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CONTENTS

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A I—GENERAL, PHYSICAL, AND INORGANIC CHEMISTRY.
A II—ORGANIC CHEMISTRY.
A III—PHYSIOLOGY. BIOCHEMISTRY. ANATOMY.
B I—CHEMICAL ENGINEERING AND INDUSTRIAL INORGANIC CHEMISTRY.
B II—INDUSTRIAL ORGANIC CHEMISTRY.
B III—AGRICULTURE, FOODS, SANITATION, ETC.
C—ANALYSIS AND APPARATUS.

COLLECTIVE INDEXES

DECENNIAL INDEX 1923—1932. QUINQUENNIAL INDEX 1933—1937.

INDEX OF AUTHORS' NAMES, A III.

NOVEMBER, 1944.

BRITISH CHEMICAL AND PHYSIOLOGICAL ABSTRACTS

A III—Physiology. Biochemistry. Anatomy.

NOVEMBER, 1944.

I.—GENERAL ANATOMY AND MORPHOLOGY.

Inguinal region. I. Conjoined aponeurosis and conjoined tendon. S. B. Chandler and M. Schadewald (*Anat. Rec.*, 1944, **89**, 339—343).—Observations on the inguino-hypogastric region in 220 body halves showed that the internal oblique muscle took origin from almost the entire inguinal ligament. The internal oblique and transversus abdominis united to form a conjoined aponeurosis in approx. 95% of cases. The relation of these muscles and their aponeurosis to the inguinal triangle is discussed. A conjoined tendon was observed in slightly over 5% of the cases. W. F. H.

Renal fascia and its relation to transversalis fascia. C. E. Tobin (*Anat. Rec.*, 1944, **89**, 295—311).—The renal fascia is derived from a local condensation of the retro-peritoneal tissue and not from the transversalis fascia. The anterior and posterior lamina of the renal fascia enclose the kidney, adrenal, and peri-renal fat of each side in a space which is subdivided by a layer of connective tissue separating the kidney from the adrenal. The layers of renal fascia approach each other at the hilum of the kidney and are adherent to the renal pelvis and vessels, aorta, and vena cava and are continuous with corresponding layers of the opposite side. In congenital absence of the kidney, the renal fascia does not develop. The transversalis fascia is immediately adjacent to the transversus abdominus, quadratus lumborum, and psoas. It is distinct from the intrinsic fascia of these muscles and is attached to the bodies of the lumbar vertebræ. W. F. H.

Eustachian tube : review of its descriptive, microscopic, topographic, and clinical anatomy.—See A., 1944, III, 586.

Study of human bone by *X*-ray diffraction. P. Lamarque (*Compt. rend.*, 1943, **216**, 804—805).—The study of the structure of human bone by *X*-ray diffraction indicates that there is no direct relationship between the mechanical part played by any part of a bone and the preferential orientation of the cryst. substance. The orientation exists only in the true bone, and not in a transition zone. The preferential direction of orientation is parallel to the longer axis of the bone. There is no alteration in the orientation throughout the thickness of the bone. The mineral constituent of bone gives the same *X*-ray diagram as apatite. On calcination at 750°, the org. matter (ossein and collagen) is destroyed and the apatite remaining maintains its orientation. By removing the mineral constituent with acid it is shown that the collagen also has a definite orientation, the axis of the fibre being parallel to the long axis of the bone. In general, in the whole bone, the *X*-ray pattern of collagen, obtained by the ordinary method, is completely masked by that of apatite, and experiments on mixtures of the two substances show that this is the case even when the mixture contains as much as 50% of collagen. Special apparatus, however, reveals an interference due to collagen, and it is found that the orientation of the apatite follows that of the collagen, the orientation of the latter deciding that of the apatite. This agrees with the fact that cartilaginous structure precedes calcification. In all cases the ternary axis of the apatite appears to be parallel to the local direction of the polypeptide chains of the collagen. A. J. M.

Deposition of lead in bone. II. Calcium–phosphorus and lead–phosphorus ratios. F. R. Barrett (*Med. J. Austral.*, 1943, **II**, 433—435).—In rats, P added to a basal diet containing a considerable amount of Pb but a negligible amount of Ca causes an appreciable reduction in circulating and deposited Pb. Of the Pb absorbed, less Pb was deposited when the Ca–P ratio was high, when the influence of vitamin-*D* or P on Pb metabolism was secondary to the correction of the Ca–P ratio. F. S.

Ossification sequences in identical triplets. L. W. Sontag and E. L. Reynolds (*J. Hered.*, 1944, **35**, 57—64).—The patterns of onset of ossification in "identical triplets" are similar but not identical because of the operation of environmental factors and acquired metabolic characters. L. G. G. W.

Seasonal variations in weight, height, and appearance of ossification centers. E. L. Reynolds and L. W. Sontag (*J. Pediat.*, 1944, **24**, 524—535).—In 133 children aged 12—60 months, the period of max. wt. gain was from October to December; min. wt. gain, from April to June; the period of max. height gain was from April to June; min. height gain, from October to December; the period of max. rate of appearance of ossification centres was from March to May; min. rate of appearance, from September to November. C. J. C. B.

Chondrodystrophia calcificans congenita. M. P. Borovsky and J. Arendt (*J. Pediat.*, 1944, **24**, 558—567).—A case report. C. J. C. B.

Osteogenesis imperfecta. W. H. Pickel, R. K. Ghormley, and J. D. Camp (*Radiology*, 1943, **40**, 145—154).—Report of 40 cases, 11 of which were of the hereditary, and 29 of the non-hereditary congenital, type. E. M. J.

Osteopetrosis (Albers–Schönberg disease). C. A. W. Zimmermann, III (*Radiology*, 1943, **40**, 155—162).—A review and report of a case of a 9-year-old boy. E. M. J.

Architecture of upper end of femur in various pathological conditions. W. Townsley (*J. Path. Bact.*, 1944, **56**, 199—207).—The internal architecture of the upper extremity of the human femur in several pathological conditions is described. The newly formed trabeculæ and trabeculated plates are laid down on mechanical principles to withstand the altered stresses and strains imposed on the bone. In coxa valga the internal architecture undergoes a devolutionary change as the result of a modification of the external form and is similar to that of the almost straight reptilian femur. In osteo-arthritis a new compact articular surface is formed superficial to the original one, separated from it and supported by new trabeculated elements which continue the radiating lines of the original trabeculæ and trabeculated plates. In femoral amputation stumps the angle shows an increase in val. and the internal architecture resembles that of the reptilian femur. Other changes are noted and described. C. J. C. B.

[Staining of] osseous skeleton in human embryos and fœtuses. C. R. Noback and E. Noback (*Stain Tech.*, 1944, **19**, 51—54).—Alcohol-fixed material, from which skin, viscera, and heavy musculature are removed, is cleared and stained simultaneously in aq. KOH containing alizarin-red *S*. This allows control of the clearing and staining so that maceration may be avoided. The stained specimen is dehydrated and stored in glycerol. K. C. R.

[Pathogenesis of] congenital anomalies of intra- and extra-hepatic bile ducts. S. E. Moolten (*N.Y. Sta. J. Med.*, 1943, **43**, 727—738).—Report of a case of polycystic disease of liver and kidneys and one of congenital atresia of extrahepatic bile ducts and gall bladder and discussion of embryological mechanisms of these malformations with special reference to embryonic organisers. E. M. J.

Annular pancreas. B. E. Stofer (*Amer. J. med. Sci.*, 1944, **207**, 430—435).—A tabulation of the recent literature and report of a case. C. J. C. B.

Body weights and organ measurements in relation to age and season in ring-necked pheasants. C. M. Kirkpatrick (*Anat. Rec.*, 1944, **89**, 175—194).—The period of most rapid growth was from 42 to 138 days of age and was correlated with increase in thymus, pancreas, and intestinal wt. Max. body wt. was reached at 210 days. No positive correlation existed between seasonal variation of body wt. and thyroid wt. Cocks in their first year lost wt. before the breeding season. Hens did not lose wt. appreciably until the laying season was over. In seasonal development the ovary lagged behind the testis more than a month. Hypertrophy of gonads occurred only when the thymus was completely involuted. There were no marked seasonal variations in the wt. of pituitary, adrenal, heart, lungs, liver, and gizzard of either sex. W. F. H.

II.—DESCRIPTIVE AND EXPERIMENTAL EMBRYOLOGY. HEREDITY.

Cytological structure of human chorionic villus and decidua parietalis. B. L. Baker, S. J. Hook, and A. E. Severinghaus (*Amer. J. Anat.*, 1944, **74**, 291—325).—In early pregnancy the trophoblast performs a secretory function, its period of activity corresponding with the time of max. excretion of gonadotropin. Syncytium and cytotrophoblast are polarised towards the surface of the villus. In cytotrophoblast cells and syncytium differentially-stained granules occur in the region of the Golgi apparatus. The granules

are considered to be products of cytoplasmic activity and a probable source of secretion. Cellular changes in the cytotrophoblast in late pregnancy are described and interpreted to be indicative of reduced secretory activity. W. F. H.

Bovine prenatal development. L. M. Winters, W. W. Green, and R. E. Comstock (*Univ. Minnesota Agric. Exp. Sta.*, 1942, *Tech. Bull.* 151).—A general account of the development of external and internal form in the bovine embryo from fertilisation to full-term. J. D. B.

Transformation of valves of sinus venosus in higher mammals and man. V. N. Schedenov (*Compt. rend., Acad. Sci. U.R.S.S.*, 1943, **40**, 294—296).—An account of the embryonic and post-embryonic development of the right and left sinus valves based on the study of a large no. of hearts of ungulates, carnivores, rodents, and man. In all the investigated types the left sinus valve becomes gradually reduced. In man the right venous valve becomes transformed into the Eustachian and Thebesian valves but in the ungulates and carnivora examined this valve undergoes total reduction and has no functional significance, while in the rodents examined partial secondary alterations of the right valve result in a kind of prototype of the human Eustachian and Thebesian valves. J. D. B.

Post-embryonic transformations of foramen ovale of heart in higher mammals and man. V. N. Schedenov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **41**, 39—40).—A description of the closure of the foramen ovale in higher mammals and man based on the study of material previously used in the study of the later stages in cardiac morphogenesis [A., 1941, III, 719]. The mechanism of closure is a complicated process but may be reduced to three factors: (*a*) functional closure; (*b*) rearrangement of the structure of the valve, and (*c*) endocardial coalescence of the valve with the adjoining wall of the atrial septum. Various forms of atypical closure and incomplete closure are described. Persistent foramen ovale is most common in domesticated cattle but is less common in wild species of ruminants. This may be associated with a sharp abatement of natural selection as a result of domestication. J. D. B.

Structure and development of pulmonary arteries of guinea-pig. E. Wildi (*Arch. Sci. phys. nat.*, 1944, [v], **26**, *Suppl.*, 53—57).—A review of the anatomy and development of the pulmonary artery in the guinea-pig fœtus from 35 days (approx. 33·5 mm. in length) to 60 days (95 mm.) when it is near term, together with that of adult animals. Conclusions do not always agree with those of earlier writers. P. G. M.

Histogenesis of pig neurohypophysis. W. M. Shanklin (*Amer. J. Anat.*, 1944, **74**, 327—353).—Between the 10- and 15-mm. stages many cells (pituiblasts) leave the ependymal layer. At the 60-mm. stage a large infundibular process is present and most of the pituicytes have several processes that attach nearby cells to one another. Blood vessels appear in the primary lobule by the 125-mm. stage. The differentiation of secondary and tertiary lobules is described. This results in dividing the pituicytes into areas between which are blood vessels each surrounded by a perivascular space. Pituicytes and astrocytes originate from supportive spongioblasts. The former differ from astrocytes, oligodendroglia, and microglia in having many connexions between one another. Microglia cells appear at the 125-mm. stage. W. F. H.

Histological alterations in the hypophysis during larval development in *Rana temporaria*. A. I. Irichimovitsch (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 554—557).—A description of the histogenesis of the frog hypophysis together with an account of the correlated changes in the thyroid gland and in the body generally. J. D. B.

Congenital malformations induced in rats by maternal nutritional deficiency. VI. The preventive factor.—See A., 1944, III, 673.

Transplantation of ear ectoderm in axolotl. A. S. Ginzburg (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 546—549).—Experiments are recorded which indicate that the material of the future labyrinth in the axolotl acquires stable peculiarities at an early stage. Ear ectoderm transplanted at the beginning of neurulation is capable of resisting the action of a foreign inductor and will develop in the determined direction while in contact with the retina. J. D. B.

Factors influencing loss of ability to regenerate in Anuran extremities. L. V. Poleshaev and J. I. Ginzburg (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 550—553).—A study of the local and humoral factors concerned in regeneration of extremities in tadpoles of *Rana temporaria*. J. D. B.

Alterations in immunity of organisms during metamorphosis. R. I. Belkin and K. A. Fride (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 569—573).—Injection of axolotls with material from a dead culture of *Bacillus septicæmiæ ranarum* conferred immunity against subsequent infection with this organism. After thyroidin-induced metamorphosis of these axolotls the immunity was lost in 71% of the animals. It is suggested that this loss of immunity is a part of the profound changes occurring in the amphibian organism during metamorphosis. J. D. B.

Quadruplets. VII. The Schenses; four-egg quadruplets. I. C. Gardner and H. H. Newman (*J. Hered.*, 1944, **35**, 83—88).—A record of the physical and mental characters of these quadruplets at 13 years. L. G. G. W.

Genetic aspects of persistency in dairy cattle. T. M. Ludwick, W. E. Petersen, and J. B. Fitch (*J. Dairy Sci.*, 1943, **26**, 447—455).—The variation in persistency vals., which are closely related to total production, is greater among non-related animals than among related ones. The effect of the parents on the persistency of lactation is readily observed. Lactations following the first are usually similar, but with persistency vals. about 10% lower. The study of inherited characters by combining records from different breeds is unsound. N. J. B.

III.—PHYSICAL ANTHROPOLOGY.

Weight of negro infants. H. Bakwin and T. W. Patrick, jun. (*J. Pediat.*, 1944, **24**, 405—407).—There is no difference in wt. or wt. gain of white and negro infants during the first year of life. The slower growth observed in earlier studies was probably due to differences in socioeconomic status. C. J. C. B.

Length of first, twelfth, and accessory ribs in American whites and negroes; their relationship to certain vertebral variations. R. L. Lanier (*Amer. J. phys. Anthrop.*, 1944, [ii], **2**, 137—146).—The first ribs of whites are longer than those of negroes and those of white males, negro males, and white females longer than those of negro females. First ribs of white females and negro males exhibit the most marked variation in length. There is no racial difference in the length of the twelfth rib but this rib is longer in males than in females. Cranial-shifting columns have longer first ribs and shorter twelfth ribs than caudal-shifting columns. Incidence of cervical ribs was 1·1% and of lumbar ribs 8·8% in 559 subjects. W. F. H.

IV.—CYTOLOGY, HISTOLOGY, AND TISSUE CULTURE.

Cell replacement and its relation to zona glomerulosa in adrenal cortex of mammals. P. Gruenwald and W. M. Konikov (*Anat. Rec.*, 1944, **89**, 1—21).—Newly differentiated cortico-adrenal tissue attaches itself to the cortex by end-to-end junction of newly formed cords with those of the cortex, or by apposition of a complete new layer which replaces the old zona glomerulosa. Three mechanisms are described in the replacement of functioning cortical cells, viz., (1) mitotic division at the zona glomerulosa and fasiculata junction, (2) mobilisation of cells from a reserve in the zona glomerulosa, and (3) replacement by apposition from the capsule. Adrenals with a large zona glomerulosa exhibit apposition less frequently than those in which this zone is poorly developed. W. F. H.

Theory of cell division and the principle of maximum energy exchange. H. E. Stanton (*Bull. Math. Biophysics*, 1944, **6**, 71—76).—The equation for cell elongation during division, derived by Rashevsky from the principle of max. energy change (A., 1944, III, 160), is reduced to a form that has already been shown to agree with experimental data for *Arbacia* eggs. F. O. H.

Golgi apparatus of protozoa. J. D. Smyth (*Biol. Rev.*, 1944, **19**, 94—104).—A review. J. D. B.

Properties of living thyroid cells and follicles. R. G. Williams (*Amer. J. Anat.*, 1944, **75**, 95—119).—Living thyroid cells in follicles are polarised to secrete towards the lumen only. Each follicular cell has three surface regions, one in contact with colloid, one close to blood vessels, and one in contact with adjacent cells. Factors regulating follicular structure are discussed. The contents of follicular lumina may be reduced by diffusion across cells. Experimental hæmorrhage into follicles indicates that capillary pressure is greater than colloid pressure and that colloid is not sufficiently different from blood serum to cause visible change in erythrocytes. No material or organic connexion between thyroid cells exists and the staining of boundaries where cells meet is a post-vital phenomenon. W. F. H.

Significance of *Gewebeganzheit* in the multiplication of cells. B. V. Kedrovski (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 542—545).—From a study of the multiplication behaviour of isolated and grouped bone marrow cells in tissue culture it is concluded that isolation of cells inhibits the mechanism of mitosis or those factors that are concerned in the initiation of mitosis. J. D. B.

Growth and modifications of neuroglial cells from spinal ganglia grown *in vitro*. L. S. Sutulov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 567—568).—A description of the types of cells which grow in spinal ganglion explants and of the behaviour of those cells under the conditions of tissue culture. J. D. B.

Types of cell growth in nervous system. Z. P. Ignatieva (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 558—560).—An account of resemblances and differences of cells grown *in vitro* from the cerebral

hemispheres, midbrain, cerebellum, medulla, and spinal cord of chicks between the 15th day of incubation and two days after hatching. J. D. B.

Effect of different agents on rate of epithelial regeneration : use of dermatome donor area in obtaining data. H. Baxter, J. A. F. Stevenson, V. Schenker, and J. S. L. Browne (*Canad. Med. Assoc. J.*, 1944, **50**, 411—415).—Since the wound created by the dermatome (cutting instrument used for preparing skin grafts) heals almost exclusively by epithelial proliferation and does not undergo scar contraction during healing, it is a particularly suitable method for studying the effect of different agents on epithelial repair. Various ointments and hormones as well as dried plasma and red blood cells were no better than Bettman's ointment gauze with regard to the property of stimulating epithelial regeneration. C. J. C. B.

Mitotic devisions in parasitised cells. H. Mayer and M. Xavier de Oliveira (*Anais Acad. Brasil. Sci.*, 1942, **14**, 289—292).—In tissue cultures contaminated with *Schizotrypanum cruzi* and *Toxoplasma*, mitosis in parasitised cells was frequently observed. There is no rule as to the distribution of parasites in the daughter-cells, their no. varying or one daughter-cell only being parasitised. I. C.

Eosinophilic granuloma of bone. H. L. Jaffe and L. Lichtenstein (*Arch. Path.*, 1944, **37**, 99—118).—Eosinophilic granuloma of bone, Letterer–Siwe disease, and Schueller–Christian disease represent varieties of an inflammatory reaction to an unknown agent; the lesions are characterised at first by the presence of many histiocytes. In eosinophilic granuloma of bone the lesions develop only in the skeleton or even in a single bone, and are distinguished by many eosinophils intermingled with the histiocytes. The lesions heal readily after simple curettage or spontaneously. In Letterer–Siwe disease the histiocytic lesions are widely distributed through the soft tissues (especially the lymphoid tissues) and the skeleton, the marrow sometimes being extensively affected even when there are few destructive bone lesions. With the presence of widespread destructive lesions in the skull bones, Letterer–Siwe disease may present the complete Christian triad of calvarial defects, diabetes insipidus, and exophthalmos. (13 photomicrographs.) C. J. C. B.

Histochemical test for alkaline phosphatase in kidney. M. L. Menten, J. Junge, and M. H. Green (*J. Biol. Chem.*, 1944, **153**, 471—477).—The sites of alkaline phosphatase activity in human, mouse, and rat kidney are rapidly detected by adding Ca β-naphthyl phosphate [from β-naphthol and $POCl_3$ in pyridine, decomp. with water of the resulting chloride, and addition of saturated aq. $Ca(OH)_2$] and coupling the liberated β-naphthol with diazotised α-naphthylamine. Results agree with those obtained by the Ag technique. W. McC.

Fat-staining by Sudan dyes suspended in watery media. A. D. T. Govan (*J. Path. Bact.*, 1944, **56**, 262—263).—An equal vol. of a saturated solution of the Sudan dye in acetone is added drop by drop to a 1% solution of gelatin containing 1% of acetic acid (which prevents gel formation). A marked ppt. is formed, but addition of the dye should be continued until the resulting suspension is a deep brick-red colour and resembles milk in consistency. The mixture is kept at 37° for 2 hr. to allow evaporation of the acetone; the sediment is removed by filtration through coarse filter-paper. To stain, the frozen section is taken from water to 1% gelatin, left for 2 or 3 min., stained with the filtered colloidal suspension for ½ hr. in the 37° oven, washed in 1% gelatin for 2 or 3 min., washed thoroughly in water, counterstained, and mounted in any of the ordinary mountants for frozen sections. C. J. C. B.

Oil-soluble dyes in *iso*propanol as fat stains. R. D. Lillie (*Stain Tech.*, 1944, **19**, 55—58).—35 oil-sol. dyes, in supersaturated *iso*propanol solution, were compared with Sudan IV as fat stains for frozen sections of adrenal cortex. Three dyes of the series gave deeper orange-red coloration than did Sudan IV and were more stable in solution. Some brownish-red dyes are also quoted as satisfactory. K. C. R.

Modification of Wirtz spore-staining technique. J. E. Shapiro (*Stain Tech.*, 1944, **19**, 65).—An aq. suspension of spore-forming bacilli is mixed in a test-tube with 5% aq. malachite-green and boiled for 15 min. Air-dried smears, after differentiation in tap-water, are counterstained with safranin. The method used on 8 species of spore-forming bacilli was more reliable than the routine technique of heating the stain on the slide. K. C. R.

Iodine vapour or carbolfuchsin staining for vaginal smears. R. S. Siddall (*Amer. J. Obstet. Gynec.*, 1944, **47**, 260—264).—Duplicate vaginal smears were taken daily from 21 post-menopausal women under treatment with thyroid or œstrogen preps., and stained by I vapour or carbolfuchsin There was no significant difference between the results and the I technique is recommended as quicker and easier. P. C. W.

Method for staining rickettsia of typhus in histological sections. W. Nyka (*J. Path. Bact.*, 1944, **56**, 264).—Small pieces of tissue are fixed in Muller's fluid and embedded in paraffin; thin sections (1—3 μ.) are cut and stained for 5—10 min. in 5% basic fuchsin in 90% alcohol, rinsed rapidly in tap-water, differentiated in 90% alcohol for 1—2 min., stained for 1—3 min. in 1 : 10,000 aq. methyl-violet, rinsed in tap-water, differentiated in 1 : 1500 alcohol, dehydrated in abs. alcohol or acetone, cleared in xylol, and mounted in DPX4 mounting medium. The resulting prep. shows cytoplasm and red blood cells pale yellow or pink, rickettsia and nuclei, violet. C. J. C. B.

Injection and clearing method for rabbit's ear. T. B. Dunn and A. M. Kessel (*J. Nat. Cancer Inst.*, 1944, **4**, 359—360).—The artery near the tip of the ear of a white rabbit is injected with diluted Indian ink immediately after death, using a pressure of 20 cm. Hg. The tissue is cleared in glycerol and mounted in glycerol jelly. E. B.

Rapid clearing of pin worms for class study. D. Minckler (*Stain Tech.*, 1944, **19**, 63—64).—Specimens of *Enterobius vermicularis* fixed in formalin, dehydrated in dioxan, and cleared in carbol-xylene were sufficiently transparent unstained for anatomical study as whole mounts. K. C. R.

Device for transferring histological material without handling. P. R. Peacock and J. C. Graham (*J. Path. Bact.*, 1944, **56**, 275—276).—A short test-tube with perforations in the sides and bottom gives the best results with minute pieces of tissue. C. J. C. B.

V.—BLOOD AND LYMPH.

Death following sternal puncture. L. M. Meyer and J. Halpern (*Amer. J. clin. Path.*, 1944, **14**, 247—248).—The marrow only was punctured; death may have been due to reflex cardiac inhibition. C. J. C. B.

Locomotion of blood cells in tissue cultures.—See A., 1944, III, 630.

Erythrocyte catalase.—See A., 1944, III, 689.

Phosphatases of red blood corpuscles active in acid media (acid phosphatases).—See A., 1944, III, 691.

Clumping of erythrocytes in Hayem's diluting fluid. E. de Angelis and M. Huntsinger (*J. Lab. clin. Med.*, 1944, **29**, 624—627).—The phenomenon is described and pathological states in which it occurs are tabulated. It is a grave prognostic sign. C. J. C. B.

Kinetics of *in-vivo* hæmolytic systems. E. Ponder (*J. Gen. Physiol.*, 1944, **27**, 483—512).—Hæmolysis *in vivo*, and the possibility of regarding the contents of the blood stream as a hæmolytic system in which a steady state is maintained by production of new erythrocytes to replace those that are destroyed, are discussed. The effects of single accelerators and inhibitors in mixtures, like the effect of individual lysins, are roughly additive in simple systems and the acceleration or inhibition produced by the individual substances are most readily expressed in terms of *R*-vals. (where *R* is the concn. ratio between a standard system and the system examined when the two systems show the same time for complete hæmolysis). Normal intravascular lysins probably play only a small part in erythrocyte destruction unless the concn. rises to unusual levels, or unless their effects are increased by accelerators or by reduction of concn. of normal inhibitors. The three normal hæmolytic processes *in vivo* are probably (*a*) action of bile salts and soaps derived from chyle, (*b*) action of the spleen, and (*c*) action of hæmolytic substances derived from tissues. The results of Maegraith *et al.* (A., 1943, III, 302, 545) on the presence of widely distributed tissue-lysins are confirmed except for the conclusion that these are species-sp. If such are present, they are not the only lysins derived from tissues by immersion in saline, for non-species-sp. lysins are also obtained, and are similar to "lysolecithin." Approx. 30% of the total inhibitory effect of plasma for saponin hæmolysis is due to cholesterol, whilst not more than 25% is due to plasma-proteins, especially globulins. The remaining 45% is due probably to enhancing effects among the inhibitors, the mechanism of which is not completely clear. There is no evidence of diffusible inhibitory substances in plasma, and variations in inhibitory power of human plasma are probably due to combined concn. of cholesterol, protein, and possibly lecithin, rather than to cholesterol content alone. This is probably the reason why inhibitory power is low under conditions of poor nutrition. On the basis of a steady state resulting from a balance between production and destruction of erythrocytes, equations are derived for the way in which erythrocytes of different resistances are affected by changes in rate of destruction, and a method for analysis of experimental curves is described. J. N. A.

Effect of type III pneumococcus polysaccharide and gelatin on circulation and sedimentation rate of erythrocytes in mice. J. S. Youngner and W. J. Nungester (*J. infect. Dis.*, 1944, **74**, 247—253).—The intravenous injection of type III polysaccharide or isoelectric gelatin solutions into anæsthetised mice produced slowing and irregularity of blood cell flow, due to intravascular clumping of erythrocytes, and an increase of the erythrocyte sedimentation rate. F. S.

Comparison of Westergren and Kato erythrocyte sedimentation rate readings. Relation of clinical status of children with rheumatic

fever. J. B. McKinley and R. L. Jackson (*Amer. J. Dis. Child.*, 1944, **66**, 474—479).—The Westergren vals., having a higher range than the Kato vals., showed greater sensitivity in evaluating the severity of the disease. The Kato method showed a more progressive change in vals. from 0 to 40. However, the coeff. of correlation, 0·77, indicated a high degree of relation between the two methods. C. J. C. B.

Erythrocyte sedimentation reaction during pregnancy. C. J. Vogt (*Amer. J. Obstet. Gynec.*, 1941, **41**, 206—215).—The sedimentation rate increases during pregnancy until the 2nd post-partum day when it is about 200% of normal. There is an accompanying increase in plasma-fibrinogen. There is a slow reversion to normal during the puerperium. P. C. W.

Erythroblastic anæmia of Cooley (familial erythroblastic anæmia) in an Indian boy. R. G. Dhayagude (*Amer. J. Dis. Child.*, 1944, **67**, 290—293).—A case report. C. J. C. B.

Methæmoglobin : a normal constituent of blood. W. D. Paul and C. R. Kemp (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 55—56).—Methæmoglobin was determined by the method of Michel and Harris (A., 1940, III, 377) in blood of 100 patients not receiving any methæmoglobin-forming drug, and of 20 normal subjects. Only 1 patient had no methæmoglobin, and 9 had vals. of 0·16—0·38 g.-%. Average was 0·09 g.-%. All the normal subjects had some methæmoglobin, and vals. were 0·03—0·13 g.-%. V. J. W.

Operation of complete blood bank service utilising assembled parts. S. B. Rose and I. S. Hneleski (*Amer. J. clin. Path. Tech. Sect.*, 1944, **8**, 28—34).—A review of the methods used in the Philadelphia General Hospital. C. J. C. B.

Plasma transfusion in severe anaphylactic shock in man. A. H. Raynolds (*J. Allergy*, 1943, **14**, 495—496).—Successful case report. C. A. K.

Rôle of organo-mineral elements in experimental blood transfusion. H. Violle (*Compt. rend.*, 1943, **217**, 183—185).—A dog had 70% of its blood removed and was immediately injected via the saphenous vein with an equiv. amount of partially (95%) deproteinised horse serum containing appropriate salts to produce an isotonic solution. It recovered completely after 48 hr. P. G. M.

Transfusion reactions caused by acquired intragroup incompatibilities. G. D. Ayer, jun., and W. F. Kammer (*Arch. intern. Med.*, 1944, **73**, 199—202).—Since the centrifuge and the biological test were used, 108 transfusions have been given to 42 patients without serious reaction. There were 6 allergic and 5 pyrogenic reactions (2 major, 3 minor). 63 transfusions were given in 7 patients and all had more than 5. 18 donors were rejected because of positive reactions to centrifuge tests. C. J. C. B.

Oral administration of citrated blood in man. Effect on temperature and white blood cell count. L. Schiff, N. Shapiro, and R. J. Stevens (*Amer. J. med. Sci.*, 1944, **207**, 465—467).—The presence of 600—1800 c.c. of citrated human blood in the intestinal tract of men does not produce fever or leucocytosis within 3—4 days. C. J. C. B.

Homologous serum jaundice.—See A., 1944, III, 658.

Inhibitions of human isoagglutinins by polysaccharide from *Ascaris suum*. J. Oliver-Gonzalez (*J. infect. Dis.*, 1944, **74**, 81—84).—A polysaccharide from *A. suum* (Campbell, *ibid.*, 1936, **59**, 266) inhibits the agglutination of erythrocytes by human serum and is therefore identical or closely related to an antigen common to groups *A* and *B* sp. substances in human blood. This type of polysaccharide may be of use in reducing the agglutinin content of group *O* blood. F. S.

Substance in animal parasites related to human isoagglutinogens. J. Oliver-Gonzalez and M. V. Torregrosa (*J. infect. Dis.*, 1944, **74**, 173—177).—Polysaccharide fractions, isolated by the method of Melcher and Campbell (A., 1943, III, 442) from *Ascaris suum*, *A. lumbricoides*, *Trichinella spiralis*, *Necator americanus*, *Schistisoma mansoni*, and the larval forms of *Tænia solium*, all inhibited the α- and β-agglutinins in human sera. They also inhibited the hæmolysis of sheep cells in a system consisting of Forssman antiserum, sheep cells, and guinea-pig complement. A high titre of the α-agglutinins was detected in the sera of malarial patients belonging to groups *O* and *B* who had suffered repeated attacks of the disease. F. S.

Reactions in blood and organs of dogs on intravenous injection of solution of hæmoglobin. W. C. Hueper (*J. Lab. clin. Med.*, 1944, **29**, 628—631).—The intravenous injection of hæmoglobin dissolved in normal saline in dogs elicits a hæmoclastic crisis followed by a leucocytosis within 24 hr. Repeated daily injections of hæmoglobin solutions cause loss of wt., anæmia, leucocytosis, and accelerated erythrocytic sedimentation. There were no hæmoglobin casts in the tubular lumina and only a mild deposit of pigment in the liver and spleen. C. J. C. B.

Deficiency anæmia in infants. M. H. Bass (*Amer. J. Dis. Child.*, 1944, **67**, 341—343).—Report of 2 cases, with associated temporary deficiency of anti-anæmic factor in one and allergy and abnormal digestion of protein in the other. C. J. C. B.

White blood-cell preservation with yeast extract in stored blood. E. W. E. Macfarlane (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 30—31).—Addition of 1·1—2·2% of alcoholic yeast extract to citrated blood maintained leucocyte count at normal for 3—4 days; the effect was due mainly to delayed disintegration of neutrophils. V. J. W.

Morphological changes in leucocytes of stored blood. E. W. E. Macfarlane (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 32).—After 14 days' storage with yeast extract (see preceding abstract) many leucocytes showed active amœboid movement. Lymphocytes were the most resistant, and after 14 days were the most numerous type of cell, and in some specimens the count increased on the 4th—6th day, due possibly to changed neutrophils. Eosinophils are more resistant than other granulocytes. V. J. W.

Agglutination of circulating leucocytes by anti-leucocytic sera. B. Steinberg and R. A. Martin (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 50—52).—Agglutinins were prepared by injection of human leucocytes into rabbits. Suspensions of leucocytes were added to serum diluted 1 : 10 to 1 : 5120, kept at 37° for 1 hr., then placed in the cold overnight, and examined macro- and micro-scopically next day. V. J. W.

Lymphocyte content of rabbit bone marrow. J. M. Yoffey and J. Parnell (*J. Anat., Lond.*, 1944, **78**, 109—112).—A technique is described for obtaining abs. counts of nucleated cells of bone marrow. W. J. H.

Infectious mononucleosis. A. W. Contratto (*Arch. intern. Med.*, 1944, **73**, 449—459).—A review of 196 cases. C. J. C. B.

Metabolism of pyruvate by normal and leukæmic white cells.—See A., 1944, III, 666.

Determination of plasma-proteins in boys. R. P. Cook, D. M. Keay, and D. G. McIntosh (*Proc. Biochem. Soc.*, 1944, **38**, xiv).—Mean plasma-protein vals. were 6·65±0·42 g. per 100 c.c. Agreement between vals. obtained by micro-Kjeldahl and gravimetric methods was good. P. G. M.

Complex carbohydrates with blood-group specificity. H. G. Bray, H. Henry, and M. Stacey (*Proc. Biochem. Soc.*, 1944, **38**, xix—xx).—Blood group *A* factors containing carbohydrate and amino-acids have been separated from gastric mucin, pepsin, pancreatin, etc. Removal of amino-acids from the carbohydrate residue results in loss of activity, and the latter portion is shown to contain derivatives of *l*-fucose, *N*-acetylglucosamine, mannose, and galactose; the mol. is therefore of the branched-chain type of low mol. wt. Group *B* factors have been isolated from salivary and gastric mucins, and group *O* factors from gastric mucin. P. G. M.

Crystalline albumin from chicken blood. M. Laskowski (*Arch. Biochem.*, 1944, **4**, 41—44).—The albumin was cryst. by slow dropwise addition of saturated $(NH_4)_2SO_4$ at pH 4·7 to its solution. It is chemically similar to, but serologically different from, ovalbumin. The amount of albumin is increased in the blood of laying hens. E. R. S.

Chemical nature of blood-proteins. I. Hydrolysis of serum-albumin. II. Amino-acids of serum-albumin. III. Production of aldehydes by acid hydrolysis of serum-albumin. E. D. Stacheeva-Kaverzneva (*J. Gen. Chem. Russ.*, 1943, **13**, 403—407, 408—424, 425—427).—I. With a view to hydrolysing ox (?) serum-albumin under conditions least likely to lead to reactions other than complete hydrolysis, the albumin was heated for varying times and with varying methods of treatment in an oil-bath at 125—130°, and in an atm. of N_2. The hydrolysis products were analysed for total, amino-, and NH_3-N and the iontophoretic method of Gavrilov and Balabouha-Popzova (A., 1940, III, 163) was used to detect the presence of diketopiperazines in the hydrolysates obtained with strong acids. Min. deamination, and hence formation of NH_3-N, occur when using aq. 20% HCl. The data, however, indicate that 25% H_2SO_4 is best; further, hydrolysis by H_2SO_4 appears to be complete (absence of diketopiperazines). H_2S and volatile aldehydes are formed in some cases of acid hydrolysis.

II. Globulin-free albumin was obtained from ox serum by thrice-repeated pptn. by acetic acid from solutions half-saturated with $(NH_4)_2SO_4$, followed by dialysis and drying. It was hydrolysed with aq. 20% HCl for 22—24 hr. at 125—130°. The hydrolysate contained (% of wt. of albumin): glycine approx. 0·3, alanine 3·36, leucine + norleucine 16·3, *iso*leucine 3·4, valine 1—2, serine 1·2, phenylalanine 5·11, tyrosine 5·2, threonine 2·2, tryptophan 0·96, proline 2·51, hydroxyproline [picrate, m.p. 180—185° (decomp.); cf. A., 1928, 526] 2·98, glutamic acid 9·95, hydroxyglutamic acid approx. 0·5, aspartic acid 4·67, histidine 2·5, arginine 5·3, lysine 11·5, cystine approx. 5·1, methionine 0·77, NH_3 1·09, glucosamine 0·18. Valine, threonine, and hydroxyglutamic acid have not hitherto been found as products of hydrolysis of the albumin.

III. The albumin (50 g.) was hydrolysed in aq. 20% HCl for 22 hr. in a stream of N_2. The volatile aldehydes obtained contained acetaldehyde but no formaldehyde. The hydrolytic product volatile in steam (N_2 atm.) together with the above fraction contained

105·4 mg. of aldehydes as acetaldehyde or 172·5 mg. as butaldehyde. It is suggested that the aldehydes may arise by indirect decomp. of hydroxyamino-acids via diketopiperazine derivatives but more probably by deamination (*e.g.*, *iso*butaldehyde from hydroxyvaline and acetaldehyde from serine or from aspartic acid). F. Hi.

Influence of liver on blood-plasma-proteins. G. H. Berryman, J. L. Bollman, and F. C. Mann (*Amer. J. Physiol.*, 1943, **139**, 556—562).—Regeneration of plasma-protein was studied after plasmapheresis of ⅓ of the calc. blood vol. in normal dogs, in animals after splenectomy, after removal of ⅓—½ of the liver, and dogs with Eck's fistula and with varying degrees of CCl_4 hepatitis. Globulin in additional amounts up to 1 g. per kg. body wt. and measurable amounts of albumin appeared within 1 hr. following hæmorrhage, especially in dogs receiving diets containing 12% of protein. Eck's fistula and severe toxic hepatitis dogs added only 0·1—0·2 g. of protein per kg. body wt. to the plasma, unaffected by their diet; except in those 2 groups, fibrinogen had returned to normal after 6—9 hr. Some globulin was added to the plasma following hæmorrhage even after total hepatectomy. There was little evidence of loss or addition of protein to the plasma in dogs for periods up to 30 hr. after hepatectomy. A. S.

Action of 3 : 3′-ethylidenebis-(4-hydroxycoumarin) as blood anticoagulant. P. Fantl (*Austral. J. Exp. Biol.*, 1944, **22**, 125—129).—Intraperitoneal injection of the compound into normal rabbits produces hypoprothrombinæmia to a smaller extent than does an equimol. amount of the corresponding methylene compound (cf. Lehmann, A., 1942, III, 798), and recovery is more rapid. 3-Methyl-4-hydroxycoumarin (*oxime*, m.p. 95°) has no effect on blood coagulation in tolerated doses. Formaldehyde and acetaldehyde increase the coagulation time of plasma, and it is suggested that these aldehydes, rather than salicylic acid, might be responsible for the biological effects of the alkylidenedicoumarins. J. N. A.

Treatment of dicoumarol-induced hypoprothrombinæmic hæmorrhage with vitamin-K_1 oxide. S. P. Lucia and P. M. Aggeler (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 36—37).—Daily oral administration of 0·5—1 g. of dicoumarol to a patient with phlebitis caused a fall in blood-prothrombin with hæmorrhages. Intravenous administration of 0·5 g. of vitamin-K_1 oxide raised the prothrombin level in 4 hr. Hæmorrhages ceased in 24 hr., and prothrombin returned to normal in 5 days. V. J. W.

Electrophoresis of purified prothrombin. W. H. Seegers, E. C. Loomis, and J. M. Vandenbelt (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 70—71).—Prothrombin of ox plasma was conc. and purified to contain 1300—1500 units (Warner *et al.*, *Physiol. Abs.*, 1936, **21**, 620) per mg. It is more mobile than other plasma-proteins and, at pH 7, its mobility is not altered by heparin. The isoelectric point is at pH 4·8 and coincides with its inactivation point. V. J. W.

Oxidised cellulose and thrombin. W. H. Seegers and L. Doub (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 72—73).—Cotton oxidised by NO_2 becomes more acid as oxidation proceeds. When carboxyl content is 14% acidity is sufficient to inactivate thrombin, but if the cotton is soaked in 1% $NaHCO_3$ no inactivation occurs. If carboxyl content is 21% another destructive factor, of unknown nature, is present which is not affected by neutralisation. V. J. W.

Antihæmorrhagic effect of vitamin-K_3. V. V. Babuk (*Compt. rend. Acad. Sci. U.R.S.S.*, 1943, **39**, 277—279).—The increase in the rate of blood coagulation caused by oral administration of alcoholic extracts and intramuscular or subcutaneous injection of oily solutions of vitamin-K_3 preps. is due to stimulation of prothrombin synthesis in the liver. The max. effect occurs in 2 hr. after oral administration of alcoholic extracts of maize stigmata, and somewhat longer after oily solutions. The rate of coagulation increases rapidly (1—3 hr.) after subcutaneous injection and remains const. for up to 10 hr. Intravenous administration of alcoholic solution is also effective, but is not recommended. The clinical uses are discussed. P. G. M.

Prothrombin concentration in parturient women and their newborn infants. C. T. Javert and R. A. Moore (*Amer. J. Obstet. Gynec.*, 1940, **40**, 1022—1025).—The prothrombin concn. in 20 parturient women was 77% of normal and in the cord blood of their newborn infants 23% of normal. Vals. as low as 10—15% of normal occurred in the infants without hæmorrhagic tendencies. P. C. W.

Treatment of prothrombinopenia with water-soluble menadione. H. R. Litchfield, H. M. Rabinowitz, P. Kavetsky, M. J. Greene, and E. Kaye (*Amer. J. Obstet. Gynec.*, 1944, **47**, 642—654).—Favourable clinical report. Bleeding in hæmorrhagic disease of the newborn infant is controlled within 8 hr. after intramuscular injection. P. C. W.

Mechanics and management of hæmorrhagic disorders in children. I. N. Kugelmass (*Arch. Pediat.*, 1944, **61**, 240).—A review. C. J. C. B.

Effects of potassium arsenite (Fowler's solution) on respiration and glycolysis of normal and leukæmic tissues; action of menadione, 2-methyl-1 : 4-naphthaquinone. C. O. Warren (*Amer. J. Physiol.*, 1943, **139**, 719—725).—K or Na arsenite depresses the respiration, under accumulation of lactic acid, of normal rabbit and human bone marrow and of human leukæmic leucocytes. Menadione increases bone marrow respiration, decreases aërobic glycolysis, and may counteract the effect of arsenite, but it is unable to restore the amœboid and granular movements of myeloid cells poisoned with arsenite and itself impairs these forms of motility. Glutathione is ineffective in preventing or counteracting the effects of arsenite on respiration and motility of marrow cells. A. S.

Blood-pyruvic acid. II. Effects of administering glucose, insulin, and adrenaline on blood-pyruvic acid in normal humans. T. Gillman and L. Golberg (*S. Afr. J. Med. Sci.*, 1943, **8**, 156—167).—Blood-pyruvic acid is raised following the ingestion of glucose (1 g. per kg.), the intravenous injection of insulin (10 units), or the intramuscular injection of adrenaline (0·5 μg.). The intensity of the rise decreases in the above order, and simultaneous insulin and glucose does not affect the rise produced by insulin alone. In the case of adrenaline injection the blood-sugar and -pyruvic acid rises are parallel but with the other treatments the rise in -pyruvic acid is slower than the rise or fall in blood-sugar. P.·C. W.

Serum-protein, blood-urea, and uric acid in pregnant Bantu women. P. W. Flemming and H. D. Barnes (*S. Afr. J. Med. Sci.*, 1944, **9**, 51—58).—The vals. were no different from those reported in European or American pregnant women. 16 of the 65 cases showed slight œdema but this was unrelated to any difference in serum-protein vals. P. C. W.

Normal plasma-carotene and -vitamin-*A* levels in young adults—European, Indian, and Bantu. S. E. Highman (*S. Afr. J. Med. Sci.*, 1944, **9**, 69—73). P. C. W.

Serum-phosphatase activity and clinical rickets in children in Jerusalem. R. Klasmer (*Amer. J. Dis. Child.*, 1944, **67**, 348—354).—Swelling of the epiphyses is generally accompanied by increased serum-phosphatase activity; normal phosphatase activity indicates a state of healing. Serum-phosphatase activity remains high throughout the period of active rickets; the decrease to normal vals. coincides with clinical recovery. Increased phosphatase vals. may precede the first clinical symptoms. C. J. C. B.

Plasma acid phosphatase in carcinoma of prostate and effect of stilbœstrol treatment.—See A., 1944, III, 667.

Treatment of hypochloræmia. T. Ariel, J. C. Abels, G. T. Pack, and C. P. Rhoads (*J. Amer. Med. Assoc.*, 1943, **123**, 28—30).—Hypochloræmia and alkalosis occurred postoperatively in 5 abdominal cases. Administration of large amounts of saline failed to correct the hypochloræmia until the coexisting hypoproteinæmia was restored to normal. C. A. K.

Influence of diet on cholesterol concentration of blood serum in normal, spayed, and hypothyroid monkeys. W. M. Sperry, J. W. Jailer, and E. T. Engle (*Endocrinol.*, 1944, **35**, 38—48).—Following the ingestion of 2—5 eggs or egg-yolks there was no increase in serum-cholesterol in intact, spayed, or hypothyroid monkeys. When the treatment was continued daily for 4 days there was a 50% rise above normal on the 5th day, the combined cholesterol rising more than the free form. No rise was produced by feeding egg-phospholipins or cholesterol emulsion in equiv. amounts over 4 days. A smaller rise than that produced by eggs followed the ingestion of an equiv. amount of cholesterol in oily solution; half the small rise was accounted for by the oily solute. In only 1 case was there any evidence of a difference in behaviour between normal and hypothyroid monkeys. P. C. W.

Blood-diastase values in mumps and mumps pancreatitis. S. Zelman (*Amer. J. med. Sci.*, 1944, **207**, 461—464).—Blood-diastase vals. of 89 cases of mumps showed 73% above normal on admission, and 9% on discharge. 3% were subnormal on admission, and 20% on discharge. 15% showed evidence of pancreatitis some time during the course of illness and those cases had an especially high % of increased diastase vals. on admission. C. J. C. B.

Influence of sulphadiazine on plasma-lipins in pneumonia.—See A., 1944, III, 679.

Esterase (butyric) activity. III. Effect of foster nursing on esterase content of blood serum and liver of strains of mice susceptible or insusceptible to mammary cancer.—See A., 1944, III, 666.

Vitamin-*B*, nutrition in surgical patients as determined by the blood level of pyruvic acid.—See A., 1944, III, 672.

VI.—VASCULAR SYSTEM.

Recognition and treatment of fœtal heart arrhythmias due to anoxia. C. J. Lund (*Amer. J. Obstet. Gynec.*, 1940, **40**, 946—957). P. C. W.

Pulse and respiratory variations in normal women during labour. H. E. B. Pardee and C. L. Mendelson (*Amer. J. Obstet. Gynec.*, 1941, **41**, 36—44).—No significant changes occurred before the appearance of bearing-down efforts, when the pulse and respiration rate may

continue unchanged or increase. The increase is more likely where labour or second stage is prolonged. P. C. W.

Effects of pressure on the carotid sinus at various altitudes. L. Palitz, T. Frist, and E. Kocour (*J. Aviat. Med.*, 1943, **14**, 346—355).—Two cases are reported which suggest that a hypersensitive carotid sinus becomes more sensitive at a lower O_2 saturation as a result of simulated ascent in the altitude chamber without administered O_2. F. S.

Transient *T*-wave inversion following paroxysmal tachycardia. S. L. Zimmerman (*J. Lab. clin. Med.*, 1944, **29**, 598—605).—One case of supraventricular tachycardia and 2 cases of ventricular tachycardia followed by *T*-wave inversion in multiple leads, persisting for variable period of time and not associated with myocardial infarction, are described. C. J. C. B.

Nodal rhythm and bundle branch block following aspirin hypersensitivity. N. Bloom and H. Walker (*J. Lab. clin. Med.*, 1944, **29**, 595—597).—A case report. C. J. C. B.

Pneumopericardium in a 42-day-old infant. D. J. L. Netto (*Amer. J. Dis. Child.*, 1944, **67**, 288—289).—A case report. C. J. C. B.

Myocarditis in children. O. Saphir, S. A. Wile, and I. M. Reingold (*Amer. J. Dis. Child.*, 1944, **67**, 294—312).—A general review of 97 children with myocarditis of differing ætiology. C. J. C. B.

Diseases of heart. C. Williams and P. D. White (*Arch. intern. Med.*, 1944, **73**, 477—498).—A review of the literature for 1943. C. J. C. B.

Behaviour of lymphatic vessels in living bat. R. L. Webb and P. A. Nicoll (*Anat. Rec.*, 1944, **88**, 351—367).—Three divisions of lymph channels are defined. The structure and activity of the larger transporting channels are arranged on a segmental basis and each segment includes the entire lymphatic between two valves (*e.g.*, mesenteric lymph vessels). The second pattern evolves from the transporting channels towards the peripheral area. Here the segmental structure is replaced by a thick-walled expanded sinus or "lymph heart." The third division is in the form of large bulbous capillary structures with walls indistinguishable from surrounding connective tissue. They begin as large spheroidal sacs connected to the collecting lymphatics by one or a series of oval bulbous structures. Rapid contractions of these propel the lymph centrally. Rythmic activity of the collecting vessels is confined largely to the valvular areas. W. F. H.

Drainage of particulate matter from peritoneal cavity by lymphatics.—See A., 1944, III, 625.

Capillary permeability in myxœdema. K. Lange (*Amer. J. med. Sci.*, 1944, **208**, 5—15).—A method using fluorescein is described which, combined with the Dermofluorometer (photoelectric skin colorimeter), permits an assessment of capillary permeability. Cardiac œdema and œdema of the lower extremities in cirrhosis of the liver do not show increased capillary permeability; with œdema due to undernutrition and severe avitaminosis, there is marked increase in permeability. 5 cases of myxœdema all showed a marked increase in capillary permeability which rapidly returned to normal, simultaneously with diuresis following thyroid treatment. C. J. C. B.

Visualisation of blood vessels of nerves and other tissues.—See A., 1944, III, 626.

Ætiology of "immersion foot." B. W. Goldstone and H. V. Corbett (*Brit. Med. J.*, 1944, I, 218—219).—In four groups of men rescued from the sea, the syndrome of "immersion foot" presented two main stages, the swollen stage with muscular paresis and anæsthesia of the limbs affected, and the stage of diminishing œdema with pain, paræsthesia, and tenderness. Complications were gangrene, salt-water rash, and in one or two cases duodenitis. Immersion foot may be regarded as a massive chilling and ischæmia of various tissues, the more quickly affected being the nerves and other less resistant structures. The clinical picture may vary from the neuritis type to the gangrene case. Differences between immersion foot and frost-bite are pointed out. I. C.

Alcohol lumbar paravertebral block in peripheral vascular disease. G. Saland and C. Klein (*Amer. J. med. Sci.*, 1944, **207**, 749—753).—The use of 1—3 c.c. of 100% alcohol in lumbar paravertebral block produces peripheral vasodilatation, which may be complete, and may last up to 2 years or longer. The neuritis that is often produced never lasted more than 45 days. The use of novocaine in sweet almond oil did not reduce the incidence of neuritis. There was no correlation between claudication time and the degree or duration of the vasodilatation. C. J. C. B.

Œdema in eclampsia and pre-eclampsia. W. J. Dieckmann and S. Kramer (*Amer. J. Obstet. Gynec.*, 1941, **41**, 1—16).—In normal pregnancy the venous pressure and capillary permeability in the legs are increased; renal elimination of water and solids is delayed. If these changes are exaggerated pre-eclampsia or eclampsia develops. In œdematous patients with pre-eclampsia, serum-protein concn. and colloid osmotic pressure of the serum are respectively 6·2 g.-% and 24·9 cm. of water; normal vals. in pregnancy are 6·5% and 28·7 cm. The retention of Na, Cl, and water may result in abnormal gains in wt. NaCl and water restriction are beneficial treatments. During diuresis and wt. loss produced by NaCl restriction there may be pronounced hypoproteinæmia, showing that this is not the cause of the œdema. P. C. W.

Treatment of experimental renal hypertension with renal extracts. G. E. Wakerlin, C. A. Johnson, W. G. Moss, and M. L. Goldberg (*J. Pharm. Exp. Ther.*, 1944, **81**, 101—110).—Partly purified hog renin is more effective than highly purified hog renin in reducing experimental renal hypertension of dogs. Partly purified dog renin, or hog liver extract, had no effect on the hypertension of dogs (cf. A., 1941, III, 562; 1942, III, 205). G. P.

Unexpected post-partum hypertension. H. Meyer and S. B. Nadler (*Amer. J. Obstet. Gynec.*, 1941, **41**, 231—236).—A syndrome of a rise in blood pressure following parturition and lasting for 6—16 weeks found in American negroes is described. The average pre-partum pressure is higher in the negroes that develop the condition than in those that do not. The average negro post-partum pressure is higher than that in whites. P. C. W.

Effect of pregnancy on experimental hypertension. E. W. Page, H. S. Patton, and E. Ogden (*Amer. J. Obstet. Gynec.*, 1941, **41**, 53—60).—Pregnancy produced a fall in blood pressure in 10 hypertensive rats and 12 hypertensive rabbits. Renal ischæmia produced during pregnancy caused hypertension to develop but only after delivery. A fall in blood pressure also occurred in hypertensive rats after the production of deciduomata during pseudopregnancy. Increasing the protein content of the diet of non-pregnant hypertensive rabbits caused sickness or death, indicating that though an increased load on the kidneys does have an adverse effect on the kidneys, pregnancy does not constitute such a load and cannot account for the exacerbation of hypertension which pregnancy commonly produces in women. P. C. W.

Influence of hypothermia and hyperthermia on survival time of dogs in hæmorrhagic shock. R. J. Antos (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 60—62).—Shock was induced by the method of Wiggers and Werle (A., 1942, III, 801). In those dogs in which mean body temp. was kept at 39—40°, survival time was 2—13 hr. with an average of 5·3 hr. In those in which temp. was 28—36°, survival time was 3—33 hr. with an average of 15·4 hr., but only 1 dog survived indefinitely. V. J. W.

Effect of pectin and saline solutions on survival time of dogs in hæmorrhagic hypotension. R. M. Dworkin (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 20—22).—Neither pectin nor NaCl solution increases chance of recovery unless they are given within 30 min. of onset of blood pressure of 50 mm. Hg. V. J. W.

Influence of body movement on shock due to repeated hæmorrhage. R. Elman and H. W. Davey (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 14—15).—10 c.c. of blood per kg. was withdrawn each hr. by a needle from the femoral artery of dogs. Animals which were kept immobilised and supine throughout had an average survival time of 3·1 hr. Those which could move freely about the cage survived 4·2—4·5 hr. V. J. W.

Influence of anæsthesia on circulatory changes in dogs subjected to graded hæmorrhage. B. W. Zweifach, S. G. Hershey, E. A. Rovenstine, and R. Chambers (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 73—77).—Circulatory changes were determined by microscopic examination of the omental vessels. Anæsthesia was either local with procaine, or general with morphine, *cyclo*propane, ether, pentobarbital, or pentothal. Only with procaine and *cyclo*propane was circulation maintained after severe hæmorrhage. V. J. W.

Shock induced by hæmorrhage. VII. Destruction of cozymase and alloxazine adenine dinucleotide in tissues during shock. M. E. Greig (*J. Pharm. Exp. Ther.*, 1944, **81**, 164—173).—A decrease in cozymase and alloxazine adenine dinucleotide content of brain, skeletal muscle, and liver was found during shock induced by hæmorrhage in dogs. Administration of nicotinic acid and riboflavin results in resynthesis of the respective co-enzymes. Animals requiring large amounts of bleeding to produce shock showed less destruction of cozymase than did animals which developed shock after the withdrawal of small amounts of blood. (Cf. A., 1943, III, 623; 1944, III, 397.) G. P.

Technique for measurement of local fluid loss in experimental traumatic shock. M. L. Cullen and N. E. Freeman (*Surgery*, 1941, **10**, 770—775).—A method of dissecting the right and left extremities with the superficial tissues of the trunk in dogs is described. Local fluid loss after trauma, applied to the extremities of one side, was measured by the difference in wt. of the extremities of the normal and injured side. After a standard injury the local fluid loss was 3·5—5·8% of the body wt. G. P.

Anuria in experimental shock. W. H. Olson, L. Walker, and H. Necheles (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 64—67).—Shock, in dogs, produced by hæmorrhage caused immediate anuria, but secretion was resumed after saline infusion. Shock produced by burns caused an immediate anuria which did not respond to saline infusion, and the severity of which was correlated with the degree

of hæmoglobinæmia. Crushing of a limb caused an immediate oliguria which responded to infusions but was followed, at 18—36 hr. after the injury, by an anuria which failed so to respond; renal damage and hæmoglobinuria were present in this condition. V. J. W.

[Blood-]amino-acid nitrogen changes in shock. W. S. Hoar and R. E. Haist (*J. Biol. Chem.*, 1944, **154**, 331—338).—Shock produced by the application of pressure cuffs is accompanied by a rise in the plasma-NH_2-N of 3—5% in dogs and 2% in rats. The primary rise is due to processes occurring in the tissues of the injured limbs and significant changes may occur before the blood pressure has fallen to shock levels. Little or no excretion occurs in the urine after removal of the cuffs and early transfusion or reclamping of the injured parts may bring about recovery before the NH_2-acid level returns to normal. H. G. R.

Temperature and blood flow in extremities immersed in water. C. R. Spealman (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 38—40).—When one hand is immersed in water, the difference between skin and water temp. is min. when the water is at 15—20°. This difference is greater when the room temp. is raised from 16° to 24° or 32°. V. J. W.

Treatment of burn shock with continuous hypodermoclysis of physiological saline into burned area. J. K. Berman, L. Peterson, and J. Butler (*Surg. Gynec. Obstet.*, 1944, **78**, 337—345).—Anæsthetised dogs were burnt by immersion in boiling water for 20—40 sec. The survival was longer and blood and respiratory changes were less pronounced if physiological saline was injected under pressure (40 mm. Hg) hypodermically and continuously, as much as 12% body wt. being given. Under these conditions there was no anuria, and subcutaneously injected India ink and phenolsulphonephthalein were rapidly distributed through the body and appeared in the urine respectively. It is concluded that the treatment prevents a large part of the loss of plasma and electrolytes into the burned areas. If treatment is not started for 2 hr. after the burn the effects are much less. P. C. W.

Reversibility of carbohydrate and other changes in rats shocked by clamping technique.—See A., 1944, III, 677.

Local skin lesions in experimental burns and their relation to systemic manifestations. R. Elman and C. Lischer (*Surg. Gynec. Obstet.*, 1944, **78**, 346—349).—Various experimental procedures produced œdema, wet necrosis, or dry necrosis of the skin in anæsthetised dogs; the type of lesion depends on the duration and intensity of the burning. The cooling effect of the blood is shown by the greater likelihood of necrosis developing after burns of the areas over bony prominences, the toes, or when the burning agent exerts pressure on the skin; the margins of a necrotic burn often show œdema only. With wet necrosis adrenal hæmorrhage occurred if the animal survived more than 24 hr. P. C. W.

Tissue injury by heat. I. Influence of anoxia. C. H. Kellaway and W. A. Rawlinson. **II. Liberation of enzymes from perfused liver.** W. A. Rawlinson and C. H. Kellaway. **III. Isolated limb preparations.** C. H. Kellaway and W. A. Rawlinson (*Austral. J. Exp. Biol.*, 1944, **22**, 63—68, 69—81, 83—93).—I. When isolated guinea-pig's lung is perfused with saline, tissue injury as shown by liberation of histamine occurs within 6 hr. at 43°, but not at 41°. Lungs ventilated with N_2 do not show a greater output of histamine during perfusion for 6 hr. at 45° than lungs ventilated with air. More vigorous ventilation with air, O_2, or N_2 gives larger outputs of histamine during perfusion for 6 hr. at 45°; these variations are closely related to variation in degrees of ventilation. It is concluded that anoxia does not cause gross injury to tissue cells and hence is unlikely to aggravate heat injury.

II. When the isolated cat's liver is perfused with saline at 38°, histamine, inorg. PO_4''', alkaline phosphatase, catalase, esterase, and proteolytic enzymes appear in the perfusate after approx. 7 hr. This is evidence of cell damage. There is a rapid increase in liberation of the above constituents (except catalase) and, to a smaller extent, of histamine when the temp. is raised to 40—42°, and this is greater than can be accounted for by the normal exponential increase of the process at 38°. Liberation of catalase and histamine at temp. slightly higher than 38° is slower than that of the other constituents. The liberation process for catalase satisfies the Arrhenius equation and it is concluded that the rate-determining steps are characteristic of the enzyme. There is great deviation from the Arrhenius equation by alkaline phosphatase above 44—45°, and by esterase above 45—46°, which is evidence of irreversible heat-inactivation. Catalase is not destroyed at temp. up to 50°.

III. Histamine is liberated at 45—50° from the perfused hind limbs, and histaminase from the uterus, of the guinea-pig. Active adenyl compounds are absent from the perfusate between 37·5° and 53°, but at 43° and 45° there is cardiodepressant activity, more prolonged than that of adenosine, which is not diminished after incubation with extract of cat's liver. Subcutaneous œdema fluid has similar activity. Histamine, but not histaminase, is liberated from the cat's fore limb between 43° and 50°. The perfusate obtained during the first few hr. contains a substance that relaxes smooth muscle and inhibits the stimulant effect of histamine. No active adenyl compounds are present between 37·5° and 50°, but cardiodepressant activity, similar to that observed with guinea-pig hind limb, is present between 42° and 50°. The active substance, also present in subcutaneous œdema, is thermostable. The pH of the perfusate shows max. decrease at 44—45°. The small output of inorg. PO_4''' at 37·5—41° is greatly increased at higher temp. Alkaline phosphatase, lipase, and proteolytic enzymes are also liberated at temp. above 41°. J. N. A.

Recurrences and failures following treatment of varicose veins. P. J. Sarma (*Surgery*, 1941, **10**, 752—756).—An analysis of 230 cases of recurrent varicose veins from the therapeutical point of view. G. P.

Vascular allergy. J. Harkavy (*J. Allergy*, 1943, **14**, 507—537).—15 cases of asthma had inflammatory interstitial lesions in the lungs, sputum eosinophilia, and pleural, pericardial, or peritoneal effusions. Abnormalities in the *P* waves and *QRS* complexes appeared in the attacks. In 4 of the patients who died there were found vascular changes such as internal thickening, necrotising arteritis, endarteritis obliterans, and fibrosing arteritis. C. A. K.

VII.—RESPIRATION AND BLOOD GASES.

Height-weight formula for estimation of vital capacity. H. S. Fang (*Proc. Chinese Physiol., Chengtu Branch*, 1942, **1**, 74—77).—The formula given is: vital capacity (c.c.) = 30·34 × body height (cm.) + 24·50 × body wt. (kg.) − 2628.

Physiologically controlled oxygen mask apparatus. A. L. Barach and M. Eckman (*Anesthesiology*, 1941, **2**, 421—426).—An apparatus is described in which the O_2 concn. in the inspired air can be maintained within ±1·5% of a desired concn. The concn. of CO_2 in the inspired air does not rise above 0·2%, and mechanical resistance to breathing is also eliminated. G. P.

Comparative anoxæmic effects from carbon monoxide hæmoglobin and methæmoglobin. D. Lester and L. A. Greenberg (*J. Pharm. Exp. Ther.*, 1944, **81**, 182—188).—The shift to the left in the O_2 dissociation curve of hæmoglobin caused by met- and CO-hæmoglobin was confirmed. Cats became unconscious and died when 66 and 71% respectively of the total hæmoglobin was converted into CO hæmoglobin, while cats and dogs recovered even after more than 80% of their hæmoglobin was converted into methæmoglobin by $NaNO_2$. G. P.

Treatment of experimental anoxia with certain respiratory and cardiac stimulants. N. J. Estman and J. Kreiselman (*Amer. J. Obstet. Gynec.*, 1941, **41**, 260—267).—Anæsthetised dogs were asphyxiated by being given 100% H_2 to breathe; arterial O_2 tension fell to 2·3—4·0 vols.-%. Injection of α-lobeline (10 mg.), metrazol (3 ml.), or coramine (3 ml.) intravenously at the start of the apnœic phase did not alter the course of the respiratory failure. P. C. W.

Report of case of severe anoxic anoxia with recovery. R. L. Ward and O. C. Olson (*J. Aviat. Med.*, 1943, **14**, 360—365).—A 20-year-old man, exposed to high altitudes for 55 min. without supplementary O_2, was unconscious for 8 hr. and semicomatose for an additional 11 hr. There was hyperpyrexia for 1½ hr., diminished or absent reflexes, a bilateral Babinski response, increased c.s.f. pressure, and projectile vomiting. Psychological changes lasted 6 days, leaving no permanent effects. F. S.

Investigation of pneumothorax and respiratory function at altitude. E. W. Peterson, B. S. Kent, H. R. Ripley, and D. R. Murphy (*Canad. Med. Assoc. J.*, 1944, **50**, 520—523).—2 cases of pneumothorax which were subjected to conditions of altitude while breathing O_2 are described. A small pneumothorax (20% at collapse) led to no decrease in respiratory reserve even at 20,000 ft. A large pneumothorax (50% collapse) led to definite reduction in the respiratory reserve and marked symptoms at 15,000 ft. C. J. C. B.

Importance of bronchography in cases of unresolved pneumonia. G. S. Grier, III (*Arch. intern. Med.*, 1944, **73**, 444—448).—27 of 40 patients with bronchiectasis had an initial misdiagnosis of primary atypical pneumonia and subsequently were found to have pneumonitis around a pre-existing bronchiectasis. In 30 the bronchiectasis was unilateral; in 20 of these it involved the lower lobe of the left lung. Bronchography should be done in all cases of pneumonia which fail to resolve in 4—6 weeks. C. J. C. B.

Roentgenograms of chest taken during pertussis. J. L. Kohn, I. Schwartz, J. Greenbaum, and M. M. L. Daly (*Amer. J. Dis. Child.*, 1944, **66**, 463—468). C. J. C. B.

Bronchospasm associated with pulmonary embolism. N. H. Boyer and J. J. Curry (*Arch. intern. Med.*, 1944, **73**, 403—409).—Dogs subjected to pulmonary embolism by rubber strips introduced into the jugular vein showed transient bronchoconstriction. Atropine prevented bronchospasm, while papaverine produced transitory constriction. Digitalis had no appreciable effect on the bronchi. The death of the dog was usually due to respiratory failure. C. J. C. B.

Weltmann reaction in bronchial asthma. S. C. Dees (*J. Allergy*, 1943, **14**, 469—476).—The Weltmann coagulation reaction was tested in 224 asthmatics. It may help to detect the presence of infection and fibrotic changes. C. A. K.

Pulmonary pathology in bronchial asthma. R. W. Lamson, E. M. Butt, and M. Stickler (*J. Allergy*, 1943, **14**, 396—413).—Post-mortem findings in 82 fatal cases, diagnosed as asthma during life, are discussed. There are no gross or microscopic changes characteristic of asthma. C. A. K.

Induction of bronchial relaxation in intractable asthma. A. L. Barach (*J. Allergy*, 1943, **14**, 296—309).—Repeated relaxation of the bronchial muscle was produced in 21 cases of severe intractable asthma by rectal administration of 0·5 g. of aminophylline once or twice daily for 1—3 weeks, inhalation of He-O_2 mixtures for 1—6 hr. daily for 5 days, in some cases 2 mg. of dilaudid with the aminophylline, ingestion of saturated KI solution in doses of 1—3 c.c. daily, and inhalation of nebulised spray of 1/100 adrenaline. In many cases the bronchial relaxation was followed by weeks of relief. C. A. K.

Spontaneous pneumothorax complicating bronchial asthma. M. Trowbridge, jun. (*Arch. intern. Med.*, 1944, **73**, 460—465).—Spontaneous pneumothorax occurred as a complication of bronchial asthma in 2 cases. It was sometimes associated with mediastinal and interstitial emphysema. C. J. C. B.

Pulmonary hæmosiderosis in 6-year-old boy. J. D. Filcher and O. Eitzen (*Amer. J. Dis. Child.*, 1944, **67**, 387—392).—A white boy 6 years old, ill for 18 months, had severe anæmia for the first 6 months and after recovery had progressive weakness, breathlessness, and clubbing and cyanosis of the fingers. Roentgenograms showed diffuse fibrosis of the lungs and enlargement of the root of the pulmonary artery. Autopsy disclosed extensive fibrosis of the lungs, with great deposition of hæmosiderin together with siderotic nodules, and also cardiac hypertrophy, especially of the right ventricle. The cause of the condition was not determined. C. J. C. B.

VIII.—MUSCLE.

Attachment of skeletal muscle fibres.—See A., 1944, III, 629.

Birefringence of striated and smooth mammalian muscles. E. Fischer (*J. Cell. Comp. Physiol.*, 1944, **23**, 113—130).—Total birefringence of striated muscles was $2{\cdot}48—2{\cdot}61 \times 10^{-3}$, and was increased about 4% by a 25% elongation by stretching. It was decreased in isotonic but unchanged in isometric contraction. Vals. for smooth muscle are higher and are more increased by stretching. Formalin-fixed give the same results as living muscles, and indicate that the " crystalline " component is 35% and the " form " component is 65% of total birefringence. n for micellæ of striated muscle is 1·57 and of smooth muscle 1·54—1·55. The micellar pattern of smooth muscle is identical with that of the anisotropic disc of the striated. V. J. W.

Early effects of inanition on structure of motor end plates. E. J. Carey (*Anat. Rec.*, 1944, **89**, 139—153).—Within 48 hr. after acute starvation there was an expansion of 70% of motor end plates in the intercostal muscle fibres of adult albino rats. Respiration was accelerated and the animals exhibited increased excitability. The histology of the expanded nerve plate and its associated granular sole plate is described. Structural variations in this region are attributed to normal and abnormal amœboid motion. In 5—12 days progressive retraction of the hypolemmal ramifications of the axis cylinders from intercostal muscle fibres occurs, together with acute dilatation of the epilemmal branches of the cylinder. It is concluded that acute inanition blocks normal transmission of axonic nerve substances to the muscle fibre. W. F. H.

Creatine content of gastrocnemius muscle of young male rats on diets varying in choline content. E. Roberts and H. C. Eckstein (*J. Biol. Chem.*, 1944, **154**, 377—379).—The creatine content of the gastrocnemius muscle of young rats is unaffected by a diet deficient in choline or by the addition of ethanolamine to this diet. H. G. R.

Glycolysis in extracts of oyster muscle. G. F. Humphrey (*Austral. J. Exp. Biol.*, 1944, **22**, 135—138).—Pyruvic and lactic acids are formed and accumulate in ice-water extracts of oyster muscle. More CO_2 is evolved from the HCO_3' buffer than can be accounted for by the determined amounts of the two acids. PO_4''', K, Mg or Mn, and diphosphopyridine nucleotide are essential components of the system involved. Oyster and rabbit glycogen and starch, but not fructose, glucose, galactose, or mannose, function as substrates for the reaction, which is inhibited by F′ and indoacetate. J. N. A.

Surface and interior effects in unstriated muscle produced by various ions. I. Singh (*Proc. Indian Acad. Sci.*, 1943, **17**, **B**, 143—148).—Ions such as K, NH_4, and H, to which the *Mytilus* muscle is permeable, neutralise the contractures produced by substances to which the muscle is less permeable, such as NaCl, adrenaline, and acetylcholine. It is suggested that excitation is caused by difference in concn. of ions within and without the cells. I. C.

Insulin and response of frog muscle to acetylcholine. J. H. Welsh (*Amer. J. Physiol.*, 1944, **141**, 109—116).—Responses of the isolated frog's heart and rectus abdominis muscle to acetylcholine are modified by previous administration of insulin to the intact frog. At 15° (when the action of insulin in the frog is relatively slow) it increases the rectus abdominis response to acetylcholine and decreases the % inhibition of the heart at 10^{-8} concn. and higher. These modifications in response are not directly related to blood-sugar or muscle-glycogen levels but may be due to changes in rate of carbohydrate utilisation. T. F. D.

Effect of heat produced by short-wave diathermy on activity of muscle. W. W. Tuttle and L. Fitts (*J. Lab. clin. Med.*, 1944, **29**, 609—613).—All periods of the form curve of contraction of the gastrocnemius muscle in man were shortened by heat. C. J. C. B.

Exploratory anterior mediastinotomy in myasthenia gravis. P. B. Hardymon and H. H. Bradshaw (*Surg. Gynec. Obstet.*, 1944, **78**, 402—408).—The literature is reviewed and 3 cases are reported. In one no thymus tissue was found. In the other two thymus tissue was removed with clinical improvement in one case. P. C. W.

IX.—NERVOUS SYSTEM.

Effect of high potassium concentrations on aërobic and anaërobic fractions of resting potential of frog nerve. A. M. Shanes (*J. Cell. Comp. Physiol.*, 1944, **23**, 193—196).—The aërobic fraction of the resting potential (*i.e.*, the recovery in O_2 after 90 min. in N_2) is abolished by K in the same manner as 50% of nerve O_2 uptake, which is therefore responsible for maintenance of resting potential, probably through a sp. phosphorylation. V. J. W.

Prevention of neuroma formation by encasement of severed nerve end in rigid tubes. E. J. Poth and E. Bravo-Fernandez (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 7—8).—Neuroma formation on the cut end of the dog's sciatic is prevented if the end is enclosed in a closely fitting tube of Ag, Cellophane, vitalium, or glass. V. J. W.

Experimental evidence against " neurotropism " in nerve regeneration. P. Weiss and A. C. Taylor (*J. Exp. Zool.*, 1944, **95**, 233—257).—By allowing nerve fibres to regenerate in forked arteries in the rat, alternative channels could be provided which were either blind, or filled with degenerated nerve, tendon, or fat tissue. The results showed that the regenerating fibres showed no preference for channels which contained supposed " neurotropic " agents. Fibres which grew into blind channels showed no sign of absorption after 20 weeks, despite their lack of functional peripheral connexions. H. L. H. G.

Test for median nerve function. R. Wartenberg (*Surg. Gynec. Obstet.*, 1941, **73**, 872—873).—A test is described based on the ability to abduct the thumb when median nerve function is normal. P. C. W.

Muscular disorders in infantile paralysis. J. Moldaver (*J. Amer. Med. Assoc.*, 1943, **123**, 74—77).—Action potentials and chronaxie measurements were recorded in the muscles of 49 patients with infantile paralysis. It is concluded that " muscle spasm " (Kenny) is not damaging to muscle and does not lead to degeneration; it is due to increased tonus resulting from meningeal irritation. " Alienated muscles " show paralysis because of damage to anterior horn cells. " Inco-ordination " is due simply to the muscular paralysis. The suggestions of Kenny (" The Treatment of Infantile Paralysis in the Acute Stage," 1941) were thus not confirmed. C. A. K.

Treatment of poliomyelitis during the acute stages of the disease. J. A. Toomey and P. M. Kohn (*Amer. J. Dis. Child.*, 1944, **67**, 393—399). C. J. C. B.

Location of lateral spinothalamic tract in brain stem of man. A. T. Rasmussen and W. T. Peyton (*Surgery*, 1941, **10**, 699—710).—Topographical description of degenerations in the spinal cord and brain stem of a man who died 19 days after right chordotomy at the 4th—5th thoracic level. The fibres of the lateral spinothalamic tract are most superficial in the trigonum lemnisci just below the trochlear nerve, where they could be readily cut for relief of pain. G. P.

Water, nitrogen, and electrolyte concentration in brain. L. Eichelberger and R. B. Richter [with M. Roma] (*J. Biol. Chem.*, 1944, **154**, 21—29).—The cerebral hemispheres of the dog gave the following vals. per kg. of tissue: total water, $761{\cdot}3 \pm 8{\cdot}3$ g.; Cl′, $36{\cdot}71 \pm 1{\cdot}05$ mM.; Mg $5{\cdot}63 \pm 0{\cdot}56$ mM.; Na $51{\cdot}0 \pm 2{\cdot}4$ mM.; K $95{\cdot}6 \pm 4{\cdot}7$ mM.; Ca $1{\cdot}07 \pm 0{\cdot}07$ mM.; total N $18{\cdot}9 \pm 0{\cdot}3$ g. Vals for cerebellar tissue are equal to, or slightly lower than, those for the cerebral hemispheres with the exception of N ($19{\cdot}1 \pm 0{\cdot}5$ g.). Comparative vals. for serum are given. Determinations were made without removal of fat, since extraction with ether and light petroleum gave low vals. for Cl′, Na, and K. P. G. M.

Electroencephalographic studies during fever induced by typhoid vaccine and malaria in patients with neurosyphilis. M. Greenblatt

and A. S. Rose (*Amer. J. med. Sci.*, 1944, **207**, 512—519).—23 patients with neurosyphilis were subjected to 54 bouts of fever induced by intravenous typhoid vaccine injection and therapeutic inalaria, and electrencephalograms were taken before and at intervals during the fever. As the temp. rose there was a gradual increase in delta activity and in the voltage and irregularity of the brain potentials; as the temp. subsided there was a gradual return to the subject's prefebrile pattern. The magnitude of the changes was correlated with the severity of the fever paroxysm and the severity of the disease. The delta activity appeared as sporadic slow waves, continuous slow waves, and organised bursts of slow activity.
C. J. C. B.

Study of occipital cortical potentials in 500 normal adults. M. A. B. Brazier and J. E. Finesinger (*J. clin. Invest.*, 1944, **23**, 303—311).—The dominant frequency of an individual is comparatively stable, but becomes less so with increasing age. Waves of 8·0—13·0 cycles per sec. (" alpha ") were always present. The % time occupied by alpha waves varied inversely with the frequency of the dominant frequency. Waves of 13·5—17·5 cycles per sec. (" intermediate ") are rare in normal records, and constitute the dominant frequency in only 3·6% of all normals examined. Waves of 18·0 cycles per sec. and faster (" beta ") were always present. The % time occupied by waves in this range is nearly const. for an individual in repeated runs. Waves slower than 8·0 cycles per sec. are found in occipital potentials of 25% of normal subjects. Waves as slow as 6·0 cycles were found in only 41 out of 500 subjects. No waves of 4·0 cycles per sec. or slower (" delta ") were found in any normal subject while breathing normally. Max. voltages are higher in those records which contain the most alpha activity, and in the slower alpha frequencies. The physiological factors of sex, height, wt., or the height–wt. ratio did not correlate with any characteristic in the brain wave record. C. J. C. B.

Effect of varying blood-sugar levels on occipital cortical potentials in adults. I. During quiet breathing. II. During hyperventilation. M. A. B. Brazier, J. E. Finesinger, and R. T. Schwab (*J. clin. Invest.*, 1944, **23**, 313—317, 319—323).—I. Blood-sugar levels below 70 mg.-%, but not impairing consciousness, may have the following effects on the occipital potentials of the normal electroencephalogram (e.e.g.) during quiet breathing: slowing of the dominant frequency; development of activity slower than alpha waves; there was no change in the beta or intermediate waves. High blood-sugar levels (above 130 mg.-%) do not affect the e.e.g.

II. Delta wave activity in the 3rd min. of hyperventilation occurs in 38% of normals at non-fasting blood-sugar levels and is not diagnostic of abnormality. With blood-sugar levels above 130 mg.-%, 11% of normals still show delta wave activity in the 3rd min. In the 2nd min. of hyperventilation only 7% of normals give delta wave activity. The % delta time in normals varies inversely with the blood-sugar level, in both the 2nd and 3rd min. of hyperventilation. With const. blood-sugar level, the amount of delta activity depends on the degree of hyperventilation.
C. J. C. B.

***Rb* gene as cause of mental deficiency.** R. Cook (*J. Heredity*, 1944, **35**, 133—134). L. G. G. W.

***dl*-Glutamic acid hydrochloride in petit mal and psychomotor seizures.** J. C. Price, H. Waelsch, and T. J. Putnam (*J. Amer. Med. Assoc.*, 1943, **122**, 1153—1156).—*dl*-Glutamic acid hydrochloride was given to 8 patients with different forms of epilepsy. Attacks of petit mal or psychomotor seizures were reduced in frequency, and increased mental and physical alertness were noted. Grand mal seizures were unaffected. C. A. K.

Hydranencephaly. E. H. Watson (*Amer. J. Dis. Child.*, 1944, **67**, 282—287).—Report of 2 cases which combine features of hydrocephalus and anencephaly. C. J. C. B.

Does physiological correlation exist between basic intelligence and physical efficiency of school children? F. T. Milne, E. H. Cluver, H. Suzman, A. Wilkens-Steyn, and E. Jokt (*J. Gen. Psychol.*, 1943, **63**, 131—140).—There is no correlation between general intelligence and mechanical aptitude, but it appears that clerical ability is correlated with general intelligence. The youths examined appear to have chosen their vocations without any regard for their capabilities. I. C.

Cerebrospinal fluid protein and intracranial tumours. G. Phillips and G. Goswell (*Med. J. Austral.*, 1944, I, 390—392).—In 42 of 161 cases of intracranial tumour the protein content of c.s.f. was increased to above 40 mg.-%. The increase was associated with lateral shift of the ventricles in supratentorial tumours or of the brain stem in cerebello-pontine angle tumours. F. S.

X.—SENSE ORGANS.

Developmental pathology. II. Sporadic unilateral microphthalmia and associated malformations in chick embryos.—See A., 1944, III, 627.

Sulphonamides in ophthalmia neonatorum. A. Sorsby and E. L. Hoffa (*Brit. Med. J.*, 1944, I, 353—354).—Of 258 cases of ophthalmia neonatorum, 133 were treated with sulphapyridine, 43 with sulphathiazole, 28 with sulphamethazine, and 31 with sulphadiazine; in 23 cases two or more sulphonamides were used. A clinical cure was obtained within 8 days in 85·7% of cases. There was no difference in the action of the four sulphonamides used. In a previous series of 273 cases treated with sulphapyridine a clinical cure was obtained within 8 days in 82%; because of its greater toxicity sulphapyridine is the least indicated. Gonococcal cases responded more rapidly to the treatment than non-gonococcal cases. I. C.

Actinic keratoconjunctivitis. R. G. Scobee and E. W. Grippey (*Amer. J. Ophthal.*, 1944, **27**, 632—635).—The pathological effect of light of short λ is described as well as the clinical course of the disease. There is a latent period of about 8—12 hr. before the onset of severe pain, lacrimation, etc. Adrenaline treatment is suggested in the early stages to counteract the action of the histamine liberated by the light. This prevents circulatory stasis with a consequent piling up of metabolites leading to vasodilatation and œdema. Usually there is immediate relief, enabling patients to return to work at once. In severe burns more drastic measures must be taken especially if treatment has been delayed. M. G. M.

Sugar content of cataractous human lenses. P. W. Salit (*Amer. J. Ophthal.*, 1944, **27**, 612—616).—191 cataractous lenses were analysed by a modification of Gibson's colorimetric method; these included six lenses from diabetics. 12·5% of intumescent cataracts came from diabetics, a much higher percentage than of either incipient or mature type. The sugar % was highest in intumescent cataracts whether the diabetics were included or not and therefore the intumescent cataracts must be associated with sugar metabolism. The average sugar val. exclusive of diabetics decreases with age, although the blood-sugar increases with age. M. G. M.

Meridioneal magnifying lens system in measurement and correction of aniseikonia. K. N. Ogle (*J. Opt. Soc. Amer.*, 1944, **34**, 302—312).—A mathematical treatment of the distortions of visual images to be expected from cylindrical " size " lenses (*i.e.*, those having equal curvatures of opposite surfaces). K. J. W. C.

Space perception. H. H. Emsley (*Proc. Physical Soc.*, 1944, **56**, 294—304).—A size lens (*i.e.*, one with front and back curvatures equal but of opposite sense) alters the size of the retinal image and might be expected to cause apparent tilting of the plane of objects actually equidistant from the observer. Ames in America considers that the cortical images of objects may be thus distorted though the retinal images are equal, and claims to be able to measure this inequality and to correct it with size lenses. This claim is not supported by the present experiments, which suggest that a high degree of compensation for such inequality, if it occurs, can exist.
K. J. W. C.

Theory of induced size effect. A. S. Householder (*Bull. Math. Biophysics*, 1943, **5**, 155—159).—The induced size effect of Ogle is described quantitatively by a simple co-ordinate geometrical treatment. It is assumed that the position of the median plane is determined by the relative vertical dimensions of the retinal images of objects in the visual field, while the frontal plane is determined by the relative horizontal dimensions. The accuracy of the theoretical predictions indicates that these assumptions are largely justified. P. D. M.

Stiles–Crawford effect. P. Moon and D. E. Spencer (*J. Opt. Soc. Amer.*, 1944, **34**, 319—329).—Formulæ are derived for correcting field-brightnesses in helios for the effect of pupil size and the relative visual effectiveness of rays at high brightnesses entering through different parts of the pupil (Stiles–Crawford effect). K. J. W. C.

Ophthalmoplegia and retinal degeneration. R. I. Barnard and R. O. Scholz (*Amer. J. Ophthal.*, 1944, **27**, 621—624).—Report of 4 cases, 2 syphilitic and 1 mentally deficient, in which retinal degeneration was associated with ophthalmoplegia. In spite of complicating factors the association is considered to be more than coincidental and the syndrome to have some common ætiological factor. M. G. M.

Current problems of visual research. W. S. Stiles (*Proc. Physical Soc.*, 1944, **56**, 329—356, and *Nature*, 1944, **154**, 290—293).—A survey of recent work on the sensitivity of the retina, including the min. no. of quanta of the optimal λ required to excite vision and the spectral sensitivity of the retina in dark, light, and intermediate states of adaptation. K. J. W. C.

Observations of dark adaptation in man and their bearing on problem of human requirements for vitamin-*A*.—See A., 1944, III, 601.

Day studies in photopic vision. P. C. Livingston (*Lancet*, 1944, **247**, 67—72).—Low degrees of astigmatism often require correction while high degrees are tolerated by the patient. Main requirements for flying goggles and spectacles are also reviewed. Trouble will be experienced in flying when latent defects of muscle balance and accommodation show themselves and adjustments which are ordinarily unconscious demand conscious effort; here orthoptic

training is valuable. High-altitude " bends " can be accompanied by contraction of visual fields. K. J. W. C.

Head noises in normal and disordered ears. E. P. Fowler (*Arch. Otolaryngol.*, 1944, **39**, 498—503).—A discussion of tinnitus, its causes and treatment. K. T.

Injection of tympanum for chronic conductive deafness and associated tinnitus aurium. B. C. Trowbridge (*Arch. Otolaryngol.*, 1944, **39**, 523—526).—Ethylmorphine hydrochloride was injected into the tympanum of patients with chronic conduction deafness with a view to producing a sterile inflammation with subsequent absorption of the scar tissue, adhesions etc. preventing normal mobility of the conductive apparatus. On the whole the results were encouraging. K. T.

Conservation of hearing. I. F. T. Hill. **II.** L. M. Polvogt. **III.** M. F. Jones. **IV.** W. Hughson and S. N. Reger (*Trans. Amer. Acad. Ophthal. Otolaryngol.*, 1944, 280—282, 282—284, 284—287, 287—288).—I. A brief review of the present position with regard to the treatment of impaired hearing by conventional methods. These are generally effective when the conditions responsible for impairment are reversible if they are applied in time. For deafness due to such irreversible changes as otosclerosis or cochlear degeneration hearing aids are the only remedy.

II. An account of the treatment of deafness due to obstruction in the nasopharynx by hypertrophied lymphoid tissue with the sulphonamide drugs, penicillin, radon, etc.

III. An appraisal of the usefulness of the endaural fenestration operation in the treatment of deafness.

IV. A discussion of hearing aids. K. T.

Mechanism of speech and song. D. Guthrie (*Proc. Roy. Phil. Soc. Glasgow*, 1943—44, **58**, 1—14).—A lecture.

XI.—DUCTLESS GLANDS, EXCLUDING GONADS.

Vitamin-B_1 nutrition in surgical patients as determined by blood level of pyruvic acid. Thyroid disease.—See A., 1944, III, 672.

Progressive exophthalmos in toxic disease of thyroid gland.—See A., 1944, III, 648.

Structural changes associated with advancing age in thyroid gland of female rat with particular reference to alterations in the connective tissue.—See A., 1944, III, 629.

Effects of thiouracil [on the organs]. R. H. Williams, A. R. Weinglass, G. W. Bissell, and J. B. Peters (*Endocrinol.*, 1944, **34**, 317—328).—The drinking-water of rats was replaced by a 0·25% solution of thiouracil Na. Retardation of growth was apparent within 10 days. The effect of simultaneously-injected growth hormone was inhibited. The growth inhibition affected all organs equally, apart from the thyroid. Thiouracil treatment increased the adreno-megalic action of adrenotropin and the goitrogenic action of thyrotropin. The colloid depletion produced by thyrotropin was unaffected by thiouracil. Some rats showed anæmia and leucopenia, with blood-thiouracil concns. higher than obtained in human therapy. P. C. W.

Graves' disease with disassociation of thyrotoxicosis and ophthalmopathy associated with myasthenia gravis. R. Flynn (*Med. J. Austral.*, 1944, I, 344—346).—Report of a case. F. S.

Gastrointestinal tract in hyperthyroidism. R. P. Brown, E. P. Pendergrass, and E. D. Burdick (*Surg. Gynec. Obstet.*, 1941, **73**, 766—783).—24 hyperthyroid and 14 normal patients were studied. The hyperthyroid cases had in increased incidence of achlorhydria, increased prominence of the gastric rugæ, delay in gastric emptying, and increases in tone and motility of small and large intestines. The small intestine tone was of abnormal pattern. P. C. W.

Cardiac and metabolic actions of thyroid compounds. C. P. Leblond and H. E. Hoff (*Amer. J. Physiol.*, 1944, **141**, 32—37).—Thyroidectomy decreases the average heart rate of male rats from 431 to 339 beats per min. in fully conscious restrained animals and from 379 to 265 beats per min. in anæsthetised animals. Thyroxine (3 μg. daily) and di-iodothyronine (412 μg. daily) restore the heart rate almost to normal while thyroxine in doses of 30,300 and 3000 μg. gives vals. above normal, reaching in the case of the highest dose to 647 beats per min. in conscious and 574 in nembutal-treated rats. Generally, thyroidectomy reduces, and graded doses of thyroxine increase, body temp., breathing rate, and O_2 consumption. Dinitrophenol stimulates breathing rate, body temp., and O_2 consumption but affects heart rate only slightly, suggesting that the effect of thyroxine on heart rate is not the consequence of general metabolic stimulation but a direct effect on the heart. T. F. D.

Effect of thyroxine on neutral fat and cholesterol content of body and liver of rats. J. C. Forbes (*Endocrinol.*, 1944, **35**, 126—129).—Rats fed with a high-carbohydrate, low-protein, fat-free, moderate-choline diet were given thyroxine and showed lower liver-neutral fat and -cholesterol than rats not given thyroxine. In the absence of choline the liver-neutral fat of thyroxine-fed rats was high, indicating that the lipotropic action of thyroxine is shown only in the presence of choline. P. C. W.

Thyroid gland and hæmopoiesis. T. E. Wilson (*Med. J. Austral.*, 1944, I, 261—269).—Examinations of blood and bone marrow in 31 untreated thyrotoxic patients showed a mild anæmia and an increased cellularity of the bone marrow affecting all cells except monocytes. Thyroidectomised rats and rats injected with thyroxine showed no significant blood changes. It is concluded that the thyroid gland plays only a non-sp. rôle in hæmopoiesis. F. S.

Effect of thyroid treatment on respiration of various rat tissues. E. S. Gordon and A. E. Heming (*Endocrinol.*, 1944, **34**, 353—360).—Rats were injected with 20 mg. of thyroxine per kg. daily for 2 days or fed 1000 mg. of desiccated thyroid per kg. daily for 3 days. The O_2 consumption of liver, kidney, diaphragm, and heart tissue was raised in different degrees while that of spleen, brain, and testis tissue was unaffected. In the presence of glucose and glycogen there was an increase in kidney R.Q. but a decrease in the R.Q. of liver and diaphragm. F, pyrophosphate, and CN produced similar decreases in O_2 consumption in both normal and hyperthyroid rat liver, but malonate produced greater fall in hyperthyroid than in normal liver suggesting that it acts on another enzyme besides succinic dehydrogenase. Malate and citrate caused a greater increase in normal liver metabolism than in hyperthyroid liver metabolism. Similar experiments with diaphragm tissue indicate that the increase in the O_2 consumption of this tissue chiefly involves succinate consumption and the cytochrome system. P. C. W.

Water intoxication in relation to thyroid and adrenal function. R. Gaunt, M. Cordsen, and M. Liling (*Endocrinol.*, 1944, **35**, 105—111).—Hyperthyroid rats show increased diuresis following water ingestion and marked resistance to water intoxication, partly due to the smaller loss of Cl during water diuresis. In hypothyroidism produced by thiourea or thiouracil water diuresis and susceptibility to water intoxication are normal. The hyperthyroid effects are largely abolished by adrenalectomy. Adrenal cholesterol is depleted in normal and hyperthyroid rats given large doses of water, though the extent of the depletion is not related to the severity of the toxic symptoms. P. C. W.

Diuretic action of thyroid in diabetes insipidus. K. Hare, D. M. Phillips, J. Bradshaw, G. Chambers, and R. S. Hare (*Amer. J. Physiol.*, 1944, **141**, 187—195).—Thyroid feeding to female dogs increased glomerular filtration rate (creatinine and inulin clearances) and diminished the effectiveness of pituitrin in controlling the renal tubular reabsorption of water. T. F. D.

Experimental hypothyroidism in monkey. J. W. Jailer, W. M. Sperry, E. T. Engle, and G. Smelser (*Endocrinol.*, 1944, **35**, 27—37).—The effects of thyroidectomy on 7 adult female monkeys were slight during a post-operative period of 10—22 months. Circulation time was decreased by 30%. Serum-cholesterol increased markedly in 1 animal. Urinary creatine was unaffected but there was an increased retention of administered creatine. P. C. W.

***In vitro* formation of thyroxine from di-iodotyrosine.** A. E. Barkdoll and W. F. Ross (*J. Amer. Chem. Soc.*, 1944, **66**, 898—899).—*In vitro* formation of thyroxine from di-iodotyrosine (A., 1939, II, 369; 1940, II, 329) is confirmed by eliminating possible sources of contamination. Air is essential. 3 : 5-Di-iodo-4-hydroxybenzoic acid or $K_3Fe(CN)_6$ inhibits the reaction; 2 : 4 : 6-tri-iodophenol is without effect. R. S. C.

Inhibiting effect of inorganic iodide on the formation *in vitro* of thyroxine and di-iodotyrosine by surviving thyroid tissue. M. E. Morton, I. L. Chaikoff, and S. Rosenfeld (*J. Biol. Chem.*, 1944, **154**, 381—387).—Inorg. I′ inhibits the formation of thyroxine and di-iodotyrosine by thyroid slices in HCO_3′-Ringer's solution at the expense of inorg. I′ of the medium at levels of between 10 and 50 μg. H. G. R.

Extrathyroidal metabolism of iodine. A. Chapman, G. M. Higgins, and F. C. Mann (*J. Endocrinol.*, 1944, **3**, 392—396 ; cf. A., 1942, III, 306).—Half of a group of young rats fed on a low-I diet received a supplement of 1·5 μg. of I per ml. of distilled drinking-water. After 95 days there was no significant difference in the body wts. of the 2 groups, and half of each sub-group was thyroidectomised. After a further 126 days there was no difference in body wt. or basal caloric output between the intact rats on high- and low-I diets, but in the thyroidectomised animals those given extra I gained 25 g., while those who were not lost 46 g., and their caloric output was also low. It is concluded that I is utilised in the body in the absence of the thyroid gland. P. C. W.

Failure of certain steroid hormones to prevent enlargement of thyroids in rats fed thiourea. A. Segaloff (*Endocrinol.*, 1944, **35**, 134—136).—Thyroid hyperplasia produced by thiourea is prevented by hypophysectomy or thyroid administration but was unaffected by oestrone, α-œstradiol, diethylstilbœstrol, or testosterone propionate, injected daily for 21 days in doses of 100 μg. for the œstrogens and 500 μg. for the androgen. The excess production of thyrotrophin is not inhibited by these doses. P. C. W.

Effect of thiourea on fish development. E. D. Goldsmith, R. F. Nigrell, A. S. Gordon, H. A. Charipper, and M. Gordon (*Endocrinol.*, 1944, **35**, 132—134).—Hybrid fish of *Platypoecilus maculatus* and *Xiphophorous hellerii* had their growth and development of secondary sex characters inhibited by immersion in thiourea solutions. P. C. W.

Thiouracil and metabolism of isolated tissues from normal and hyperthyroid rats. B. J. Jandorf and R. H. Williams (*Amer. J. Physiol.*, 1944, **141**, 91—96).—Respiration of excised rat thyroid is increased by previous thiouracil feeding and thyrotropic hormone injections more by the combination than by either alone, and more than can be accounted for by the concomitant thyroid hyperplasia. Excised adrenals showed little change in respiration with thiouracil or thyrotropic hormone alone, while their combination produces an increase in young but not in mature animals. Liver and muscle show increased metabolism with thyrotropic hormone alone (but not thiouracil alone), which is abolished by simultaneous treatment with thiouracil. T. F. D.

Malignant tumour of parathyroid glands with osteitis fibrosa cystica. R. J. Gentile, H. L. Skinner, and L. L. Ashburn (*Surgery*, 1941, **10**, 793—810).—21 cases from the literature are reviewed and an additional case is reported. G. P.

Effect of parathyroid extract on distribution, retention, and excretion of labelled phosphorus. W. R. Tweedy and W. W. Campbell (*J. Biol. Chem.*, 1944, **154**, 339—347).—Following intraperitoneal injection of a single dose of Na_2HPO_4 containing ^{32}P the accumulation of ^{32}P reaches higher vals. in the liver and kidneys and lower vals. in the femurs of rats receiving parathyroid extract subcutaneously than in the controls. During the last half of the first 24-hr. interval the sp. content of ^{32}P diminishes more rapidly in the femurs of the treated rats. Parathyroid extract produces an immediate increase in the urinary excretion of ^{32}P, and a decrease in fæcal excretion is observed 18—24 hr. after administration. H. G. R.

Insulin mixtures. A. R. Colwell and J. L. Izzo (*J. Amer. Med. Assoc.*, 1943, **122**, 1231—1236).—A mixture consisting of 2 parts of sol. insulin and 1 part of protamine Zn insulin was satisfactory in the control of diabetes in 60 patients in whom previous treatment with protamine Zn and sol. insulin, given separately, was unsatisfactory. The modified insulin was given once daily, in the morning. C. A. K.

Modified protamine zinc insulin. C. M. MacBryde and H. K. Roberts (*J. Amer. Med. Assoc.*, 1943, **122**, 1225—1231).—A new type of insulin was made by mixing equal parts of protamine Zn and regular insulin at pH 7·2. Owing to the 40% excess of protamine Zn in the former, the mixture finally contained 25% of insulin in the sol. form and 75% in the pptd. Clinical studies in 62 diabetics showed that the duration of action of this mixture was intermediate between that of protamine Zn and that of regular insulin. One injection in the morning produced better control of the blood-sugar than separate injections of protamine Zn and regular insulin. C. A. K.

Extended cross-over design and its use in insulin assay. K. W. Smith, H. P. Marks, E. C. Fieller, and W. A. Broom (*Quart. J. Pharm.*, 1944, **17**, 108—117).—Mathematical. J. N. A.

Variations in response of diabetics to insulin therapy [and influence of body habitus and length of illness]. M. B. Handelsman (*N.Y. Sta. J. Med.*, 1943, **43**, 2287—2293).—Report of 50 cases. E. M. J.

Initial stabilisation of diabetic child. J. M. Brush (*Amer. J. Dis. Child.*, 1944, **66**, 429—444).—Children with diabetes mellitus may show some recovery if insulin is given in doses that relieve the islets of the need to secrete. A regimen is outlined. C. J. C. B.

Juvenile diabetes insulin sensitivity. H. M. Feinblatt, B. B. Alpert, and E. A. Ferguson, jun. (*J. Lab. clin. Med.*, 1944, **29**, 366—371).—Case reports are given showing exacerbation of the diabetic state in association with supposed increased anterior pituitary activity at puberty and menstrual period. 5 of the diabetic patients were also observed before and throughout their pregnancies. Each shows dramatic insulin sensitivity during the immediate post-partum period. The dose of insulin to which the patient had been regularly accustomed for a period of years becomes a toxic and even fatal amount. C. J. C. B.

Diabetes mellitus associated with Albright's syndrome (osteitis fibrosa disseminata, areas of skin pigmentation, and endocrine dysfunction with precocious puberty in females). F. B. Peck and C. V. Sage (*Amer. J. med. Sci.*, 1944, **208**, 35—46).—Report of case in a male. C. J. C. B.

Effect of insulin on glucose tolerance of normal man. J. D. Rosenbaum, H. De Kreuf, and P. H. Lavietes (*J. clin. Invest.*, 1944, **23**, 45—50).—Normal men were given 15—20 units of protamine Zn insulin daily and their response to the ingestion of 50 g. of glucose was determined at intervals. Within 24 hr. of the start of insulin administration excessive hyperglycæmia and a delayed rise of R.Q. after glucose were observed and these effects lasted for about 2 days, though the sugar tolerance and rise of R.Q. both ultimately become normal again despite continuation of insulin treatment. One possible explanation is that insulin administration diminished the insulin-secretory activity of the pancreas. C. J. C. B.

Effect of exercise on response of rabbits to insulin. R. H. Thorp (*Quart. J. Pharm.*, 1944, **17**, 75—88).—Mild exercise of rabbits that have received insulin causes the blood-sugar to return to normal more rapidly than it does in non-exercised or anæsthetised rabbits. The degree of animal variation is greater when rabbits are exercised. Severe exercise in animals after a dose of insulin causes severe hypoglycæmia and frequently death. Activity of rabbits also affects, but to a smaller extent, the response to modified insulins, *e.g.*, protamine Zn insulin, and the apparent delayed-action effects of such insulins vary according to the activity of the animals. The conditions of assay of insulin by determination of fall in blood-sugar in rabbits are discussed, and it is recommended that delayed-action insulins should be compared with standards of the same nature and not with sol. insulin. J. N. A.

Alloxan diabetes in rabbits. C. C. Bailey and O. T. Bailey (*J. Amer. Med. Assoc.*, 1943, **122**, 1165—1166).—Intravenous injection of alloxan in rabbits produces transitory hyperglycæmia followed by several hr. of marked hypoglycæmia. If sufficient glucose is given to prevent hypoglycæmic death, permanent hyperglycæmia, glycosuria, polydipsia, polyuria, acetonuria, and lipæmia develop. These effects are due to sp. actions of alloxan on the islets of Langerhans (cf. Dunn *et al.*, A., 1943, III, 735). C. A. K.

Inhalation of adrenaline in glycerin in asthma. S. D. Lockey (*J. Allergy*, 1943, **14**, 382—385).—1/100 adrenaline hydrochloride in 5% glycerin can be vaporised by passage of O_2 through it; irritation and dryness of the throat, on inhalation by asthmatic subjects, was much less than with 1/100 adrenaline hydrochloride in water. C. A. K.

Adrenaline in gelatin + urea for prolonged action. H. A. Abramson (*J. Allergy*, 1943, **14**, 414—419).—Adrenaline was dissolved in a solution of 8·5% gelatin +15% urea, which remains liquid at room temp. A prolonged adrenaline effect was noted on injection into 5 patients. C. A. K.

Disturbances of water balance in rat on removal of adrenal medulla. L. Stein and E. Wertheimer (*J. Endocrinol.*, 1944, **3**, 356—369).—Diuresis following administration of water to (adreno)-medullectomised rats is retarded, markedly in the first post-operative month and slightly later. Normal diuresis is restored in medullectomised and adrenalectomised rats by the injection of adrenaline (0·1 mg. per 100 g.). Cl excretion in water diuresis tests is increased slightly in normal rats injected with adrenaline and markedly in medullectomised rats; deoxycorticosterone only abolishes the inhibition of diuresis produced in medullectomised rats when given in high doses (5 mg. per 100 g.) and does not affect Cl excretion. Water intoxication is more readily produced in medullectomised rats than in normal rats; adrenaline injection abolished the difference. Polydipsia and polyuria may occur in medullectomised rats 2—3 months after operation, particularly in spring and summer. P. C. W.

Carcinoma of the adrenal cortex in a rabbit.—See A., 1944, III, 664.

Heat production in adrenalectomised pigeons. O. Riddle, C. C. Smith, and R. A. Miller (*Amer. J. Physiol.*, 1944, **141**, 151—157).—Heat production at 30° of 102 salt-maintained young Carneau pigeons 2·5—7·5 days after adrenalectomy (but not in the terminal stages) showed little change directly due to loss of adrenal hormones. True basal vals. were probably not obtained since adrenalectomy altered the conditions under which basal measurements had to be made. The metabolism of the operated birds was probably nearly basal 5—12 hr. after food but an apparent sp. dynamic effect was obtained at 24 hr. after food. Small indirect effects on heat production apparently associated with delayed absorption and sp. dynamic effects of food were observed. Only when these indirect effects are overlooked do the results seem to indicate a paradoxical decrease of 4—10% in O_2 consumption at 5—12 hr. and an increase of 5—7% at 24 hr. after ingestion of 15 g. of food. T. F. D.

Rôle of hypophysis and adrenals in control of systolic blood pressure in rat. J. H. Leathem and V. A. Drill (*Endocrinol.*, 1944, **35**, 112—120).—Deoxycorticosterone acetate prevents the fall in systolic blood pressure following adrenalectomy in rats. The fall that follows hypophysectomy is unaffected by deoxycorticosterone acetate, and is only partly inhibited by adrenal cortical extracts. P. C. W.

Metabolism of steroid hormones; adrenal gland as source of cortin-like material in urine of monkeys. R. I. Dorfman, B. N. Horwitt, R. A. Shipley, and W. E. Abbott (*Endocrinol.*, 1944, **35**, 15—21).—Cortin-like material in the urine of monkeys was estimated by its ability to protect adrenalectomised rats against cold. The material was demonstrated in about half of the assays carried out on intact or gonadectomised male or female monkeys. None was

found in the urine of adrenalectomised monkeys. When such animals were injected with adrenal-cortical extracts cortin-like material was invariably demonstrable in their urine; after injection of deoxycorticosterone acetate it was demonstrable in one instance. P. C. W.

Extraction of cortin-like substance from human post-operative urine. E. H. Venning, H. M. Hoffman, and J. S. L. Browne (*Endocrinol.*, 1944, **35**, 49—62).—A method for the concn. of the active material from ethylene dichloride extract of post-operative urine is described. The final product represents a 100-fold concn. of the crude extract with a 25% loss of biological activity; it can protect adrenalectomised rats against cold, induce deposition of liver-glycogen in fasted adrenalectomised rats, and sustain life and growth in such rats. It contains 25—100 cold units per mg. Following surgical procedures the urinary excretion of this material is 3—30 times normal. 7—12% of intravenously injected adrenal cortical extract can be recovered from the urine. P. C. W.

Metabolism of steroids. Adrenal-cortical-like material in urine. R. I. Dorfman, B. N. Horwitt, and R. A. Shipley (*Endocrinol.*, 1944, **35**, 121—125).—Cortin-like material able to protect adrenalectomised rats against cold was demonstrated in the urine of 9 normal men and 8 normal women, but was found only once in 15 assays of urine from 7 cases of Addison's disease. Administration of adrenal cortical extracts for these patients caused the appearance of cortin-like material in the urine; oral administration of deoxycorticosterone had no such effect. P. C. W.

Water diuresis and water intoxication in relation to adrenal cortex. R. Gaunt (*Endocrinol.*, 1944, **34**, 400—415).—The diuretic response to water ingestion or intraperitoneal injection of physiological saline is subnormal in adrenalectomised rats. Immediately after operation replacement therapy with adrenal-cortical extract or deoxycorticosterone acetate is effective but is erratic 7 days later even if the rats have been maintained in good health by such means. Similar treatment in normal rats will protect them against water intoxication. The progress of water intoxication can be reliably assessed by the fall in body temp. The lack of diuresis is due to delay in intestinal absorption and gastric emptying and to inability to excrete absorbed water. In water intoxication in normal rats there is a loss of Cl by diarrhœa and by urinary excretion; in adrenalectomised rats the latter loss is small but there is a shift of Cl into the unabsorbed fluid in the gut sufficient to account for the fall in plasma-Cl. There is no œdema or ascites. The hæmatocrit vals. rise and the plasma-protein falls in water intoxication, particularly in adrenalectomised rats. P. C. W.

Relationship of effects of adrenal cortical secretion on lymphoid tissue and on antibody titre. T. F. Dougherty, A. White, and J. H. Chase (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 28—29).—Rabbits injected with adrenal cortical extract gave a greater agglutinin response to sheep red-cell injections than did controls, indicating that one of the serum-proteins the formation of which is stimulated by the extract may possess antibody activity. V. J. W.

Thymus weight in relation to body weight in castrated and in adrenalectomised rats. H. C. Stoerk (*Endocrinol.*, 1944, **34**, 329—334).—Wt. analyses show that castration or adrenalectomy has no effect on the normal course of thymic development in male albino rats. P. C. W.

Antifibromatogenic action of synthetic deoxycorticosterone. A. Lipschutz, C. Nunez, and J. Zanartu (*Rev. Med. Aliment. Santiago*, 1943, 77—78).—The antifibromatogenic threshold of deoxycorticosterone at which the fibromatogenic action of œstradiol (2—7·8 mg.) is countered is for the guinea-pig 6 mg. in two months. I. C.

Effect of androgenic steroids on adrenal cortex of hypophysectomised rats. S. L. Leonard (*Endocrinol.*, 1944, **35**, 83—90).—The rate of adrenal atrophy following hypophysectomy in rats was decreased by the daily injection of testosterone propionate, androstane-3(α) : 17-*trans*-diol, or androstene-3(β) : 17-*trans*-diol for 10 days from the day of operation in total doses of 10 mg. The injections were less effective when started 10 days after operation; there was no difference in adrenal wts. when the injections were started 20 days after operation. Stimulation of the cortical cells was noted histologically in some cases where there was no difference in adrenal wt. The partial maintenance of adrenal wt. is due to maintenance of cell size and not to an increase in the no. of cells. The adrenal-stimulating activity paralleled the ability to stimulate the testes and ventral prostate. Androstenedione, *trans*-dehydroandrosterone, progesterone, and deoxycorticosterone were ineffective. P. C. W.

Chromophobe adenoma-like lesions of the rat hypophysis. Frequency of the spontaneous lesions and characteristics of growth of homologous intraocular transplants.—See A., 1944, III, 664.

Renal function of newborn infants. [**Response to post-pituitary anti-diuretic hormones.**]—See A., 1944, III, 659.

Evolution of the pituitary with special reference to teleosts. T. Kerr (*Proc. Leeds Phil. Soc.*, 1943, *Sci. Sect.*, **4**, 75—83).—An outline of the possible origin and lines of evolution of the pituitary. It is suggested that the teleost gland may have derived with other vertebrate pituitaries from an ancestral type which possessed a nervous lobe and proximal and distal lobes separated by a hypophyseal cavity and probably a paired tuberal lobe. I. C.

Anterior pituitary–thyroid relationships in fowl. F. Payne (*Anat. Rec.*, 1944, **88**, 337—350).—Body, comb, and gonad wt. remain low following thyroidectomy. Thyroidectomy cells form in the anterior pituitary. These cells originate from chromophobes and they are regarded as secretory. Thyroidectomy retards basophilic development but no castrate changes occur. In 62-day-old chicks castrated on 5th day, and thyroidectomised on 35th day, castrate changes are marked and thyroidectomy cells are present in small nos. Thyroidectomy cells do not form following injections of thyroxine in normal, thyroidectomised, or castrate chicks. Large doses of thyroxine retard castrate changes. Thyroxine and testosterone injections block castrate changes more effectively than either thyroxine or testosterone alone. It is concluded that castrate pituitaries contain a larger quantity of gonadotropic hormone than pituitaries from controls and that thyroidectomy cells possibly secrete the thyrotropic hormone. W. F. H.

Pituitary basophilism syndrome of Harvey Cushing. N. G. B. McLetchie (*J. Endocrinol.*, 1944, **3**, 332—346).—A case of basophilism without hypophyseal or thymic tumour or adrenal tumour or hyperplasia is described. Chief changes in the anterior pituitary were: basophil-cell hyalinisation and vacuolation with occasional demonstration of refractile material surrounding the individual vacuoles (cobweb vacuolation); the basophil-cell nuclei were normal except that cobweb vacuolation may displace the nucleus to the periphery of the cell and scallop the nuclear edges; increased basophil-cell size and decreased acidophil-cell size. These changes are discussed in relation to the findings in two other cases of basophilism, a large series of hypophyses from non-basophilism cases, and to basophil-cell abnormalities recorded in the literature. The basophil-cell size and vacuolation changes are inconst. in basophilism and not related to any particular type of basophilism and are regarded as a reaction to hypogonadism. The reported changes in pituitary cytology produced in rats fed a diet rich in *Brassica* seeds are compared. It is concluded that basophil-cell hyperactivity is the essential abnormality in Cushing's syndrome and that hyalinisation is a cytoplasmic result of overactivity. P. C. W.

Carcinoma of adreno-cortical rest associated with hypophyseal abnormality. N. G. B. McLetchie and L. D. W. Scott (*J. Endocrinol.*, 1944, **3**, 347—355).—Mild virilism suddenly developed in a normal adult woman. Death occurred after coma 3 months later. A carcinoma of an adreno-cortical rest was associated with bilateral adreno-cortical hyperplasia and extreme basophil-cell hyalinisation with 3 small chromophobe adenomata, and an increased proportion of basophil cells in the anterior pituitary. The basophilia and hyalinisation are considered as evidence of basophil-cell hyperactivity secondary to the adreno-cortical hyperactivity and it is suggested that Cushing's syndrome would have eventually developed had not death occurred so suddenly. P. C. W.

Ateleiotic dwarfism with normal sexual function: result of hypopituitarism. T. F. Hewer (*J. Endocrinol.*, 1944, **3**, 397—400).—A dwarf senile woman who had had a child at the age of 36 exhibited a deficiency of anterior pituitary acidophil cells at autopsy. P. C. W.

Effect of adrenocorticotropic hormone (ACTH) on anterior pituitary of adrenalectomised young male rat. A. A. Koneff (*Anat. Rec.*, 1944, **89**, 163—173; cf. A., 1944, III, 408).—Changes occurred in both types of chromophil cells of the pituitary following injections of ACTH into adrenalectomised male rats. Basophils exhibited degenerative changes involving the cytoplasm, nucleus, and cell organelles. There was also a marked increase (up to 15%) in the no. of young basophils. These changes were considered direct effects of ACTH. A decrease in no., diminished size, and degranulation observed in acidophils were not regarded as the result of treatment. W. F. H.

Effects of adrenocorticotropic hormone (ACTH) on osseous system in normal rats. H. Becks, M. E. Simpson, C. H. Li, and H. M. Evans (*Endocrinol.*, 1944, **34**, 305—310).—Intraperitoneal injection of the hormone in young rats thrice daily for 30 days produced retardation of growth, chondrogenesis, and osteogenesis without significantly lowering food intake. The changes were not so pronounced as those following hypophysectomy, and greater than those following restriction of food intake. The inhibition of growth and bone changes were not produced by similar injections in adrenalectomised immature rats. P. C. W.

Antagonism of pituitary adrenocorticotropic hormone (ACTH) to action of growth hormone on osseous system of hypophysectomised rats. H. Becks, M. E. Simpson, W. Marx, C. H. Li, and H. M. Evans (*Endocrinology*, 1944, **34**, 311—316).—Adrenocorticotropin injected intraperitoneally for 15 days had little effect on the suppression of bone formation following hypophysectomy in young rats. Growth hormone stimulated the cartilage and caused renewed formation of straight bone trabeculæ. When adrenocorticotropin

was given simultaneously with growth hormone the effects of the latter were much retarded and there was an irregular arrangement of bony trabeculæ and cartilaginous columns of the erosion zone. P. C. W.

Effect of pure adrenocorticotropic hormone on work performance of hypophysectomised rats. D. J. Ingle, C. H. Li, and H. M. Evans (*Endocrinol.*, 1944, **35**, 91—95).—Hypophysectomised rats received 0·5 mg. of adrenocorticotropin thrice daily from the time of operation. The hormone caused an accelerated wt. loss, adrenal cortical hypertrophy, thymus atrophy, and an increased ability in a work test. P. C. W.

Influence of hormones on lymphoid tissue structure and function. Rôle of pituitary adrenotropic hormone in regulation of lymphocytes and other cellular elements of the blood. T. F. Dougherty and A. White (*Endocrinol.*, 1944, **35**, 1—14).—Pituitary adrenocorticotropin injected intravenously in mice, rats, or rabbits produces an abs. lymphopenia within a few hr. and an increase in polymorphonuclear leucocytes. The latter effect is non-sp., being produced in the absence of the adrenals or by pure proteins. The lymphopenia does not occur in adrenalectomised animals nor when pure proteins from other sources are given. Adrenal-cortical extract, cortical steroids, corticosterone, and compound *F* (Wintersteiner) all produce the lymphopenia in intact or adrenalectomised animals; deoxycorticosterone has no such effect. Adrenocorticotropin or cortical extract increases the red cell count and hæmoglobin concn. P. C. W.

Influence of pituitary adrenotropic hormone on lymphoid tissue in relation to serum-proteins. A. White and T. F. Dougherty (*Proc. Soc. Exp. Biol. Med.*, 1944, **56**, 26—27).—In mice, administration of this hormone, which is known to cause degeneration of lymphoid tissue and leucopenia, also causes increase of serum-proteins. No such changes occur in adrenalectomised animals. V. J. W.

Hypoglycæmic effect of growth hormone. W. Marx, V. V. Herring, and H. M. Evans (*Amer. J. Physiol.*, 1944, **141**, 88—90).—Injections of growth hormone (cysteine-treated anterior pituitary globulin fractions), but not of thyroxine, into fasted hypophysectomised rats produced typical hypoglycæmic symptoms after 1—3 hr. T. F. D.

Sensitivity of reproductive tract of hypophysectomised 40-day male rats to gonadotropic substances. M. E. Simpson, C. H. Li, and H. M. Evans (*Endocrinol.*, 1944, **35**, 96—104).—The testis wt. of 40-day-old rats was maintained after hypophysectomy for 15 days by daily injections of less than 1 r.u. of serum-gonadotropin, chorionic gonadotropin, or pituitary interstitial cell-stimulating gonadotropin. Spermatogenesis occurred with all 3 hormones in doses of about 0·25 r.u. daily. Higher doses were required to stimulate the interstitial cells and accessory organs. P. C. W.

Increased response of full-term gravid uterus to pituitrin after alkalinisation. R. V. Boedeker (*Amer. J. Obstet. Gynec.*, 1941, **41**, 84—88).—Labour is most frequently started during passage of cold air masses and this climatic condition is associated with smooth muscle spasms and increased CO_2-combining power of the blood. In 94 patients in which induction of labour was attempted by pituitrin injections after alkalinising measures (40 g. of $NaHCO_3$ given during the preceding 24 hr.) successful inductions were produced in 70%; a control series of 113 cases gave successes in 41% of cases, and in 20 patients treated with NH_4Cl as an acidifying measure there were only 15% of successes. The CO_2-combining power of the blood was 66, 52, and 46 vols.-% respectively. P. C. W.

Contractile response of pregnant human uterus to posterior pituitary extract. D. P. Murphy (*Amer. J. Obstet. Gynec.*, 1941, **41**, 274—281).—Records were made of the effects of 375 subcutaneous injections of posterior pituitary extract in 96 women during pregnancy and labour by means of the Lorand tocograph. Doses were 0·5—3 minims. 47% of the injections produced no effect. Increased frequency of response was noted more often in multigravidas, later in pregnancy, when the uterine wall was already under tension, or with larger doses of pituitrin. Tetanic responses were elicited more frequently when the dose was larger or the uterine tension was higher. P. C. W.

Separation of oxytocic and pressor principles of posterior pituitary extract. A. M. Potts and T. F. Gallagher (*J. Biol. Chem.*, 1944, **154**, 349—356).—The pressor principle is adsorbed from an aq. extract of the desiccated gland on "permutit according to Folin" and may be eluted with 5% aq. NaCl whereas the oxytocic principle is not adsorbed. H. G. R.

Cardiac and blood-pressure effects of pitocin (oxytocin) in man. R. A. Woodbury, W. F. Hamilton, P. P. Volpitto, B. E. Abreu, and H. T. Harper, jun. (*J. Pharm. Exp. Ther.*, 1944, **81**, 95—100).—Pitocin (3 units) injected intravenously into man produced a fall of 30—50 mm. of Hg in arterial pressure and a rise of 1—2 mm. of Hg in the jugular venous pressure; these effects lasted for 2—5 min. The fall in arterial pressure was attributed to weakened cardiac contractions and not to peripheral vasodilatation, which was slight and occurred only occasionally. Pitressin had no blood pressure-lowering effects. G. P.

XII.—REPRODUCTION.

Relation between shell strength, potential hatchability, and chick viability in fowl. S. S. Munro (*Sci. Agric.*, 1942, **22**, 698—704).—In most cases the density and % of shell of new-laid eggs are closely related to hatchability. Under certain conditions other factors intervene. Variations between flocks in respect of density of eggs are not correlated with differences in hatchability between flocks; variations in density for hens within flocks, individual eggs within flocks, or for eggs within hens are so related. Chicks from low-density eggs have a higher death rate in early life than do those from high-density eggs. A. G. P.

Effect of hyperthyroidism on genital structure and function. K. M. Richter (*J. Morph.*, 1944, **74**, 375—394).—The characteristic effects of hyperthyroidism on the seminiferous tubules of adult male guinea-pigs are: (1) a narrowing of diameter, (2) a reduction in the no. of germ cells, though those present are in an active spermatogenetic phase; there is no degeneration of the germinal epithelium. The tubules are affected in a definite sequence. The proximal parts of the epididymis contain immature germ cells, and mature sperm are present in the bladder. It is concluded that hyperthyroidism causes a precocious maturation of germ cells and an increased rate of their transference through the genital system. H. L. H. G.

Hormonal excretion during menstrual cycle. F. E. D'Amour (*Amer. J. Obstet. Gynec.*, 1940, **40**, 958—965).—Œstrogen and gonadotropin assays were carried out on daily urine collections from 5 subjects during a total of 29 menstrual cycles. Gonadotropin was assayed by recording the increase in uterine wt. in immature rats injected with a tannic acid ppt. of the urine. There was a peak of gonadotropin excretion 12—16 days preceding the next menstruation in 25 of the cycles; the other 4 are considered anovulatory. There are 2 peaks of œstrogen excretion; the rise to the first peak precedes the rise in gonadotropin excretion. The max. gonadotropin output corresponds to a daily excretion of 4—16 i.u. of chorionic or serum gonadotropin and the max. œstrogen output corresponds to about 800 i.u. of œstrone per day. P. C. W.

Origin of ovarian adhesions from organised liquor folliculi in rhesus monkeys. C. G. Hartman (*Surg. Gynec. Obstet.*, 1944, **78**, 391—396).—In rhesus monkeys there are often adhesions between the ovaries and the omentum or tubal fimbriæ, consisting of strands of tissue sometimes several mm. thick. Observations on many monkeys during laparotomy show that the strands are formed by the ingrowth of connective tissue and blood vessels into threads of viscous tertiary liquor folliculi escaping from the newly formed corpora lutea. The adhesions usually have their origin in corpora lutea or corpora albicantes and may contain luteal tissue at their ovarian end. P. C. W.

Ovarian function in hypophysectomised rats. H. Selye and E. Clark (*Anat. Rec.*, 1944, **88**, 393—402).—Testosterone, pregnenolone, and androstenedione are more folliculoid in the non-spayed than in the spayed hypophysectomised animal. Cystic mammary development was observed in hypophysectomised rats with androstenedione, testosterone, and, to a smaller extent, with œstradiol. Four cases of uterine metaplasia occurred in non-spayed, hypophysectomised rats with testosterone, androstenedione, and pregnenolone. W. F. H.

Differential analysis of mixtures of α- and β-œstradiol in urine extract. W. H. Pearlman and M. R. J. Pearlman (*Arch. Biochem.*, 1944, **4**, 97—100).—Using the method of Pearlman and Pincus (A., 1943, III, 648), the œstradiol fraction of human pregnancy urine contains the α-isomeride only, whilst the œstradiol fraction of the urine from rabbits injected with œstrone contains only the β-isomeride. The non-ketonic, weakly acidic, phenolic œstrogens are referred to as the œstradiol fraction. Female rabbits injected with œstrone excrete in the urine an œstrogen with physical and chemical properties resembling those of œstriol. E. R. S.

Clinicopathologic study of causes of metromenorrhagia. E. Henriksen (*Amer. J. Obstet. Gynec.*, 1941, **41**, 179—196). P. C. W.

Hormonal studies in artificial menopause produced by roentgen rays. I. T. Nathanson, C. Rice, and J. V. Meigs (*Amer. J. Obstet. Gynec.*, 1940, **40**, 936—945).—There is a reciprocal relation between the urinary excretion of œstrogen and follicle-stimulating gonadotropin during and following artificial menopause caused by *X*-irradiation. The gonadotropin excretion is raised while the œstrogen excretion is lowered. Vasomotor disturbances are almost always accompanied by raised gonadotropin excretion though the excretion may be raised without the appearance of vasomotor symptoms. P. C. W.

Pain threshold in dysmenorrhœa. J. O. Haman (*Amer. J. Obstet. Gynec.*, 1944, **47**, 686—691).—Threshold to pressure pain applied to the proximal phalanx of the thumb was measured in 100 dys-

menorrhœic women, 100 post-menopausal women, 100 normal women, and 100 men. The mean sensitivity was lower in the dysmenorrhœic women than in the other groups. The mean in the post-menopausal women who had had dysmenorrhœa was lower than in those who had not. P. C. W.

Hyperossification of long bones in rats produced by large doses of œstradiol benzoate. H. N. Lippman and J. B. de C. M. Saunders (*J. Endocrinol.*, 1944, **3**, 370—383).—Daily subcutaneous injections of 125 i.u. of œstradiol benzoate were given to intact and ovariectomised immature female rats for 1—6 weeks. In the femurs of the œstrogenised rats there was a decrease in the abs. water, org., and ash contents. There was a marked depression of body-wt. increase. The % of ash in the fat-free dry femurs of the œstrogenised rats was increased, while sections of their tibias showed increased trabeculation and formation of apparently new endosteal bone. The Ca : P ratio of the femur ash was unaffected by treatment. It is concluded that the hyperossification produced is largely relative, due to relative reduction in the water and org. contents of bone. P. C. W.

Œstrogenic potency of stilbœstrol in guinea-pig. P. Bacsich and G. M. Wyburn (*J. Endocrinol.*, 1944, **3**, 401—405).—Stilbœstrol dipropionate produces a complete œstrogenic response in spayed guinea-pigs including the characteristic vascular changes in the uterus. Stilbœstrol dipropionate is 5 times less active than œstradiol benzoate in producing this response. P. C. W.

Rôle of vitamins of *B*-complex in œstrogen metabolism. Albert Segaloff and Ann Segaloff (*Endocrinol.*, 1944, **34**, 346—350).—Vitamin-*B* deficiency reduces the ability of the rat's liver to inactivate œstrone, α-œstradiol, and stilbœstrol. Addition of thiamin hydrochloride or riboflavin to the diet restored the ability to inactivate œstrone and œstradiol, but not stilbœstrol. Supplements of choline chloride, pyridoxine, or Ca pantothenate had no effect. P. C. W.

Intrasplenic injection of synthetic œstrogens and proœstrogens. A. Segaloff (*Endocrinol.*, 1944, **34**, 335—339).—Stilbœstrol, hexœstrol, and octofollin are inactivated in the liver to a smaller extent than œstrone or α-œstradiol. Esterification and methylation reduce the degree of inactivation, showing that this is related to the hydroxyl groups. Ethinylœstradiol is inactivated to the same extent as œstradiol. Triphenylethylene, triphenylchloroethylene, and 9 : 10-dihydroxy-9 : 10-di-*n*-propyl-9 : 10-dehydro-1 : 2 : 5 : 6-dibenzanthracene are potentiated by passage through the liver, suggesting that this organ is concerned in the conversion of proœstrogens into œstrogens. P. C. W.

Effect of diethylstilbœstrol and its dipropionate on postmenopausal vaginitis and symptoms. L. A. Gray and J. D. Gordinier (*Amer. J. Obstet. Gynec.*, 1941, **41**, 326—328).—Favourable clinical report. P. C. W.

Clinical evaluation of stilbœstrol in women with hypoplastic genitalia. H. H. Lardaro (*Amer. J. Obstet. Gynec.*, 1941, **41**, 301—304).—Of 28 women with hypoplastic uteri treated with stilbœstrol (5 mg. thrice weekly for 1—14 weeks) only 5 showed any increase in the size of the organ. P. C. W.

Metabolism of steroid hormones. Excretionof œstrogenic material by ovariectomised mice bearing adrenal tumours. R. I. Dorfman and W. U. Gardner (*Endocrinol.*, 1944, **34**, 421—423).—The total urinary + fæcal excretion of œstrogenic material was 4 times greater in 10 ovariectomised female mice with spontaneous adrenal tumours than in 11 intact females of the same (*NH*) strain. P. C. W.

Response of intraocular endometrial implants to œstrogen in female rabbits. E. M. Jacobsen (*Endocrinol.*, 1944, **34**, 376—388).—2·5—500 i.u. of œstrone per kg. were given every 2 days to castrated rabbits with intraocular endometrial implants. The rabbits were wholly or partly hysterectomised, but there was no difference in their responses, suggesting that response is independent of the vol. of the effector-organ. The lowest dose did not maintain the transplant area but this was slightly increased by 5 i.u. doses; the lowest dose to produce marked endometrial growth was 100 i.u. Deleterious effects were produced by 500 i.u. doses. The responses were too irregular within a group of animals for the method to be used for assay purposes. Diurnal variations in implant area occur and are described. P. C. W.

Removal of exogenous œstrogens from circulation. A. E. Rakoff, A. Cantarow, K. E. Paschkis, L. P. Hansen, and A. A. Walkling (*Endocrinol.*, 1944, **34**, 370—375).—Œstrogenic activity rapidly disappears from the peripheral blood of dogs or humans injected intravenously or intramuscularly with α-œstradiol. In the presence of hepatic damage the blood-œstrogen curve is prolonged. Similarities between such behaviour and that of bile acids suggest an entero-hepatic circulation of œstrogens like that of bile acids. P. C. W.

Inactivation of ovarian hormones by liver. P. Engel (*Endocrinol.*, 1944, **35**, 70—72).—The uterus was maintained in the normal state in rabbits whose ovaries were transplanted into their back muscles but became atrophic when the ovaries were transplanted into the mesentery. Progesterone was not inactivated by liver pulp *in vitro*. P. C. W.

Effect of œstrogenic stimulation on mangabey prostate. F. M. P. Eckstein and S. Zuckerman (*J. Anat., Lond.*, 1944, **78**, 146).—The response of the uterus masculinus of the mangabey (*Cercocebus torquatus atys*) to œstrogenic stimulation was investigated. It was injected daily for 42 days with 100 g. of œstrone monobenzoate in oil. The epithelium of the uterus masculinus became deeply stratified with extensive desquamation. The glandular elements of the prostate were unaffected but the collecting ducts showed marked hyperplasia and metaplasia. No changes were seen in the terminal parts of the ejaculatory ducts. W. J. H.

Effect of œstrogens on true pre-eclampsia and eclampsia. E. Shute (*Amer. J. Obstet. Gynec.*, 1940, **40**, 1003—1011).—Beneficial effects are claimed in 7 cases of pre-eclampsia and 2 of eclampsia treated with massive doses of œstradiol benzoate (one or more injections of 10,000—50,000 i.b.u.) sometimes supplemented with oral stilbœstrol therapy. P. C. W.

Psychiatric contraindications to use of œstrogens during menopause. W. L. Heaver (*Amer. J. Obstet. Gynec.*, 1940, **40**, 980—985). P. C. W.

Treatment of gonorrhœal salpingitis with œstrogens. G. Weitzner (*Amer. J. Obstet. Gynec.*, 1941, **41**, 92—95).—Beneficial effects are claimed in the treatment of acute salpingitis with daily injections of 10,000 i.u. of œstrogen and in the treatment of chronic salpingitis by 3 similar doses given during menstruation. P. C. W.

Effect of foster nursing on the response of mice to œstrogens.—See A., 1944, III, 663.

Effect of dietary protein on liver-riboflavin and on inactivation of œstradiol by liver.—See A., 1944, III, 658.

Are œstrogens carcinogenic in human female? S. H. Geist and U. J. Salmon (*Amer. J. Obstet. Gynec.*, 1941, **41**, 29—36).—In women suffering from œstrogen deficiency continuous œstrogen therapy produces regeneration of the vaginal and uterine mucosa with increased desquamation of superficial epithelial layers and no signs of abnormal proliferation. Continued administration of 1,500,000 i.u. per month may cause the appearance of cystic glands in the endometrium and proliferation of the stroma of the uterus but even when a total of 53,000,000 i.u. has been given no abnormal proliferation was noted. P. C. W.

Lymphoid tumours in mice receiving steroid hormones.—See A., 1944, III, 662.

Hormonal influences on chemically induced tumours of reproductive system.—See A., 1944, III, 661.

Comparative antifibromatogenic activity of progesterone and related artificial steroids.—See A., 1944, III, 662.

Cancer. VIII. Stilbœstrol and certain steroids in relation to tumour growth resistance.—See A., 1944, III, 664.

Antifibromatogenic activity of synthetic progesterone in experiments with the 17-caprylic and dipropionic esters of α-œstradiol.—See A., 1944, III, 662.

Stilbœstrol dimethyl ether in treatment of menopausal symptoms and for suppression of lactation. O. H. Bloom (*Amer. J. Obstet. Gynec.*, 1944, **47**, 692—696).—Stilbœstrol dimethyl ether given in 30-mg. doses by intramuscular injection once weekly completely controlled menopausal symptoms after an average of 3 injections for an average of 138 days. Toxic symptoms were not produced. 245 patients were given two injections of 15 mg. of stilbœstrol + 15 mg. of the dimethyl ether and 24 were given 3 such injections for the suppression of lactation. Only 4 cases were failures with painful and engorged breasts and only 11% of the whole group had reingorgement. P. C. W.

Relation of œstrogenic activity to structure in 4 : 4′-dihydroxydiphenylmethanes.—See A., 1944, II, 333.

Metabolism of steroid [sex] hormones. B. N. Horwitt, R. I. Dorfman, and G. Van Wagenen (*Endocrinol.*, 1944, **34**, 351—352).—The urine of 3 pregnant rhesus monkeys collected during periods when a total of 1·2 g. of testosterone propionate had been injected yielded 22 mg. of androsterone. 2½ times as much urine from uninjected pregnant monkeys yielded no androsterone. P. C. W.

Influence of sex hormones on bursa of Fabricius and pelvis in ring-necked pheasant. C. M. Kirkpatrick and F. N. Andrews (*Endocrinol.*, 1944, **34**, 340—345).—The rate of involution of the bursa of Fabricius was increased in normal and castrated male pheasants injected with 0·3 mg. of testosterone daily for 20 days, and in normal females injected with 0·2 mg. of stilbœstrol daily for 20 days; both series of injections were started in the 15th week of age. Castration of male pheasants at the same age did not affect the bursa. The distance between the pubic bones was doubled in the stilbœstrol-injected females. P. C. W.

Solubility of certain steroids and other water-insoluble substances in aqueous solutions of sodium dehydrocholate. A. Cantarow, K. E.

Paschkis, A. E. Rakoff, and L. P. Hansen (*Endocrinol.*, 1944, **35**, 129—132).—α-Œstradiol, œstrone, œstriol, progesterone, androsterone, testosterone, deoxycorticosterone acetate, calciferol, stilbœstrol, methylstilbœstrol, naphthalene, and 2-methyl-1 : 4-naphthaquinone are readily soluble in aq. solutions of Na dehydrocholate. In the case of œstrone, a water-sol. œstrogenic compound diffuses through Cellophane membranes, suggesting a firm œstrone–dehydrocholate complex. P. C. W.

Biochemical effects of sex hormones on acid and alkali phosphatase activity, calcium, and phosphorus. K. W. Buchwald and L. Hudson (*Endocrinol.*, 1944, **35**, 73—82).—Subcutaneous injections of 0·1 mg. of diethylstilbœstrol into male rats and of 0·2 mg. of testosterone propionate into female rats were given daily for 28 days. There was no change in serum-Ca, or fæcal Ca or P output. Diethylstilbœstrol treatment decreased serum-P and acid phosphatase activity. The alkaline serum-phosphatase activity of the blood was unaffected, that of the femurs decreased. Testosterone propionate had no effect on serum-P, acid phosphatase activity of the serum, or alkaline phosphatase activity of the femurs, but increased the latter activity in the blood. P. C. W.

Augmentation of castrate urinary gonadotropin by non-specific urinary component. B. G. Smith (*Endocrinol.*, 1944, **34**, 301—304).—Dialysis of the original urine or of solutions of an alcohol ppt. produced limited loss of activity which was not further decreased by longer dialysis. The loss is due to dialysis of an augmenting substance as the addition of an appropriate amount of dried urine, heated to destroy all gonadotrophic activity, restores the activity of dialysed gonadotrophic samples. The augmenting substance is not identified. P. C. W.

Seasonal study of the normal and pituitary-stimulated frog (*Rana pipiens*). I. Testis and thumb pad. F. M. Glass and R. Rugh (*J. Morph.*, 1944, **74**, 409—428).—The normal seasonal cycles in the testis and thumb pad are described. Injection of frog pituitary leads to discharge of mature spermatozoa and stimulation of the thumb pad within 48 hr. at any season of the year; the interstitial tissue of the testis is not increased within 48 hr. As the vol. of interstitial tissue is directly correlated with the state of the thumb pad in the normal cycle, it remains uncertain whether the pituitary hormone acts directly on the pad or through the interstitial tissue, since it is possible that the latter might not show appreciable histological change until more than 48 hr. had elapsed. H. L. H. G.

Use of equine gonadotropin in male infertility. C. W. Charny (*Amer. J. med. Sci.*, 1944, **207**, 519—527).—Results in 127 unselected cases of male infertility treated with equine gonadotropin were generally unsatisfactory. The histology of the seminiferous tubules found on biopsy in infertile men is described. 52% of patients showed irreparable lesions of the seminiferous tubules. (6 photomicrographs.) C. J. C. B.

Production of ovulation in immature rats. I. W. Rowlands (*J. Endocrinol.*, 1944, **3**, 384—391).—Serum-gonadotrophin was effective in producing follicular growth but had a limited capacity to produce ovulation. Ovulation was produced by 10 i.u. of serum-gonadotrophin followed 48—72 hr. later by 10 i.u. of chorionic gonadotrophin. Ova (10 per rat) appeared in the tubes 14—16 hr. after the latter injection. Superovulation was produced when the dose of serum-gonadotrophin was raised to 30 i.u., but further increases over-stimulated the ovary and prevented the discharge of ova. P. C. W.

"Rebound phenomenon" : its bearing on œstrogen and progestogen metabolism in the baboon. C. Gilbert and J. Gillman (*S. Afr. J. Med. Sci.*, 1943, **8**, 143—147).—Immature baboons injected with 1 mg. of œstradiol benzoate daily for 10 days followed by no treatment, or the daily injection of 2 mg. of progesterone + 0·1, 1, or 5 mg. of œstradiol for a further 10 days showed no difference in the initial perineal turgescence, which developed, receded, and was followed by œstrogen or progestogen withdrawal bleeding on the 22nd–25th day of the experiment. With the 2 higher doses of œstradiol given with the progesterone there was immediately before or after, or at the same time as, the progestogen withdrawal bleeding a short phase of perineal turgescence (rebound phenomenon). The facts are made the basis for quant. estimations of the interrelations of œstrogen and progesterone metabolism. P. C. W.

Oral pregneninolone in treatment of spontaneous abortion. L. Krohn and J. M. Harris (*Amer. J. Obstet. Gynec.*, 1941, **41**, 95—98).—50 patients with habitual (2 or more) or threatened abortion were given pregneninolone (10 mg. twice weekly or twice daily while abortion was threatened) by mouth; there were 42 normal deliveries. P. C. W.

Absorption of steroid hormones from oral mucous membranes, especially of progesterone given sublingually. G. W. Corner (*Amer. J. Obstet. Gynec.*, 1944, **47**, 560—677).—Sublingual administration of progesterone in propylene glycol + alcohol solution to rhesus monkeys and rabbits gave variable results but suggested that 4 times as much was required to produce the same effects as subcutaneous injection. P. C. W.

Abdominal pain in pregnancy. E. C. Fahmy (*Edinb. Med. J.*, 1944, **51**, 229—246).—A lecture. H. S.

Survey of 425 cases of toxæmia of pregnancy. C. A. Jones (*Amer. J. Obstet. Gynec.*, 1941, **41**, 242—253). P. C. W.

Possible relation between diet and late toxæmia of pregnancy. J. H. Kooser (*Amer. J. Obstet. Gynec.*, 1941, **41**, 288—294).—In a rural population there was a direct seasonal relation between the incidence of toxæmia and the scarcity of food. There appeared to be no relation between the incidence and the type of diet. P. C. W.

Action of steroid hormones in ovipositor test. II. Substances resembling progesterone. III. Adrenal hormones. IV. Androgenic substances. V. Œstrogenic substances. VI. Substances in gland extracts and body fluids. J. J. Duyvené de Wit (*Biochem. Z.*, 1941, **310**, 83—95, 96—100, 101—113, 114—118, 170—184; cf. A., 1944, III, 537).—II. The comparative action of progesterone and derivatives is shown by the growth rate of the ovipositor of bitterling to depend on their chemical constitution. Thus with the *allo*pregnane derivatives, the dione is 9 times as effective as the ol-one, and 50 times as effective as the diol derivative; the duration of effect, however, is in the reverse order. $\Delta^{4:5}$-Pregnene derivatives are more effective than are the corresponding $\Delta^{5:6}$-pregnene compounds: *allo*pregnane derivatives are more active than the pregnane series, whilst with both series the duration of action is in the reverse order. Progesterone derivatives inactive in mammals are active in the bitterling ovipositor growth test.

III. Synthetic corticosterone is active, whilst deoxycorticosterone and its acetate are respectively 80 and 200 times as effective. The acetate is active in concns. as low as 0·5 μg. per 750 c.c.

IV. All the androgenic compounds examined gave a positive response and, with the exception of testosterone propionate, a two-phase growth curve. No relationship exists between constitution and response, or between the various responses to tests by the bitterling pituitary, seminal vesicle, or cock's comb methods. Testosterone propionate produces a growth curve very much like that of the progesterone type.

V. The activities of œstrone, œstradiol, and œstriol are approx. equal but the three compounds show significant differences in the form of the curves for growth and concn.

VI. The growth test is not suitable for the detection of œstrogenic or androgenic substances in organ extracts or body fluids but is applicable to the detection of progesterone-like and other (possibly new) substances. Testicular extracts contain a progesterone-like substance, whilst adrenal cortex appears to contain the true cortical hormone, not identical with corticosterone or deoxycorticosterone. Ovaries without ripe follicles or corpora lutea also contain a progesterone-like substance, as do single animal or human corpora lutea, placenta, and liquor folliculi. Human urine contains an active substance that is apparently not identical with any known hormone. F. O. H.

Activity of histaminase in normal and toxæmic pregnancy. R. Kapeller-Adler (*Biochem. J.*, 1944, **38**, 270—274).—The serum of non-pregnant women gives a negative reaction for histaminase, but normal pregnancy serum is always positive. The strength of the reaction is diminished in mild, and reduced almost to zero in severe, cases of toxæmia. The activity of the histamine in the placenta appears to be inversely proportional to the uterine efficiency. The lack of parallelism between tests with histamine and cadaverine as substrates makes it unlikely that histaminase and diamine oxidase are identical. E. C. W.

Effect of illumination on egg-extrusion reaction of *Xenopus lævis* in the frog test for pregnancy. A. I. Weisman and C. W. Coates (*Endocrinol.*, 1944, **35**, 68—69).—Egg-extrusion was produced normally in a group of *Xenopus* toads injected with gonadotropin and kept in the dark; a similar group treated and maintained in direct fluorescent light responded poorly or not at all. P. C. W.

Nausea and vomiting of pregnancy due to allergic reaction. J. W. Finch (*Amer. J. Obstet. Gynec.*, 1940, **40**, 1029—1036).—The nausea and vomiting of pregnancy develop at the same time as the corpus luteum reaches an appreciable size and disappear when the gland regresses. 98 patients with the complaint gave cutaneous reactions proportional to the severity of the condition when intradermally injected with 0·02—0·03 ml. of progestin in oil. They did not react to progesterone and normal pregnant women or pre-puberal girls did not react to progestin. 91% of 51 patients treated with progestin in oil as for allergic desensitisation were relieved of their symptoms. P. C. W.

Lead mobilisation following toxæmia of pregnancy. T. V. Letonoff, J. G. Reinhold, H. E. Riggs, and C. Cohn (*Amer. J. Obstet. Gynec.*, 1940, **40**, 1017—1021).—The mean blood-Pb was about 200% of normal in 18 cases of pregnancy toxæmia; the mean val. in 15 normal pregnant women was normal. It is suggested that Pb mobilisation may account for some of the symptoms of toxæmia. P. C. W.

Antuitrin-*S* skin test for pregnancy. T. E. Mandy and A. J. Mandy (*Amer. J. Obstet. Gynec.*, 1941, **41**, 109—112).—300 pregnant women and 223 non-pregnant women were tested. 7% of the

.iant and 28% of the non-pregnant women were incorrectly .gnosed. P. C. W.

Endometrial biopsy in early extrauterine pregnancy. D. R. Mishell (*Amer. J. Obstet. Gynec.*, 1941, **41**, 129—134).—Decidual changes in the stroma and characteristic changes in the epithelial cells of the endometrial glands (ballooning out into the lumen with the free edge of the cells appearing clear and dome-shaped so as to resemble exaggerated goblet cells) are recorded in endometrial biopsy specimens from 2 cases of ectopic pregnancy. P. C. W.

Prolongation of pregnancy and excessive fœtal development following administration of corpus luteum extract. D. P. Murphy (*Amer. J. Obstet. Gynec.*, 1944, **47**, 697—698).—A case of threatened abortion was given 14 grains of corpus luteum extract (equiv. to 56 grains of fresh luteal tissue) daily by mouth for 4 months. Parturition occurred 26 days after the expected day and the infant weighed 5 kg. P. C. W.

Endometriosis and pregnancy. R. B. Scott (*Amer. J. Obstet. Gynec.*, 1944, **47**, 608—632).—2 cases are reported and the literature is reviewed and discussed. P. C. W.

Hormonal content of ovarian cysts associated with pregnancy. R. M. Watts and F. L. Adair (*Amer. J. Obstet. Gynec.*, 1944, **47**, 593—607).—30 ovarian cysts associated with pregnancy were examined and the findings compared with similar examinations of cysts from non-pregnant patients. Œstrogen was found in 43 of the cysts, which is a higher proportion than in the non-pregnant cases. Gonadotropin was also found. The findings in the different types of cyst are detailed. P. C. W.

Relationship between hormonal abnormalities and accidents of late pregnancy in diabetic women. O. W. Smith, G. van S. Smith, and D. Hurwitz (*Amer. J. med. Sci.*, 1944, **208**, 25—35).—Hormonal changes during pregnancy were studied in 16 diabetic women starting at the 16th—29th weeks. Only 8 had normal offspring; in all but 3 some accident of late pregnancy occurred. Serum-chorionic gonadotropin (C.G., prolan, A.P.L.) was estimated. An abnormal rise in serum-C.G. does not always precede the accidents of late pregnancy which so frequently occur in diabetic women, particularly those involving death of the offspring. Premature withdrawal of œstrogen and progestin, however, such as normally develops only during the last 2 weeks of pregnancy, was a consistent finding in abnormal cases and an immediate precursor of either toxæmia or death of the offspring. This change was preceded by an increase in the production of the placental steroids (such as normally develops only after the 36th week) at least 10 weeks prior to the clinical accident and at least 5 weeks before any rise in serum-C.G. The rise in serum-C.G. when it occurs, therefore, may be secondary to a more fundamental deviation from the normal, the nature of which suggests premature ripening of the placenta with ensuing premature senility. C. J. C. B.

Artificial induction of lactation in the bovine by the subcutaneous implantation of synthetic œstrogen tablets. S. J. Folley and F. H. Malpress. **Addendum: Fracture of the pelvic bones in bovines implanted with tablets of synthetic œstrogens.** A. T. Cowie (*J Endocrinol.*, 1944, **4**, 1—22).—Lactation may be induced in nulliparous heifers or dry cows by the subcutaneous implantation of hexœstrol or stilbœstrol tablets, either as many small tablets (15, 25, or 50 mg. each) totalling 2·5 or 5 g. or as 1—2 tablets of a 1000 mg. each. The degree of lactation induced varied from nil to that of normal lactation. Stilbœstrol was absorbed faster than hexœstrol, but there appeared to be no difference between their efficacies. The treatment was accompanied by nymphomania in most cases, which culminated in pelvic fracture in as many as 20% of animals in some experiments.

Addendum. The fractured pelves in some of the animals were examined. There was no evidence of bone rarefaction. Trauma from persistent coital mimicry was responsible for the fractures. The daily absorption in heifers implanted with small tablets was 8—24 mg., though these vals. may be exaggerated owing to the tendency for the tablets to break up and migrate. With the large tablets the absorption was 2·7—7·3 mg. per day. There was no correlation between the amount absorbed and lactation performance. P. C. W.

Artificial induction of lactation in bovines by oral administration of synthetic œstrogens. S. J. Folley and F. H. Malpress (*J. Endocrinol.*, 1944, **4**, 23—36).—8 heifers given 20—200 mg. of hexœstrol or dienœstrol daily in their drinking-water or food came into lactation. In a subsequent experiment lactation was induced only in 19 of 32 heifers treated with similar doses of hexœstrol or dienœstrol. Lactation when induced varied in degree, but was in general less than in heifers given subcutaneous implants (see preceding abstract). Nymphomania was slight and pelvic fractures were not produced. It is estimated that oral administration results in the utilisation of less than 10% of the dose. The smaller lactation may be due to the heifers being generally younger than those used in the implantation experiments. P. C. W.

Chemical composition of bovine mammary secretions induced by the subcutaneous implantation or oral administration of synthetic œstrogens. S. J. Folley and F. H. Malpress (*J. Endocrinol.*, 1944, **4**, 37—42).—The secretion was initially colostral, but the composition changed to that of good-quality milk at a rate roughly proportional to the increase in yield. A daily output of 5 lb. or more is a guarantee of normal composition. P. C. W.

Use of tablets containing 50% hexœstrol for artificial induction of lactation in the bovine. S. J. Folley, D. L. Stewart, and F. G. Young (*J. Endocrinol.*, 1944, **4**, 43—52).—Tablets containing 50% of hexœstrol, 49% of lactose, and 1% of stearic acid are more slowly absorbed than tablets of pure hexœstrol (10—40 50-mg. or 2—8 250-mg. tablets implanted subcutaneously). Such tablets induce satisfactory lactation in maiden heifers and dry cows, though individual variations are great. Nymphomania is produced, but no pelvic fracture has occurred. In heifers giving low yields of milk subsequent implantation of pure hexœstrol tablets increased the yield in 2 cases but had no effect in others. P. C. W.

Œstrogen treatment of cattle: induced lactation and other effects. J. Hammond, jun., and F. T. Day (*J. Endocrinol.*, 1944, **4**, 53—82).—140 cows and heifers were treated with œstrogens, usually by tablet implantation. During treatment follicular growth in the ovaries ceased and occasionally there was persistence of the corpus luteum; when the tablets were removed normal sexual rhythms were resumed and an increased incidence of double ovulations was noted. The heifers used had failed to get in calf and after treatment there was development of the udders and lactation was initiated in many cases. Secretion was suppressed in the presence of persisting corpora lutea. Lactation varied from nil to commercial yields. Tablet absorption was greatly hastened by intraperitoneal implantation. The mechanism of the induced lactation is discussed. P. C. W.

Œstrogen excretion in milk from œstrogenised cattle. W. Lawson, S. W. Stroud, and P. C. Williams (*J. Endocrinol.*, 1944, **4**, 83—89).—Hexœstrol added to milk in small quantities (1—2 μg. per pint) may be extracted and assayed with 60—100% yield. The amount of œstrogen present in the milk from maiden goats or heifers treated with synthetic œstrogens is too small for assay by direct feeding of the milk to ovariectomised rats but when extracted is never greater than 0·5 μg. per pint. Single determinations on the blood and urine of a heifer receiving 20—24 mg. of dienœstrol daily by mouth gave dienœstrol concns. of 5 μg. per l. of blood and 2 mg. per l. of urine. P. C. W.

Induction of lactation in heifers by single injection of esters of diethylstilbœstrol. A. S. Parkes and R. E. Glover (*J. Endocrinol.*, 1944, **4**, 90—102).—Lactation can be induced in small virgin heifers by a single injection of an ester of stilbœstrol (dipalmitate, dibutyrate, dilaurate, or dipropionate) in a dose of 250 mg. 1000 mg. gave smaller responses. The most effective treatment was the simultaneous injection of a slowly acting and rapidly acting ester; the best yield (13 lb. per day at the peak) was obtained by the injection of 250 mg. of dilaurate and 250 mg. of dipropionate. The method appears to be as effective as the implantation of stilbœstrol or hexœstrol tablets. The milk was of normal or high quality. P. C. W.

Use of diethylstilbœstrol in inhibition and suppression of lactation. J. W. Walsh and W. B. Stromme (*Amer. J. Obstet. Gynec.*, 1944, **47**, 655—669).—150 patients were divided into 3 groups: a control group given analgesics only, a control group given normal conservative treatment, and a third group given 10 mg. of stilbœstrol on the day of parturition or the first post-partum day and 5 mg. on each of the 2 succeeding days. Pain and engorgement were greatly reduced in the stilbœstrol-treated group, which also exhibited delayed and depressed lactation; the incidence of erythema was reduced by stilbœstrol. The depression of lactation was less marked than the suppression of the other symptoms. Once lactation was established stilbœstrol had little advantage in the treatment of breast pain though engorgement was relieved and subsidence of lactation hastened slightly. P. C. W.

Effect of stilbœstrol on lactation. A. R. Abarbanel and M. J. Goodfriend (*Amer. J. Obstet. Gynec.*, 1940, **40**, 1037—1046).—Doses of 50—1000 mg. of stilbœstrol given orally 1—10 days after parturition did not inhibit the onset of lactation but prevented the mother giving the normal daily amount of milk until several days after the last dose of stilbœstrol. 50—500 mg. of stilbœstrol given in 1—4 daily doses had no effect on established lactation. Painful engorgement of the breasts was prevented in 86% of 65 non-nursing full-term mothers given 25—40 mg. of stilbœstrol in divided doses; painful engorgement occurred in 50% of a control group. Where lactation had to be interrupted painful engorgement was prevented within 24 hr. by a single dose of 25 mg. followed by 5 doses of 5 mg. Untreated primiparous nursing women suffered painful engorgement in 80% of cases while similar mothers given 5 mg. of stilbœstrol for the first 3 post-partum days had painful engorgement in only 16% of cases and there was no effect on lactation. P. C. W.

Component fatty acids of early and mature human milk fat. A. R. Baldwin and H. E. Longenecker (*J. Biol. Chem.*, 1944, **154**, 255—265).—The total fat content of human milk increases, and

phospholipin decreases, during transition from the colostral stage to maturity. There are no significant changes in the proportion of acids of low mol. wt., but the amount of C_{12}- and C_{14}-acids increases and that of stearic acid and acids of greater mol. wt. than C_{18} decreases. Compared with cow's milk fat, the amounts of fat of low mol. wt. were relatively small and those of octadecenoic and octadecadienoic acids greater. G. D.

Deposition of pigment in sparrows' bill in response to direct application as specific and quantitative test for androgens. C. A. Pfeiffer, C. W. Hooker, and A. Kirschbaum (*Endocrinol.*, 1944, **34**, 389—399).—By allowing a drop of alcoholic solution of testosterone to fall on the skin–bill junction on one side in English sparrows (intact females or castrated males) for 4—16 days an area of pigmentation is produced. The min. dose of testosterone necessary to produce an effect is 1 μg. spread over 4, 8, or 16 daily applications. Androsterone was equally effective. Deoxycorticosterone and progesterone were ineffective and 10 μg. of œstradiol benzoate daily had no affect on simultaneously given testosterone. Androgenic assays of pig or bull testicular extracts gave the same results as capon assays. Daily doses of 1 μg. of testosterone were necessary to produce the same effects when given by injection or inunction. P. C. W.

Evidence for early testis hormone secretion in a rat from study of the epididymis. E. S. Cieslak (*Endocrinol.*, 1944, **35**, 63—67).—Male rats castrated 1 day after birth have lighter epididymal tails than sham-operated controls 7—44 days later. Daily injection of 0·01 mg. of testosterone propionate from day 3 to day 8—13 produces increases in epididymal wt. Hormone production from the testis is thus demonstrable by the 8th day of life. P. C. W.

Organ extracts. VI. Isolation of chimyl alcohol (*d*-α-hexadecyl glycerol) from testes extract and its identity with "testriol." V. Prelog, L. Ruzicka, and F. Steinmann (*Helv. Chim. Acta*, 1944, **27**, 674—677).—Chimyl alcohol is isolated from testes extract and shown to be identical with the "testriol" of Hirano (*J. Pharm. Soc. Japan*, 1936, **56**, 122). It is noteworthy that the alcohol is obtained relatively easily from testes extract, whilst batyl alcohol has not yet been isolated therefrom (cf. A., 1944, II, 285). H. W.

Metabolism of steroid hormones: metabolism of testosterone in the male chimpanzee. W. R. Fish and R. I. Dorfman (*Endocrinol.*, 1944, **35**, 22—26).—Oral administration of 1—5 g. of testosterone propionate in each of 2 adult male chimpanzees produced a 13-fold increase in the excretion of urinary androgenic material. Androsterone and ætiocholan-3(α)-ol-17-one are identified as urinary metabolites of the ingested testosterone; androsten-17-one was also isolated but considered to be formed by dehydration of androsterone during the hydrolysis and extraction of the urine. P. C. W.

Effect of testosterone propionate on thermo-regulatory function of rat scrotum. J. O. Almquist and F. N. Andrews (*Anat. Rec.*, 1944, **89**, 125—133).—Following injections of testosterone propionate into rats castrated at the 35th day there was an increase in the height of scrotal contraction and in the wt. of scrotal sacs and seminal vesicles. Similar treatment maintained scrotal sac wt. and increased seminal vesicle wt. and contractility of the scrotum in sexually mature rats castrated on the 90th day. The results provide additional evidence that thermo-regulatory functions of the scrotum are dependent on testicular hormone. W. F. H.

Influence of testosterone propionate on adrenals and testes of hypophysectomised rats. J. Leathem (*Anat. Rec.*, 1944, **89**, 155—161).—Injections of large amounts of testosterone propionate maintained adrenal wt. for at least 15 days in hypophysectomised immature male rats. This effect was not continued and after that period adrenal wt. decreased despite androgen treatment. Similar injections induced spermatid formation in some animals hypophysectomised at the 27th day and spermatozoa formation in others hypophysectomised at the 33rd day. Extended treatment produced tubular damage. W. F. H.

XIII.—DIGESTIVE SYSTEM.

Bleeding peptic ulcer in infancy. L. E. Meiselas and A. H. Russakoff (*Amer. J. Dis. Child.*, 1944, **67**, 384—386).—A case report. C. J. C. B.

Cystic fibrosis of pancreas. M. L. Menten and T. O. Middleton (*Amer. J. Dis. Child.*, 1944, **67**, 355—359).—Report of 18 proved cases. C. J. C. B.

Pancreatic insufficiency following resection of pancreas. P. E. Rekers, G. T. Pack, and C. P. Rhoads (*J. Amer. Med. Assoc.*, 1943, **122**, 1243—1245).—The duodenum and head of the pancreas were removed for malignant disease in a woman of 39. The pancreatic ducts were ligated. Pronounced loss of fat and N in the fæces was observed. Oral administration of amino-acids did not increase N loss. Lipocaic and bile salts were ineffective but pancreatic extracts decreased fæcal excretion of fat and N. C. A. K.

Association of acute interstitial pancreatitis with acute pneumococcic mural endocarditis. A. Trasoff and D. R. Meranze (*J. Lab. clin. Med.*, 1944, **29**, 590—594).—A case report. C. J. C. B.

Effect of distension of duodenum on whole blood-specific gravity and -potassium. S. B. Childs and J. Scudder (*Surg. Gynec. Obstet.*, 1941, **73**, 880—884).—Distension of the duodenum for 24 hr. in dogs with balloons at a pressure of 30 mm. Hg caused a rise in whole blood-sp. gr. and -K. There was a marked fall 1 hr. after the distension was released; normal vals. returned 24 hr. later. When the distension was maintained for 48 hr. with a pressure of 44 mm. Hg there was no fall when the pressure was released and there was a continued rise until the dogs died of the results of gangrene. P. C. W.

New clamp for aseptic anastomosis in gastrointestinal surgery. M. DeBakey (*Surgery*, 1941, **10**, 826—831).—Description of instrument and its use. G. P.

Nutritional problems in a patient with extensive jejuno-ileitis. S. T. Killian and F. J. Ingelfinger (*Arch. intern. Med.*, 1944, **73**, 466—471).—In a patient with extensive granulomatous jejuno-ileitis and pronounced hypoproteinemia, the following results were found: a deficiency in pancreatic amylase; a positive N balance was easily established, but the hypoproteinæmia and the body wt. responded only moderately to a high oral intake of proteins and amino-acids; oral administration of conc. amylase was followed by a gain in wt. and an increase in serum-proteins, probably due to improvement in absorption of carbohydrates. Amylase inhibits the growth of *Monilia albicans* in the stools. C. J. C. B.

Peritoneoscopy. R. Shackleford (*Surgery*, 1941, **10**, 742—746). G. P.

Fate of methylcellulose in human digestive tract. W. Machle, F. F. Heyroth, and S. Witherup (*J. Biol. Chem.*, 1944, **153**, 551—559).—Most of the methylcellulose (5—10-g. dose) passed through the digestive tract unchanged. Addition of roughage to the diet increased the proportion of insol. fæcal methoxyl groups and the proportion sol. in hot water, but the total of methoxyl groups recovered was unaffected. No significant amounts of methanol were absorbed and excreted as such or as formic acid. R. L. E.

Food of crocodile (*Crocodilus niloticus*, L.). J. B. Welman and E. B. Worthington (*Proc. Zool. Soc. Lond.*, 1943, **113**, **A**, 108—112).—The stomach contents of 22 West African and 13 East African specimens are described. H. L. H. G.

XIV.—LIVER AND BILE.

Clinical evaluation of tests of liver function. G. Higgins, J. R. P. O'Brien, A. Stewart, and L. J. Witts (*Brit. Med. J.*, 1944, I, 211—215).—Determinations of bilirubin, phosphatase, albumin, and globulin in plasma, and measurements of hippuric acid excretion and fructose tolerance, were made in normal subjects, in cases of liver disease, and in other patients. Plasma-bilirubin is a reliable prognostic guide in acute hepatitis, and of little val. in subacute and chronic forms. Plasma-phosphatase and hippuric acid tests may give supporting evidence, but are not reliable as individual tests. Fructose index is a good test for liver damage in subacute and chronic hepatitis, but not in the acute type. In cases of hepatitis with jaundice there is a close correlation between the duration of the jaundice, the changes in the albumin–globulin ratio, and the prognosis. Irreparable liver damage is present if jaundice persists for more than two months or the plasma-albumin falls below 2 g.-%. In these cases plasma-globulin is usually over 4 g.-%. The combination of these tests provides good prognostic and diagnostic information. I. C.

Relationship of adenosine polyphosphates to fatty acid oxidation in homogenised liver preparations. A. L. Lehninger (*J. Biol. Chem.*, 1944, **154**, 309—310).—The rate of oxidation of normal saturated fatty acids with 4—18 C atoms added to homogenates of rat's liver supplemented with cytochrome depends on the concn. of adenosine polyphosphate; optimum results were obtained at 0·0025M. Intermediate formation of acyl phosphates is suggested. G. D.

Influence of some sulphur-containing compounds on liver-lipin content of young white rats. E. Roberts and H. C. Eckstein (*J. Biol. Chem.*, 1944, **154**, 367—375).—No additional accumulation of fat in the livers of young male rats fed a basal diet which produces fatty livers follows intraperitoneal administration of 17—32 mg. of Na_2S during 3 weeks. Dimethyl sulphide, dimethyl disulphide, *S*-methyl*iso*thiourea, and methylxanthogenate all exert a lipotropic effect in these circumstances but neither intraperitoneal injection of methionine sulphone nor oral administration of trimethylsulphonium chloride causes a drop in liver-lipin content. H. G. R.

Effect of vitamin deficiency on œstradiol inactivation by liver. H. O. Singher, C. J. Kensler, H. C. Taylor, jun., C. P. Rhoads, and K. Unna (*J. Biol. Chem.*, 1944, **154**, 79—86).—Liver slices from rats deficient in riboflavin and thiamin lose their power to inactivate œstradiol in proportion to the change in the riboflavin and thiamin

content of the liver. Œstradiol inactivation is unaffected by a deficiency in pyridoxine, pantothenic acid, biotin, or vitamin-*A*.
H. G. R.

Excretion of œstrogen after injection of œstradiol and œstrone into men with liver cirrhosis.—See A., 1944, III, 593.

Isolation and properties of ribonucleic acid from liver. J. N. Davidson and C. Waymouth (*Proc. Biochem. Soc.*, 1944, **38**, xiii).—Minced sheep liver is dehydrated with alcohol, and nucleic acids are extracted with aq. 10% NaCl and pptd. with alcohol. Pentose-nucleic acid is purified through the Ba salt and pptd. with acetic acid. The product is free from protein and thymonucleic acid and resembles yeast-ribonucleic acid. P. G. M.

Nucleotide and polynucleotide content of liver. J. N. Davidson and C. Waymouth (*Proc. Biochem. Soc.*, 1944, **38**, xiii).—The concn. of acid-sol. nucleotide is the same in livers of fed and fasted animals, slightly lower in liver tumours produced by *p*-dimethylaminoazobenzene, and low in embryonic liver. The concn. of nucleic acid rises on fasting, is high in pregnancy and liver tumours, and very high in embryonic liver; 60—90% of the total is ribonucleic acid. The ratio of ribonucleic to deoxyribonucleic acid-P is higher in regenerating than in control liver, and low in embryonic and tumour-bearing livers. P. G. M.

Isolation of fructose 1-phosphate from biological material [liver]. J. Pany (*Z. physiol. Chem.*, 1942, **272**, 273—279).—The aldose phosphate portion of the hexose monophosphate isolated by Barrenscheen *et al.* (A., 1931, 391) by glycogenolysis of the liver contains a small proportion of glucose 1-phosphate, identified as the K salt. The ketose phosphate portion contains fructose 1-phosphate, which is thus identified for the first time in biological material.
H. W.

Magnitudes of " unit chains " of liver-glycogen of rabbits supplied with glucose, fructose, and sucrose.—See A., 1944, III, 606.

Influence of metal ions on glucose formation by the liver.—See A., 1944, III, 606.

Cytological study of storage and secretion in developing liver of mouse.—See A., 1944, III, 572.

Butyrate oxidation by liver enzymes.—See A., 1944, III, 612.

Hepatic dysfunction. I. Carbon tetrachloride poisoning treated with casein digest and methionine. J. Beattie, P. H. Herbert, C. Wechtel, and C. W. Steele (*Brit. Med. J.*, 1944, I, 209—211).—A case of acute CCl_4 poisoning was successfully treated with *dl*-methionine partly by infusion and partly by mouth. I. C.

Ætiology of post-arsphenamine jaundice. J. Beattie and J. Marshall (*Brit. Med. J.*, 1944, I, 547—550).—Infective hepatitis has an incubation period of about 28—30 days and is transmitted by contact. It can exist in a form in which icterus does not appear but able to confer immunity against reinfection. Late post-arsphenamine jaundice or homologous serum jaundice has an incubation period of 80—100 days and is transmitted by inoculation of infective material (blood, plasma, or serum). Attacks of either disease do not confer immunity against the other. I. C.

XV.—KIDNEY AND URINE.

Back-diffusion of urea in mammalian kidney. V. P. Dole (*Amer. J. Physiol.*, 1943, **139**, 504—513).—From physico-chemical considerations it is assumed for the human and dog's kidney that urea diffuses from the tubular urine into the blood in two phases, related to the proximal and distal water reabsorption; the distal tubular wall, as compared with ox erythrocytes, has a low permeability as shown by estimation of its permeability coeff. for urea. A. S.

Renal phosphatase. H. A. Wilmer (*Arch. Path.*, 1944, **37**, 227—237).—By histochemical demonstration of phosphatase in the renal tubules it was possible to correlate enzyme activity with tubular function. Following complete or partial obstruction of a ureter (rabbit, cat) the phosphatase in the corresponding kidney is reduced or disappears. Following temporary occlusion of the renal artery, ligation of the renal vein, or permanent partial constriction of the left renal artery with resultant unilateral renal ischæmia, phosphatase activity is only slightly reduced. Aglomerular toadfish kept in captivity have no alkaline phosphatase in their renal tubules; this is related to the inability of this fish to secrete sugar. Phosphatase is related to reabsorption of sugar by dephosphorylating hexose phosphates. (4 photomicrographs.) C. J. C. B.

Renal circulation in shock. H. D. Lauson, S. E. Bradley, A. Cournand, and V. V. Andrews (*J. clin. Invest.*, 1944, **23**, 381—401).—The rate of glomerular filtration and effective plasma flow are reduced in shock. The reduction is variable but roughly parallels the degree of shock. In most cases, the decrease is greater than can be accounted for solely on the basis of reduced arterial pressure, suggesting active vasoconstriction in the renal vessels. The relationship between the renal blood flow and general circulation has been expressed in terms of 2 calc. vals.: the " renal fraction," *i.e.*, the approx. fraction of the total cardiac output which flows through the kidneys, and the " effective renal vascular resistance," *i.e.*, the relation between systemic blood pressure and renal blood flow. The decrease in " renal fraction " usually observed shows that a smaller proportion of the cardiac output flows through the kidneys, and that blood is shunted away from the kidneys during shock. The increase in " renal resistance " indicates that renal vasoconstriction is the mechanism responsible for this redistribution of the circulation. Though the lowest clearances were associated with lowest blood-pH vals., the acidosis is not regarded as the primary cause of decreased renal circulation. On the contrary, renal ischæmia probably augments the acidosis resulting from widespread tissue anoxia. The clearances described give a reasonably accurate description of the state of the renal circulation in this condition. Urine flow is uniformly reduced and, in extreme cases, anuria occurs. The degree of oliguria reflects the reduction in rate of glomerular filtration, which in turn is related to the reduction in renal blood flow. Blood or plasma transfusion tends to increase the filtration fraction, suggesting efferent arteriolar constriction; the filtration rate increased with the rise in arterial pressure, but the renal blood flow remained low or fell to subnormal vals. after a temporary increase. In spite of the approx. return to normal of blood pressure and cardiac output, the renal circulation generally failed to improve proportionately during emergency transfusion treatment. After several weeks filtration rate and effective renal blood flow were normal in all cases. The urinary findings in shock (oliguria or anuria) and loss or impairment of concentrating power result from decreased circulation through the kidneys.
C. J. C. B.

Renal injury and lymphatic atrophy.—See A., 1944, III, 576.

Factors influencing micturition volume in rats. W. E. Leonard and C. McC. Brooks (*Amer. J. Physiol.*, 1943, **139**, 532—542).—The rise in micturition vol. in rats during pregnancy depends on the outcome of the pregnancy with abortion or early death of the litter. The rise begins early in pregnancy; in rats with living litter surviving until weaning the rise begins relatively late. The micturition vol. remains high or rises further following parturition; it decreases slightly during lactation but normal frequency and vol. of micturition is not restored until death of the young or weaning. Administration of α-œstradiol benzoate in the non-pregnant rat increases the micturition vol. as in pregnancy and following parturition. Progesterone was without effect on micturition vols. A. S.

Excretory urography as test of urinary tract function. E. P. Pendergrass (*Radiology*, 1943, **40**, 223—246).—A review.
E. M. J.

Antidiuretic action of yohimbine [action of pituitary gland].—See A., 1944, III, 591.

Fatal spontaneous potassium intoxication in patients with uræmia. J. F. Marchand and C. A. Finch (*Arch. intern. Med.*, 1944, **73**, 384—390).—The failure of the kidneys to excrete K raised K concn. in the serum to 9·8 and 10·1 m-equiv., in the pericardial fluid to 9 and 8·8 m-equiv., and in the c.s.f to 4·5 m-equiv. per l. at death. Serial e.c.g. showed characteristic changes including auricular arrest and progressive delay of conduction in the ventricles. The symptoms were those usual with uræmia. The cessation of respiration in each case was preceded by circulatory failure; the heart was arrested in diastole. C. J. C. B.

Chemistry of infectious diseases. VII. Excretion of certain urinary constituents during type I pneumococcal pneumonia in dogs. B. Vassel, R. Partridge, and M. L. Crossley (*Arch. Biochem.*, 1944, **4**, 59—74).—In type I lobar pneumonia in dogs there are increases in urinary N, creatine, inorg. SO_4'', and org. S. Creatinine, ethereal SO_4'', and S_2O_3'' excretion are unchanged. Sulphadiazine treatment of normal and infected dogs has no effect on the excretion of these substances. With bull-terriers, 2 out of 6 males excreted 10 times as much S_2O_3'' as the females. Urinary S_2O_3'' disappears during fasting and reappears 24 hr. after resumption of food. Sulphadiazine causes diuresis in normal dogs, but not during fasting.
E. R. S.

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

Origin of life. N. Rashevski (*Bull. Math. Biophysics*, 1943, **5**, 165—169).—A quant. formulation of the degree of " biological organisation " in terms of the degree of concn. of the " constituent material of the cell " makes possible an extension of the author's " new fundamental equation of mathematical biophysics " to the description of the formation of " a primitive cell " from " non-living material." The time required for the formation of " the primitive cell " is predicted to be several years or decades. This prediction is made by considering a system in which the " constituent material of the cell " is gradually conc. within the confining boundaries of the cell from an initial state of uniform distribution in the surrounding medium. The " material of the cell " is treated as a homogeneous system, and amongst other arbitrary assumptions, the free energy

of this system is taken as proportional to its degree of " biological organisation." The predictions made are in accord with the underlying assumptions, but do not necessarily bear any relation to the quant. description of the spontaneous generation of life. P. D. M.

Possible mechanism for biological periodicity. M. F. Morales (*Bull. Math. Biophysics*, 1944, **6**, 65—70).—Osmotic coupling between solutes leads, under certain conditions, to differential equations of penetration that have periodic solutions. The conditions are exemplified by permeating solutes having similar colligative properties and different concns. in the external media; these conditions are satisfied by isotopes and this is in agreement with observations on the uptake of radioactive K by *Nitella* (cf. Brooks, A., 1940, III, 329). F. O. H.

Mathematical biophysics of amœboid movements. R. Buchsbaum, N. Rashevsky, and H. E. Stanton (*Bull. Math. Biophysics*, 1944, **6**, 61—63).—Theoretical considerations indicate a possibility of some regularities occurring in the apparently random changes in amœboid shape and this expectation is borne out by observations of a quasi-periodicity in changes in the optical cross-sectional area of amœbæ. F. O. H.

Hygiene aspects of the El Alamein victory, 1942. H. S. Gear (*Brit. Med. J.*, 1944, I, 383—387).—An account of the hygienic organisation, sanitation, rations and feeding problems, water supplies, and means of combating typhus, infective hepatitis, desert sores, dysentery and diarrhœa, and heat and sun troubles, during the latter part of the North African campaign. I. C.

Recent advances in school health service. G. M. Wheatley (*J. Pediat.*, 1944, **24**, 470—481).—A crit. review. C. J. C. B.

Palindromic rheumatism. P. S. Hench and E. F. Rosenberg (*Arch. intern. Med.*, 1944, **73**, 293—321).—This is a new oft-recurring disease of joints (arthritis, periarthritis, para-arthritis) apparently producing no articular residues. 34 cases are reported. (9 photomicrographs.) C. J. C. B.

Biological significance of mammalian hair. J. L. Stoves (*Proc. Leeds Phil. Soc.*, 1943, *Sci. Sect.*, **4**, 84—86).—Various aspects of the anatomy and physiology of mammalian hair are discussed in relation to animal genetics and comparative studies of fibre morphology. Photomicrographs illustrate the characteristic features of transverse sections of animal fibres. Results of a histological examination of several types of pigmented fibre are included. I. C.

Structural viscosity and frothing of human saliva.—See A., 1944, III, 611.

Effect of softened water on fish. L. F. Miller (*Ecology*, 1944, **25**, 249—253).—Softening of water by CaO–soda, CaO, and zeolite renders it toxic to fish. Death of fish follows anoxæmia through respiratory and circulatory failure and interference with gill functions. The quantities of salt in the water are insufficient to cause these effects. The toxicity of softened water decreases rapidly and may disappear in 3 days. L. G. G. W.

Fluorocyanine, blue fluorescent pigment from *Cyprinida* scales. M. Polonovski, R. G. Busnel, and M. Pesson (*Compt. rend.*, 1943, **217**, 163—164).—Ultrafiltered 10% acetic acid extracts of carp scales contain riboflavin. By chromatography on frankonite a yellow and a colourless zone are obtained. Elution of the latter with aq. methanol–pyridine and evaporation of the extract yields *fluorocyanine hydrochloride* on treatment with HCl. Aq. solutions fluoresce blue under ultra-violet light. It is sol. in methyl alcohol and saturated solutions of phenol, but insol. in anhyd. org. solvents, and contains 15·3% N. It is adsorbed from acid solution by frankonite or animal charcoal, but not by floridin XS or fuller's earth, or by Al_2O_3 from alkaline solution. $Na_2S_2O_4$ reduces it to a *leuco*-compound. The absorption spectrum is continuous and the fluorescence spectrum shows a max. at 4316—4323 A. P. G. M.

Marine products. Sterols of starfish. 7-Dehydroclionasterol.—See A., 1944, II, 340, 341.

Fatty materials in diapausing codling moth larvæ (*Carpocapsa pomonella*, L.). E. Hastings and J. H. Pepper (*Arch. Biochem.*, 1944, **4**, 89—96).—Diapausing larvæ contain moisture (54%), crude fat (44% of dry wt.), and crude protein (40% of dry wt.). The ether-extracted fat had I val. (Wijs) 100·0, CNS val. 82·0, sap. val. 202·0, acid val. 8·1, ester val. 193·9, unsaponifiable matter 1·34%, linoleic acid glycerides 20·8%, oleic acid glycerides 74·3%, saturated acid glycerides 3·6%. These results are compared with those from the larvæ of the sugar-beet webworm (*Loxostege sticticalis*). E. R. S.

Secretion of salicylaldehyde by larvæ of the brassy willow beetle (*Phyllodecta vitellinæ*, L.). R. L. Wain (*Ann. Rept. Agric. Hort. Res. Sta., Long Ashton*, 1943, 108—110).—Salicylaldehyde is an important constituent of the secretion of the glands of *P. vitellinæ* living on *Salix purpurea*. A. G. P.

Effect of crowding on natality of grain-infesting insects. A. C. Crombie (*Proc. Zool. Soc. Lond.*, 1943, **113**, **A**, 77—98; cf. A., 1944, III, 261).—Experiments were carried out on *Tribolium confusum* and *Oryzaephilus surinamensis*. The decrease in the no. of eggs found per female per day with increase of density of population is accounted for partly by the increase of the rate at which the eggs are eaten, and partly by the effect of crowding on fecundity.. Egg-fertility is not affected by adult density or by conditioned media. The greater is the degree of conditioning of the media the lower is the fecundity. When the two species compete for the same environment of flour, *Oryzaephilus* suffers more severely than *Tribolium*; reasons are given for this. H. L. H. G.

Parotid gland and metamorphosis in *Bombyx mori*. J. J. Bounhiol (*Compt. rend.*, 1943, **217**, 237—238).—Experiments involving removal of the parotid gland from silkworms at the end of the nutrition period indicate that this gland is not indispensable to metamorphosis. P. G. M.

Isolation of trehalose from desert manna. J. Leibowitz (*Biochem. J.*, 1944, **38**, 205—206).—Manna from the North Iraq desert is probably the excretion of some scale insect. It gives only a slight ppt. with protein precipitants and shows $[\alpha]_D$ more than +100°. Differential hydrolysis establishes that the bulk of the substance consists of a non-reducing carbohydrate other than sucrose, which yields only aldose on ultimate hydrolysis. Determinations of $[\alpha]_D$ indicate that this carbohydrate is trehalose, which constitutes 7% of the raw material. A syrup (method of prep. unknown) contained 60% of trehalose. P. G. M.

Naturally occurring octadecenoic (oleic) acids.—See A., 1944, II, 318.

Chondroitin from cartilage.—See A., 1944, II, 327.

XVII.—TUMOURS.

Factors affecting carcinogenesis. II. Incorporation of 3 : 4-benzpyrene in media containing purified lecithin or kephalin. H. Weil-Malherbe and F. Dickens (*Cancer Res.*, 1944, **4**, 425—429; cf. A., 1943, III, 181).—Mice were given subcutaneous implantations or injections of a single dose of 0·3 mg. of 3 : 4-benzpyrene dissolved in (*a*) purified lecithin; (*b*) purified kephalin; (*c*) medicinal cod-liver oil; (*d*) tricaprylin. The incidence of local tumours was: lecithin group, 2 of 22 mice (9%); kephalin group, 2 of 19 (10·5%); cod-liver oil group, 7 of 19 (37%); tricaprylin group, 6 of 18 (33%). The latent period in the cod-liver oil group was 4 months and approx. 6 months for the others. The rate of elimination of benzpyrene in the 4 groups of mice decreased in the order: kephalin, lecithin, cod-liver oil, tricaprylin. F. L. W.

Antifibromatogenic effects produced by the intermittent action of progesterone. R. Iglesias, A. Lipschütz, and G. Nicto (*Cancer Res.*, 1944, **4**, 510—511).—Uterine and other abdominal fibroids induced in the female guinea-pig by the prolonged action of subcutaneously implanted tablets of œstradiol can be prevented by progesterone even when the antifibromatogenic steroid is allowed to act only intermittently. These findings support the view that the rhythmic secretion of progesterone by the ovary is a means of autodefence against the toxic and tumour-producing actions of œstrogens. F. L. W.

Inactivation of antifibromatogenic substances (progesterone and deoxycorticosterone acetate) in the liver. C. Dosne (*Cancer Res.*, 1944, **4**, 512—514).—The liver is capable of inactivating antifibromatogenic substances such as progesterone and deoxycorticosterone acetate, but this ability is subject to quant. limitations. F. L. W.

Multiple primary tumours in dogs. R. M. Mulligan (*Cancer Res.*, 1944, **4**, 505—509).—Cases of multiple canine tumours recorded in the literature are reviewed in order to determine the age, sex, and breed of dog, and types and sites of neoplasms. The various malignant and benign neoplasms in 46 cases are tabulated. F. L. W.

Spontaneous tumours of the adrenal cortex in a castrated male rat. J. Heiman (*Cancer Res.*, 1944, **4**, 430—432).—An adrenal cortical adenoma arose spontaneously in an old male rat 22 months of age which had been castrated at 18 months. The rat had proved resistant to implants of mammary fibroadenoma. F. L. W.

Incidence of spontaneous fibroadenoma in the Albany strain of rats. E. Burack, M. V. Danzi, J. M. Wolfe, and A. W. Wright (*Cancer Res.*, 1944, **4**, 410—416).—Tumour incidence in the Albany colony of rats and in a subline (147) increased from Jan., 1940, to Oct., 1943. Incidence in 1943 for line 147 was twice that of the whole colony in 1940. Incidence for the whole colony in 1943 was 60% of that of line 147. Incidence was higher for females that had never been pregnant than for breeders. F. L. W.

Inhibition of development of spontaneous leukæmia in mice by underfeeding. J. A. Saxton, M. C. Boon, and J. Furth (*Cancer Res.*, 1944, **4**, 401—409).—The incidence of spontaneous lymphoid leukæmia in a high-leukæmia strain of mice was 65% in 100 normally fed control mice. In 79 related mice fed limited amounts of an otherwise adequate diet the incidence was 10·1%. The life of these mice was considerably prolonged by underfeeding. Malignant lymphocytes were absent in the underfed mice at 9 and 12 months and

present at 14, 16, and 17 months. In normally fed mice malignant cells appeared at 7—13 months. F. L. W.

Effect of adrenalectomy on the susceptibility of rats to a transplantable leukæmia. E. Sturm and J. B. Murphy (*Cancer Res.*, 1944, **4**, 384—388).—Removal of the adrenals reduced the natural resistance of old rats and the induced resistance of young rats to a transplantable lymphatic leukæmia. Inoculation of intact, middle-aged animals of a special strain resulted in 43·5% mortality, while 89·7% of adrenalectomised rats of the same strain and age developed the disease. Young rats with induced resistance gave 33·9% takes. Animals in which the adrenals were removed after the resistance-inducing treatment became 90% susceptible; another group, adrenalectomised before immunising, showed 78·8% death from leukæmia. A strain of rats highly resistant to the transplanted leukæmia became 100% susceptible after adrenalectomy. In adrenalectomised animals regeneration of the retrogressed thymus in old animals and stimulation of this gland in young ones occurs. It is suggested that the greater receptivity of adrenalectomised rats to transplanted leukæmia is the result of action of the same stimulating factors on the malignant lymphoid cells. F. L. W.

Rôle of thymus, spleen, and gonads in development of leukæmia in a high-leukæmia stock of mice. D. P. McEndy, M. C. Boon, and J. Furth (*Cancer Res.*, 1944, **4**, 377—383).—Removal of the thymus from mice of high-leukæmic stock (*Ak*) at 31—71 days of age reduced the incidence of spontaneous leukæmia from 77% to 8% in females and from 61% to 11% in males. Leukæmia is more common in female than in male mice. The incidence was lowered from 74% to 45% by ovariectomy at 23—56 days. In males orchidectomised at 20—56 days the incidence was 60% as compared with 52% in controls. Splenectomy at 28—48 days was without effect. F. L. W.

Atypical cell proliferation in the anterior lobe adenomas of œstradiol-treated rats. H. Selye (*Cancer Res.*, 1944, **4**, 349—351).—The anterior lobe adenomas elicited in rats by long-continued œstradiol treatment may exhibit signs of atypical cell proliferation. Such adenomas contained polynuclear giant cells and an unusually large no. of mitotic figures. The cytoplasm of the giant cells was basophilic and frequently contained pigment granules or crystalloid inclusions. Metastases or other signs of malignancy were not observed. F. L. W.

Heterologous transplantation of human cancers. H. S. N. Greene and P. K. Lund (*Cancer Res.*, 1944, **4**, 352—363).—10 human cancers including a fibro-sarcoma of the chest wall, an adenocarcinoma of salivary gland tissue, a chondromyxosarcoma of the larynx, a malignant melanoma, an epidermoid carcinoma of buccal mucosa, an adenoacanthoma of the urethra, a mammary fibrosarcoma, an undifferentiated carcinoma of the lung, an epidermoid carcinoma of the lung, and a chordoma were successfully transferred to the anterior chambers of the eyes of guinea-pigs. The transplants grew progressively and bore close histological resemblance to the original tumours. F. L. W.

Immunity reactions obtained with a transmissible fowl tumour (Olson). B. R. Burmester and C. O. Prickett (*Cancer Res.*, 1944, **4**, 364—366).—The transmissible fowl tumour (Olson) implanted into 312 chickens produced a high incidence of local tumours which, on regression, rendered the birds immune to subsequent implantation of the same tumour. The immunity appears in all birds surviving an active growth of the tumour; it cannot be overwhelmed by large or repeated doses of the same agent; it is present over a prolonged period. F. L. W.

Retarding effect of glyceraldehyde on benzpyrene sarcoma formation in mice. J. F. Riley and F. Pettigrew (*Cancer Res.*, 1944, **4**, 502—504).—0·5 ml. of 0·1M-glyceraldehyde, injected subcutaneously into mice twice weekly for the 16 weeks during which tumours from a previous injection of 0·7 mg. of benzpyrene were to be expected, delayed the appearance of tumours and slightly reduced the incidence. F. L. W.

Action of heptanal sodium bisulphite methyl salicylate and of 2 : 4 : 6-trimethylpyridine on tissue cultures of human and mouse carcinoma and rat lymphosarcoma. G. Cameron, C. J. Kensler, and R. Chambers (*Cancer Res.*, 1944, **4**, 495—501).—Human mammary carcinoma cultures exposed for 24 hr. to a concn. of 0·002M-heptanal sodium bisulphite methyl salicylate, followed by return to normal medium, underwent a slow, progressive, and complete disintegration of the epithelium in 4—5 days. Epithelium of normal human mammary gland cultures and fibrocytes and lymphocytes in cultures of normal or malignant tissues were not affected by prolonged exposure to concns. up to 0·007M. Mouse mammary carcinoma cultures showed similar effects. The action on rat lymphosarcoma was highly selective and rapid. 0·001M. in 24 hr. induced complete destruction of lymphoid cells only, while all cell types in cultures of normal rat lymph nodes survived 48 hr. at concn. 0·0075M. and, usually, 0·01M. 2 : 4 : 6-Trimethylpyridine in concn. sufficient to destroy epithelium in cultures of human mammary carcinoma also exerted toxic action on cultures of normal mammary gland. Outgrowing sheets of the former culture were more sensitive (destroyed by 0·025M.) than those of the latter. Epithelium of outgrowing sheets of mouse mammary carcinoma was destroyed at concn. of 0·05M., which did not affect normal mammary epithelium. Macrophages of the malignant cultures were also destroyed. F. L. W.

Oxidative response of normal and neoplastic tissues to succinate and to *p*-phenylenediamine. O. Rosenthal and D. L. Drabkin (*Cancer Res.*, 1944, **4**, 487—494).—Oxidative responses to addition of 0·05M-succinate or -*p*-phenylenediamine were measured in normal tissues (rat, rabbit, man) and in neoplasms (rat and man). Objective evaluation of " maximal " O_2 consumption rates was achieved by use of the crit. rate of O_2 consumption as a criterion. Normal epithelial tissues fall into two main groups: (*a*) tissues with high oxidative response to the two test substrates (kidney cortex, liver, brain cortex, muscle); (*b*) tissues with low responses (gastrointestinal mucosa, lung, skin, mammary gland, lymphatic tissue). Benign and malignant rat tumours and human cancers resemble tissues of group (*b*) and changes of oxidative behaviour incidental to a malignant transformation can be expected to occur only in tissues of type (*a*). F. L. W.

Fluorescence studies on cancer. I. Porphyrin metabolism, Harderian gland fluorescence, and susceptibility to carcinogenic agents. F. H. J. Figge. **II. Red fluorescence of the genitalia of women.** E. G. Jones, F. H. J. Figge, and J. M. Hundley. **III. Extraction and identification of porphyrins from the red-fluorescent exudates on the genitalia of women.** F. H. J. Figge, E. G. Jones, and G. F. Wolfe (*Cancer Res.*, 1944, **4**, 465—471, 472—482, 483—486).—I. Examination of many birds, reptiles, and mammals showed that the red-fluorescent Harderian glands were present only in mice, rats, and hamsters. These 3 species are the most susceptible to induction of tumours by carcinogens. A relationship between excess porphyrins (or a unique porphyrin metabolism) and susceptibility to carcinogens is postulated. Protoporphyrin 9 and coproporphyrin I are the sp. porphyrins excreted by the Harderian glands. Porphyrins injected intraperitoneally concentrate in the skin and subcutaneous tissues and Harderian glands. Porphyrins excreted by the Harderian glands are smeared on the areas where tumours develop on irradiation of the animals with ultra-violet light.

II. The genitalia of 121 women were examined for fluorescence in near ultra-violet light. The clitoris was red-fluorescent in 40 cases, labia minora and majora in 16 and 13 cases respectively. Red-fluorescent secretion or exudates were observed in the vagina in 12 and on the uterine cervix in 11 women. When red-fluorescent material was seen on the vulva it was most conc. on and near the clitoris. Similar material was observed near the corona of the glans penis in uncircumcised males. The genitalia of some women are intermittently red-fluorescent, most often during the menstrual or postmenstrual phase. The occurrence of red-fluorescence was not related to any organic disease. Most of the red-fluorescent material was thought to arise from decomp. of blood exuded from the uterus.

III. The red-fluorescent material observed on the genitalia of women was collected and identified. Most of the porphyrin from the cervix was a mixture of mesoporphyrin, deuteroporphyrin 9, and coproporphyrin (probably type III); only 5% was protoporphyrin 9. Porphyrin in the lochia was mainly coproporphyrin (probably type III). Only small amounts of meso- and deuteroporphyrin were present in lochia; about half of the lochia porphyrin was protoporphyrin 9. F. L. W.

Tumours of the testis. I. Water and electrolyte content of testicular tumours and of normal, cryptorchid, and œstrogenised testis. C. Huggins and L. Eichelberger (*Cancer Res.*, 1944, **4**, 447—452).—Typical patterns of the content of water, fat, and electrolytes are described for normal dog testis and for various physiological types of atrophy of the germinal epithelium. While definite changes occur in neutral fat, water, solids, and N, quant. generalisations concerning electrolytes cannot be made for the testicular cancer of dogs because of the wide deviations. F. L. W.

Non-hæm iron content of the tissues of mice of high-cancer and low-cancer strains. F. L. Warren and F. Goulden (*Cancer Res.*, 1944, **4**, 417—420).—Estimations of non-hæm Fe in the kidneys of mice of two high-mammary-cancer strains (*R*III and *C3H*) and one low-mammary-cancer strain (*CBA*) were made in an effort to detect differences in physiological age at the same chronological ages. No such differences were found. Female *CBA* mice showed a considerable increase in non-hæm Fe between 300 and 400 days. With this exception no great differences were found between young and old mice of either sex in any strain. The great increase in non-hæm Fe in the tissues of old rats in confirmed: the non-hæm Fe content of the kidneys of old female rats is higher than that of old male rats. F. L. W.

Hæmoglobin content of blood of mice of the *R*III and *CBA* strains. F. Goulden and F. L. Warren (*Cancer Res.*, 1944, **4**, 421—424).—In *CBA* (low-mammary-cancer) and *R*III (high-mammary-cancer) mice the concn. of blood pigment is higher in female mice than in male mice at all ages. Female mice of the *R*III strain show a rapid fall of blood-hæmoglobin between the ages of 360 and 430 days.

This fall is approx. 10% of the blood pigment initially present and occurs at the age at which spontaneous mammary carcinoma normally begins to appear in female mice of this strain. F. L. W.

Cancer. X. Oxidative capacity of tumours. N. Mayer (*Cancer Res.*, 1944, **4**, 345—348).—Tumour homogenates show little or no response to *p*-phenylenediamine or to succinate in a comparison of cytochrome oxidase and succinoxidase systems whereas normal tissue homogenates show considerable response to both substrates. Homogenates and slices behave in the same way. F. L. W.

Factors that alter fluorescence of certain carcinogens.—See A., 1944, I, 237.

Action of chemical carcinogenic agents on yeasts. Arsenic.—See A., 1944, III, 692.

Effect of aromatic compounds on ascorbic acid content of liver in mice.—See A., 1944, III, 658.

Bilateral blindness due to lesions in both occipital lobes.—See A., 1944, III, 647.

XVIII.—ANIMAL NUTRITION.

Comparison of diets of school children in New York City in 1917 and 1942. C. J. Evans and R. Lubschez (*J. Pediat.*, 1944, **24**, 518—523).—There was an improvement in the diet during the period due to increased consumption of milk, citrus fruits, and vegetables. The consumption of protective foods, particularly foods containing vitamin-*C*, is probably inadequate. C. J. C. B.

Nutrition of boys aged 14—15 years. R. P. Cook, W. A. Davidson, D. M. Keay, and D. G. McIntosh (*Proc. Biochem. Soc.*, 1944, **38**, xiii—xiv).—The mean daily calorific intake was 2228. Determinations were made of protein intake, urinary N, vitamin-*A* and carotene intake (mean, 2920 i.u.), plasma-vitamin-*A* (93·7 i.u. per 100 c.c.), plasma-ascorbic acid (0·14 mg.-%), blood-hæmoglobin, Ca intake (0·83 g. per day), vitamin-B_1 intake (588 i.u. per day), etc. General health was good, but incidence of gingivitis (29%) and folliculosis (29%) may be due to dietary deficiencies. P. G. M.

Use of synthetic diet for food allergy and typhoid. W. H. Olmsted, C. G. Harford, and S. F. Hampton (*Arch. intern. Med.*, 1944, **73**, 341—348).—A purified diet composed of amino-acids, glucose, and emulsified oil to which is added a salt mixture and cryst. vitamins is suggested for patients with food allergy or severe infections of the intestinal tract, and for determining vitamin requirements. C. J. C. B.

Use of strained meats as protein basis for milk substitutes in treatment of milk allergy [in infants]. J. Glaser (*N.Y. Sta. J. Med.*, 1943, **43**, 2399—2401). E. M. J.

Protein nutritional value of soya-bean, peanut, and cottonseed flours and their value as supplements to wheat flour. D. B. Jones and J. P. Divine (*J. Nutrition*, 1944, **28**, 41—49).—The growth-promoting vals. of the proteins of soya-bean, peanut, and cottonseed flours are approx. 4—4½ that of wheat flour when fed at the same protein level and are well adapted to enhance the nutritive val. of the proteins of wheat flour. The addition of 5% of these substances to wheat flour increases the protein by 16—19% and they are superior in growth-promoting power to the same quantity of wheat flour protein. H. G. R.

Effect of dietary protein on liver cytoplasm. H. W. Kosterlitz (*Proc. Biochem. Soc.*, 1944, **38**, xiv—xv).—The livers of 4-month-old female rats on a protein-free but otherwise adequate diet for 1 week lost 25% of protein and phospholipin and 13% of nucleic acid. A smaller loss occurred when the diet contained 18·5% of zein or 18% of gelatin, but the vals. closely resembled those of controls when zein was supplemented by 2% of tryptophan and 5% of lysine dihydrochloride. On an 85% casein diet, the vals. were 122, 105, and 118% of the normal, respectively. Storage of protein does not seem to occur in rat liver, 20—25% of cytoplasmic contents being lost by fasting or protein-deficient diets, with a possible resulting decrease in metabolic activity. P. G. M.

Effect of nature and level of protein and amino-acid intake on accumulation of fat in liver. J. M. R. Beveridge, C. C. Lucas, and M. K. O'Grady (*J. Biol. Chem.*, 1944, **154**, 9—19).—The lipotropic effect of methionine is the same whether administered as such or in equiv. amount as casein, provided that the basal diet contains amounts of essential amino-acids adequate for max. growth. P. G. M.

Synthesis of β-alanine in rats. [Assay of β-alanine.] J. R. Schenck and V. du Vigneaud (*J. Biol. Chem.*, 1944, **153**, 501—505; cf. C., 1944, Part 4).—Growing rats on a diet low in pantothenic acid synthesise β-alanine, which is deposited in their tissues although the level in their livers varies with that in the diet. R. L. E.

Effect of choline and cystine on serum-phosphatase and hepatic dye clearance of dogs maintained on deficient diets. V. H. Hough, E. P. Monahan, T. W. Li, and S. Freeman (*Amer. J. Physiol.*, 1943, **139**, 642—651).—Daily ingestion of 0·5 g. of choline chloride for 6—8 weeks prevents the decrease in the Rose Bengal dye clearance and the elevation of serum-phosphatase caused by a protein-deficient diet during the early weeks of protein deficiency; the dye clearance and serum-phosphatase changes caused by protein deficiency are increased by the daily ingestion of 1 g. of cystine. Choline-deficient puppies maintained on a methionine-low diet rapidly develop a marked increase in serum-phosphatase and a decrease in dye clearance. Oral choline administration will prevent or reverse these changes. A. S.

Choline and prevention of hæmorrhagic kidneys in rats. II. Phospholipin turnover determined with radioactive phosphorus. J. M. Patterson, N. B. Keevil, and E. W. McHenry (*J. Biol. Chem.*, 1944, **153**, 489—493; cf. A., 1942, III, 906).—Dietary choline deficiency decreases phospholipin turnover in rats. The turnover and therefore the choline requirement are greatest in rats 10 days old, the age at which kidney injury due to choline deficiency is most severe. These kidney injuries are probably due to lack of phospholipin. R. L. E.

Relation of the diet to the composition of tissue-phospholipins. IV. Action of choline and choline precursors in weanling rats. V. Action of choline, vitamins, amino-acids, and their combinations in two-month-old rats. W. H. Fishman and C. Artom (*J. Biol. Chem.*, 1944, **154**, 109—115, 117—127).—IV. Weanling rats on low- or high-fat experimental diets exhibit low vals. for liver-lecithins and fatty infiltration of the liver occurs. When the diet is supplemented with choline the concn. of lecithins increases, the total phospholipins exhibit a lower level of non-choline phospholipins and an increase in the choline-containing phospholipins, and the amount of neutral fat is decreased. These effects cannot be produced by ethanolamine, *dl*-methionine, *dl*-serine, or glycine, though ethanolamine, alone or with methionine, is effective to some extent.

V. The changes in the liver-phospholipins of 2—3-month-old rats induced by the experimental diet cannot be reversed by supplementation after 7 days with choline either alone or in combination with vitamin-*B*, -*E*, or -*K*, amino-acids, or other N compounds. When choline supplementation was initiated immediately the val. for the liver-lecithins is higher than the controls but less than normal and is accompanied by a decrease in the non-choline phospholipins. H. G. R.

Growth-promoting value of butter fat. R. K. Boutwell, R. P. Geyer, C. A. Elvehjem, and E. B. Hart (*J. Dairy Sci.*, 1943, **26**, 429—437).—Butter fat was superior to maize oil as the sole fat in a diet in which the only carbohydrate was lactose. With glucose, sucrose, dextrin, or starch as the only carbohydrate, maize oil was slightly superior. The effect is possibly due to the suppression by lactose of intestinal flora normally supplying valuable fatty acids. N. J. B.

Intravenous administration of fat for nutritional purposes. L. J. Dunham and A. Brunschwig (*Arch. Surg., Chicago*, 1944, **48**, 395—405).—Dogs fed on a commercial dog food containing only 4—6% of fat showed an increase in the I val. and a decrease in the sap. val. of the omental fat. Dogs on the same diet and receiving intravenous infusions of olive oil and lard oil emulsified under high pressure did not show sufficient differences in these vals. to indicate physiological storage of the infused fat. Changes in m.p. of the depot fats in some animals did suggest some storage. Protein-sparing effects were demonstrated after oral administration of these fats but not by intravenous administration. The infusions of fat caused severe secondary anæmia and were probably responsible for the deaths of 9 of 24 dogs. (5 photomicrographs.) F. S.

Comparison of acetic acid fed in the form of triacetin with glucose as a nutrient in feeds. T. B. McManus, C. B. Bender, and O. F. Garrett (*J. Dairy Sci.*, 1943, **26**, 13—23).—Rats were used to compare two diets, of which one contained 15% of glucose and the other the calorific equiv. of triacetin. Growth, metabolic rate, urinary volatile acids, and energy obtained were the same for each group, so that the diets were equiv. N. J. B.

Efficiency of utilisation of phosphorus by the albino rat. L. F. Marcy (*J. Nutrition*, 1944, **28**, 17—25).—Na_2HPO_4-P, crude soya-bean lecithin-P, and phytin-P were utilised to the extent of 63·9 and 45·0, 69·2, 49·2 and 42·5% respectively (the second vals. being obtained in a more prolonged experiment). The corresponding Ca utilisations were 41·9, 67·0, 32·0, 16·1, and 51·5%. The low utilisation of Na_2HPO_4-P in the prolonged experiment was due to a low level of Ca in the diet making this the limiting factor. The lower absorption of P in the phytin-fed rats is accompanied by a higher excretion in the fæces. The average pH of the intestinal contents is 6·60 but is higher for the phytin- and lower for the Na_2HPO_4-fed rats. A phytate-splitting enzyme is found in extracts of the intestinal wall of the Na_2HPO_4- and phytin-fed rats but utilisation of phytin-P was not correlated with the activity of the enzyme though the pH of the intestine may influence the latter. H. G. R.

Efficacy of cobaltised salt for prevention of cobalt deficiency symptoms in sheep. J. E. Bowstead, J. P. Sackville, and R. D. Sinclair (*Sci. Agric.*, 1942, **22**, 479—481).—Use of a cobaltised salt lick

(4 oz. of Co per ton of rock salt) proved as effective as administration of $CoCl_2$ (8 mg. of Co weekly). A. G. P.

Vitamins.

Chemical definition and new classification of vitamins. M. Noriega del Aguila (*Bol. Soc. Quím. Peru*, 1944, **10**, 100—115).—Vitamins are classified into 13 groups according to their chemical properties. F. R. G.

Vitamin-*A*, -*B*, and -*C* in diabetic children. H. O. Mosenthal and W. C. Loughlin (*Arch. intern. Med.*, 1944, **73**, 391—396).—Hypercarotenæmia was observed in 28% of 114 diabetic children; 68% of the diabetic children showed a sub-normal plasma-vitamin-*A* level, none showed an increase. It is suggested that excess of blood-fat held the carotene in solution and prevented its being available for conversion into -*A* by the liver. 20—25% showed -*B* deficiency often with hepatomegaly. There were no cases of clinical scurvy but 5 patients had a plasma-*C* level below 0·4 mg.-%. C. J. C. B.

Vitamins and eye, ear, nose, and throat.—See A., 1944, III, 582.

Influence of vitamin deficiency and sapotoxin on leprosy of rat.—See A., 1944, III, 617.

Effects of micro-nutrient deficiencies on growth and vitamin content of tomato.—See A., 1944, III, 623.

Production of vitamins in germinated peas, soya beans, and other beans. C. E. French, G. H. Berryman, J. T. Goorley, H. A. Harper, D. M. Harkness, and E. J. Thacker (*J. Nutrition*, 1944, **28**, 63—70).—Sprouting is accompanied by a marked increase in ascorbic acid, a fair increase in riboflavin and nicotinic acid, and none in thiamin, especially in various varieties of peas; soya beans are less effective but superior to other types of beans. Germination and production of vitamins proceed at a higher rate as the temp. is increased. H. G. R.

Testing of colour vision in relation to vitamin-*A* administration.—See A., 1944, III, 586.

Biological value of carotene from various sources, and effect of vitamin-*E* on utilisation of carotene and of vitamin-*A*. K. Guggenheim (*Biochem. J.*, 1944, **38**, 260—264).—The carotene content of various materials was assayed both chemically and biologically (for method see C., 1944, Part 4) and the biological val. (=biological potency expressed as % of the chemically determined content) evaluated. Beef liver and lettuce gave vals. of 100%, but other vegetables gave 33—67%. This poor utilisation is not caused by a large proportion of carotenoid pigments other than β-carotene, nor by high fæcal excretion of carotene. Utilisation appears to be correlated with content of vitamin-*E*, which may act by protecting carotene against oxidation in the intestine. The human -*A* requirement may thus be related to the -*E* content of the diet. E. C. W.

Skin temperatures of extremities of persons with induced deficiencies of thiamin, riboflavin, and other components of the vitamin-*B* complex. G. M. Roth, R. D. Williams, and C. Sheard (*J. clin. Invest.*, 1944, **23**, 373—379).—Under controlled environmental, postural, and metabolic conditions, none of 8 subjects of induced thiamin, riboflavin, or vitamin-*B* complex deficiency showed any vasomotor disturbance as evidenced by measurements of skin temp. and determination of rates of cooling and warming of body tissue. C. J. C. B.

Assay of purified proteins, enzymes, etc. for "*B* vitamins." R. J. Williams, F. Schlenk, and M. A. Eppright (*J. Amer. Chem. Soc.*, 1944, **66**, 896—898).—24 materials are assayed biologically for aneurin, niacin, pantothenic acid, pyridoxine, biotin, inositol, *p*-aminobenzoic acid, and folic acid. Contents are low with the following exceptions: inositol in pancreatic amylase 4100, nucleoprotein 330, alkaline phosphatase 278, chymotrypsin 270, and renin 158 μg. per g.; aneurin in carboxylase 530—940, nucleoprotein 22, and cytochrome reductase 19·3 μg. per g.; niacin in carboxylase 131—145, cytochrome reductase 84, tyrosinase 24, renin 20, and pancreatic amylase 19·7 μg. per g.; pantothenic acid in renin 18, pyridoxine in cytochrome reductase 2·8, biotin in cytochrome reductase 1·4, *p*-aminobenzoic acid in ribonuclease approx. 1·4, and lactogenic hormone approx. 1·5, and folic acid in pancreatic amylase 13 and renin 11 μg. per g. Inositol may be a constituent part of pancreatic amylase. Vitamin-*B* content may be a criterion of animate matter, in which case viruses are inanimate. R. S. C.

Vitamin-*B* content of groats and rolled oats.—See B., 1944, III, 207.

Retention of *B*-vitamins in raw and well-done beef. Retention of vitamins in pork hams during curing.—See B., 1944, III, 210.

Thiamin metabolism, the rôle of liver and kidneys. R. H. Williams, G. W. Bissell, and J. B. Peters (*Arch. intern. Med.*, 1944, **73**, 203—211).— Thiamin hydrochloride given to normal subjects by mouth was absorbed and converted into diphosphothiamin within a few min. 15 mg. of thiamin hydrochloride given intravenously to normal subjects immediately increased blood-diphosphothiamin; blood-thiamin was normal within 6 min. and the total blood-diphosphothiamin never represented more than about 5% of the injected dose. In patients with severe hepatic cirrhosis, phosphorylation of the thiamin was impaired, but not in patients with nephritis. 15 mg. of cocarboxylase injected intravenously into normal subjects immediately increased plasma- and red cell-diphosphothiamin and -free thiamin. The thiamin level rapidly returned to normal, but the diphosphothiamin remained elevated for more than 1 hr. In patients with advanced cirrhosis there was also an immediate increase in blood free thiamin, but there was less rise in -diphosphothiamin. In patients with severe nephritis, the changes were intermediate between those of the normal and of the cirrhotic groups. Mercurophylline caused the excretion of much thiamin. This effect was not due alone to an increased elimination of water, because, in some instances, the urinary thiamin concn. was many times that found in normal urine. C. J. C. B.

Inter-relationship between thiamin and riboflavin in the liver. H. O. Singher, C. J. Kensler, H. Levy, E. Poore, C. P. Rhoads, and K. Unna (*J. Biol. Chem.*, 1944, **154**, 69—77).—The concn. of thiamin in the liver of young rats is increased in riboflavin deficiency and that of riboflavin increased in thiamin deficiency. A deficiency of pyridoxine, pantothenic acid, biotin, or vitamin-*A* has no effect on the concn. of thiamin or riboflavin in the liver. H. G. R.

Utilisation of thiamin in the human subject: effect of high intake of carbohydrate or of fat. J. G. Reinhold, J. T. L. Nicholson, and K. O'S. Elsom [with C. Chornock] (*J. Nutrition*, 1944, **28**, 51—62).—A decrease in the urinary excretion of thiamin is observed on increasing the carbohydrate : fat ratio in the diet in females but there is no significant change in the fæcal excretion. No evidence is obtained of a thiamin-sparing action of fat. H. G. R.

Relation of thiamin to blood regeneration. A. R. Maass, L. Michaud, H. Spector, C. A. Elvehjem, and E. B. Hart (*Arch. Biochem.*, 1944, **4**, 105—110).—Food consumption by thiamin-deficient dogs is spasmodic. Less than 10 μg. of thiamin per kg. of body wt. per day is inadequate for maintenance of body wt. of adult dogs. Growth increases on 10 μg. for growing dogs are not comparable with those for littermates on higher thiamin levels. Adult dogs on a thiamin-restricted diet and growing dogs receiving 10 μg. per kg. per day show no sign of anæmia. There is a slight anæmia in thiamin-deficient dogs after phlebotomy, due to inanition associated with the deficiency. There is no disturbance of the hæmatopoietic function of either growing or adult dogs under the strain of phlebotomy and anæmia on a restricted thiamin intake. E. R. S.

Effect of vitamin-B_1 on histidine excretion in urine. J. Dawson (*Proc. Biochem. Soc.*, 1944, **38**, xv—xvi).—Normal histidine excretion is 0—15 mg. per 100 c.c. of urine. Normal pregnancy progressively increases, and pre-eclamptic toxæmia reduces, histidine excretion. In all cases administration of vitamin-B_1 reduces the excretion, and a daily dosage of 140 mg. completely abolishes it. Normal excretion returns on cessation of administration of -B_1. P. G. M.

Development and nature of resistance to pyrithiamin in yeast.—See A., 1944, III, 614.

Effect of vitamin-B_1 on utilisation of glucose by *Melanospora destruens*, Shear.—See A., 1944, III, 614.

Vitamin-B_1 and -B_2 activity of fluorocyanine. R. G. Busnel, P. Chauchard, H. Mazoué, M. Pesson, and M. Polonovski (*Compt. rend.*, 1943, **217**, 185—186).—The growth of rats maintained on a vitamin-B_2-deficient diet is accelerated by daily doses of 50 μg. of fluorocyanine. The nervous symptoms that occur in rats on a -B_1-deficient diet are abolished by administration of fluorocyanine, and the animals increase in wt. from approx. 69 g. to 106—108 g. in a fortnight with a daily dose of 10 μg. (Cf. A., 1944, III, 745.) P. G. M.

Production of riboflavin deficiency with phenazine analogues of riboflavin. D. W. Woolley (*J. Biol. Chem.*, 1944, **154**, 31—37; cf. A., 1944, II, Dec.).—2 : 4-Diamino-7 : 8-dimethyl-10-ribityl-5 : 10-dihydrophenazine and, to a smaller extent, the corresponding dinitro-compound produce riboflavin deficiency in bacteria and mice, respectively. Adequate supplements of riboflavin abolish the deficiency symptoms. P. G. M.

Photochemical destruction of vitamin-B_2 in milk. J. A. Ziegler (*J. Amer. Chem. Soc.*, 1944, **66**, 1039—1040).—Decomp. of riboflavin in milk by sunlight (cf. Peterson *et al.*, A., 1944, III, 673) is confirmed (26—39% in 1 hr., 54—68% in 2 hr.). R. S. C.

Ocular rosacea in ariboflavinosis.—See A., 1944, III, 584.

Effect of excessive nicotinamide feeding on rabbits and guinea-pigs. P. Handler (*J. Biol. Chem.*, 1944, **154**, 203—206).—The ingestion of large quantities of nicotinamide by rabbits and guinea-pigs did not impair their growth, and there was no increase in the amount of *N'*-methylnicotinamide excreted, in contrast to rats. J. F. M.

Acute nicotinic acid deficiency. B. Gottlieb (*Brit. Med. J.*, 1944, I, 392—393).—5 cases of nicotinic acid deficiency are reported and the clinical picture, diagnosis, and treatment discussed. I. C.

Urinary elimination of nicotinamide methochloride by man. P. Ellinger and R. A. Coulson (*Biochem. J.*, 1944, **38**, 265—270).—The daily elimination of nicotinamide methochloride is 2—8 mg. Ingestion of nicotinamide or its derivatives increases the elimination, but storage of, and eventual saturation with, nicotinamide may occur. The shape of the elimination curve plotted hourly is fairly const. for different individuals and conditions; its height depends on the nicotinamide intake and on the efficiency of methylation in the body. The amount of nicotinamide in the diet was not enough to account for all that was excreted as methochloride. E. C. W.

Tetra- and hexa-hydronicotinic acid as growth-promoting factors for *Staphylococcus aureus* and *Bacillus proteus vulgaris*.—See A., 1944, III, 615.

Vitamin activities of pyridoxal and pyridoxamine. E. E. Snell (*J. Biol. Chem.*, 1944, **154**, 313—314).—Pyridoxal and pyridoxamine (cf. A., 1944, II, 347) are probably responsible for the "pseudopyridoxine" activity of natural materials in the growth of lactic acid bacteria (A., 1942, III, 648) and it is suggested that transformation into pyridoxal, pyridoxamine, or substances derived from them is required for fulfilment of the catalytic function of pyridoxine. G. D.

Oral administration of pyridoxine hydrochloride in treatment of nausea and vomiting of pregnancy.—See A., 1944, III, 593.

Microbiological differentiation of pyridoxine and pseudopyridoxine.—See A., 1944, III, 615.

"Folic acid," a tumour growth inhibitor.—See A., 1944, III, 598.

Evidence of the synthesis of vitamin-*C* by dairy cows. G. C. Wallis (*J. Dairy Sci.*, 1943, **26**, 401—408).—Cows kept for 3—4 years on a ration such that the daily losses of vitamin-*C* by each cow exceeded the intake by 279—1360 mg. (increasing with increasing secretion in the milk) showed concns. of -*C* in plasma and milk not less than those for animals on normal diets. The losses were greatest in the fæces, smaller in the milk, and very small in the urine. It is suggested that synthesis may take place in the alimentary canal. N. J. B.

Failure of ascorbic acid to augment equine gonadotrophin in rat.—See A., 1944, III, 594.

Effect of adrenotropic hormone on ascorbic acid and cholesterol content of adrenal.—See A., 1944, III, 591.

Reduced and total vitamin-*C* in milk.—See B., 1944, III, 209.

Effect of mastication on ascorbic acid content of raw vegetables. G. N. Jenkins (*Proc. Biochem. Soc.*, 1944, **38**, xvii).—A similar apparent loss of ascorbic acid occurs on mastication of both raw and cooked vegetables. The phenomenon is therefore not due to ascorbic acid oxidase. NO_2' is the only salivary constituent shown to oxidise ascorbic acid to dehydroascorbic acid, and then only in acid media, not at the normal pH of the mouth. Mastication does not alter the antiscorbutic val. of either raw or cooked vegetables. P. G. M.

Factors affecting ascorbic acid content of cabbage lines. Destruction of ascorbic acid during the cooking of green vegetables. Ascorbic acid content of some fruit syrups and other products.—See B., 1944, III, 211, 212.

Influence of ascorbic acid on cultures of *Spirochæta gallinarum*.—See A., 1944, III, 614.

Oxidative decomposition of hexose diphosphate by barley. Rôle of ascorbic acid.—See A., 1944, III, 624.

Autoxidation of as corbic acidin presence of copper, etc.—See A., 1944, I, 253.

Production of hypercalcæmia with small amounts of vitamin-*D*. J. H. Jones (*J. Nutrition*, 1944, **28**, 7—16).—Inclusion of 1 i.u. per g. of vitamin-*D* in the form of irradiated ergosterol or 7-dehydrocholesterol, or calciferol in a diet very low in P and high in Ca produces marked hypercalcæmia in rats but dihydrotachysterol is much less effective. The degree of hypercalcæmia is dependent on the Ca in the diet and the inhibition of growth observed in marked hypercalcæmia is directly related to the degree of the latter. Calcification is greater where there is a definite increase in serum-Ca. H. G. R.

Effect of α-tocopherol and β-carotene in oxidation of plant and animal fats. C. R. Thompson and H. Steenbock (*Arch. Biochem.*, 1944, **4**, 15—23).—Small additions of α-tocopherol had no effect on the induction period of cottonseed and soya-bean oils, lard, and oleo oil. After removing antioxidants from the fats by chromatographing, the antioxidant effect of α-tocopherol is easily shown. These results were obtained by measurement of O_2 absorbed at 37° and confirm those obtained by peroxide titration after aëration at 60—75° (cf. Swift *et al.*, B., 1943, II, 84). β-Carotene is a pro-oxidant, shortening the induction period of chromatographed animal and plant fats and accelerating the rate of oxidation; the effect is greater with plant than with animal fats. The effect is greater with ethyl linoleate than with ethyl oleate, corresponding with relative degree of unsaturation of the ester. E. R. S.

Vitamin-*K* group. Mechanism of action of vitamin-*K* and of its synthetic analogues. M. M. Schemjakin, L. A. Schtschuikina, and J. B. Schvetzov (*J. Gen. Chem. Russ.*, 1943, **13**, 398—402).—*o*-Phthalic acid has an antihæmorrhagic effect and hence derivatives of 1 : 4-naphthaquinone that could conceivably undergo change to *o*-phthalic acid in the organism are those that exhibit antihæmorrhagic action; this theory is contrary to that of Fieser (A., 1941, III, 377; 1940, II, 96). There is, however, no direct evidence to support the authors' theory and the true mechanisms by which degradations to phthalic acid occur (if they do) are unknown. It is suggested that compounds, *e.g.*, Na 2-methyl-1 : 4-naphthaquinone-3-sulphonate, an aq. solution of which at room temp. yields *o*-phthalic acid, may be converted into a tautomeric isomeride which is subsequently reduced. F. H.

Biological conversion of active non-quinones of vitamin-*K* into quinone form. D. A. Richert (*J. Biol. Chem.*, 1944, **154**, 1—8).—The Craven colour test for quinones has been modified for use at pH 10·5, at which reaction the colour is stable for at least 25 min. Vitamin-*K* quinones are excreted in the urine in conjugated form, and they require hydrolysis by addition of 0·1 vol. of conc. HCl and refluxing for 30 min. before the determination is made. Recovery of 2-methylnaphthaquinone added to urine averages 80—90%, whilst recovery from urine after administration to rabbits by various routes is 31—42%. In the rabbit 4-amino-2-methyl-α-naphthol, 2-methyl-α-tetralone, and 2-methyl-1 : 4-naphthaquinol diphosphate are converted into 2-methyl-1 : 4-naphthaquinone in varying amounts. 1 : 4-Dimethoxy-2-methylnaphthalene is not converted in the rabbit and only slightly in the chicken. P. G. M.

XIX.—METABOLISM, GENERAL AND SPECIAL.

Use of low environmental temperature during the preparation of tissue slices for respiration studies *in vitro*. F. A. Fuhrman and J. Field, 2nd (*J. Biol. Chem.*, 1943, **153**, 515—520).—Slices of rat cerebral cortex, kidney cortex, and liver were prepared in moist chambers at 10° and 35° and kept under the same conditions. The val. of Q_{O_2} at 37·7° of kidney and liver slices from the cold chamber was higher than that of slices kept warm, but with brain slices there was no difference. Tissue injury due to lack of O_2 is probably prevented by the decreased metabolism at low temp. R. L. E.

Metabolic changes in growing chickens. H. H. Kibler and S. Brody (*J. Nutrition*, 1944, **28**, 27—34).—During the first 2 months after hatching the metabolism per day (in kg.-cal. per sq. m.) is correlated with growth per day (in g. per sq. m.) and the resting, non-fasting heat production increases from 750 kg.-cal. at hatching to a max. of 1250—1300 at 30 days and then decreases to 900 at 60 days. Daily growth rate per sq. m. increases to a max. of 370 g. at 25 days and then decreases. After 2 months of age the non-fasting heat production in females is 900 kg.-cal. compared with 750 after 24-hr. fasts, higher vals. being obtained for males. H. G. R.

Metabolism of cornea.—See A., 1944, III, 583.

Metabolism of œstrone in normal and partially heptatectomised rats.—See A., 1944, III, 593.

Effect of adrenaline on oxidation in living cells.—See A., 1944, III, 589.

Metabolic effects of thiouracil, particularly on adrenal function.—See A., 1944, III, 589.

Acetylation *in vivo* of *d*-amino-acids. F. Binkley, J. L. Wood, and V. du Vigneaud (*J. Biol. Chem.*, 1944, **153**, 495—500).—Phenyl- and benzyl-*d*-cysteine fed to rats are largely excreted as the *N*-acetyl-*l*-amino-acids; there is also some direct acetylation of the *d*-acids. The presence of Br in the aromatic ring increases direct acetylation, with less inversion. *p*-Bromobenzyl-*d*-homocysteine is completely inverted, but there is no inversion of the corresponding *l*-amino-acid, or of *N*-acetylbenzyl-*d*-cysteine. Inversion of the *d*-acids occurs before acetylation. R. L. E.

1-Methylhistidine. II. Metabolism of *dl*-1-methylhistidine in albino rat. W. Sakami and D. W. Wilson (*J. Biol. Chem.*, 1944, **154**, 223—225; cf. A., 1944, II, 348).—Albino rats on a histidine-deficient diet did not grow when supplied with *dl*-1-methylhistidine, though the compound was not toxic. Rats therefore cannot demethylate this compound. J. F. M.

Metabolism of phosphorylcholine. II. Partition of phosphorylcholine-phosphorus between blood-phosphate fractions. III. Partition of phosphorylcholine-phosphorus between tissues. IV. Distribution of phosphorylcholine-phosphorus in tissue-lipins. R. F. Riley (*J. Biol. Chem.*, 1944, **153**, 535—541, 544, 544—549; cf. A., 1944, II, 248).—II. When phosphorylcholine is given intraperitoneally in rats, it quickly disappears and its P appears as inorg. P in the blood.

III. The rate of uptake of phosphorylcholine-P from blood into the principal organs is about the same as that of inorg. P.

IV. Injection of phosphorylcholine appears to retard phospholipin turnover in the liver; this effect is mainly on the non-choline phosph-

atides. Phosphorylcholine is probably not used as such in phospholipin synthesis. R. L. E.

Absorption and excretion of allantoin in mammals. E. G. Young, H. P. Wentworth, and W. W. Hawkins (*J. Pharm. Exp. Ther.*, 1944, **81**, 1—9).—After oral administration of allantoin, 35—92% of the given dose was excreted in the urine by dogs, 19—34% by man, but none by rabbits. After intravenous injection of 75—600 mg., practically the entire dose of allantoin was excreted in 12—72 hr. by man and in 5 hr. by dogs. Uric acid injected intravenously into a dog was converted into allantoin within 2 hr. G. P.

Cholesterol metabolism of the adrenal glands and the influence on it of the thyroid gland hormone.—See A., 1944, III, 588.

Utilisation of acetic acid for fatty acid synthesis. D. Rittenberg and K. Bloch (*J. Biol. Chem.*, 1944, **154**, 311—312).—A prep. of Na acetate containing 19·6 at.-% excess of ^{13}C in the carboxyl group and 77 at.-% excess of D in the methyl group was fed to mice and growing rats, and the concns. of ^{13}C and D in various fractions of livers and carcasses were determined. It is suggested that the fatty acids are synthesised by successive condensations of C_2 units. G. D.

Sugar in the cerebroside of the spleen in Gaucher's disease. E. Klenk and F. Rennkamp (*Z. physiol. Chem.*, 1942, **272**, 280—282).—The isolation of a cerebroglucoside, $[\alpha]_D^{20}$ −9·76° in pyridine, and its hydrolysis to glucose, identified by fermentation and reduction vals., is described. H. W.

Carbohydrate metabolism in vitamin-B_1 deficiency.—See A., 1944, III, 603.

Excretion of choline in diabetes mellitus. O. Lindberg and J. Möllerström (*Naturwiss.*, 1943, **31**, 65—66).—Diabetics who excrete little or no ketones excrete only small proportions of choline whilst those who excrete ketones (β-hydroxybutyric acid) also excrete choline; the proportion of both substances is increased by fasting. In diabetics who do not excrete the acid, the proportion of choline is decreased by fasting. Administration of insulin diminishes the excretion of choline. The ratio of β-hydroxybutyric acid to choline is usually 7—10 but vals. much lower and much higher are also found. The findings suggest a relationship between excretion of choline and that of β-hydroxybutyric acid. Production of the acid in fasting diabetics is possibly related to the degradation of lipins that results from disturbed fat metabolism. W. McC.

Thyroid and diabetes. Pathogenesis of diabetes mellitus. Diabetes mellitus [after pancreatectomy] in the rat.—See A., 1944, III, 588.

Biochemical importance of phosphoric acid for agriculturally useful animals. R. Schreiber (*Chem.-Ztg.*, 1944, **68**, 29—30).—Utilising an admixture of radioactive P, it has been shown that a growing animal stores P mainly in the bones whilst the small amount in the kidneys, liver, and mucous membrane of the intestines is rapidly esterified. The function of this P in the degradation of sugars is discussed. The org. and inorg. P contents of various plants are tabulated and the importance of the mode of occurrence of the P is discussed. Milk-casein contains 0·8% of P, so milking cows need hay rich in P and Ca. Hay from poor land, however, is less rich, especially in Ca, than that from good meadows, and the latter can be improved by suitable fertilisers. J. W. S.

Rejuvenation of phosphate in adenine nucleotides. I. Enzymic separation of phosphate groups in polyphosphorylated nucleotides. H. M. Kalckar. **II. Rate of rejuvenation of labile phosphate compounds in muscle and liver.** H. M. Kalckar, J. Dehlinger, and A. Mehler (*J. Biol. Chem.*, 1944, **154**, 267—273, 275—291).—I. The terminal PO_4 group in adenosine triphosphate was separated by the use of hexokinase from baker's yeast and the second phosphate group by an adenylpyrophosphatase prep. from potato. This sp. enzymic separation makes possible an analysis of ^{32}P in each of the phosphate groups.

II. Rate of penetration of PO_4 in muscle was approx. 1 μg. of P per min. per g. of muscle. In rabbit muscle, ^{32}P concns. of the two labile PO_4 groups in adenosine triphosphate were equal, but in frog muscle at low temp. there were marked differences in ^{32}P concns. of the two groups, the terminal PO_4 group attaining the same ^{32}P concn. as phosphocreatine, whilst the second group had a higher concn. Possible reasons for this are discussed. The rate of rejuvenation of labile PO_4 in adenosine triphosphate in liver was 15 μg. of P per g. of liver per min. The high turnover of PO_4 *in vivo* is attributed to (*a*) the separation and removal of extracellular ^{32}P by perfusion and (*b*) the shortening of the incubation period to 6—7 min. G. D.

Metabolism of azo-compounds. I. Azobenzene. L. A. Elson and F. L. Warren (*Biochem. J.*, 1944, **38**, 217—220).—Rats injected with azobenzene excrete in the urine aniline and a water-sol. compound which yields benzidine on acidification. The latter is probably excreted in the urine as a conjugated hydrazobenzene. Traces of benzidine are also found (as such) in the liver. P. G. M.

Excretion of metabolic products of sulphapyridine in the dog.—See A., 1944, II, 347.

XX.—PHARMACOLOGY AND TOXICOLOGY.

Penicillin in various infections. C. S. Keefer, F. G. Blake, E. K. Marshall, J. S. Lockwood, and W. B. Wood (*J. Amer. Med. Assoc.*, 1943, **122**, 1217—1224).—Penicillin was used in 500 cases of various kinds of infection. 54 (60%) of 91 patients with *Staph. aureus* bacteræmia recovered, also 48 of 55 patients with osteomyelitis. 13 of 23 patients with sulphonamide-resistant hæmolytic streptococcus infections recovered. Pneumococcal cases are not included in this report, but 16 of 23 cases of pneumococcal meningitis died, possibly owing to inadequate dosage and poor penetration of the drug into the c.s.f. 125 of 129 gonococcal infections were successfully treated. 14 of 17 cases of subacute bacterial endocarditis showed no response to penicillin. Toxic effects were rare and insignificant. Modes of administration and schemes of dosage are discussed. C. A. K.

Therapeutic effectiveness of penicillin in experimental murine typhus infection in *dba* mice. V. Moragues, H. Pinkerton, and D. Greiff (*J. Exp. Med.*, 1944, **79**, 431—437).—Administration of large but non-toxic doses of penicillin to *dba* mice after injection with murine typhus rickettsiæ markedly reduced the mortality rate, particularly when the initial dosage of rickettsiæ was relatively small. There was no evidence of secondary bacterial infection. A. S.

Ineffective penicillin chemotherapy of arthritic rats infected with pleuropneumonia-like organisms. H. M. Powell and R. M. Rice (*J. Lab. clin. Med.*, 1944, **29**, 372—374).—Penicillin is of little val. in infectious rat polyarthritis. Myocrysin, as a control drug, was chemotherapeutically effective but toxic in the doses used. C. J. C. B.

Dissociation constant and isoelectric point of sulphanilamide.—See A., 1944, I, 249.

Inhibitory effect of sulphonamides on action of nicotine on isolated intestine. E. P. Pick, G. W. Brooks, and K. Unna (*J. Pharm. Exp. Ther.*, 1944, **81**, 133—141).—Sulphonamides inhibit or abolish the effect of nicotine on the isolated intestine of rabbits and guinea-pigs. *p*-Aminobenzoic acid does not antagonise this effect of sulphonamides. The effect of adrenaline, acetyl- and carbamyl-choline, prostigmine, histamine, and $BaCl_2$ on the isolated intestine is not affected by sulphonamides. G. P.

[Solubility, absorption, and excretion, acute and chronic] toxicity of sulphamerazine and sulphamethazine [compared with sulphadiazine]. L. H. Schmidt, H. B. Hughes, E. A. Badger, and I. G. Schmidt (*J. Pharm. Exp. Ther.*, 1944, **81**, 17—42).—The solubilities at 37° in M./15-PO_4''' buffer at pH 6 and 8 were: sulphamerazine 36·5 and 199·0, sulphamethazine 67·2 and 165·5, and sulphadiazine 16·8 and 177·5 mg.-%. The solubilities of these compounds in urine at the same vals. of pH were similar to those in the buffer; the N^4-acetyl derivatives were more sol. than the parent compounds. Experiments suggest that sulphamerazine and sulphamethazine are absorbed from the intestine more rapidly than is sulphadiazine and that sulphamerazine is excreted more slowly than is sulphamethazine or sulphadiazine. The LD_{50} (48 hr.) of the drugs, administered by oral, subcutaneous, and intraperitoneal routes, was determined. In chronic toxicity experiments, all three sulphonamides retarded the growth of immature rats to the same extent. After prolonged administration of the drugs in various doses to rats, dogs, and monkeys, sulphamerazine and sulphadiazine caused renal damage: sulphadiazine was more toxic in this respect than was sulphamerazine, whilst sulphamethazine had no toxic effects. G. P.

Chemotherapeutic activities of sulphamerazine and sulphamethazine [compared with sulphadiazine]. L. H. Schmidt, C. L. Sesler, and H. B. Hughes (*J. Pharm. Exp. Ther.*, 1944, **81**, 43—57).—Sulphamerazine and sulphamethazine are slightly more effective than sulphadiazine in the treatment of pneumococcal septicæmia in mice and pneumococcal meningitis in rats. Sulphadiazine was as effective as sulphamerazine and sulphamethazine against infections with β-hæmolytic streptococci and Friedländer's bacilli and was definitely superior against infections with staphylococci and dysentery bacilli. The *in-vitro* bacteriostatic effect of these sulphonamides depended on the composition of the medium (cf. A., 1944, III, 205). G. P.

Vasosulpha compounds. W. F. Hamilton, M. F. George, jun., E. Simon, and F. M. Turnbull (*J. Amer. Pharm. Assoc.*, 1944, **33**, 142—145).—Aq. Na sulphathiazole is stabilised by presence of 2% of Na_2SO_3 together with 1% of glycerol. Both sulphathiazole and sulphadiazine form compounds with ephedrine and deoxyephedrine (cf. A., 1944, II, 352). These compounds, especially deoxyephedronium sulphathiazole, appear to be of therapeutic interest and their utilisation for, *e.g.*, intranasal therapy is indicated. F. O. H.

Sulphonamide aërosol inhalation. C. C. Chapple and H. M. Lynch (*Amer. J. med. Sci.*, 1944, **207**, 488—492).—Cryst. sulphonamides, blown from a simple blower, were inhaled and rapidly appeared in the peripheral blood. The blood of mice taken within 15 min. of a 5-min. exposure showed 3·4—7 mg.-% of the drug.

30 min. exposures produced 12—18 mg.-%; 1 hr. exposures, 18—22 mg.-%; and 2 hr. exposures 50 mg.-%. C. J. C. B.

Sulphanilamide as prophylactic measure in recurrent rheumatic infection. R. H. Feldt (*Amer. J. med. Sci.*, 1944, **207**, 483—488).—Sulphanilamide in small daily doses was given to rheumatic children during the autumn, winter, and spring of 1941—42 and 1942—43; 89 patient-seasons were represented in the treated and 42 patient-seasons in the control series. No rheumatic recurrences appeared among the treated children. There were 3 major and minor recurrences among control patients. The incidence of positive β-hæmolytic streptococcus throat cultures was similar in the two groups. Manifestations of sulphanilamide toxicity were neither frequent nor severe. C. J. C. B.

Prophylactic use of sulphanilamide in children with inactive rheumatic fever. K. G. Dodge, J. S. Baldwin, and M. W. Weber (*J. Pediat.*, 1944, **24**, 483—501).—88 children and adolescents with quiescent rheumatic disease were given 1—2 g. of sulphanilamide daily throughout the winter and spring months for a total of 181 patient-seasons. 101 rheumatic children were studied as controls for 138 patient-seasons. Toxic drug reactions were rare. In the control group there were 54 group *A* hæmolytic streptococcal infections but only 5 in the test group. C. J. C. B.

Anti-sulphonamide action. VII. Action of proteins and their enzymic hydrolysates on sulphonamide. J. Tabone, F. Nitti, M. Senecal, and H. Mousset. **VIII. Anti-sulphonamide action of guinea-pig organs. Conclusions.** F. Nitti, J. Tabone, H. Mousset, and M. Senecal (*Ann. Inst. Pasteur*, 1943, **69**, 253—256, 303—304).—VII. The anti-sulphonamide activity of serum, fibrin, and the muscle-proteins, myosin and myogen, is very feeble, but is progressively increased by continued hydrolysis with pepsin, papain, or trypsin. During enzymic hydrolysis anti-sulphonamide activity increases more rapidly than amino-acid content.

VIII. The anti-sulphonamide activity of the peptones derived from papain hydrolysis of guinea-pig protein from muscle and liver was about equal, from kidney about half as much, and from serum 10 times less. Enzymic hydrolysates of whole guinea-pig or rabbit muscle contained 2½—4 times more anti-sulphonamide activity than the corresponding hydrolysates of the isolated muscle proteins, although the amino-acid contents were of the same order. Intensive acid or alkaline hydrolysis destroyed anti-sulphonamide activity which, however, was more sensitive to acid in whole muscle preps. and more sensitive to alkali in isolated protein preps.

F. S.

Treatment of meningococcal infection with serum and sulphonamides. R. F. Konas (*N.Y. Sta. J. Med.*, 1943, **43**, 2069—2074).—A review. E. M. J.

Meningococcus infections with articular complications [rôle of sulphonamides]. M. J. Fox and J. Gilbert (*Amer. J. med. Sci.*, 1944, **208**, 63—69).—Of 215 patients not treated with sulpha-drugs, the incidence of arthritis was 1·9%, in comparison with an incidence of 11·8% among 51 patients receiving sulphonamides. C. J. C. B.

Sulphadiazine and its sodium compound in treatment of meningococcic meningitis and meningococcæmia. E. Appelbaum and J. Nelson (*Amer. J. med. Sci.*, 1944, **207**, 492—506).—Sulphadiazine and its Na compound were used in the treatment of 141 bacteriologically proved cases of meningococcal meningitis and 8 cases of meningococcæmia without meningeal involvement. Of the 141 patients with meningitis, 139 recovered and 2 died. The 8 patients with meningococcæmia, but without meningeal involvement, also recovered. There were few complications. The most common was arthritis, which occurred in 15 cases. Toxic reactions were encountered in 42 patients, 10 of whom had more than one untoward effect. The most common toxic reactions were related to the urinary tract, and drug fever, which usually occurred 24—48 hr. after the institution of chemotherapy. There were 4 cases of encephalopathy and 2 of peripheral neuropathy. C. J. C. B.

Treatment of pneumonia with a single dose of sulphadiazine. H. Völlmer, C. Abler, and D. A. Rosenberg (*J. Pediat.*, 1944, **24**, 553—557).—Uncomplicated pneumococcus pneumonia in children (25 cases) responds as promptly to a single dose of sulphadiazine 0·15—0·3 g. per kg. as to continued doses of this drug. The temp. dropped to normal in 4—96 hr. (average 38 hr.) following a single dose and in 6—100 hr. (average of 40 hr.) when a full course of sulphadiazine was given. 3 patients with pneumonia complicated by otitis media did not respond to the single dose treatment. C. J. C. B.

Sulphaguanidine in treatment of Flexner dysentery. H. G. Smith (*Brit. Med. J.*, 1944, I, 287—288).—44 young women, either symptomless carriers of *B. dysenteriæ* (Flexner) or with a record of diarrhœa, were given 142 g. of sulphaguanidine over 10 days. After treatment the stools were non-dysenteric and fæces and rectal swabs were negative for *B. dysenteriæ*. About the 9th day of treatment 21 patients developed a toxic rash, morbilliform and petechial in some cases, without any relation to the blood concn. of the drug. 8 of 12 patients reacted to a sensitisation dose of sulphaguanidine, but not to other sulphonamides. The guanidine radical may be the sensitising agent. I. C.

[Treatment of] gonorrhœa in North Africa and Central Mediterfanean. D. J. Campbell (*Brit. Med. J.*, 1944, II, 44).—In Algeria and Tunisia the response of patients to 10 g. of sulphathiazole in two days was not as good as that claimed in the United Kingdom (90%) and in only 75% of cases were results satisfactory. In Italy, forward treatment of gonorrhœa failed and short courses of chemotherapy were useless. Larger doses of and longer treatment with sulphathiazole or sulphapyridine have been necessary. It is not established yet whether the gonococcus encountered is resistant to chemotherapy, but the accepted methods of treatment failed in these countries under the existing conditions. I. C.

Wound healing and infection after local sulphonamide application. J. A. Key (*J. Amer. Med. Assoc.*, 1943, **122**, 1003—1006).—Sulphanilamide or sulphathiazole powder or crystals were satisfactorily used in over 600 cases by local application to clean operative wounds. C. A. K.

Acute macrocytic hæmolytic anæmia occurring following administration of sulphadiazine. J. A. Layne and F. R. Schemm (*J. Lab. clin. Med.*, 1944, **29**, 347—351).—Acute macrocytic hæmolytic anæmia occurred after administration of 39 g. of sulphadiazine over 9 days in a case of atypical pneumonia. A true reversible cold hæmagglutinin was present in the plasma of this patient during the period of acute illness. Recovery occurred coincidently with the administration of liver extract. C. J. C. B.

Sulphonamide allergy. R. G. Park (*Brit. Med. J.*, 1944, I, 781—782).—40 cases allergic to sulphonamide drugs were investigated. In 60% the allergy was confined to one drug of the sulphonamide group. In 40% the allergy occurred to multiple sulphonamides and to sulphanilic acid. In half the latter cases allergy was to the $NH_2 \cdot C_6H_4 \cdot SO_2$ radical; in the others it was to the $NH_2 \cdot C_6H_4 \cdot$ radical, reactions occurring also with procaine. No reactions were obtained to $NH \cdot C_6H_4$ in 4 cases. I. C.

Alkalis and renal complications from sulphadiazine. D. R. Gilligan, S. Garb, C. Wheeler, and N. Plummer (*J. Amer. Med. Assoc.*, 1943, **122**, 1160—1165).—Patients receiving sulphadiazine usually have a urinary pH of 5—6. This favours urinary pptn. of the drug, particularly the acetylated form. The solubilities of sulphadiazine and acetylsulphadiazine at pH 7·5 are about 20 and 30 times respectively those at pH 5·0. No crystalluria or signs of renal damage were seen in 350 patients on 6 g. of sulphadiazine daily in whom the urine was kept neutral or alkaline by 15·6 g. of $NaHCO_3$ daily. The urinary output should be at least 1500 c.c. daily. C. A. K.

Toxicity of phthalylsulphathiazole. P. A. Mattis, W. M. Benson, and E. S. Koelle (*J. Pharm. Exp. Ther.*, 1944, **81**, 116—132).—Phthalylsulphathiazole [2-(N^4-phthalylsulphanilamido)thiazole] is not toxic orally as it is absorbed from the intestine only sparingly. The intraperitoneal LD_{50} for mice was 0·8—0·9 g. per kg. Intraperitoneal injections to monkeys of 0·1 g. per kg. per day for 10 days caused only a mild nephrosis, but similar injections of 1 g. per kg. per day caused severe renal damage and death on the 6th day. G. P.

Anti-plasmodial action and chemical constitution. VII. Derivatives of quinine and *iso*quinine.—See A., 1944, II, 355.

Quinolines patterned as "open models" of atabrine.—See A., 1944, II, 308.

Cinchona alkaloids in human plasma. E. P. Hiatt (*J. Pharm. Exp. Ther.*, 1944, **81**, 160—163).—After a single oral dose of 10 mg. per kg. of cinchona alkaloids the max. plasma concns. in normal human subjects were: quinine 2·5—4·6, quinidine 2—2·9, cinchonidine 1·7—3·7 and cinchonine 0·5—1·2 mg. per l. G. P.

Erythrina alkaloids. XIV. Erysothiovine and erysothiopine, new alkaloids containing sulphur.—See A., 1944, II, 354.

Chemotherapy of filariasis in cotton rat by administration of neostam and of neostibosan. J. T. Culbertson and H. M. Rose (*J. Pharm. Exp. Ther.*, 1944, **81**, 189—196).—Repeated injections of neostam or of neostibosan to cotton rats infected with the filaria *Litomosoides carinii* kill the adult parasites which occur in the pleural space of the animals and result in the gradual disappearance of microfilariæ from the blood. The adult parasites are more susceptible to these compounds than the microfilariæ. Neostam or neostibosan in concns. of 1—5 mg.-% kills adult filariæ *in vitro* after 4 days at 37°. G. P.

Treatment of malaria. E. T. Brennan (*Med. J. Austral.*, 1944, I, 189—193.—A review. F. S.

Cationic chemotherapy with special reference to acridines. A. Albert (*Med. J. Austral.*, 1944, I, 245—248).—A review. F. S.

Control of scabies by use of soap impregnated with tetra-ethylthiuram monosulphide ("Tetmosol"). R. M. Gordon, T. H. Davey, K. Unsworth, F. F. Hellier, S. C. Parry, and J. R. B. Alexander (*Brit. Med. J.*, 1944, I, 803—806).—In cases of rat scabies due to Notoëdres, Tetmosol combined with soap in 5, 10, or 20% dilutions has local

therapeutic effect when used daily or weekly, the infestation being cured or reduced. In 6 cases of human scabies due to *Sarcoptes scabiei* 5—6 baths with 20% Tetmosol soap on successive days cured the patients; of 110 cases treated with 3 baths with 20% Tetmosol soap over a period of a week, 80% were cured, 20% relapsed. Clean rats were exposed to Notoëdres infestation: in these washing of the tail once a week with 5 or 10% Tetmosol soap was followed by marked reduction of the no. of mites developing on the skin in comparison with controls washed with unmedicated soap. When 20% soap was used once weekly rats were protected for over 22 days or had light infestation. 5% Tetmosol soap used twice daily on rats gave them complete protection for 25—36 days. Tetmosol soap could therefore be used as a prophylactic measure in an infested community. The incidence of dermatitis is low. I. C.

Comparison of atropine and curare as antagonists of acetylcholine. J. V. Luco and M. Altamirano (*Amer. J. Physiol.*, 1943, **139**, 520—524).—The acetylcholine–curare and –atropine antagonism was studied in cats, using the variability of the threshold to acetylcholine of the superior rectus muscle of the eye and the submaxillary gland. Large doses of atropine inhibit the muscular, large doses of curare the glandular, response to acetylcholine. The doses of atropine capable of inhibiting the responses to acetylcholine are directly, those of curare inversely, proportional to the acetylcholine thresholds of the 2 effectors used. A. S.

Physiological activity of yohimbine quaternary ammonium compounds. Raymond-Hamet and G. Bertrand (*Compt. rend.*, 1943, **217**, 181—183).—The physiological effects of moderate doses of adrenaline are almost unaffected by doses of yohimbine methiodide 50—100 times greater than a dose of the hydrochloride which would cause complete inhibition of these effects. The renal vasoconstrictive action is the only one that is inhibited; a dose of 5 mg. per kg. only lowers the arterial pressure from 194 to 167 mm. Hg. P. G. M.

Adrenolytic and sympatholytic actions of yohimbine and ethylyohimbine. F. F. Yonkman, D. Stilwell, and R. Jeremias (*J. Pharm. Exp. Ther.*, 1944, **81**, 111—115).—2—8 mg. of yohimbine or ethylyohimbine per kg. abolished the response of adrenergic nerves in cats to adrenaline (adrenolysis), while the nerves still responded to faradic stimulation. Larger doses of the drugs abolished the response to the latter stimulus as well (sympatholysis). G. P.

Pharmacology and chemistry of substances with cardiac activity. III. Effect of simple unsaturated lactones and *tert.*-butyl hydrogen peroxide on isolated frog heart. R. Mendez (*J. Pharm. Exp. Ther.*, 1944, **81**, 151—159).—The systolic standstill of the isolated frog heart caused by $\alpha\beta$- and $\beta\gamma$-angelicalactone can be accounted for by the formation of peroxides in their solutions. These peroxides are resistant to the action of catalase. Peroxidase reacts more readily with the peroxide of $\beta\gamma$-angelicalactone than with that of the $\alpha\beta$-homologue. Na pyruvate reacts equally well with the peroxides of both lactones. Serum-globulin, cysteine, glutathione, and diethyldithiocarbamate decrease or prevent the effect of both lactones on the heart. *tert.*-Butyl H peroxide causes irreversible standstill of the frog heart. Catalase, peroxidase, Na pyruvate, or substances which inhibit Cu catalysis do not modify this effect. (Cf. A., 1942, III, 709; 1944, III, 169.) G. P.

Phenothiazine as anthelmintic. Z. Bercovitz, R. C. Page, and E. J. de Beer (*J. Amer. Med. Assoc.*, 1943, **122**, 1006—1007).—Phenothiazine was clinically ineffective in 41 of 44 patients with various types of intestinal parasitic infections. Toxic effects included anæmia, albuminuria, and nausea and vomiting. C. A. K.

[Treatment of] hookworm infestation. T. E. Lowe and H. O. Lancaster (*Med. J. Austral.*, 1944, I, 289—292).—In 386 cases, emulsions containing Oleum chenopodii with either CCl_4 or tetrachloroethylene were the most effective of various anthelmintics tried. F. S.

Amides, amines, and related compounds as diuretics. W. L. Lipschitz and Z. Hadidian (*J. Pharm. Exp. Ther.*, 1944, **81**, 84—94).—70 amides, amines, amidines, urea, pyrimidine, and purine derivatives, and amino-derivatives of cyanuric acid were tested by the rat assay method for diuretic action (cf. C., 1944, III, 86). The diuretic activities were: melamine 76·5, adenine sulphate 139·0, and formoguanamine 347·1 (urea = 1). These three compounds, urea, and the known xanthine diuretics are characterised by the group :N·(C:)·N:. G. P.

Cranial-nerve palsies with herpes following general anæsthesia [due to dichloroacetylene]. J. R. Humphrey and M. McClelland (*Brit. Med. J.*, 1944, I, 315—318).—13 cases of cranial-nerve palsy following general anæsthesia and involving mainly the fifth and seventh, but in some cases also the third, fourth, sixth, tenth, and twelfth, nerves are reported. In 9 cases there was also labial herpes. Evidence is given for chemical reactions between soda-lime and trichloroethylene in the anæsthetic machine, with production of dichloroacetylene, a substance found toxic to rabbits. Trichloroethylene should not be used if there is the possibility of its coming in contact with soda-lime. I. C.

Hazards in use of the closed-circuit technique for trilene anæsthesia. S. Carolen (*Brit. Med. J.*, 1944, I, 319—320).—Trilene (trichloroethylene) anæsthesia in closed circuit may result in trigeminal and other cranial-nerve palsies, which may be permanent and disabling. These palsies are caused by toxic oxidation products formed by the interaction of soda-lime and trilene. The reaction is speeded up by the heat generated in the soda-lime. Different brands of soda-lime contain varying quantities of NaOH and their hygroscopic properties are different. This is an important factor in the occurrence of the toxic products: one of these is dichloroacetylene, which is easily oxidised to $COCl_2$ and CO. I. C.

Continuous pentothal sodium anæsthesia [in major surgery]. D. Battaglia and B. A. Winne (*N.Y. Sta. J. Med.*, 1944, **44**, 1120—1123). E. M. J.

Narco-analysis with nitrous oxide. C. H. Rogerson (*Brit. Med. J.*, 1944, I, 811—812).—Two cases in which N_2O inhalation was effective and useful are described. I. C.

Relationship of chemical structure of sympathomimetic amines to ventricular tachycardia during *cyclo*propane anæsthesia. O. S. Orth, J. W. Stutzman, and W. J. Meek (*J. Pharm. Exp. Ther.*, 1944, **81**, 197—202; cf. A., 1939, III, 1087; 1940, III, 678).—Primary and *sec.* sympathomimetic amines with a catechol nucleus, in doses producing a rise in blood pressure equal to that caused by 0·01 mg. of adrenaline per kg., caused ventricular tachycardia during *cyclo*propane anæsthesia in dogs. *tert.* Amines with a catechol nucleus and other amines examined had no such effect. G. P.

Alkyl and dialkylaminoalkyl esters of 5-fluoro-2-nitro- and -2-amino-benzoic acid.—See A., 1944, II, 336.

Antispasmodics.—See A., 1944, II, 335.

Comparative study of analgesic effect of morphine sulphate and monoacetylmorphine. C. M. Jones and W. P. Chapman (*Arch. intern. Med.*, 1944, **73**, 322—328).—In 24 normal subjects monoacetylmorphine was 4 times as effective an analgesic as morphine sulphate in control of cutaneous and ischæmic pain. The side reactions (nausea and vomiting) are fewer with monoacetylmorphine, which also permits increased voluntary muscular effort in the presence of severe pain (*e.g.*, in muscular ischæmia). C. J. C. B.

Antispasmodic activity of 4-morpholinoalkyl esters. I. Toxicity, effects on isolated smooth muscle, and spasmolytic activity on ileum of anæsthetised dogs. H. F. Chase. A. J. Lehman, and F. F. Yonkman (*J. Pharm. Exp. Ther.*, 1944, **81**, 174—181).—Out of 8 morpholinoalkyl esters ω-4-morpholinohexyl diphenylacetate hydrochloride is an outstanding drug for its moderate toxicity and powerful spasmolytic activity. G. P.

Influence of succinate and malonate on barbiturate hypnosis. K. H. Beyer and A. R. Latven (*J. Pharm. Exp. Ther.*, 1944, **81**, 203—208).—The intramuscular injection of Na succinate to mice and rats shortened the duration of pentobarbital hypnosis, but Na malonate and glutamate were without effects. Pentobarbital does not inhibit the oxidation of succinate by the succinoxidase system *in vitro*. G. P.

Barbiturate intoxication and picrotoxin treatment. B. W. Billow (*J. Lab. clin. Med.*, 1944, **29**, 265—269).—A case of pentobarbital Na poisoning is reported. The patient was treated by injections of picrotoxin, receiving 135 mg. in all. The patient recovered after swallowing 3 g. of the drug. Metrazol and coramine were employed first, but no improvement occurred until picrotoxin was administered. C. J. C. B.

Reliability of chemical tests for alcoholic intoxication. L. D. Ellerbrook and C. B. Van Gaasbeek (*J. Amer. Med. Assoc.*, 1943, **122**, 996—1002).—Venous blood- and urine-alcohol concn. were studied in 101 cases of suspected intoxication. Blood-alcohol concn. cannot be reliably calc. from the urine-alcohol concn. (or from alveolar air concn.) but the venous blood level is a very good indication of the degree of clinical intoxication. C. A. K.

Amphetamine sulphate poisoning in child of 20 months. H. A. Rosenbaum (*J. Amer. Med. Assoc.*, 1943, **122**, 1011).—Case report. C. A. K.

Atopic dermatitis due to amphetamine sulphate and *d*-amphetamine sulphate. S. S. Kanvar, E. J. Henschel, and A. Ravin (*J. Amer. Med. Assoc.*, 1943, **122**, 1073—1074).—Case report. C. A. K.

Occurrence of arsenic in human hair and its medicolegal significance. E. G. Young and F. A. H. Rice (*J. Lab. clin. Med.*, 1944, **29**, 439—446).—Ethanol or ether followed by dil. HCl and NaOH removed 70—90% of As present in human hair and also extracted over 90% in guinea-pig hair after parenteral administration. Hair soaked in Na arsenite solution absorbed As slowly over several weeks. This As was removable to the extent of 66% by distilled water. An additional 8% could be extracted only with great difficulty by the use of acid, alkali, alcohol, or potent "wetting" agents. When untreated normal hair was converted into its keratein derivative, there was a loss in As content of only 10%, while this treatment of hair with adsorbed As resulted in a loss of 89%. Silk fibroin is

inert towards As in solution. As administered subcutaneously to guinea-pigs was detected in the hair within 2 days. It is concluded that most of the As in hair can be extracted by the use of relatively mild agents and that a small proportion is firmly fixed. There is no distinction between As of "internal" and "external" origin in human hair. C. J. C. B.

Toxicity and treponemicidal activity of amide-substituted phenyl arsenoxides and their derivatives. H. Eagle, R. B. Hogan, G. O. Doak, and H. G. Steinman (*J. Pharm. Exp. Ther.*, 1944, **81**, 142—150).—Amide-substituted phenylarsenoxides ($R{\cdot}CO{\cdot}NH_2$, $R{\cdot}SO_2{\cdot}NH_2$) were much less toxic than phenylarsenoxide. Their treponemicidal activity was not reduced to the same extent and thus their "chemotherapeutic index" increased 2- to 6-fold. Substitution of one or both amide H (*e.g.*, $-SO_2{\cdot}NMe_2$, $-CO{\cdot}NH$-pyridine) increased the toxicity of the compounds and abolished the favourable effect of amide substitution. Only in compounds with terminal hydroxyl, acetamido-, or nitrile groups was the favourable effect of the amide substitution preserved. (Cf. A., 1941, III, 130.) G. P.

Methionine protects against mapharsen liver injury in protein-depleted dogs. J. P. B. Goodell, P. C. Hanson, and W. B. Hawkins (*J. Exp. Med.*, 1944, **79**, 625—632).—Normal dogs tolerate mapharsen in doses of 6—8 mg. per kg., whereas 2—2·5 mg. causes liver injury with jaundice in protein-depleted dogs (low-protein diet or plasmaphoresis). Methionine (2—4 g.) given by mouth 20—24 hr. prior to the administration of mapharsen increases the tolerance to 4·5 mg. per kg. without development of icterus. The protective effect of 1 g. of methionine given intravenously is less consistent. A. S.

Physiological properties of indium and its compounds. II. G. C. Harrold, S. F. Meek, N. Whitman, and C. P. McCord (*J. Ind. Hyg.*, 1943, **25**, 233—237; cf. A., 1943, III, 834).—In-treated Ag discs implanted in rabbits, subcutaneously, intramuscularly, or intraperitoneally, caused only foreign body reactions. Prolonged daily feeding of 58 mg. per kg. of $In_2(SO_4)_3$ to rats produced no demonstrable changes, but 116 mg. per kg. eventually produced a subnormal state. In was found in the urine of these animals. Certain foods, placed in contact with In-treated metal, took up detectable quantities of In, the quantity being greatest with dil. acetic acid, resembling pickled foods. E. M. K.

Effect of urethane on oxygen consumption and cell division in the ciliate *Tetrahymena geleii*. R. A. Ormsbee and K. C. Fisher (*J. Gen. Physiol.*, 1944, **27**, 461—468).—The form of the relation between urethane concn. and O_2 consumption of *T. geleii* suggests that urethane has two distinct modes of action. A break in the curve occurs at 0·1M., which is also the concn. at which cell division is suppressed. The urethane may therefore act on two independent respiratory systems, one of which, the "activity" system, is more sensitive to narcosis than is the "resting" system. E. C. W.

Effects of urethane and chloral hydrate on oxygen consumption and cell division in egg of sea urchin, *Arbacia punctulata*. K. C. Fisher and R. J. Henry (*J. Gen. Physiol.*, 1944, **27**, 469—481; cf. preceding abstract).—In unfertilised (*i.e.*, not dividing) eggs of *A. punctulata*, inhibition of O_2 consumption can be related to the concn. of urethane or chloral hydrate by the mass-action law, assuming the narcotic acts on a single system. In fertilised (dividing) eggs, the form of the relation can be explained if two parallel systems are affected, 40% of the O_2 consumption being due to the "activity" system and 60% to the "resting" system. The latter is probably identical with the system affected in the unfertilised egg; the former is necessary for cell division. E. C. W.

Effects of sulphanilamide and azide on oxygen consumption and cell division in egg of sea urchin, *Arbacia punctulata*. K. C. Fisher, R. J. Henry, and E. Low (*J. Pharm. Exp. Ther.*, 1944, **81**, 58—66).—Sulphanilamide and azide depress the rate of cell division and of O_2 consumption in the fertilised egg of the sea urchin. The max. degree of reduction in O_2 consumption (approx. 50% of normal) occurred when cell division stopped. Neither drug inhibits the respiration of the resting unfertilised egg. When the respiration of the fertilised egg is maximally inhibited by azide, the addition of sulphanilamide to the medium does not produce any further reduction in O_2 consumption; however, the addition of urethane will reduce the rate of O_2 consumption to 54% of that uninhibited by azide. It is concluded that total respiration of the dividing fertilised egg is maintained by two respiratory systems, (*a*) the basal system inhibited by narcotics, and (*b*) the "activity" system on which cell division depends and which is inhibited by sulphanilamide and azide and also by narcotics. G. P.

Morphogenetic action of glyoxaline derivatives on mutants of *Drosophila melanogaster*. Y. Khouvine, S. Chevais, and J. Grégoire (*Compt. rend.*, 1943, **217**, 161—163).—The majority of compounds which effect an increase in the no. of eye facets of the mutant are related to glyoxaline. Only 1-methylhydantoin is active by injection. Other compounds are effective by oral administration only. Addition of a side-chain to $C_{(5)}$ and removal of the 1-methyl group have an inhibiting effect. The larvæ appear to be capable of cyclising glycocyamine, since the guanidine group is, in itself, devoid of activity. P. G. M.

Clinical effects of heptaldehyde bisulphite in patients with cancer.—See A., 1944, III, 667.

Metabolism of 2 : 4 : 6-trinitrotoluene (α-T.N.T.).—See A., 1944, III, 606.

Pharmacological actions of capaurine. A. K. Reynolds and R. A. Waud (*Canad. J. Res.*, 1944, **22**, E, 64—66).—Capaurine, an alkaloid of *Corydalis aurea*, produces paralysis in frogs and convulsions in mice and rabbits in doses of 100—200 mg. per kg. It has a depressant effect on heart and on smooth muscle of intestine and uterus *in vitro*. The methyl ether caused convulsions in frogs; its other effects were similar to that of the base. G. P.

Physiological response of rabbits to *cyclo*hexane, methyl*cyclo*hexane, and their derivatives. J. F. Treon, W. E. Crutchfield, jun., and K. V. Kitzmiller (*J. Ind. Hyg.*, 1943, **25**, 199—214).—Oxygenated compounds, which are more sol., were more toxic than the hydrocarbons when administered orally. Toxicity decreased in the order: ketone, alcohol, hydrocarbon, and the methylated compounds were more toxic than the corresponding non-methylated ones. Oxygenated compounds were anæsthetic, while hydrocarbons caused diarrhœa and marked wt. loss. The urinary excretion of inorg. SO_4'' was decreased and that of glucuronic acid increased. Repeated cutaneous application of the hydrocarbons caused slight temporary local irritation and thickening of the skin; the oxygenated compounds, thus applied, caused hypothermia, narcosis, and convulsive movements. No abnormalities in the cellular elements of the blood were found, but toxic doses caused general vascular injury. E. M. K.

Threshold toxicity of gasoline vapour. P. Drinker, C. P. Yaglou, and M. F. Warren (*J. Ind. Hyg.*, 1943, **25**, 225—232).—Human subjects were exposed to controlled concns. of gasoline in an air-conditioned chamber for periods of 8 hr. Complaints were slight in concns. up to 0·027%. Subjects exposed to 0·1% gasoline experienced nausea, slight dizziness, and headache at the end of an hr., while 0·26% caused anæsthesia and symptoms resembling drunkenness. At 1% dizziness and drunkenness appeared in 5 min. E. M. K.

Treatment of black-water fever. I. Singh and I. Singh (*Current Sci.*, 1944, **13**, 98).—Antivenene, by its antihæmolytic action, completely cured attacks of blackwater fever in 36 cases which had an expected mortality of 25—50%. The dosage used was 20 c.c. of antivenene (1 in 300) followed by 10 c.c. 4-hourly. F. S.

Basic constituents of venom of South American toads. V. Deulofeu and E. Duprat (*J. Biol. Chem.*, 1944, **153**, 459—463).—Methods of isolating constituents of dried venom and venom extracted from dried skins are described. Bufothionine, bufotenine, and dehydrobufotenine occur in the venom of *Bufo chilenis*, *B. crucifer*, *B. paracnemis*, and *B. arenarum*. The venom of *B. spinulosus* also contains bufothionine and dehydrobufotenine and, possibly, bufotenine. No bufotenidine occurs in the venom of these toads or in that of *B. marinus*. W. McC.

Hypersensitivity to adhesive tape. Report of four cases showing its variable ætiology. H. Keil (*J. Ind. Hyg.*, 1943, **25**, 238—242).—Patch testing of these patients with a no. of ingredients used in adhesive tape revealed hypersensitivity to Beni Para rubber, to a dehydrogenated rosin, and to "pitch sub-compound." A positive patch test to abietic acid was thought to be due to oxidised fractions of the acid. E. M. K.

XXI.—PHYSIOLOGY OF WORK AND INDUSTRIAL HYGIENE.

Nutrition: a factor important for industrial hygiene. G. R. Cowgill (*Amer. J. Publ. Health*, 1944, **34**, 630—636).—A lecture. C. J. C. B.

Bagasse disease of lungs. W. A. Sodeman and R. L. Pullen (*Arch. intern. Med.*, 1944, **73**, 365—374).—Report of 11 cases. C. J. C. B.

Byssinosis—report of two cases and review of literature. H. L. Bolen (*J. Ind. Hyg.*, 1943, **25**, 215—224).—The main symptoms were cough, dyspnœa, and pyrexia, progressing to bronchitis and emphysema. Both patients had suffered exposure to cotton for more than 20 years; one progressed to marked bronchiectasis and the other to fibrosis of both lungs. No sp. bacteria were found in the sputum. E. M. K.

Toxic effects in women exposed to industrial rubber solutions [benzene poisoning]. J. L. Hamilton-Paterson and E. Browning (*Brit. Med. J.*, 1944, I, 349—352).—Neutropenia is the commonest and earliest sign of benzene absorption. Urinary sulphates were normal. There is no correlation between subjective symptoms and hæmotological changes. Regular white cell counts and suitable periods of rest are suggested to prevent the onset of chronic benzene poisoning. I. C.

Industrial noise hazard.—See A., 1944, III, 586.

XXII.—RADIATIONS.

Action of electric blankets. G. M. Brown and K. Mendelssohn (*Brit. Med. J.*, 1944, I, 390—392).—The body-warming action of electric blankets is about half as quick as that of the radiant-heat cradle. I. C.

Chest *X*-ray survey methods in practice. A. B. Robins (*Amer. J. Publ. Health*, 1944, **35**, 637—642).—The rapid roll paper method and use of the 35-mm. film were found satisfactory in practice. C. J. C. C.

Irradiation sickness. W. B. Bean, T. D. Spies, and R. W. Vilter (*Amer. J. med. Sci.*, 1944, **208**, 46—53).—A measured quantity of irradiation was given to the left side of the upper abdomen. Persons on a diet deficient in vitamin-*B* complex developed Roentgen sickness, which could be prevented or reduced in severity by supplements of nicotinic acid or thiamin for a few days before irradiation. A patient with carcinoma and myomata of the uterus is reported in detail since she was given repeated Roentgen therapy which in each instance was followed by severe irradiation sickness. She was not given supplements of nicotinic acid or thiamin and subsequently developed classical pellagra and beriberi. C. J. C. B.

Variations in *Mycobacterium lepræ* induced by *X*-radiation.—See A., 1944, III, 617.

Cytological demonstrations of chromosome freaks soon after *X*-irradiation.—See A., 1944, III, 573.

Effect of α-radiation from radon on the virulence and antigenicity of vaccinia virus.—See A., 1944, III, 621.

Seasonal variations of ultra-violet energy in daylight. M. Luckiesh, A. H. Taylor, and G. P. Kerr (*J. Franklin Inst.*, 1944, **238**, 1—7).—A continuous record of the erythemally-weighted ultra-violet energy in daylight, as measured by a Cd–Mg alloy photo-tube, extending over six years has been made in a suburb of Cleveland, U.S.A. The seasonal variations are discussed. The % of the average annual total of the erythemally effective ultra-violet energy received during three-monthly periods beginning in December were 5·3, 31·1, 46·9, and 16·7. The hourly variation is also studied. For about 8 months of the year a clear sky contributed more than half the erythemal ultra-violet energy in daylight at all times, incident on a horizontal plane. In the midsummer months there are only a few hr. in the middle of the day when the erythemally-weighted ultra-violet energy from the sun on a horizontal plane exceeds that from the sky. A. J. M.

XXIII.—PHYSICAL AND COLLOIDAL CHEMISTRY.

Heat of fusion method for bound water. A. B. Caster and J. L. St. John (*Arch. Biochem.*, 1944, **4**, 51—58).—The disadvantage of the method is the necessity and difficulty of determination of f.p. and sp. heat of egg white, whilst its advantage is its wider applicability. E. R. S.

Rapid method for calculating isotonic solutions. J. M. Wells (*J. Amer. Pharm. Assoc.* [*Pract. Pharm. Ed.*], 1944, **5**, 99—106).—An account of work already published (A., 1944, III, 497), with special reference to pharmaceutical practice. Data for the NaCl equiv. of 80 substances are tabulated. F. O. H.

Fractionation of fatty acids and bile acids from solutions of crude bile salts by adsorption on foam. R. Bader and F. Schütz (*Proc. Biochem. Soc.*, 1944, **38**, xx).—Foaming of crude bile salts (containing much fatty acid) at 21—25° yields cryst. fatty acids in the first foam fractions. After removal of these, the foam stability increases and bile acids begin to crystallise. P. G. M.

Reduction potentials of acridines with reference to their antiseptic activity.—See A., 1944, I, 251.

Bound water in egg white. J. L. St. John and A. B. Caster (*Arch. Biochem.*, 1944, **4**, 45—49).—Measured by the calorimetric method (A., 1932, 123), ¼ of the total moisture in fresh unmanipulated egg white is bound water, and there is considerable variation between eggs. E. R. S.

Electrophoretic evidence for complex formation in casein. L. E. Krejci, R. K. Jennings, and L. DeS. Smith (*J. Franklin Inst.*, 1941, **232**, 592—596).—Electrophoresis shows that when acid alcohol-sol. casein is dissolved in 0·15M-NaCl, 0·01M-PO_4''' buffer, pH 7, about ⅛ consists of an unstable complex of β-casein with rather less than its own wt. of α-casein. There may also be more complicated interaction of α-, β-, and γ-forms. R. L. E.

Electrophoretic evidence for complex formation in casein. Correction. L. E. Krejci (*J. Franklin Inst.*, 1942, **234**, 197—201).—Wrong assumptions previously made in the interpretation of electrophoretic patterns of α-, β-, and γ-casein (cf. preceding abstract) are corr. The casein data have now been applied to the equations of Longsworth and MacInnes (cf. A., 1942, III, 487) with the result that the concn. of α-casein is less and that of β-casein is more than the val. previously given. Acid alcohol-sol. casein appears to belong to the fifth type of equilibrium distinguished by Longsworth *et al.* C. R. H.

Ultracentrifugation of rat plasma-phosphatase. E. O. Kraemer, L. Weil, E. B. Sanigar, and M. T. Allen (*J. Franklin Inst.*, 1941, **232**, 587—591).—Rat plasma-phosphatase in the ultracentrifuge sediments at a rate similar to that of the main blood-proteins, and probably mainly with the globulins. R. L. E.

Small-angle interference of myosin. O. Kratky, A. Sekora, and H. H. Weber (*Naturwiss.*, 1943, **31**, 91).—Examination at small angles of myosin fibres prepared by Weber's method (*Pflüger's Arch.*, 1934, **253**, 205) reveals three weak equator reflexes corresponding to spacings of 33, 42, and 66 A. in the lattice. Hence the fibres, which are approx. 66 A. thick, lie side by side at regular distances from each other. At still smaller angles, diffuse diffraction, which becomes intense at approx. 100 A., is observed. Probably this is caused by bundles of fibres. The diffraction decreases when the fibres are caused to swell in liquids of increasing electron density such as hexane, alcohol, CS_2, CCl_4, and ethyl iodide. After swelling in water the diffraction is too weak to be observed. Fibres from muscle which has been treated with formaldehyde and dried show only one equator reflex corresponding to a spacing of approx. 37 A. (See also A., 1944, I, 240.) W. McC.

XXIV.—ENZYMES.

Temperature factor in adsorption [of enzymes] on solid–liquid interface. R. Bader and F. Schütz (*Proc. Biochem. Soc.*, 1944, **38**, xviii).—More efficient purification of enzymes is obtained by adsorption of these or accompanying impurities by prolonging the contact period for days, or even weeks, at 0°. P. G. M.

Action of clavatin on enzyme systems. F. C. Happold and J. W. Waters (*Proc. Biochem. Soc.*, 1944, **39**, xvi).—Glucose dehydrogenase, succinoxidase, malic acid dehydrogenase, α-glycerophosphate dehydrogenase, and tryptophanase are completely inhibited by clavatin. Mannose and lactic acid dehydrogenases, and *d*-amino-acid oxidase are partly inhibited. Uricase, cytochrome oxidase, proteolytic enzymes, pancreatic lipase, catalase, phosphatase, and tyrosinase are unaffected. P. G. M.

Growth and enzyme activity of *Penicillium roqueforti*.—See A., 1944, III, 613.

Restoration of normal *d*-amino-acid oxidase activity by removal of tumours. U. Westphal (*Naturwiss.*, 1943, **31**, 117—118; cf. A., 1944, III, 64).—In rats, implantation of tumours results in decrease in the *d*-amino-acid oxidase activity of the liver. When the tumours are extirpated, the activity is restored to the normal level. Restoration is only partial if the extirpation is incomplete. W. McC.

***d*-Amino-acid oxidase of *Neurospora*.** N. H. Horowitz (*J. Biol. Chem.*, 1944, **154**, 141—149).—Extracts of *Neurospora* contain a *d*-amino-acid oxidase similar to that of mammalian tissues with pH optimum of 8·0—8·5. The enzyme is destroyed by drying, is not inhibited by CN′, iodoacetate, or benzoate, and is competitively inhibited by *iso*valine. The activity of the enzyme depends on the chain length of the substrate. H. G. R.

Activity of tyrosinase towards phenol. R. C. Behm and J. M. Nelson (*J. Amer. Chem. Soc.*, 1944, **66**, 709—711).—The activity of cresolase- or catecholase-rich tyrosinase preps. towards phenol is determined by measuring the disappearance of phenol. Results agree with the O_2-uptake method, thus proving that the latter measures the monohydric phenol activity of the enzyme. R. S. C.

Aërobic oxidation of phenol by tyrosinase. R. C. Behm and J. M. Nelson (*J. Amer. Chem. Soc.*, 1944, **66**, 711—714).—For tyrosinase to catalyse oxidation of monohydric phenols, it must be activated by simultaneously oxidising an *o*-dihydric phenol. This view is based on five known facts and the following: reducing agents, *e.g.*, ascorbic acid, shorten the induction period; oxidation of *o*-4-xylenol has a long induction period; and tyrosinase cannot be obtained free from *o*-dihydric phenol activity. Simultaneous oxidation of more than 1 mol. of pyrocatechol is necessary to overcome the induction period when 1 mol. of phenol is acted on by tyrosinase or to increase the rate of oxidation when this is less than the max. R. S. C.

Tyrosine–tyrosinase reaction and aërobic plant respiration. E. S. Robinson and J. M. Nelson (*Arch. Biochem.*, 1944, **4**, 111—117).—Only a trace of *l*-tyrosine is oxidised by tyrosinase when a reducing agent, *e.g.*, *l*-ascorbic acid, is present. 3 : 4-Dihydroxyphenylalanine, the first product of oxidation, acts as competitive inhibitor in the oxidation, and is the H carrier functioning adjacent to the terminal oxidase, tyrosinase, in a respiratory chain present in potato tubers. Free *l*-tyrosine in potato tubers serves as a reservoir for 3 : 4-dihydroxyphenylalanine. The monophenolase activity of tyrosinase has thus a physiological rôle. The darkening of cut surfaces of potato is due to dislocation of the reducing system. E. R. S.

Vitamin-antivitamin. IV. Cozymase displacement. E. Adler, H. von Euler, and B. Skarzynski (*Arkiv Kemi, Min., Geol.*, 1943,

17, **A**, No. 2, 15 pp.).—Cozymase-regulated dehydrogenases such as glucose and lactose dehydrogenases are inhibited by cyclic carboxylic and sulphonic acid, *e.g.*, salicylic, nicotinic, and pyridine-3-sulphonic acids, as well as by adenine, adenosine, and adenine nucleotide. Inhibition, except with the adenine group, is decreased by increasing amounts of cozymase. The above acids also inhibit succinic dehydrogenase. Inhibition of lactose and succinic dehydrogenases is not decreased by increased concn. of substrate. It is concluded that inhibition of co-enzyme-I-conditioned dehydrogenases is not due to simple displacement of cozymase but depends on a more complicated mechanism. J. N. A.

Effects of adrenalectomy on activity of cytochrome oxidase and the concentration of cytochrome *c* in rats.—See A., 1944, III, 589.

Luciferin–luciferase system. F. H. Johnson and H. Eyring (*J. Amer. Chem. Soc.*, 1944, **66**, 848).—Reduced luciferin is oxidised in the dark reversibly by O_2 or ferricyanide and irreversibly with luminescence by O_2 + luciferase. When purified, it has an absorption max. at approx. 320 mμ. (cf. dihydroco-enzyme, 340 mμ.), changed by O_2 to 430 and then 470 mμ., finally vanishing (aq. luciferin is unstable in presence of O_2). The absorption at 470 mμ. resembles that of some flavoproteins and practically coincides with the luminescence max. at 475 mμ. The energy of the luminescent transition is 59,430 g.-cal. (cf. 57,340 g.-cal. available by direct oxidation of 2 H of glucose). After prolonged dialysis and storage at 0°, luciferase luminesces with O_2 if previously treated with $Na_2S_2O_4$, reduced (H_2–Pt) (not oxidised) co-enzyme-I, reduced riboflavin, washed cells of *E. coli* + glucose, or growing *E. coli* cultures. Luminescence is repeated many times on alternate addition of $Na_2S_2O_4$ and O_2, and is continuous when H_2 + a little O_2 is passed through luciferase solutions containing Pt–asbestos. The luminescent system consists of a pyridine nucleotide + flavoprotein. Luciferin contains co-enzyme-I or -II (the reductant) + a flavine prosthetic group, excitable by oxidation when combined with its sp. protein. Irreversible luminescence is due to destruction, without radiation, of some of the excited mols. by their absorbed energy. R. S. C.

Spoilage of fats. XIV. Iron as constituent of anti-oxygen complex of oatmeal. K. Täufel and R. Müller (*Biochem. Z.*, 1941, **310**, 152—159; cf. B., 1943, II, 288).—An anti-oxygen prep. (acetone pptn. of a light-petroleum extract) of oatmeal had only slight catalase activity and contained 0·02—0·12% of Fe. The peroxide val. of a strongly autoxidised olive oil is decreased when shaken with the prep., but not if HCN is present; when the system is not shaken, the inhibition persists in presence of HCN. The prep. probably contains a lipin-sol., Fe-containing constituent other than catalase. F. O. H.

Bacterial amino-acid decarboxylases. I. *l*(+)-Lysine decarboxylase. E. F. Gale and H. M. R. Epps. **II. *l*(−)-Tyrosine decarboxylase from *Streptococcus fæcalis*. III. Distribution and preparation of codecarboxylase.** E. F. Gale and H. M. R. Epps (*Biochem. J.*, 1944, **38**, 232—242, 242—249, 250—256).—I. *l*(+)-Lysine decarboxylase is prepared from suspensions of *Escherichia coli* and *Bact. cadaveris* by drying with acetone and ether. It is extracted by borate buffer (pH 8·5), adsorbed on Al_2O_3 cream from 20% alcohol at pH 5·5—6·0, and eluted twice by 0·2M-PO_4''' at pH 7·0. It is conc. by repeated fractional pptn. by $(NH_4)_2SO_4$ at various concns., which also separates it from arginine decarboxylase; the final product is sp. for lysine and possibly hydroxylysine. The prep. has ultra-violet absorption typical of a protein and optimum pH 6·0. The apo-enzyme can be separated from codecarboxylase by pptn. with NH_3–$(NH_4)_2SO_4$.

II. *l*(−)-Tyrosine decarboxylase is prepared from acetone-dried cell residues of 8 strains of *Str. fæcalis* by extraction with M./45-PO_4''' buffer (pH 5·5), adsorption on $Ca_3(PO_4)_2$, and fractionation with $(NH_4)_2SO_4$. The preps. are sp. for *l*(−)-tyrosine and *l*-3 : 4-dihydroxyphenylalanine, and a single enzyme is probably responsible for bacterial decarboxylation of both substrates.

III. The prep. of concentrates of codecarboxylase from brewers' yeast is described. The co-enzyme is extracted by aq. $Ba(OH)_2$ and purified by Ba–alcohol and Pb salt pptns., and extraction with phenol. The same co-enzyme activates lysine and tyrosine decarboxylases. It is widely distributed in animal and plant tissues and in yeasts and bacteria. It contains C, H, and N, but no P or S, has a single absorption band at 265 mμ., and is stable to alkali, but not to acid hydrolysis. R. L. E.

Enzymic decarboxylation of oxalacetate and carboxylation of pyruvate. G. Kalnitsky and C. H. Werkman (*Arch. Biochem.*, 1944, **4**, 25—40).—Mn, but not cocarboxylase and inorg. PO_4''', is essential for decarboxylation of oxalacetate. The enzyme (A., 1944, III, 146) forms oxalacetate from fumarate and malate, and smaller amounts from succinate aërobically. No oxalacetate is formed from fumarate anaërobically. Under optimal conditions and in the absence of H_2 and H donators, small amounts of oxalacetate are formed from pyruvate and CO_2. The use of higher concns. of enzyme or pyruvate, or of CO_2, results in increased formation of oxalacetate. E. R. S.

Mechanism of enzyme–inhibitor–substrate reactions. Choline-esterase–eserine–acetylcholine system. A. Goldstein (*J. Gen. Physiol.*, 1944, **27**, 529—580).—The mechanism of enzyme–inhibitor–substrate reactions is analysed from the theoretical viewpoint, and illustrated by data from the choline-esterase–eserine–acetylcholine system. Competitive enzyme–inhibitor–substrate systems show the same characteristic "zones of behaviour" as non-competitive systems. The three zones determine the mathematical function relating activity of an enzyme to concn. of added substrate or inhibitor or both. The effects of sub-optimum substrate concn. in these systems are discussed. The zone-behaviour phenomenon is useful in determination of the no. of mols. of substrate or inhibitor combining reversibly with a single enzyme centre. Kinetics of competitive inhibition, dilution effect, combination of inhibitor or substrate with enzyme, and destruction of inhibitor or substrate by enzyme are analysed and verified, and abs. velocity coeffs. are determined. Inhibition of choline-esterase by eserine is competitive, and one mol. of eserine or acetylcholine combines with one centre of choline-esterase. No definite val. can be assigned to the molar concn. of enzyme centres, but in 4·54% serum (dog) it is less than $1·8 \times 10^{-8}$. Competitive displacement of inhibitor by substrate and vice versa introduce considerable error in the normal 20-min. determination of activity of an inhibited enzyme unless a correction is applied. Dissociation of enzyme–inhibitor complex proceeds moderately slowly on dilution so that full corrections for dilution cannot be applied unless time has been allowed for complete dissociation. Combination of eserine with choline-esterase is slow at all but high concns. of inhibitor. Destruction of eserine or acetylcholine by choline-esterase follows the predicted curve; k_D for destruction of eserine is greater than 0·00182, whilst for destruction of acetylcholine it is greater than 3500. There is no evidence of inhibition of destruction by excess of substrate or inhibitor. The assumption that enzymic activity follows or nearly follows a unimol. course is true only under certain definite limited conditions; it is generally invalid for enzymic destruction of an inhibitor. J. N. A.

Action of anti-choline-esterases on motility of extrinsically denervated intestine *in situ*.—See A., 1944, III, 595.

Formation of lower glycerides during hydrolysis of triglyceride with pancreatic lipase. A. C. Frazer and H. G. Sammons (*Proc. Biochem. Soc.*, 1944, **38**, xviii).—The acetyl val. of olive oil rises from 4 to 64 during hydrolysis with pancreatic lipase for 4 hr. This indicates the presence of 20—25% of the glycerides as lower glycerides (calc. as monoglyceride). The complex bile salt–fatty acid–monoglyceride is an emulsifying agent for neutral fat within the range pH 5·0—9·0. P. G. M.

Esterase content of various types of pneumococci.—See A., 1944, III, 618.

Urease activity in mammals. L. Weil (*J. Franklin Inst.*, 1944, **238**, 145—149).—Rat, rabbit, and human erythrocytes exhibit urease activity which is increased by autolytic processes and inhibited by plasma. The optimum pH of the enzyme is approx. neutrality. Leucocytes exhibit only slight urease activity. Rat liver also contains urease which resembles erythrocyte urease as regards pH optimum and activation by autolysis. The enzyme is present in rat spleen, but not in rat kidney, gastric mucosa, pancreas, brain, thymus, muscle, and Philadelphia No. 1 rat sarcoma. J. N. A.

Histamine–histaminase reaction in presence of peroxidase and catalase. B. Swedin (*Arkiv Kemi, Min., Geol.*, 1944, **17, A**, No. 27, 11 pp.).—Histaminase is very labile, being destroyed by pH below 5·9 and temp. above 50°. It is partly inactivated during interaction with histamine. When subjected to dialysis, it loses 80% of its activity but 31·5% is restored by adding flavin. Treatment with methyl alcohol also causes great diminution of activity and if the alcoholic solution is made alkaline, irradiated with electric light, and neutralised, all activity is lost. When purified histaminase is used, only one O atom is consumed during the interaction of histamine and histaminase and probably no H_2O_2 is produced. Cryst. peroxidase, but not catalase or hæmoglobin, accelerates the rate of O_2 uptake but not that of cleavage of the glyoxaline ring, 2 O being consumed and H_2O_2 probably produced. Similar acceleration occurs when cadaverine is the substrate. When peroxidase is present together with histaminase, competition appears to occur between breakdown of the side-chain and cleavage of the ring. W. McC.

Animal peptidases. V. E. Maschmann (*Biochem. Z.*, 1941, **310**, 28—41; cf. A., 1944, III, 366).—The normal action of peptidase preps. from many animal sources on di- and tri-peptides (synthesised from glycine, alanine, and leucine) is accelerated by Mn, Mg, Zn, or Co, one of these metals being the most effective for each prep. and the others having a weaker or even inhibitory action. Thus with dipeptidase preps. (glycerol extracts) from rabbit's liver, kidney, or intestinal mucosa, Mg, Mn, and Co have, in that order, increasing accelerating effects when glycylglycine is substrate and varying inhibitory effects when glycyl-leucine or -alanine is substrate; with leucyl-, alanyl-, and glycyl-glycylglycine as substrates, acceleration generally occurs but there is an inhibitory effect with

some of the systems. The di- and tri-peptidase activity of glycerol extracts of carcinomatous tissue (mouse) is less than that of other tissues, whilst that of a growing carcinoma is greater than that of the necrotic tissue: with all such tissues, activation or inhibition by metals appears to be similar to that for normal tissues. Data are given for peptidase activities of chick embryo and liver of river-eel. The (complete) inhibition by cysteine of the hydrolysis of glycyl-leucine and -alanine by extracts of rabbit's kidney is partly abolished by Mn or Zn. The results are discussed with reference to those of other authors. F. O. H.

Specificity of *d*-peptidase in [cancerous and normal] sera. D. Albers (*Biochem. Z.*, 1941, **310**, 54—63).—The literature on the sp. occurrence of *d*-peptidase in cancerous sera and the methods of determining peptidase activity are critically reviewed. When followed by Van Slyke's amino-N method, no significant mean difference was found between cancerous sera on the one hand and normal and pathological, non-cancerous sera on the other. Examination of the colorimetric determination of glycine by Zimmermann's reagent (*o*-diphthalaldehyde) shows the method to be unsuitable for following the course of *d*-peptidase action. F. O. H.

Peptidases. II. Fission of *d*-peptides by enzyme preparations from growing seedlings and effect of natural and artificial activators. III. *d*-Peptidase in human organism. Kögl's tumour theory and the stereochemical analysis of proteins. E. Bamann and O. Schimke (*Biochem. Z.*, 1941, **310**, 119—130, 131—151; cf. A., 1944, III, 287). —II. Preps. from seedlings of beans, peas, and cereals hydrolyse both *d*- and *l*-components of *dl*-leucylglycine, the rate of hydrolysis being accelerated by Mn^{++} but not by Mg^{++}. The rate is reduced by dialysis of the extracts, after which Mg^{++} has an activating effect, although less than that of Mn^{++}. Mn^{++} activates the hydrolysis of both *d*- and *l*-peptide, and Mg^{++} only that of *l*-peptide. The naturally occurring activator is therefore not exclusively Mg^{++}. Activation by Mn^{++} is increased by cysteine. *d*-Leucylglycine is hydrolysed slightly more rapidly by extracts of pea seedlings than is the *dl*-compound. The presence of glycine + *l*-leucine tends to inhibit hydrolysis of *d*-leucylglycine. The activity of peptidase preps. from barley seedlings with *l*-leucylglycine as substrate is reduced by about 33% by prolonged dialysis, whilst the corresponding reduction with the *d*-dipeptide is about 92%. The existence of a *d*- and a *l*-dipeptidase and the general characteristics of animal and plant dipeptidases are discussed.

III. The peptidase activity of aq. glycerol extracts of human ovary with *d*-leucylglycine as substrate is accelerated by Mn^{++} and hardly affected by Mg^{++}. Extracts of various human tissues (spleen, ovary, liver, mammary gland) all show *d*-peptidase activity. The ratio of *d*- to *l*-peptidase varies within fairly narrow limits for any one tissue but differs considerably from one tissue to another. Neither this ratio nor the content of *d*-peptidase in carcinomatous tissues is significantly different from that for the corresponding healthy tissues. *l*-Leucine inhibits the hydrolysis of *d*-leucylglycine by animal peptidases. Both animal and plant tissues contain peptidase systems that hydrolyse or synthesise peptides with amino-acid constituents of "unnatural" configuration. The specificity of peptidases from various sources is discussed. F. O. H.

Comparison of crude and purified preparations of a leucylpeptidase associated with beef muscle. S. Schwimmer (*J. Biol. Chem.*, 1944, **154**, 361—366).—The crude glycerol extract of beef muscle contains more than one peptidase. The leucylpeptidase is purified by pptn. of a 50% aq. glycerol extract with acetone followed by repeated pptn. of a solution of this ppt. with $(NH_4)_2SO_4$. This procedure results in a 24-fold concn. with a loss of 2/3 of the activity of the original extract. The enzyme hydrolyses leucylglycine and leucyldiglycine to a max. of 50% but not alanyl or glycyl peptides as does the crude extract. It may be activated in both the purified and crude form by Mn^{++} salts; Mg^{++} and Cu^{++} are also effective whereas Fe^{++}, CN', and cysteine have little action. The optimum pH of the purified enzyme is 8·3 and that of the crude extract 7·6. The purified enzyme is rather unstable, losing 75% of its activity in 2 weeks at 0°, but may be stabilised with glycerol. It is less stable in presence of Mn^{++}. The stability of the crude extract is max. at pH 5·9 and is rapidly decreased at a more acid pH. H. G. R.

Cleavage of fibrin by fibrolysin from hæmolytic streptococci. C. G. Holmberg (*Arkiv Kemi, Min., Geol.*, 1944, **17, A**, No. 28, 8 pp.).—Purified human fibrinogen, obtained from heparinised plasma by successive repeated pptn. with 20% aq. $(NH_4)_2SO_4$, 50% aq. NaCl, and 0·66M-PO_4''' buffer of pH approx. 7·3, has sedimentation and diffusion consts. indicating a mol. wt. of approx. 7×10^5. Less pure material is obtained by repeated pptn. with 20% aq. $(NH_4)_2SO_4$ only. Fibrolysin from streptococcal broth destroys the less pure material but not the purified. If the purified material is first coagulated with impure thrombin, fibrolysin causes rapid dissolution but the solution contains material pptd. by half-saturation with $(NH_4)_2SO_4$. No further pptn. occurs on saturation with $(NH_4)_2SO_4$ or addition of trichloroacetic acid. The pptd. material, which contains most of the N of the fibrinogen, consists of two globulin-like components having different sedimentation consts. The average mol. wt. calc. from sedimentation and diffusion consts. is approx. 1×10^5. Fibrolysin does not act on serum-proteins other than fibrinogen. Fibrolysis sometimes occurs in thrombin–fibrinogen mixtures, especially when purified fibrinogen is used, without addition of bacterial fibrinolysin, the process probably differing only quantitatively from that induced by the bacterial product. The fibrolytic enzyme probably occurs preformed in human plasma. Possibly fibrolysin activates the enzyme. W. McC.

Preparation of *l*-leucyl-*l*-glutamic acid anhydride. Its behaviour towards proteinases.—See A., 1944, II, 324.

Properties of alkaline phosphatase II with various M_2 [metallic activators] and M_2-free apophosphatase. R. Cloetens (*Biochem. Z.*, 1941, **310**, 42—53; cf. A., 1944, III, 288).—Alkaline phosphatase II contains two groups, G_1 and G_2, capable of combination with two metal ions M_1 and M_2. The linking G_1–M_1 is readily dissociated (*e.g.*, by simple dialysis) whilst G_2–M_2 is more stable and requires dialysis against 0·01M-KCN for rupture. With Zn as M_2, active phosphatases are obtained with Ca, Mg, Mn, Co, and Ni as M_1; also with Ca, Mg, or Co as M_1 and Co or Hg as M_2. The affinity for substrate of the Mg–Co enzyme is greater than that of the Mg–Zn enzyme: this is related to the activity–pH relationship, the activity of the former increasing with pH over the range 8·7—9·9, whilst the latter has an optimum pH of 9·4 (0·01M-Na β-glycerophosphate as substrate). Mg appears to have its greatest affinity for the phosphatase with Hg as M_2. The Mg–Co enzyme is more strongly inhibited by metallic ions than are the Mg–Zn and Mg–Hg enzymes; a similar difference is shown by complex-forming substances (*e.g.*, cysteine, KCN). Dog's plasma contains a Zn-phosphatase. The M_2-free apophosphatase occurs in two forms, which can be differentiated by activation by Zn and change in activity with pH; the type more rapidly inactivated by Zn is inactivated at pH 9·6 and stable at pH 5·0 and 6·4, whilst the other type is stable at pH 9·6 and inactivated at pH 5·0 and 6·4. F. O. H.

Preparation of glucose 1-phosphate.—See A., 1944, II, 325.

Hydrolyses of maltohexaose.—See A., 1944, II, 326.

Comparative value of bromsulphalein, serum-phosphatase, prothrombin time, and intravenous galactose tolerance tests in detecting hepatic damage produced by carbon tetrachloride.—See A., 1944, III, 596.

Organisation of active biochemical substances in the cell. R. Nilsson (*Naturwiss.*, 1943, **31**, 25—35).—A review of fermentation by living and dried yeast and yeast maceration juice. Extract of ground dried yeast contains a hitherto unknown fermentation enzyme which acts like the living yeast cell although apparently separated from the cell. W. McC.

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

Production of true pilei of *Polyporus brumalis* (Pers.) Fr. in artificial culture. S. N. Banerjee and B. K. Bakshi (*Current Sci.*, 1944, **13**, 102—103).—Cultures in the medium described by Badcock (*Trans. Brit. Mycol. Soc.*, 1941, **25**, 2) in 1-l. Erlenmeyer flasks gave good growth and the formation of fruit-body stalks in a month. Pilei did not develop until the cotton-wool plug was removed, suggesting that abundant O_2 was the most important factor for their development. F. S.

Gliotoxin, the antibiotic principle of *Gliocladium fimbriatum*.—See A., 1944, II, 310.

Configuration of valylvaline in gramicidin.—See A., 1944, II, 324.

Dissimilation of glucose by *Chætomium funicola*, Cke. III. Some phosphorus relationships of *Ch. funicola*. G. Semeniuk (*Iowa State Coll. J. Sci.*, 1944, **18**, 325—358; cf. A., 1943, III, 919).—P was continually removed by *Ch. funicola* from Czapek–Dox medium throughout a 23 days' growth period. Higher initial concns. of P yielded correspondingly higher total and % P in the mycelium. The initial pH of the medium did not influence the removal of P except when high or low pH retarded growth. At 10—23 days' growth, 20% of the P in the medium was a non-orthophosphate-P fraction containing labile P and org. P of a type resistant to hydrolysis. In macerated mycelial preps. incubated at 30°, the predominating reaction was autocatalytic mineralisation of P. Max. increases of 10—27% in total acid-sol. P and 50—200% in org. orthophosphate-P were obtained in 18 hr. Labile P and org. P hydrolysed by acid in 3 hr. generally decreased with progressive autolysis, and org. P resistant to hydrolysis showed initial increases with subsequent decreases, suggesting an origin in some acid-sol. fraction. Respirometer tests of macerated preps. revealed characteristically oxidative endogenous activity and exogenous activity suggestive of respiration with an initial fermentative phase. Direct attempts to demonstrate phosphorylation in carbohydrate metabolism showed neither phosphoglyceric acid formation nor P uptake. Formation of methylglyoxal, pyruvic acid, and acetaldehyde was readily demonstrated. F. S.

Leucineless mutant of *Neurospora crassa*. D. C. Regnery (*J. Biol. Chem.*, 1944, **154**, 151—160).—A single gene mutation of *N. crassa*, induced by ultra-violet light, destroyed the ability of the mould to synthesise leucine, which had to be supplied to the mutant to maintain growth, and to initiate germination. While only *l*-leucine or α-keto*iso*hexoic acid would initiate growth, once induced growth could be maintained by certain peptides and proteins, and by leucic acid. In the presence of *l*-leucine *iso*valeric acid, *iso*amyl alcohol, *iso*valeraldehyde, and *d*-leucine will further stimulate growth. The dry wt. of mycelium produced is approx. proportional to the concn. of leucine. J. F. M.

Ornithine cycle in *Neurospora* and its genetic control. A. M. Srb and N. H. Horowitz (*J. Biol. Chem.*, 1944, **154**, 129—139).—Seven genetically and biochemically different argininеless strains of *N. crassa* are described, the argininеless character being inherited as a single gene. The mutant strains are classified into (1) those able to grow on arginine, ornithine, or citrulline; (2) those able to use arginine or citrulline but not ornithine; (3) one mutant with a sp. requirement for arginine. This suggests that synthesis of arginine occurs in the stages ornithine → citrulline → arginine and it is confirmed by the growth requirements of double mutant strains obtained by crossing different argininеless mutants. *Neurospora* contains arginase and urease. H. G. R.

Morphology and physiology of a strain of *Candida albicans* associated with vaginitis. B. Studt (*Amer. J. Bot.*, 1941, **28**, 509—516).—The morphology and biochemical activities of the fungus are examined under laboratory conditions. The N rather than the C source is the main factor limiting growth. A. G. P.

Effect of cold on repair of radiation damage in yeast and bacteria. R. Latarjet (*Compt. rend.*, 1943, **217**, 186—188).—Like *Ascaris* ova, yeast (*S. ellipsoideus*) maintained at 5° retains its metabolic activity and damage by radiation is suppressed. In *B. paradysenteriæ Y* the primary damage caused by radiation remains latent and becomes apparent on rise in temp., owing to the inability of the organism to repair the primary lesion, and the simultaneous abolition of metabolic and regenerative processes. P. G. M.

Mechanism of enzymic adaptation in genetically controlled yeast populations. S. Spiegelman, C. C. Lindgren, and L. Hedgecock (*Proc. Nat. Acad. Sci.*, 1944, **30**, 13—23).—The use of double-layered agar test plates permits an examination of the phenotypic homogeneity of yeast populations with respect to ability of individual members to produce gas from galactose. The method was applied to the study of the mechanism of enzymic adaptation in a haploid and a diploid strain of yeast. Adaptation in the haploid only occurred in increasing populations but in the diploid it occurred in the absence of cell division. In studies of enzyme synthesis, a knowledge of the genetic background and phenotypic composition of initial populations is necessary to avoid complicating the problem by the kinetics of competitive interaction between phenotypes. J. D. B.

Utilisation of aneurin by baker's yeast. E. Sperber and S. Renvall (*Biochem. Z.*, 1941, **310**, 160—169).—The yeast aërobically utilises added aneurin at a rapid rate, especially in presence of glucose or alcohol. The uptake anaërobically is slight and increased by addition of glucose but not by that of alcohol. The uptake occurs in two phases, viz., a rapid adsorption-like process and, after an induction period of 5—40 min., a slower phase. The aneurin removed from the medium is converted into cocarboxylase by the yeast without significant loss. F. O. H.

Decomposition of pyruvic acid by disorganised baker's yeast. J. Runnström, K. Brandt, and R. Marcuse (*Arkiv Kemi, Min., Geol.*, 1943, **17, A**, No. 3, 31 pp.).—A dried yeast (*D*1) causes only slight oxidation, but considerable decarboxylation, of added pyruvic acid. There is no dismutation of the acetaldehyde so formed. After 18 hr. aëration of dried *D*1 in presence of glucose, pyruvic acid is only very slowly attacked and reaction proceeds as with fresh poor yeast. After drying for many weeks, another yeast (*D*5) decomposes pyruvic acid similarly to a fresh yeast, but the decomp. resembles that produced by fresh *D*1. Aërobic decomp. of pyruvic acid yields more acetaldehyde the older is the dried *D*5 yeast. This agrees with the suggestion that acetaldehyde is an intermediate in the aërobic decomp. of pyruvic acid by baker's yeast although with fresh yeast acetaldehyde formation is not detected. With fresh *D*1 and dried *D*5 yeast the acetaldehyde formed is dismuted to alcohol and acetic acid. Under anaërobic conditions the older is the *D*5 dried yeast the greater is the extent of decarboxylation of pyruvic acid, whilst under these conditions fresh baker's yeast does not attack pyruvic acid. After aëration, dried *D*5 yeast resembles fresh yeast. When dried yeast is shaken with aq. solutions, N compounds from the cells dissolve in the suspension liquid. After shaking under anaërobic conditions there is marked decrease in aërobic decomp. of pyruvic acid, whilst the anaërobic decomp. is nearly or completely inhibited. The brei obtained by grinding fresh *D*5 yeast does not oxidise, but decarboxylates, pyruvic acid. Maceration juice from *D*1 yeast behaves similarly, but *D*5 does not yield such a juice. After freezing of dried yeast at −80° and subsequent thawing, oxidation of pyruvic acid is markedly decreased whilst there is considerable decarboxylation. *D*1 dried yeast does not attack glucose in presence of hexose diphosphate or yeast extract, but after aëration for 16 hr. decomp. of glucose occurs. J. N. A.

Optimum amount of phosphate and magnesium in culture media for yeast growth. H. F. Fang and I. C. Wang (*Golden Sea J.*, 1943, **4**, 92).—1 l. of culture medium [$(NH_4)_2SO_4$ 1 g., $MgSO_4$ 0·5 g., KCl 1 g., sucrose 75 g., malt juice 10 ml.] was distributed between 10 flasks, with addition of various amounts of $Na_2HPO_4,12H_2O$ (0·01—2·00 g.) and lactic acid to adjust the pH val. After sterilising, it was inoculated with a pure yeast culture. A similar run used 1 l. of culture medium [KH_2PO_4 1 g., $(NH_4)_2SO_4$ 1 g., sucrose 100 g., malt juice 10 ml.] with the addition of varying amounts of $MgSO_4$. Addition of 0·3% of $Na_2HPO_4,12H_2O$ or 0·5% of $MgSO_4$ gave max. production of CO_2.

Synchronous sporulation with possible reference to malarial parasites. A. S. Householder (*Bull. Math. Biophysics*, 1943, **5**, 149—154).—The mathematical expressions which purport to show that "sporulation may be synchronous" are based on the following assumptions: transformation of segmenter into schizonts occurs only as a result of the segmenter reaching a fixed crit. radius; the growth of the cell to the crit. radius results from the excess of intake of "*n*" metabolites over elimination of their resultant waste products; the rate of consumption of the "*n*" metabolites is controlled by the concn. of a single "limiting factor" metabolite, and this is liberated from storage organs of the host and subsequently disappears exponentially once during each day. P. D. M.

Duration of immunity to *Plasmodium knowlesi* malaria in rhesus monkeys. J. Maier and L. T. Coggeshall (*J. Exp. Med.*, 1944, **79**, 401—430).—Rhesus monkeys with *P. knowlesi* infections were treated with Na sulphathiazole and reinoculated intraperitoneally with homologous strains of the plasmodium. There was no acquired immunity on reinfections 3 and 10 weeks after the first illness. In monkeys treated with immune sera or quinine partial immunity persisted up to 1 year after sterilisation of the infection with Na sulphathiazole. The end point at which immunity disappears seems to be independent of the length of the chronic infection. A. S.

Action of penicillin and other antibiotics on *Treponema pallidum*.—See A., 1944, III, 606.

Recovery of agar from used media. B. S. Roy and J. N. Ray (*Current Sci.*, 1944, **13**, 98—99).—The used agar is autoclaved, filtered hot through muslin, and then allowed to gel in shallow dishes under water. The gel is broken into small pieces and washed until the washings give no ppt. with the $FeCl_3$ reagent for inhibitory substances. F. S.

Simple method for the manufacture of agar from *Gracilaria lichenoides*. P. D. Karunakar, M. S. Raju, and S. Varadarajan (*Current Sci.*, 1944, **13**, 99).—The dried seaweed is washed and then soaked in 1% HCl to remove $CaCO_3$ and again washed until it is acid-free. After bleaching and drying in the sun it is extracted in boiling water successively until the extract fails to gel. The gel is cut in small pieces, soaked twice for 48 hr. in distilled water, and then thoroughly washed and dried. The yield of agar is about 20% of the dry wt. of the seaweed. F. S.

Effect of media composition on numbers of bacterial and fungal colonies developing in Petri plates. L. E. Tyner (*Soil Sci.*, 1944, **57**, 271—274).—Numerous substances were examined with the object of restricting the growth of "spreading" colonies of bacteria and fungi in soil counts. H_3BO_3 added to synthetic media or potato–glucose–agar suppressed the growth of bacteria but permitted satisfactory counts of fungi. Substitution of H_2SO_4 for H_3BO_3 resulted in much smaller fungal counts. A. G. P.

Culture, general physiology, morphology, and classification of the non-sulphur purple and brown bacteria. C. B. van Niel (*Bact. Rev.*, 1944, **8**, 1—118).—(101 photomicrographs.) F. S.

Cation adsorption by bacteria. T. M. McCalla (*J. Bact.*, 1940, **40**, 23—32).—The adsorption capacity per 100 g. of *Bact. coli* was 35—47 m-equiv. for H ion, and 6—14 and 20—24 m-equiv. for methylene-blue in concns. of 0·0004M. and 0·0016M. respectively. Adsorbed Mg was slightly or not at all replaced by Na or K whereas the vals. obtained by replacement of Mg with Ca, Ba, H, and Mn were within the range of 16·5—54 m-equiv. per 100 g. The mechanism of bacterial absorption is discussed. F. S.

Physico-chemical behaviour of soil bacteria in relation to the soil colloid. T. M. McCalla (*J. Bact.*, 1940, **40**, 33—43).—Methylene-blue adsorbed on soil bacteria may be replaced by other cations. The degree of adsorption of the replacing ion determines how much methylene-blue is replaced. The order of the adsorption series is $Na < NH_4 < K < Mg < Ca < Ba < Mn < Al < Fe < H$. It is suggested that soil bacteria obtain their mineral needs by contact exchange of adsorbed ions between the bacterium and clay particles. F. S.

Activity of micro-organisms in transformation of plant materials in soil under various conditions.—See B., 1944, III, 190.

Use of lucerne extract to supply nutrients for growth and chemical activities of *Acetobacter suboxydans*. E. I. Fulmer, A. C. Bantz, and L. A. Underkofler (*Iowa State Coll. J. Sci.*, 1944, **18**, 369—376).—Lucerne extracts (acidic, alkaline, or aq.) provide the nutrients necessary for satisfactory growth of *A. suboxydans*; acid extracts give the best results. All extracts were, however, inferior to yeast extract for this purpose. Growth of the organism in media prepared from dried lucerne extract approached that obtained with an equal wt. of dried yeast extract and yields of keto-compounds from glycerol, sorbitol, or $\beta\gamma$-butylene glycol were similar. A. G. P.

Fermentability of stereoisomeric butane-$\beta\gamma$-diols by *Acetobacter suboxydans*. L. A. Unterkofler, E. I. Fulmer, A. C. Bantz, and E. R. Kooi (*Iowa State Coll. J. Sci.*, 1944, **18**, 377—379).—*A. suboxydans* oxidises *meso*- and *l*-butane-$\beta\gamma$-diol but not the *d*-isomeride to acetylmethylcarbinol. A. G. P.

Value of certain tests in the differentiation of *Lactobacillus bulgaricus* from *L. acidophilus*. J. M. Sherman and H. M. Hodge (*J. Bact.*, 1940, **40**, 11—22).—*L. bulgaricus* is unable to make repeated growth in a lactose–peptone–yeast extract broth, is unable to grow in media containing 2·5% of NaCl, does not grow in broth at pH 7·8, rarely grows at 15°, and never grows at 50°. *L. acidophilus* is not inhibited by these conditions. F. S.

Growth factors for *Lactobacillus casei* ε. F. W. Chattaway, D. E. Dolby, and F. C. Happold (*Proc. Biochem. Soc.*, 1944, **38**, xvi—xvii).—The amyl alcohol-insol. fraction of liver extracts at pH 3 has been split into 2 fractions, neither of which is folic acid. Growth factors also exist in the amyl alcohol-sol. portion and are not adsorbed on fuller's earth at pH 3. They are adsorbed on active C and are sol. in phenols, from which two fractions are separated by treatment with saturated aq. $Ba(OH)_2$. The $Ba(OH)_2$ ppt. is extracted with dil. H_2SO_4. P. G. M.

Purity of synthetic *dl*-leucine.—See A., 1944, II, 250.

Production of β-hydroxybutyric acid by Lemoigne's *M* bacillus. P. Heitzmann (*Ann. Inst. Pasteur*, 1943, **69**, 27—38, 87—94).—In anaërobic conditions and in the presence of glucose, the *M* bacillus reduces acetoacetic acid to *l*-β-hydroxybutyric acid. This oxidation–reduction reaction is optimal at pH 7 and liberates 5 times as much acid as from autolysis alone. In the presence of glucose or acetoacetate alone, no more acid is produced than in the absence of substrate. During the course of the oxidation–reduction reaction, glucose is transformed into lactic and acetic acids. The *M* bacillus produces small amounts of acetoacetic acid from glucose. F. S.

Lactic acid fermentation of streptococci under aërobic conditions. J. C. White and J. M. Sherman (*J. Dairy Sci.*, 1943, **26**, 371—374).—Cultures of organisms representative of pyogenic, viridans, and lactic streptococci, and enterococci were grown under non-aërobic and under strongly aërobic conditions. In all cases lactic acid production was considerably less with vigorous aëration. *S. lactis* frequently showed only feeble growth under these conditions, one of the 4 strains used failing to produce measurable fermentations. N. J. B.

Bacterial flora of pasteurised milk.—See B., 1944, III, 209.

Iron deficiency in bacterial metabolism. W. S. Waring and C. H. Werkman (*Arch. Biochem.*, 1944, **4**, 75—87).—Fe deficiency in *Aërobacter indologenes* results in suppression of the catalase, peroxidase, formic hydrogenlyase, formic dehydrogenase, and hydrogenase activities. The Fe-deficient cells show no cytochrome bands. Fermentation of glucose by Fe-deficient cells gives high yields of formic and lactic acids, a low yield of CO_2, and no succinic acid or H_2 gas. An Fe-containing electron mediator operates in the formic hydrogenylase enzyme system. E. R. S.

Ecological study of the coliform bacteria. A. M. Griffin and C. A. Stuart (*J. Bact.*, 1940, **40**, 83—100).—The distribution of 6577 strains of coliform organisms indicated that *Aerobacter* and intermediates constitute the normal coliform flora of non-fæcal materials, while *Escherichia* are normal to fæces. F. S.

Agglutinogen common to certain strains of lactose- and non-lactose-fermenting coliform bacilli. (Lord) Stamp and D. M. Stone (*J. Hygiene*, 1944, **43**, 266—272).—Certain motile and non-motile strains of lactose- and non-lactose-fermenting coliform bacilli possess a common agglutinogen, distinct from "*H*," "*O*," and rough antigens and the "*X*" antigen of Topley and Ayrton. It resembles the Vi antigen of Felix and Pitt in its inhibition of "*O*" agglutination. It is not associated with virulence and is widely distributed. Subculture of the strains under certain conditions results in loss of the antigen and development of sp. variants. Agglutinins to these strains in certain diagnostic sera are a possible source of error. J. H. B.

Antigenic relationships of coliform bacteria. C. A. Stuart, M. Baker, A. Zimmerman, C. Brown, and C. M. Stone (*J. Bact.*, 1940, **40**, 101—142). F. S.

Fluorescence and absorption spectral data for pterin-like pigments synthesised by the diphtheria bacillus and isolated by chromatographic analysis. M. O'L. Crowe and A. Walker (*J. Opt. Soc. Amer.*, 1944, **34**, 135—140).—Pigments found in ultrafiltrates of diphtheria toxin have been separated by chromatographic analysis. Yellow-fluorescing material from the top of the column has ultra-violet absorption and fluorescence emission very similar to those for xanthopterin and uropterin. B. S. C.

Simple medium for detection of *Corynebacterium diphtheriæ*. P. M. Anderson (*Med. J. Austral.*, 1944, I, 213—215).—2·5 c.c. of glycerol are added to 5·0 c.c. of defibrinated sheep blood and the mixture is stored in the refrigerator for 3 weeks with occasional shaking to ensure complete hæmolysis. The medium is prepared by adding 20 c.c. of the glycerolated blood and 4 c.c. of 2% tellurite to 100 c.c. of nutrient agar. The results of culture of 752 throat swabs compared with Loeffler's medium were: both negative 406, both positive 212, tellurite only positive 119, Loeffler only positive 15. F. S.

Rôle of carbon dioxide in metabolism of *Clostridium thermoaceticum*. H. A. Barker (*Proc. Nat. Acad. Sci.*, 1944, **30**, 88—90).—*Cl. thermoaceticum* ferments glucose anaërobically with the formation of somewhat more than 2·5 mols. of acetic acid and a trace of CO_2 per mol. of glucose fermented (cf. Fontaine *et al.*, A., 1943, III, 281). The corresponding yields from the fermentation of 100 m-mol. of *l*-xylose and pyruvate were: acetic acid 223 and 109, CO_2 2·3 and 51·3 m-mol., respectively. These results are consistent with the hypothesis that the acetic acid fermentation of this organism may be regarded as an anaërobic oxidation of glucose by means of CO_2 as expressed by the equations: oxidation, $C_6H_{12}O_6 + 2H_2O = 2CH_3{\cdot}COOH + 2CO_2 + 8H$; reduction, $8H + 2CO_2 = CH_3{\cdot}COOH + 2H_2O$; net reaction, $C_6H_{12}O_6 = 3CH_3{\cdot}COOH$. F. S.

Serological identification of dysentery bacilli. K. M. Wheeler (*Amer. J. Publ., Health*, 1944, **34**, 621—629).—The technique employed utilises a slide agglutination test employing formalinised antigens and titrated and adsorbed typing fluids. C. J. C. B.

Value of selective medium of Wilson and Blair for isolation of dysentery bacilli. T. S. Gregory (*Med. J. Austral.*, 1944, I, 319—320). F. S.

[Treatment and recognition of] bacillary dysentery in Dundee. W. M. Jamieson, J. Brodie, and D. Stiven (*Brit. Med. J.*, 1944, I, 322—324).—The use of sulphaguanidine in bacillary dysentery gives results superior both clinically and bacteriologically to those from aperients and chalk, but even with sulphaguanidine 30% of cases remain bacteriologically positive in convalescence. The use of C.R.A. broth-enrichment technique gives many positive results which are missed if direct plating only is employed. I. C.

Carrier state in Sonne dysentery. J. G. Hailwood (*Brit. Med. J.*, 1944, I, 306—307).—A chronic symptomless carrier spread the infection by food during his duties in the cook-house. Removal of all the infected cases in the cook-house stopped the outbreak. I. C.

Gonococcus cultures. State laboratory service. M. W. Higginbotham (*Amer. J. Publ. Health*, 1944, **34**, 643—647).—Cultures of shipped specimens using chocolate agar were superior to microscopical examination alone, although not as good as immediate culture. C. J. C. B.

Correlation of *in-vitro* sulphonamide resistance of the gonococcus with results of sulphonamide therapy.—See A., 1944, III, 607.

Meningitis due to Pittman and non-Pittman strains of *H. influenzæ*. J. Gordon, H. E. de C. Woodcock, and K. Zinnemann (*Brit. Med. J.*, 1944, I, 779—781).—Two cases of meningitis caused by *H. influenzæ* belonging to strains different from any of the six Pittman types and apparently identical with the strains commonly isolated from respiratory conditions were successfully treated with sulphapyridine. Three other cases of meningitis are described: they were due to *H. influenzæ* type 6 (Pittman). In two of them no adequate treatment could be instituted; in the third case sulphapyridine treatment was successful. All cases of meningitis due to *H. influenzæ* should be typed in order to determine possible differences in prognosis and treatment. I. C.

Bilateral adrenal hæmorrhage [Waterhouse–Friderichsen syndrome] associated with meningococcal septicæmia.—See A., 1944, III, 589.

Optical activity of copper complexes of polysaccharides. [Polysaccharide of *Phytomonas tumefaciens*.]—See A., 1944, II, 326.

Nutritional requirements of a strain of type III pneumococcus. E. Badger (*J. Bact.*, 1944, **47**, 509—518).—The factors necessary for the growth of type III (CHA) pneumococcus were a casein acid hydrolysate, cystine, KH_2PO_4, $MgSO_4$, nicotinic acid, pantothenic acid, biotin, choline, glucose, and ascorbic acid. The addition of creatine, asparagine, or thiamin increased the rate of growth but was not essential. Cystine could be replaced by cysteine or glutathione but not by methionine, homocysteine, or thioglycollic acid.

Ethanolamine in 10 times the molar concn. of choline could replace choline. Virulence and type specificity were maintained after repeated subculture in this semi-synthetic medium. F. S.

Pyrogens. I. Isolation of pyrogens from various micro-organisms. E. S. Robinson and B. A. Flusser (*J. Biol. Chem.*, 1944, **153**, 529—534).—Pyrogens were obtained from *Proteus vulgaris*, *Eberthella typhosa*, and *Pseudomonas aëruginosa* by extraction with acid–acetone, dialysis, and removal of proteins by extraction with phenol. The preps. contained no N or carbohydrate. The ash varied, but on an ash-free basis the C : H ratio was fairly const. at 1 : 2. The typhoid prep. was homogeneous in the ultracentrifuge and had mol. wt. 62,000. R. L. E.

Use of *B. proteus OX* 19 agglutination in diagnosis of cancer.—See A., 1944, III, 598.

(A) Description of some colour variants produced by *Serratia marcescens*, strain 274. (B) Production of stable populations of colour variants of *Serratia marcescens* in rapidly growing cultures. M. I. Bunting (*J. Bact.*, 1940, **40**, 57—68, 69—81).—(A) This strain of *B. prodigiosus* when grown on a well-buffered NH_4 citrate–glycerol medium produced colonies of 4 principal colour types: dark red, bright pink, pale pink, and white. When the colonies were replated they invariably gave rise to daughter colonies in const. proportions of one or more variant types in addition to the parent type. The pigments in cells from the dark red colonies contained 2 major components.

(B) Cultures were maintained in the logarithmic phase by repeated transfer when their turbidities indicated the presence of approx. 10 million cells per ml., *i.e.*, about once every 12 hr. Under these conditions all 4 variants eventually came to equilibrium with about 97% of dark red type cells and 3% of bright pink type cells. F. S.

Occurrence of members of genus *Salmonella* in inhabitants of State hospitals of greater Chicago area. O. Felsenfeld and V. M. Young (*J. Lab. clin. Med.*, 1944, **29**, 375—382). C. J. C. B.

Strain of *Shigella paradysenteriæ* (Flexner) requiring uracil. S. H. Hutner (*Arch. Biochem.*, 1944, **4**, 119—122).—A typical Flexner strain of the organism, possessing a main antigen identical with race *V* of Andrewes (Flexner I Boyd), requires uracil, nicotinic acid or nicotinamide, and tryptophan (which may be replaced by indole but not anthranilic acid). E. R. S.

Subacute endocarditis associated with infection with a spirillum. W. M. Hitzig and A. Liebesman (*Arch intern. Med.*, 1944, **73**, 415—424). C. J. C. B.

Staphylococcus empyema in infants and children. C. M. Riley (*J. Pediat.*, 1944, **24**, 577—584).—A review of 29 cases. C. J. C. B.

Nutritional status of *Staphylococcus aureus* as influenced by proflavine. G. J. Martin, and C. V. Fisher (*J. Lab. clin. Med.*, 1944, **29**, 383—389).—Proflavine (2 : 8-diaminoacridine) produces bacteriostasis in *Staphylococcus aureus* cultures by inhibiting adenine-containing physiologically important factors, *i.e.*, adenylic acid, co-enzymes 1 and 2, and adenine flavine dinucleotide. The action of proflavine is inhibited by adenine, adenylic acid, cozymase, and nucleic acid (yeast). Metabolic intermediates of the action of these agents including glutamic, lactic, acetic, pyruvic, and gluconic acid inhibit the action of the acridine. C. J. C. B.

Aminobenzoic acid production by staphylococci. W. W. Spink, L. D. Wright, J. J. Vivino, and H. R. Skeggs (*J. Exp. Med.*, 1944, **79**, 331—339).—Staphylococci produce diazotisable material which can be converted into a dye and the intensity of the colour reaction can be determined. Sulphonamide-resistant strains produce more diazotisable substance than non-resistant strains. The colour development can be inhibited by a soil bacillus (Mirick) adapted to oxidise *p*-aminobenzoic acid. The diazotisable substance inhibits the antistaphylococcal action of Na sulphathiazole to the same degree as equiv. amounts of *p*-aminobenzoic acid. Sulphonamide-resistant strains produce more *p*-aminobenzoic acid than sulphonamide-sensitive strains. A. S.

Relationship of serological groups *A*, *B*, and *C* of Lancefield to the type of hæmolysis produced by streptococci in poured blood-agar plates. L. A. Rantz and M. L. Jewell (*J. Bact.*, 1940, **40**, 1—8).—After 24 hr. incubation in poured blood–agar plates group *A* colonies were surrounded by an area of almost complete hæmolysis, 1·5—3·5 mm. in diameter, with a sharp border; group *B* colonies had an area of incomplete hæmolysis, about 2·5 mm. in diameter, with a diffuse border; and group *C* colonies were large and surrounded by an area of clear hæmolysis diminishing to the periphery and 3—5 mm. in diameter with an indefinite border. F. S.

Transmissibility of hæmolytic streptococcal infection by flies. R. A. Shooter and P. M. Waterworth (*Brit. Med. J.*, 1944, I, 247—248).—Of 27 flies caught in surgical wards 3 gave sterile plates, 9 cultures containing hæmolytic streptococci, and the remainder grew a variety of other organisms. From flies caught in the laboratory, no hæmolytic streptococci were grown in any culture. Flies may thus be transmitting agents for some streptococcal infections in surgical wards. I. C.

Hospital dust. L. P. Garrod (*Brit. Med. J.*, 1944, I, 245—247).—In wards where there are patients with hæmolytic streptococcal infections hæmolytic streptococci are more numerous in floor dust than in dust collected from sites on or close to the windows. They are more numerous also in dark wards (poorly lit ground floor 72%) than in more lit wards (first floor 18%). Ordinary diffuse daylight is bactericidal to hæmolytic streptococci; the interposition of glass does not prevent this action. Streptococci survive in dark rooms for several months. Natural lighting may therefore be a factor in preventing atm. spread of infection in surgical wards. I. C.

Rôle of mucoid polysaccharide (hyaluronic acid) in virulence of group *A* hæmolytic streptococci. E. H. Kass and C. V. Seastone (*J. Exp. Med.*, 1944, **75**, 319—330).—A turbidimetric method of measuring hyaluronidase activity, based on the decrease of the capacity of the polysaccharide to ppt. acidified protein, is described. 2 units of hyaluronidase are equiv. to 1 viscosity-reducing unit. Hyaluronidase added to a phagocytic system with defibrinated human blood greatly increases the rate of phagocytosis of group *A* hæmolytic streptococci; the phagocytosis of type I pneumococci is not affected. The enzyme increases the bactericidal activity of non-immune blood against group *A* streptococci; it inhibits the activity of immune blood but does not affect pneumococci. 200 turbidity reducing units of the enzyme, frequently given, protect mice against group *A* infection; this protective effect is destroyed by heating at 60° for 1 hr. A. S.

Group *A* hæmolytic streptococcus antibodies. Simultaneous infection of large number of men by single type. L. A. Rantz and G. Dole (*Arch. intern. Med.*, 1944, **73**, 238—240).—118 men of comparable age infected by a single type group *A* hæmolytic streptococci were examined. Great variation in the initial antistreptolysin titres was demonstrated. There was no correlation between the initial antistreptolysin titre and the presence of a rash. There was a relationship between the initial level and the absence of tonsils. Striking differences in the magnitude of antistreptolysin response were observed. These were closely correlated with the initial antibody titre. 14% of the group acquired agglutinins for the homologous type of streptococci. C. J. C. B.

Experimental *Streptobacillus moniliformis* arthritis in chick embryo. G. J. Buddingh (*J. Exp. Med.*, 1944, **80**, 59—64).—Inoculation of chorio-allantois of the chick embryo by a strain of *S. moniliformis* isolated from a case of rat bite fever in man produced an infection of the blood stream and almost exclusive localisation of the infection in the synovial linings of the joints. Conditions for the growth of the organism within the cytoplasm of the synovial lining cells are maintained only temporarily and the infection appears to be self-limiting. A. S.

Experimental epidemiology of tuberculosis. I. Prevention of natural airborne contagion in rabbits by ultra-violet radiation. M. B. Lurie, H. Tomlinson, and S. Abramson. **II. Hereditary resistance to attack and ensuing disease and effect of concentration of tubercle bacilli on these phases of resistance.** M. B. Lurie (*J. Exp. Med.*, 1944, **79**, 559—572, 573—589).—By ultra-violet irradiation of low intensity of room air rabbits of high natural resistance are protected against air-borne tuberculous infection though they become tuberculin-sensitive; it fails to protect a small proportion of rabbits of low natural resistance from fatal tuberculosis. With ultra-violet radiation of high intensity all rabbits are completely protected without development of tuberculin-sensitivity although the exposure is fatal to non-protected rabbits. The radiation has bactericidal effects.

II. Hereditary resistance to attack by air-borne tubercle bacilli may be independent of resistance to the ensuing disease, and vice versa. The incidence of infection and the character of the disease are affected by increasing concns. of tubercle bacilli in the environment of rabbits with high hereditary resistance to the disease. A. S.

Wartime incidence and mortality from respiratory tuberculosis. P. Stocks and E. Lewis-Faning (*Brit. Med. J.*, 1944, I, 581—583).—In the period 1923—39, despite the rapid fall in the no. of notifications of and deaths from respiratory tuberculosis, the average expectation of death from the disease for a person just notified remained const. at about ½ in England and Wales. Immediately before the war the average expectation of dying within one year of notification was about 22% and within 5 years 44%. In Middlesex 43·5% eventually died of tuberculosis and the curve of the rate of dying was similar to that for the country. If the incidence of new cases had continued to decrease, about 6000 fewer deaths would have occurred during the period 1940—1943. Owing to a temporary rise in short-term fatality in 1940—1941 about 2500 notified patients died in these years instead of in 1942—1943 as expected. Another 1500 notified persons and 1000 unnotified cases, who in normal circumstances would not have died, must have died of respiratory tuberculosis in 1940—1941. I. C.

Human pulmonary tuberculosis of bovine origin in Great Britain. A. S. Griffith and W. T. Munro (*J. Hygiene*, 1944, **43**, 229—240).—The results of an investigation of 6963 cases of pulmonary tuberculosis in the British Isles are summarised. The proportion of infections with bovine strains showed wide regional variations and increased progressively from the south of England (incidence 0·6%) to the north of Scotland (25·8% in the Orkneys). Human to human infection was disproved in two families, in four it was presumptive. 9 out of 13 autopsies indicated the alimentary canal as the route of infection. J. H. B.

Pulmonary tuberculosis of bovine origin. L. J. Cutbill and A. Lynn (*Brit. Med. J.*, 1944, I, 283—285).—Of 2100 cases of tuberculosis, 48 (2·3%) were due to bovine type of bacilli. Infection from milk probably occurred in 33% of cases. In 10 cases (21%) the infection was possibly by direct contact with cattle. In three families there were two bovine cases in each; the original source of infection was probably contact with tuberculous cattle and the subsequent infection of the other member was due to human transmission. Infections from milk, from human to human, from cattle to human, and from human to cattle are discussed. I. C.

Comparative results with transdermal (or transcutaneous) and intracutaneous tuberculin tests. H. J. Corper (*J. Lab. clin. Med.*, 1944, **29**, 398—403).—A transdermal test with tuberculin (prepared from an autolytic tuberculin) and an intradermal test with a purified protein tuberculin (prepared from the same original bacillary cultures) gave similar results in 103 patients, 90 were positive by the transdermal and 89 by intradermal injection. Agreement between the 2 tests occurred in 82 of the positive tests. In the 64 definitely tuberculous cases tested, the agreement was 58 for the transdermal and 62 for the intradermal tests. C. J. C. B.

Lipins of tubercle bacilli. LXVI. Structure of tuberculostearic acid.—See A., 1944, II, 319.

Production and properties of BRF direct cholera vaccine. R. K. Jennings, and R. W. Linton (*J. Franklin Inst.*, 1944, **238**, 65—70).—*Vibrio choleræ* is grown in a liquid medium consisting of tryptic digest of casein, salts, and glucose. The culture is continuously aërated with air to which 20% of CO_2 is added. Growth is complete at 24 hr., when the culture is sterilised with Hg phenyl acetate. The entire culture may be used directly as a vaccine without further manipulation. F. S.

Immunological relationships among central nervous system viruses. J. Casals (*J. Exp. Med.*, 1944, **79**, 341—359).—In complement fixation, neutralisation, and intraperitoneal cross-resistance tests Russian encephalitis and louping-ill viruses showed close relationship, but not in intracerebral cross-resistance tests. The viruses were not related to Japanese *B*, St. Louis, and West Nile types of encephalitis, which showed a certain degree of relationship to each other. Western equine encephalomyelitis virus was not related to any of these viruses. Japanese *B* serum reacted with St. Louis and West Nile antigens; St. Louis and West Nile sera reacted with Japanese antigen. In neutralisation tests with mouse sera no relationship amongst these three viruses was found; with hamster or guinea-pig sera Japanese serum protected against West Nile and St. Louis viruses, St. Louis serum against West Nile and West Nile serum against Japanese viruses. No relationship between these three viruses was found in intracerebral and intraperitoneal cross-resistance tests. The homologous titres of complement-fixing antibodies and heterologous reactions of mouse sera gradually declined in the period after vaccination, the complement-fixing antibodies in hyperimmune sera reaching on the 50th day levels of $\frac{1}{4}$—$\frac{1}{8}$ of those on the 10th day following vaccination; the levels of neutralising antibodies did not alter in this period, except with Japanese *B* virus. A. S.

Bloodsucking vectors of encephalitis: experimental transmission of St. Louis encephalitis (Hubbard strain) to white Swiss mice by American dog tick, *Dermacentor variabilis* Say. R. J. Blattner, I. M. Heys, and M. B. McDonald (*J. Exp. Med.*, 1944, **79**, 439—454).—The common dog tick, by feeding on inoculated animals, can be infected with the St. Louis encephalitis virus and can transmit to normal animals. A female tick can transmit the infection through all stages of metamorphosis of the 2nd generation into the 3rd. Ticks infected under laboratory conditions and kept at 12·5° remained infective for at least 10 months; eggs laid by an infected tick and stored at 12·5° for 10 months remained infective and larvæ hatched from such eggs were infective. A. S.

Preparedness for defence against influenza. W. J. MacNeal and E. R. Parker (*Amer. J. clin. Path.*, 1944, **14**, 103—111).—A review. C. J. C. B.

Interference between influenza viruses. I. Effect of active virus on multiplication of influenza viruses in chick embryo. J. E. Ziegler, jun., and F. L. Horsfall, jun. **II. Effect of virus rendered non-infective by ultra-violet radiation on multiplication of influenza viruses in chick embryo.** J. E. Ziegler, jun., G. I. Lavin, and F. L. Horsfall, jun. (*J. Exp. Med.*, 1944, **79**, 366—377, 379—400).—I. Reciprocal interferences between influenza *A* and *B* and swine influenza viruses were found in the chick embryo. This was not due to interaction of one virus with another, nor did the presence of multiplying virus *per se* interfere with the multiplication of another virus.

II. Influenza *A* or *B* virus made non-infective by exposure to ultra-violet radiation interfered with the multiplication of active influenza viruses in the chick embryo. A. S.

Qualitative differences in antigenic composition of influenza *A* virus strains. W. F. Friedewald (*J. Exp. Med.*, 1944, **79**, 633—647).—Serum antibodies were specifically absorbed with allantoic fluid containing influenza *A* virus or with conc. virus suspensions obtained from allantoic fluid by high-speed centrifugation or by the red cell adsorption and elution technique; influenza *B* virus caused no antibody absorption from antisera directed against *A* strains but absorbed antibody from *B* antisera. The neutralising, agglutination-inhibiting, and complement-fixing antibodies in ferret antisera were completely absorbed only by the homologous virus strain. *PR*8 virus absorbed heterologous antibodies in Christie and W.S. sera. The Christie, Talmey, W.S., and swine strains were more sp. The absorption tests were more sp. than various cross reactions. The strain sp. of *PR*8 virus was equally manifest in absorption tests with ferret sera and with human sera following vaccination. The amount of homologous antibody in a *PR*8 ferret serum after absorption with *PR*8 virus varied inversely with the virus concn. used for absorption. A given virus concn. absorbed a greater % of neutralising antibodies than agglutination-inhibiting or complement-fixing antibodies. A. S.

Stability of influenza virus in presence of salts. C. A. Knight (*J. Exp. Med.*, 1944, **79**, 285—290).—The stability of centrifugally purified *PR*8 influenza virus can vary considerably at pH 7·0 depending on the nature and concn. of salts. Borate, veronal, and PO_4''' buffers at 0·1M. concn. maintain virus activity over several weeks at 4°; unbuffered saline does not maintain virus activity. The activity of partially inactivated virus in distilled water and in saline was increased 10—1000 times by dilution with 0·1M-PO_4''' buffer; veronal buffer effected some reactivation, borate buffers none. A. S.

Evaluation of methods for concentration and purification of influenza virus. W. M. Stanley (*J. Exp. Med.*, 1944, **79**, 255—266).—The methods studied were differential centrifugation in a vac.-type centrifuge, by adsorption on and elution from embryonic and adult chicken erythrocytes, by elution of the ppt. formed by freezing and thawing of allantoic fluid, and combination of the first with the other methods; yields of virus of 50—70% were obtained. Purified products of the red-cell and freezing–thawing methods contained 80% of non-virus protein. The purified products were homogeneous with a sedimentation const. of 600 *S*. Such preps. contained 22,000 chicken red-cell agglutinating units per mg. of protein-N. The Sharples centrifuge was as efficient as the vac.-type centrifuge. A. S.

Centrifugation and ultrafiltration studies on allantoic fluid preparations of influenza virus. W. F. Friedewald and E. G. Pickels (*J. Exp. Med.*, 1944, **79**, 301—317).—Sedimenting boundaries of infective virus particles, hæmagglutinin, and complement-fixing antigen were obtained in the angle centrifuge and correlated with boundaries observed optically in the ultracentrifuge. The sedimentation const. of Lee virus particles is 800 *S*, that of *PR*8 virus 700 *S*, corresponding to diameters of 85 and 80 mμ. respectively. These vals. agree with those obtained by filtration with graded collodion membranes. The concn. of primary virus particles in untreated allantoic fluid preps. of *PR*8 and Lee virus is 0·01%. The primary infective particles are identical with the hæmagglutinin and the complement-fixing agent. Sol. antigen which sediments more slowly than the virus and is not adsorbed by red cells represents disintegrated virus particles. 10 *PR*8 or Lee virus particles are required to infect chick embryos, 10,000 particles for mice. The ratio of hæmagglutinin to red cells required to produce 50% agglutination with dil. virus suspensions is roughly 1. A. S.

Effect of some chemicals on purified influenza virus. C. A. Knight and W. M. Stanley (*J. Exp. Med.*, 1944, **79**, 291—300).—Influenza virus activity is destroyed by strong oxidising agents (I, salts of heavy metals, mercurochrome, formaldehyde, and by the detergents phemerol, roccal, and Na dodecyl sulphate; conc. and also 0·05—0·5N. solutions). Reducing agents had little effect, except in the case of 0·05N-ascorbic acid. Na sulphathiazole had a weak inactivating effect. Prompt inactivation was produced by 0·5N-phenol. The virus was not affected by glucose, $(NH_4)_2SO_4$, $CaCl_2$, $Na_2S_2O_3$, and arginine. A. S.

Titration of influenza virus in chick embryos. C. A. Knight (*J. Exp. Med.*, 1944, **79**, 487—495).—6 tests of 5 replicate titrations of a purified *PR*8 influenza virus strain were done; the chances are 19 out of 20 that differences in end-points of 0·37 and 0·62 log units were significant. Chick embryos are sensitive to considerably smaller amounts of virus than mice. Mouse titrations are adversely affected by inactive virus under conditions which do not influence the embryo titrations. A. S.

Size of influenza virus. W. M. Stanley (*J. Exp. Med.*, 1944, **79**, 267—283).—In the presence of a sucrose density gradient, virus

activity sedimented at a rate comparable with particles of 80—120 mμ. in diameter. 30% of the high-mol. protein in allantoic chick fluid infected with the *F* 12 strain had a diameter of 10 mμ. The residual protein of high mol. wt. had a particle diameter of 70 mμ. The proportion of the 10-mμ. component was less in chick embryo infected with the *PR*8 strain. Purified preps. of the 70-mμ. component had a sp. virus activity 100—10,000 times those of the 10-mμ. component, the difference in activity depending on the degree of fractionation. The 10-mμ. component sedimented in the presence of 12% sucrose. Influenza virus activity is associated with material having a sedimentation const. of 600 *S.* and a particle diameter of about 70 mμ. A. S.

Reactivity of leprosy sera with lecithin. I. Incidence of the lecithin reaction in Wassermann-positive and -negative sera of lepers and control cases. II. Properties of the anti-lecithin reagin in leprosy sera. F. W. Eichbaum (*Rev. Brasil. Biol.*, 1943, **3**, 225—230, 231—236).—I. In controls the lecithin reaction was positive in 4% of cases which included Wassermann-positive sera and sera from tuberculosis, leishmaniasis, pregnancy, etc. In 61% of cases a positive complement fixation and flocculation with egg-lecithin were found in leprosy sera. The mixed lepromatous form gave a higher incidence than the nervous-anæsthetic form. In 80% of leprosy cases the lecithin reaction runs parallel with the Wassermann reaction and the flocculation test for syphilis. The complement fixation with Witebsky–Klingenstein–Kuhn antigen and the lecithin reaction run parallel in 72% of cases.

II. The reactivity of leprosy sera with egg lecithin is due to the presence of a sp. antibody (reagin) and not to serum lability. It is abolished by heating the globulins for 15 min. at 65—70°. The lecithin flocculation in leprosy is stronger at 1° than at 37°; the opposite occurs in lecithin-positive syphilis sera. The antilecithin reagin can be eluted from the pptd. serum-lecithin by treatment with saline for 30 min. at 56°. The formation of antibodies against lecithin in leprosy may be related to the action of haptenic phosphatides liberated by the leprous process. I. C.

Epidemic keratoconjunctivitis. R. F. Korns, M. Sanders, and R. C. Alexander (*Amer. J. Publ. Health*, 1944, **34**, 567—571).—Cases of epidemic keratoconjunctivitis, and to a smaller extent contacts, show neutralising antibodies in their sera against the virus isolated from conjunctival scrapings in cases of the disease. C. J. C. B.

Epidemic keratoconjunctivitis—Detroit experience. J. G. Molner and E. L. Cooper (*Amer. J. Publ. Health*, 1944, **34**, 572—577).—The plan of control of the disease in Detroit is outlined. Tryothricin appeared to have definite val. in preventing opacities. C. J. C. B.

Lymphogranuloma venereum. II. Association of specific toxins with agents of lymphogranuloma-psittacosis group. G. Rake and H. P. Jones (*J. Exp. Med.*, 1944, **79**, 463—486; cf. A., 1943, III, 441).—The toxins associated with the agents of lymphogranuloma venereum, meningo-pneumonitis, and mouse pneumonitis growing in the chick embryo yolk sac resemble bacterial endotoxins, are labile and are not readily separated from the bodies of the agents, kill mice rapidly after intravenous and occasionally intraperitoneal injection, and produce characteristic lesions, especially in the liver (central lobular necroses). The min. lethal dose is relatively large and corresponds to 36 million infective units. Antitoxic sera can be produced in rabbits and chicken by using toxins or toxoids; they behave like antiendotoxins against bacterial endotoxins, and do not neutralise by the law of multiple proportions. Antitoxic sera can also be obtained from convalescents of one of the diseases. The toxins and antitoxins are highly sp. A. S.

Primary atypical pneumonia. C. A. Owen (*Arch. intern. Med.*, 1944, **73**, 217—231).—An analysis of 738 cases occurring during 1942. C. J. C. B.

Isolation from normal mice of pneumotropic virus forming elementary bodies. C. Nigg and M. D. Eaton (*J. Exp. Med.*, 1944, **79**, 497—510).—A pneumotropic virus forming elementary bodies was isolated from apparently normal albino Swiss mice. The antigenic relationship of this virus to the agents of meningopneumonitis, lymphogranuloma venereum, hamster pneumonia, and human pneumonitis was established by either cross-immunity or complement-fixation tests or both. The virus was differentiated from the other viruses by certain of its properties. A. S.

Poliomyelitis in cynomolgus monkey. III. Infection by inhalation of droplet nuclei and nasopharyngeal entry. H. K. Faber, R. J. Silverberg, and L. Dong (*J. Exp. Med.*, 1944, **80**, 39—57).—Inhalation of poliomyelitis virus produces infection in cynomolgus and rhesus monkey by the olfactory and afferent trigeminal pathways. Entry by way of the sympathetic fibres of the nose and pharynx was demonstrated in 1 case. A. S.

Physico-chemical and ultramicroscopic examination of purified poliomyelitis virus preparations. S. Gard (*Arkiv Kemi, Min., Geol.*, 1943, **17, B**, No. 1, 4 pp.).—Brains of mice infected with poliomyelitis virus yield an active substance (1 mg. from 375 g.) which is 10^5 times more active than the original material. A similar substance is present in smaller amount in the spinal cords of paralysed children. Products with similar physico-chemical properties are present in fæces of mouse, man, pig, and brown rat, but not in guinea-pig and white rat fæces. Sedimentation and diffusion determinations indicate that the mol. wt. of the neurovirus is approx. 5×10^7, the smallest particle diameter is approx. 14 mμ., average length 500 mμ. The corresponding vals. for intestinal virus are 2×10^8, 14 mμ., and 2000 mμ. respectively. The mols. are hydrated in aq. solution and the degree of association increases with degree of purity. In the ultra-microscope the very elastic, fibre-like particles have diameter approx. 15 mμ. Mouse neurovirus fibres have an average length of 1 μ. J. N. A.

Dry blood test for typhus fever. P. N. Bardhan, N. Tyagi, and K. Boutros (*Brit. Med. J.*, 1944, I, 253—254).—Drops of blood from typhus cases dried in air are mixed with a conc. suspension of OX2 and OX19. Results are read in 5—10 min. by naked eye. All typhus cases give a slide-positive result, though a slide-positive result does not necessarily mean a positive case. I. C.

Typhus fever in Great Britain. A. P. Agnew and W. B. Kyles (*Brit. Med. J.*, 1944, II, 10—11).—Case report. I. C.

Ætiology of primary atypical pneumonia. Filterable agent transmissible to cotton rats, hamsters, and chick embryos. M. D. Eaton, G. Meiklejohn, and W. van Herick (*J. Exp. Med.*, 1944, **79**, 649—668).—A filterable virus from cases of atypical pneumonia was transmitted to chick embryos by inoculation into the amnion of suspensions of bacteriologically sterile lung tissue or filtered sputum; three strains were adapted by passage. Suspensions of infected chick embryo tissue, after intranasal inoculation in cotton rats or hamsters, produced pulmonary lesions similar to those seen after instillation of infective human material. The chick embryo agent was neutralised by serum from patients recovered from primary virus pneumonia but was not neutralised by specimens obtained during the acute phase of the disease. A. S.

Immunological reactions of variola and vaccinia viruses grown in developing egg. E. A. North (*Austral. J. Exp. Biol.*, 1944, **22**, 105—109).—The present state of knowledge concerning transformation of variola into vaccinia is discussed. Previous reports dealing with appearance of membranes and attempts at animal passage do not suggest that variola is transformed into vaccinia on continued egg passage. The ability of variola virus to agglutinate chick embryo erythrocytes and a continued difference in the Hirst reaction with adult fowl erythrocytes between variola and vaccinia point to a continued distinction between the viruses on repeated egg passage. Immunological reactions as far as Hirst phenomenon and pock-inhibiting antibodies are concerned are extremely similar and they may be identical; if there is a difference, it is that the viruses contain common group antigens and that variola has a sp. antigen not present in vaccinia virus. J. N. A.

Accidental vaccinations on the hands of workers in a vaccine lymph institute. E. S. Horgan and M. A. Haseeb (*J. Hygiene*, 1944, **43**, 273—274).—Recently vaccinated workers engaged in vaccine lymph manufacture frequently developed infections of vaccinia or vaccinoid type. A parallel is drawn with natural cowpox infections and " milker's warts " in milkers and farm hands. Such facts are not explained by the modern theory of vaccinal immunity. J. H. B.

Cleavage of virus proteins of tobacco-mosaic group. E. Pfankuch and F. Piekenbrock (*Naturwiss.*, 1943, **31**, 94).—Nucleic acid is removed from the protein of the virus by pyridine and NaOH, various degradation products being produced. One of these is an electro-chemically homogeneous, well-defined protein, mol. wt. probably $1{\cdot}3 \times 10^6$, *i.e.*, 1/10 of that of the virus, which is obtained in good yield and forms homodisperse solutions. Smaller units of the virus mol. are obtained by treatment with decyl and dodecyl sulphate and individual or mixed larger units when the conditions of cleavage are mild, *e.g.*, in buffered media when the pH is 11—12 and appropriate conditions of reaction (concn., duration of action, etc.) are chosen. Such products have 75, 50, and 25% of the mol. wt. of the virus. W. McC.

Dimerisation of tobacco-mosaic virus.—See A., 1944, III, 611.

Cleavage of tobacco-mosaic virus into low-molecular proteins and reproduction of high-molecular proteins from the products of cleavage. G. Schramm (*Naturwiss.*, 1943, **31**, 94—96).—At pH above 9, the virus yields a nucleoprotein and a protein free from nucleic acid; both are biologically inactive and have mol. wt. $3{\cdot}6 \times 10^5$. The nucleoprotein is separated from unchanged virus in the ultracentrifuge, the protein free from nucleic acid being already separated by electrophoresis. At pH approx. 5, the protein free from nucleic acid is spontaneously and reversibly transformed into a biologically inactive protein having the same cryst. form and mol. wt. as the virus and, at pH 4—6, being as stable as the virus. It exhibits streaming double refraction. The nucleoprotein behaves similarly. W. McC.

Antigenic characters of spore-forming, aërobic bacteria. O. Sievers and B. Zetterberg (*J. Bact.*, 1940, **40**, 45—56.)—The injection of rabbits with *B. subtilis*, *B. mycoides*, *B. mesentericus*, *B. vulgatus*, and *B. cereus* respectively yielded antisera which gave complement

fixation and pptn. (of autolysate) with the corresponding bacterial type. There was some separation into serological types, and pptn. experiments with a small number of strains indicated the presence of a sp. antigen structure in the different types. F. S.

Heterogenetic antibodies in acute hepatitis. M. D. Eaton, W. D. Murphy, and V. L. Hanford (*J. Exp. Med.*, 1944, **79**, 539—557).—Heterogenetic antibodies showing complement fixation with human liver and agglutination of sheep erythrocytes were found in certain cases of acute infective hepatitis; they were heat-stable and alcohol-sol. There were differences from other heterogenetic antigen–antibody systems. A. S.

Serological properties of simple substances. VII. Quantitative theory of inhibition by haptens of precipitation of heterogeneous antisera with antigens, and comparison with experimental results for polyhaptenic simple substances and for azoproteins. L. Pauling, D. Pressman, and A. L. Grossberg (*J. Amer. Chem. Soc.*, 1944, **66**, 784—792; cf. A., 1943, III, 442).—A quant. theory of the inhibition by haptens of the pptn. of heterogeneous antisera by antigens has been developed by assuming that the heterogeneity of an antiserum can be described by a distribution function that is an error function of the free energy of interaction of antibody and hapten in competition with the pptg. antigen. Satisfactory agreement with experimental results has been found by applying it to data on the inhibition by each of 24 haptens of the pptn. of anti-*R* serum and anti-*R'* serum with a dihaptenic simple antigen and with *R'*-ovalbumin. The effective inhibition const. of haptens and heterogeneity indices of antisera have been evaluated. The relationships between structure and these quantities are discussed. W. R. A.

Microscopic observation of collodion particle agglutination in protein–antiprotein systems. M. Burger (*J. Lab. clin. Med.*, 1944, **29**, 352—356).—A microscopic method using a collodion particle agglutination technique for detecting the presence of sp. antibody in several antiprotein sera is described. In higher dilutions of the various antisera studied, the method gives positive results while negative results are obtained at the same titre by either the ordinary pptn. test or the macroscopic collodion particle agglutination test. C. J. C. B.

Anaphylaxis to serum-proteins in guinea-pig. L. B. Winter (*J. Physiol.*, 1944, **102**, 373—405).—The problem investigated was whether horse serum-albumin and -globulin can be absorbed from the small intestine and if so, whether the much smaller mol. wt. of albumin allows its more ready absorption. Guinea-pigs were sensitised by one of the proteins, and an isolated uterine horn was tested some weeks later for anaphylaxis *in vitro*. The second uterine horn was tested after several hr. to see if the animal was desensitised by a second dose. 6 mg. per 100 g. body wt. of both albumin and globulin desensitised when given by the intestine, proving absorption. 4 mg. per 100 g. body wt. of albumin placed in the portal vein desensitised. Globulin via the portal vein killed or severely shocked the animals without desensitising them, showing the liver to be the site of a severe anaphylactic reaction and of destruction of globulin. On prolonging and attenuating the portal injection, 20 mg. per 100 g. body wt. desensitised without killing the animals. The lymphatic route of absorption for the smaller desensitising dose via the intestine may account for its escaping the liver. Only half the portal dose of albumin and 1/10 that of globulin are required to desensitise via the jugular vein. In animals sensitised by whole serum, very small doses of globulin by the portal route desensitise, suggesting that fixation of globulin by the liver is determined by the type of antibody and not by a peculiar property of the globulin. The possible dual character of horse serum-protein was investigated. The presence of albumin ensures the safe passage of the "portal" desensitising dose of globulin through the liver of the globulin-sensitised animal, and reduces it even below the "jugular" (albumin absent) dose. The presence of globulin enhances to a less degree the desensitising of the albumin-sensitised animal by albumin, but introduces the risk of shock. Serum and albumin plus globulin act similarly. Neither serum nor the mixture is a very effective desensitiser of the globulin-sensitised animal when placed in the intestine, but both are good desensitisers of the albumin- and serum-sensitised animal. When serum is used as a sensitising antigen, the results of the tests for desensitisation are different from those when the albumin–globulin mixture, or diluted serum, is used. It is suggested that serum contains a protein complex in which albumin and globulin have no separate existence. W. H. N.

Allergy. F. M. Rackemann (*Arch. intern. Med.*, 1944, **73**, 248—266).—A review of the literature of 1943. C. J. C. B.

Chemistry of allergens. IX. Isolation and properties of an active, carbohydrate-free protein from castor beans. J. R. Spies, E. J. Coulson, D. C. Chambers, H. S. Bernton, and H. Stevens (*J. Amer. Chem. Soc.*, 1944, **66**, 748—753; cf. A., 1944, III, 81).—The allergenic fraction, *CB*-1*A*, of castor beans yields, by electrophoresis, a cathodic fraction, *CB*-60*C*, containing 0·47% of carbohydrate. Subsequent chromatography of the picrate, electrophoretic recovery of the protein from the picrate, electrophoresis of the protein, and solvent-fractionation gives a carbohydrate-free fraction, *CB*-65*A* (N 19·0, C 47·6, H 6·95, S 2·57%), $[\alpha]_D^{20}$ −49·5° in water. *CB*-60*C* resembles *CB*-65*A*, except that 26·7% and none, respectively, of the N is pptd. by trichloroacetic acid at 20°. Positive transfer reactions are obtained with 10^{-10} g. of *CB*-65*A* and biological tests are thus much more sensitive than chemical analysis. *CB*-65*A* is as potent as *CB*-1*A* in passive transfer reactions and in shocking guinea-pigs but has only about one eleventh of the sensitising power. It is concluded that the allergenic and anaphylactogenic properties reside in carbohydrate-free proteins. R. S. C.

XXVI.—PLANT PHYSIOLOGY.

Factors influencing germination of seed of *Trifolium repens*. G. W. Burton (*J. Amer. Soc. Agron.*, 1940, **32**, 731—738).—The principal factor inhibiting germination at 20° or 30° is eliminated by scarifying the seed with sand-paper. Internal changes having an effect comparable with that of scarification occur only at 10°. Storage of seed for 5 months at 5—15° and at high R.H. increased the germination of unscarified seed at 20—30°. With rise of temp. the absorption of water by and rate of germination of seeds increased although the total germination was not greatly affected. Scarification increased water absorption, germination rate, and total germination, the effects being greatest when seed was germinated at higher temp. Germination is correlated with ability to absorb water. Varietal differences in response to low-temp. treatment are examined. A. G. P.

Effect of light quality on growth and mineral nutrition of bean. L. M. Rohrbaugh (*Bot. Gaz.*, 1942, **104**, 133—151).—Lengths of hypocotyls and first internodes of red kidney beans were least in plants receiving light from nearly the whole range of the visible spectrum. In plants illuminated by light from narrow regions of the spectrum inhibition of elongation was greatest in the red and least in the blue zones; leaf area and dry matter production were greatest in green and not greatly different in red and blue light. Flower buds developed earlier in green than in other light but many of the buds abscissed. Colour quality had no appreciable effect on the total ash content or on the % of K or Mg in the ash. The Ca content of leaves was closely correlated with dry matter production and was greatest in light from nearly the whole range of the visible spectrum. High Ca contents of leaves was associated with low vals. in stems and vice versa. The P content of plants was higher in blue-free or red-free light than in daylight and still higher when both red and blue light was omitted. A. G. P.

Chemical composition of the plant growing point: its relation to daily light exposure. G. F. Sheard (*Ann. Appl. Biol.*, 1943, **27**, 305—310).—No general relationship was apparent between the onset of flowering under a favourable photoperiod and the sol. C/N ratio of apices of chrysanthemum, *Cosmos*, or tomato. Appearance of flower buds in *Cosmos* and late-flowering chrysanthemum is associated with high sugar content. In *Cosmos* and tomato a protein-N cycle is demonstrated. The cycle is affected by the photoperiod if the latter also affects the time of flowering. A. G. P.

Relationship of dissociation of cellular [plant] proteins by incipient drought to physiological processes. H. T. Northen (*Bot. Gaz.*, 1942, **104**, 480—485).—Incipient drought in *Mnium* sp. and *Bryum* sp. decreased the structural viscosity of protoplasm in leaf cells due to protein dissociation. The dissociation causes increased protoplasmic swelling pressure and accelerated respiration rates and polysaccharide hydrolysis. During recovery decreased viscosity precedes the return to normal. A. G. P.

Growth and anatomical structure of carrot (*Daucus carota*) as affected by boron deficiency. K. Warington (*Ann. Appl. Biol.*, 1940, **27**, 176—183).—Deficiency symptoms arising in early and in late growth of carrot are described. 0·5 p.p.m. of B in culture solutions sufficed for normal growth provided the medium was changed regularly. Recovery of both root and shoot in deficient plants took place after supplementary feeding of B even if the deficiency period was a prolonged one. A. G. P.

Translocation of potassium among peach roots. O. W. Davidson (*Soil Sci.*, 1944, **58**, 51—59; cf. A., 1943, III, 534).—The K absorbed by one section of roots of the plant may be translocated vertically up or down to other sections of the root not in contact with external supplies of K. This movement occurs quickly and in considerable quantity. A. G. P.

Biochemical nitrogen fixation. IV. Excised legume nodules. F. E. Allison, S. R. Hoover, and F. W. Minor (*Bot. Gaz.*, 1942, **104**, 63—71).—Whole or crushed nodules from 5 legume species failed to fix N in Warburg vessels when supplied with a mineral nutrient containing sucrose, glucose, or mannitol. No fixation occurred in pure cultures of rhizobia or of excised nodules supplied with oxal-acetic acid. No evidence was obtained of N fixation by juices extracted from nodules after sterilisation by filter candles and incubation with mineral salt–sugar media. A. G. P.

Metabolism of non-volatile organic acids in excised barley roots as related to cation–anion balance during salt accumulation. A Ulrich (*Amer. J. Bot.*, 1941, **28**, 526—537).—In excised barley roots

containing an ample proportion of sugars absorption of cations in excess of anions from the culture medium resulted in the production of org. acids in response to the tendency towards increased pH in the root sap. When anions were absorbed in excess of cations org. acids disappeared. Such changes in the org. acid content of roots were reflected in the R.Q., which was less than 1 during formation and more than 1 during disappearance of the acids. Formation of org. acids is not correlated with production of NH_3 or amides. A. G. P.

Metabolism of starving leaves. V. Changes in amounts of some amino-acids during starvation of grass leaves. Relationship between proteins and amino-acids. J. G. Wood and D. H. Cruickshank (*Austral. J. Exp. Biol.*, 1944, **22**, 111—123; cf. A., 1942, III, 500).—Data are given for the respiration rate and amounts of protein, residual amino-N, NH_3, total N, dipeptide-N, glutamine, asparagine, cystine, arginine, tyrosine, tryptophan, aspartic and glutamic acid, and carbohydrate in leaves of Kikuyu grass and Algerian oats when starved in air and in N_2. In grass leaves starved in air, transformations of N compounds are accounted for by hydrolysis of proteins to amino-acids and subsequent oxidation of these to asparagine and NH_3. These processes occur in oats, but undetermined N compounds are also formed during later stages of starvation, peptides accumulate, and there is more extensive breakdown of protein and secondary formation of glutamine. During starvation in air, amino-acids are preferentially oxidised, the order of utilisation being cystine, glutamic acid, arginine, tyrosine, and tryptophan. During starvation in N_2, very little breakdown of protein and accumulation of amino-acids occur unless the leaves are injured; only amino-acids and no asparagine or NH_3 are formed. It is concluded that (*a*) presence of a pattern in which proteins, pigments, phosphatides, and ascorbic acid are interlocked components provides steric hindrance that prevents protein hydrolysis in N_2, and that in air all components are subject to oxidation to a degree which depends on rate of carbohydrate oxidation; (*b*) the relations between protein and total amino-acid concns. are expressed by a curve concave to the axis of amino-acid concn.; (*c*) this curve is not directly affected by rate of respiration, and protein content is determined by the rate at which carbohydrates are utilised in an oxidation cycle. It is suggested that maintenance of a definite protein level depends on whether synthesis of the most readily oxidised amino-acids from carbohydrate and N substrates occurs at least as rapidly as their rate of oxidation. J. N. A.

[Plant] metabolism and flowering. J. Grainger (*Ann. Appl. Biol.*, 1940, **27**, 311—322).—Mobile carbohydrate was present in 11 species of plants which form flower initials at all times of the year. In species in which flower initiation occurs on the short days of autumn and winter there is no delay in nocturnal translocation. Although the proportion of dry matter used in flower production is small, flowering may be a preliminary to much future development for which the photosynthetic capacity is inadequate. In such cases a proportion of flowers fall. In apple such abscission was counteracted by thinning the flower trusses as soon as they can be distinguished. Flower formation in *Epilobium angustifolium* was accompanied by a marked increase in vegetative growth. In *Sisymbrium albania* vegetative growth of first-year plants was stimulated by inoculation with an extract of the inflorescence of the same species. Flower initiation and flower emergence are dependent on different sets of factors. Flower initiation is probably not determined by a relative excess of any individual metabolic product. A. G. P.

Thermodynamic aspect of respiration.—See A., 1944, III, 604.

Susceptibility of *Colchicum* and *Chlamydomonas* to colchicine. I. Cornman (*Bot. Gaz.*, 1942, **104**, 50—62).—Excised roots of *Colchicum* were immune to the action of 1% of colchicine in the nutrient medium. Mitosis in *C. byzantium* was blocked by 5% and that in *C. autumnale* by 10% colchicine. The relative immunity of *Colchicum* is due to extramitotic protection and not to differences in mitotic mechanism. *Chlamydomonas pseudococcus* was resistant to colchicine and to acenaphthene. This immunity was not sp. to colchicine. A. G. P.

Effects of platinum chloride on bean and tomato. C. L. Hamner (*Bot. Gaz.*, 1942, **104**, 161—166).—Sand-cultured bean plants grown in media containing concns. of 15^{-5}, 9^{-5}, and 3^{-5} $H_2PtCl_6.6H_2O$ are restricted in growth, have smaller leaf area, higher osmotic pressure, lower transpiration rates, and greater resistance to wilting, and are less succulent than controls. With plants grown in darkness stem growth and elongation of hypocotls are inhibited. Tomato plants responded to the treatment by growth restriction and chlorosis of lower leaves. Cut stems of bean and tomato show toxicity symptoms and die soon after being placed in aq. H_2PtCl_6. A. G. P.

Defoliation of tomato plants as a response to gaseous emanations from the fruit. J. Skok (*Bot. Gaz.*, 1942, **104**, 486—489).—Emanations from ripe fruit (probably largely ethylene) constitute a major factor contributing to defoliation of the plant. A. G. P.

Effects of vitamins on germination and growth of orchids. G. R. Noggle and F. L. Wynd (*Bot. Gaz.*, 1942, **104**, 455—459).—Orchid seeds failed to germinate in a nutrient containing specially purified maltose although germinating and growing normally when another sample of maltose was used. The deficiency in the purified nutrient was completely corr. by the addition of nicotinic acid. No other vitamin examined produced this effect. Vitamin-B_6 permitted good germination but subsequent development was poor. A. G. P.

Effects of application of thiamin to *Cosmos*. J. Bonner (*Bot. Gaz.*, 1942, **104**, 475—479).—Thiamin added to nutrient media for *Cosmos* produced positive growth response when plants were grown at const. temp. of 20° but not at 26·6° or at day temp. 26·6° and night temp. 20°. Temp. favouring luxuriant growth do not favour growth response to thiamin. Other factors are probably concerned. A. G. P.

Significance of auxins in relation to plant growth. J. H. Hamence (*Analyst*, 1944, **69**, 234—235).—A brief review. L. A. D.

Auxins. M. Noriega del Aguila (*Bol. Soc. Quím. Peru*, 1944, **10**, 4—19).—A survey of the literature. F. R. G.

Effect of treatment with hormones on loss of water by plants. H. U. Amlong (*Naturwiss.*, 1943, **31**, 44—45).—The loss of water by evaporation from tomato plants, isolated leaves of tomato plants, and isolated sugar beet leaves is increased by steeping the seeds before sowing in aq. K α-naphthylacetate + ascorbic acid + thiourea. In the case of the plants, the difference decreases when the water content of the growth medium exceeds 20%. The treatment increases the development of roots and the no. of stomata in the leaves. W. McC.

Some root-forming substances, in relation to one another, to plant metabolism, and to growth. M. A. H. Tincker (*Ann. Appl. Biol.*, 1940, **27**, 184—195).—Indolyl-acetic and -butyric acids stimulated root production of cuttings. Certain derivatives of histidine and tyrosine were inactive. Phenylacetic and β-phenylpropionic acid showed small activity. Tetrahydronaphthylideneacetic acid was highly active and a fairly active mixture of dihydro-1-naphthyl- and tetrahydronaphthylidene-acetic acids was obtained by dehydration of tetralolacetic acid. 2- and 3-Phenanthryl-, *cyclo*pentylidene-, and fluorenylidene-acetic acids were all inactive. Application of growth-substances to annual seeds by soaking did not increase the growth of the seedlings; application to bulbs checked stem elongation and in some cases accelerated root formation. A. G. P.

Effect of various concentrations of naphthoxyacetic acid and naphthylacetic acid in inhibiting shoot development in apple, swede, carrot, and potato. T. Swarbrick (*Ann. Rept. Agric. Hort. Res. Sta. Long Ashton*, 1943, 25—30).—Treatment of 1-year apple shoots with 1% naphthoxy- or naphthyl-acetic acid in methylated spirit or lanolin inhibited lateral bud development. Crowns of swede or carrot treated with the growth-substances in water or lanolin failed to produce root or shoot when planted in soil. Similar treatment of potato tubers before planting inhibited sprouting. In all cases the effect of naphthyl- exceeded that of naphthoxy-acetic acid. A. G. P.

Effects of growth-regulating substances on shoot development of roses during common storage. P. C. Marth (*Bot. Gaz.*, 1942, **104**, 26—49).—Application of methyl or ethyl naphthylacetate or naphthylaceto-nitrile as 0·01% wax emulsion sprays or in vapour form (0·3—0·49 g. per 1000 cu. ft.) to dormant rose trees inhibited the development of vegetative buds for 40—60 days. Vapour of the methyl ester in lower concn. (0·1 g.) increased the no. of shoots developing in storage whereas high concn. (0·5 g. per 1000 cu. ft.) caused injury. The growth-substances inhibited mould growth on the bushes either by direct fungicidal action or by minimising the development of etiolated shoots on which mould infection most readily occurs. Treated bushes retain their starch reserve during storage and when planted out produce increased root and top growth. A. G. P.

Effects of growth-substances on reserve starch. S. C. Bausor (*Bot. Gaz.*, 1942, **104**, 115—121).—Treatment of tomato cuttings with indolyl- or β-naphthoxy-acetic acid when growing in darkness in mineral media containing sucrose, maltose, fructose, glucose, or lactose accelerated the depletion of starch. N-deficient plants responded similarly. Starch was deposited in root primordia formed by treatment with the growth-substance. In thin sections of bean or tomato plants starch digestion was inhibited by 0·02—0·002% of indolylacetic acid in the medium. In intact stems 0·02% aq. indolylacetic acid accelerated starch hydrolysis. A. G. P.

Chemical stimulation of ovule development and its possible relation to parthenogenesis. J. van Overbeek, M. E. Conklin, and A. F. Blakeslee (*Amer. J. Bot.*, 1941, **28**, 647—656).—Injection of an emulsion of NH_4 naphthylacetate into young ovaries of 4*n* *Melandrium* induces parthenocarpic fruit. External application to ovary or peduncle causes development of the ovary but not of the ovule. Injection of naphthylacetic or indolylbutyric acid into ovaries of *Datura stramonium* induces parthenocarpic fruiting with enlarged ovules which develop seed-coats and often contain pseudo-embryos formed by proliferation from the endothelium of the embryo sac. A. G. P.

Conditions affecting acceleration of protoplasmic streaming by auxin. B. M. Sweeney (*Amer. J. Bot.*, 1941, **28**, 700—702).—In oat coleoptile sections protoplasmic streaming was increased by auxin if the sections were infiltrated with air and to a smaller extent if not infiltrated. No acceleration resulted if sections were infiltrated with water or 1% aq. fructose. A. G. P.

Inheritance of quantitative characters in plants. H. H. Smith (*Bot. Rev.*, 1944, **10**, 349—382).—A review. L. G. G. W.

Over five hundred reasons for abandoning the cross-inoculation groups of legumes. J. K. Wilson (*Soil Sci.*, 1944, **58**, 61—69).—Numerous cross-inoculation tests show that the boundaries of the proposed 22 cross-inoculation groups overlap to such an extent that it would be impossible to assign a plant to one group or to an organism which is sp. for a group. A. G. P.

Antagonism in inoculation tests of wheat with *Helminthosporium sativum*, P.K. and B., and *Fusarium culmorum* (W.G. Sm.), Sacc. R. J. Ledingham (*Sci. Agric.*, 1942, **22**, 688—697).—Inoculation with the two fungi in conjunction caused less injury than either used alone. In laboratory tests germination of conidia of *H. sativum* was diminished in presence of conidia of *F. culmorum*. A. G. P.

XXVII.—PLANT CONSTITUENTS.

Volatile sulphur content of black mustard plants. S. V. Eaton (*Bot. Gaz.*, 1942, **104**, 82—89).—The volatile S content of black mustard leaves exceeded that of stems, and was greater when plants were grown in sand culture than when in soil. Vals. were greater in young than in old leaves and smaller in tissue of high than in that of low water content. Leaves of plants grown in S-free nutrients possessed little or no pungency; N-deficient nutrients produced leaves of somewhat greater pungency than did nutrients containing adequate N. A. G. P.

Aconitic acid and aconitates in sorgo and sugar-cane products.—See B., 1944, III, 203.

Palm oil carotenoids. III. Examination of lipin pigments of "Malay" and "Bissao" palm oils. IV. Proportion of α- to β-carotene in unripe and ripe palm oils and attempted interconversion of α- and β-carotenes. R. F. Hunter, A. D. Scott, and N. E. Williams (*Biochem. J.*, 1944, **38**, 209—211, 211—213).—III. The non-saponifiable matter of "Malay" palm oil contains α-, β-, and γ-carotenes, lycopene, and xanthophylls with absorption spectra similar to those of lutein and neolutein. "Bissao" oil contains lycopene, neolycopene, and γ-carotene, as well as α- and β-carotenes to which the colour of the oil is mainly due.

IV. The proportion of α- and β-carotenes is the same for oil from ripe and unripe fruit of the same tree, but varies in different trees. α- and β-Carotenes cannot be interconverted by refluxing in *iso*propanol solution with Na *iso*propoxide, but some neo-α-carotene is formed. P. G. M.

Chemical differences between artificially produced parthenocarpic fruits and normal seeded fruits of tomato. B. E. Janes (*Amer. J. Bot.*, 1941, **28**, 639—646).—Parthenocarpic fruit produced by treatment with indolyl-acetic or -butyric acid or pollen of *Lycopersicum peruvianum*, Mill., were smaller than normal fruits, contained higher proportions of starch and sugar, but similar amounts of titratable acid. The distribution of titratable acid was fairly uniform in ripe parthenocarpic fruit but in normal fruit higher proportions of acid occurred in the locular region than in the outer wall. Differences in total starch and sugar contents were also located in the locular areas. Seed formation exerts a marked influence on the chemical composition of the fruit. A. G. P.

Chemistry of wheat germ with reference to scutellum. J. J. C. Hinton (*Biochem. J.*, 1944, **38**, 214—217).—The aneurin content of the scutellum is 41—75 i.u. per g., and the proportion of the total found in wheat averages 59%. Wheat flour of 100% extraction contains 0·88 i.u. of vitamin-B_1 per g. due to the scutellum, increasing to 1·03 i.u. per g. with an 85% extraction flour. Soaking the grain in water for 12 hr. causes no loss of vitamin from the scutellum. The embryo and scutellum contain respectively, total N 5·86 and 5·04, total P 1·16 and 1·90, phytate-P 0·397 and 1·311, phytic acid equiv. 1·41 and 4·65, lipin content 15·4 and 30·3%. P. G. M.

Carotene and lycopene in rose hips and other fruits. F. C. Jacoby and F. Wokes (*Biochem. J.*, 1944, **38**, 279—282).—Details are given of the method and results previously reported (see A., 1944, III, 516). E. C. W.

Vitamin-*P* activity of black currants. A. Pollard (*Ann. Rept. Agric. Hort. Res. Sta. Long Ashton*, 1943, 141—147).—The isolation of vitamin-*P* from black currant juice is described. A yellow cryst. *substance*, m.p. 260—270° (acetyl derivative, m.p. 192—194°), probably a flavonol, was also obtained from the currants. It had no -*P* activity. A. G. P.

Catalposide, the heteroside of *Catalpa* fruits.—See A., 1944, II, 327.

Water-soluble polysaccharides of sweet corn. J. B. Sumner and G. F. Somers (*Arch. Biochem.*, 1944, **4**, 7—9; cf. Hassid and McCready, A., 1942, II, 82).—A new *polysaccharide* is present in 3 varieties of sweet corn. It gives a slight blue colour with I and is sol. in cold water with strong opalescence. It is a *d*-glucose anhydride, distinct from starch amylose, amylopectin, glycogen, and the polysaccharide described by Morris and Morris (A., 1939, III, 1112; 1940, III, 273). When 10 ml. of saturated $(NH_4)_2SO_4$ are added to 10 ml. of 0·5% solution of the polysaccharide and 1 drop of I in KI is added to the filtrate, the new polysaccharide gives a pink colour, whilst animal glycogen gives a yellow. E. R. S.

Chloroplast substance of spinach leaves. C. L. Comar (*Bot. Gaz.*, 1942, **104**, 122—127).—Less protein contamination occurred when chloroplast substance was isolated by fractional centrifuging than when by freezing or flocculation by $CaCl_2$. The substance isolated from spinach leaves contained protein 54, lipin 34, chlorophyll 5, and ash 7%. Approx. 11% of the total N was present in the lipin fraction; less than ⅛ of the lipin-N was accounted for by chlorophyll. A. G. P.

Chlorophyll–protein complex. II. Species relationships in certain legumes as shown by electric mobility curves. L. S. Moyer and M. M. Fishman (*Bot. Gaz.*, 1942, **104**, 449—454).—Electrophoretic mobility–pH curves of the chlorophyll–protein complex from *Phaseolus vulgaris, P. limensis, P. coccineus, Vigna sesquipedalis, Dolichos lablab, Glycine max, Medicago sativa, Trifolium pratense, Melilotus alba, Vicia faba*, and *Pisum sativum* were closely related but differed completely from that of *Aspidistra*. A. G. P.

Orange-coloured pigment of cottonseed. C. H. Boatner, M. Caravella, and C. S. Samuels (*J. Amer. Chem. Soc.*, 1944, **66**, 838—839).—Cottonseed yields a pigment, m.p. 212° (corr.), resolidifies, remelts at 238—239° (corr.; decomp.) (absorption max. at 435 mμ. in $CHCl_3$; $SbCl_3$ colour absorption max. at 450—460 mμ., changed by conc. HCl to that of gossypol–$SbCl_3$), which does not react with aniline, Fehling's solution, or fuchsin–aldehyde reagent, gives an oxime and dinitrophenylhydrazone, and in conc. H_2SO_4 is yellow, slowly changing to the scarlet of gossypol. This pigment may account for the toxicity of cottonseed not always agreeing with the gossypol content determined as dianilino-compound. R. S. C.

Enzymes in germinating seeds. II. Optimum pH for the enzymes from germinating Bajri and Gram.—See A., 1944, III, 612.

Heteregeneous nature of pyrethrolone.—See A., 1944, II, 339.

Confirmation of the presence of theobromine in maté. H. Diaz (*Anal. Asoc. Quím. Argentina*, 1942, **30**, 232—234).—Theobromine is present in the leaves of *Ilex paraguariensis*. F. R. G.

Composition of bracken fronds and rhizomes at different times during the growing season.—See B., 1944, III, 191.

Alkaloids of the Leguminosæ.—See A., 1944, II, 354.

Erythrina alkaloids. XIV. Isolation and characterisation of erysothionine and erysothiopine, new alkaloids containing sulphur.—See A., 1944, II, 354.

XXVIII.—NEW BOOKS.

Advances in Enzymology and Related Subjects in Biochemistry. Vol. IV. F. F. Nord and C. H. Werkman (*Interscience Publishers Inc., New York*, 1944, 332 pp. $5.50).—Each volume of this series contains about 10 short monographs on biochemical subjects selected for their topical interest or as showing considerable advances in knowledge. The themes are reviewed by competent authorities and the collection performs the useful function of enabling workers to refresh their knowledge of recent developments in fields other than their own. In this 4th volume the topics and authors are as follows. Chemical formulation of gene structure and gene action, A. Gulick; specificity, classification, and mechanism of action of the glycosidases, W. W. Pigman; transamination reaction, R. M. Herbst; tyrosinase, J. M. Nelson and C. R. Dawson; gramicidin, tyrocidine, and tyrothricin, R. D. Hotchkiss; biological energy transformations and the cancer problem, V. R. Potter; influence of hormones on enzymic reactions, H. Jensen and L. E. Tenenbaum; absorption spectra of vitamins, hormones, and enzymes, W. R. Brode. J. H. B.

LIST OF ABBREVIATIONS ETC. USED IN ABSTRACTS.

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

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

In addition, elements, groups, and easily recognised substances are denoted in the text by symbols and formulæ. The groups are as follows: methyl, Me; ethyl, Et; *n*-propyl, Pr^{α}; *iso*propyl, Pr^{β}; *n*-butyl, Bu^{α}; *iso*butyl, Bu^{β}; *tert.*-butyl, Bu^{γ}; phenyl, Ph; acetyl ($CH_3 \cdot CO$), Ac; benzoyl ($C_6H_5 \cdot CO$), Bz. (In Section A., III this applies only to inorganic compounds, excluding water, and to chloroform and carbon tetrachloride.) "Oleum" is allowed to describe fuming sulphuric acid and "room temp." for "the ordinary temperature." The symbol for 10 A. is mμ. (not μμ.) and for the International *X*-ray unit it is X, not XU. The symbol for 10^{-6} g. is μg. (not γ).

The following symbols are used except in Section A., III: $>$, greater than; $\gg$, much greater than; $\not>$, not greater than (and $<$, $\ll$, $\not<$ conversely); $\propto$, (is) proportional to; $\sim$, of the order of, or approximately.

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

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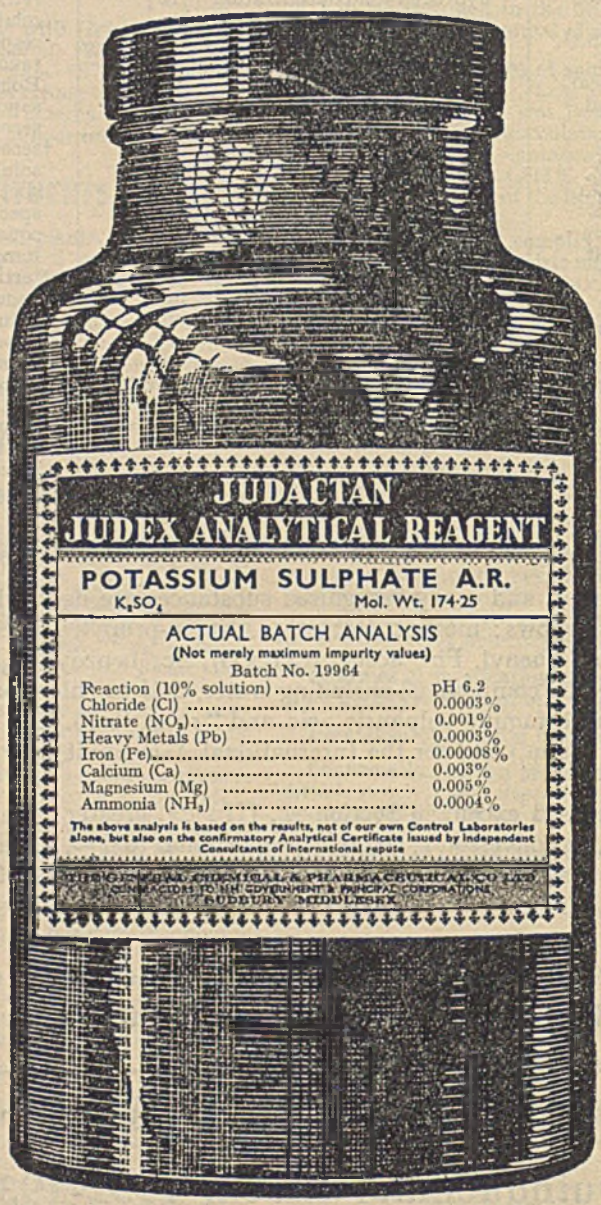

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