younger ones, and that half of all the dips were for a tone of 4096 c.p.s. 493 of these children had their thresholds measured repeatedly over a period of 2 years and it was found that, although 40% of the dips were permanent, some were recurrent and some temporary (*i.e.*, only appeared once). Persistent dips were found most often at 4096 c.p.s. and temporary ones at 1031 c.p.s. Dips at 1031 c.p.s. showed the greatest increase with age for both sexes. No correlation between the presence of tonal dips and the following conditions could be established: tonsillectomy and adenoidectomy, past otitis media, frequent colds, abnormal appearance of the tympanum, condition of the nasopharynx, or season of the year.

K. T.

Audiogram interpretation and fitting of hearing aids. E. P. Fowler, jun. (*Proc. Roy. Soc. Med.*, 1943, **36**, 391—398).—Several technical details in the construction of audiometers are given, and different methods of evaluating the capacity for hearing speech are suggested (*e.g.*, the interpolation of the threshold audiogram for speech). It is emphasised that it is better to recommend a lip-reading teacher before recommending a hearing aid. The physician ought always to make plaster casts of the external auditory meatus, since these are so essential for the efficiency of the modern air conduction hearing aid.

P. G.

Diaphragm-rod prosthesis for middle ear. A. G. Pohlman (*Arch. Otolaryngol.*, 1943, **37**, 628—644).—A hearing aid, consisting of a diaphragm which vibrates to sound connected to a rod which makes contact with the inner ossicle or the round window, was found to be of great help in cases where the drum and outer ossicles had been lost or removed with a resultant conduction deafness. The sensitivity for low tones was not much improved but that for the important speech frequencies from 512 to 4096 c.p.s. might be increased by as much as 10 db. The conditions under which this type of hearing aid is a success are thought to demonstrate that all frequencies are conducted through the middle ear by the ossicular chain.

K. T.

Discharges from vestibular receptors in cat. E. D. Adrian (*J. Physiol.*, 1943, **101**, 389—407).—Decerebrate or anaesthetised cats immobilised on a platform suspended to swing in any direction have yielded the first mammalian records of nerve impulses from directed movements of the labyrinths. Difficulties of approach were surmounted by leading from the exposed floor of the IVth ventricle. The part of the labyrinth stimulated was inferred from the direction of the movement and analogy with the frog, where the origin of the sets of fibres responding to given movements is known. Gravity receptors signal both posture of the head (downward tilt to the same side) and linear accelerations having the same action (movement away from side recorded). Rotation receptors, studied by a turntable, signal angular accelerations, and the duration of after-effects when rotation is stopped is of the same order as that of post-rotatory nystagmus in man. The planes of rotation most effective for the different units correspond with those of the 3 canals. All responses are consistent with the structure of the sense organs and the reactions of the intact animal. The response of gravity receptors increases with deviation of posture from normal and with degree of linear acceleration; both saccular and utricular maculae are probably involved. Adaptation is slow. Responses to vibration have not been found. The response to brief rapid rotation corresponds closely with the actual movement. In prolonged steady rotation the initial deflexion of the cupula is envisaged as being lost, the cupula returning during the rotation to its resting position. It is therefore moved in the opposite sense when rotation stops, yielding impulses which signal an illusory movement in the opposite direction. Most rotation receptors give a resting discharge which is

increased or abolished according to the direction of the onset of rotation (or cessation of a steady rotation). The canals differ in whether a positive response corresponds with an ampulla-leading or an ampulla-trailing movement of the canal.

W. H. N.

Periodicity in development of threshold of tactile stimulation in *Amblystoma*. G. E. Coghill and R. W. Watkins (*J. comp. Neurol.*, 1943, **78**, 91—111).—The results of studies on the development of amphibian pattern of behaviour and the related bodily structure are given. In *Amblystoma* a pronounced periodicity in the development of sensitivity to light touch is present until the min. threshold is reached. Although the min. threshold may be reached at different times for different regions, there is for some regions a near approach to synchrony in the major fluctuations in tactile sensitivity. In the fluctuations of sensitivity in numerous individuals of the same age there is a pronounced synchrony when the periods are calc. from the time of fertilisation of the eggs. The synchrony is less marked when the time is calc. for each individual from the beginning of sensitivity. A periodicity in the development of *Amblystoma* may be the primary factor in the activities and sleep of these animals generally.

P. G.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Hormonal equilibrium. I. Abelin (*Schweiz. med. Wschr.*, 1942, **72**, 788—792).—The relationships between insulin and adrenaline, insulin and anterior pituitary secretion, insulin and cortin, and thyroxine and cortin are discussed.

A. S.

Endocrines and calcium metabolism. L. Gunther (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 304—309).—A review.

P. C. W.

Voice and speech of cretins. R. Luchsinger (*Schweiz. med. Wschr.*, 1942, **72**, 811—817).—17 cretins showed inner ear deafness and hypoplasia of the larynx.

A. S.

Calcium metabolism in thyroid disease. I. D. Puppel, K. P. Klassen, and G. M. Curtis (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 374—399).—3 normal persons maintained on a low Ca intake (913 mg. per 3-day period) for 30 days showed a negative Ca balance (231 mg. per 3-day period). 2 cases of non-toxic nodular goitre on a similar intake showed a negative balance within normal limits. 4 patients with exophthalmic goitre given 1771 mg. per 3-day period had an increased negative balance up to 7—8 times the normal with enhanced urinary and faecal excretion. Increased Ca feeding in hyperthyroid cases resulted in a Ca retention up to 10 times the normal retention with such increased intake and a positive Ca balance could be attained by giving sufficient Ca in the diet. Adequate thyroidectomy caused the Ca balance to return to normal vals. 2 cases of toxic nodular goitre had only slightly increased Ca excretion; the excretion in exophthalmic goitre was much greater though the basal metabolic rates may be the same. A patient with incipient exophthalmic goitre showed a temporary decrease in basal metabolic rate during I therapy and a concomitant decrease in Ca excretion.

P. C. W.

Furunculosis [use of thyroid]. B. Barnes (*J. Clin. Endocrinol.*, 1943, **3**, 243—244).—16 cases of furunculosis showed subnormal metabolic rate or body temp. Further lesions did not appear after thyroid therapy.

P. C. W.

Metabolic disturbances following thyroidectomy. C. A. Nafe (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 253—260).—Analysis and discussion of results in 300 cases.

P. C. W.

Disturbance of carbohydrate metabolism in hyperthyroidism. H. J. John (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 313—316).—Carbohydrate metabolism is disturbed in 7% of hyperthyroid cases. In 50 cases with glycosuria, the glucose-tolerance curve was abnormal in 43, and only improved in 16% followed after subtotal thyroidectomy. There was some improvement in the diabetic condition in 55% of 166 patients with thyrotoxicosis and diabetes after thyroidectomy; none of the cases showed cure of the diabetes.

P. C. W.

Evaluation of blood test for galactose tolerance [of liver efficiency] in diagnosis of hyperthyroidism. N. G. Schneberg, W. B. Likoff, and D. R. Meranze (*Arch. Surg., Chicago*, 1943, **46**, 581—588).—A review.

F. S.

Function of thyroid in maintaining heat production. G. C. Ring (*Amer. J. Physiol.*, 1942, **137**, 582—588).—O₂ consumptions of rats were determined before and after injections of adrenaline in gelatin. The basal metabolic rate (which is a function of the amount of thyroid hormone in the body) increases after adrenaline to a degree increasing with the amount of thyroid hormone present in the body. After prolonged exposure to cold the calorogenic effect of adrenaline in rats is about as much as would be expected from the elevation in basal metabolism, but becomes normal if extra NaI is given.

T. F. D.

Intracellular colloid in initial stages of thyroid activation. E. De Robertis (*Anat. Rec.*, 1942, **84**, 125—135).—Rats were injected intraperitoneally with graded doses of thyrotropic factor of the pituitary gland. The thyroid cells first produce a large quantity

of intracellular colloid which is secreted toward the follicular lumen. Later, colloid is secreted towards the base and reabsorption of the intrafollicular colloid occurs. The method described is sensitive and quick, and can be used in the assay of the thyrotropic factor.

W. F. H.

Lid retraction in toxic diffuse goitre.—See A., 1943, III, 553.

Calcinosis and scleroderma and parathyroidectomy. C. S. Byron and S. Michalover (*Ann. int. Med.*, 1943, **18**, 225—232).—A case is reported of universal calcinosis, scleroderma and sclerodactylia, and muscle atrophy in a woman of 24 years with normal Ca metabolism and a negative P balance. Hemithyroidectomy and removal of 2 parathyroid glands were without effect on the Ca deposits.

A. S.

Hyperparathyroidism with normal blood chemistry. C. J. Baumgartner (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 324—327).—A case is reported with normal blood-Ca, slightly lowered blood- PO_4''' , raised blood-phosphatase, and marked decalcification of the bones. Following the removal of a parathyroid adenoma there was rapid recalcification of the bones.

P. C. W.

Islet of Langerhans tissue in Ammocoete larva. E. J. W. Barrington (*J. Exp. Biol.*, 1942, **19**, 45—55).—The "follicles of Langerhans," at the junction of fore and mid gut, respond to sugar injection by vacuolisation. Their destruction raises the blood-sugar. Histologically, they do not decisively resemble islet cells.

G. P. W.

Insulin content of extemporaneous mixtures of insulin and protamine zinc insulin. F. B. Peck (*Ann. int. Med.*, 1943, **18**, 177—181).—Two tables are given to show the approx. insulin concn. in mixtures of insulin and protamine Zn insulin which were prepared to suit individual requirements of diabetic patients.

A. S.

Intestinal absorption of insulin. E. Frommel, A. Bischler, R. Dobrick, and J. Piquet (*Verh. Ver. Schweiz. Physiol.*, 1940, **17**, 14—15).—Insulin was directly injected into the stomach and into different parts of the intestines in rabbits; it is absorbed from the lower parts of the duodenum and the small intestines, as shown by hypoglycaemia.

A. S.

Effect of insulin on pyruvic acid formation in depancreatised dogs. E. Bueding, J. F. Fazekas, H. Herrlich, and H. E. Himwich (*J. Biol. Chem.*, 1943, **148**, 97—104).—In contrast to normal animals, intravenous injection of glucose (2 g. per kg.) into depancreatised dogs does not increase blood-pyruvate unless the blood-sugar is raised to 0.7—1.0% by continuous infusion, when a moderate elevation occurs, which is further increased by insulin. When insulin is administered together with or shortly after the glucose, a marked rise in pyruvate occurs and a second rise follows a further injection of glucose alone 4 hr. later. The presence of insulin in normal or excessive amounts does not affect the rate of disappearance of injected pyruvic acid from the blood and even in large doses in absence of glucose produces no increase in normal or diabetic subjects.

H. G. R.

Pulmonary ventilation and adrenaline action. G. W. Stayraky (*Amer. J. Physiol.*, 1942, **137**, 485—491).—In spinal cats, hypo- and hyper-ventilation, bleeding, histamine, adrenalectomy, damage to the spinal cord, or bilateral removal of the sympathetic chain results in reduction of sensitivity to small doses of adrenaline. Prolonged hyperventilation or destruction of the spinal cord abolishes the effects of changes in ventilation on the action of the small doses of adrenaline.

T. F. D.

Effect of adrenaline on oxygen consumption of fish. D. C. Smith and S. A. Matthews (*Amer. J. Physiol.*, 1942, **137**, 533—538).—Intra-peritoneal injections of comparatively huge doses of adrenaline of the order of 1 mg. to 50—90-g. specimens of the teleost, *Girella nigricans*, produce depression in O_2 consumption which parallels changes in colour (excitement pallor).

T. F. D.

Mechanism of effect of adrenaline on bioluminescence of firefly. G. A. Emerson and M. J. Emerson (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 700—703).—Various amines were injected into fireflies. Adrenaline caused much longer and brighter luminescence than any other tried, and effects were parallel to sympathomimetic potency and not related to any single chemical group.

V. J. W.

Natural and synthetic inhibitors of choline-esterase [effect of products of adrenaline oxidation].—See A., 1943, III, 597.

Rôle of adrenal cortex in anoxia. G. W. Thorn, B. F. Jones, R. A. Lewis, E. R. Mitchell, and G. F. Koepf (*Amer. J. Physiol.*, 1942, **137**, 606—619).—Rats, rabbits, and dogs were exposed daily for several hr. to low barometric pressures corresponding to altitudes of up to 27,000 ft. Young male rats maintained a normal rate of growth at 18,000 ft. but failed to grow at 27,000 ft. Adrenalectomised rats did not tolerate exposures to low pressures unless treated with adrenal cortical hormone. Young male rabbits tolerated exposures to 18,000 ft. but did not tolerate 27,000 ft. Young male rats and rabbits showed reduced fasting levels of blood-sugar and liver-glycogen, increased hæmatocrit vals., and increased adrenal wt. Normal dogs subjected to pressures equiv. to 25,000 ft. soon developed anorexia and wt. loss. Adrenalectomised dogs maintained

× 4 (A., III.)

on deoxycorticosterone acetate did not tolerate such exposures. The great increase in the no. of red cells, hæmatocrit val., and O_2 capacity of the blood was the most striking change in normal dogs exposed to low pressure.

T. F. D.

Deoxycorticosterone as hormone of adrenal cortex. F. Verzář (*Verh. Ver. Schweiz. Physiol.*, 1941, **18**, 48—49).—Adrenalectomised cats can be maintained in full health with daily intramuscular injections of 1—2 mg. per kg. body wt. of deoxycorticosterone acetate.

A. S.

Estrogenic reaction in adrenal cortical carcinoma.—See A., 1943, III, 572.

Anti-insulin effect of deoxycorticosterone acetate. E. Peyser (*Verh. Ver. Schweiz. Physiol.*, 1941, **18**, 42—43).—Mice previously treated with repeated doses of 2 mg. of deoxycorticosterone acetate are more resistant to insulin.

A. S.

Decreased carbohydrate appetite of adrenalectomised rats. C. P. Richter (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 577—579).—Adrenalectomised rats have the same decreased appetite for solid glucose as for its 40% solution (A., 1941, III, 755).

V. J. W.

Solubility of muscle-protein in adrenalectomised and in hypophysectomised rats. R. Bucher (*Verh. Ver. Schweiz. Physiol.*, 1941, **18**, 19—21).—The fraction of muscle-proteins sol. in mixtures of Na_2HPO_4 and NaH_2PO_4 at const. pH is diminished after adrenalectomy and hypophysectomy. This diminution is more marked in red than in white muscle.

A. S.

Purpura fulminans (Waterhouse-Friderichsen syndrome). W. L. Rucks and J. J. Hobson (*J. Pediat.*, 1943, **22**, 226—232).—Report of a case with recovery; sulphathiazole and adrenal cortex extract were employed.

C. J. C. B.

Addison's disease in a seven-year-old boy. S. Rosin and S. Friedman (*J. Clin. Endocrinol.*, 1943, **3**, 137—140).—A case is reported.

P. C. W.

Cortical necrosis of the adrenal glands associated with Addison's disease. J. D. Duffin (*Arch. Path.*, 1943, **35**, 649—666).—8 cases of Addison's disease due to a non-tuberculous destructive process of the adrenal cortex are reported. In 6 cases the lesion was cortical destruction, with severe and widespread necrosis of the cortex in 4 cases and complete disappearance of cortical tissue in the other 2. In each, the adrenal medulla was well preserved but showed lymphocytic infiltration. In 2 cases no adrenal parenchymal tissue remained. The thyroid gland was atrophic, fibrosed, and infiltrated with lymphocytes. The pituitary gland in 3 of 4 cases examined showed a diffuse increase in the connective tissue of the anterior lobe and few basophil cells. The eosinophilic and chromophobe cells were also fewer. (9 photomicrographs.)

C. J. C. B.

Intrasternal bone marrow grafts of foetal organs in man; new method of adrenal cortex grafts in the treatment of Addison's disease. J. B. Thiersch (*Med. J. Austral.*, 1943, **1**, 249—251).—A report of two cases one of which was temporarily relieved by adrenal grafts from a full-term foetus dead for 12 hr. (2 photomicrographs.)

F. S.

Metabolic effects of testosterone propionate in Addison's disease. A. T. Kenyon, K. Knowlton, I. Sandiford, and L. Fricker (*J. Clin. Endocrinol.*, 1943, **3**, 131—136).—A man and a woman with Addison's disease maintained on NaCl and daily injections of deoxycorticosterone were given daily intramuscular injections of 25 mg. of testosterone propionate. Characteristic effects of androgen therapy such as depression of urinary N, inorg. PO_4''' , SO_4'' , Na, K, and creatine, with gain in body wt. and no alteration in basal metabolic rate, fasting R.Q., or serum-electrolyte concn. were observed. It is concluded that the adrenal cortex plays no part in the metabolic response of the organism to androgen.

P. C. W.

Preparation and comparative physiological activities of ox, pig, and sheep adrenal cortex extracts. M. H. Kuizenga, A. N. Wick, D. J. Ingle, J. W. Nelson, G. F. Cartland (*J. Biol. Chem.*, 1943, **147**, 561—565).—Ox and sheep adrenals were extracted as previously described (cf. A., 1937, III, 38); the extra fat in extracts of pig glands was decanted from the aq. acetone extract before evaporating the acetone. The extract from pig glands is more active than that from ox glands; this is attributed to the presence of sterols with O at C_{11} . Sheep-gland extract is intermediate.

R. L. E.

Case of Cushing's syndrome with adrenal cortical hyperplasia, without pituitary basophilic adenoma or hyperplasia. K. E. Paschkin, P. A. Herbut, A. E. Rakoff, and A. Cantarow (*J. Clin. Endocrinol.*, 1943, **3**, 212—217).—A case is reported with autopsy findings.

P. C. W.

Pituitary hormones and urine-nitrogen. W. Marx, D. B. Magy, M. E. Simpson, and H. M. Evans (*Amer. J. Physiol.*, 1942, **137**, 544—550).—Purified growth hormone or unfractionated pituitary extract produced a greater drop in the urine-N of normal "plateaued" female rats than any of the known pituitary hormones. Pituitary follicle- and interstitial cell-stimulating hormones, thyroxine, adrenal cortex extract, and protamine Zn insulin were without effect on urinary N excretion.

T. F. D.

Renal concentration test using solution of posterior pituitary.—See A., 1943, III, 567.

Reaction of orbital tissues in experimental exophthalmos following removal of Harder's gland. Retrobulbar tissues in experimental exophthalmos in guinea-pigs.—See A., 1943, III, 559.

Use of pitressin tannate in oil as hæmostatic agent in menorrhagia and metrorrhagia. R. C. Moehlig (*J. Clin. Endocrinol.*, 1943, 3, 184—185).—1—2 injections of 1 ml. of pitressin tannate were successful in the treatment of 16 cases of menorrhagia or metrorrhagia. P. C. W.

Pituitrin concentration test of renal function. N. G. Schneeberg, W. B. Likoff, and I. E. Rubin (*J. Lab. clin. Med.*, 1943, 28, 757—761).—The substitution of pituitrin (10 units) for the period of water deprivation used in the Fishberg test resulted in 90% correlation of the 2 tests (100 cases). Abs. failure of the test was encountered in only 4 cases. In 6 cases the pituitrin test reflected kidney function more accurately than the Fishberg test. C. J. C. B.

XII.—REPRODUCTION.

Physical changes in constituent parts of developing salmon eggs. Parthenogenetic stimulation of aged anuran eggs.—See A., 1943, III, 561.

Sex hormones and lymphomatosis in fowls.—See A., 1943, III, 570.

Sexual development in small and large types of swine. R. H. Phillips and J. H. Zeller (*Anat. Rec.*, 1943, 85, 387—400).—Animals of the Poland China breed were studied. Spermatozoa appear in seminiferous tubules at 20 weeks. The testes increased slightly in wt. between 10 and 17.5 weeks and grew rapidly between 17.5 and 20 weeks. In relation to body wt. the testes increased slowly in size up to a body wt. of 80—85 lb. Beyond this point testis wt. increases rapidly. No marked differences appeared in the rate of sexual development of males of the two types. In the female of the small type oestrus appeared at an average age of 207.8 days and an average wt. of 189.5 lb. For the large type the averages were 198.7 and 199.3, respectively. The findings indicate a lower level of sexual activity in the small type and also the possibility of a lower level of pituitary gland activity in this type. W. F. H.

"Silvering" and gonad development in fish. F. W. Landgrebe (*J. Exp. Biol.*, 1941, 18, 162—169).—"Silvering," a developmental change in pigment pattern, is independent of gonad development. In eels, pattern and gonads are not affected by injections of pregnancy urine, anterior lobe, or thyroid. In salmon, anterior lobe and thyroid produce "silvering" but do not affect the gonads. In brown trout, thyroid produces "silvering," anterior lobe does not, and neither affects the gonads. G. P. W.

Fate of corpora lutea and nature of corpora aberrantia in rhesus monkey. G. W. Corner (*Carnegie Inst. Wash., Contrib. to Embryol.*, 1942, 30, 85—96).—The history of the corpora lutea in the ovary of the rhesus monkey was followed by a method involving marking them with local C injections. Corpora lutea so marked have been followed by laparotomies in successive cycles. Retrogression of a standard type is characterised by gradual shrinkage of the corpus luteal cells, which acquire lipid granules. The corpus aberrans is recognised as an alternative mode of retrogression of the corpus luteum; the cells remain epithelioid for a long time without lipin infiltration. The corpus aberrans resembles the corpus luteum of pregnancy and persists possibly as long. W. J. H.

Lipin and pigment in corpus luteum of rhesus monkey.—See A., 1943, III, 544.

Vaginal smear technique. Its use in diagnosis of ovarian failure as index to efficacy of endocrine therapy and as human assay method. H. C. Mack (*J. Clin. Endocrinol.*, 1943, 3, 169—178).—A review. P. C. W.

Tuberculoïd reaction in ovarian dysgerminoma. E. L. Heller (*Arch. Path.*, 1943, 35, 674—680).—2 cases of ovarian dysgerminoma accompanied by an unusual tuberculoïd stromal reaction are reported. The epithelioid and giant cells are most likely inflammatory in character rather than neoplastic. (6 photomicrographs). C. J. C. B.

Zinc salts in utero-ovarian troubles. H. Vignes (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 320—323).—Brief analysis of 75 cases of menstrual irregularity, menorrhagia, or metrorrhagia treated with 0.1 g. of Zn acetate or valerate daily. There was improvement in more than 60% of cases. Reasons for the success are discussed. P. C. W.

Menarcheal age and the height, weight, and skeletal age of girls aged 7 to 17 years. K. Simmons and W. W. Greulich (*J. Pediat.*, 1943, 22, 518—547).—From 7 to 15 years of age the means of standing height and wt. of girls with early menarches are greater than those of girls with late menarches. The year of max. increment in standing height is related to menarcheal age; the greatest mean annual height increment occurs at 10—11 years for girls

with menarches at 10—11½ years; at 11—12 years with menarches at 12—12½ years; and at 12—13 years with menarches at 13—15½ years. Vals. of max. annual increments are negatively related to menarcheal age; girls with early menarches experience the greatest acceleration, followed by the greatest deceleration; girls with late menarches experience the least acceleration followed by the least deceleration. C. J. C. B.

Influence of menstrual cycle on titre of circulating allergins. O. C. Hansen-Pruss and R. Raymond (*J. Clin. Endocrinol.*, 1943, 3, 81—85).—The serum of allergic women contains the highest allergin concn. on the last day of menstruation, coincident with the highest reactivity of the skin. The concn. may be inversely proportional to the oestrogen concn. P. C. W.

Prostigmine in delayed menstruation.—See A., 1943, III, 590.

Treatment of menstrual disturbances in adolescent girls. B. B. Rubenstein (*J. Clin. Endocrinol.*, 1943, 3, 163—166).—7 patients were divided on the basis of their vaginal smears as suitable for oestrogen or progesterone therapy. P. C. W.

Case of secondary amenorrhœa. B. L. Cinberg (*J. Clin. Endocrinol.*, 1943, 3, 167—168). P. C. W.

Control of menopausal flushes by vitamin-E. A. M. Hain and J. C. B. Sym (*Brit. Med. J.*, 1943, II, 8—9).—Vitamin-E was administered in 4 cases of menopausal flushes; the results suggest that this therapy should be given a trial especially in subjects where an idiosyncrasy for oestrogens exists. I. C.

Nutritional deficiency in ætiology of menorrhagia, metrorrhagia, cystic mastitis, and premenstrual tension; treatment with vitamin-B complex. M. S. Biskind (*J. Clin. Endocrinol.*, 1943, 3, 227—234).—29 cases are reported with menorrhagia, metrorrhagia, cystic mastitis, or premenstrual tension. It is suggested that these symptoms are due to excess of oestrogen caused by a failure of hepatic inactivation due to vitamin-B deficiency. Prompt improvement followed -B administration. P. C. W.

Endometriosis. H. von Geldern (*West. J. Surg. Obstet. Gynec.*, 1940, 49, 154—163).—A clinical review. P. C. W.

Metabolism of oestrone in men. W. H. Pearlman and G. Pincus (*J. Biol. Chem.*, 1943, 147, 379—387).—96 hr. after the injection of massive doses (up to 100 mg.) of oestrone acetate into young men a small amount of cryst. oestriol was isolated from the strong phenolic fraction of the urine. The high concn. of oestrogenic activity in the weakly acidic phenolic, non-ketonic fraction appeared to be due chiefly to α -oestradiol as indicated by the changes in the activity following mild oxidation. H. G. R.

Oral effectiveness of oestrone sulphate in women. S. C. Freed, W. M. Eisin, and J. P. Greenhill (*J. Clin. Endocrinol.*, 1943, 3, 89—91).—A favourable report of treatment in 150 cases. Optimal dosage was 0.4—1.2 mg. daily in 3 doses. The prep. used ("Premarin") is a complex of oestrogens occurring in pregnant mare's serum in which oestrone sulphate predominates. P. C. W.

Clinical study of new type of oestrogenic preparation of oral use. L. A. Gray (*J. Clin. Endocrinol.*, 1943, 3, 92—94).—64 menopausal women were treated orally with "Premarin" (see preceding abstract). Favourable results were obtained with doses of 1.25 mg. daily for 7—14 days followed by maintenance doses of 1.25 mg. every 2 days. P. C. W.

Therapy of menopause. S. J. Glass and G. Rosenblum (*J. Clin. Endocrinol.*, 1943, 3, 95—97).—A favourable report on the clinical use of oral "Premarin" (see preceding abstract) in 71 menopausal patients. Toxic symptoms were less frequent than with diethylstilbœstrol. P. C. W.

Oral use of conjugated oestrogens-equine. E. L. Sevringhaus and R. St. John (*J. Clin. Endocrinol.*, 1943, 3, 98—100).—A favourable clinical report on the oral use of "Premarin" (see preceding abstracts). P. C. W.

Relation of stilbœstrol to carbohydrate metabolism. R. G. Jones and W. O. Nelson (*Amer. J. Physiol.*, 1942, 137, 557—563).—Fasted adrenalectomised rats, whether maintained by deoxycorticosterone or not, or hypophysectomised rats show low carbohydrate levels which were not increased by administration of diethylstilbœstrol. Since it is known that stilbœstrol administration increases liver-glycogen and urine-sugar in normal rats it is concluded that stilbœstrol stimulates the release of the adrenotropic hormone from the pituitary and this in turn stimulates the production of adrenal cortical hormone which produces these carbohydrate changes. T. F. D.

Oestrone and growth of protozoa. G. Calcutt (*J. Exp. Biol.*, 1942, 19, 118—123).—Exposure for 24 hr. or less to oestrone (10^{-5} to 10^{-7}) stimulates growth of *Colpidium*. Longer exposures, or higher concns., cause retardation and death. G. P. W.

Treatment of essential pruritus and kraurosis vulvæ. E. Klaffen (*J. Clin. Endocrinol.*, 1943, 3, 218—223).—An analysis of 68 cases, treated by local application of oestrone ointment and parenteral administration of oestradiol benzoate. P. C. W.

Effect of oestradiol and diethylstilboestrol on atrophic human buccal mucosa; use of oestrogens in the management of senile gingivitis. M. J. Richman and A. R. Arbarbanel (*J. Clin. Endocrinol.*, 1943, 3, 224—227).—25 climacteric patients showed atrophic changes in the buccal mucosa and bleeding gums. Administration of oestradiol or diethylstilboestrol overcame these changes; local injection beneath the muco-buccal fold was the most effective mode of administration. P. C. W.

Oestrogen therapy of climacteric. E. C. Smith (*Surg. Gynec. Obstet.*, 1940, 71, 744—749).—An analysis of 67 cases. P. C. W.

Influence of age on serosal tumoral reaction of guinea-pig to oestrogens. A. Lipschütz and L. Vargas, jun. (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 584—587).—Administration of 80 µg. 3 times weekly of oestradiol monobenzoate caused the same incidence of abdominal fibroids in female guinea-pigs weighing 180—245 g. as in those weighing 700—1050 g. V. J. W.

Oestrogens and acetylcholine. C. W. Emmens, F. C. Macintosh, and D. Richter (*J. Physiol.*, 1943, 101, 460—464).—Reynolds' finding (A., 1939, III, 586) that treatment of rabbits with oestrogen increases the acetylcholine content of their uterus is not upheld, and is therefore not an explanation of the vasodilator effect of oestrogens on the accessory genital organs. W. H. N.

Sex-hormone assays in menopause: their clinical significance. B. A. Watson, N. Yolton, and L. Rauls (*J. Lab. Clin. Med.*, 1943, 28, 732—735).—A correlation exists between the incidence of "hot flushes" and the oestrogenic and androgenic content of the urine. Estrone was found in the urine of patients who had the ovaries and uterus removed. C. J. C. B.

Authentic Δ^1 -androstene-17-ol-3-one, an isomeride of testosterone.—See A., 1943, II, 239.

Choline-esterase and female sex hormones. H. Birkhäuser (*Verh. Ver. Schweiz. Physiol.*, 1941, 13, 15—16).—A glycerin solution of oestradiol dipropionate has no effect on the choline-esterase content of rat's liver *in vitro*. *In vivo*, oestradiol increases the choline-esterase content of liver secondary to an increase in its acetylcholine content. The increase in uterine blood flow following administration of oestradiol is due to an increase in uterine acetylcholine concn. The liver-choline-esterase content of the rats suffering from beri-beri is diminished. A. S.

Oestrogens and androgens. S. C. Freed (*Amer. J. med. Sci.*, 1943, 205, 735—747).—A review. C. J. C. B.

Inactivation and conversion of oestrogens *in vitro* by liver and other tissues from human cancer patients and from mice of strains susceptible to mammary carcinoma.—See A., 1943, III, 568.

Effect of oestrone on mouse skeleton, with particular reference to Newcastle bone tumour (N.B.T.) strain.—See A., 1943, III, 568.

Assay of solutions of stilboestrol dipropionate in oil. W. R. Daacay and G. E. Foster (*Analyst*, 1943, 68, 181—182).—1 c.c. of solution (containing 1—10 mg. per c.c.) is boiled for 2 hr. with 10 c.c. of 96% alcohol and 2—3 drops of conc. H₂SO₄. After shaking with 50 c.c. of ether and extraction with 3 × 10 c.c. of N-NaOH, the combined alkaline extracts are washed with 25 c.c. of ether, and the latter is washed with 5 c.c. of N-NaOH. The alkaline extracts are acidified (H₂SO₄), extracted twice with 25 c.c. of ether, and the ethereal extract is washed with 5 c.c. of water. The residue from evaporation is dissolved in 0.4% aq. NaOH (10 mg. of stilboestrol dipropionate in 100 c.c.). 5 c.c. of this solution is treated with 3 c.c. of Folin-Ciocalteu phenol reagent and 2 c.c. of 20% aq. Na₂CO₃, and heated at 100° for 5 min. The cooled mixture is diluted to 25 c.c. for colorimetric comparison with a stilboestrol standard similarly treated. The error is within 10%. J. N. A.

Effects of certain oxytocics on tubal contractions in rhesus monkeys. A. H. Morse and I. C. Rubin (*Surg. Gynec. Obstet.*, 1940, 71, 620—623).—It is possible to record the tubal contractions in rhesus monkeys using the uterotubal insufflation apparatus for testing tubal patency. In 6 monkeys injected at different times during the oestrous cycle with pituitrin there was considerable individual variation in the latent period and the duration of action; there was no apparent relation to the stage of the cycle at which the test was made. Thymophysin was effective in 1 of 4 trials and ergotrate in none of 2. P. C. W.

Sulphodiethyl succinate and maleic acid mixture in clinical contraception. H. C. Mack and R. S. Siddall (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 110—117).—The mixture ("Almol") was slightly more effective than a lactic acid jelly of known efficacy. The cervical occlusive diaphragm used in conjunction with contraceptive jelly is more effective than other contraceptive methods. P. C. W.

Sterilisation procedures in women. E. M. Lazard (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 294—299). P. C. W.

Endocrine factors responsible for sterility in women. E. C. Hamblen (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 300—303).—Discussion. P. C. W.

Serum-diastase and its relation to oestrogen metabolism in pregnancy and menstrual cycle. S. Schiller and O. W. Smith (*J. Clin. Endocrinol.*, 1943, 3, 154—162).—Serum-diastase rises after the 30th week of pregnancy, reaches a peak 10 days before parturition, falls before and during labour, and remains low for 1 month post-partum. A progressive fall preceded and accompanied symptoms of pre-eclampsia; this was abolished by oestrogen and progesterone therapy. There is a rise in serum-diastase during the luteal phase of the normal menstrual cycle and a precipitous drop precedes and accompanies menstruation. A fall at the time of ovulation was observed in 2 cases. In discussion the rise is associated with decreased oestrogen degradation and increased progesterin secretion. P. C. W.

Histidine and histamine metabolism in normal and pathological pregnancy. R. Kapeller-Adler and E. Adler (*J. Obstet. Gynaec.*, 1943, 50, 177—183).—Urinary histamine and histidine are normal in cases of normal pregnancy. In cases with hyperemesis gravidarum or mild pre-eclamptic toxæmia there is increased histamine in the urine and diminished histidine. In severe pre-eclamptic toxæmia and toxæmia the 2 substances are absent or present only in traces. P. C. W.

Excretion of ketosteroids in human pregnancy urine in relation to sex of foetus. H. Burrows, D. MacLeod, and F. L. Warren (*J. Obstet. Gynaec.*, 1940, 50, 212—216).—A detailed account of results already noted (A., 1942, III, 453). All of 7 women with more than 20 mg. of ketosteroid per l. of urine at the 8th week after the last period gave birth to male children. P. C. W.

Choline-esterase and diamine oxidase during pregnancy. E. A. Zeller (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 52).—The choline-esterase content of rat's liver rises during pregnancy and returns to normal within 24 hr. after parturition. Equally high vals. were found in ovariectomised animals treated with oestradiol or oestradiol + progesterone. There is a high diamine oxidase content in the pregnant rat's liver, returning to normal shortly after parturition, but oestradiol + progesterone do not increase the diamine oxidase concn. in ovariectomised animals. A. S.

Diagnosis of pregnancy in mare by hormonal means. H. H. Cole and G. H. Hart (*J. Amer. Vet. Med. Assoc.*, 1942, 101, 124—128).—Between the 45th and 140th day after mating the blood is tested for gonadotrophin by the immature rat or rabbit-ovulation test. After the 140th day diagnosis is based on detection of oestrogen either in spayed rats or by a slightly modified Cuboni's test. Weighing the uterus and ovaries enables the immature rat test for gonadotrophin to be read after 48 instead of 96 hr. E. G. W.

Vitamin-B₁ and toxæmia of pregnancy.—See A., 1943, III, 576.

Attempts to cause ovulation by means of gonadotropins in adult rhesus monkey. C. G. Hartman (*Carnegie Inst. Wash., Contrib. to Embryol.*, 1942, 30, 111—126).—The administration of Gonadogen-Upjohn resulted in ovulation in 3 animals, overstimulation in 11, but was without effect in 7. Follicle-stimulating hormone (Squibb & Sons) resulted in ovulation twice and overstimulation of the ovaries twice. The experience from 150 experiments shows that best results are obtained if the follicle is slowly built up with follicle-stimulating hormone and the final rupture precipitated with follicle-stimulating and luteinizing hormone. W. J. H.

Δ^1 -Dehydroprogesterone.—See A., 1943, II, 271.

Utilisation of β -hydroxybutyric acid by perfused lactating mammary gland. J. C. Shaw and W. E. Petersen (*J. Biol. Chem.*, 1943, 147, 639—643; cf. A., 1942, III, 333).—Perfusion balance tests show that added β -hydroxybutyrate is utilised by the cow's mammary gland; when large amounts are added, up to 88% of the O₂ uptake of the gland may be due to oxidation of β -hydroxybutyrate. R. L. E.

Growth of crop-glands of doves after treatment with prolactin. J. R. Valle and L. A. R. Valle (*Rev. Brasil. Biol.*, 1942, 2, 73—80).—Intramuscularly injected prolactin increases the wt. of the crop-glands of *Columbigallina talpacoti talpacoti*, proportionally to the doses of hormone injected. Hyperplasia of the organs occurs. I. C.

Influence of lactogenic preparations on mammary glands and time of vaginal opening in young rats. W. R. Lyons, M. E. Simpson, and H. M. Evans (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 634—637).—Daily injections of 0.5, 1, and 2 mg. of lactogenic hormone were given to rats from the 21st to the 50th day. Vaginal opening was not delayed, but further injections induced continuous vaginal mucification and mammary lobular development. V. J. W.

Mammary growth in hypophysectomised male mice receiving oestrogen and prolactin. W. U. Gardner and A. White (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 590—592).—Mammary growth was not caused by prolactin alone but took place when 1 µg. of oestradiol dipropionate every other day was given in addition. V. J. W.

Personality changes in endocrine disorders. B. N. Tager and E. K. Shelton (*J. Clin. Endocrinol.*, 1943, 3, 239—242). P. C. W.

Sexual behaviour of intersexual domestic fowl. L. V. Domm and D. E. Davis (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 665—667).—

Male fowls, rendered intersexual by injection of oestrogens into the egg on or before the 4th day of incubation, showed graded copulatory behaviour which was correlated with masculinity of plumage.

V. J. W.

Sexual behaviour of hormonally treated domestic fowl. D. E. Davis and L. V. Domm (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 667—669).—In capons, either androgen or oestrogen induced copulation, but crowing and courting reactions were only caused by androgen. In spayed pullets androgen induced crowing but not masculine copulation; oestrogen induced female copulatory behaviour.

V. J. W.

Angina-like pain: manifestation of male climacteric. T. H. McGavack (*J. Clin. Endocrinol.*, 1943, **3**, 71—80).—8 patients had angina-like pain which did not respond to treatment with vasodilator drugs and sedatives; the symptoms were promptly relieved by testosterone administration. Other symptoms of declining testicular function were present.

P. C. W.

Nutritional therapy of infertility in male, with special reference to vitamin-B complex and -E. M. S. Biskind and H. C. Falk (*J. Clin. Endocrinol.*, 1943, **3**, 148—153).—Dietary supplements of vitamin-B complex alone or in combination with -E were followed by improvement in no., motility, and morphology of the sperm in previously infertile men. In cases of long-standing infertility in which sperm defects were not detected, -B therapy restored normal fertility.

P. C. W.

Atypical laryngeal and vocal changes in adolescence [effect of gonadotropin in cryptorchidism]. J. S. Greene (*J. Amer. Med. Assoc.*, 1942, **120**, 1193—1197).—A lecture, with case reports. 2 identical twins with cryptorchidism were studied; 1 of them, at 12 years, was given chorionic gonadotropic hormone which caused him to become 2 in. taller and 8 lb. heavier than his twin; his voice became low and resonant while his twin's remained high-pitched and childish.

C. A. K.

Effect of X-rays on rat's testis. H. von Wattenwyl (*Schweiz. med. Wschr.*, 1942, **72**, 765—766).—A single dose of 60—2400 r. was given. The spermatogonia were the most sensitive cells in the rat's testis. With the larger doses spermatids, spermatocytes, spermatozoa, and, lastly, the supporting cells were affected. There were pathological mitoses and giant cell formation. The interstitial cells showed no change. The epithelium of the epididymis remained intact. There was much cellular debris in the canaliculi. The fertility of the animals decreased according to the diminution in active spermatozoa. The litters of irradiated animals were normal.

A. S.

Relation of interstitial cell hyperplasia to secretion of male hormone in sparrow. C. A. Pfeiffer and A. Kirschbaum (*Anat. Rec.*, 1943, **85**, 211—227).—The production of androgen during the normal sexual cycle and after stimulation of the testis by increased daily light ration was indicated by the deposition of melanin in the bill. Leydig cells were not found under these conditions. It is suggested that androgen originates in the germinal epithelium. Following stimulation of the testis by injections of large amounts of pregnant mare's serum or hypophyseal extracts, Leydig cells appeared between the testicular lobules. In some cases where such hyperplasia occurred, androgen was secreted, in the absence of active germinal epithelium, suggesting that Leydig cells were the source of the androgen. No cells comparable to testicular Leydig cells occur in sparrow ovaries which were secreting androgen during the normal cycle, or after stimulation with pregnant mare's serum.

W. F. H.

Factors influencing development of scrotum. H. Selye (*Anat. Rec.*, 1943, **85**, 377—385).—In castrate albino rats testosterone in itself does not induce full scrotal development in immature rats. Further it does not completely inhibit scrotal involution in gonadectomised adults. Distention by the epididymis or an "artificial glass testis" can sensitise the scrotum to the action of testosterone.

W. F. H.

Sperm production of pony stallion and treatment of spermatozoa in vitro with special reference to artificial insemination of mares. M. C. Chang (*J. Agric. Sci.*, 1943, **33**, 67—73).—The production of sperm, when collected three weekly, was maintained at a const. high level. Glucose-yolk- $PO_4^{'''}$ (or -tartrate) was the best dilutor for the preservation of sperms at 1° for 24 hr. Concn. of the semen by centrifuging was beneficial. Following this treatment, insemination of the sperms produced pregnancies.

R. H. H.

New method for staining spermatozoa. B. E. Greenberg, S. Berman, S. L. Gargill, and R. C. Griffin (*J. Clin. Endocrinol.*, 1943, **3**, 179—180).—A modification of the Pappenheim-Saathoff formula (Conn, "Biological Stains," Commission on Standardisation of Biological Stains, Geneva, 1929) is applied to the staining of sperm.

P. C. W.

Influence of cell concentration on respiration rate of sperm. C. F. Winchester and F. F. McKenzie (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 648—653).— O_2 consumption of ram or boar spermatozoa in phosphate buffer declines as concn. increases from 1 to 6×10^9 cells per cu. mm. O_2 consumption of yeast cells is const. at all concns.

The effect in the sperm is not due to pH, lessened O_2 supply per cell, an enzyme, or products of metabolism.

V. J. W.

Influence of hydrogen-ion concentration on respiration rate of sperm. C. F. Winchester and F. F. McKenzie (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 654—656).—Respiration of spermatozoa is max. at pH 7.2—7.3 for the boar and 7—7.2 for the ram. Those of the boar are more affected by pH changes.

V. J. W.

Effect of iodoacetate and malonate on respiration of sea-urchin sperm. E. S. G. Barron and J. M. Goldinger (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 570—574).—Concns. of either substance sufficient to inhibit respiration of other animal tissues increased respiration of sea-urchin sperm; O_2 uptake and CO_2 output were increased equally.

V. J. W.

Enzyme chemistry of human sperm. C. A. Joel (*Verh. Ver. Schweiz. Physiol.*, 1941, **18**, 23—24).—Human sperm contains diamine oxidase, as shown by the decolorisation of indigodisulphonic acid in presence of cadaverine.

A. S.

Chromogenic effect of varying mixtures of androsterone and dehydroandrosterone. E. Saier, R. C. Grauer, and W. F. Starkey (*J. Biol. Chem.*, 1943, **148**, 213—218).—Solutions containing androsterone and dehydroandrosterone behave as simple mixtures in the dinitrobenzene colour reaction, by the Friedgood and Whidden or Neustadt technique. The biological effect of mixtures is probably not simply additive.

R. L. E.

Influence of steroid hormones on metabolism of chlorides. H. Selye and C. Dosne (*Anal. Acad. Biol. Univ. Chile*, 1940, **3**, 93—103).—Deoxycorticosterone (10 mg. during 10 days) injected subcutaneously in white rats lower blood-Cl'; the decrease is greater in the red cells than in serum. Testosterone is less active and progesterone and cholesterol are completely inactive. Oestradiol increases blood-Cl' in males only. Testosterone and deoxycorticosterone inhibit the rise of blood-Cl' caused by oestradiol.

I. C.

Effect of androgens on libido in women. U. J. Salmon and S. H. Geist (*J. Clin. Endocrinol.*, 1943, **3**, 235—238).—88 of 101 women treated for endocrine disorders reported increased libido during androgen therapy.

P. C. W.

Artificial cross-insemination. G. S. Beardsley (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 94—98).—2 human cases are reported.

P. C. W.

Castration in treatment of prostatic cancer. Endocrine effects in advanced prostatic cancer [and serum-phosphatase].—See A., 1943, III, 571.

XIII.—DIGESTIVE SYSTEM.

Rate of secretion of parotid glands in normal children. R. S. Lourie (*Amer. J. dis. Child.*, 1943, **65**, 455—479).—The rate gradually decreased in 51 children from 0.74 c.c. in 5 min. at age 3—4 to 0.1 c.c. in 5 min. at age 11—14.

C. J. C. B.

Nasal intubation: dangers and difficulties from rhinological aspect. A. R. Dingley (*Brit. Med. J.*, 1943, I, 693—694).—Possible complications, contraindications, and precautionary measures of nasal intubation are described.

I. C.

Gastric acidity during first year of life. R. A. Miller (*Arch. Dis. Child.*, 1942, **17**, 198—208).—Gastric acidity during the first year of life shows a rapid increase in concn. with a probable increase in vol. At the end of this period the reaction of the stomach to a test-meal of milk resembles that of an adult. With the development of digestive powers there is a diminution in the no. of achlorhydric infants.

C. J. C. B.

Influence of intravenously administered alcohol on emptying time of stomach. L. A. Greenberg, G. Lolli, and M. Rubin (*Quart. J. Stud. Alcohol*, 1942, **3**, 371—375).—Intravenous injection of alcohol (2 g. per kg.) in rats caused delay in the passage of glucose from the stomach; disappearance of orally administered alcohol from the stomach is inhibited. The effects are attributed to a central action of alcohol.

P. C. W.

Effect of urogastone on gastric secretion in enterectomised dogs. M. J. Schiffrin and J. S. Gray (*Amer. J. Physiol.*, 1942, **137**, 417—420).—1.0 mg. of urogastone injected intravenously inhibits the vol. of gastric secretion and output of free acid in enterectomised dogs and dogs with vagotomised total gastric pouches. During the 1st hr. after injection the average vol. of secretion was reduced from 92.3 to 51.5 c.c., output of free acid from 11.260 to 6.638 m-equiv. (total gastric pouch dogs). In enterectomised dogs the vol. of secretion was reduced from 87.4 to 39.6 c.c., free acid output from 9.184 to 3.277 m-equiv. No evidence was obtained that urogastone acts by liberating enterogastone.

M. W. G.

Method for continuous recording of gastric pH in situ. Evaluation of efficacy of antacids in vitro and in man. N. E. Rossett and J. Flexner (*Ann. int. Med.*, 1943, **18**, 193—200).—The antacid effects of $NaHCO_3$, Sippy A powders, Mg trisilicate, MgO_2 , and $Al(OH)_3$ on a mixture of 30 c.c. of 0.1N-HCl and 70 c.c. of water (pH 1.4) in vitro and on gastric acidity of fasting patients were tested with a

glass electrode continuous pH recorder. The *in vivo* method gives reliable results as to the antacid activity *in vitro*. MgO, MgO₂, Mg(OH)₂, MgCO₃, and CaCO₃, especially when combined with milk or colloidal Al(OH)₃, are powerful antacids. Physiologically, milk or Al(OH)₃ gives the best results. A. S.

Effectiveness of replacement therapy in achlorhydria. A. E. Koehler (*Ann. int. Med.*, 1943, 18, 182—192).—The usual amount of HCl used in replacement therapy of achlorhydria has little effect on the pH of a test meal *in vitro* at body temp. because of the buffering action of the food; 35 c.c. of U.S.P. HCl are required to bring the pH below 2.0; 20 420-mg. capsules of glutamic acid hydrochloride failed to produce normal physiological post-meal activity. The buffer action of the food is proportional to the protein content; an average large meal has 15—20 times the neutralising ability of the Ewald test meal of 3 g. of protein. Except for gelatin, the swelling of proteins as a step in dissolution and digestion is not appreciably influenced by even the largest doses of acid advocated in replacement therapy. The usual acid administration has no bactericidal effect. Only a pH below 2.0 has a marked bactericidal effect and even this pH may not be effective within the normal emptying time of the stomach for certain acid-resistant, encapsulated or sporulated organisms; other pathogenic organisms, however, are very sensitive to a slight lowering of the pH below neutrality (e.g., β -streptococci). Increased liberation of Ca from milk over a 3-hr. period was observed with decreasing pH vals. from 6.5 to 1.5. Anacidity or hyperacidity has no effect on thiamin destruction. The amount of HCl secreted by the stomach for an average meal is calc. to be in excess of 104 c.c. of N-HCl or 3.8 g. of HCl, considering the buffer action of digested protein, mucin, and the alkaline regurgitation. A. S.

Diffuse metaplastic gastritis in patient with prolonged cachexia and macrocytic anemia. S. Sailer (*Arch. Path.*, 1943, 35, 730—743).—A Negro woman aged 52 had, during 6 years, recurrent attacks of vomiting, abdominal pain, and progressive weakness. There was marked cachexia associated with macrocytic anemia which did not respond to liver therapy. Röntgen examinations showed an extremely small and sluggish stomach. Gastroscopically, the mucosa was pale and rugæ were absent. At autopsy the stomach was uniformly reduced in size and its wall regularly thickened with diffuse squamous metaplasia of the mucosa. No apparent cause for the gastric changes was found. (3 photomicrographs.) C. J. C. B.

Effects of atropine, prostigmine, adrenaline, and calcium on movements of fasting human stomach.—See A., 1943, III, 586.

Effects of jejunal transplants on experimental production of peptic ulcers. J. W. Lord, W. DeW. Andrus, and P. Stefko (*Arch. Surg.*, Chicago, 1943, 46, 459—464).—Dogs with pedicle grafts of jejunum transplanted into the stomach wall secreted a more alkaline gastric juice in response to histamine than normal dogs. The duodenal lesions which follow prolonged histamine stimulation in normal dogs were absent in the grafted dogs. (1 photomicrograph.) F. S.

Hæmatemesis and melæna. F. A. Jones (*Brit. Med. J.*, 1943, I, 689—691).—An analysis of 171 cases of hæmatemesis or melæna, treated by prompt feeding and liberal transfusions, which decreased the incidence of recurrent bleeding. Early gastroscopy gave the diagnosis in $\frac{2}{3}$ of the X-ray-negative cases. I. C.

Duodenal ulcer in infancy. S. A. Schwartz and C. A. Halberstam (*Arch. Pediat.*, 1943, 60, 185—193).—A review; report of a case of perforated duodenal ulcer in an 11-month-old infant successfully operated on. C. J. C. B.

Current trends in treatment of jejunal ulcer. E. N. Collins and G. J. Ward (*Cleveland Clin. Quart.*, 1942, 9, 159—164).—5 of 29 patients with jejunal ulcer had had gastric resections, 24 patients had had gastroenterostomy prior to the development of jejunal ulcers. 4 patients had immediate operation for serious complications, 18 patients were satisfactorily maintained on medical treatment alone. Liberal use is made of milk and Al(OH)₃ gel. A. S.

Intubation studies of human small intestine. Method for measuring intra-luminal pressures and its application to digestive tract. W. O. Abbott, H. K. Hartline, J. P. Hervey, F. J. Ingelfinger, A. J. Rawson, and L. Zetzel (*J. clin. Invest.*, 1943, 22, 225—233).—An instrument for recording in abs. terms the intra-luminal pressures simultaneously at multiple selected points in the human digestive tract, without obstructing the lumen, stimulating the gut locally, necessitating a fasting state, or disturbing sick patients is described. The principle depends on the closure of an electrical contact by a flexible diaphragm when the pressures on the 2 sides of the diaphragm are made equal. Basic pressures of 8—10 cm. H₂O are present in the human small intestine. Phasic pressures rising to 30 or 40 or occasionally even to 50 cm. H₂O occur spontaneously. Placing the gut under stress, by creating an obstruction or by giving morphine, changes the extremes of intra-luminal pressures by only a few cm. of H₂O but alters the pressure pattern. The coincident gastric and duodenal pressures attendant on gastric emptying are recorded. C. J. C. B.

Cystic fibrosis of pancreas. C. E. Snelling and I. H. Erb (*Arch. Dis. Child.*, 1942, 17, 220—226).—A review of 19 cases. (20 photomicrographs.) C. J. C. B.

Relationship between sugar absorption and phosphate metabolism. L. Laszt, L. D. Torres, and N. Pittet (*Schweiz. med. Wschr.*, 1942, 72, 817—819).—2.5 c.c. of a PO₄''' buffer at pH 7.0 with a P content of 1.25 mg. were injected into an intestinal loop 30 cm. long in rats suffering from experimental rickets. 0.507 mg. of P was absorbed in 30 min., compared with 0.786 mg. in normals. After injection of 2.5 c.c. of a 6% glucose solution normal animals absorbed 70 mg. of glucose after 15 and 99 mg. after 30 min.; the vals. in rickety rats were 39.1 and 57.5 mg., respectively, and more inorg. P was found in the intestinal content than in the controls. A. S.

Relationship between sugar absorption from intestines and phosphorus metabolism. L. Laszt and L. Dalla Torre (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 16—17).—P is secreted into the lumen of small intestines in rabbits in the presence of hexoses and pentoses, not of NaCl or amino-acids. There is no P secretion into the large intestines. The P secretion and sugar absorption in the small intestines are diminished in adrenalectomised animals. A. S.

Phosphate and sugar absorption from intestines. L. Laszt (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 29—30). A. S.

Ten years' experience with thorotrast hepatosplenography. W. M. Yater and F. O. Coe (*Ann. int. Med.*, 1943, 18, 350—366).—286 cases are reviewed. Hepatosplenography is of val. in the diagnosis of cirrhosis or abscess of the liver and to determine the presence of metastases in the liver. No immediate or remote ill effects of importance were observed. There is no evidence of latent radioactivity, impairment of hepatic, splenic, or hæmatopoietic functions, lowered resistance to infections, or development of malignant growths at the site of the injection or in other parts of the body. A. S.

Tuning-fork auscultation; test for abdominal adhesions. B. B. V. Lyon (*Ann. int. Med.*, 1943, 18, 297—310).—The test determines the presence of adhesions in the upper right quadrant of the abdomen, and is based on the transmission of the vibrations of a tuning fork, e.g., placed over the liver, via adhesions to the walls of the stomach over which they can be heard with the stethoscope. In 85 cases, controlled by operation, the test was accurate in 90%, whereas X-ray evidence was less than 65% accurate. A. S.

Acute abdominal conditions in children. H. R. Litchfield (*Arch. Pediat.*, 1943, 60, 128—138).—A review. C. J. C. B.

Low blood-carbon dioxide content as prodrome of diarrhoea in newborn infant. J. W. St. Geme (*J. Pediat.*, 1943, 22, 205—207).—Acidosis (low CO₂-combining power) is a prodrome of impending diarrhoea. Prompt alkaline therapy may moderate or prevent the occurrence of gastrointestinal symptoms. C. J. C. B.

Rôle of colon organisms and their toxins in epidemic diarrhoea of newborn infant.—See A., 1943, III, 602.

XIV.—LIVER AND BILE.

Plasma-amino-acid retention, as evidence of impaired liver function. Investigation in children with nephrosis and liver disease. J. D. Lyttle, E. Goettsch, D. M. Greeley, W. M. Grim, and P. Dunbar (*J. clin. Invest.*, 1943, 22, 169—181).—In 45 normal hospital children, the fasting plasma-amino-acid-N was 2.92—4.63 mg.-%. Intravenous injections of casein hydrolysate were given. In 4 children with portal cirrhosis, there was a delay in clearing the plasma of amino-acids, following the injection. In 2 of 7 patients with liver disease other than cirrhosis, there was moderate delay. In 1 patient with hepatosplenomegaly and impaired renal function, retention of plasma-amino-acid was noted, which disappeared when the enlargement of liver and spleen abated. 8 of 9 patients with nephrosis, 2 patients with chronic glomerular nephritis, and 3 patients with other kidney diseases cleared the plasma of amino-acid as quickly as the normal controls. C. J. C. B.

Effect of choline deficiency on fat content of regenerated liver. P. Handler and F. Bernheim (*J. Biol. Chem.*, 1943, 148, 649—654).—Regeneration of liver in partly hepatectomised rats occurs rapidly during choline deficiency, mixed choline and aneurin deficiency, and also when growth of the whole animal is depressed by oral administration of large doses of nicotinamide. The regenerated livers of rats with choline deficiency show the usual fatty infiltration, whilst the fat content of regenerated livers of choline-deficient rats whose growth is depressed by deficiency of aneurin or by feeding of nicotinamide is slightly less than normal. Development of fatty livers in choline deficiency probably occurs only when all other dietary factors will allow growth of the whole rat and not only growth of the liver. The effect of deficiency of members of the vitamin-B complex in preventing formation of fatty livers during choline deficiency is due to impairment of the entire metabolism rather than to some sp. defect in metabolism of the liver. J. N. A.

Liver cell fat necrosis caused by pancreatic reflux. W. Schiller (*Surg. Gynec. Obstet.*, 1941, 72, 70—80).—A case of liver cell fat

necrosis is described due to pancreatic reflux proved by the lipase content of the bile. P. C. W.

Alcoholic cirrhosis of liver. J. D. Kirschbaum and N. Shure (*J. Lab. clin. Med.*, 1943, 28, 721—731).—A clinical and pathological review of 356 fatal cases selected from 12,267 necropsies. C. J. C. B.

Determination of glucose 1-phosphate and galactose 1-phosphate in liver. H. W. Kosterlitz and C. M. Ritchie (*Biochem. J.*, 1943, 37, 181—186).—Inorg. $PO_4^{'''}$ is removed by Ba^{++} , and total hexose 1-phosphate determined after complete hydrolysis by acid at 100°. Controlled incubation at 50° hydrolyses 28.6% of glucose 1-phosphate and 77.5% of galactose 1-phosphate. The individual vals. are calc. from the ratio of reducing powers and inorg. $PO_4^{'''}$ after hydrolysis at 50° and 100°. Recovery of hexose 1-phosphates added to liver was 77—85%. R. L. E.

Intensified cholecystography. M. Feldman (*Radiology*, 1942, 39, 697—699).—A series of cholecystograms taken at 42—48 hr. with a fatty meal given before the administration of the dye in 29 cases where the ordinary cholecystographic technique had shown a faint or no shadow produced 13 normal and 16 abnormal cholecystograms. E. M. J.

Effect of cinchophen on bile formation. A. L. Berman, E. F. Snapp, A. J. Atkinson, and A. C. Ivy (*J. Lab. clin. Med.*, 1943, 28, 682—689).—1 g. of "pure" cinchophen was fed daily (0.5 g. with each meal) to 5 chronic biliary fistula dogs for 3- and 14-day periods, and in 1 instance for 33 days. It caused a marked hydrocholerisis with no change in cholic acid and total pigment output, increased cholesterol output, with recovery of 60—75% of the administered cinchophen. On a g.-wt. basis cinchophen increased bile flow 3 times as effectively as dehydrocholic acid. In the presence of an injured liver, cinchophen feeding did not increase or improve the hepatitis. C. J. C. B.

Tetrahydroxycholane [sulphate], trihydroxycholene, and trihydroxy-bisnorsterocholanic acid from the bile of *Rana catesbina*, Shaw.—See A., 1943, II, 269.

Separation of the constituents of ox bile.—See A., 1943, II, 269.

XV.—KIDNEY AND URINE.

Passage from activity to inactivity of renal glomeruli. L. Vargas F. (*Anal. Acad. Biol. Univ. Chile*, 1939, 3, 5—14).—Active glomeruli of *Bufo chilensis*, Gay, close down slowly, the duration of the process when observed microscopically being 3 hr. Vasoconstrictor drugs (post-pituitary extracts) constrict the glomeruli while vasodilator drugs (renal extract) open them up. I. C.

Tubular reabsorption of phosphate in the dog. P. K. Smith, R. W. Ollayos, and A. W. Winkler (*J. clin. Invest.*, 1943, 22, 143—146).—No limiting or "max." rate of tubular reabsorption of inorg. $PO_4^{'''}$ in the dog could be demonstrated. The relation of the excretion of $PO_4^{'''}$ to its serum concn. and its relation to glomerular filtration are similar in character to those of SO_4^{--} and of K. C. J. C. B.

Urinary excretion and serum concentration of inorganic phosphate in man. R. W. Ollayos and A. W. Winkler (*J. clin. Invest.*, 1943, 22, 147—154).—The rate of urinary excretion of $PO_4^{'''}$ in man normally does not depend primarily on serum- $PO_4^{'''}$, but may be influenced by changes in the latter. Following intravenous injection of large amounts of isotonic Na_3PO_4 solution in normal man, the rate of urinary $PO_4^{'''}$ excretion was mainly determined by the serum- $PO_4^{'''}$ concn. Injected $PO_4^{'''}$ is distributed through a greater vol. than that of the extracellular fluid. C. J. C. B.

Disturbed kidney function in newborn infant associated with decreased calcium : phosphorus ratio. C. E. Snelling (*J. Pediat.*, 1943, 22, 559—564).—In 11 cases of tetany of the newborn, there was urinary retention of N and P associated with a decreased Ca : P ratio. The symptoms were relieved by the intravenous injection of Ca gluconate and glucose in saline. C. J. C. B.

Effect of testosterone propionate on renal function in dog. C. A. Welch, A. Rosenthal, M. T. Duncan, and H. C. Taylor, jun. (*Amer. J. Physiol.*, 1942, 137, 338—347).—Injection of testosterone propionate, 100 mg. daily in 4 c.c. of sesame oil (total 600—2100 mg.), may temporarily double the max. capacity of the kidney (dog) to excrete diodrast (diodrast T_m) and reduces the urinary excretion of Na and K. Creatinine clearance and effective renal blood flow are unaffected. M. W. G.

Postmortem study of renal pelvis in relation to hypertension. B. E. Stoffer and L. L. Kline (*Arch. Path.*, 1943, 35, 681—684).—A method for exactly determining the position of the pelvis relative to the parenchyma of the kidney is described. There was no significant correlation between the position of the intrarenal pelvis and hypertension or between hypertension and rotation or between hypertension and foetal lobulation. C. J. C. B.

Lipin nephrosis. H. Schwarz, J. L. Kohn, and S. B. Weiner (*Amer. J. dis. Child.*, 1943, 65, 355—363).—A discussion based on 40 cases

seen over 20 years. 8 patients were followed for 7—20 years. 4 now have hypertension and increased urinary sediment counts (Addis). 2 others have increased urinary sediment counts only. C. J. C. B.

Effects of renal ischaemia on arterial pressure and urine flow in dogs. E. B. Verney and M. Vogt (*Quart. J. Exp. Physiol.*, 1943, 32, 35—65).—Occlusion of an artery to a sole remaining kidney for 2 to 600 sec. inhibited urine flow with no change in arterial pressure. Partial occlusion caused hypertension, which fell when the obstruction was released, and inhibited urine flow. Division of splanchnic and renal nerves had no effect. If a second kidney were present, partial obstruction of one renal artery produced either no hypertension or hypertension from which recovery was rapid. Hypertension was of normal origin and disappeared on functional removal of chronically ischaemic and sole remaining kidney. The liver played no part in these effects. Normal renal tissue may depress the formation of pressor substance by ischaemic kidney and accelerate its disappearance from blood. T. F. D.

Renal damage due to crush injury and ischaemia of limbs of anaesthetised dog. M. G. Eggleton, K. C. Richardson, H. O. Schild, and F. R. Winton (*Quart. J. Exp. Physiol.*, 1943, 32, 89—106).—Ischaemia in dogs caused by crushed limbs produced impaired renal function characterised by reduction in urine flow, creatinine clearance, and urine-/plasma-creatinine ratio and increase in pigmentation of urine. Diuretics increased urine flow and raised creatinine clearance, but not to normal vals. The damaged kidney was flaccid, although no sp. lesion could be detected histologically. No single mechanism has been found to account for the renal damage due to limb injury. T. F. D.

Uric acid clearance in normal pregnancy and pre-eclampsia. N. K. Schaffer, L. V. Dill, and J. F. Cadden (*J. clin. Invest.*, 1943, 22, 201—205).—The plasma-uric acid clearance in 12 cases of antepartum normal pregnancy averaged 31.9 c.c. per min. and in 10 cases of antepartum pre-eclampsia 21.9 c.c. The plasma-uric acid in the corresponding groups was 3.83 and 5.29 mg.-%. The inulin and urea clearances were reduced simultaneously with the uric acid clearance in pre-eclampsia, and indicate that the decreased uric acid and urea clearances were due to a reduction in glomerular filtration. The absence of an elevated blood-urea when the blood-uric acid is raised in pre-eclampsia is due to the fact that pregnancy normally lowers blood-urea but not blood-uric acid. C. J. C. B.

Diurnal rhythm in excretion of urinary ketosteroids by young men. G. Pincus (*J. Clin. Endocrinol.*, 1943, 3, 195—199).—Urine was collected from 7 young men for a total of 48 24-hr. periods. Excretion of 17-ketosteroids was lower during the night than during the day; max. rates of excretion occur in the morning hours. High excretion during the night was associated with high excretion during the day, and vice versa. In one subject forced diuresis did not alter the rate of excretion, which was, however, raised during a period of emergency hospital duty. P. C. W.

Excretion of 17-ketosteroids by normal and by abnormal children. N. B. Talbot, A. M. Butler, R. A. Berman, P. M. Rodriguez, and E. A. McLachlan (*Amer. J. dis. Child.*, 1943, 65, 364—375).—The output of 17-ketosteroids is low from birth to 10 years. The vals. then gradually rise to 18 years of age. Moderately increased output of 17-ketosteroids was observed in "normal" children with physiologic sexual precocity, and in abnormally overwt. children. Abnormally low vals. were obtained for children over 12 years old whose growth and development were retarded. The excretion of 17-ketosteroids of patients with mongolism was not consistently abnormal. C. J. C. B.

Rapid clinical determination of urinary 17-ketosteroids. W. A. Robbie and R. E. Gibson (*J. Clin. Endocrinol.*, 1943, 3, 200—205).—Urine is hydrolysed with 10% HCl, extracted for 10 min. with boiling CCl_4 in a reflux, and the hormone content determined by the alkaline *m*-dinitrobenzene method. Tests for accuracy show a max. variation of $\pm 5\%$ for any one stage, and an overall variation of $\pm 10\%$. P. C. W.

New steroid glucuronide from human urine. H. S. Strickler, C. B. Shaffer, D. A. Wilson, and E. W. Strickler (*J. Biol. Chem.*, 1943, 148, 251—252).—A steroid glucuronide, m.p. 267—269° (decomp.) is reported in the urine of a girl showing masculinism. The steroid has m.p. 212—213° (corr.), is saturated, and probably has α -OH at C_{19} and CO at C_{20} . It gives an acetate, m.p. 192—194°, and an oxime, m.p. 223—225°. R. L. E.

Diagnosis of alkaptonuria. J. N. Gould and T. G. Thomas (*Brit. Med. J.*, 1943, I, 788).—Urine is made strongly alkaline with NaOH or KOH. A drop of urine so treated placed on regulation sensitised photographic paper immediately turns the latter black. No other normal or pathological substance in the urine gives this reaction. I. C.

Determination of glucuronates in urine. W. Deichmann (*J. Lab. clin. Med.*, 1943, 28, 770—778).—The method employed makes use of a preliminary hydrolysis at 75°, a great excess of naphthoresorcinol, and a HCl-naphthoresorcinol mixture heated to 50°. The final estimation is carried out with a photoelectric spectrometer or

colorimeter. The daily output of glucuronates for men on an unrestricted diet is 65—239 mg. per 24 hr. A dog excreted 24—108 mg. and rabbits 15—75 mg. for 1-day periods. The administration of half the lethal oral dose of phenol, *o*-, *m*-, and *p*-cresol, cyclohexanol, and cyclohexanone, respectively, produces, in addition to drop in output of inorg. sulphates, a sharp rise in excretion of glucuronates.

Fluorescence analysis of human urine. W. Koschra, S. von der Selpen, and P. A. Aldred (*Z. physiol. Chem.*, 1939, **262**, 158—167).—Human urine by treatment with C and elution of the C with hot dil. NaOH affords solutions, the fluorescence of which is regarded as a rough measure of the uropterin content. Fluorescence measurements of the C eluates of normal and pathological urines are recorded. The fluorescence, *i.e.*, the uropterin content, of urine may be a measure of the oxidative N metabolism. J. H. B.

Study of excretion of organic antimonials using a polarographic procedure. L. G. Goodwin and J. E. Page (*Biochem. J.*, 1943, **37**, 198—209).—The rates of urinary excretion of org. Sb^{III} and Sb^V compounds after injection into mice and man are reported. 30—40% of stibophen and Sb^V compounds is excreted in 1—2 hr. after injection into mice. Thereafter the rate of excretion is slower and there is a slow reduction of Na Sb^V gluconate to Sb^{III}. Human subjects excrete Na Sb^V gluconate more rapidly than stibophen. There is no measurable Sb in blood 3 hr. after injection. Sb^{III} was recovered from the livers of injected animals. R. L. E.

XVI.—OTHER ORGANS, TISSUES, AND BODY-FLUIDS.

Bridgeheads of child health in five ages of childhood. C. McNeil (*Brit. Med. J.*, 1943, I, 715—717).—A review. I. C.

Importance of post-mortem examination of foetus and newly-born infant. E. I. Potter (*Amer. J. clin. Path.*, 1943, **13**, 133—138).—A lecture. C. J. C. B.

Medico-legal necropsy. A. R. Moritz (*Amer. J. clin. Path.*, 1943, **13**, 123—126).—A lecture. C. J. C. B.

Examination and preservation of non-medical scientific evidence acquired incident to conduct of a medico-legal postmortem examination. J. T. Walker (*Amer. J. clin. Path.*, 1943, **13**, 127—132).—A lecture. C. J. C. B.

Nature of the insoluble sodium of bone. Adsorption of sodium at 40° by bone, dentin, enamel, and hydroxyapatite as shown by the radioactive isotope. H. C. Hodge, W. F. Koss, J. T. Ginn, M. Falkenheim, E. Gavett, R. C. Fowler, I. Thomas, J. F. Bonner, and G. Dessauer (*J. Biol. Chem.*, 1943, **148**, 321—331).—Bone, dentin, and enamel take up Na from solutions of NaCl containing radioactive Na, the uptake of each tissue being described by the Freundlich adsorption isotherm. Synthetic hydroxyapatite yields a similar adsorption isotherm, suggesting that the adsorption of Na in the calcified tissues takes place at the surface of the mineral ultimate crystals. The amounts of Na adsorbed (bone > dentin > enamel) are in the order of increasing crystal size and therefore of decreasing surface area of the ultimate crystals. The adsorbing power of bone is great enough to account for the Na present *in vivo* but this does not necessarily prove that the bone-Na is adsorbed *in vivo*. J. E. P.

Significance of streaming in the formation of connective tissue fibres. L. Kantor (*Magyar Orv. Arch.*, 1941, **42**, 264—268).—Salt solution was allowed to stream through drops of collagen solution adhering to perforated mica plates. Argyrophil fibres were formed along the lines of streaming. M. A. B.

New method of grafting. P. Gabarro (*Brit. Med. J.*, 1943, I, 723—724).—A graft of desired thickness and $\frac{1}{2}$ — $\frac{1}{3}$ of the raw area to be covered is cut from the donor area. It is placed on stiff sticky paper and skin and paper are cut in strips as thin as convenient. The strips are again placed on the same type of paper at the distance desired and cut at right angles to the first series of strips. In this way strips of paper with square grafts are obtained and these can be arranged in any desired shape. The advantages of the new method are described. I. C.

Permeability of the intestinal epithelium and the tubular epithelium of the kidney. H. Gordon and T. Csáky (*Magyar Orv. Arch.*, 1941, **42**, 245—250).—By the dye method of Chambers and Gordon it was shown that in both types of cell the side nearer the lumen was less permeable than the side towards the basal tissue, and that the permeability of corresponding sides of the two types of cells was of the same order, in air at room temp., at 1—2°, and in N₂. M. A. B.

Is urticaria pigmentosa a form of nævus? E. Földes (*Magyar Orv. Arch.*, 1941, **42**, 208—224).—The first stage in urticaria pigmentosa is the formation of the weal due to changes in the capillary walls. Invasion by leucocytes occurs, and the melanin content of the epithelium increases, after an erythematous pre-stage, and

decreases again after the eruption has ceased. Pigmentation is never followed by a navoidal change in the epithelial cells. In nævus, increased pigmentation is the first stage. In the dormant condition of urticaria the connective tissue shows a picture of chronic inflammation with infiltrating mast cells. During weal formation the mast cells are replaced by leucocytes. M. A. B.

Control of fish chromatophores. I, II. E. F. B. Fries (*Biol. Bull.*, 1942, **82**, 261—272, 273—283).—I. Denervation experiments suggest that the xanthophores of *Fundulus* are controlled by dispersing and concentrating autonomic nerves, acting by neurohumours which may spread by cellular transmission to neighbouring xanthophores. There is probably also a humoral mechanism, with antagonistic dispersing (pituitary) and concentrating (adrenaline?) secretions.

II. Background-matching experiments on *Gobius minutus*, *Labrus ossifagus*, and *Pleuronectes platessa* confirm that erythro- phores, xanthophores, and melanophores may act independently of each other. Denervation experiments suggest double antagonistic innervation, at least of the melanophores and erythro- phores of the goby. G. P. W.

Tissue pigments of cephalopod molluscs. D. L. Fox and S. C. Crane (*Biol. Bull.*, 1942, **82**, 284—291).—The distribution of melanins, flavins, and carotenoids in *Paroctopus bimaculatus* and *Loligo opalescens* is described. There is also a water-sol., Fe-containing red pigment with reducing properties in the octopus kidney. G. P. W.

Factors influencing coloration of grasshopper, *Melanoplus bivittatus*, Say. J. M. Grayson (*Iowa State Coll. J. Sci.*, 1942, **17**, 69—70).—The two distinct colours of the two types of adult *M. bivittatus* are due mainly to carotene together with traces of another pigment of xanthophyll character. The female and male bodies without the alimentary canals contain 0.0436 and 0.0397 mg. per g. of carotene, respectively, whilst the reproductive organs and surrounding fatty tissue contain 0.266 mg. per g. Nymphs reared at low temp. possess more black pigment than those reared at high temp., but with the latter there is a trend towards production of dark-phase adults. Similarly nymphs reared under crowded conditions contain more black pigment than those reared singly. No significant differences in coloration of nymphs or adults occur when nymphs are reared in different humidities in absence of light, or under various coloured lights. When typical males and females of each colour type are mated, the results in the *F*₁ generation show that the colour type of the parent may be a factor in the determination of the adult coloration of the offspring. J. N. A.

Potassium effects, tension effects, and accommodation in an Annelid rhythmic preparation. G. P. Wells and I. C. Ledingham (*J. Exp. Biol.*, 1942, **19**, 176—185).—Experiments on the "isolated ex- pert" of *Arenicola marina* are described. G. P. W.

Response of the larvae of the Black Sea *Teredo navalis*, L., to different water temperatures. G. A. Bulatov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **32**, 291—292).—*Teredo* larvae become immobile at 10—12° and again at above 30—35° and gradually die. Temp. above 35° and below 12° are lethal. The optimum for development is between 20° and 30°. M. A. B.

Excitation of nematocysts. C. F. A. Pantin (*J. Exp. Biol.*, 1942, **19**, 294—310).—In *Anemonia sulcata*, the cnidoblasts are independent effectors. The primary stimulus for discharge is mechanical contact, but the cells are greatly sensitised thereto by a substance, probably a surface-active lipin, in the food. G. P. W.

Development of larvæ of *Trichinella spiralis* in roller tube tissue cultures. T. H. Weller (*Amer. J. Path.*, 1943, **19**, 503—511).—(8 photomicrographs.) C. J. C. B.

Amino-acid composition of animal tissue protein. E. F. Beach, B. Munks, and A. Robinson (*J. Biol. Chem.*, 1943, **148**, 431—439).—The proportion of 10 amino-acids in the proteins of 10 muscle (mammal, bird, fish, and reptile) and 6 ox organ tissues are tabulated. All the muscle tissues are similar, but the ox organ proteins differ more. R. L. E.

Mercury content of human organism. XXX. Effect and distribution of mercury. A. Stock (*Biochem. Z.*, 1940, **304**, 73—80; cf. A., 1940, I, 131).—Data are given for the amount of Hg in 29 human tissues and organs. Normal persons, similarly to animals and plants, contain 0.1—1.0 µg. of Hg per 100 g. of fresh tissue. Persons with amalgam teeth fillings contain considerably greater amounts. Hg is accumulated mainly in the kidneys, and in smaller amount in the liver. A considerable amount is present in the pituitary, and the significance of this in clinical medicine is discussed. J. N. A.

Biogeochemistry of aluminium and related elements. G. E. Hutchinson (*Quart. Rev. Biol.*, 1943, **18**, 1—45, 128—153).—A comprehensive review of the distribution and biological significance of the non-radioactive metals (especially Al, Ga, and Sc) of group III of the periodic table. J. D. B.

XVII.—TUMOURS.

Rate and periodicity of mitotic activity of experimental epidermoid carcinoma in mice. C. M. Blumenfeld (*Arch. Path.*, 1943, 35, 667—673).—Mitotic activity in the cancers showed no diurnal rhythm but remained at a const. level throughout the day and night. Mitotic activity in the normal epidermis showed the characteristic diurnal rhythm. The rate of mitotic activity in carcinoma was no greater than the max. rate in an equal vol. of normal epidermis. C. J. C. B.

Distribution of radioactive dyes in tumour-bearing mice. F. D. Moore, L. H. Tobin, and J. C. Aub (*J. clin. Invest.*, 1943, 22, 161—168).—Radioactive dibromo-trypan-blue and radioactive dibromo-Evans-blue were injected into tumour-bearing mice. Subsequent quant. measurement of the distribution of the radioactive colloidal dye showed a widespread gradual uptake from the blood stream by many tissues and organs. Large amounts of dye are excreted in the bile and faeces in the first 24 hr. following injection. The uptake of dye by tumours thus is not as selective as when judged by tinctorial methods alone. Possible therapeutic effectiveness of a radioactive colloid would be increased by agents producing tumour necrosis. C. J. C. B.

Influence of vitamin-B₆ and pantothenic acid on growth of sarcoma 180. F. Bischoff, L. P. Ingraham, and J. J. Rupp (*Arch. Path.*, 1943, 35, 713—716).—The maintenance of 122 Marsh-Buffalo mice on a synthetic diet containing B-vitamins other than -B₆ decreased the rate of tumour growth; this disappeared on addition of -B₆. Pantothenic acid did not influence the rate of tumour growth in 31 additional mice. In 30 mice, the addition of -B₆ to a diet otherwise completely deficient in the -B complex increased tumour growth. C. J. C. B.

Acetylcholine-esterase content of brain tumours. K. A. Youngstrom, B. Woodhall, and R. W. Graves (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 555—557).—Esterase content is expressed as mg. of acetylcholine iodide hydrolysed by 100 mg. of dry tissue in 1 hr. at 37° and pH 7.61. In 8 specimens of astrocytoma and astroblastoma this val. averaged 18.8. In 21 specimens of glioblastoma it averaged 5.2, and in all other tumours was much smaller. V. J. W.

Effect of mercury indigodisulphonate on breast cancer of mice. J. E. Davis (*Canad. Med. Assoc. J.*, 1943, 48, 443—444).—The drug was given orally or by injection into the tumour; in many cases retrogression, total or partial, occurred. C. J. C. B.

Orchidectomy for carcinoma of prostate. E. P. Alyea and A. F. Henderson (*J. Amer. Med. Assoc.*, 1942, 120, 1099—1102).—40 patients with carcinoma of the prostate were castrated. Immediate results in all cases included relief of urinary obstruction and metastatic pain, regression of the tumour, lowering of serum-acid phosphatase, and X-ray signs of healing of bone and lung metastases. Stilbesterol produced similar but less marked effects. The cases have not been followed for more than 1 year. C. A. K.

Orchidectomy for prostatic carcinoma. R. M. Nesbit and R. H. Cummings (*J. Amer. Med. Assoc.*, 1942, 120, 1109—1111).—75 cases of prostatic carcinoma were castrated and observed for at least 6 months. 48 cases were objectively and subjectively improved, 20 were failures. Preoperative serum-acid phosphatase levels were raised in 11 of 28 cases. C. A. K.

Serum-acid phosphatase in prostatic carcinoma. A. B. Gutman (*J. Amer. Med. Assoc.*, 1942, 120, 1112—1116).—A review. C. A. K.

Hormonal therapy of prostatic carcinoma. W. P. Herbst (*J. Amer. Med. Assoc.*, 1942, 120, 1116—1122).—A review, with case illustrations, of the beneficial effects of oestrogens on prostatic carcinoma. C. A. K.

Surgical treatment of [malignant] prostatic disease. C. C. Higgins (*Cleveland Clin. Quart.*, 1942, 9, 178—184).—Double orchidectomy with or without transurethral prostate resection is recommended for advanced malignant prostatic neoplasms when perineal prostatectomy is impossible due to the extent of the disease. A. S.

Histological changes in carcinoma of prostate following resection and use of stilbesterol. E. R. Hall (*Canad. Med. Assoc. J.*, 1943, 48, 441—442).—A patient with carcinoma of the prostate was given 5 mg. of stilbesterol daily (total 1000 mg.); resection of prostatic tissue for histological study was then performed. These sections, in comparison with those removed previously, showed that the carcinoma cells, though still present, were scattered and fewer, also mostly swollen and distorted. C. J. C. B.

Incidence and nature of tumours in ectopic testes. J. B. Gilbert and J. B. Hamilton (*Surg. Gynec. Obstet.*, 1940, 71, 731—743).—Analysis of 841 cases. P. C. W.

Mesotheliomas of uterine and tubal serosa and tunica vaginalis testis. N. Evans (*Amer. J. Path.*, 1943, 19, 461—467).—Report of 4 cases. (4 photomicrographs.) C. J. C. B.

Myoepithelial proliferations in human breast. J. F. Kuzma (*Amer. J. Path.*, 1943, 19, 473—482).—Myoepithelial cells of the mammary gland possess the faculty of proliferation, either alone or in conjunction with the usual epithelium, especially in breasts showing mastopathia cystica and fibroadenomatosis. Proliferations of the myoepithelial cells are benign as long as they retain the characteristics of their epithelial ancestry but may become malignant when forming derivatives of the type usually ascribed to mesoderm. (10 photomicrographs.) C. J. C. B.

Adenosis of vagina and its relation to primary adenocarcinoma of vagina. A. Plaut and M. L. Dreyfuss (*Surg. Gynec. Obstet.*, 1940, 71, 756—765). P. C. W.

Occurrence of protozoan-like cells in biopsy from anus. P. H. Hartz and F. R. van de Stadt (*Amer. J. Clin. Path.*, 1943, 13, 148—153).—The occurrence of protozoan-like cells in a small tumour, removed from the anal region, is described. The cells were confined to a small area and were most frequently found in the subendothelial layer of small blood vessels. Transitional forms between normal connective tissue and protozoan-like cells could be demonstrated. (8 photomicrographs.) C. J. C. B.

Benign and malignant cystic tumours of appendix. R. Woodruff and J. R. McDonald (*Surg. Gynec. Obstet.*, 1940, 71, 750—755).—Among 43,000 appendices examined there were 146 benign cysts and 10 grade I adenocarcinoma. These cases are discussed. P. C. W.

Differentiation of benign from malignant polyploid bronchial tumours. H. Grunn and A. Goldman (*Surg. Gynec. Obstet.*, 1940, 71, 703—722). P. C. W.

Pneumonectomy for bronchiogenic carcinoma. P. C. Samson and E. F. Holman (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 275—283).—Report of 5 cases with 1 operative death. P. C. W.

Primary bronchial carcinoma at age of 4 years 4 months. C. E. Field and J. P. Quilliam (*Brit. Med. J.*, 1943, 1, 691—693).—A case of anaplastic carcinoma of the bronchus with extensive pleural involvement and metastases in the bronchial, mediastinal, right supraclavicular, axillary, and coeliac axis lymph glands is described. I. C.

Rhabdomyosarcoma and other myocardial tumours. C. P. Larson and W. L. Lidbeck (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 151—153).—2 cases of rhabdomyosarcoma and 2 of metastatic myocardial tumours are reported. P. C. W.

Clinical significance of neurofibromatosis (von Recklinghausen's disease). D. Trueblood (*West. J. Surg. Obstet. Gynec.*, 1940, 48, 134—145).—7 cases are reported. P. C. W.

Blood and lymph vessel tumours. W. L. Watson (*Surg. Gynec. Obstet.*, 1940, 71, 569—589).—Analysis and discussion of 1056 cases. P. C. W.

Tumours of sebaceous glands. S. Warren and W. N. Warvi (*Amer. J. Path.*, 1943, 19, 441—458).—A review and report of 34 personal cases. (4 photomicrographs.) C. J. C. B.

XVIII.—NUTRITION AND VITAMINS.

Assessing physical condition of children. Simple malnutrition: problem of failing growth and development. N. C. Wetzel (*J. Pediat.*, 1943, 22, 208—225).—Malnutrition among school age children is essentially a problem of failing growth and development and may be best assessed by the grid method. C. J. C. B.

Relation of maternal diet to breast feeding. J. H. Ebbs and H. Kelley (*Arch. Dis. Child.*, 1942, 17, 212—216).—The incidence of breast feeding in 3 groups of low-income class mothers was compared. The groups supplied with extra food or educated to provide a good prenatal diet were more successful in nursing their infants than mothers on poor prenatal diets. There was a decrease in the % of breast-fed babies when extra food was stopped 6 weeks after the birth of the baby. C. J. C. B.

Incidence and mortality of breast- and artificially-fed infants admitted to hospital with infections. J. H. Ebbs and F. Mulligan (*Arch. Dis. Child.*, 1942, 17, 217—219).—Of 1500 infants under 1 year of age, admitted to the Hospital for Sick Children, Toronto, with infections, during 3½ years, there were fewer breast-fed than artificially-fed babies with infection. The incidence of breast feeding among 1500 admissions with infections was less than half the incidence of breast feeding in the well-baby clinics in the city. The incidence of gastro-intestinal infections was lower in the breast-fed babies. The % mortality was slightly higher in the breast-fed group. C. J. C. B.

Contribution of non-fat milk solids to nutritive value of wheat breads. H. H. Mitchell, T. S. Hamilton, and J. B. Shields [with J. R. Beadles] (*J. Nutrition*, 1943, 25, 585—603).—Small differences in the nutritive val. of experimental diets may be obscured and the effect of large differences exaggerated by the *ad lib.* method of feeding as compared with well-considered control of food intake by comparative experimental animals. Commercial baking produces only

slight destruction of thiamin and riboflavin. The growth-promoting and bone-calcifying vals. of bread from flour containing 6% of non-fat milk solids are superior to those from flour enriched with thiamin, riboflavin, and Fe. Enrichment of white bread containing skim-milk solids does not increase the growth-promoting properties but does induce a slightly greater concn. of blood-haemoglobin. It equals whole wheat bread as regards growth-promotion and haemoglobin production, gives bone calcification, and is superior to white bread supplemented to an equiv. extent with CaHPO_4 and riboflavin except in respect of the power of calcification. Skim-milk solids are superior to wheat milling residues and may increase the riboflavin content of white bread to that of whole wheat bread. Whole wheat as compared with patent white flour contains a substance which impairs Ca metabolism. The amount of nicotinic acid in the tissues of the growing rat depends on the growth irrespective of the intake but the thiamin concn. depends on the intake. Enrichment of white bread with skim milk solids is superior to that with thiamin, nicotinic acid, and Fe and will improve the nutritive val. of both enriched white and whole wheat bread. When a change in bread formula induces an increase in blood-haemoglobin a greater concn. of Fe in the whole body also occurs but the reverse is not always true.

H. G. R.

White, national, or wholemeal bread. J. D. Robertson (*Chem. and Ind.*, 1943, 293).—A reply to comments (cf. A., 1943, III, 573).

J. N. A.

Nation's food. VI. Fish as food. I. Biology of sea fisheries. R. S. Wimpenny (*Chem. and Ind.*, 1943, 230—233).—The "producer" plankton group consists of small floating algae and flagellates, e.g., diatoms, which grow in the upper photic layers only in an adequate concn. of nutrient salts. These, which are 2—50 μ . in diameter, form the food for the consumer organisms, which are approx. 0.5—50 mm. in diameter. The latter in turn provide food for post-larval food fishes, some adult food fishes, e.g., herring etc., and the Antarctic blue whale. Where plankton production is affected by a cyclical incursion of oceanic water, there is an extension of the fishable area and an increase in the landings of cod in the northern hemisphere. Concns. of both types of plankton much in excess of those occurring in nature (5×10^4) may be cultivated by addition of suitable nutrient salts (5×10^7). Diatoms, which elaborate fat, are more numerous towards the poles, and carbohydrate-forming flagellates thrive in warmer waters. The individual variation in fat content of the herring is greater at full than at the new moon.

P. G. M.

Nutritive value of dried testicle. A Scheunert and G. Krockert (*Biochem. Z.*, 1940, 303, 383—390).—Feeding experiments with young male and female rats show that bull's testicle (crude protein 69.8, fat 11.6, ash 8.1%) dried at 50°, if supplemented with Ca, is an adequate source of protein and vitamins for growth and reproduction.

W. McC.

Breeding records of rats fed certain diets containing meat. P. P. Swanson, W. E. Armstrong, and P. M. Nelson (*Iowa State College J. Sci.*, 1943, 17, 417—429).—Four groups of rats were maintained for up to 6 generations on supposedly adequate diets containing partially dehydrated canned autoclaved pork or beef muscle in proportions equiv. to 15 or 30% of protein. The 15% protein diets resulted in complete reproductive failure. The 30% pork-protein diet gave little improvement whereas 30% beef-protein allowed adequate reproductive function for 6 generations.

F. S.

Availability of proteins of Kiechow leafy vegetables. T. Y. Lo and C. H. Wu (*J. Chinese Chem. Soc.*, 1942, 9, 108—111).—The available protein in 24 vegetables determined by the method of Horwitz *et al.* (A., 1937, III, 238) is 15—33%.

A. T. P.

Biological value of mixed proteins in food in Royal Air Forces messes. T. F. Macrae, K. M. Henry, and S. K. Kon (*Biochem. J.*, 1943, 37, 225—230).—The biological vals. of the combined proteins of food at four R.A.F. stations were 77.6—81.2, although only approx. 40% of the total proteins were of animal origin. These high vals. appear to be due to a complementary effect. The corresponding true digestibility coeffs. were 83.5—86.3.

P. G. M.

Nutritive value of wheat-germ protein. E. L. Hove and C. G. Harrel (*Cereal Chem.*, 1943, 20, 141—148).—The biological val. of wheat-germ protein fed at a 10% level as determined by the Osborne-Mendel rat-growth method was comparable with that of casein, dry skim-milk, and boiled egg-white and 2½ times that of plant proteins in the "average American diet." When heat-processed for human consumption the biological val. was unaltered but the germ kept better.

N. L. K.

Dietary protein minimum. E. Rhyn and I. Abelin (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 45—47).—2 subjects were fed for 6½ years on a diet containing 30—35 g. of proteins per day (daily intake 1500—1600 calories). There were no significant alteration in blood chemistry. Both subjects are well.

A. S.

Amino-acids in human nutrition. W. C. Rose, W. J. Haines, J. E. Johnson, and D. T. Warner (*J. Biol. Chem.*, 1943, 148, 457—458).—Threonine, leucine, isoleucine, and phenylalanine are essential

for man. Removal of any of them from the diet causes a negative N balance. No such effect followed the removal of histidine, which is apparently not essential for maintenance of N equilibrium.

R. L. E.

Tryptophan deficiency in rats. Chemical and morphological changes in blood. A. A. Albanese, L. E. Holt, jun., C. N. Kajdi, and J. E. Frankston (*J. Biol. Chem.*, 1943, 148, 299—309).—A tryptophan-deficient diet reduces the concn. of plasma-proteins and haemoglobin of adult rats, which are normally higher than those of young animals. Rats on a restricted normal diet failed to grow, but the plasma-protein and haemoglobin levels were unaffected.

P. G. M.

Nitrogen balance in experimental tryptophan deficiency in man. L. E. Holt, jun., A. A. Albanese, J. E. Brumback, jun., C. Kajdi, and D. M. Wangerin (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 726—728).—4 normal male subjects, on a diet in which 90% of N was in the form of a tryptophan-free casein hydrolysate, had a negative N balance until tryptophan was added to the extent of 1.5% of the hydrolysate.

V. J. W.

Nitrogen balance in experimental lysine deficiency in man. A. A. Albanese, L. E. Holt, jun., J. E. Brumback, jun., M. Hayes, C. Kajdi, and D. M. Wangerin (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 728—730).—4 male and 1 female subjects, on a diet in which 90% of N was in the form of deaminated and acid-hydrolysed casein + 1.5% of tryptophan, had a negative N balance until either 6% of lysine or an enzymic digest of casein was given.

V. J. W.

Tyrosine poisoning in rats. W. C. Hueper and G. J. Martin (*Arch. Path.*, 1943, 35, 685—694).—Rats kept on a diet containing 10% of *l*-tyrosine show within 1—2 weeks purulent keratitis and swelling and redness of the feet and legs, and die within 5 weeks. They show degenerative necrotising and fibrosing changes of the pancreas, affecting primarily the exocrine tissue, but leading ultimately to extensive destruction of the exocrine and endocrine tissues. In the kidneys additional degenerative and necrotising lesions are found, resulting from excretion of a toxin. The arterioles of the brain, heart, lungs, and kidneys exhibit swelling and hyalinisation of the media associated with focal haemorrhages, necroses, and glia cell accumulations in the brain. (6 photomicrographs.)

C. J. C. B.

Relation of diet to composition of tissue phospholipins. I. Normal composition of liver and muscle lipins of the rat. Analytical procedures. II. Changes in tissue phospholipins induced by experimental diets. III. Effects of supplemented experimental diets on tissue phospholipins in rats of two age groups. C. Artom and W. H. Fishman (*J. Biol. Chem.*, 1943, 148, 405—414, 415—422, 423—430).—I. Methods are described for the determination of total lipins, non-choline and choline phospholipins, sphingomyelins, non-phospholipin fatty acids, and unsaponifiable matter on small tissue samples. Vals. for normal rat liver and muscle are given. Total, non-choline, and choline phospholipins show little variation, particularly when based on the fat-free tissue; fatty acids and unsaponifiable matter vary more.

II. The choline-containing liver lipins of rats on diets, believed complete, containing 5, 10, and 30% of casein as the only protein fall to a min. after 12 days, and then tend to rise slightly. The non-choline phospholipins of liver vary on these diets, and skeletal muscle phospholipins remain normal. Fat accumulates in the muscle and liver of rats on the 5 and 10% but not on the 30% casein diet.

III. The fall in choline-containing liver lipins of 2—3-month-old rats on casein diets is not prevented by doses of choline sufficient to prevent fatty infiltration. Ethanolamine, *dl*-serine, glycine, *l*-cystine, and *dl*-methionine are also ineffective. The fall in choline-containing phospholipins occurs in newly weaned rats on casein diets, but is prevented by feeding choline. The possible effect of other factors is discussed.

R. L. E.

Meat in nutrition. XXI. Distribution and partition of fats in tissues of rats fed a diet containing dried autoclaved pork muscle. E. B. Wilcox (*Iowa State Coll. J. Sci.*, 1942, 17, 158—160). Feeding a supposedly adequate diet containing dried, autoclaved pork muscle to rats consistently produces a pregnancy disorder at parturition in approx. 33% of the animals maintained on the ration. A fatty yellow liver is a characteristic finding at necropsy. When the same diet is fed to virgin rats, there is no change in the wt. or moisture content of the liver, but there is an increase in the amount of total lipins. In the gravid pork-fed rat, enlargement of the liver occurs, and there is greater dehydration of tissue and deposition of fat than in normal pregnant animals. The pork diet causes an accumulation of neutral fat in the liver of pregnant rats, and whilst there is no significant change in the amounts of phospholipin and total cholesterol, a significant decrease in the amount of free cholesterol is accompanied by approx. the same increase in the amount of esterified cholesterol. The concns. of total fatty acids, phospholipins, and total cholesterol in the plasma of pregnant controls are twice those in the plasma of gravid rats on the pork diet. It is concluded that metabolism of fat is altered in the pregnant rat on a pork diet, but that the development of a fatty liver is not a basic cause of the pregnancy disorder.

J. N. A.

Calcium and phosphorus requirements of premature infants. H. R. Benjamin, H. H. Gordon, and E. Marples (*Amer. J. dis. Child.*, 1943, **65**, 412—425).—The retention of Ca and P by 3 premature infants fed on human milk was compared with 3 fed on a cow's milk prep. The infants retained more of the intake of both minerals than full-term infants. The degree of utilisation of Ca of cow's milk was greater than of human milk, because of the lack of P in the latter. Mineral retention with a diet of human milk supplemented with vitamin-D did not meet even the lowest calc. requirement. Retentions by premature infants on cow's milk were sufficient to insure normal calcification at 1 year. Since retention of P by the premature infants showed the expected relationship to retention of Ca and N, the conclusions concerning the Ca requirement are equally applicable to the P requirement. C. J. C. B.

Molybdenum in nutrition of rat. J. D. Teresi, C. A. Elvehjem, and E. B. Hart (*Amer. J. Physiol.*, 1942, **137**, 504—508).—A colorimetric method for determining Mo in biological fluid is described. Cow's milk contains 3 times as much Mo as goat's milk. Mo (as Na molybdate) is poorly absorbed by young rats; absorption of 0.5 µg. daily satisfies growth requirements. M. W. G.

Teart pastures of Somerset. IV. Effect of continuous administration of copper sulphate to dairy cows. W. S. Ferguson (*J. Agric. Sci.*, 1943, **33**, 116—118; cf. B., 1943, III, 94).—Six dairy cows receiving 2 g. of CuSO₄ daily remained in perfect health. The blood-Cu content increased by 73% in 10 weeks and 133% in 18 weeks. R. H. H.

Bodily store of vitamin-A as influenced by age and by food. A. B. Rohrer and H. C. Sherman (*J. Nutrition*, 1943, **25**, 605—609).—The vitamin-A content of rat's liver increases as the dietary -A is increased from 3 to 12 i.u. per g. of air-dried food for both 30- and 60-day-old animals. No difference is observed between the two age groups on the lower level but storage in the liver continues during the second 30 days at the higher levels of intake. The skeletal muscles exhibit similar but less marked differences. H. G. R.

Spectrophotometric studies of the storage of vitamin-A in the body. R. W. Little, A. W. Thomas, and H. C. Sherman (*J. Biol. Chem.*, 1943, **148**, 441—443).—The concns. of vitamin-A in the liver tissues of rats maintained to the ages of 30, 90, and 150 days on family dietaries containing 3, 6, and 12 i.u. of -A per g. respectively were studied, using a new spectrophotometric method. The higher levels of nutritional intake supported greater concns. of -A in the liver and enabled the body to continue to increase its store of this vitamin to higher ages. J. E. P.

Vernix caseosa: manifestation of vitamin-A deficiency. J. V. Straumfjord (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 341—351).—The incidence of vernix caseosa was reduced by administration of vitamin-A to pregnant women. Scrapings of the skin of adults with follicular keratosis and xerosis when immersed in amniotic fluid for 2 weeks or more had the histological appearance of vernix caseosa. (128 refs.) P. C. W.

Vitamin-A concentration in rat liver during recovery from carbon tetrachloride cirrhosis. C. Haig and J. Post (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 710—714).—In rats which had recovered from cirrhosis, 3 months after stopping of CCl₄ injections, vitamin-A concn. in liver was 12.5 i.u. per g. as against 26.9 i.u. in controls. V. J. W.

Vitamin-A content and toxicity of bear and seal liver. K. Rodahl and T. Moore (*Biochem. J.*, 1943, **37**, 166—168).—The toxic effect of polar bear and seal liver on man is probably due to hypervitaminosis. Bear liver (3 specimens) had 13,000—18,000 i.u., and seal liver (1 specimen) 13,000 i.u. of vitamin-A per g. Small doses of the liver had no effect on rats, but a large dose (33 g. in 3 weeks) was fatal. R. L. E.

Vitamin-A content of some green vegetable leaves. A. Scheunert and K. H. Wagner (*Biochem. Z.*, 1940, **304**, 42—48).—By bio-assay (rats) chervil contains 10,000, green leek leaves 6650, kohlrabi leaves 10,000, and cauliflower leaves 13,300 i.u. of vitamin-A per 100 g. of fresh tissue. Cauliflower itself contains practically no -A. J. N. A.

Carotene content of Chinese fruits and vegetables. T. H. Kwoh, C. H. Lee, and T. P. Sun (*J. Chinese Chem. Soc.*, 1941, **8**, 54—59).—The carotene contents of 16 fruits and vegetables are given. Celery, *Ipomoea aquatica* leaves, and green amaranth are very rich sources. A. Li.

Biological determination of small vitamin-A concentrations. E. A. Zeller (*Verh. Ver. Schweiz. Physiol.*, 1940, **17**, 24—26). A. S.

Micro-determination of vitamin-A and carotenes. F. Urban, B. Milder, and C. Carruthers (*Biochem. J.*, 1943, **37**, 295—298).—A micro-method for determination of vitamin-A by the Carr-Price reaction is described. Under appropriate conditions it can be used for the simultaneous and mutually independent determination of -A and β-carotene in the same sample. The instrument used is a modified photo-electric colorimeter. After the beam of light

has traversed the sample (Carr-Price reaction) it is split into two beams which pass through 620- and 589-mµ. filters respectively before they reach two recording photocells. The beams must be nearly monochromatic, and the temp. of the apparatus and room must be near 0°. At room temp. only -A is determined because the 589-mµ. band of β-carotene fades in a few sec. J. N. A.

Determination of carotene and vitamin-A in butter.—See B., 1943, III, 183.

Anhydro- (cyclised) -vitamin-A.—See A., 1943, II, 257.

Kitol, a new provitamin-A.—See A., 1943, II, 262.

Water-soluble vitamins. C. A. Elvehjem (*J. Amer. Med. Assoc.*, 1942, **120**, 1388—1397).—A review. C. A. K.

Vitamins and prevention of colds. D. W. Cowan, H. S. Diehl, and A. B. Baker (*J. Amer. Med. Assoc.*, 1942, **120**, 1268—1271).—The effects of administration of vitamin-C alone, or -A, -B₁, -B₂, -C, -D, and nicotinic acid together, on the frequency and severity of colds, were studied in several hundred students who were presumably on adequate diets. A 60—65% reduction in the no. of colds occurred in both treated subjects and controls who were given placebo tablets indistinguishable from those containing vitamins. C. A. K.

Inadequacy for mice of synthetic diet supplemented with all known vitamin-B factors. E. Troeschler-Elam and H. M. Evans (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 549—555).—On the diet described body wt. was maintained but the mice developed a rough coat and occasional alopecia. Improvement resulted from addition to diet of liver, but none from pimepic acid. V. J. W.

Influence of vitamin-B₁ on the adrenaline content of the adrenals and of blood. E. Sárfy (*Z. physiol. Chem.*, 1939, **262**, 87—94).—In pigeons deprived of vitamin-B₁ there is at first a small increase of the adrenaline content of the adrenals and a decrease in the blood; in the later stages the amount in the adrenals is lowered, that in the blood increased. The adrenaline content of the adrenals shows similar behaviour in rats with beri-beri. On increasing the -B₁ dose for pigeons there is first a decrease followed by return to normal in the adrenaline of the adrenals and an increase in the blood which persists. J. H. B.

Effect of vitamin-B₁ on survival time after hæmorrhage and application of cold. W. d'A. Maycock (*Quart. J. Exp. Physiol.*, 1943, **32**, 29—34; cf. Govier and Greer, A., 1941, III, 1049).—In rabbits, survival rate after bleeding and applying cold to the intestines is not increased by intravenous injection of vitamin-B₁ or, 3 hr. after bleeding, by transfusion of blood equiv. to half of that removed. W. McC.

Glycogen content of the liver of B₁-avitaminotic rats. V. S. Hermann (*Z. physiol. Chem.*, 1939, **262**, 95—102).—In white rats deprived of vitamin-B₁ the liver-glycogen rises in the early stages, then falls to normal, and finally sinks to a very low level. J. H. B.

Inactivation of aneurin by the fresh-fish or Chastek-paralysis factor. R. R. Sealock, A. H. Livermore, and C. A. Evans (*J. Amer. Chem. Soc.*, 1943, **65**, 935—940).—The aneurin-destroying activity of fish tissues is determined by incubating them with aq. aneurin at pH 7.4 and 37.5° for 2 min., adding trichloroacetic acid, keeping, centrifuging, and determining colorimetrically the residual aneurin in the supernatant liquid. A unit of activity is defined as that amount which destroys 1 µ-mol. of aneurin in 5 ml. of 0.0005M. solution at pH 7.4 and 37.5°. The destructive principle is present in most of the viscera of carp, notably in the spleen, liver, pancreas, gastrointestinal, and gills. Active extracts are obtained as dry powders by pptn. by acetone. The solubility in dil. salt solutions, thermo-lability, and pptn. by protein precipitants indicate that the active principle is a protein. Its action is probably enzymic, since it is max. at pH 9.1 and 60°, is proportional to the amount used, and has first-order kinetics. R. S. C.

Thiamin in sweat. L. L. Hardt and E. U. Still (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 704—707).—In sweating induced by exercise after injection of 50 mg. of thiamin chloride, concn. of thiamin in sweat reached 4.5 mg. per l. Conc. in urine was 63 µg. per l. in these subjects, and 41 µg. in those who received no thiamin by mouth. V. J. W.

Excretion of ascorbic acid, thiamin, riboflavin, and pantothenic acid in sweat. D. M. Tennent and R. H. Silber (*J. Biol. Chem.*, 1943, **148**, 359—364).—Sweat (both thermal and induced by exercise) contained insignificant quantities of thiamin and of dehydro-ascorbic acid, and no ascorbic acid. The hourly excretion of riboflavin and pantothenic acid in sweat was 10 µg. and 24 µg. respectively. Only with pantothenic acid was the loss increased (to 50 µg. per hr.) by dosing the subject with large amounts of vitamins, although this greatly increased the amount excreted in the urine. Vitamin deficiency due to excessive sweating is unlikely. E. C. W.

Vitamin-B₁ and -B₂ content of dried wood-sugar yeast. A. Scheunert and K. H. Wagner (*Biochem. Z.*, 1940, **303**, 329—334; cf. A., 1940, III, 322).—The vitamin-B₁ and -B₂ (complex) contents of

dried yeast (*Torula utilis*) grown on media containing wood-sugar or its by-products are 5—8 and 13—20 i.u. per g., respectively.

W. McC.

Determination of stability of thiamin, nicotinic acid, and riboflavin in whisky over a six-month period. A. F. Novak and S. L. Adams (*Quart. J. Stud. Alcohol*, 1943, 3, 541—545).—Thiamin (0.65 mg. per pint), nicotinic acid (26 mg. per pint), and riboflavin (1.22 mg. per pint) were added to 3 samples of 86.8 proof whisky, and stored in daylight in clear or amber glass bottles or in darkness. Riboflavin was unstable in whisky, 50% disappearing within 2 months in the samples kept in darkness or in amber bottles, and within 1 week in the sample kept in the clear bottle. There was no loss of nicotinic acid or thiamin during 6 months in any case.

P. C. W.

Photometric determination of vitamin-B₁. G. G. Villela (*Rev. Brasil. Biol.*, 1942, 2, 67—71).—A new photometric technique is described.

I. C.

Assay of vitamin-B₁ in New Zealand materials by the thiochrome method. D. I. Allen (*J. Nutrition*, 1943, 25, 521—537).—The vitamin-B₁ content of a no. of cereal products has been determined. Whole wheat contains 4.3 and white flour 2.0 µg. per g. Breads made from 70, 80, and 100% extraction flour contain 1.28, 2.37, and 2.61 µg. per g. Oat and wheat porridge products are good sources of -B₁ and no difference is observed in the partially precooked material. The "ready-to-eat" cereals are poor sources of -B₁, most or all the vitamin being lost in processing. Urinary excretion of -B₁ in 24 hr. by normal subjects bears no relationship to the vol. of the urine. The daily excretion of home and college subjects on a diet adequate in -B₁ was 156 µg. whereas that of subjects residing in cheap lodgings receiving -B₁ insufficient for min. requirements was 90 µg.

H. G. R.

Phycomyces test of vitamin-B₁ determination and its clinical use. E. Deutsch (*Schweiz. med. Wschr.*, 1942, 72, 895—900).—The phycomyces growth test is sp. for vitamin-B₁ and cocarboxylase. Addition of 20 µg. of lactoflavin, -B₆, nicotinamide, P.P. factor, -C, or -P to the culture medium did not produce growth. Between aneurin concn. of 0.1 and 0.3 µg. growth depends only on the -B₁ content and not on the N content of the culture medium. In blood -B₁ determination, growth is not influenced by the N or mineral contents of the blood, nor by Na citrate or heparin. Normal vals. of blood-B₁ were 9—16 µg.-%; 3—10% of the total blood-B₁ was in the plasma. A decreased blood-B₁ was found in diseases of the nervous system, severe cardiac diseases, and cirrhosis of the liver; in these conditions more aneurin was found in the plasma than normal.

A. S.

Visual method for vitamin-B₁ assay in flour.—See B., 1943, III, 184.

Chemical determination of thiamin in pharmaceutical preparations.—See B., 1943, III, 191.

Aneurin pyrophosphate as catalyst of acetylations. A. Jung and M. Ritter (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 25—26). A. S.

Effects of inanition and riboflavin deficiency on blood picture of the rat. C. F. Shukers and P. L. Day (*J. Nutrition*, 1943, 25, 511—520).—Rats fed on a riboflavin-deficient diet exhibit a leucopenia with a relative and abs. decrease in lymphocytes which occur prior to the changes in the lens and cornea of the eye. A relative increase in neutrophils occurs after 3—4 weeks and some animals become anemic after 12—14 weeks. Similar changes in the no. and distribution of the leucocytes occur in the inanition controls (rats receiving adequate riboflavin but the basal diet intake restricted to amounts approx. equiv. to those eaten by the deficient animals). Total leucocyte counts were usually lower than in the deficient animals but no cataract was observed and a transient keratitis found only in one animal. It is concluded that the changes in the no. and distribution of the leucocytes in rats on a riboflavin-deficient diet are due to inanition.

H. G. R.

Celiac disease with ariboflavinosis. R. B. McMillan (*Edinb. Med. J.*, 1943, 50, 321—331).—A description of a long-standing case in a female of 36. Deficiencies of hæmopoietic principle, thiamin, riboflavin, ascorbic acid, and possibly vitamin-K were detected. The dermatosis was ascribed to pyridoxine deficiency.

H. S.

Microbiological assay of riboflavin. Influence of inorganic constituents and unknown growth factors. F. W. Chattaway, F. C. Happold, and M. Sandford (*Biochem. J.*, 1943, 37, 298—302).—Production of acid by *Lactobacillus casei* ϵ in presence of riboflavin is altered by variations in the amounts of Fe⁺⁺, Ca⁺⁺, K⁺, PO₄^{'''}, and NaCl in the basal medium. Optimum concns. for these constituents are determined. Further increases in the concn. of Fe⁺⁺, K⁺, PO₄^{'''}, and NaCl do not cause a great decrease in acid production, but further addition of Ca⁺⁺ results in a serious decrease in the amount of acid. A liver eluate which is free from riboflavin is added to the basal medium. The bearing of the results on the microbiological assay of riboflavin in foodstuffs is discussed.

J. N. A.

Beriberi heart in 4-month-old infant. H. Rascoff (*J. Amer. Med. Assoc.*, 1942, 120, 1292—1293).—Case report.

C. A. K.

Biological assay of pyridoxine (vitamin-B₆). M. F. Clarke and M. Lechycka (*J. Nutrition*, 1943, 25, 571—584).—A diet supplemented with pure vitamins and biotin suitable for pyridoxine assay in rats is described. The depletion period is prolonged until the growth rate is very slow and the animals exhibit any one symptom of pyridoxine deficiency. The characteristic symptoms are those of the ears, paws, and mouth (Supplee *et al.*, A., 1941, III, 26) and tail symptoms similar to those described by McElroy and Goss (A., 1941, III, 286). The dose-response curves are linear for doses of 1—8 µg. when the log of the dose is plotted against the gain in wt. in 4 weeks, the slope of the curve for females being slightly less than that for males.

H. G. R.

Nicotinic acid for prevention of infectious swine enteritis. B. H. Edgington, W. L. Robison, W. Burroughs, and R. M. Bethke (*J. Amer. Vet. Med. Assoc.*, 1942, 101, 103—108).—140 pigs were artificially infected by feeding cultures of *Salmonella cholerae suis*; nicotinic acid did not protect against necrotic enteritis.

E. G. W.

Symmetrical skin disease in adrenalectomised rats cured by cozymase and nicotinamide. L. Laszt (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 4).—The dermatitis was cured within 3—6 weeks by daily intraperitoneal injections of 5—10 mg. of nicotinamide and 4 c.c. of 1% NaCl by mouth. Quicker success was obtained by local application of 1% nicotinamide. The condition was also cured by daily ingestion of 2 mg. of cozymase. Lactoflavin was ineffective.

A. S.

Synthesis of vitamin-B₆.—See A., 1943, II, 276.

Direct determination of nicotinamide in vitamin mixtures. F. W. Lamb (*Ind. Eng. Chem. [Anal.]*, 1943, 15, 352—355).—The solution of the vitamin mixture is treated with aniline-cyanogen bromide, the time reaction measurements of the colours produced forming the basis of the method. The relationship between max. extinction coeff. and time for their development is characteristic for nicotinic acid and nicotinamide as well as for pyridine and β -picoline. Results obtained are reproducible to within $\pm 2\%$ for the direct determination of either nicotinic acid or nicotinamide.

J. D. R.

Chemical differentiation between nicotinamide and nicotinic acid in pharmaceutical products. D. Melnick and B. L. Oser (*Ind. Eng. Chem. [Anal.]*, 1943, 15, 355—356).—The photometric density of the colour produced with cyanogen bromide-aniline is measured before hydrolysis (coloration due to nicotinamide) and after hydrolysis (nicotinic acid plus nicotinamide). Readings of photometric density are taken periodically by photoelectric colorimeter, and the max. const. vals. are used.

J. D. R.

Differentiation of nicotinic acid and nicotinamide in the microbiological assay procedure.—See A., 1943, II, 288.

Use of oxidising agents in removal of interfering compounds in determination of nicotinic acid.—See B., 1943, III, 181.

Pantothenic acid. Optical rotation as a measure of stability.—See A., 1943, II, 287.

Rôle of "folic acid" and biotin in nutrition of the rat. A. D. Welch and L. D. Wright [with K. L. Sprague] (*J. Nutrition*, 1943, 25, 555—570).—The inhibition of growth and increase in prothrombin time caused by the addition of succinylsulphathiazole to otherwise adequate synthetic diets may be largely overcome by the supplements of a "folic acid" concentrate and cryst. biotin. These substances also have a slight activity when administered singly probably due to promotion of bacterial synthetic activity. No gross histological changes were observed in rats given succinylsulphathiazole either with or without inositol and *p*-aminobenzoic acid. The following substances were inactive: glutamine, indolyl-3-acetic, anthranilic, and chondroitinsulphuric acids, gum arabic, Ca gluconate, and adenine. Proteose-peptone and dried grass were both highly active and the properties of the effective material in the latter indicate the presence of "folic acid."

H. G. R.

Microbiological assay of *p*-aminobenzoic acid. R. C. Thompson, E. R. Isbell, and H. K. Mitchell (*J. Biol. Chem.*, 1943, 148, 281—287).—The accuracy of the method described is $\pm 15\%$. It depends on the amount of growth of a mutant strain of *Neurospora crassa* on an agar medium containing the material to be assayed. The determination of "bound" *p*-aminobenzoic acid, after hydrolysis with 6N-H₂SO₄, is also described. The 15% destruction of the acid occurring during hydrolysis is not significant. Vals. are given for the amounts present in various foodstuffs and animal tissues.

P. G. M.

New members of the B complex: their nutritional significance. C. A. Elvehjem (*Chem. Eng. News*, 1943, 21, 853—857).—A review.

Reticuloendothelial system and vitamin-C storage after adrenalectomy. G. Wolf-Heidegger (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 20—21).—The reticuloendothelial system of the normal rat's liver does not show vitamin-C storage (Giroud-Leblond method). Pronounced -C storage was observed in the Kupffer cells of adrenalectomised animals.

A. S.

Vitamin-C requirements for Chinese adults. C. F. Wang (*J. Chinese Chem. Soc.*, 1942, 9, 97—107).—The vitamin-C requirement

for Chinese adults (4 cases examined) is 0.75 mg. daily, per kg. body wt. A. T. P.

Enzymic action of ascorbic acid. T. L. Araujo (*Rev. Brasil. Biol.*, 1942, 2, 53—55).—Ascorbic acid has no enzymic action in Schar- dinger's reaction used to differentiate raw from pasteurised milk. The reduction of methylene-blue occurs only in presence of artificial light, owing to the action of the light on ascorbic acid. I. C.

Identification of ascorbic acid. F. Feigl and H. T. Cardoso (*Rev. Brasil. Biol.*, 1942, 2, 117—121).—Three spot reactions for identification of ascorbic acid are proposed: MnO_2 , sensitive to 0.03 $\mu g.$, NH_4 phosphomolybdate, sensitive to 0.1 $\mu g.$, HgO, sensitive to 0.06 $\mu g.$ of ascorbic acid. I. C.

Ascorbic acid saturation tests. P. Barrelet (*Schweiz. med. Wschr.*, 1942, 72, 796—798).—Urinary ascorbic acid excretion was tested in 100 men of a local defence force in September, 1941, after ingestion of 300 mg. of ascorbic acid. There were no signs of serious -C hypovitaminosis. A. S.

Effect of various ions on catalytic oxidation of ascorbic acid. L. Armentano (*Magyar Orv. Arch.*, 1941, 42, 44—51).—Oxidation of ascorbic acid is catalysed by Cu^{II} salts in proportion to the amount of Cu^{II} present. Dil. aq. KCl, NaCl, and $CaCl_2$ accelerate oxidation; more conc. solutions retard it, and may even inhibit completely both the spontaneous oxidation and the catalytic effect of 0.05—0.1 mg. of $CuCl_2$. This effect is due to Cl^- . M. A. B.

Autoxidation of l-ascorbic acid. H. Schümmer (*Biochem. Z.*, 1940, 304, 1—17).—Autoxidation of ascorbic acid in PO_4^{III} buffer at 20° and pH 7.0 is determined, and the method is described. The divergent results of other workers are discussed; the differences are probably due to the presence of inhibitors. Traces of tobacco smoke and coal gas have a pronounced effect due probably to HCN and CO, although nicotine itself has no effect on autoxidation, which is a pseudounimol. reaction. The optimum pH depends on many factors including the purity of the ascorbic acid, the water, and the Na_2HPO_4 . Autoxidation is partially inhibited by KCN and the extent of inhibition is proportional to [KCN], but autoxidation cannot be inhibited completely, and this residual autoxidation may be due to traces of Fe which, unlike Cu, annuls the inhibition. In presence of H_2O_2 there is increased autoxidation which is not, or only very slightly, inhibited by KCN. J. N. A.

Effect of protoporphyrin on autoxidation of l-ascorbic acid. H. T. Schreus and H. Schümmer (*Biochem. Z.*, 1940, 304, 18—25).—Protoporphyrin inhibits autoxidation of ascorbic acid in the same way as does HCN, and it is approx. 10% more active. Inhibition is probably due to a complex formed between protoporphyrin and traces of Cu present in the PO_4^{III} buffer, the Cu having been reduced to the univalent condition by ascorbic acid. In distinction to protoporphyrin the complex does not exhibit red fluorescence, and unlike protoporphyrin it does not act photocatalytically on the autoxidation. Similarly to HCN, protoporphyrin does not completely inhibit autoxidation, and the residual autoxidation is considered to be due to catalysis by Fe. Under the same conditions Fe does not form a complex with protoporphyrin. The affinity of Cu^+ for protoporphyrin is greater than that for HCN. J. N. A.

Extraction of ascorbic acid from plant materials. Relative suitability of various acids. J. D. Ponting (*Ind. Eng. Chem. [Anal.]*, 1943, 15, 389—391).—Thirteen acids are compared as to their stabilising effect on ascorbic acid solutions under conditions favourable to oxidation. Only HPO_3 and oxalic acid are suitable; these are equally satisfactory. J. D. R.

Ascorbic acid contents of Chungking fruits and vegetables. C. H. Lee, T. H. Kwoh, and T. P. Sun (*J. Chinese Chem. Soc.*, 1941, 8, 67—73).—The ascorbic acid contents (2 : 6-dichlorophenol-indophenol method) of 80 Chungking fruits and vegetables are recorded. Pea shoots, green pepper, coriander, and *Chenopodium album* are very rich sources. A. Li.

Histochemical vitamin-C determinations in choroid plexus epithelium and ependyma. G. Wolf-Heidegger (*Verh. Ver. Schweiz. Physiol.*, 1941, 18, 51—52).—It is concluded, from vitamin-C determinations with the Giroud-Leblond method in normal rats and guinea-pigs, that blood-dehydroascorbic acid is reduced near the Golgi apparatus of the choroid plexus epithelia and transferred to the c.s.f. as reduced ascorbic acid. A. S.

Determination of vitamin-C in urine. T. Nagayama, T. Tomoi, and T. Sagara (*Biochem. Z.*, 1940, 303, 354—363).—The vitamin-C content of urine is accurately and rapidly determined by adding successively HPO_3 and phosphotungstic acid in dil. H_2SO_4 (which removes pigment), centrifuging, and titrating with dichlorophenol-indophenol. Glutathione, cysteine, and $S_2O_3^{II}$ are not pptd. by phosphotungstic acid; they are not responsible for "residual" reduction. W. McC.

Determination of vitamin-C with the Zeiss step-photometer. F. Bukatsch (*Z. physiol. Chem.*, 1939, 262, 20—28).—The sample is treated with an excess of 2 : 6-dichlorophenol-indophenol and the unused indicator is extracted with nitrobenzene or xylene and

determined photometrically. The method is rapid and particularly suited to the examination of coloured and turbid extracts.

H. W.

Physical chemical method for determination of vitamins-D in fish-liver oils. D. T. Ewing, G. V. Kingsley, R. A. Brown, and A. D. Emmett (*Ind. Eng. Chem. [Anal.]*, 1943, 15, 301—305).—The oils are saponified with alcohol-KOH and the vitamins isolated by ether, dissolved in light petroleum-alcohol, and passed through a chromatograph column. The upper (vitamin-A) band is rejected, and the -D are eluted with ether and determined by measurement of the extinction coeff. at 500 μ . of the reaction product with $SbCl_3$. Data are presented for -D potency of 51 liver oils from salt-water fish. The method gives results in good agreement with those by U.S.P. procedure for oils above 5000 units per g., but is not satisfactory with weaker oils. J. D. R.

Biological assay of vitamin-D₃. J. I. M. Jones and J. F. Elliot (*Biochem. J.*, 1943, 37, 209—214).—The growth rate of chicks in a 5-week test period on a suitable basal diet affords as accurate a basis for assay of vitamin-D₃ as does the radiographic method. A satisfactory basal diet has Ca 0.8—1.17%, P 1.0—1.1%, Ca : P 0.76—1.1. R. L. E.

Control and verification of vitamin-D in milk.—See B., 1943, III, 183.

Biological potency of the natural tocopherols and certain derivatives. M. Joffe and P. L. Harris (*J. Amer. Chem. Soc.*, 1943, 65, 925—927).—The following relative potencies (rat-antisterility) are recorded: α -tocopherol and its H succinate 1.0; β -tocopherol 0.4 and its azobenzene-4-carboxylate 0.125; γ -tocopherol and its palmitate 0.083; dl- α -tocopherol 0.75. Use of the crystall. α -H succinate as reference standard is proposed. R. S. C.

α -Tocopherol, a natural antioxidant in a fish liver oil. C. D. Roberson and J. G. Baxter (*J. Amer. Chem. Soc.*, 1943, 65, 940—943).—The antioxidant (against oxidation of vitamin-A in sardine oil) of Mangona shark-liver oil is isolated by collecting the fraction of b.p. 145—240°/0.003 mm., esterifying with succinic anhydride and pyridine at 70°, removing and hydrolysing the acid ester, removing sterols by pptn. from ethyl formate at 5°, partitioning (light petroleum-83% alcohol), and adsorbing on Al_2O_3 , and identified as α -tocopherol by crystallisation of the palmitate. The oil contains approx. 0.01%. Commercial soup-fin shark-liver oil contains approx. 0.04%. R. S. C.

Natural α -, β - and γ -tocopherols and esters of physiological interest.—See A., 1943, II, 273.

Vitamin-K action of some naphthaquinones and naphthaquinone derivatives. B. Sjögren (*Z. physiol. Chem.*, 1939, 262, I—III).—2-Methyl-1 : 4-naphthaquinone has a curative activity of 30—35 $\times 10^6$ units per g. (determined by the method of Dam and Glavind; A., 1938, III, 680). The quinol has the same activity, the diacetate 20 $\times 10^6$ units, 2-ethyl-1 : 4-naphthaquinone only slight action. J. H. B.

Vitamin-P activity of some British fruits and vegetables.—See B., 1943, III, 186.

Effect of dietary supplements on growth and lactation in mouse. Z. B. Ball and R. H. Barnes (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 692—696).—Ascorbic acid has no effect on growth. The basal diet with 8% of yeast is not adequate for lactation, which is promoted by addition of dried grass or bran. The effect of these is not due to thiamin, riboflavin, pantothenic acid, factor W, or inositol. V. J. W.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Regulation of body temperature of premature infants. R. Day, J. Curtis, and M. Kelly (*Amer. J. dis. Child.*, 1943, 65, 376—398).—Using a calorimetric technique, measurements were made on 25 healthy premature infants, aged 1 week, of heat production, heat loss by radiation and conduction, heat loss by evaporation, skin- and rectal temp. In warm air the premature infant sweats inadequately but vasodilatation occurs normally. In cool air the total heat loss per unit area of skin is greater than for adults owing to the greater thermal conductivity of the tissues and an increased heat production; vasoconstriction was normal. Cool air increases heat production and crying. C. J. C. B.

Metabolism of warm and cool spring fishes. F. B. Sumner and U. N. Lanham (*Biol. Bull.*, 1942, 82, 313—327).—*Crenichthys baileyi* respire much faster in a warm spring (35—37°) than in a cool (21°). Warm spring fishes, transferred to the cool, drop to the normal cool spring rate. Cool spring fishes speedily die when transferred to the warm. In the warm spring, small fishes have a much higher metabolic rate than large; in the cool, the rate is almost independent of size; the temp. coeff. is thus greater for smaller fishes. G. P. W.

Size and metabolic rate in flatworms. R. J. Whitney (*J. Exp. Biol.*, 1942, 19, 168—175).— O_2 consumption per unit wt. decreases

with size in *Polycelis cornuta*, *Crenobia alpina*, and *Planaria polychroa* but increases in *Polycelis nigra*.
G. P. W.

Tissue metabolism following shock induced by hæmorrhage. H. K. Beecher and F. N. Craig (*J. Biol. Chem.*, 1943, **148**, 383—392).—O₂ uptake and lactic acid production in slices of brain cortex, heart muscle, kidney cortex, and liver from cats in profound hæmorrhagic shock were normal. The drop in basal metabolic rate commonly observed in shock does not therefore appear to be due to abnormality in the cells.
E. C. W.

Action of malonic acid on respiration of nerve. S. Huszák (*Biochem. Z.*, 1940, **303**, 349—353; cf. Szent-Györgyi *et al.*, A., 1935, 1406).—The respiration of nerve (peripheral, white and grey matter of central nervous system) is usually inhibited by malonate, the effect being less pronounced than with muscle. KCN inhibits the respiration of grey matter and muscle to approx. the same extent. White matter and peripheral nerve are less sensitive to the action of KCN. Lactic and pyruvic acid (but not succinic, fumaric, citric, and glycerophosphoric acid) diminish or abolish the inhibition produced by malonate. Glucose (but not fructose or galactose) increases the respiration of nerve and also the inhibitory action of malonate: the inhibition is further increased if a low concn. of succinate is also added.
W. McC.

Storage of food and uric acid in mosquito larvæ. V. B. Wigglesworth (*J. Exp. Biol.*, 1942, **19**, 56—77).—In *Aedes aegypti* larvæ, many tissues besides the fat body are important in storage and metabolism. Fed casein is stored as protein, glycogen, and fat, fed carbohydrate as glycogen and fat, and fed fat as fat. In starvation, proteins, glycogen, and fat are used concurrently and uric acid accumulates in the fat body. Different sugars vary in their efficiency as glycogen precursors.
G. P. W.

Theory of protein metabolism. III. Protein-sparing effect of incomplete proteins (zein and gelatin) in man. W. Lintzel and J. Rechenberger (*Biochem. Z.*, 1940, **304**, 214—222; cf. A., 1938, III, 746, 825).—The tryptophan-free proteins, zein and gelatin, have a considerable protein-sparing effect in man. The utilisation of an endogenous supplement of tryptophan is postulated.
F. O. H.

Effect of pure proteins of potato and green bean on urinary quotient C:N and vacat O:N, and on glycogen content of liver. A. Bickel and A. Parlow (*Biochem. Z.*, 1940, **304**, 105—133).—When rats are fed diets containing the same amounts of N, either in the form of potato or green beans or as the pure proteins prepared from these, the urinary quotient C:N and vacat O:N as well as the amount of glycogen in the liver are all significantly greater than when caseinogen is used as source of N. In every case vacat O:C is scarcely affected. The results are discussed in relation to intermediary metabolism.
J. N. A.

Nitrogen storage following intravenous and oral administration of casein hydrolysate to infants with acute gastro-intestinal disturbance. A. T. Shohl (*J. clin. Invest.*, 1943, **22**, 257—263).—Infants with acute gastro-intestinal disturbance involving vomiting, diarrhoea, dehydration, and acidosis retained N given in adequate amounts as casein hydrolysate, either intravenously or orally or both. Positive N balances were obtained when the N intake was 0.35 g. per kg. of body wt. Retentions were greater when N intakes were greater, and were as large as those reported for healthy infants.
C. J. C. B.

Fate of *l*- and *d*-histidine in guinea-pigs. S. Edlbacher and H. Baur (*Verh. Ver. Schweiz. Physiol.*, 1941, **18**, 21—22).—No histidine is excreted in the urine if 0.1 g. per 100 g. body wt. of *l*-histidine is subcutaneously injected in guinea-pigs. The whole of 10—50 mg. per 100 g. of *d*-histidine and 66% of 0.1—0.2 g. per 100 g. are excreted. If large doses of *l*-histidine are given, only 5—8% is excreted as *l*-histidine and 75% is eliminated as other glyoxaline compounds; part of the histidine is retained and probably converted into glutamic acid.
A. S.

Formation of hippuric acid. F. Leuthardt (*Verh. Ver. Schweiz. Physiol.*, 1941, **18**, 30—32).—Guinea-pig's liver and kidney slices form with glutamine large amounts of an unidentified benzoic acid compound.
A. S.

Metabolism of glycine. I. Studies with stable isotope of carbon. N. S. Olsen, A. Hemingway, and A. O. Nier (*J. Biol. Chem.*, 1943, **148**, 611—618).—The synthesis of isotopic glycine, NH₂CH₂¹³CO₂H, from ¹³CH₄ in an overall yield of 32% is described. Max. storage of liver-glycogen occurs 16 hr. after oral administration of isotopic glycine to mice. During this first 16 hr. 50% of the ¹³C is present in respired CO₂, and an increased amount of CO₂ occurs in the early period after feeding. This increase is not entirely due to combustion of the added glycine. The liver-glycogen contains an excess of ¹³C, and this increase in liver-glycogen is greater than can be accounted for by conversion of glycine into glycogen.
J. N. A.

Sex hormones and related substances (sterols). XIII. Formation of cholesterol in the animal body. W. Dirscherl and H. Traut (*Z. physiol. Chem.*, 1939, **262**, 61—86).—The content of sterols, precipitable with digitonin, in the bodies of male white mice fed on

oats varies between 0.29 and 0.37% (mean 0.32%) of the body wt. The daily negative balance varies between 1.1 and 1.6 (mean 1.33) mg. There is no synthesis of cholesterol. Increased sterol synthesis is not observed after administration of sec.-butyl stearate, *linolenate*, b.p. 193—195°/ < 0.01 mm., or *oleate*, b.p. 163—165°/ < 0.01 mm., which diminishes the daily sterol balance. The sterols from the bodies and fæces of the animals are mainly singly unsaturated. There is no evidence of the production of cholesterol from fatty acids in the white mouse.
H. W.

Lipotropic effects of choline, inositol, and lipocaic in rats. G. Gavin, J. M. Patterson, and E. W. McHenry (*J. Biol. Chem.*, 1943, **148**, 275—279).—With fatty livers due to feeding cholesterol, lipocaic, unlike choline and inositol, shows no lipotropic activity, although it contains some inositol. Both lipocaic and inositol, but not choline, are effective against biotin fatty livers. Choline, but not inositol (which requires the presence of other B vitamins), is effective against vitamin-B₁ fatty livers. There is insufficient evidence to prove the cause of the activity of lipocaic.
P. G. M.

Influence of dietary fat of varying unsaturation on component acids of cow-milk fats. T. P. Hilditch and H. Jasperson (*Biochem. J.*, 1943, **37**, 238—243).—Ingestion of arachis oil results in a milk fat richer in oleic glycerides than normal milk fat. There is no evidence of desaturation of stearo-glycerides. Ingestion of arachis oil hydrogenated to I val. 17 results in a more normal milk fat, except for a slight increase in oleic and stearic acids. A large part of such hydrogenated oil consists of glycerides of m.p. 65—70°, which are relatively unassimilable.
P. G. M.

Action of bromo-substituted fatty acids on liver fat. C. Artom and M. Swanson (*J. Biol. Chem.*, 1943, **148**, 633—639).—When single doses of the ethyl esters of 9:10-dibromostearic, 13:14-dibromobehenic, 6:7- and 2:3-dibromostearic acids are administered orally to fasting rats there is an increase in the amount of fatty acids in the liver, the highest degree of fat infiltration being observed with 9:10-dibromostearic ester, followed by the other esters in the above order. The 10:11-dibromoundecic ester is very toxic to rats; 0.003—0.008m-ester causes death in 6—16 hr. The undecenoate is even more toxic and causes death in 45—90 min. whilst undecate is harmless. Most of the fatty acids accumulated in the liver have lost their Br, and the amount of Br found in the liver lipins follows the same order as the increase in liver fat, and the highest degree of fat infiltration coincides with the lowest rate of excretion of Br in the urine. The acids which cause the greatest increase in liver fat contain the Br in positions which are not physiologically attacked according to the theories of β-oxidation or multiple alternate oxidation. A tentative explanation is suggested.
J. N. A.

Treatment of obesity. W. C. Cutting (*J. Clin. Endocrinol.*, 1943, **3**, 85—88).—Discussion with evidence that propadrine and amphetamine had no effect in reducing obesity in the absence of dietary restrictions.
P. C. W.

Chemistry of lipoidoses. III. Niemann-Pick disease and amaurotic idiocy. E. Klenk (*Z. physiol. Chem.*, 1939, **262**, 128—143; cf. A., 1935, 1265).—The lipid constituents of brain were examined and compared in cases of Niemann-Pick (NP) disease and in infantile Tay-Sachs (TS) and juvenile amaurotic idiocy. In the TS cases the high sphingomyelin content of the NP organs is replaced by a sugar-containing lipid which contains a labile water-sol. acid, completely destroyed by dil. H₂SO₄ or HCl. Other constituents of the lipid are (a) fatty acids, (b) a nitrogenous base (probably sphingosine), and (c) a reducing carbohydrate. Cerebronic acid was not present in the fatty acids; it was probably replaced by stearic acid. The lipid (possibly not obtained pure) was also found in the NP brain (*loc. cit.*) and a small amount in the protagon fraction of normal brain. In the juvenile amaurotic idiocy cases there was no such marked deviation from normal. The chief constituents in the 3 types of disease are tabulated. The high phosphatide content of the spleen and liver in the NP cases is due almost entirely to sphingomyelin deposition.
J. H. B.

Lipotropic substances in psoriasis. P. Gross and B. Kesten (*Arch. Dermat. Syphilol.*, 1943, **47**, 159—174).—8 cases of psoriasis improved following administration of soya-bean lecithin and defatted wheat germ (VioBin) and in 5 cases an elevated serum-cholesterol was reduced.
C. A. K.

Two cases of glycogen disease in children. E. L. Cohen (*Arch. Dis. Child.*, 1942, **17**, 235—238).
C. J. C. B.

Effect of intravenous injection of corn glycogen in rabbits. D. L. Morris (*J. Biol. Chem.*, 1943, **148**, 699—706).—*In vitro* experiments indicate that at 0° only 5%, and at 40° 25%, of the glycogen destroyed is converted into glucose. This suggests the *in vivo* formation of an alkali-labile dextrin which is only slowly decomposed to glucose. These findings, combined with the fact that human blood-diastase is even lower than that in rabbits, suggest the use of intravenous glycogen in hypoglycæmia, in preference to slow glucose injection.
P. G. M.

Aërobie carbohydrate and lactic acid metabolism of muscle preparations in vitro. W. C. Stadie and J. A. Zapp, jun. (*J. Biol. Chem.*, 1943, **148**, 669—684).—Incubation of strips or minced skeletal muscle of pigeons or cats in various buffers gives rise to a decrease of initial carbohydrate the major part of which is accounted for by lactic acid formed. Additional large amounts of O_2 (60—100%) are utilised by some undetermined substrate, not identical with ketones derived from fat, with pyruvic or phosphoglyceric acid, or with amino-acids derived from muscle-proteins. P. G. M.

Carbohydrate tolerance of hypophysectomised dogs. Z. Aszódi (*Biochem. Z.*, 1940, **303**, 289—299).—In dogs, the fasting blood-sugar val. and the carbohydrate tolerance are increased by removal of the pituitary gland, the increased levels being attained after restoration of the equilibrium between the various endocrine organs (3—6 months). W. McC.

Significance of ketosis. E. M. MacKay (*J. Clin. Endocrinol.*, 1943, **3**, 101—111).—A review. P. C. W.

Metabolism of acetylpyruvic acid. A. L. Lehninger (*J. Biol. Chem.*, 1943, **148**, 393—404).—A method for the determination of acetylpyruvic acid in blood and urine is described. Na acetylpyruvate is non-toxic in moderate doses (up to 0.5 g. orally, or smaller doses of isotonic solution by intravenous, subcutaneous, or intraperitoneal injection). Absorption from the intestine is complete, and it is as rapidly removed from the blood after injection as is lactic acid. There is a small resultant rise in blood-pyruvate. Up to 4% of the acetylpyruvate given to dogs, rats, or rabbits by any of these routes is excreted in the urine, and up to 2.5% appears in the urine as oxalic acid. Acetylpyruvic acid greatly increases fasting ketosis. It does not increase liver-glycogen, but gives slight protection against insulin hypoglycæmia. R. L. E.

In-vitro oxidation of pyruvic and α -ketobutyric acids by ground preparations of pigeon brain. Effect of inorganic phosphate and adenine nucleotide. C. Long (*Biochem. J.*, 1943, **37**, 215—225).— α -Ketobutyric acid is equally rapidly utilised by minced and ground preps. of pigeon brain. Aërobie utilisation of the two acids by minced brain is similar, but pyruvic acid is more rapidly utilised by suspensions. PO_4''' or AsO_4''' is required for oxidation of both acids, in the presence of methylene-blue. The utilisation of pyruvic acid by brain suspensions in presence of PO_4''' , but not normally that of α -ketobutyric acid, is stimulated by adenine nucleotide; the mechanism of this reaction is discussed. P. G. M.

Biochemistry of fluorine. I. Physiological responses to fluorine compounds in rats. C. A. Kempf (*Iowa State Coll. J. Sci.*, 1942, **17**, 91—92).—When anæmic rats are fed CuF_2 and FeF_3 , regeneration of hæmoglobin is as good as when $CuSO_4$ and $FeCl_3$ are used. With rats on a diet containing 0.05% of NaF, the hæmoglobin vals. are unaffected during growth, reproduction, and lactation, although the no. of pregnancies is decreased by 50%, lactation is markedly impaired, and the incisor teeth are damaged; these defects are largely overcome by simultaneous administration of $Al_2(SO_4)_3$. AlF_3 is considerably less toxic than are CuF_2 , ZnF_2 , and $CaSiF_6$, whilst CuF_2 , which is intermediate in toxicity, causes a much greater storage of F in the tibia than does AlF_3 . AlF_3 is non-toxic when injected intraperitoneally, and it considerably decreases the toxicity of intraperitoneally administered NaF. Administration of NaF increases recalcification in rachitic animals which also receive vitamin-D. Oral administration of large amounts of NaF causes marked hyperglycæmia (reduced by insulin) whether or not glucose is administered simultaneously. Feeding 0.1% of NaF in the diet after a 36-hr. fast causes a marked decrease in blood-sugar. When 1-fluoronaphthalene, *p*-fluorobromobenzene, and *p*-fluoroiodobenzene are fed to rats, they cause changes in the incisors, whilst *p*-fluorobenzoic acid, 4:4'-difluorodiphenyl, and fluorobenzene have no effect. J. N. A.

Comparison of acetylation in vivo of phenylaminobutyric acid with *p*-aminobenzoic acid and sulphanilamide. W. H. Fishman and M. Cohn (*J. Biol. Chem.*, 1943, **148**, 619—626; cf. A., 1940, II, 44).—When *d*-phenylaminobutyric acid, *p*-aminobenzoic acid, and sulphanilamide are administered orally to rats whose body-water contains 2—3% of D_2O the acetyl derivatives isolated from the urine contain approx. the same amount of D, which is present entirely in the acetyl group. If under identical conditions rats are fed the acetyl derivatives of sulphanilamide and *p*-aminobenzoic acid, the excreted acetyl compounds contain no D, showing that it is a precursor of the acetyl group which contains D, and body-water D does not enter the preformed acetyl derivatives. The nature of this possible precursor of the acetyl group is discussed. During acid hydrolysis, in presence of D_2O , of the acetyl derivatives of sulphanilamide and *p*-aminobenzoic acid the liberated acetic acid contains no D, and when *dl*-phenylaminobutyric acid is boiled with 2N-HCl in D_2O there is no introduction of D. J. N. A.

Fate of phenothiazine in domestic animals. H. B. Collier, D. E. Allen, and W. E. Swales (*Canad. J. Res.*, 1943, **21**, D, 151—159).—Sheep, horses, and dogs excrete the drug as leucophenothiazone conjugated with H_2SO_4 , and rabbits mainly as conjugated leuco-

thionol. The urine of pigs, on acidification, contains free phenothiazine, with smaller amounts of thionol and phenothiazone.

R. H. H.

XX.—PHARMACOLOGY AND TOXICOLOGY.

2-Sulphanilamido-4-methylpyrimidine (sulphamerazine, sulphamethyldiazine) in man. F. D. Murphy, J. K. Clark, and H. F. Flippin (*Amer. J. med. Sci.*, 1943, **205**, 717—726).—Sulphamerazine was investigated in 28 convalescents and in 20 patients with acute bacterial infections. After a single 3-g. oral dose higher serum levels are attained more rapidly and sustained longer than after similar amounts of sulphadiazine. Desired serum concns. can be obtained by giving sulphamerazine Na subcutaneously or intravenously. Sulphamerazine is readily distributed through body fluids and enters the red cell in varying concns. It is slowly excreted in the urine in amounts comparable with sulphadiazine. C. J. C. B.

Sulphamerazine. I. Comparison of sulphamerazine with sulphadiazine on the basis of absorption, excretion, and toxicity. A. D. Welch, P. A. Mattis, A. R. Latven, W. M. Benson, and E. M. Shiels (*J. Pharm. Exp. Ther.*, 1943, **77**, 357—391).—Compared with sulphadiazine, sulphamerazine is more rapidly and completely absorbed, and is more slowly excreted by the kidney; its acetyl derivative is more sol. than acetylsulphadiazine. Sulphadiazine and sulphamerazine are of similar toxicity (see above). L. L. W.

Substituted sulphanilamidopyrimidines. E. J. Fellows (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 680—684).—Of 6 such compounds, tested by oral administration to mice 30 min. after intraperitoneal infection with hæmolytic streptococcus, none was equal therapeutically to sulphadiazine and some were ineffective or toxic. V. J. W.

Determination, distribution, and excretion of *p*-aminobenzenesulphonacetylamide. E. Deutsch (*Schweiz. med. Wschr.*, 1942, **72**, 672—676).—The technique is a modification of Scudi's colorimetric method, using alkaline hydrolysis. A. S.

Subcutaneous administration of sodium sulphathiazole in clinical conditions. J. J. A. Lyons, D. R. Climenko, and L. W. Gorham (*Amer. J. med. Sci.*, 1943, **205**, 703—708).—Subcutaneous administration of dil. (0.5%) solutions of Na sulphathiazole is safe and practical, judged by the physical properties of the solutions, administration to experimental animals, and a clinical study of 200 patients so treated. C. J. C. B.

Sulphonamides in otitis media. A. G. De Sanctis, V. de P. Larkin, and W. A. Gougelman (*J. Amer. Med. Assoc.*, 1942, **120**, 1087—1093).—Since the introduction of sulphonamides the incidence of mastoiditis following otitis media has fallen from 30% to 9%. Sulphathiazole is the drug of choice. C. A. K.

Chemotherapy of pneumonia. T. Anderson (*Brit. Med. J.*, 1943, I, 717—719).—A comparison of the results obtained in the pre-sulphonamide and sulphonamide treatment of pneumonia in relation to types of pneumococci, age of patients, bacteræmia, and process of resolution. I. C.

Treatment of pneumococcal peritonitis with sulphathiazole. H. Kaelin (*Schweiz. med. Wschr.*, 1942, **72**, 765).—A child of 5½ years, suffering from severe pneumococcal peritonitis, recovered after intraperitoneal, oral, rectal, and intravenous administration of sulphathiazole. A. S.

Sulphonamide therapy of bacterial endocarditis. W. R. Galbreath and E. Hull (*Ann. int. Med.*, 1943, **18**, 201—203).—42 patients suffering from bacterial endocarditis (32 with positive blood cultures) were treated with sulphonamides; 25 patients did not receive sulphonamides. The drugs used, alone or in combination, were sulphanilamide, sulphapyridine, sulphathiazole, sulphamethyldiazine, and sulphadiazine. All 67 patients died. A. S.

Use of sulphanilamides in differential diagnosis. J. L. Burckhardt (*Schweiz. med. Wschr.*, 1942, **72**, 717—718).—A tuberculous condition has to be suspected if the body temp. of febrile children does not return to normal after administration of sulphanilamides. A. S.

Comparative effects of six compounds administered with therapeutic intent to tuberculous guinea-pig. W. H. Feldman and H. C. Hinshaw (*Amer. J. clin. Path.*, 1943, **13**, 144—147).—The tuberculotherapeutic efficacy of sulphonamides and sulphones and Na *p*-nitrobenzoate was studied in guinea-pigs inoculated subcutaneously with 0.0005 mg. of human tubercle bacilli, strain H37RV. Treatment was delayed until 6 weeks after infection. The dose of all compounds was 400—450 mg. daily in 1% concn. in the food. The experiment continued until all the control animals had died. Derivatives of 4:4'-diaminodiphenyl sulphone were more successful than derivatives containing a sulphonamide nucleus. C. J. C. B.

Sulphonamides in compound fractures. C. J. Frankel and R. V. Funsten (*J. Amer. Med. Assoc.*, 1942, **120**, 1384).—Local application

of sulphanilamide or sulphathiazole was part of a routine treatment successful in 28 cases of compound fracture. C. A. K.

Effects of various urinary antiseptics on strains of *E. coli*. H. F. Helmholz (*Amer. J. dis. Child.*, 1943, **65**, 399—411).—Resistance to sulphathiazole is shown by a small % of strains of *E. coli*. Strains resistant to sulphathiazole were also resistant to urinary acidity and mandelic acid but were more susceptible to methenamine and methenamine mandelate than non-resistant strains. Sulphathiazole and sulphadiazine seem to be more effective against *E. coli* than sulphacetamide, sulphapyridine, or sulphanilamide. In concns. of 0.5 mg.-% sulphathiazole is more effective than sulphadiazine. C. J. C. B.

Sulphonamides and coliform bacteria. H. J. White (*Johns Hopkins Hosp. Bull.*, 1942, **71**, 213—234).—The activity of sulphonamides against the intestinal coliform flora of mice was measured by including the drug in the diet and estimating faecal coliform densities by a lactose broth dilution count. Activity decreased in the order: sulphapyridine, sulphadiazine, sulphathiazole, *N*-benzoylsulphanilamide, sulphapyridine, *N*-acetylsulphanilamide, sulphaguanidine, sulphanilylarsanilic acid, succinylsulphathiazole, and sulphanilamide. The *in-vivo* activities are in qual. agreement with the *in-vitro* activities against *E. coli*. T. F. D.

Reduction of 2-(*p*-nitrobenzenesulphonamido)pyridine to sulphapyridine in animal body. C. J. Weber, J. J. Lalich, and R. H. Major (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 616—619).—Blood-concn. was determined by applying Bratton and Marshall's method before and after shaking with Zn and HCl. The substance is almost insol. and is hardly absorbed from the gut, but incubation with *B. coli* reduces it to sulphapyridine, which is found in the urine when the compound is given by mouth. V. J. W.

Effects of sulphanilamide, sulphapyridine, sulphathiazole, and sulphanilylguanidine on colon-typhoid-dysentery group. C. A. Lawrence and K. D. Sprague (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 696—700).—*In vitro*, sulphathiazole was the most effective of these compounds. Feeding them to mice reduced coliform organisms of the faeces except in the case of sulphanilamide. V. J. W.

Sulphaguanidine for typhoid carriers. R. J. Hoagland (*J. Amer. Med. Assoc.*, 1942, **120**, 1211—1212).—2 typhoid carriers were successfully treated with sulphaguanidine. C. A. K.

Sulphonamides in treatment of calf diphtheria. J. Farquharson (*J. Amer. Vet. Med. Assoc.*, 1942, **101**, 88—93).—Sulphapyridine and sulphathiazole were effective in calf diphtheria due to *Fusiformis necrophorus*. A single intravenous injection of sulphapyridine (3 g. per 100 lb. body wt.) cures most cases but it may be advisable to supplement by oral administration of 6.5 g. per 100 lb. for 2—3 days. The blood level should be kept above 3.5 mg.-%. Experiments on a smaller no. of animals using sulphathiazine gave almost as good results, the doses being the same. E. G. W.

Sulphasuxidine (succinylsulphathiazole) in veterinary practice. A. H. Bryan (*J. Amer. Vet. Med. Assoc.*, 1943, **102**, 22—26).—A variety of conditions in the dog and cat were treated with succinylsulphathiazole, 0.25—0.5 g. per day in 4—6 doses. Toxicity is very low and pups tolerate large doses; good results were obtained in diarrhoea and dysentery in puppies and kittens. E. G. W.

Prevention and treatment of infectious calf scours with sulphaxidine. H. W. Herriott (*J. Amer. Vet. Med. Assoc.*, 1943, **102**, 261—263).—Calf scours were treated successfully in 4 herds with succinylsulphathiazole in doses of 1 g. per kg. daily, given in 4 doses at intervals of 6 hr. The drug was administered in a drench of 0.6% NaHCO₃ and continued for 1—10 days. E. G. W.

Sterility test for sulphanilamide powders. M. Landy and E. J. Oswald (*J. Lab. clin. Med.*, 1943, **28**, 743—745).—5 g. of sulphanilamide are transferred aseptically to a flask containing 500 c.c. of sterile water. The flask is shaken for 5 min., set aside for 30 min. at room temp., and shaken again for 5 min. The undissolved sulphanilamide is allowed to settle and 5 c.c. of the supernatant fluid are added to each of 2 tubes containing 20 c.c. of Brewer's medium. The tubes are incubated at 37° for 7 days and examined for evidence of growth. C. J. C. B.

Neurotoxic effects of sulphanilamide derivatives. L. Pühr (*Schweiz. med. Wschr.*, 1942, **72**, 761—763).—Groups of 8 2-week-old Leghorn chicks were given daily by mouth 0.33 g. per kg. of sulphanilamide, sulphapyridine, sulphanildimethylsulphanilamide, or methylsulphathiazole for 70 days. 7 animals died, 2 were ill. The animals showed a spastic ataxic gait. Repeated injections of 2 mg. of aneurin had no effect. The sciatic nerve did not show histological changes. The spinal cord showed diffuse myelitis. A. S.

Fatal anuria following administration of sulphonamides with reference to tubular necrosis and regeneration. J. A. Ergaman and J. H. Doval (*J. Lab. clin. Med.*, 1943, **28**, 808—812).—The kidneys of this case showed 2 distinct lesions, one the result of crystallisation of sulphathiazole in the ureters, pelvis, and tubules, and the other necrosis of the epithelium of the proximal convoluted tubules with early regeneration. C. J. C. B.

Renal complications of sulphadiazine. D. O. Wright and R. E. Kinsey (*J. Amer. Med. Assoc.*, 1942, **120**, 1351—1354).—7 of 38 patients given sulphadiazine in the summer had renal complications, *i.e.*, oliguria, renal tenderness, and hæmaturia. There are probably 2 types of renal damage, one due to mechanical blockage, the other similar to HgCl₂ poisoning. C. A. K.

Complete anuria following sulphadiazine. A. L. Louria and C. Solomon (*J. Amer. Med. Assoc.*, 1942, **120**, 1354—1356).—Case report and review of literature. C. A. K.

Lesions in body tissues following sulphonamide therapy. H. J. Schattenberg and W. H. Harris, jun. (*J. Lab. clin. Med.*, 1943, **28**, 671—680).—A general review. C. J. C. B.

Therapy of experimentally induced gangrene [with azochloroamide]. K. K. Grubaugh and W. A. Starin (*Amer. J. med. Sci.*, 1943, **205**, 709—712).—Experimentally induced gangrene was produced in guinea-pigs and Syrian hamsters with *Cl. histolyticum* or combined *Cl. histolyticum*, *Cl. perfringens*, and *Cl. septique*. The infections in the test animals were treated with a stock solution of azochloroamide or with azochloroamide combined with a wetting agent. There were 71—91% recoveries as compared with an 80—100% mortality in controls. Low concns. of azochloroamide (1/4720 to 1/10,980) when incorporated in the culture medium inhibit the growth of various groups of anaerobic bacteria. The production of hæmolytins and lethal toxins of these organisms in the culture medium is inhibited by even lower concns. of azochloroamide (1/33,000). When acting on filtrates of these organisms, similarly low concns. of azochloroamide inactivate some preformed hæmolytins and lethal toxins. C. J. C. B.

Treatment of streptococcal mastitis with tyrothricin. F. E. Martin (*J. Amer. Vet. Med. Assoc.*, 1943, **102**, 267—268).—Injection into the udder of 20 ml. of a 50% mineral oil emulsion containing 150 mg.-% of tyrothricin cured 24 of 37 quarters infected with streptococci. The 18 cows treated received 1—37 injections at intervals of 1—2 weeks. E. G. W.

Effects of gramicidin, tyrocidine, and penicillin on cultures of mammalian lymph node. W. E. Herrell and D. Heilman (*Amer. J. med. Sci.*, 1943, **205**, 157—162).—Gramicidin is more toxic than tyrocidine for cells migrating from explants of mammalian lymph node, but the min. toxic dose was large as compared with the amounts necessary to kill most Gram-positive cocci. Penicillin is approx. $\frac{1}{5}$ as toxic by wt. as gramicidin. C. J. C. B.

Fate of salol in duodenum. A. L. F. Marshall, jun., and C. W. Bauer (*J. Amer. Pharm. Assoc.*, 1943, **32**, 104—106).—Salol is not hydrolysed by active pancreatic lipase or normal duodenal juice, nor in the duodenum of a child having a normal or deficient pancreatic secretion. In man, salol taken orally gives a positive phenol test in the urine after 2 hr., but not after 28 hr. Ingested Na salicylate appears in the urine within 25 min., but no positive phenol test is given after 27.5 hr. Salol is insol. in bile acids or salts but is converted into phenol by minced liver or kidney tissue (cat). F. O. H.

Absorption of sulphur after application of thiorubrol to the skin. P. Lietha (*Schweiz. med. Wschr.*, 1942, **72**, 650—652).—The S concn. in the deproteinised blood increases by 5—6 mg.-% 2—2½ hr. after application of thiorubrol (an ointment with a high S content) to the skin of rabbits. There was also an increase in the blood-cystine-glutathione content. A. S.

Sulphur-containing ointments. E. A. Strakosch (*Arch. Dermat. Syphilol.*, 1943, **47**, 216—225).—The action of S on human skin was studied histologically. Ptd. S (1, 3, 5, 10, 15, and 20%) was incorporated in soft paraffin, soft paraffin + hydrous wool fat (equal parts), an oxycholesterol-soft paraffin ointment base, fatty acid esters of diethanolamine in soft paraffin, or stearyl alcohol in liquid paraffin, water, and soft paraffin, and biopsies were performed after 2—14 days. The best keratolytic effects were obtained with S in soft paraffin, and the greatest keratoplastic action was seen with S in emulsion bases. C. A. K.

Camphor-phenol mixture in fungous infections of feet. W. R. Glenn and H. E. Hailey (*Arch. Dermat. Syphilol.*, 1943, **47**, 239—241).—A camphor-phenol mixture (equal parts) was used in the treatment of fungous infections of the feet in 85 young men. It is not a cure, it may be harmful in vesicular types, it may retard healing of fissures, it is a primary irritant to groins and perianal region, and its odour is objectionable when it is used for a few days. C. A. K.

Effect of 2-1'-naphthylmethyliminazoline hydrochloride on eye. J. Babel (*Schweiz. med. Wschr.*, 1941, **71**, 561—563).—Local application of a 0.1—0.5% solution in the rabbit produces pupillary dilatation which reaches a max. after 30 min. and disappears after 10—12 hr. 2% pilocarpine does not counteract this dilatation but 1% eserine produces constriction in a few min. In man, the iminazoline produces mydriasis only in people with blue eyes. There is marked vasoconstriction in the conjunctiva of rabbits and in man, especially in all types of conjunctivitis. The effect, using a 0.1% solution, lasts for several hr.; in many conditions the vasoconstrictor

effect was more marked than with ephedonin. There is no secondary hyperæmia, and the substance is useful as a styptic. In solutions of 0.1—0.5% the drug has either no effect on, or lowers, the intra-ocular pressure in rabbits and in man; it can be used without danger in primary and secondary glaucoma. A. S.

Splenic contracting substance in orange seeds. F. T. Macias, R. G. Smith, and F. N. Martin (*J. Pharm. Exp. Ther.*, 1943, **77**, 311—316).—Orange seeds contain a water-sol. substance of comparatively low toxicity which produces strong splenic contraction. L. L. W.

Effect of drugs on circulation and on spleen volume. R. Domenjoz and A. Fleisch (*Verh. Ver. Schweiz. Physiol.*, 1940, **17**, 9—10).—The spleen vol. in dogs was optically recorded after intrajugular and intra-arterial (splenic) injection of adrenaline, *l*-corbasil, sympatol, suprifin, veritol, Ciba-2020, tyramine, pervitin, *l*-ephedrine, and histamine. The active threshold concns. of the drugs are tabulated. A. S.

[Pharmacology of] alkaloids of *Lunasia amara*. F. A. Steldt and K. K. Chen (*J. Amer. Pharm. Assoc.*, 1943, **32**, 107—111).—The air-dried bark yields lunacrine, $C_{16}H_{19}O_3N$; lunacridine, $C_{17}H_{23}O_4N$; lunamarine, $C_{18}H_{25}O_4N$, and lunamaridine, $C_{16}H_{15}O_2N$, m.p. 209—210°. None shows any digitalis-like action. The first 3 alkaloids reduce arterial blood pressure in cats; intravenous injection into rabbits has no effect on blood-sugar. Lunacrine and lunacridine inhibit peristaltic movement of isolated rabbit's intestine, whilst lunamarine stimulates isolated rabbit's intestine or uterus. The median lethal dose (mice) of intravenously injected lunacrine hydrochloride is 78.7 mg. per kg. and of lunacridine by mouth 1097 mg. per kg. Oral doses of lunamarine of 1 g. per kg. are not fatal in mice. F. O. H.

Synthetic glycosides of digitoxigenin, digoxigenin, and periplogenin. K. K. Chen, R. C. Elderfield, F. C. Uhle, and J. Fried (*J. Pharm. Exp. Ther.*, 1943, **77**, 401—406).—These were prepared by reaction of a mol. of glucose with the *sec.* hydroxyl on $C_{(3)}$ of each aglycone. On cats they were more potent than the original glycosides. In frogs this was also the case for the first two, but the periplogenin derivative was weaker than periplocymarin. V. J. W.

***K*-Strophanthin- β , *K*-strophanthoside, periplocymarin, and periplocin.** K. K. Chen, R. C. Anderson, and E. B. Robbins (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 676—680).—*K*-Strophanthin- β is more potent than *K*-strophanthoside in frogs and cats, and periplocymarin is less potent than periplocin. There is thus no correlation between potency and no. of sugar mols. V. J. W.

Synthetic glycosides of strophanthidin.—See A., 1943, II, 220.

Fraudulent use of digitalis to simulate heart disease. O. F. Hedley (*Ann. int. Med.*, 1943, **18**, 154—163).—Digitalis was administered (mostly in unknown doses) to produce e.c.g. which could be interpreted as due to coronary sclerosis. In most instances only a flattening of the *ST* interval and varying degrees of auriculo-ventricular block occurred. Extrasystoles and even *T* wave inversions were observed. A. S.

Clinical evaluation of cedilanid. M. Sokolow and F. L. Chamberlain (*Ann. int. Med.*, 1943, **18**, 204—213).—Lanatoside *C* is efficacious in congestive heart failure with normal rhythm, in auricular flutter, and fibrillation. In auricular fibrillation intravenous injection of the drug produced an abrupt fall in the ventricular rate, often within 10 min. The average oral digitalising dose is 7.5 mg. in 3 days, the average intravenous dose 1.6 mg. in 24 hr., the average maintenance dose by mouth is 1.6 mg. per day (0.34 mg. intravenously). Oral cedilanid is absorbed 3 times as readily as *Digitalis purpurea*. There are no differences in clinical effects after oral administration of the 2 drugs. The most important advantage of cedilanid is obtained from intravenous use because of its rapid action. 2—8 times as much drug is required for oral as for intravenous 24-hr. digitalisation. A. S.

Maintenance treatment with digitalis. A. S. Rogen (*Brit. Med. J.*, 1943, I, 694—695).—From the results obtained in 20 patients with cardiac failure who required digitalis in the decompensated state, it appears that a maintenance dose of the drug is necessary. I. C.

Factors affecting absorption of sodium *dl*-mandelate from intestine of cats. R. C. Garry and I. A. Smith (*J. Physiol.*, 1943, **101**, 484—488).—The gut of cats anaesthetised with $CHCl_3$ or recently killed, and surviving gut *in vitro*, absorb the *d*- and *l*-forms equally. In decerebrate cats there is preferential absorption of the *l*-form. W. H. N.

Body temperature of mice during anaesthesia. E. F. Barrows and H. Dodd (*Amer. J. Physiol.*, 1942, **137**, 259—262).—With mice more than 3 weeks old differences in age or environmental temp. do not change the time required to kill them with ether or $CHCl_3$. With mice less than 3 weeks old, the effectiveness of these anaesthetics diminishes as younger mice are tested and colder environmental temp. employed. Fall in internal temp. is the principal cause of the slower effectiveness of the anaesthetics. Clinically, combining an anaesthetic with a lowering body temp. may increase the length of narcosis and anaesthesia. M. W. G.

Toxicity of intravenous paraldehyde. C. L. Burstein and E. A. Rovenstein (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 669—670).—In cats, dogs, and rabbits the min. anaesthetic dose was 0.3 c.c. per kg. The 50% lethal dose was 0.45 c.c. per kg. for cats and rabbits, and 0.5 c.c. for dogs. Anaesthetic doses were liable to cause pulmonary hæmorrhage. V. J. W.

Comparative toxicity of pentobarbital in newborn and adult rat. B. Etsten, F. A. D. Alexander, and H. E. Himwich (*J. Lab. Clin. Med.*, 1943, **28**, 706—710).—The newborn rat is more susceptible than the adult to pentobarbital both ante- and post-partum. The lethal dose for the newborn rat is 0.3 mg. per g. and for the adult 0.5 mg. Doses of pentobarbital and metrazol, which when given singly are lethal, may successfully antagonise each other and facilitate survival when administered together. C. J. C. B.

Ethyl chloride analgesia. J. D. Rochford and B. T. Broadbent (*Brit. Med. J.*, 1943, I, 664—665).—Ethyl chloride administered alone produces analgesia. The method is simple, safe, and rapid, comparable with N_2O analgesia, and useful in dental surgery. I. C.

Anæsthesia and analgesia in obstetrics. C. F. Fluhmann (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 361—369). P. C. W.

"Permonid compositum" in surgery. G. Drack (*Schweiz. med. Wschw.*, 1942, **72**, 900—903).—The prep. (Roche) contains in 1 c.c. 2 mg. of dihydrocodeine hydrobromide, 0.5 mg. of scopolamine hydrobromide, and 25 mg. of ephedrine hydrochloride and was successfully used subcutaneously, intramuscularly, or intravenously as a pre- or post-operative analgesic. A. S.

Problems of local anaesthesia. A. J. Leser (*West. J. Surg. Obstet. Gynec.*, 1940, **48**, 261—263).—Brief discussion. P. C. W.

Condensation of unsaturated amines with aromatic compounds. Preparation of β -substituted phenylethylamines.—See A., 1943, II, 225.

Conversion of Δ^2 -cyclohexenones and cyclohexanones into spirohydantoin.—See A., 1943, I, 279.

Vinylalkylmalonic esters and barbituric acids.—See A., 1943, II, 279.

Alkyl phenylthiocarbamates.—See A., 1943, II, 258.

***NN'*-Substituted α -aminodiphenylacetamides.**—See A., 1943, II, 262.

Alkamine esters of fluorenonecarboxylic acids.—See A., 1943, II, 266.

Atropine-esterase, a genetically determined enzyme in the rabbit.—See A., 1943, III, 543.

Atropine glaucoma.—See A., 1943, III, 553.

Relationship between chemical structure and inhibitory action of barbiturates on rat brain respiration *in vitro*. F. A. Fuhrman and J. Field, 2nd (*J. Pharm. Exp. Ther.*, 1943, **77**, 392—400).—In 6 alkylethyl- and 3 alkylallyl-barbiturates mol. concn. needed to reduce respiration by 50% decreased with increasing length of alkyl side-chain. V. J. W.

Barbituric acid derivatives. Relationship between action on smooth muscle and frog's heart and chemical action. C. E. Powell, H. M. Lee, and E. E. Swanson (*J. Amer. Pharm. Assoc.*, 1943, **32**, 128—133).—With a series of primary and *sec.* alkyl-barbituric and -thiobarbituric acids, the inhibitory or sedative effect on isolated intestine (rabbit, frog) or uterus (guinea-pig) or perfused frog heart increases with increase in no. of C atoms in the alkyl chain. Na ethyl- α -dimethylbutylbarbiturate, a convulsant in warm-blooded and a depressant in cold-blooded animals, stimulates or contracts isolated intestinal strips of rabbit but depresses the isolated intestine or perfused heart of frog; its stimulating action is inhibited by the true depressant barbiturates, including its isomerides. F. O. H.

Comparative rate of gastro-intestinal absorption of barbital, sodium barbital, and elixir of barbital N.F. VII. V. P. Seeberg and J. M. Dille (*J. Amer. Pharm. Assoc.*, 1943, **32**, 133—137).—Na barbital, administered as crushed tablets, is absorbed from the gastro-intestinal tract of cats (starved for 24 hr.) more rapidly than is barbital in the form of crushed tablets or N.F. VII elixir. Absorption occurs mainly in the small intestine. Absorption from the ligatured intestine is about the same for barbital and Na barbital provided both are in solution; that of the elixir appears to be delayed owing to the presence of alcohol. F. O. H.

Rapidly absorbed elixir of sodium barbital. V. P. Seeberg (*J. Amer. Pharm. Assoc.*, 1943, **32**, 137—138).—The elixir (Na barbital 38 g., caramel 20 g., compound spirit of vanillin 30 c.c., syrup 375 c.c., talc. 30 g., 50% alcohol to 1 l.) is absorbed (gastro-intestinal tract of starved cats) more rapidly than is the glycerol-containing N.F. VII elixir (cf. preceding abstract). F. O. H.

Determination of demerol (hydrochloride of ethyl 4-phenyl-1-methylpiperidme-4-carboxylate) in urine; its excretion in man. R. A. Lehman and T. Aitken (*J. Lab. Clin. Med.*, 1943, **28**, 787—793).—The method depends on the formation of a benzene-sol. compound

between the free base of demerol and bromothymol-blue in an equimol. ratio. The free base is first extracted from the urine with benzene at pH 7.5. The resulting benzene solution of demerol is then shaken with an aq. solution of the dye, also buffered at pH 7.5, whereupon an amount of dye equiv. to the amount of demerol is carried into the benzene as a yellow compound. This compound is readily decomposed so that the Na salt of bromothymol-blue may be extracted by aq. alkali while the free base of demerol remains in the benzene and is discarded. The amount of dye extracted may be determined colorimetrically, and thus, indirectly, the original concn. of demerol. The presence of various alkaloids in the urine interferes with the determination of demerol and care should be exercised accordingly in analysing specimens when the subject has received other medication. Morphine does not interfere.

C. J. C. B.

Acetoin not a product of metabolism of alcohol. L. A. Greenberg (*Quart. J. Stud. Alcohol*, 1942, 3, 347—350).—The rate of disappearance of alcohol from the blood in dogs given 4 g. of alcohol per kg. was increased following the injection of insulin and glucose (1 unit and 3 g. per kg.) or the administration of 1 g. of Na pyruvate per kg. intravenously or orally. No acetoin was found in the blood in any experiment.

P. C. W.

Factors influencing intoxicating effect of alcoholic beverages. H. W. Newman and M. Abramson (*Quart. J. Stud. Alcohol*, 1942, 3, 351—370).—The same degree of inco-ordination exists at a higher blood-alcohol concn. after the ingestion of dessert wines than after distilled liquor. The difference is due to the sugar content of the wine, and is abolished when glucose is added to the distilled liquor. Alcohol in distilled liquor is more rapidly absorbed than that in wines, and consequently produces a greater degree of intoxication. Differences in rates of absorption are due to the differing amounts of buffer substances. During a gradual rise in blood-alcohol concn. intoxication starts abruptly at a crit. concn. characteristic for each individual. Above the crit. level small increases in concn. produce marked enhancement of intoxication.

P. C. W.

Death from alcoholism in United States in 1940. E. M. Jellinek (*Quart. J. Stud. Alcohol*, 1942, 3, 465—494).—Statistical analyses.

P. C. W.

Effect of vitamin-C deficiency on metabolism of alcohol. G. A. Jervis (*Quart. J. Stud. Alcohol*, 1942, 3, 533—540).—Alcohol metabolism, determined by determining blood- and tissue-alcohol concn. of guinea-pigs at hourly intervals following intraperitoneal injection of 25% solution of alcohol (2 mg. per g.), was subnormal in vitamin-C-deficient pigs.

P. C. W.

Alcoholic deterioration. L. Maletz and A. Gardner (*Quart. J. Stud. Alcohol*, 1943, 3, 546—553).—A brief analysis of 83 cases.

P. C. W.

Actions of a series of diphenylethylamines. M. L. Tainter, F. P. Luduena, R. W. Lackey, and E. N. Neuru (*J. Pharm. Exp. Ther.*, 1943, 77, 317—323).—A no. of sec. amines derived by substitution on α -diphenylethylamine have a LD₅₀ for rats of about 50 mg. per kg. Small doses may have a slight pressor action but larger ones cause a fall of blood pressure unaffected by atropine. Cortical stimulation is slight and irregular.

V. J. W.

Stimulant power of secondary and tertiary phenylisopropylamines. A. N. Novelli and M. L. Tainter (*J. Pharm. Exp. Ther.*, 1943, 77, 324—331).—In rats *d*-methylbenzidine is slightly more active than *d*-benzidine as a cerebral stimulant judged by threshold and duration, but at optimum dosage its effect is less. It has a much smaller pressor effect. *l*-Methylbenzidine is a much weaker stimulant, but, if enough is given to produce an equal effect, that effect lasts longer.

V. J. W.

Use of latent period in assay of ergonovine [ergometrine] on isolated rabbit uterus. B. J. Vos, jun. (*J. Amer. Pharm. Assoc.*, 1943, 32, 138—141).—The described method of assay is based on the fact that large doses of ergometrine stimulate contraction of the isolated rabbit's uterus more promptly than do small doses. The assay, which is performed by comparing the dose-latent period relationship of unknown and appropriate standard preps., gives results more accurate than those by previously described methods. Ergotoxine and ergometrinine do not seriously interfere.

F. O. H.

Salicylate and quinine deafness and Mygind-Dederding view of hearing tests.—See A., 1943, III, 555.

Diuretic effect of combination of salyrgan and intravenous sorbitol or sucrose.—See A., 1943, III, 567.

Contamination of foodstuffs with diphenylchloroarsine (D.A.). E. A. Lum (*Pharm. J.*, 1943, 151, 32).—Albino rats fed for 8 days on a normal diet plus 250 p.p.m. of D.A. showed As poisoning. 7 mg. of D.A. was ingested.

C. J. C. B.

Arsenical encephalopathy. R. B. Nelson, C. McGibbon, and F. Glyn-Hughes (*Brit. Med. J.*, 1943, I, 661—663).—The pathology of arsenical encephalopathy is described and cases are reported. The condition is rapidly fatal; one case recovered after repeated drainage of the theca.

I. C.

Case of hæmorrhagic encephalopathy following arsenical therapy. J. P. A. Halcrow (*Brit. Med. J.*, 1943, I, 663—664).—A case of arsenical encephalopathy with pathological findings is described. Treatment is unavailing unless instituted in the first few hr. after onset.

I. C.

Chronic lead arsenate poisoning with recovery. H. H. Kilgore and P. S. Rhoads (*J. Amer. Med. Assoc.*, 1942, 120, 1125).—Case report.

C. A. K.

Sodium thiosulphate in arsenical dermatitis. E. W. Abramowitz, M. R. Mattice, and I. Botvinick (*Arch. Dermat. Syphilol.*, 1943, 47, 175—184).—Na₂S₂O₃ in 8 cases of As dermatitis did not increase the rate of urinary excretion of As and did not appear to influence the skin lesions. Excretion of Bi, and, in 1 case, Au, was also not altered by Na₂S₂O₃.

C. A. K.

Phenarsine hydrochloride for syphilis. W. E. Long (*Arch. Dermat. Syphilol.*, 1943, 47, 226—234).—3-Amino-4-hydroxyphenyldichloroarsine hydrochloride (phenarsine hydrochloride) was used in the treatment of 96 patients with syphilis. Spirochaetes disappeared rapidly from infectious lesions, early and late lesions healed rapidly, there were no clinical relapses, serological reversal was satisfactory, and toxic effects, chiefly gastrointestinal, were mild.

C. A. K.

Phenarsine hydrochloride in syphilis. W. H. Guy, B. A. Goldmann, and G. P. Gannon (*Arch. Dermat. Syphilol.*, 1943, 47, 235).—Phenarsine hydrochloride was used in the treatment of 233 patients with syphilis. In 4 cases spirochaetes disappeared from primary lesions within 24 hr., and skin manifestations cleared within 14 days. The dose of each injection was 0.068 g. in male and 0.04 g. in female patients. Toxic effects were mild; there were 1 nitritoid reaction and 1 Herxheimer reaction. There were no toxic effects on the blood.

C. A. K.

Massive arsenotherapy for syphilis in children. I. M. Levin, S. J. Hoffman, D. S. Koransky, I. B. Richter, and B. Gumbiner (*J. Amer. Med. Assoc.*, 1942, 120, 1373—1376).—32 infants and children with congenital syphilis were treated for 5 days by massive dosage of mapharsen intravenously. The Kahn test became negative in 12. 4 children with acquired syphilis became Kahn-negative after similar treatment. Toxic effects were slight.

C. A. K.

Lethal dose of lead for cow: elimination of ingested lead through milk. W. B. White, P. A. Clifford, and H. O. Calvery (*J. Amer. Vet. Med. Assoc.*, 1943, 102, 292—293).—18 of 20 cows died after eating on a single day silage contaminated by red-Pb. The amount ingested was estimated at 4.8 mg. of Pb per kg. The two remaining animals showed symptoms of Pb poisoning and the milk of one of them contained 2.26 p.p.m. (normal 0.03 p.p.m.) of Pb 12 days after consuming the contaminated silage.

E. G. W.

Chemotherapeutic agent with osteotropic properties. N. Ercoli (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 672—674).—Intraperitoneal injections in the mouse (0.18 mg. of Bi per kg.) of Na Bi 1:2-dihydroxyanthraquinone-3-sulphonate caused after 24—48 hr. red staining of bones but of no other organs.

V. J. W.

Sulphur dioxide chemical pneumonia; case report with recovery, following accidental explosion of refrigerator unit. H. L. Goldburgh and B. A. Gouley (*Ann. int. Med.*, 1943, 18, 237—242).—The pneumonia was of bronchopulmonary type.

A. S.

Fate of nicotine in body. III. Methylated and demethylated derivatives of nicotine. P. S. Larson and H. B. Haag (*J. Pharm. Exp. Ther.*, 1943, 77, 343—349).—Integrity of pyridine-N is essential for high toxicity, but progressive methylation of the pyrrolidine-N increases toxicity to mice in proportion of 1:2:4 for normicotine, nicotine, and nicotinium methiodide. Ratios of intraperitoneal to intravenous LD₅₀ for these 3 compounds are 7.3, 1.6, and 11.6, probably due to differing dissociation consts. Nicotine has a much greater pressor effect than the other two, and nicotinium isomethiodide and nicotinium dimethiodide have none.

V. J. W.

Toxin from eggs of S. African ticks. B. de Meillon (*S. Afr. J. Med. Sci.*, 1942, 7, 226—235).—The toxin in the eggs of all *Ixodes* is present from the moment of deposition until hatching; it is a protein salting out with Na₂SO₄ at 57°. Toxic symptoms produced in guinea-pigs injected with the protein are: pyrexia with collapse and subsequent fall in temp. and death with large doses; loss of appetite; loss of wt.; diarrhoea; hyperæsthesia; languor and staring coat. Sterile indurating lesions develop at the injection site. Paralysis was noted in 1 pig 48 days after injection. Congestion of injection site and peritoneum were noted at death but no other pathological changes. Pigs that recovered were not immune to tick-bite fever.

P. C. W.

Nature and action of a salamander toxin. W. J. van Wagtenonk, F. A. Fuhrman, E. L. Tatum, and J. Field (*Biol. Bull.*, 1942, 83, 137—144).—The toxin occurs in *Triturus* eggs and embryos. Neither the chemical nature nor the mode of action was established, but a no. of possibilities were eliminated.

G. P. W.

Amanitin, chief poison of Amanita.—See A., 1943, II, 285.

Purification of paralytic shellfish poison by filtration through active charcoal. W. M. Bendien and H. Sommer (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 715—717).—An extract containing 150 lethal mouse doses is acidified to N-HCl and filtered through a column of Norit A. From this Norit the poison is washed out with water. The product has 93% of the original activity; it is free from ash, non-fluorescent, contains equal nos. of Cl and N atoms, and gives a greenish-yellow colour with Nessler's reagent. V. J. W.

Toxicity of foliage of *Aleurites fordii* for cattle. M. W. Emmel, D. A. Sanders, and L. E. Swanson (*J. Amer. Vet. Med. Assoc.*, 1942, **101**, 136—137).—Cattle died after eating foliage of the tung oil tree (*Aleurites fordii*). Affected cattle showed gastro-enteritis; similar symptoms followed feeding two heifers with macerated leaves of the plant. E. G. W.

Greying of hair produced by ingestion of phenylthiocarbamide. C. P. Richter and K. H. Clisby (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 684—687).—Black rats which had phenylthiocarbamide solution in place of drinking-water became grey in 27—58 days and recovered their colour in 83 days on tap-water. The concn. of the solution was gradually raised from 0.001 to 0.1% in 6 stages. V. J. W.

Standardised toxicological tests for clinical laboratories. C. A. Hellwig (*Amer. J. Clin. Path.*, 1943, **13**, 96—104).—Standard techniques are described for the detection of carbolic acid, P, strychnine, morphine, barbiturates, As, Hg, CO, F, ethyl or methyl alcohol. C. J. C. B.

Wound treatment with chlorophyll ointment. F. Boehringer (*Schweiz. med. Wschr.*, 1942, **72**, 850—852).—Stimulation of wound granulation was obtained by the application of a chlorophyll ointment. A. S.

Choline chloride in treatment of icterus gravis neonatorum.—See A., 1943, III, 566.

Liver function in therapeutic malaria.—See A., 1943, III, 565.

Rate of disappearance of subcutaneous vegetable oil in normal and castrate mice. J. C. Turner and B. Mulliken (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 598—601).—Maize oil, injected subcutaneously into young adult mice, is absorbed more rapidly in males than in females. This difference is not found in castrates. V. J. W.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Physiologic responses of women and men to moderate and strenuous exercise. E. Metheny, C. Brouha, R. E. Johnson, and W. H. Forbes (*Amer. J. Physiol.*, 1942, **137**, 318—326).—Men and women walked 15 min. at 3.5 miles per hr. and ran for 5 min. or until exhausted on a motor-driven treadmill. The responses which differentiate the trained from the untrained are more economical ventilation, ability to attain greater max. ventilation and greater max. O₂ consumption, lower gross R.Q., lower blood-lactate for a given amount of exercise, ability to attain a higher blood-lactate before exhaustion, quicker recovery in pulse rate. The differences between the average for men and women are similar in nature to those between the trained and untrained. The women were less fit than the men for both moderate and strenuous exercise. M. W. G.

Exercise tolerance test as measure of chronic fatigue in children. R. E. Netzley (*J. Pediat.*, 1943, **22**, 194—201).—All children with a low exercise tolerance test score show poor endurance and complain of chronic fatigue. C. J. C. B.

Principles of exercise therapy. E. A. Nicoll (*Brit. Med. J.*, 1943, I, 747—750). I. C.

Oral occupational disease. I. Schour and B. G. Sarnat (*J. Amer. Med. Assoc.*, 1942, **120**, 1197—1207).—A review. C. A. K.

XXII.—RADIATIONS.

Inhibition of embryo formation in certain nematodes by Roentgen radiation. T. C. Evans, A. V. Levin, and N. M. Sulkin (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 624—628).—Suitable doses of X-rays have no effect on growth or development of *Trichinella spiralis* or *Rhabditis pellio* but inhibit or kill the embryos contained in them. V. J. W.

Effects of repeated small doses of Roentgen rays on canine blood and bone-marrow. R. M. Mulligan (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 607—611).—4 dogs received doses of 75—100 r. weekly for several months. They showed a slight leucopenia and anaemia and occasional eosinophilia. There was some hypoplasia of the bone-marrow with decrease in myeloid-erythroid ratio. V. J. W.

Bone cyst successfully treated with X-rays. S. P. Barden (*Radiology*, 1942, **39**, 732—733).—An expanding lesion of the proximal phalanx of the little finger without break of the cortex which had progressed slowly over 30 years was treated with 2400 r. through each of 2 fields at 135 kv. peak, 5 ma., a filter of 5 mm. of Al, and 30

cm. target-skin distance in doses of 600 r. After the second treatment it became necessary to cut the sensory nerves to that area because of the severity of pain with immediate success. 8 years after the treatment the phalanx was radiologically normal. E. M. J.

Relation of sunlight to desert sores. J. M. Henderson (*Brit. Med. J.*, 1943, I, 657—659).—Desert sores bear a marked relation to exposure to light; they were found in individuals whose powers of adaptation to sunlight are below average, and appeared in epidemic fashion at the beginning of the desert summer when increased duration and intensity of sunlight and rise in temp. are present. In some cases trauma preceded the sores; small clear vesicles were often precursors of many of the sores. I. C.

Evaporation from human skin with sweat glands inactivated. E. A. Pinson (*Amer. J. Physiol.*, 1942, **137**, 492—503).—Repeated anodal cataphoresis of formaldehyde into a local area of skin renders the sweat glands in that area non-responsive to heat stimuli for periods of 2—4 weeks. Insensible perspiration is not diminished. Cutaneous insensible perspiration rate is not affected by the rate of skin blood flow but is decreased by an increased vapour tension over the skin; it is doubled with a skin temp. increase of 10°. M. W. G.

Importance of infra-red rays in relation to the skin capillaries. L. Vámos (*Magyar Orv. Arch.*, 1941, **42**, 199—207).—Infra-red rays penetrate the skin more deeply than do visible and ultra-violet rays. They are absorbed by the red blood cells and by particles of metal, gunpowder, coal, or inorg. pigments which have penetrated the skin, and can be used to detect such foreign particles and also the invisible skin capillaries. M. A. B.

Effects of infra-red irradiation on tissues of the rabbit. R. H. Rigdon, F. Ewing, and A. Tate (*Amer. J. Path.*, 1943, **19**, 517—523).—Infra-red irradiation caused extensive necrosis and ulceration. Lesions were present in skin, abdominal muscles, stomach, intestine, spleen, liver, lungs, brain, eyes, and bone marrow. (12 photomicrographs.) C. J. C. B.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Mathematical approach to general biology. II. N. Rashevsky (*Bull. Math. Biophysics*, 1943, **5**, 49—64; cf. A., 1943, III, 449).—A principle, similar in form to that of Hamilton in mechanics and developed by Lotka (*Proc. Nat. Acad. Sci.*, 1922, **8**, 146, 151), that the course of events in the biological world is determined by the total energy changes between biological units tending to a max., is applied to various biological phenomena. F. O. H.

Hamiltonian principle in biology and physics. N. Rashevsky (*Bull. Math. Biophysics*, 1943, **5**, 65—68; cf. preceding abstract).—A general, variational principle is derived from the principle of max. energy change and it is shown that there is no sharp distinction between living and non-living systems. F. O. H.

Mechanism of division of cell with impermeable membrane. H. D. Landahl (*Bull. Math. Biophysics*, 1943, **5**, 75—81).—The production and consumption of metabolites that do not leave the cell are mathematically considered. The resulting diffusion forces are discussed and an expression for rate of elongation is developed for conditions under which there may occur an excess of production at the centre of the cell; this expression is similar to that for a cell with a membrane permeable to the metabolites (A., 1943, III, 225). F. O. H.

Calculation of constants of cell permeability for rapidly penetrating substances. W. Wilbrandt (*Verh. Ver. Schweiz. Physiol.*, 1940, **17**, 19—20). A. S.

State of tyrosine in ovalbumin and in insulin as determined by spectrophotometric titration. J. L. Crammer and A. Neuberger (*Biochem. J.*, 1943, **37**, 302—310).—Changes in the dissociation const. of the phenolic groups of tyrosine and 3:5-di-iodotyrosine are determined by observation of the change of absorption spectra with pH. These two amino-acids have pK 10.15 and 6.4 respectively. The absorption spectrum of insulin is accounted for by the tyrosine and cystine present in the mol. if a slight shift of the tyrosine band in the protein is assumed. The change of the spectrum with pK shows that the pK of the phenolic group increases with increase of pH. This change in the dissociation const. is assumed to be due mainly to the increased net charge of the protein. The absorption spectrum of ovalbumin cannot be quantitatively interpreted in terms of its content of tyrosine and tryptophan, but the change of adsorption with pH shows that in the native protein few or none of the phenolic groups are able to ionise, whilst after denaturation ionisation can be determined spectroscopically. The bearing of the results on the mechanism of denaturation is discussed. J. N. A.

Coagulation of silicic acid gels compared with that of plasma. U. Ebbecke (*Biochem. Z.*, 1940, **304**, 165—176).—Aq. Na silicate, diluted with 2 vols. of water or aq. NaCl, is treated with varying amounts of HCl. The reaction velocity, viscosity, transparency,

syneresis, and colour by transmitted light are used as criteria of coagulation of the aq. SiO_2 gel and the data thus obtained are discussed with reference to polymerisation of the aq. SiO_2 gel and to blood coagulation. F. O. H.

Ultracentrifugal studies of the salt-soluble protein fraction of barley and malt. O. E. Stenberg and J. W. McBain (*Tech. Comm., Master Brewers' Assoc. of Amer.*, 10.4.42; *Wallerstein Lab. Comm.*, 1943, 6, 75).—The average sedimentation consts. obtained appear to indicate that barley- and malt-albumins have mol. wt. of about 17,500, and the globulins about 70,000. There is no significant amount of protein of mol. wt. 310,000, such as is shown by the edestin of hemp-seed. I. A. P.

Acid-, base-, and salt-binding capacity of salt-denatured collagen.—See A., 1943, I, 226.

Magnetic properties of ferritin.—See A., 1943, I, 223.

XXIV.—ENZYMES.

Animal fatty acid dehydrogenase and its codehydrogenase. III. Chemical nature of codehydrogenases. K. Lang and H. Mayer. **IV. Reaction product of dehydrogenation of stearic acid and the probable biological significance of fatty acid dehydrogenase.** K. Lang and F. Adickes (*Z. physiol. Chem.*, 1939, 262, 120—122, 123—127; cf. A., 1940, III, 344).—III. The identity of the codehydrogenase of fatty acid dehydrogenase with muscle-adenylic acid is confirmed. Other substances acting as codehydrogenase are inosic and adenosinetriphosphoric acid and adenosine. Yeast-adenylic acid has a much weaker action, adenine none.

IV. Dehydrogenation of stearic acid by the dehydrogenase affords oleic acid but no $\alpha\beta$ -unsaturated octadecenoic acid. The possible biological significance of fatty acid dehydrogenase is discussed. J. H. B.

Inhibition of succinodehydrogenase by pyrophosphate. L. Masart, R. Dufait, and G. Van Grembergen (*Z. physiol. Chem.*, 1939—40, 262, 270—274).—Inhibition of the activity of succinodehydrogenase by $\text{P}_2\text{O}_7^{4-}$ is stronger in acid than in alkaline solution, but by malonate is independent of pH (possibly greater in alkali). Adding fumaric acid overcomes the inhibition by malonate but not that by $\text{P}_2\text{O}_7^{4-}$. $\text{P}_2\text{O}_7^{4-}$ thus resembles F' in forming a metallic complex and this, not enzymic action, is responsible for the inhibition. R. S. C.

Specificity and biological significance of diamine oxidase. E. A. Zeller (*Verh. Ver. Schweiz. Physiol.*, 1940, 17, 23—24).— NN' -Dimethylputrescine is oxidised by diamine oxidase at the same rate as putrescine; the rate of oxidation quickly decreased when 1 atom of O was consumed by 1 mol. of substrate. The reaction was inhibited by exceeding an optimal concn. of substrate. A. S.

***l*-Amino-acid oxidase of animal tissues.** D. E. Green, V. Nocito, and S. Ratner (*J. Biol. Chem.*, 1943, 148, 461—462).—*l*-Amino-acid oxidase free from the *d*-oxidase was prepared in pure form by low-temp. acetone pptn. and salt fractionation. It catalyses oxidation of 12 *l*-amino-acids by O_2 or by H-acceptors such as methylene-blue, but has little or no effect on 9 others or on the *d*-acids. Some keto-acids and NH_3 and, in the absence of catalase, H_2O_2 have been isolated as oxidation products. R. L. E.

Mol. wt. of crystalline horse-radish peroxidase. H. Theorell (*Arkiv Kemi, Min., Geol.*, 1942, 15, B, No. 24, 4 pp.).—From ultracentrifugal and diffusion experiments, the material was found to be homogeneous and to have a mol. wt. of 44,100, in complete agreement with the min. mol. wt. calc. from its hæmin content. E. C. W.

Specificity of amino-acid decarboxylases. P. Holtz, K. Credner, and H. Walter (*Z. physiol. Chem.*, 1939, 262, 111—119).—By comparison of organ extracts from various animals in competition and adsorption experiments it is shown that histidine-, tyrosine-, and dopa-decarboxylase are different enzymes, each sp. for its substrate. J. H. B.

Histidine-decarboxylase and histaminase. E. Werle (*Biochem. Z.*, 1940, 304, 201—213; cf. A., 1939, III, 322).—Histidine-decarboxylase (extracts of guinea-pig and rabbit liver or kidney), in absence of O_2 , is inhibited by Girard's ketone reagents, trimethyl-carbohydrazidomethylammonium chloride and carbohydrazido-methylpyridinium chloride; dimedon, phenylhydrazine, and dinitrophenylhydrazine also inhibit. The inhibition is reversed by dialysis of the system against water. These substances, which inhibit the decarboxylase in 0.01—0.001M. concn., are 10—100 times as active in their inhibition of histaminase. In presence of O_2 , histamine is not formed from added histidine by the tissue extracts unless one of the above inhibitors is added in amounts just sufficient to inhibit the histaminase. Guinea-pigs' intestinal mucosa, especially that from the small intestine, converts histidine into histamine, the activity being inhibited by the above inhibitors; the decarboxylase also occurs in small amounts in the small intestine of rabbits, but could not be detected in cats. The small intestine of ox, pig, and dog contains histaminase but not histamine-decarboxylase, which is also absent from human appendix, small intestine,

uterus, and gall bladder. Trypsin and papain degrade the carrier-protein of the decarboxylase and histaminase. The activity of both enzymes is independent of amino-groups. Germanin, trypan-blue, and bile inhibit the decarboxylase but not histaminase. F. O. H.

Breakdown of fat. X. Rôle of catalase. K. Täufel and R. Müller (*Biochem. Z.*, 1940, 304, 275—284).—Horse-liver catalase inhibits the autooxidation of olive oil by a reduction of the peroxide content. Aq. alcoholic extracts produce a greater inhibiting effect than CHCl_3 extracts. The alcohol-precipitable fraction of liver extracts is inactive, as are also olive oil extracts. P. G. M.

Carboligase problem. B. Tankó and L. Munk (*Z. physiol. Chem.*, 1939, 262, 144—157).—The optimum conditions for acetoin production by pea meal were determined. The pH optima for decarboxylation of pyruvate and synthesis of acetoin coincide. When acetaldehyde, but no pyruvate, is added to the meal, acetoin formation is regulated by the rate of transformation of carbohydrate into pyruvate; in presence of pyruvate acetoin formation is controlled by the rate of decarboxylation of pyruvate. The degrees of inhibition by CHCl_3 of decarboxylation and of acetoin synthesis do not differ markedly. With excess of pyruvate, F' or iodoacetate shows the same weak inhibition of acetoin formation as of the carboxylase, whereas the inhibitions of carbohydrate degradation and of acetoin synthesis are both strongly marked in absence of added pyruvate. The small amounts of acetoin formed with added acetaldehyde in presence of F' or iodoacetate are not due to "carboligase" action on the acetaldehyde added. It is concluded that "carboligase" does not exist and that acetoin is produced as a consequence of decarboxylation. J. H. B.

Preparation of crystalline rennin.—See B., 1943, III, 183.

Stability of aminopolypeptidase in presence of pancreatic enzymes. G. Ågren (*Arkiv Kemi, Min., Geol.*, 1942, 15, B, No. 25, 6 pp.).—Some commercial pancreatic preps. contain practically no peptidase, although fresh extracts of cat's pancreas contain a considerable amount. Aminopolypeptidase from duodenal mucosa (a rich source) disappears fairly rapidly when brought in contact with pancreatic extracts at pH 7.4. E. C. W.

Steric selection by peptidases in normal and carcinomatous sera. E. Waldschmidt-Leitz and K. Mayer (*Z. physiol. Chem.*, 1939, 262, IV—VI).—The hydrolysis of *dl*-leucyl- and *dl*-glutamyl-glycine and the ethyl ester of the latter by normal sera proceeds to the extent of 50%, only the *l*-component being attacked, but carcinomatous sera hydrolyse up to 100% of the substrate owing to the presence of enzymes which also hydrolyse the *d*-component. J. H. B.

***d*-Peptidases in normal and carcinomatous tissue.** H. Bayerle and F. H. Podlucky (*Biochem. Z.*, 1940, 304, 259—265).—Using the Waldschmidt-Leitz-Mayer technique (preceding abstract) the sera or tissue extracts of healthy or tumour-bearing rabbits did not hydrolyse over 50% of *dl*-leucylglycine. When the enzyme was added in small amounts at intervals carcinomatous sera or extracts produced over 50% hydrolysis, indicating fission of the *d*-component. P. G. M.

Joint action of two factors in the enzymic degradation of benzoyldiglycine. T. Kazama (*Ber.*, 1940, 73, [E], 331—334).—Degradation of β -naphthalenesulphonyltriglycine using pancreas extract shows appreciable hydrolysis, and of benzoyldiglycine some hydrolysis, whereas kidney extract has little action. Suitable amounts of both extracts, however, give considerable hydrolysis. Addition of an extract of the small intestine inhibits hydrolysis in the case of benzoyldiglycine. The action of old and new enzyme preps. is examined. A. T. P.

Action of proteolytic enzymes on fibrinogen solutions. H. G. Hind (*Biochem. J.*, 1943, 37, 289—293).—When pepsin reacts with fibrinogen at pH 5.0—5.6 the fibrinogen is rendered non-precipitable by 20% saturation with $(\text{NH}_4)_2\text{SO}_4$ and non-coagulable in presence of plasma containing Ca^{2+} . The amount of fibrinogen thus converted is approx. proportional to the amount of enzyme added. Trypsin and papain react similarly to pepsin under suitable conditions. Destruction of the enzyme by alkali restores to the fibrinogen the ability to clot under appropriate conditions, and of being pptd. by low concn. of salts. It is concluded that the enzyme combines with or is adsorbed by the fibrinogen, and protects it against pptn. and coagulation. J. N. A.

Separation of fibrinogen from "pepsin-inhibitor." H. G. Hind (*Biochem. J.*, 1943, 37, 293—295).—Fresh serum and plasma contain a pepsin inhibitor, which inhibits the ability of pepsin to protect fibrinogen against pptn. at pH 5.0—5.6 by low concn. of salt. The inhibitor is present in fibrinogen which has been pptd. by 20—25% saturation with $(\text{NH}_4)_2\text{SO}_4$, but it can be removed by repeated pptn. of the fibrinogen by 21.6% saturation with $(\text{NH}_4)_2\text{SO}_4$. The activity of the inhibitor is almost completely destroyed by heating at 58° for 2 min. J. N. A.

Limit dextrins and starch. IV. Dextrins from maize starch. B. Örtenblad and K. Myrback (*Biochem. Z.*, 1940, 303, 335—341).—The prep. with malt-diastase and fractionation with alcohol of the

dextrins are described. Approx. 22% of the starch is thus recovered. The dextrins each contain a free aldehyde group and are very similar to those obtained with taka-diastase but the proportions of the individual dextrins are different, possibly because malt-diastase contains an enzyme that degrades dextrins of high mol. wt.

W. McC.

Hydrolysis of starch and glycogen by blood-amylase. D. L. Morris (*J. Biol. Chem.*, 1943, **148**, 271—273).—Starch is hydrolysed only slightly more slowly than is glycogen by blood-amylase.

P. G. M.

Kinetics of amylase action. A. Janke [with J. Holota] (*Biochem. Z.*, 1940, **304**, 194—200).—Data for the liquefaction of starch paste by malt-amylase or the hydrolysis of diphosphorylated starch by pure β -amylase confirm Olsson's finding (A., 1923, i, 497) that the hydrolysis is a unimol. reaction. This implies the possibility of one substance in the reaction system either alone reacting or being solely responsible for the measured velocity of reaction. Assuming the latter not to hold, it follows that β -amylase changes the reaction velocity so that it corresponds with a negative autocatalysis by a product of the reaction. The action of β -amylase is small at high concns. of substrate, i.e., when substrate concn. is const., and the reaction may be considered as unimol. with positive autocatalysis by the reaction product. Hydrolysis by various β -amylase-containing bacterial and mould preps. is generally complicated by what appears to be a simultaneous attack by the enzyme on several parts of the starch mol.

F. O. H.

Determination of liquefaction of starch.—See A., 1943, II, 221.

Amylase inhibitor from cereals. E. Kneen and R. M. Sandstedt (*J. Amer. Chem. Soc.*, 1943, **65**, 1247).—The grain of wheat, rye, and some sorghums (but not of barley, oats, maize, rice, or most sorghums) contains a protein-like substance, which inhibits the action of salivary, pancreatic, or (most) bacterial amylases (inhibitions: 82, 48, and 23%, respectively) on native or gelatinised starch. The inhibitor is sol. in water, dil. NaOH, or dil. alcohol, insol. in light petroleum, and is pptd. from water by $(\text{NH}_4)_2\text{SO}_4$ or alcohol to give ppts. which are active when redissolved. It is retained by a Cellophane membrane and is stable at 90° but not if autoclaved at 15 lb.

R. S. C.

Effect of neutral salts on activity of emulsin (β -glycosidase). H. Yu and T. H. Koo (*J. Chinese Chem. Soc.*, 1941, **8**, 49—53).—The effects of 16 neutral salts on the activity of almond emulsin have been studied. Of these 1% KCNS has the greatest accelerating, 5% $\text{AlCl}_3 \cdot 5\text{H}_2\text{O}$ the greatest inhibiting, effect, the effect being due chiefly to the anion, and, in the case of Na salts, in the order of the valency of the anion.

A. Li.

Effects of high pressure on the inversion of sucrose and the mutarotation of glucose. F. V. Sander, jun. (*J. Biol. Chem.*, 1943, **148**, 311—319).—Pressures up to 10,000 lb. per sq. in. do not affect the rate of hydrolysis of sucrose by invertase. The rate at which α -glucose attains equilibrium with β -glucose is related positively to the pressure. A vol. change occurs in the rate-determining step for glucose mutarotation, the activated complex of α -glucose possessing a smaller mol. vol. than α -glucose itself. The vol. decrease on activation is calc.

J. E. P.

Synthesis of β -D-glucosides.—See A., 1943, II, 255.

Diffusing factors. II. Assay of hyaluronidase and correlation with skin diffusing activity. D. McClean. **III. New biological assay of diffusing factor in guinea-pigs.** J. H. Humphrey (*Biochem. J.*, 1943, **37**, 169—177, 177—181; cf. A., 1941, III, 302).—II. Hyaluronidase destroys the mucin-clotting power of a hyaluronic acid-protein complex before there is any appreciable fall in viscosity. A test based on destruction of clotting power gave results similar to those obtained by the diffusion and viscosity tests, for 9 enzyme preps. Active sera inhibit all three actions of the enzyme. Sera active against enzymes from *Cl. welchii* and *Vibrio septique* are species- but not type-sp., and those active against streptococcal enzymes are group- but not type-sp. Serum prepared active against the bull testis enzyme was inactive against mouse testis and bacterial enzymes.

III. The assay is based on the min. dose required to produce a 20% increase over the bleb area of a control injection in guinea-pigs. A 2:1 difference in activity can be distinguished. No standard prep. is required.

R. L. E.

Phosphorylation of glycogen in muscle and organs. J. Bodnár and B. Tankó (*Biochem. Z.*, 1940, **303**, 391—397; cf. A., 1929, 1106).—Priority is claimed for the discovery that cozymase of boiled yeast and muscle juice plays a necessary part in the phosphorylation of glycogen by muscle and that phosphorylation of the glycogen of liver and kidney occurs *in vitro*. In the phosphorylation of glycogen of powdered muscle, the yield is increased threefold by adding boiled muscle juice in place of adenylic acid. The reaction is not favourably affected by Mg^{++} .

W. McC.

Distribution of acid phosphatases with special reference to nervous system. A. Wolf, E. A. Kabat, and W. Newman (*Amer. J. Path.*, 1943, **19**, 423—435).—The histochemical technique of Gomori (A.,

1941, III, 1063) for demonstrating acid phosphatases in tissues was modified to insure optimal enzyme activity. Acid phosphatase activity was found in the nuclei and cytoplasm of many cells. The nervous system contained large amounts of an acid phosphatase, as did the male and female genital systems, parts of the digestive, hæmatopoietic, urinary, and endocrine systems. In 25 tumours of the nervous system, the acid phosphatase content of the tumours could be correlated with the enzyme content of the cell types from which the tumours were derived. (19 photomicrographs.)

C. J. C. B.

Distribution of alkaline phosphatase in tissues. G. Bourne (*Quart. J. Exp. Physiol.*, 1943, **32**, 1—19).—Gomori's phosphatase technique (A., 1940, III, 274) is improved by staining pptd. $\text{Ca}_2(\text{PO}_4)_2$ with Na alizarinsulphonate. The distribution of phosphatase in guinea-pigs is recorded. In the alimentary tract, phosphatase occurs only where active absorption of glucose takes place. There is an inverse relationship between the phosphatase contents of the capillaries and the brush borders of the epithelial cells. Vitamin-C deficiency does not affect the phosphatase content of soft tissues (kidneys, adrenal glands) but decreases that of intact and regenerating bone. The phosphatase content of the skeleton is not increased by slight injury to the bone. In the laying hen, phosphatase probably does not play an important part in the deposition of egg shell. In the mussel (*Mytilus*) and the gastropod mollusc *Calliostoma*, phosphatase, which occurs in the mantle edge, probably plays a part in secretion of the shell.

W. McC.

Polysaccharide synthesised by action of muscle-phosphorylase.—See A., 1943, II, 221.

Activation of the adenosinetriphosphatase system by acetylcholine. K. P. Dubois and V. R. Potter (*J. Biol. Chem.*, 1943, **148**, 451—452).—Portions of rat submaxillary gland were incubated, some with the addition of acetylcholine. After homogenisation the tissue treated with acetylcholine had up to 50% greater adenosinetriphosphatase activity. Addition of Ca increases the activity of untreated tissue; acetylcholine has no further effect.

R. L. E.

Reactions of cozymases and their cleavage products. [Determination of nicotinic acid and its amide.] B. Hogberg, F. Schlenk, and H. von Euler (*Arkiv Kemi, Min., Geol.*, 1942, **15**, A, No. 18, 9 pp.).—A method for the separate determination of nicotinic acid and its amide in presence of each other is described, depending on the much greater intensity of the colour produced by the amide with cyanogen bromide and aniline as compared with that produced by the free acid, and the stability of the coloured derivative of the amide when extracted into butyl alcohol, whilst the corresponding derivative of the free acid is practically decolorised in 10 min. For the determination of "bound" nicotinic acid and amide in cozymases, fission is effected with 0.1N-HCl in a sealed tube at 100° and the estimation carried out on the product as above, allowance being made for the small amount of amide hydrolysed to acid. The results show that practically all the nicotinic acid in cozymase is in the form of amide. Pentose (ribose) is determined with Bial's orcinol-HCl reagent; only 1.3—1.6 mols. of pentose per mol. of cozymase were found by this method, but after acid hydrolysis of the latter the expected 2 mols. of pentose were obtained. Cold alkaline hydrolysis (0.1N-NaOH, 16—20 hr., 0—2°) of cozymase is stated to give about 80% fission of nicotinamide, 8—10% of cophosphorylase, and a residue of about 12% of unattacked cozymase.

E. C. W.

XXV.—MICROBIOLOGICAL AND IMMUNOLOGICAL CHEMISTRY. ALLERGY.

New chemical and physiological tools for investigating the intermediary metabolism of carbohydrates. O. Meyerhof (*Wallerstein Lab. Comm.*, 1943, **6**, 19—25).—A review, referring especially to yeast fermentation. The topics discussed include the isolation of intermediates in arrested metabolic reactions, measurement of hydrolysis const., the reversible synthesis of glycogen and the enzyme system concerned therein, and the use of isotopes in elucidating biochemical reactions, special reference being made to the use of radioactive P.

I. A. P.

Limit dextrins and starch. V. Fermentability of starch breakdown products. K. Myrback (*Biochem. Z.*, 1940, **304**, 147—159; cf. A., 1939, III, 199).— α -Methylglucoside, trehalose, and a dextrin prep. from maize starch are fermented (measured by evolution of CO_2) by a fresh press-yeast. The rate of fermentation increases with increase in concn. of substrate, whilst the induction period is characteristic. The fermentation curves for dextrin preps. and hydrolysates are divisible into parts representing the fermentation of glucose, maltose, and trisaccharides. With mixtures of glucose and maltose, the fermentation of either sugar is independent of that of the other. High concns. of glucose, but not of maltose, inhibit the fermentation of dextrin. The fermentation characteristics of various simple carbohydrates are described. Native and "sol." starches are not fermented, nor are hydrolysis (HCl) products of mol. wt. approx. 500—1500. Tri- but not tetra-saccharides are

fermented, although there are exceptions to the former. The fermentability of fractions obtained by hydrolysis of starches with various amylases is discussed (cf. Leibowitz and Hestrin, A., 1939, III, 724).

Activation of catalase in yeast cells by chloroform or toluene. K. Yamafuji, H. Imagawa, and S. Suzuki (*Biochem. Z.*, 1940, 304, 266—270).—The catalase-activating effect of CHCl_3 or toluene is unaffected by either NaCl or glucose. Treatment of a suspension of yeast, containing some dead cells, with narcotics does not give rise to any enzyme in the aq. phase. The enhanced catalase activity of narcotised yeast is still further increased by ultra-violet light. There is no direct relationship between respiration and catalase activity of narcotised yeast, since the former is unaffected by ultra-violet light. P. G. M.

Induced autotrophism in yeast. L. H. Leonian and V. G. Lilly (*J. Bact.*, 1943, 45, 329—339).—Eight strains of *Saccharomyces cerevisiae* were induced to grow without an exogenous supply of one or more vitamins by successively subculturing the yeasts with large inocula on media from which one of the vitamins was missing. Yeasts developed in the absence of the vitamin were often able to grow without one or more additional vitamins. Two of the variants were able to grow without any of the five vitamins known to be essential to yeast. Reversions occurred in most cases after the variants were grown continuously for 6 months on a medium containing all the vitamins. F. S.

Utilisation of pentoses in biological synthesis of protein. V. Growth of *Torula utilis* on xylose and galactose. R. Lechner (*Biochem. Z.*, 1940, 304, 84—89; cf. A., 1939, III, 790).—The amount of yeast substance produced when *Torula utilis* is grown in a xylose medium for 6 hr. with aeration is determined. The highest yield is obtained with 1.5% of xylose and initial pH 5.86 or 7.09. The final pH is very nearly the same for both. The amount of xylose present in the medium is important, and an increase from 1.5 to 3.0% has a very unfavourable effect on growth and production of protein, whilst with 10% the xylose is scarcely attacked by the organism. With 1.5% of xylose, approx. 3% remains unaffected even after a very long period of growth. The previous history, culture conditions, and the physiological state of the yeast are important factors in the utilisation of pentoses. None or scarcely any pentose is present in the carbohydrate constituent of the cell material of *T. utilis* when it is grown on glucose or xylose. Contrary to earlier results, *T. utilis* of any origin will utilise galactose. J. N. A.

Biochemistry of *Torula utilis*. V. Nicotinic acid content of fodder yeast, spent waste, brewer's yeast, and press-yeast. Total synthesis of nicotinic acid by *Torula*. H. Fink and F. Just (*Biochem. Z.*, 1940, 303, 404—414; cf. A., 1940, III, 537).—*Torula utilis* synthesises nicotinic acid from simple C sources (e.g., alcohol), $\text{NH}_3\text{-N}$, and inorg. salts. The nicotinic acid content of *Torula* grown on glucose, alcohol, wood-sugar, or sulphite waste liquor is approx. 37—38 mg.-%. The corresponding vals. for spent waste, brewer's yeast, and baker's press-yeast are 38—43, 50—54, and 28—32 mg.-%. Heating of yeast with alkali or successively with alkali and acid does not increase the nicotinic acid content. W. McC.

Fungistatic medium for enumeration of yeasts. M. R. Hertz and M. Levine (*Food Res.*, 1942, 7, 430—441).—A malt extract-agar medium containing 100 p.p.m. of diphenyl exerts a marked fungistatic action on a large no. of moulds for 72—96 hr. whereas yeasts grow luxuriantly, though some strains of *Rhizopus* are only slightly inhibited by 500 p.p.m. of diphenyl. Na propionate inhibits all moulds at a concn. of 3000 p.p.m. but many yeasts are also slightly inhibited. In presence of diphenyl a pink yeast failed to produce pigment, spore formation of *Aspergillus niger* was suppressed, and the vegetative mycelium became intensely yellow. Diphenyl may be used to enumerate yeasts in presence of moulds and to recover bacterial and yeast cultures contaminated with moulds but its insolubility and loss of activity due to volatilisation on incubation render it inconvenient. H. G. R.

Production of acid from sugar by *Aspergillus niger*. VIII. Effect of magnesium. H. Bernhauer, A. Iglauer, H. Knobloch, and O. Zippelius (*Biochem. Z.*, 1940, 303, 300—307).—Production of acid by *A. niger* grown on a sucrose medium is usually increased and sucrose consumption is accelerated by 0.06—0.092% of Mg [as MgCl_2 and $\text{Mg}(\text{NO}_3)_2$]; the wt. of mould produced is also increased. Most of the acid is citric but small amounts of gluconic and, especially when the N source is $\text{Mg}(\text{NO}_3)_2$, oxalic acid are also produced. Mg^{++} seems also to accelerate degradation of citric acid. With some strains, Mg^{++} diminishes acid production. W. McC.

Effect of biotin and thiamin on growth of fungi from take-all-affected wheat.—See B., 1943, III, 174.

Improvements in cup assay for penicillin. J. W. Foster and H. B. Woodruff (*J. Biol. Chem.*, 1943, 148, 723).—The original cup assay of penicillin (A., 1941, III, 1048) has the disadvantage that the test bacterium, *S. aureus* H, shows a tendency to spontaneous lysis. The modified method described involves the use of *B. subtilis* spore cultures, which may be stored indefinitely at 0°. The growth lag

due to spore germination allows greater diffusion of penicillin, with resulting larger zones, the edges of which are sharp and allow more accurate measurement of the diameter. P. G. M.

Penicillin B: preparation, purification, and mode of action. J. T. van Bruggen, F. J. Reithel, C. K. Cain, P. A. Katzman, E. A. Doisy, R. D. Muir, E. C. Roberts, W. L. Gaby, D. M. Homan, and L. R. Jones (*J. Biol. Chem.*, 1943, 148, 365—378).—A new method for the prep. and purification of this substance (cf. A., 1943, III, 353) is described, involving pptn. by 1% U acetate, extraction from the ppt. with PO_4^{---} buffer (pH 6.8), and salting-out with $(\text{NH}_4)_2\text{SO}_4$. The ppt. is then dissolved in water, dialysed, and lyophilised. Further purification may be effected by fractional pptn. with $(\text{NH}_4)_2\text{SO}_4$. The product inhibits growth of *Staph. aureus* at dilutions as high as 1 in 6×10^9 . Its electrophoretic behaviour, absorption spectra, chemical properties, and reaction with glucose under various conditions show that penicillin B is an enzyme of a flavoprotein nature, which brings about the aerobic oxidation of glucose to gluconic acid and H_2O_2 . The effect of heat and of various substances on its antibacterial activity indicates that the latter is due to the H_2O_2 , and that inhibition of activity by serum is due to catalase. In anaerobic conditions, penicillin B shows no antibacterial activity. There is general correspondence in properties between penicillin B and "notatin" (Coulthard *et al.*, A., 1943, III, 143) but there is a discrepancy in that the former reacts with other sugars besides glucose to give H_2O_2 , whereas notatin is stated not to do so. E. C. W.

Notatin: antibacterial glucose aerodehydrogenase from *Penicillium notatum*. Westling. J. H. Birkinshaw and H. Raistrick (*J. Biol. Chem.*, 1943, 148, 459—460; cf. A., 1943, III, 143).—The activity of notatin is attributed to formation of H_2O_2 . It is probably identical with penatin (Kocholaty, A., 1943, III, 353) and penicillin B (Roberts *et al.*, *ibid.*), and is distinct in chemical nature and action from penicillin. R. L. E.

Determination of streptothricin. J. W. Foster and H. B. Woodruff (*J. Bact.*, 1943, 45, 408—409).—The method is based on the cup method for penicillin estimation (Abraham *et al.*, A., 1941, III, 1048). The agar is sown with spores of *B. subtilis*. Unknown samples are set up along with cups filled with dilutions of a known standard from which a standard curve is obtained by measuring the zones of inhibition. Units of the unknowns are read off the standard curve by projecting the val. of the inhibition zone. F. S.

Reduction in the efficiency of ablastic action in *Trypanosoma lewisi* infection by withholding pantothenic acid from the host's diet. E. R. Becker, M. Manresa, and E. M. Johnson (*Iowa State Coll. J. Sci.*, 1943, 17, 431—441).—The trypanosome population in infected rats was greatly increased by adding liberal amounts of vitamin-B₅ and -B₆ to a diet severely restricted in pantothenate. The increased population was attributed to a decrease in the efficiency of the action of ablastin, the trypanosome-reproduction inhibiting antibody manufactured by the rat. F. S.

Precipitative tests in malaria. A. D. Dulaney and V. House (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 620—623).—Dried *P. knowlesi* parasites were extracted with NaOH or NaCl for use as antigen. Colloidion particles coated with this, or added at the time of combining it with antibody, were agglutinated by serum of malarial subjects. V. J. W.

Respiratory metabolism of a colourless flagellate. H. von Dach (*Biol. Bull.*, 1942, 82, 356—371).—*Astasia klebsii* contains cytochrome. On transfer from culture to inorg. medium, O_2 consumption falls in about 3 hr. to a const. val., higher in cells from young cultures than from old. Respiration is sensitive to CN' but not to N_3' . Of many substrates tried, only formate, acetate, propionate, ethyl alcohol, and hexose diphosphate increase O_2 consumption. The increased respiration with acetate is sensitive both to CN' and to N_3' . G. P. W.

Growth and respiration of a ciliate. R. A. Ormsbee (*Biol. Bull.*, 1942, 82, 423—437).—A study of cell growth, population growth, no. of fissions, and O_2 consumption in bacteria-free cultures of *Tetrahymena geleii*. G. P. W.

Bactericidal properties of synovial fluid. P. F. de Gara (*J. clin. Invest.*, 1943, 22, 131—135).—4 of 37 synovial effusion fluids from patients with rheumatoid arthritis or other joint diseases killed hæmolytic streptococci and 34 of 39 synovial fluids were bactericidal for *E. coli*. The killing power of the fluid was stronger than that of the oxalated plasma. Bactericidal properties for hæmolytic streptococci were detected in only 2 of 9 fluids in rheumatoid arthritis and 2 of 28 fluids in other joint diseases. The bactericidal activity for *E. coli*, but not for hæmolytic streptococci, was related to the complement content of the synovial fluid; it was not completely destroyed by heating at 56° for 30—60 min. and remained unaltered for 6 months in frozen synovial fluid. There was no relation between viscosity, sp. gr., and $[\text{H}']$ at the beginning of the experiment, or cytology of human synovial effusions and their bactericidal activities for hæmolytic streptococci or *E. coli*. C. J. C. B.

Internal structure of certain bacteria as revealed by electron microscope: study of bacterial nucleus. G. Knaysi and S. Mudd (*J. Bact.*, 1943, 45, 349—359).—The cell of *Staphylococcus flavocyaneus* contains one or more granules having similar solubilities to nucleoproteins. In very young cells the granules are smaller because the nuclear material is then partly in solution. *Neisseria meningitidis* contains granules which are insol. in hot water and are probably of nuclear nature. *N. gonorrhoea*, *Staph. aureus*, and *Streptococcus pyogenes* appear homogeneous at all voltages. *Brucella abortus* and *Pasteurella pestis* appear uniform, or contain transparent areas in young cultures. These are probably vacuoles. (22 electron micrographs.) F. S.

Factors which influence growth of heat-treated bacteria. I. Comparison of four agar media. F. E. Nelson (*J. Bact.*, 1943, 45, 395—403).—The relative suitability of different media for determinations of viable population after heat-treatment varied according to the test organism. Beef-infusion agar gave the largest viable population with most heat-treated bacteria, while new standard milk agar ("Standard Methods for the Examination of Dairy Products, 8th ed.; Amer. Publ. Hlth. Assoc., N.Y., 1941) was superior to nutrient agar for enumeration of viable organisms of most of the heat-treated thermophilic lactic streptococci. F. S.

Numbers of bacteria developing on plates in relation to soil environment. N. James and M. L. Sutherland (*Canad. J. Res.*, 1943, 21, C, 191—197).—Estimates of the bacterial population are influenced by the no. of colonies developing on a plate. Counts on plates prepared from 30 different dilutions are considered in relation to changes in moisture, time of sampling, and cropping. R. H. H.

Simple multiple-loop method speeds bacterial counts. A. Moldavan (*Food Ind.*, 1943, 15, No. 6, 56—57).—Description of an apparatus (designed originally for bacterial control of milk) which permits the handling of 16—400 samples at any one time, and dispenses with pipettes, culture dishes, and dilution blanks for making the bacterial counts. E. B. H.

Apparatus for delivering measured quantities of medium. H. Hurni (*Zentr. Bakt.*, 1942, II, 105, 233).—The apparatus consists of a globular reservoir connected by rubber tubing with a clip to a four-way glass tap. The tap allows fluid to run from the reservoir to either of two measuring cylinders, at the same time allowing delivery of fluid from the cylinder not connected with the reservoir. F. S.

New dish for single plate method of culturing anaerobes and bacteria requiring increased carbon dioxide tension. W. E. Bray and J. S. Carter (*Amer. J. clin. Path. Tech. Sect.*, 1943, 7, 31). C. J. C. B.

Occurrence of adenosine 3-triphosphate in autotrophic bacteria. G. A. LePage and W. W. Umbreit (*J. Biol. Chem.*, 1943, 148, 255—260).—Cells of the autotrophic organism, *Thiobacillus thio-oxidans*, contain adenosine 3-triphosphate, whilst the corresponding compound in muscle and yeast is the 5-triphosphate. This is the first demonstration of the occurrence of this ester. P. G. M.

Oxidations by acetic acid bacteria. VI. Production of carboxylic derivatives of reducing sugars and of 2-ketogluconic acid. K. Bernhauer and H. Knobloch (*Biochem. Z.*, 1940, 303, 308—315; cf. A., 1935, 1541).—In addition to 5-ketogluconic acid, various acetic acid bacteria frequently produce other acids related to reducing sugars from Ca gluconate. Thus, *Acetobacter suboxydans* produces cryst. *d*-2-ketogluconic acid (max. yield approx. 60%) from Ca and K gluconate. Under similar conditions, *A. suboxydans muciparum* produces chiefly *d*-5-ketogluconic acid (yield 60%). Ca mannonate also yields carboxy-derivatives of reducing sugars. Glucose yields only very small amounts of such derivatives if the solution is acid; in presence of CaCO₂ it yields approx. 35% of 5-ketogluconic acid with the above two strains. W. McC.

Detection of nitrogen fixation with isotopic nitrogen. R. H. Burris, F. J. Epling, H. B. Wahlin, and P. W. Wilson (*J. Biol. Chem.*, 1943, 148, 349—357).—The fixation of ¹⁵N₂ is a more sensitive and reliable index of N fixation than total N analysis, the method being useful for N fixation experiments with media or materials initially high in N. *Azotobacter vinelandii*, *Nostoc muscorum*, *Clostridium pasteurianum*, and inoculated red clover plants, which are known to fix mol. N₂, assimilated 100—1000 times the quantity of ¹⁵N₂ necessary for detection. Claims that germinating peas, excised root nodules from leguminous plants, free-living *Rhizobium*, and cell-free preps. of *Azotobacter* can fix N₂ were not confirmed. Fixation was obtained with excised nodulated roots of the pea plant. The ability to use N₂ is confined to a few organisms. J. E. P.

Microbiological formation of acetylmethylcarbinol. M. Silverman (*Iowa State Coll. J. Sci.*, 1942, 17, 120—122).—A cell-free enzyme prep. from *Aerobacter aerogenes* quantitatively converts pyruvic acid into CO₂ and acetylmethylcarbinol. The enzyme system requires inorg. PO₄^{'''} prior to decarboxylation of pyruvic acid and does not yield acetaldehyde as a result of decarboxylation, indicating that an enzyme similar to yeast-carboxylase does not take part in the carbinol formation. There is no evidence for the presence of

carboligase in the *A. aerogenes* system. An org. P compound occurs as an intermediate in the enzymic formation of acetylmethylcarbinol from pyruvic acid. The optimum pH for the enzyme is approx. 5.6, and an acid reaction is essential for formation of the enzyme in *A. aerogenes* during growth. In addition to inorg. PO₄^{'''} and an acid reaction, the enzyme requires Mn⁺⁺ or Mg⁺⁺ and cocarboxylase. When *A. aerogenes* cells act on pyruvic acid, two enzyme systems compete for the available acid; these are the acetylmethylcarbinol system and the hydroclastic system pyruvic → acetic + formic acid. The mode of action of acetic acid and acetaldehyde and their homologues in increasing the yield of carbinol during bacterial fermentation of glucose is discussed. In all cases where high yields of carbinol are obtained, the yields of hydroclastic products are decreased. Undried, resting yeast cells do not form acetylmethylcarbinol from pyruvic acid in presence of PO₄^{'''}, whilst when dried, many strains form the carbinol under the same conditions, with increased rate of production of CO₂. It is concluded that drying activates the carbinol system in yeast. J. N. A.

Bacterial hydrogenation of oleic acid and sorbic acid and the effect of bile acids. J. Schönbrunner (*Biochem. Z.*, 1940, 304, 26—36).—When pure cultures of *B. coli*, *B. subtilis*, *B. fluorescens*, *B. fluorescens liquefaciens*, and some soil and sludge strains are grown in a nutrient medium containing only inorg. salts and Na oleate or Na sorbate, the double bonds in the two org. acids are reduced. With a strain isolated from rancid oleic acid, 67% of the oleic acid is hydrogenated in 16 weeks. Sorbic acid is reduced only when its concn. is below 0.5%, and in this case 61% is hydrogenated in 20 weeks. In presence of deoxycholic acid the rate of hydrogenation is greatly increased. Filtrates from active cultures which cause hydrogenation do not cause saturation of the double bond *in vitro*. J. N. A.

Sulphanilamide bacteriostasis in presence of mercuric chloride and *p*-aminobenzoic acid. C. Lamanna and I. M. Shapiro (*J. Bact.*, 1943, 45, 385—394).—In the presence of *p*-aminobenzoic acid the growth-stimulating concn. of sulphanilamide on *Bact. coli* was increased, a result compatible with the competition hypothesis. *p*-Aminobenzoic acid has no influence on the bacteriostatic action of HgCl₂. Mixtures of sulphanilamide and HgCl₂, both in stimulating concns., were toxic. Sulphanilamide antagonised HgCl₂ bacteriostasis and HgCl₂ antagonised sulphanilamide bacteriostasis. Addition of certain non-inhibitory concns. of HgCl₂ enhanced sulphanilamide toxicity. The view is supported that growth inhibition by sulphanilamide is chiefly the result of interference with *p*-aminobenzoic acid metabolism and secondarily binding of sulphanilamide by diverse enzyme systems. F. S.

Growth of coliform bacteria in water.—See B., 1943, III, 196.

Influence of sodium ion on viability of washed cells of *Bacillus cereus*. C. D. Spangler and C.-E. A. Winslow (*J. Bact.*, 1943, 45, 373—384).—Concs. of NaCl of 0.00001—0.3M. protected *B. cereus* against the lethal effects of distilled water with a max. protection from 0.001 to 0.1M. 0.4—0.5M-NaCl was less protective and often more toxic than distilled water alone. F. S.

Mechanism of the action of toluene on bacteria. W. Bucksteeg (*Zentr. Bakt.*, 1942, II, 105, 209—213).—The cellulose-splitting bacteria, *Cytophaga globulosa*, *C. rosea*, and *Cellulivibrio fulva*, exposed to an atm. containing 0.4—2.0% of toluene at room temp. showed delayed visible growth. Concs. of 4.0% and over prevented growth. Cultures placed in a closed atm. saturated with toluene failed to grow after 19 days' exposure but when the O₂ supply was sufficient cultures withstood a toluene-saturated atm. for 26 days. *Azotobacter chroococcum* was more resistant than the cellulose organism to toluene. F. S.

Cultivation of anaerobes and oxidation-reduction (O/R) potentials. G. B. Reed and J. H. Orr (*J. Bact.*, 1943, 45, 309—320).—15 species of pathogenic clostridia grew luxuriantly from small inocula in a simple, slightly alkaline peptone solution (*War Med.*, 1941, 1, 493) provided it was poised at a favourable O/R potential, the optimum *E_h* being -0.2 v. Glucose produced an approx. optimum *E_h* but it was poorly poised. Na thioglycollate, cysteine, ascorbic acid, and Na formaldehydesulphoxylate produced better poised O/R potentials nearer the optimum than glucose. 0.1% agar greatly increased the stabilisation of O/R potentials. F. S.

Gas infection of brain as one form of serious complications of cerebro-cranial injuries. Report by a Committee of Soviet Scientists (162) (*Brit. Med. J.*, 1943, I, 785—788).—61.7% of cerebro-cranial war injuries were infected with cocci; 20.5% were infected with putrefactive aerobes; 11.2% were infected with gas-producing organisms, the great majority being *Cl. perfringens*. The severity of the various infections is discussed and a cases report is given. Treatment was surgical, coupled with the administration of anti-gas-gangrene serum; locally sulphanilamide and sulphathiazole were applied; sulphanilamide (orally), sulphathiazole and sulphathiazole were administered, with 0.8 g. of sulphanilamide intrathecally, were administered. I. C.

Acetone-butanol fermentation. IV. Acetoacetic acid decarboxylase of *Cl. acetobutylicum* (By.). R. Davies (*Biochem. J.*, 1943, **37**, 230—238).—An aq. suspension of washed cells of *Cl. acetobutylicum* is added to 10 vols. of acetone and the ppt. allowed to settle, collected, washed with acetone and ether, and dried. The enzyme is extracted with water. Max. extraction is effected by incubation for 1 hr. at 70°. Longer extraction results in inactivation. Insol. material is removed by centrifuging. The enzyme is purified by adsorption on Al_2O_3 at pH 5, elution with 0.2M- $PO_4^{''}$ buffer at pH 7 for 10 min., and addition of $(NH_4)_2SO_4$ to 80% saturation. Protein is then removed from a solution of the ppt. by addition of 2M-acetate buffer at pH 4 and 0.2 vol. of ethanol. The enzyme is again adsorbed on Al_2O_3 and eluted as before. Addition of $(NH_4)_2SO_4$ to 50—60% saturation ppts. most of the enzyme. Conc. solutions of purified preps. are still yellow. The enzyme, which is dissociated in dil. solution but cannot be separated into its components, is sp. for acetoacetic acid and has optimum activity at pH 5. Dissociation is prevented by diaphorase at a concn. equiv. to 0.07 $\mu g.$ of riboflavin per c.c. The effect of alkaline hydrolysis suggests that the co-enzyme may be riboflavin phosphate. P. G. M.

Comparative speed of response of previously immunised and non-immunised children to fluid and alum-precipitated diphtheria toxoid. V. K. Volk, W. E. Bunney, and J. T. Tripp (*Amer. J. Publ. Health*, 1943, **33**, 475—480).—97% of a group of 98 previously immunised children receiving a reimmunising injection of 0.5 c.c. of fluid or alum-pptd. diphtheria toxoid developed 0.001 unit or more of diphtheric antitoxin per c.c. of serum within 10 days. 74% developed 0.01 unit or more within 5 days. 94% developed 0.01 unit or more and 88% developed 0.1 unit or more within 10 days. C. J. C. B.

Colostrum as source of diphtheria antitoxin in actively immunised pregnant mothers. J. Liebling and H. E. Schmitz (*J. Pediatr.*, 1943, **22**, 189—193).—The colostrum of non-immunised Schick-positive or -negative mothers generally did not contain diphtheria antitoxin; actively immunised, Schick-positive mothers showed no rise in antitoxin content of the colostrum; actively immunised, Schick-negative mothers showed a slight rise. C. J. C. B.

Isolation of dysentery bacilli from stools by formaldehyde inactivation of bacteriophage. I. J. Kligler, E. Oleinik, and I. Czazkes (*Amer. J. Publ. Health*, 1943, **33**, 682—684).—The addition of 1:10,000 formalin to faeces inhibits the bacteriophage which is considered to destroy the bacteria rapidly. C. J. C. B.

Enteric group fevers in prisoners of war from Western Desert. J. S. K. Boyd (*Brit. Med. J.*, 1943, **I**, 719—721).—British troops in captivity in Libya showed relative immunity to enteric fevers, while Italian or German troops in prison camps of North Africa or before capture did not. Inoculation of prisoners with vaccine of Italian manufacture did not affect the high endemic rate or the outbreak of large epidemics, while British vaccine proved effective. The Italian vaccines thus have limited protective power and the British vaccine was far more powerful. I. C.

Species of the tribes Mimeæ, Neisseriæ, and Streptococceæ which confuse diagnosis of gonorrhœa by smears. G. G. de Bord (*J. Lab. clin. Med.*, 1943, **28**, 710—714).—From the 147 cases of conjunctivitis, vaginitis, and normal vaginas, Mimeæ were isolated 45 times; Gram-positive diplococci, which tend to lose the stain, 6 times; and Neisseriæ, excluding the gonococcus, 8 times. The identification of *N. gonorrhœa* by smears in conjunctivitis or vaginitis is not justified. C. J. C. B.

Aspects of nutritional variation of gonococcus. C. E. Lankford, V. Scott, M. F. Cox, and W. R. Cooke (*J. Bact.*, 1943, **45**, 321—326).—Some strains of gonococcus failed to grow on autoclaved media except in the presence of certain other bacteria or fresh extract of liver, yeast, or blood. These strains produced spontaneous mutants capable of synthesising the required thermolabile factor, which was relatively simple, dialysable, alcohol-sol., and not replaceable by a no. of known pure nutritives. (2 photomicrographs.) F. S.

Glutamine as growth factor for certain strains of *Neisseria gonorrhœa*. C. E. Lankford and E. E. Snell (*J. Bact.*, 1943, **45**, 410—411).—The strains of gonococcus requiring the thermolabile factor described in the preceding abstract grew luxuriantly in the presence of glutamine, the optimum concn. being 1—2 mg.-%. Autoclaving the glutamine for 10 min. at 15 lb. greatly reduced its activity. Glutamine could not be replaced by glutamic acid or glutathione. F. S.

Metabolism of lactic acid bacteria, particularly *Bacillus dextralacticus*. A. A. Andersen (*Iowa State Coll. J. Sci.*, 1942, **17**, 25—27).—Malt sprouts are a rich source of food for growth of the heterofermentative, lactic acid bacteria *Lactobacillus manniopæus*, *L. buchneri*, *L. lycopersici*, and *Streptococcus paracitrovorus*. An aq. extract of the sprouts contains the essential material for growth in a medium containing no protein or amino-acids, whilst an alcoholic extract requires hydrolysed caseinogen in order to support growth. An ethereal extract is ineffective. In a basal medium containing

hydrolysed caseinogen, the ether-sol. factor of acidified yeast extract is essential for growth of the four organisms. Tryptophan is essential for good growth of *S. paracitrovorus* and *L. buchneri*, whilst riboflavin and aneurin stimulate growth of *S. paracitrovorus*, *L. manniopæus*, and *L. lycopersici*, but neither is essential in presence of the other; if both are absent growth is completely inhibited, whilst under these conditions, *L. buchneri* is scarcely affected. In all cases growth, as determined by production of acid, is considerably decreased when the alcoholic extract of malt sprouts is replaced by the ether-sol. factor of acidified yeast extract, aneurin, riboflavin, and tryptophan. Hydrolysed caseinogen is completely replaceable by 19 amino-acids, and in this last medium pantothenic acid has no effect. Malt sprouts are also a rich source of nutrients for the holofermentative lactic acid bacteria *L. delbrückii*, *L. helveticus*, and *B. dextralacticus*. The active material is readily extracted with water. An alcoholic extract of malt sprouts in presence of a basal medium containing glucose (1), Na acetate (0.6), $(NH_4)_2SO_4$ (0.3%), and inorg. salts does not support growth of *B. dextralacticus* unless hydrolysed caseinogen is also present, whilst an ethereal extract of malt sprouts in presence of hydrolysed caseinogen and the basal medium supports growth of *B. dextralacticus*, but not that of *L. delbrückii* or *L. helveticus*. In a basal medium containing an aq. extract of gluten all three organisms utilise $(NH_4)_2SO_4$, especially when protein-N is low. *B. dextralacticus* grows well in the basal medium containing an ethereal extract of acidified yeast and aneurin, whilst *L. delbrückii* and *L. helveticus* fail to grow even when riboflavin, tryptophan, and hydrolysed caseinogen are also present. For *B. dextralacticus* the ether-sol. factor can be replaced by hydrolysed caseinogen or amino-acids. Riboflavin can replace aneurin, but only one is essential. Certain amino-acids appear to be inhibitors. *L. helveticus* grows in the basal medium containing the ethereal extract of acidified yeast, aneurin, riboflavin, tryptophan, hydrolysed caseinogen, and pantothenic, ascorbic, thioglycolic, and indole-3-acetic acids, whilst growth of *L. delbrückii* fails in this medium. When *B. dextralacticus* is grown in a medium containing glucose (15), soya-bean meal (1), $PO_4^{''}$ (0.06), and $(NH_4)_2SO_4$ (0.3%), 92—95% yield of *d*-lactic acid is obtained in 4—5 days. Inorg. salts and aeration are essential for the fermentation. Small amounts of β -butylene glycol, acetylmethylcarbinol, acetic acid, and ethyl alcohol are also formed. When soya-bean meal is replaced by 1% of yeast extract, the fermentation is complete in 1—2 days and aeration has very little effect. Aneurin is essential for production of lactic acid. J. N. A.

Brain reactions to bacterial filtrates potent in eliciting local tissue reactivity. O. Marburg and G. Schwartzman (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 612—615).—Single intravenous injections of meningococcal culture filtrates caused degenerative changes throughout the brain in rabbits. V. J. W.

Fixation of carbon dioxide in oxalacetic acid and its relationship to bacterial respiration. L. O. Krampitz (*Iowa State Coll. J. Sci.*, 1942, **17**, 93—94).—The validity of the Wood-Werkman reaction (A., 1938, III, 763) is demonstrated with an enzyme prep from *Micrococcus lysodeikticus* and $^{13}CO_2$. This enzyme prep. very rapidly converts oxalacetate into pyruvate and CO_2 , but the reversibility of the reaction is shown when decarboxylation is carried out in presence of $^{13}CO_2$, any residual oxalacetate containing ^{13}C in the carboxyl adjacent to the methylene group. This decarboxylase, in contrast to yeast decarboxylase, requires only $Mg^{''}$ or $Mn^{''}$ for its action. When fumaric acid is oxidised by the enzyme, there is an accumulation of oxalacetate. $PO_4^{''}$ is probably required for the carboxylation reaction. There is no evidence of exchange with $^{13}CO_2$ when pyruvic, lactic, and oxalosuccinic acids are enzymically decarboxylated in presence of $^{13}CO_2$. The C_4 dicarboxylic acids may play a rôle in bacterial respiration similar to that in mammalian tissue respiration. J. N. A.

Epidemiology of pneumococcus pneumonia. E. S. Rogers, A. M. Bahlke, and A. H. Harris, II (*Amer. J. Publ. Health*, 1943, **33**, 671—681).—In a small rural community pneumococcal infections were transmitted as much by contact with healthy carriers as with cases. Many healthy people showed high levels of type-sp. antibodies without history of previous infection. Males had a higher tendency to become carriers than females. C. J. C. B.

Recently isolated strains of pneumococci as incitants of experimental pneumonia in rats. W. J. Nungester and A. H. Kempf (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 631—634).—In rats inoculated intra-tracheally with pneumococci obtained from patients, mortality and incidence of pleurisy were parallel with severity of symptoms in man. There was no correlation with histological appearance of the infected rat lung or with the titre of "toxins." V. J. W.

Pneumococcal pneumonia. Prognostic significance of the number of pneumococci in sputum in relation to therapy, bacteræmia, type, leucocyte count, duration of disease, age, and degree of involvement. A. W. Frisch, A. E. Price, and G. B. Myers (*J. clin. Invest.*, 1943, **22**, 207—214).—The no. of pneumococci per oil immersion field in Wright-stained smears of rusty sputum was determined at 12-hr. intervals in 678 cases of pneumococcal pneumonia, exclusive of type

III. The close relationship between the highest sputum count during the course of the disease and the outcome was shown by the fact that the fatality rate was 2% when the pneumococci did not exceed 10 per field, 9% when 11—30 were present, 30% when 31—75 organisms were found, and 77% when the no. exceeded 75.

C. J. C. B.

Type III pneumonia: prognostic significance of reticulation in relation to number of pneumococci in sputum, therapy, bacteræmia, leucocyte count, age, and degree of involvement. A. W. Frisch, A. E. Price, and G. B. Myers (*J. clin. Invest.*, 1943, **22**, 215—220).—The type III pneumococcus differs from all other pneumococci in its capacity to produce excessive amounts of capsular polysaccharide, as shown by a fibrin-like reticulum in Wright-stained smears of rusty sputum. In 114 cases of type III pneumonia, reticulation in the sputum was the most important factor in determining the outcome. The fatality rate was 79% when reticulation was present and 7% when it was absent. Sulphapyridine and sulphathiazole were superior to serum + sulphanimide in the treatment of type III pneumonia because they prevented the formation of reticulation, and reduced the fatality rate in reticulated cases from 100 to 67%.

C. J. C. B.

Autopsy studies in pneumococcal pneumonia. A. W. Frisch (*Amer. J. clin. Path.*, 1943, **13**, 61—68).—62 autopsied cases of pneumonia (excluding type III) were classified as (a) fulminating with generalised distribution of pneumococci throughout the lungs, (b) fulminating on admission with few pneumococci in the lungs as a result of therapy, and (c) moderately ill on admission with few pneumococci in the lungs at necropsy. With 2 exceptions a correlation was found between the no. of pneumococci in the sputum during life and in the respiratory passages and in the lungs at necropsy, so that the former is as a measure of the latter.

C. J. C. B.

Autopsy studies in type III and Friedlaender's pneumonia. A. W. Frisch (*Amer. J. clin. Path.*, 1943, **13**, 69—73).—Of the 20 cases of type III pneumonia, 18 were classified as reticulated and 2 non-reticulated on the basis of appearances of sputum specimens examined during life. 17 also showed widespread reticulation throughout smears of exudate from the trachea, bronchi, and lungs at autopsy. 5 cases of Friedlaender's type A and 2 of type B pneumonia were examined. In type A infections the capsules of the bacilli took the Wright stain which resulted in the appearance of a reticulum in the sputum and lungs which was identical with that observed in type III pneumonia. Excess amounts of capsular polysaccharide were demonstrable either in the form of free masses or as strands connecting 2 or more bacilli. In type B infections, the capsules did not stain, but the sp. sol. substance was visible as coalescing clear areas surrounding the bacilli. The typing reaction showed large amounts of polysaccharide in type B cases. Examination of the sputum can thus be utilised as a biopsy of the lung in these pneumonias.

C. J. C. B.

Primary Friedlaender pneumonia. L. Hyde and B. Hyde (*Amer. J. med. Sci.*, 1943, **205**, 660—675).—Of 51 patients with Friedlaender pneumonia, 88% were over 40 years of age. The ratio of males to females exceeded 5 to 1. 60% occurred from Nov. to April. Occupation played no rôle. The clinical types and symptomatology are also described.

C. J. C. B.

Sulphonamide-fast pneumococci. Clinical report of two cases of pneumonia. Effectiveness of penicillin and tyrothricin against sulphonamide-resistant strains. W. S. Tillett, M. J. Cambier, and W. H. Harris, jun. (*J. clin. Invest.*, 1943, **22**, 249—255).—From 2 patients with pneumonia and bacteræmia, strains of pneumococci (types I and VIII) were isolated which caused infections in mice that were totally refractory to treatment with sulphadiazine. Both patients responded rapidly and successfully to sp. serum therapy. Experimentally penicillin was highly effective against infections in mice caused by either sulphonamide-resistant or susceptible strains. When tyrothricin in single doses was used for treatment of mice, the protection was not complete; sulphonamide resistance did not influence the effect of tyrothricin.

C. J. C. B.

Type VIII pneumococcus: development of sulphadiazine resistance, transmission by cross infection, and persistence in carriers. A. W. Frisch, A. E. Price, and G. B. Myers (*Ann. int. Med.*, 1943, **18**, 271—278).—A type VIII pneumonia, originally sensitive to sulphadiazine, became resistant during the course of treatment; the strain was transmitted by contact to another patient who also developed a sulphadiazine-fast pneumonia. Drug-fastness was shown by the development of a positive blood culture during treatment in one patient, an extension of the pneumonic process in both patients, a marked increase in the no. of pneumococci in the sputum, and the growth of the organisms in media containing up to 20 mg. per 100 c.c. of sulphadiazine (growth was inhibited by 5—10 mg. of sulphathiazole). Both patients recovered on type-sp. serum and sulphathiazole administration. Both patients carried virulent sulphadiazine-resistant type VIII pneumococci for 2 months after hospitalisation.

A. S.

Sodium lauryl sulphate solubility test for identification of pneumococci. M. Bayliss (*J. Lab. clin. Med.*, 1943, **28**, 748—751).—0.2%

Na lauryl sulphate rapidly cleared suspensions of pneumococci with disintegration of the organisms.

C. J. C. B.

Antipneumococcus serums. M. Finland (*J. Amer. Med. Assoc.*, 1942, **120**, 1294—1307).—A review.

C. A. K.

Formation of ascorbic from xylose by *B. prodigiosus*. K. H. Busing and F. Peters (*Biochem. Z.*, 1940, **304**, 134—136).—When *B. prodigiosus* is grown in a medium containing peptone (1), NaCl (0.5), and *d*-xylose (2%) adjusted to pH 7.5 for 12 days at 37° the amount of reducing substance present in the solution is more than doubled; this does not occur in a similar medium but without the organism. Cell-free culture filtrates from a xylose medium when administered to guinea-pigs exhibit antiscorbutic activity, which is probably due to ascorbic acid.

J. N. A.

Familial epidemiology of rheumatic fever: genetic and epidemiologic studies. M. G. Wilson, M. D. Schweitzer, and R. Lubschetz (*J. Pediat.*, 1943, **22**, 581—609).—From an analysis of 688 cases it is considered that the most important factor in the pathogenesis of rheumatic fever is the genetic susceptibility of the host.

C. J. C. B.

Correlation between clinical and experimental findings in cases showing invasion of blood stream by staphylococci. B. Kleiger and J. E. Blair (*Surg. Gynec. Obstet.*, 1940, **71**, 770—777).—35 cases were divided into 2 groups: one in which the symptoms were acute and rapid in onset among patients younger than 30 due to the toxin produced by highly toxigenic strains; the other among older patients which is less acute and rapid and is caused by the organism itself. Individuals resistant to the effects of the toxin whether due to antitoxin injections or, as in the older patients, due to natural resistance are still liable to the ill effects of the organism itself.

P. C. W.

Humoral antibodies for *Staphylococcus aureus* in infants and their mothers. J. A. Lichty, jun., C. P. Katsampes, and W. S. Baum (*J. Pediat.*, 1943, **22**, 549—558).—The blood of 50 pairs of mother and newborns examined for antitoxin and anticapsular agglutinin for *Staph. aureus* showed that the newborn reflects its mother, with a higher degree of correlation for the antitoxin than for the agglutinin. The level of antitoxin decreases during the first few months of life, while the agglutinin titer is unchanged throughout the first year.

C. J. C. B.

Effect of pleural effusions on growth of *Staphylococcus aureus* in vitro. A. B. Tobler and M. Pinner (*J. Bact.*, 1943, **45**, 341—348).—All of 49 tuberculous effusions allowed a poorer growth of *Staphylococcus aureus* than nutrient broth, the ratio varying from 1:20 to more than 1:100,000. Of 7 non-tuberculous fluids, 4 had ratios between 1:40 and 1:10,000. The inhibition of growth is due to an active inhibitory factor and not to deficiency in nutritive qualities because inhibition is present when broth is added to effusion, dilution of effusions by saline decreases inhibition, and inhibition is decreased by shaking and by heating for 30 min. at 56°.

F. S.

Mandelic acid therapy in *Staphylococcus* and *B. coli* infections. L. Sas (*Magyar Orv. Arch.*, 1941, **42**, 78—94).—1—2% solutions of alkanolamine mandelates and 1% buffered solutions of mandelic acid are strongly bactericidal if the pH of the urine does not exceed 5.0—5.5 and 5.0—6.0 respectively. Alkanolamine mandelates are equally effective against staphylococci. At lower concn. or higher pH the bactericidal action is lost but some bacteriostatic action remains.

M. A. B.

Determination of chromogenic property of staphylococci. G. H. Chapman (*J. Bact.*, 1943, **45**, 405—406).—Staphylococci which gave white or doubtful coloured colonies were retested on Bactopeptone agar to which had been added when almost cool 10% of evaporated milk. The plates were sealed and incubated at room temp. for 10 days. By this method agreement between chromogenesis and the coagulase test was increased from 80 to 93%.

F. S.

Rôle of toxin and use of antitoxin in systemic staphylococcal infections. B. Kleiger and J. E. Blair (*Arch. Surg., Chicago*, 1943, **46**, 548—554).—A report of 2 cases successfully treated with staphylococcus antitoxin.

F. S.

Reactions of monkeys to *Strep. hemolyticus* C. J. L. Schwab, S. Saslaw, O. C. Woolpert, C. Merino, and C. A. Doan (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 560—563).—Intranasal inoculation was followed within 24 hr. by a marked leucocytosis due to an increase in granulocytes. There was a slight reciprocal fall in lymphocytes and in red cells and hæmoglobin.

V. J. W.

Reactions of monkeys to re-inoculation with *Strep. hemolyticus*. C. A. Doan, S. Saslaw, M. Beard, O. C. Woolpert, J. L. Schwab, and C. Merino (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 566—568).—The 2nd inoculation was made intranasally in 8 monkeys after a 2—3 months' interval. It caused no leucocytosis but the opsonic index was markedly increased. Only 2 monkeys showed clinical evidence of infection and only in these were positive throat cultures found.

V. J. W.

Action of sulphathiazole on bacterial respiration. W. Frei (*Schweiz. med. Wschr.*, 1942, **72**, 763—764).—Sulphathiazole

diminishes the O_2 uptake of hæmolytic streptococci and *Pasteurella avicida* more markedly at pH 7.6–7.8 than at pH 6.0. This inhibitory effect was also observed after addition of serum or whole blood, and does not run parallel to the sulphathiazole concn. The drug also inhibits the CO_2 production of *B. coli* alone and after addition of glucose or pyruvic acid. A. S.

Intermediary metabolism of heterotrophic bacteria, particularly *Streptococcus paracitrovorus* and *Aerobacter indologenes*. H. D. Slade (*Iowa State Coll. J. Sci.*, 1942, 17, 123–125).—Anaerobic fermentation of citric acid by cell suspensions of *S. paracitrovorus* at pH 6.6 leads to formation of CO_2 , H_2 , and formic acetic, lactic, and succinic acids. The qual. and quant. nature of the products formed from oxalacetic and pyruvic acids suggest that these two acids are intermediates. N_2 , AsO_3''' , and iodoacetate inhibit fermentation of citric, oxalacetic, and pyruvic acids. A reaction of pH 3.5–5.7 is necessary for formation of acetylmethylcarbinol and β -butylene glycol from citric acid. As the pH of the medium is decreased, the total yield of carbinol and glycol is increased, whilst that of acetic and succinic acids is decreased, but the total amount of C_4 compound is practically the same in each case. Assimilation of $^{13}CO_2$ by certain heterotrophic bacteria is discussed (cf. A., 1942, III, 492). When succinic acid containing ^{13}C in one carboxyl group is added to fermentations of glucose by *A. indologenes*, acetic acid, ethyl alcohol, and β -butylene glycol, each containing ^{13}C , are formed, whilst addition of acetic acid containing ^{13}C in the carboxyl group leads to formation of succinic acid, ethyl alcohol, and β -butylene glycol, each containing ^{13}C , the succinic acid containing ^{13}C exclusively in the carboxyl group. Addition of acetic acid containing ^{13}C in the methyl and carboxyl groups also results in formation of the above three compounds, and in this case the succinic acid contains ^{13}C equally distributed between the methyl- and carboxyl groups. The β -butylene glycol which is formed in presence of acetic acid containing ^{13}C in the carboxyl group contains ^{13}C exclusively in the hydroxyl C, whilst that formed in presence of acetic acid containing ^{13}C in the methyl and carboxyl groups contains ^{13}C equally distributed between the methyl and hydroxyl C. These results show that a C_2 compound, probably acetaldehyde formed by reduction of acetic acid, is involved in synthesis of β -butylene glycol by intact cells of *Aerobacter*.

J. N. A.

Anti-streptococcal action of iodinin. Naphthaquinones and anthraquinones as its main natural antagonists. H. McIlwain (*Biochem. J.*, 1943, 37, 265–271).—Iodinin, the di-*N*-oxide of a dihydroxyphenazine isolated from *Chromobacterium iodinum*, partly inhibits growth of streptococci in concn. of $3 \times 10^{-7}M$, and completely inhibits growth at 1.2 – $2 \times 10^{-6}M$. In presence of subinhibitory amounts of iodinin, streptococci and other organisms will grow and destroy it. Phenazine di-*N*-oxide has a similar effect to that of iodinin, but larger amounts are required. Extracts of yeast, animal tissues and fluids, and various plants have very little effect on the inhibiting action of iodinin, but a few annul its action and this is probably due to presence of anthraquinone and naphthaquinone derivatives. Pure hydroxyanthraquinones and 2-methyl-1:4-naphthaquinone in concn. of 5×10^{-7} to $5 \times 10^{-6}M$ inhibit the effect of $2 \times 10^{-6}M$ -iodinin. When organisms overcome the inhibition caused by iodinin and phenazine di-*N*-oxide in presence or absence of quinones, the *N*-oxides are probably reduced. Some other H-transport systems and reducing agents also cause destruction of iodinin and allow growth of the organisms, but the amounts required are much greater than in the case of the antagonistic quinones. There is no reaction between the *N*-oxides and quinones in absence of organisms and hence the quinones probably participate to some degree in the metabolism of the organisms. They may be concerned with H-transport, but because of the structural similarity between the *N*-oxides and quinones it is suggested that the two classes of compound may function at common sites in the organism and that iodinin may inhibit systems normally concerned with such quinones. J. N. A.

Kahn verification test. W. J. M. Beveridge (*Edinb. Med. J.*, 1943, 50, 344–354).—In an analysis of 127 sera which gave "discrepant" results with the Wassermann reaction and standard Kahn test, the verification test proved of val. in diagnosis. A syphilitic type of reaction is very strong confirmatory evidence of, and a negative reaction strongly against, syphilis. In 28 of 335 sera examined the "general biologic response" was obtained. The significance of this is discussed. The greatly increased sensitivity of the Kahn test at 37° is stressed. H. S.

Four years' use of the Kahn presumptive test as screening agency in the serology of syphilis. E. L. Webb and T. F. Sellers (*Amer. J. Publ. Health*, 1943, 33, 537–540).—The Kahn presumptive test proved to be an efficient screening test. Less than 0.1% of 17,496 specimens examined by both tests gave negative reactions by the presumptive test and positive or doubtful reactions by the standard test. C. J. C. B.

Antigenic substance in urine in syphilis. V. Scott (*Johns Hopkins Hosp. Bull.*, 1942, 71, 242–245).—Complement-fixation tests on

urine of 23 syphilitic and 8 non-syphilitic patients failed to detect reagin or antigenic substance. Urine is frequently anti-complementary. Albuminuria with high % of globulin in the excreted protein and high blood serum reagin content seem necessary for excretion of reagin. T. F. D.

Production of anæmia by tetanus toxin. H. Farkas and I. J. Kliger (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 717–719).—Injections of sublethal doses of toxin in rabbits caused anæmia with 50% fall in red cells and hæmoglobin, and increased sedimentation rate. Injection of antitoxin brought vals. to normal in 24 hr. V. J. W.

Conversion of hydrolysate tetanus toxin into toxoid. E. B. Schoenbach, J. J. Jezukawicz, and J. H. Mueller (*J. clin. Invest.*, 1943, 22, 319–320).—Tetanus toxin, prepared on a peptone-free hydrolysate medium, can be detoxified with 0.2% formalin in 3 weeks. The resulting toxoid is sufficiently antigenic to meet the requirements of the National Institute of Health for a fluid tetanus toxoid designed for human use. The use of toxoid of this type for immunisation should prevent any possibility of anaphylactic reactions due to antigenic components of certain peptones. C. J. C. B.

Comparison of antigenicities of hydrolysate and peptone tetanus toxoids in guinea-pig. J. H. Mueller, L. R. Seidman, and P. A. Miller (*J. clin. Invest.*, 1943, 22, 321–324).—There is no qual. and little quant. difference in antigenic action between toxoids free from, and those containing, peptone. C. J. C. B.

Antitoxin response in man to tetanus toxoids. J. H. Mueller, L. R. Seidman, and P. A. Miller (*J. clin. Invest.*, 1943, 22, 325–328).—Peptone-free tetanus toxoid (for human prophylaxis) produced antitoxin as effectively as the ordinary type. C. J. C. B.

Carotenoid of *Mycobacterium phlei*. Y. Takeda and T. Ohta (*Z. physiol. Chem.*, 1939, 262, 168–170).—From the acetone extract of *M. phlei* (870 g. dry wt.) 2.5 mg. of cryst. leprotin were obtained. The product identified as β -carotene by Chargaff (A., 1934, 112) and by Ingraham and Steenbock (A., 1936, 114) may have been leprotin. J. H. B.

Polysaccharides from tubercle bacilli and from tuberculin. Y. Takeda and T. Ohta (*Z. physiol. Chem.*, 1939, 262, 171–177).—The active polysaccharides isolated from human tubercle bacilli and from tuberculin by pptn. with alcohol and subsequently with acetic acid have respectively the following properties: $[\alpha]_D +138.0^\circ$, $+133.8^\circ$, acid equiv. 971.6, 1162, ash 0, 1.54%, C 39.39, 40.15%, H 6.79, 6.72%, no N or P, acetyl 1.96, 1.73%, reducing substances as glucose, 65.7, 79.3%, acid hydrolysis products (5% H_2SO_4 for 5 hr. at 100°) α -mannose 5.8, 23.0%, α -glucose 59.9, 56.3%, precipitin reaction 1 : 10^6 , 1 : 10^4 , allergic skin reaction strong, weak. J. H. B.

Immunity to tuberculosis. G. G. Kayne (*Brit. Med. J.*, 1943, I, 777–779).—A review. I. C.

Pregnancy and experimental pulmonary tuberculosis in rabbits. H. E. Burke (*Surg. Gynec. Obstet.*, 1940, 71, 615–619).—Of 240 rabbits with pulmonary tuberculosis developed after intratracheal injection of human or bovine tubercle bacilli 21 became pregnant through inefficient segregation. Young were born during the early, intermediate, or late phases of both the progressive (bovine) or retrogressive (human) forms of tuberculosis. There was no effect on the development of the tubercular lesions. P. C. W.

Typhoid-paratyphoid vaccine. D. Longfellow and G. F. Luippold (*Amer. J. Publ. Health*, 1943, 33, 561–568).—Initial vaccination of young adult males with T.A.B. vaccine produced significant amounts of protective substances in the blood serum active against *E. typhosa*, *S. paratyphi*, *S. schottmuelleri*, the Java strain of paratyphoid B, *S. enteritidis*, *S. typhimurium*, and against 2 coliform organisms containing salmonella O-antigens I and II, and IV and V, respectively. Such vaccination failed to produce, by the method used for detection, demonstrable protective substances active against *S. cholerae suis*, *S. oranienburg*, and *Pr. morganii*. C. J. C. B.

Cultivation of *Bacterium tularensis* in simplified liquid media. J. T. Tamura and I. W. Gibby (*J. Bact.*, 1943, 45, 361–371).—Media consisting of gelatin or casein hydrolysate or amino-acids when supplemented with liver-cake extract, blood-cell extract, and biotin concentrate supported the growth of *Bact. tularensis*. Pantothenic acid, pimelic acid, nicotinic acid, and biotin mixture permitted limited growth. The accessory growth factors in liver-cake and blood cells were thermostable and dialysable. Cystine or cysteine was indispensable and could not be replaced by homocystine, methionine, or thioglycolic acid. F. S.

Asparagine bacteriophage in treatment of acute hæmatogenous osteomyelitis. P. S. MacNeal (*Surg. Gynec. Obstet.*, 1940, 71, 766–769).—Only 1 patient died among 12 which were treated with intravenous asparagine bacteriophage in addition to the usual treatment. This mortality rate (8.3%) compares favourably with that of 78% among the 36 patients previously treated without asparagine bacteriophage. P. C. W.

Medium adapted to bacteriophage of *Rhizobium leguminosarum*. T. Campbell and A. W. Hofer (*J. Bact.*, 1943, 45, 406—407).—The medium consists of Ca glycerophosphate 1 g., MgSO₄ 0.2 g., NaCl 0.2 g., sauerkraut juice 20 ml., distilled water 980 ml. adjusted to pH 7.6. Bacteriophage can be demonstrated by adding 100 g. of soil containing the sp. bacteriophage to 50 ml. of the medium previously inoculated with the susceptible organism and incubating for 24 hr. at 30°. F. S.

Semi-quantitative determinations of bacteriophage in soils. E. J. Bottcher and A. W. Hofer (*J. Bact.*, 1943, 45, 407—408).—100 g. of soil is added to 50 ml. of sterile sauerkraut-glycerophosphate medium (see preceding abstract), inoculated with the organism to be tested, and incubated overnight at 30°. 1 ml. of a suitably diluted Berkefeld filtrate of the culture is then mixed with 10 ml. of nutrient agar and 1 ml. of a 24-hr. culture of the organism. The poured plate is incubated at 30° for 48 hr., the plaques are counted, and an estimate is made of the no. of bacteriophage units in the original soil. F. S.

Lack of immunity to latent virus. G. Freeman (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 568—570).—All of 400 mice examined developed pneumonitis on intranasal, but not on intra-cranial, -peritoneal, or subcutaneous inoculation with infected lung suspension. 50% developed the disease on intranasal inoculation with sterile physiological saline solution. It was not contagious to cagemates, and no antiserum could be obtained from rabbits. V. J. W.

Effect of dilution of neutral mixtures of Eastern equine encephalitis virus and antiserum. M. E. Pierce, J. E. Kempf, and M. H. Soule (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 604—607).—When a 1:100 concn. of virus and rabbit antiserum was diluted 100 times with 0.85% saline and kept at 26° it became reactivated. V. J. W.

Course of experimental infection of chick embryo with virus of equine encephalomyelitis. F. B. Bang (*J. Exp. Med.*, 1943, 77, 337—344).—The increase in max. virus content after inoculation of the 10-day-old chick with Eastern equine encephalomyelitis continues until shortly before the generalised destruction of the embryo; this is followed by a stationary phase. There is no selective tissue destruction and the virus is distributed throughout the egg, although concn. in the embryo. The resistance of the chorioallantoic membrane and of the hatched chick to Eastern and Western virus infection increases with age. A. S.

Induced resistance of central nervous system to experimental infection with equine encephalomyelitis virus. Serotherapy in Western virus infection. P. K. Olitsky, R. W. Schlesinger, and I. M. Morgan (*J. Exp. Med.*, 1943, 77, 359—374).—Treatment of the infection induced by the virus of Western equine encephalomyelitis in mice and guinea-pigs with sp. hyperimmune rabbit serum was ineffective if begun after the onset of signs of encephalitis. In mice, after intracerebral inoculation of the virus, serum was ineffective even when given before that stage. The disease was completely arrested in some guinea-pigs, after pad inoculation, if antiserum was given 24—48 hr. following the inoculation; in other animals, the incubation period was prolonged to 2—7 weeks. Injection of virus alone in untreated guinea-pigs produced active immunity in those which survived. Antiserum blocked the antigenicity of active virus in the serum-treated animals. The decrease in titre in the sera of all antiserum-treated animals proceeded at the same rate as in those control animals which received antiserum alone; it was thus impossible to predict which animals would survive and which would succumb after a prolonged incubation period. Delayed death occurred when the neutralising antibody of the treated guinea-pigs had fallen to a low level. Such delayed reaction occurred relatively frequently. A. S.

Experimental transmission of St. Louis encephalitis to mice by *Dermacentor variabilis*. R. J. Blattner and F. M. Heys (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 707—710).—Engorged larval ticks, fed on infected mice, contained virus and transmitted the disease to young mice. Adult mice on which full-grown infected ticks had fed showed considerable resistance to intracerebral inoculation. V. J. W.

Poliomyelitis virus from flies. J. A. Toomey, W. S. Takacs, and L. A. Tischer (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 637—639).—Poliomyelitis was produced in a monkey by inoculation with a dried aq. extract of flies collected near a raw sewage effluent from a heavily infected area. V. J. W.

Armstrong mouse-adapted poliomyelitis virus; effect of pH of inoculum and of "enteric organism filtrate." W. McD. Hammon and E. M. Izumi (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 579—583).—Virus suspended in a medium of pH 4 was 4—16 times as effective as when in a medium of pH 7. Its effect was not altered by "enteric filtrate." V. J. W.

Reactions of monkeys to influenza virus A. O. C. Woolpert, J. L. Schwab, S. Saslaw, C. Merino, and C. A. Doan (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 558—560).—Macaque monkeys, inoculated intranasally, did not develop clinical influenza but their white

cell count fell to about half, due to a decrease in granulocytes, beginning 1—2 days and reaching a max. 6 days after inoculation. There was a reciprocal increase in lymphocytes. Return to normal began on the 8th day when antibodies appeared in the serum. V. J. W.

Reactions of monkeys to mixtures of influenza virus and streptococcus. C. Merino, C. A. Doan, O. C. Woolpert, J. L. Schwab, and S. Saslaw (*Proc. Soc. Exp. Biol. Med.*, 1941, 48, 563—565).—Simultaneous inoculation with both organisms caused an immediate leucocytosis, followed by leucopenia on the 11th—15th day. When inoculation with streptococcus was followed after 4 days by virus no leucopenia occurred, but when the interval was 15—17 days leucopenia occurred 1—3 days after viral inoculation. When streptococcal inoculation followed virus inoculation by 15—17 days no leucocytosis was produced. V. J. W.

Feline virus pneumonia and its possible relation to cases of primary atypical pneumonia in man. F. G. Blake, M. E. Howard, and H. Tatlock (*Yale J. Biol. Med.*, 1942, 15, 139—166).—(5 photomicrographs.) F. S.

Morphological structure of rickettsiae. H. Plotz, J. E. Smadel, T. F. Anderson, and L. A. Chambers (*J. Exp. Med.*, 1943, 77, 355—358).—The morphological structures of rickettsiae of the Breinl strain of epidemic typhus, the Wilmington strain of endemic typhus, the Bitterroot strain of Rocky Mountain spotted fever, and the American strain of Q fever, examined by electron microscopy, were similar to one another and to certain bacteria. The rickettsiae, in common with the elementary bodies of vaccinia virus and all bacteria, have a limiting membrane surrounding protoplasmic substances; dense granules were found in the inner protoplasm. A. S.

Mode of transmission of rickettsia infection. W. Löffler and H. Mooser (*Schweiz. med. Wschr.*, 1942, 72, 755—761).—Report of a laboratory infection where 6 subjects were severely infected by spray, without cutaneous lesions. A. S.

Serologic reactions following smallpox vaccinations. J. M. Lubitz (*Amer. J. Clin. Path.*, 1943, 13, 139—143).—25 cases of false positive Kahn serological reactions were encountered in 2000 individuals who had been recently vaccinated against smallpox. At least 13% of 100 people who developed a vaccinia showed positive serological findings to 1 or more tests. This reaction is transitory and may occur between the 14th day and several months following vaccination. The heterophilic antibody tests was negative in all such cases. There was a persistent fall in titre of reagin in such sera after keeping for several days. C. J. C. B.

Biological and physical-chemical characterisation of X- and γ-ray-induced mutations of tobacco mosaic virus proteins. E. Pfankuch, G. A. Kausche, and H. Stubbe (*Biochem. Z.*, 1940, 304, 238—258).—Irradiation of the ordinary forms of the tobacco mosaic virus with 12,000—14,000 r. of γ-rays produces modifications. The new forms are not fragments of the normal virus mol. but are homogeneous individuals which can be sharply differentiated electrophoretically. Qualitatively the activity of T.M. 44, 46, and 88 is enhanced, whilst that of T.M. 50 and 58 is considerably reduced. The significance of the findings in genetics is discussed. P. G. M.

Lymphogranuloma inguinale (tropical bubo). F. A. R. Stammers (*Brit. Med. J.*, 1943, I, 660—661).—The aetiology, pathology, and treatment of lymphogranuloma inguinale are described. I. C.

Serology and the ancestry of vertebrates. R. W. Wilhelm (*Biol. Bull.*, 1942, 82, 179—189).—Precipitin tests indicate that prochordates (4 species used) are more closely related to echinoderms (5 species) than to annelids (5 marine species) or to *Limulus*. G. P. W.

Precipitin reactions to *Monezia* species. M. M. Mahr (*Biol. Bull.*, 1942, 83, 88—90).—The precipitin test is sensitive enough to differentiate between *M. expansa* and *M. benedeni*. G. P. W.

Failure of azogelatin as an antigen. F. Haurowitz, M. Tunca, and P. Schwerin (*Biochem. J.*, 1943, 37, 249—250).—When arsanilazogelatin is injected intravenously into rabbits only 4.4% of the As is deposited in the liver whilst 66% is excreted in the urine, whereas after injection of arsanilazoglobulin, the corresponding amounts are 34 and 9%. The rapid elimination of As when administered intravenously as the azogelatin is probably related to the peculiar properties of the gelatin mol. and its tendency to remain in solution and not to be adsorbed. The failure of arsanilazogelatin to produce antibodies is attributed mainly to the fact that it is not deposited in the reticulo-endothelial cells, but is rapidly eliminated from the organism. This may also be the reason for the non-antigenicity of gelatin. J. N. A.

Value of mixed bacterial "oral cold vaccine." M. Siegel, M. G. Randall, M. D. Hecker, and M. Reid (*Amer. J. med. Sci.*, 1943, 205, 687—691).—The oral administration of a heat-killed vaccine containing several species of potentially pathogenic bacteria of the upper respiratory tract had no influence on the incidence, severity, or complication of the common cold in 125 persons compared with 128 controls. C. J. C. B.

Urinary excretion of trichina antigen in experimental trichinosis. L. G. Welt (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 587—589).—Rhesus monkeys with trichinosis may show fever, œdema, and eosinophilia. Antigen is present in their urine and serum over several weeks and at a time when antibody is also present in the serum. V. J. W.

Anaphylactic shock after first injection of tetanus serum. K. Brandl (*Brit. Med. J.*, 1943, II, 11).—Anaphylactic shock occurred in a subject who had an antiscarlatalin injection 12 years previously and never had asthma or any similar disease. I. C.

Hereditary predisposition to sensitisation in guinea-pigs. J. L. Jacobs, J. J. Kelley, and S. C. Sommers (*Proc. Soc. Exp. Biol. Med.*, 1941, **48**, 639—641).—Greatly increased sensitiveness to allylthiocarbimide was developed by selective breeding. V. J. W.

Allergic dermatoses due to food hypersensitivity. R. M. Wingard (*Arch. Pediat.*, 1943, **60**, 139—148).—An attempt was made to recover sensitising agents in the blood of patients with allergic dermatoses due to food hypersensitivity. The auto-serum collected after ingestion of clinically culpable foods caused a delayed skin reaction in 6 of 9 patients studied. C. J. C. B.

Contact dermatitis from resin-finished underwear. H. Keil (*Arch. Dermat. Syphilol.*, 1943, **47**, 242—248).—A case of contact dermatitis due to a resin-finished facing in cotton underwear is described. The causative substance was a special ester gum made from abietic acid and a special type of alcohol. C. A. K.

XXVI.—PLANT PHYSIOLOGY.

Physiology of incompatibility in plants. II. *Linum grandiflorum*. D. Lewis (*Ann. Bot.*, 1943, **7**, 115—122).—The osmotic pressure of thrum and pin styles, respectively, is equiv. to 10—12 and 20% of sucrose, that of thrum and pin pollen-grains to 80 and 50%. The osmotic pressure ratio of pollen to styles is 4 : 1 in both legitimate pollinations, 5 : 2 in pin × pin, and 7 : 1 in thrum × thrum. Imbibition of water in the early stages of pollen germination is probably controlled mainly by the protoplasmic colloids; osmosis is more important in later growth. R. H. H.

Foliar hydration of cotton plant. III. Observations using pruning method. IV. Influence of composition and concentration of nutrient solution. E. Phillis and T. G. Mason (*Ann. Bot.*, 1943, **7**, 147—156, 157—169; cf. B., 1942, III, 947).—III. The remaining leaves on a partially defoliated plant supplied with full nutrient solution increased in water, dry wt., and protein content, but showed little change in depression of f.p. and conductivity of the sap. When pruned plants were transferred to aq. CaCl₂, the uptake of water by the remaining leaves was proportional to the increase in CaCl₂ content, the behaviour being similar to that of leaf discs floated on these solutions.

IV. The effect of wide variations in the composition and concn. of the nutrient supply has been investigated. A high correlation was obtained between hydration in terms of dry wt. and sap conductivity. Hydration appears to be determined mainly by the level of salt concn. R. H. H.

Morphology and anatomy of *Fegatella conica* in relation to mechanism of absorption and conduction of water. D. A. Clee (*Ann. Bot.*, 1943, **7**, 185—193).—The movement of vital stains shows that water travels as capillary films between tuberculate rhizoids and ventral scales to the growing tip, where it is absorbed. Smooth-walled rhizoids immediately outside the scales have an absorptive function. Entry of liquids into internal tissues is aided by mucilage cells and large cells with irregularly pitted walls. The method of water transportation to sex organs and the developing sporophyte is described. R. H. H.

Physiological factors in growth and reproduction of trees. A. E. Murneek (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 666—671).—A review. L. G. G. W.

Factors influencing field germination and seedling vigour of Imperial 152 lettuce seed. W. A. Frazier (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 701).—Better germination and more vigorous seedlings were obtained from seed stored at 24—31° than from seed stored at 5.5°. Exposure of new seeds to 54.5° did not increase germination or seedling vigour but if the exposure was prolonged both germination and vigour decreased. Seed harvested early is larger and gives a better germination and more vigorous seedlings than seed from a later harvest. L. G. G. W.

Premature seeding studies with beets. O. Smith (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 793—798).—Mature beets in the greenhouse produced few seed stalks at 18.3° but produced them abundantly at 12.2°. In continuous darkness at 12.2° no flowering shoots developed but on moving the plants to continuous light flowers were produced. Exposure to light of 500 was superior to

that of 200 ft.-candles whilst continuous illumination induced the production of more flowering shoots than did exposure to shorter periods of daily illumination. Two weeks of complete darkness at 10° appeared to stimulate subsequent flowering under conditions of continuous illumination. Plants 33—47 days old responded more than older or younger plants to the treatments. L. G. G. W.

Relationship of temperature to flower bud formation in *Chrysanthemum*. K. Post (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 1003—1006).—Low (10°) as compared with high (15.5 and 26.6°) night temp. delayed bud formation, retarded flowering, and reduced the no. of flowers per stem. L. G. G. W.

Factors affecting shoot growth and flower bud formation in *Rhododendrons* and *azaleas*. H. T. Skinner (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 1007—1011).—Leaf bud cuttings of *Leucothoe catasbaei*, *R. ponticum*, and *R. roseum elegans* produced shoots most readily at high temp. (24—26.6°) and under long days although the effect of day length was not as marked at high as at low (10—12.8°) temp. Max. shoot elongation occurred with high temp. and continuous light. *R. carolinianum*, *R. mucronulatum*, and varieties of *A. obtusa* produced fewer flower buds at high than at low temp. and in these two species of *Rhododendron* (but not in others tested) short day treatments increased flower bud production. L. G. G. W.

Factors affecting flowering and bulb production in the Creole Easter lily. F. D. Cochran and T. V. Vereen (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 1031—1033).—Bulbs of *L. longiflorum* stored for 1 or 2 months at 1.7—4.4° or at ordinary temp. gave less vigorous plants than bulbs replanted immediately after digging, but the low-temp. storage induced earlier flowering. Storage reduced the wt. of the bulbs produced subsequently, as did cutting down the stalks, whilst plants disbudded produced a heavier wt. of bulbs and more bulblets per plant than those allowed to flower. Cold protection in winter is necessary to give the highest yield of bulbs and the best plant growth. L. G. G. W.

Effect of root temperature on growth and nitrogen intake of apple trees. L. P. Batjer, J. R. Magness, and L. O. Regeimbal (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 11—18).—In young York Imperial apples terminal bud formation quickly followed subjection of the roots to temp. of 5.5° and 7.2°. Even when a high-N culture solution was supplied, N in the leaves did not increase until after a lapse of 4 weeks and then reached that of the leaves of normal trees. Low root temp. (5.5—7.2°) caused a reduced rate of transpiration and earlier daily closing of the stomata. L. G. G. W.

Influence of pollination on seed development in certain varieties of *Citrus*. C. Y. Wong (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 161—163).—Washington Navel, Valencia, and Jaffa oranges, Marsh grapefruit, and Satsuma mandarins although generally producing seedless fruit may be seeded. The no. of seed in these commonly seedless fruits is increased by cross-pollination. In parthenocarpic fruits produced without pollination no seeds occur, and a few occur in fruits developing after self-pollination. Although nucellar embryony occurs, obviating the necessity for fertilisation, seed development does not occur without the stimulus of pollination or of artificially applied growth substances. L. G. G. W.

Relation of number of leaves in November to number of flowers the following spring in the Blakemore strawberry. E. B. Morrow and G. M. Darrow (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 571—573).—Old plants produce more flowers and more leaves but fewer flowers per leaf than younger plants due possibly to greater competition for plant nutrients in the larger older plants. L. G. G. W.

Leaf bud cuttings for multiplying tropical shrubs. J. V. Watkins (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 1109—1111).—Several tropical ornamental shrubs can be propagated vegetatively by means of leaf bud cuttings. They responded by the production of heavier root systems to treatment with indolylbutyric acid-talc powder (5 mg. per g.) and after potting up, the treated cuttings continued to make satisfactory growth. L. G. G. W.

Withdrawal of water from the fruit by the leaves of cotton. V. A. Novikov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **32**, 288—290).—In the cotton plant wilting leaves withdraw water from the bolls, mainly by way of the bark but also through the wood. The Egyptian cotton boll has a higher water content than the American and loses less water when the plant wilts. M. A. B.

Sand culture studies of the effect of various concentrations of added salts on composition of tomato plants. R. F. Wall and E. L. Hartmann (*Proc. Amer. Soc. Hort. Sci.*, 1942, **40**, 460—465).—Tomato plants were grown in quartz sand supplied with MgSO₄, KH₂PO₄, Ca(NO₃)₂, Fe citrate, and Haas A-Z solution plus varying amounts of NaHCO₃, Na₂SO₄, MgCl₂, CaCl₂, and MgSO₄. At high temp. Na₂SO₄ (up to 8000 p.p.m.) was more toxic than at low temp. Na₂SO₄ (8000 p.p.m.) reduced plant wt. by 60%, CaCl₂ by 50%, MgCl₂ (6000 p.p.m.) by 33% and MgSO₄ (8000 p.p.m.) by 50% and the toxicity in these cases appears to be due to high ionic concn. and

reduced availability and/or absorption of other ions. With NaHCO_3 (3000 p.p.m.) growth is reduced by 60% but the effect is mainly due to the increased pH of the culture. Details of the effect of the various additions on the contents of Mg, Cl, P, Ca, S, Na, N, K, Mn, and total ash in the plants are given. L. G. G. W.

Spectrographic determination of eight elements in young leaves of Delaware grape. A. T. Myers, B. C. Brunstetter, I. W. Dix, and C. A. Magoon (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 645—649).—Leaves of Delaware grape are significantly richer in K, Cu, and Ca than are those of Concord grapes, but no significant differences were found for Al, Mg, Mn, Fe, and P. Delaware leaves are richer in Mg, Ca, and Al and poorer in Mn and P than Ontario leaves. These differences are somewhat modified by mulching, N—P—K and NO_3^- dressings, but on the Delaware grape, of four treatments given, mulching + NO_3^- , mulching + N—P—K, cultivation + NO_3^- , and cultivation + N—P—K, mulching gave a significantly greater content of Mg and Ca than did cultivation + NO_3^- . With all other comparisons the differences for these and the other elements failed to reach the level of significance. L. G. G. W.

Quantitative survey of eight mineral elements by spectrographic methods and of total nitrogen in young leaves of twenty-five varieties of American grapes. B. C. Brunstetter, A. T. Myers, I. W. Dix, and C. A. Magoon (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 635—638).—Outstanding differences are found in the N, K, Mg, Ca, P, Al, Fe, Mn, and Cu contents of the leaves of different varieties amounting on occasion to several hundred % but the biological significance of these differences is uncertain. L. G. G. W.

Physiological-chemical functions of potassium in crop growth. G. T. Nightingale (*Soil Sci.*, 1943, **55**, 73—78).—A review of published work. A. G. P.

Symptoms of potassium deficiency in carnation plants. A. J. Szendel (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 1012).—In water culture when K deficiency developed the apices of carnation plants failed to grow, and young leaves and leaves from the middle part of the plant developed necrotic spots of irregular shape and size but most abundant near the apices and margins of the leaves. Later the affected regions died and shrivelled. L. G. G. W.

Catalase activity in relation to after-ripening of apple seeds. A. J. Loustalot (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 361—362).—Catalase activity of apple seeds falls throughout the winter when the seeds are stratified in moist sand and kept at 0—2.2°; as the catalase activity falls the germination % increases. Seeds kept dry at ordinary temp. retain their full catalase activity and fail to germinate. L. G. G. W.

Catalase activity and nitrogen content of apple buds in relation to advance of season. A. J. Loustalot (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 363—364).—Catalase activity of apple buds falls from early March to early April whilst the buds are still dormant, continues to fall whilst the buds swell and open, and then remains const. till full bloom (May 8th). The N content (as % of dry wt.) of the buds increases slightly before bud swelling and rapidly at bud opening, the total per bud increasing 9—12-fold. L. G. G. W.

Partial elimination of experimental error from data by the use of significance tests. E. M. Emmert (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 272—278).—Methods of interpreting relationships between sol. N and P contents of tomato petioles and plant yields are discussed. Up to 16 p.p.m. of P in the petiole an increase of 1 p.p.m. caused an increase in yield. Above this val. each increase of 1 p.p.m. of P was associated with a decrease in yield. This was under drought conditions. If plenty of water had been available a positive regression would have resulted above 16 p.p.m. of P. L. G. G. W.

Nitrogen fixation by blue-green algæ. G. E. Fogg (*J. Exp. Biol.*, 1942, **19**, 78—87).—*Anabaena cylindrica* fixes N in bacteria-free culture if sufficient combined N is not available. G. P. W.

Metastable oxygen and biological formation of hydrogen peroxide. K. Yamafuji and M. Nishioeda (*Biochem. Z.*, 1940, **304**, 160—164).—Aq. fructose, in presence of eosin— SiO_2 , forms H_2O_2 on exposure to sunlight. Activation of O_2 to a metastable form is postulated. The same system, in presence of ZnO or talc, gives H_2O_2 in absence, but not in presence, of sunlight. This is due to formation of an activated O_2 by contact of O_2 with the interface of the ZnO. The activated O_2 forms H_2O_2 by oxidation of fructose, galactose, mannose, lactose, cystine, valine, and glutamic acid but not glucose, sucrose, glycine, alanine, or leucine. Eosin may be replaced by other sensitizers. F. O. H.

Changes in invert sugar and sucrose during ripening of Arizona grapefruit. R. H. Hilgeman and J. G. Smith (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 535—538).—Total sugar content of grapefruits increases until mid-winter and then decreases. Sucrose increases rapidly in autumn and decreases in winter and spring whilst invert sugar changes little in the autumn but increases gradually during the winter, and, after falling in the autumn, the

invert sugar as % of total sugar increases rapidly throughout the winter. A low proportion of invert sugar is associated with a tendency to remain on the trees without softening and with a good storage life. Limiting the supply of N increases the sugar content of the fruit and accelerates sucrose hydrolysis. L. G. G. W.

Variability of sugar-acid ratio and total nitrogen in Valencia oranges. D. Appleman and A. V. Richards (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 539—542).—A statistical study of these vals. in oranges taken from an orchard planned to give as uniform trees as possible is described. To be representative a sample must consist of at least 20—30 fruits. L. G. G. W.

Identification of acetaldehyde among the volatile products of citrus fruits. J. B. Biale and A. D. Shepherd (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 543—547).—Oranges and lemons kept for 12—25 days in glass containers with restricted ventilation evolved vapours containing acetaldehyde. When stored in air or in a mixture of CO_2 10, O_2 10, and N_2 80% the fruits produced no acetaldehyde and very little when stored in N_2 . When transferred from N_2 to air large amounts of acetaldehyde were evolved and CO_2 production increased. L. G. G. W.

Correlation between the vitamin-C content and refractive indices of musk melons. L. E. Wagner, J. C. Hoffman, and H. D. Brown (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 839—840).—16 varieties of musk melons showed ascorbic acid contents ranging from 16 to 57 mg. per 100 g. of fruit. Vals. were positively correlated ($r = +0.89$) with the refractive index. L. G. G. W.

Comparison of tomato varieties for vitamin-C content. T. M. Currence (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 901—904).—Tests in field grown tomatoes failed to show significant varietal differences in the vitamin-C content of the fruits. Greenhouse tomatoes had a lower -C content than outdoor grown fruit and varietal differences were evident. Seasonal variations in -C content occurred but these were not correlated with sunshine records. L. G. G. W.

Source and phosphatase activity of exoenzyme systems of maize and tomato roots. H. T. Rogers, R. W. Pearson, and W. H. Pierre (*Soil Sci.*, 1942, **54**, 353—366).—Cellular matter sloughed-off from growing roots consists of well-nucleated intact cells which remain substantially unaltered in soil for a considerable time. Nuclease activity in maize and tomato roots is not influenced appreciably by previous levels of nutrition. P deficiency is associated with slightly increased glycerophosphatase activity in the roots. Optimum pH for the glycerophosphatase system in maize roots at 27° is 4.0 and for the nuclease system 6.3. Max. activity is obtained at 45° (pH 4.0) and 60° (pH 7.0) respectively. The extra-root digestive system of plants probably originates in sloughed-off root material. A. G. P.

Carotene content of tomatoes as influenced by various factors. G. H. Ellis and K. C. Hamner (*J. Nutrition*, 1943, **25**, 539—553).—The stem end of ripe tomatoes contains more carotene (determined chromatographically) than the blossom end but little correlation between the size and the carotene content is observed though large fruit are slightly richer. Although variations in the nutrients supplied to plants growing in sand cultures affect the growth and fruitfulness considerably they have little effect on the carotene content, NO_3^- only having a slightly beneficial effect. The content of ripe fruit produced in the greenhouse in summer or winter is inferior to that of outdoor, summer-grown fruit, the val. of winter marketed tomatoes being approx. half that of summer fruit. The val. for fruit picked green and ripened in storage is considerably less than that of vine-ripened fruit. H. G. R.

Effect of water supply on the rate of photosynthesis, transpiration, and respiration of apple leaves. N. F. Childers and G. W. Schneider (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 365).—In a controlled environment chamber with light intensity const. at about 4000 ft.-candles, a slight decrease in soil moisture from the field level is associated with slightly increased photosynthesis; the period of the increase is least at high temp. (37°). A decrease in soil moisture may cause a 50% increase in the respiration rate. A decrease in soil moisture to wilting point lowered transpiration by 85% and photosynthesis by 80%. The shorter the drought period the more rapid is the return to normal rates of photosynthesis, transpiration, and respiration when the soil is watered. At 32—37° a reduction in the photosynthetic rate occurred on the 3rd day after drying commenced, and on the 5th day at 23.3°, and transpiration decreases occurred at least one day earlier. Turgor was regained in 3—5 hr. but transpiration and photosynthesis did not return to normal until 2—7 days after watering. L. G. G. W.

Relationship between structure, chlorophyll content, and photosynthesis in apple leaves. W. F. Pickett and A. L. Kenworthy (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 371—373).—The correlation coeff. between the ratio of internal surface to external surface of apple leaves and photosynthetic activity is +0.70 and between chlorophyll content and photosynthetic activity +0.24.

The extent of internal leaf surface is more important than the amount of chlorophyll in controlling the amount of photosynthesis but the ratio between internal and external surfaces and chlorophyll content is also correlated ($r = +0.52$).
L. G. G. W.

Influence of Bordeaux mixture on the rate of photosynthesis and transpiration of apple leaves. F. W. Southwick and N. F. Childers (*Proc. Amer. Soc. Hort. Sci.*, 1940, **37**, 374).—Bordeaux mixture (4–6–100) sprayed on to apple trees at 10°, 15.5°, 21.1°, 27.7°, or 37° with light intensity 1000–5500 ft.-candles on 3 successive occasions at 2–5-day intervals caused at the 3 higher temp. levels a 9–14% reduction in photosynthesis. Recovery followed removal of the spray residue from the leaves. At the lower temp. reductions of 27–32% in the rate of photosynthesis occurred. Transpiration at 21.1–37° was reduced by 13–25% and again recovery followed removal of spray residue. At 10° no reduction in transpiration occurred but removal of the spray residue resulted in spotting of the leaves. The transpiration rate fell considerably whilst the photosynthetic rate failed to return to its normal val.

L. G. G. W.

Environment-control chamber for study of photosynthesis, respiration, and transpiration in horticultural plants. N. F. Childers and H. W. Brody (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 384–390).—The construction of a chamber in which temp. can be controlled to within 0.83° over the range 1.7–48.9°, R.H. to within 1% over the range 0–95%, and light controlled from 500 to floor level to 8000 ft.-candles near the ceiling, is described.

L. G. G. W.

Effect of foliar condition on the photosynthetic activity of pecan leaves. H. Lutz and M. B. Hardy (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 484–488).—Dark green leaves from high-N trees have a greater rate of photosynthesis than light green or slightly yellowish leaves from low-N trees. Spraying with Bordeaux mixture increased the rate of photosynthesis. On an unsprayed tree normal green leaves had a slightly lower rate of photosynthesis than dark green ones but the rate of photosynthesis of normally green but diseased leaves was only about 60% of normal.

L. G. G. W.

Acidity of silicofluorides.—See A., 1943, I, 233.

Chemical mode of action of the genes *Mot*, *M_D*, and *Gathe* in *Chlamydomonas*. R. Kuhn and F. Moewus (*Ber.*, 1940, **73**, [B], 547–559).—Physiological and genetic evidence is adduced in favour of the mutual dependence of crocin and picrocrocin formation in gametes. It is shown that the male sex cells which develop safranal are able to decompose picrocrocin and that all cells which separate *cis*- and *trans*-crocin dimethyl ester are able to exchange the gentiobiose residue of crocin for methyl by re-esterification. The second and third reactions are accomplished by gene-dependent enzymes (gene enzymes) which under suitable conditions are brought into solution from the sex cells and can be investigated kinetically.

H. W.

What is the cause of the relative proportions of *cis*- and *trans*-crocin dimethyl ester in the sexually-separate species of *Chlamydomonas*? R. Kuhn and F. Moewus (*Ber.*, 1940, **73**, [B], 559–562). The polyene synthesis in the gametes under the influence of the responsible genes *M* and *F* probably occurs in such a manner that the *cis*- and *trans*-pigments are formed only in definite ratio. The photochemical reaction, *cis*- to *trans*-crocin dimethyl ester, is analytically but not physiologically important. The proportions of *cis*- to *trans*-polyene in the male and female gametes appear to coincide with the respective ratios, 1 : 2, 3, 2 × 3, and 2 × 3² and 2, 3, 2 × 3, and 2 × 3² : 1.

H. W.

Induced parthenocarp in some horticultural crops. C. Y. Wong (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 158–160).—By use of growth-promoting substance applied as a lanoline paste to the style parthenocarpic seedless fruits have been produced in watermelons. All varieties did not respond equally. In some varieties fair-sized seed coats (containing no embryos) developed in the fruits. Seed coats also developed in the parthenocarpic fruits of strawberry but not in those of pepper, egg plant, and tomato.

L. G. G. W.

Effect of ethylene on breakdown of starch and pectin. S. Ruzsnyák and B. E. Hatz (*Magyar Orv. Arch.*, 1941, **42**, 36–43).—Ethylene may hasten the ripening of fruits by its effect on enzymic breakdown of carbohydrates since it is found to increase the activity of diastase. Its effect on carbohydrate metabolism in animals was also studied.

M. A. B.

Effect of nutrition and phytohormones on rooting of vine cuttings. H. L. Pearce (*Ann. Bot.*, 1943, **7**, 123–132).—The ability of cuttings to form roots and respond to treatment with plant hormones was determined largely by the nutritional conditions of the parent plant. Cuttings from plants grown under conditions of mineral starvation rooted readily and responded well to treatment with indolylbutyric acid, the response being exceptionally marked when KNO₃ was supplied in addition. Those from plants which had received adequate nutrition produced large, green leaves, but rooted

poorly and failed to increase root formation when treated with indolylbutyric acid and/or KNO₃.
R. H. H.

Effects of synthetic growth substances on cuttings and seeds.—See B., 1943, III, 174.

Cellular changes [in wheat] in relation to rust-resistance. F. S. Thatcher (*Canad. J. Res.*, 1943, **21**, C, 151–172).—The histopathological development and changes in permeability associated with the browning reaction of wheat to *Puccinia graminis tritici* are described, and their significance is discussed.
R. H. H.

XXVII.—PLANT CONSTITUENTS.

Determination of magnesium in plants and soils.—See A., 1943, III, 704.

Behaviour of the quinhydrone electrode in plant liquids.—See A., 1943, I, 234.

Relation of variety and stage of development to composition of figs. M. S. Mohamed and E. M. Mrak (*Food Res.*, 1942, **7**, 495–502).—The sugar content of Adriatic, Black Mission, Calimyrna, and Kadota figs increases gradually during the first 6 weeks and rapidly during the last 2 weeks of their development, whereas polysaccharides other than starch, crude fibre, alcohol-precipitable matter, pectic acid, protein, and ash decrease slowly at first and then rapidly. The great increase in sugar can be correlated with softening and coloration of the fruit and the decrease in ash and possibly other constituents is produced by dilution resulting from the increase in sugar. Starch and sucrose are found only in small quantities and fully matured figs of first and second crops are similar in composition. The sugar content of caprifig Kadota figs exceeds that of uncaprifig figs from the same orchard.
H. G. R.

Isolation of β -amyryn from the leaves and seeds of lucerne. L. C. King, C. D. Ball, B. Riegel, C. E. Schweitzer, P. G. Smith, and E. W. Meyer (*J. Amer. Chem. Soc.*, 1943, **65**, 1168–1170).—Isolation of β -amyryn, m.p. 196–198° (199–200°) (lit. 192–194°), [α]_D +86.1–86.5° in CHCl₃ [benzoate, m.p. 233–234° (232–233.4°), [α]_D +98.4–100.1° in CHCl₃; acetate, m.p. 238–240°, [α]_D +79.8–85.1° in CHCl₃; *p*-nitrobenzoate, m.p. 257–258°, [α]_D +95.6° in CHCl₃], from lucerne seeds and leaves is described.
R. S. C.

Chemical constituents of distilled lime oil (*Citrus medica*, L., var. *acida*, Brandis) (*Citrus aurantifolia*, Swingle). E. S. Guenther and E. E. Langenau (*J. Amer. Chem. Soc.*, 1943, **65**, 959–963).—Fractionation etc. of Mexican distilled lime oil yields α - and β -pinene, *d*-limonene, dipentene, bisabolene, furfuraldehyde, *n*-oct-, *n*-non-, *n*-dec-, and *n*-dodec-aldehyde, citral, *l*-borneol, geraniol, α -terpineol, linalool, *n*-dodecyl alcohol (probably as ester), esters of acetic, octoic, and *n*-decoic acids, an azulene, an aldehyde (b.p. in the range 103–115°), and a phenolic compound (phenylurethane, m.p. 134–137°), but no phellandrene, *p*-cymene, terpinene, cadinene, or high-boiling terpenic hydrocarbon (cf. Burgess *et al.*, *J.C.S.*, 1904, **85**, 414, 1329).
R. S. C.

Occurrence of squalene in plant fats. K. Taufel [with H. Heinisch and W. Heimann] (*Biochem. Z.*, 1940, **303**, 324–328; cf. A., 1939, III, 536).—A modification of the procedure of Grossfeld (B., 1937, 584) applicable to very small quantities of material permits the isolation, as hexahydrochloride, of squalene from the unsaponifiable matter of olive and wheat-germ oil and the fat of yeast. Coconut, cottonseed, soya-bean, and rape oil contain little or no squalene.
W. McC.

Nitrogenous constituents of jack-beans. D. Ackermann and W. Appel (*Z. physiol. Chem.*, 1939, **262**, 103–110).—The constituents isolated from *Canavalia ensiformis* were canavanine, *d*-arginine, choline, trigonelline, and betonicine, but no glycine betaine. A little deaminocanavanine [*nitrate*, (C₅H₉O₃N₃)₂.HNO₃, m.p. 215.5°, becoming brown], which was also isolated probably arose from canavanine in working up. Two new products were obtained: *caneine*, C₁₂H₂₄O₃N₂, m.p. 188–189° (browning) [*picrate*, m.p. 120–121° (browning)], obtained as a Cu salt from the phosphotungstate fraction, and *kitagine*, C₇H₉O₃N, m.p. 240–242° (browning), probably an NH₂-O- derivative of benzoic acid.
J. H. B.

(A) Proteins of hog and German millets. (B) Alcohol- and alkali-soluble proteins of hog and German millets. T. Y. Lo (*J. Chinese Chem. Soc.*, 1941, **8**, 170–176, 177–183).—(A) Hog and German millet contain respectively the following % of protein: water-sol., 5.07, 6.02, 10% aq. NaCl-sol., 4.95, 5.95, 80% boiling alcohol-sol., 53.18, 42.13, and 0.5% aq. NaOH-sol., 28.39, 34.85, also water-sol. non-protein-N, 0.85, 1.12% and insol. N in residue ($\times 6.25$), 0.33, 0.44%.

(B) The alcohol-sol. proteins of hog and German millet have much more NH₂-N, but less cystine, lysine, and histidine, than the glutelins. The glutelin of German millet is similar to that of common millet, except that the cystine and lysine contents are higher.
A. Li.

Chlorophyll-*c* (chloropucine) of diatoms and dinoflagellates. H. H. Strain, W. M. Manning, and G. Hardin (*J. Biol. Chem.*, 1943, **148**, 655—668).—Extracts of centric and pennate diatoms contain chlorophyll-*c* whilst larger amounts are present in extracts of the fresh-water dinoflagellate *Peridinium cinctum* and a similarly pigmented alga which grows symbiotically in a sea anemone. Red, green, and blue-green algae contain no chlorophyll-*c*, and it is also absent from *Euglena*. It is concluded that chlorophyll-*c* is a natural constituent of cells rather than a post-mortem product, and in respect to abundance, geographical distribution, and possible importance in photosynthesis it may rank with chlorophyll-*b*. Chlorophyll-*a* in killed plant tissue, plant extracts, and alone in solution is converted by hydrolysis, isomerisation, and oxidation into several products which are strongly adsorbed on sucrose, none of which is identical with chlorophyll-*c*. Allomerisation of chlorophyll is probably a very complex process which involves isomerisation as well as oxidation reactions. J. N. A.

Oxidising enzymes and vitamin-C in tomatoes. F. Wokes and J. G. Organ (*Biochem. J.*, 1943, **37**, 259—265).—The amounts of vitamin-C in various parts of ripe and unripe tomatoes are determined. The greatest amounts of oxidising enzymes occur in the skin of ripe and unripe tomatoes. The flesh and seeds contain less enzyme, and there is practically none in the juice. The skin of ripe and unripe tomatoes has pH 8.0—9.6 whilst the juice is always acid with pH 3.9—5.0. The pH of the flesh changes from the range 8.4—9.0 to 4.6—5.5 during ripening. When the oxidase is liberated mechanically from the tissues it destroys -C, and the rate of destruction is extremely rapid in unripe skin, 67% being destroyed in 1 min.; it is less rapid in the flesh and slowest in the juice, and is proportional to the concn. of oxidase and pH in these tissues. In general the concn. of -C is proportional to that of the oxidase, and it is 2—3 times greater in the skin than in the flesh or juice. Seeds contain a higher concn. of oxidase and a lower concn. of -C, which may be due to the fact that -C can be produced in the seeds by germination. During determination of -C the sampling error is considerably greater than the normal titration error, owing to the variation in concn. of -C in different tissues and to the action of oxidase during dissection, and this must be taken into account. Very small tomatoes sometimes contain higher concn. of -C because of the higher proportion of skin. When tomatoes are exposed to sun during ripening the -C content may be affected not only by the sun but also by oxidase action especially if ripening occurs under conditions which favour oxidase action. It is suggested that exposure to sun and contact with ascorbic acid oxidase are of more importance than other factors, such as polyloidy, affecting the amount of -C in foods. J. N. A.

Saponin of Chinese drug "San-chi."—See A., 1943, II, 256.

Anthochlor pigments of *Coreopsis grandiflora*, Nutt I.—See A., 1943, II, 274.

XXVIII.—APPARATUS AND ANALYTICAL METHODS.

Bio-assay on a general curve. E. B. Wilson and J. Worcester (*Proc. Nat. Acad. Sci.*, 1943, **29**, 150—154).—Mathematical. F. S.

Device for injections into ear of rabbits. W. Koch (*J. Lab. clin. Med.*, 1943, **28**, 745—746). C. J. C. B.

Hypodermic needle holder. E. E. Myer (*Amer. J. clin. Path. Tech. Sect.*, 1943, **7**, 40). C. J. C. B.

Simple filtration unit. E. W. Richard (*Pharm. J.*, 1943, **151**, 5).—A simple filtration unit for injectable medicaments, incorporating a sintered-glass bacterial filter. F. R. G.

Improved micrometer burette.—See A., 1943, I, 240.

Eye-glasses to be used with binocular microscope. A. Plaut (*J. Lab. clin. Med.*, 1943, **28**, 756). C. J. C. B.

Apparatus for the continuous recording of light intensity in foot-candles (graphic light meter). K. Post and M. W. Nixon (*Proc. Amer. Soc. Hort. Sci.* [1939], 1940, **37**, 278).—An apparatus assembled to produce a graphic light meter operated by photonic cells and giving readings of light intensities from below 1 ft.-candle (too weak to operate a photometer) up to max. daylight intensity is described. L. G. G. W.

Photoelectric colorimeter. R. C. Hanselman (*Amer. J. clin. Path.*, 1943, **13**, 108—115).—Data for the construction, calibration, and use of a vacuum tube photometer operating from an alternating current source are given. Photometric methods for determining blood-sugar, Fe-hæmoglobin, Mg, non-protein-N, cholesterol, P, and lactic acid are described. C. J. C. B.

Stabilised photoelectric photometer. J. Vadász (*Magyar Orv. Arch.*, 1941, **42**, 269—272).—The Lange-Roth photometer is unreliable owing to fluctuations in the light source fed by current

from the main supply. This source of error may be reduced to about one tenth by inserting a glow-lamp stabiliser before the apparatus. M. A. B.

Micro-electrodes for measuring local oxygen tension in animal tissues. P. W. Davies and F. Brink, jun. (*Rev. Sci. Instr.*, 1942, **13**, 524—533).—Two types of electrode are described which permit measurement of O₂ tensions (*p*) in solutions or in animal tissues, a spatial resolution of about 25 μ. being possible in the latter case. One electrode, in which the Pt surface is recessed in a cylindrical glass tip, gives abs. vals. of *p*, readings being possible at intervals of 5 min. The other, in which the Pt is exposed, is suitable for continuous recording of rapid *p* changes, but gives only relative vals. The characteristics of the electrodes and the methods of calibration and measurement are described. A. J. E. W.

Apparatus for determination of oxidation-reduction potential and hydrogen-ion concentration *in vivo* by a single puncture. I. Claudatus (*Biochem. Z.*, 1940, **304**, 49—55).—The apparatus consists of a syringe with a calomel electrode inside the barrel. The needle of the syringe has a coating of electrolytically deposited Sb for use in determination of pH, whilst for determination of redox potential it is coated with a layer of Au. Connexion is made between the needle and the calomel electrode by KCl-agar, and both electrodes are connected to a potentiometer. J. N. A.

Polarographic determination of formaldehyde in biological material. Application to the determination of serine.—See A., 1943, II, 287.

Determination of small amounts of glucose.—See A., 1943, II, 288.

Effect of light in the Van Slyke determination of amino-groups.—See A., 1943, II, 288.

Determination of *p*-aminobenzoic acid. E. R. Kirch and O. Bergheim (*J. Biol. Chem.*, 1943, **148**, 445—450).—A method for the determination of *p*-aminobenzoic acid based on a colour reaction with diazotised aneurin is described, and its application to studies of excretion of free and conjugated *p*-aminobenzoic acid in urine discussed. J. E. P.

Determination of micro-quantities of certain proteins. Colorimetric method.—See A., 1943, II, 288.

Sources of error in photometric determination of cholesterol. E. C. Noyons and M. K. Polano (*Biochem. Z.*, 1940, **303**, 415—424).—The colour produced in the Liebermann-Burchard reaction follows the Lambert-Beer law; that produced by cholesteryl ester is greater than the val. corresponding to its cholesterol content. For complete extraction of cholesterol with 3 : 1 alcohol-ether mixture, at least 10 vols of mixture to 1 vol. of serum are required. Deproteinisation causes no loss of cholesterol. Cholesteryl ester is readily and rapidly (1 hr.) hydrolysed by Na ethoxide but is scarcely attacked by 25% aq. NaOH or KOH. In some cases plasma contains material, possibly hydroxycholesterol, that is not pptd. by digitonin but gives the colour. W. McC.

Determination of bromides and chlorides in biological materials and accurate clinical method for determining bromide in small amounts of blood. L. A. Greenberg (*J. Lab. clin. Med.*, 1943, **28**, 779—786).—A rapid and accurate method is described for determining Br⁻ and Cl⁻ on a single sample of blood or tissue. Acid digestion is used and the Ag halides are converted into sol. halides by treatment with Na₂S₂O₃. C. J. C. B.

Micro-determination of arsenic in biological material. J. A. Sultzberger (*Ind. Eng. Chem. [Anal.]*, 1943, **15**, 408—410).—The sample is digested with HNO₃-H₂SO₄, diluted, evaporated, and the digest, in a Kjeldahl flask, is treated with KCl, KBr, and Fe(NH₄)₂(SO₄)₂ and boiled, the gases (AsCl₃) being distilled into aq. HNO₃ in a Fresenius flask. The HNO₃ solution of the distillate is evaporated to dryness, and a solution of (NH₄)₆Mo₇O₂₄ in aq. H₂SO₄ with NH₄OH is added, and the colour developed at 80—90° for 10 min. is measured at 625 mμ. in a Cenco photo-electric colorimeter. J. D. R.

Carbon arc in oxygen for spectrochemical determination of potassium.—See A., 1943, I, 210.

Photometric determination of potassium.—See A., 1943, I, 235.

Determining magnesium in plants and soils. Adaptation of the 8-hydroxyquinoline micro-method. M. E. Weeks and J. R. Todd (*Ind. Eng. Chem. [Anal.]*, 1943, **15**, 297—299).—Procedure for the isolation of Mg⁺⁺ from plant material and pptn. as the Mg salt of 8-hydroxyquinoline is described. The Mg complex is then dissolved in FeCl₃-AcOH reagent and the Mg determined colorimetrically using the green colour of the Fe complex in AcOH solution. The optimum range for the method is 0.1—0.7 mg. of Mg⁺⁺. Amounts of PO₄^{'''} likely to be encountered in soil and plant materials do not interfere seriously with the method. L. S. T.

Micro-determination of magnesium with the polarograph.—See A., 1943, I, 236.

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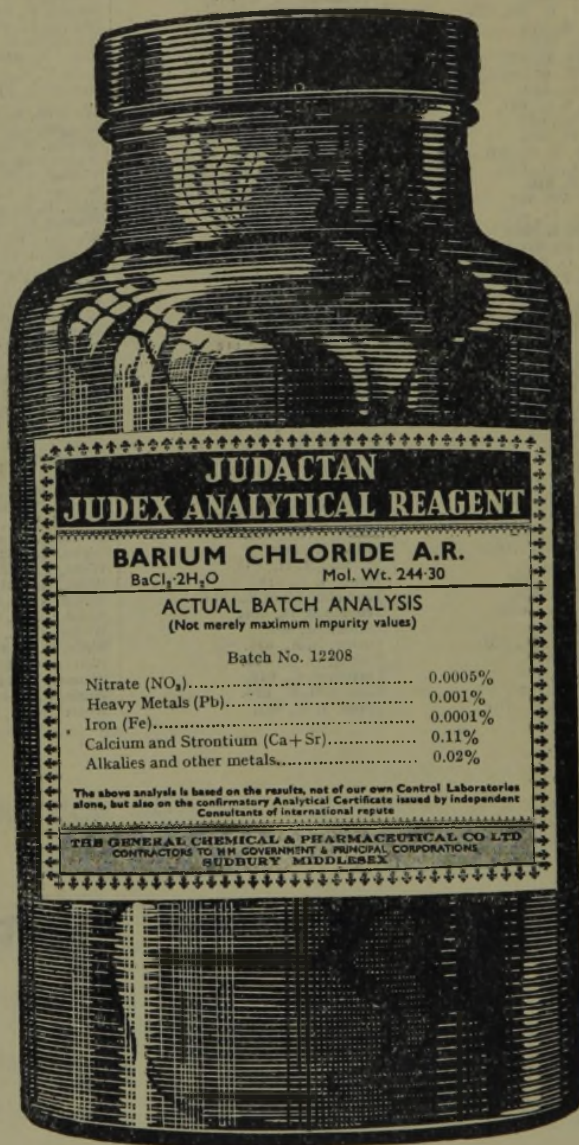
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