BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

SEPTEMBER, 1937.

Biological basis of individuality. L. Loeb (Science, 1937, **86**, 1—5). L. S. T.

Mechanism of the peripheral vascular responses to changes in blood-gas tension in man. B. Bolton, E. A. Carmichael, and D. J. Williams (J. Physiol., 1936, **88**, 113—126). R. N. C.

Oxygen and carbon dioxide subcutaneous tissue gas tensions in cases of hypertension. P. Ellman and J. H. Taylor (J. Hyg., 1937, **37**, 369—371).—Results from 22 patients show that subcutaneous CO_2 and O_2 gas tensions lie within normal limits (CO_2 40 mm., O_2 40—43 mm. Hg). Capillary walls are not thickened and capillary blood flow is normal. W. L. D.

Regulated oxygen transport in two cases of congenital circulatory defect. C. S. Hicks and C. I. Cox (Austral. J. Exp. Biol., 1937, **15**, 141—157).—Investigation of blood equilibria reveals a complex system of adaptations in face of a lowered arterial O_2 pressure consequent on mixing of arterial and venous blood. The O_2 dissociation curve is shifted to bring the steep region into action in the capillaries; the polycythæmia assists the tissue oxygenation by further increasing the O_2 available at the low pressure head which is maintained and further by slowing the circulation on account of increased viscosity which increases the total O_2 utilisation. The extra hæmoglobin buffers the greater amount of CO_2 thus removed. The weakest points in the system are the mechanical strain from the viscosity of the blood and the lowering of alveolar CO_2 which is apt to develop following anoxia of the carotid sinus. R. M. M. O.

Carbamino-compounds of carbon dioxide with human hæmoglobin and their rôle in the transport of carbon dioxide. J. K. W. Ferguson (J. Physiol., 1936, **88**, 40—55).—Carbamino-compounds (I) of CO_2 with human hæmoglobin (II) can be determined in solutions of (II) by the Ba method if suitable methods are adopted to overcome the "protective action" of (II) on the $BaCO_3$ ppt. The method can be applied to solutions of low total CO_2 content. (I) from human and ox-(II) are similar in general properties; oxygenation reduces the affinity of (II) for CO_2 in both. The amount of CO_2 combining with human (II) is > that previously reported for ox-(II). (I) are responsible for about 30% of the total CO_2 transport in resting conditions, and about 75% of the transport in the erythrocytes. R. N. C.

Study of blood-gases with a new micro-apparatus. I. Modification of the Harington and Van Slyke extraction chamber. II. Gaseous content of arterial, cutaneous, and venous blood in the normal state, acidosis, and alkalosis. K. Saito (J. Biochem. Japan, 1937, **25**, 79—87, 89—94).—I. An apparatus applicable to samples of 0·1 c.c. is described (cf. A., 1924, ii, 872).

II. Data for men and rabbits are tabulated. F. O. H.

Rate of maturation of young red cells in canaries. R. Hegner and R. Hewitt (Science, 1937, **85**, 568—569).—For peripheral blood, the period required is <24 hr. in both parasitised (malaria) and non-parasitised cells. L. S. T.

Method for fixing neutral-red in supra-vital stained blood smears. A. Hjärre and H. Berthelsen (Nature, 1937, **140**, 155).—The method described, of staining smears with neutral-red, permits the differentiation of lymphocytes and small monocytes, and indicates qual. changes in the white blood corpuscles. L. S. T.

Influence of electrolytes on the oxygen dissociation of hæmoglobin. E. S. G. Barron, R. Munch, and A. E. Sidwell, jun. (Science, 1937, **86**, 39—40).—Curves showing the effect of anions on the oxidation–reduction potential of blood-hæmin (I) and on the O_2 dissociation of hæmoglobin (II) are given. On combining with PO_4''' and borate (I) forms complex compounds possessing different free energies, whilst (II) combines with Cl', SO_4'', PO_4''', HCO_3', and citrate to form complex compounds with different dissociation consts. for the reactions Hb + anion $\rightleftharpoons$ Hb anion and Hb anion + $O_2 \rightleftharpoons$ Hb anion O_2. Previous attempts to interpret the equilibrium between O_2 and (II) have failed because the effect of electrolytes on the equilibrium by formation of complex compounds has been neglected. L. S. T.

Alkaline resistance and spreading velocity of fœtal and adult types of mammalian hæmoglobin. R. Brinkman and J. H. P. Jonxis (J. Physiol., 1936, **88**, 162—166).—The rate of denaturation of the hæmoglobin (I) of the young goat by alkali is > that of the maternal (I), but tends to increase with the age of the animal. The spreading velocities of the fœtal and maternal (I) at the isoelectric point differ from one another in the goat, cow, rabbit, and man, but not in the cat. R. N. C.

Ætioporphyrin and hæmoglobin regeneration after hæmorrhage. J. H. Hughes and A. L. Latner (J. Physiol., 1937, **89**, 403—406).—Ætioporphyrin accelerates hæmoglobin regeneration in rabbits. R. N. C.

Comparative determination of hæmoglobin in human anæmias by the colorimetric and iron methods. R. Damade, L. Servantie, and A. Pitous (Compt. rend. Soc. Biol., 1937, **125**, 754—756).—Concordant results were obtained by the various methods with the exception of that of Sahli (cf. A., 1936, 355). H. G. R.

Oxyporphyrin–hæmatin compound as intermediate between protohæmatin and verdohæmatin. R. Lemberg, B. Cortis-Jones, and M. Norrie (Nature, 1937, **140**, 65—66).—The hæmochromogen obtained by reduction of the compound (cf. this vol., 364) with the absorption band at 639 mμ is not protohæmochromogen but a hæmochromogen of a new type. This is rapidly oxidised by atm. O_2 to verdohæmochromogen, and on splitting with HCl in absence of O_2 it affords an oxyporphyrin resembling those obtained by H. Fischer *et al.* by the action of H_2O_2 on porphyrins in conc. H_2SO_4. The new hæmochromogen is probably the Fe complex salt of an oxyporphyrin carrying OH on the α-methene group. The compound with the absorption band at 639 mμ is the ferric hæmochromogen of the oxyporphyrin, and not a hæm–H_2O_2 compound (cf. *loc. cit.*). L. S. T.

Determination of bilirubin with the photoelectric colorimeter. H. T. Malloy and K. A. Evelyn (J. Biol. Chem., 1937, **119**, 481—490).—The photo-electric determination of bilirubin (I) in serum by means of its colour reaction with $Ph{\cdot}N_2{\cdot}SO_3H$ is described. A light filter is used to overcome the interference of yellow pigments. The presence of sufficient MeOH (50%) ensures the reaction of all the (I) even in the presence of serum-proteins. P. G. M.

Phase-rule study of serum-proteins : effect of changes in certain variables. E. Jameson (J. Gen. Physiol., 1937, **20**, 859—877; cf. this vol., 111).—The solubility curves of serum-proteins studied under different conditions of p_H, temp., and concn. of protein, using K citrate and $(NH_4)_2SO_4$ as precipitants, have been used to determine the effect of these conditions on the four fractions (*loc. cit.*). E. M. W.

Effect of parathyroid extract on the surface tension of plasma, its fibrinogen content, and the protein present as globulin. E. Zunz, R. Bonnyns, and L. Gillo (Arch. internat. Physiol., 1937, **44**, 232—248).—Intramuscular or intravenous injection of parathyroid extract increases γ and the fibrinogen and globulin content of rabbit's plasma. H. G. R.

Micro-determination of total protein, albumin, and globulin of [blood-]serum or -plasma. M. Florkin and J. Gomez (Arch. internat. Physiol., 1937, **44**, 547—550).—Total protein and albumin are determined by a micro-Kjeldahl method, using a special Kjeldahl flask for pptn. and subsequent operations. Globulin is determined by difference. H. G. R.

Determination of histamine in the blood. C. F. Code (J. Physiol., 1937, **89**, 257—268).—The method of Barsoum and Gaddum (cf. A., 1936, 496) for extracting histamine is considerably simplified. R. N. C.

Biochemistry of choline and its derivatives. V. Presence of acetylcholine in a latent state in blood. E. Kahane and J. Lévy (Bull. Soc. Chim. biol., 1937, **19**, 777—786; cf. A., 1936, 875).—The extracts obtained from the blood of various animals by treatment with boiling H_2O and pptn. of the protein and mineral substances with EtOH are shown by pharmacological tests and by their behaviour towards aq. NaOH, heat, and horse serum to contain acetylcholine. The mechanism of the formation during the extraction is discussed. A. L.

Micro-photometric determination of amino-acids [in blood]. M. Florkin (Arch. internat. Physiol., 1937, **44**, 551—556).—The method of Danielson (A., 1933, 965) is modified, using the Pulfrich photometer. H. G. R.

Submicro-photometric method for determining uric acid in blood-plasma. M. Florkin (Arch. internat. Physiol., 1937, **44**, 542—546).—The method is a modification of Benedict's and Borsook's (A., 1935, 1140) methods using the Pulfrich photometer. H. G. R.

Distribution of urea in blood and aqueous humour. G. H. Benham (Biochem. J., 1937, **31**, 1157—1160).—Aq. humour (cat, dog, rabbit) contains only slightly less (80—95%) urea than does serum. The vals. present further evidence in support of the dialysis theory as regards blood and aq. humour. P. W. C.

Determination of blood-galactose. S. Sugawara (J. Biochem. Japan, 1937, **25**, 11—21).—Glucose is removed by fermentation with Fleischmann's yeast and then galactose by fermentation with saké-yeast IV, reducing vals. being determined at each stage. F. O. H.

Fermentable, hydrolysable sugar in blood and its micro-determination. R. Ohta (J. Biochem. Japan, 1937, **25**, 1—9).—The sugar is determined in plasma or serum by removing free sugar by yeast fermentation, autoclaving the residue at 120° for 30 min. with H_2SO_4, and, following deproteinisation (H_2WO_4), determining the difference in reducing val. (Hagedorn–Jensen) of the hydrolysate before and after yeast-fermentation. The content in rabbits' serum (normally 0·06—0·09%) is unchanged by injection of insulin or adrenaline but is significantly decreased by starvation. F. O. H.

Determination of acetone in blood and urine. J. C. Abels (J. Biol. Chem., 1937, **119**, 663—667).—The $COMe_2$ in blood or (acidified) urine (0·5 ml.) is absorbed in 5% aq. $NaHSO_3$, which is then treated with Nessler's solution, the turbidity produced being compared with standards from known amounts of $COMe_2$. F. O. H.

Blood-alcohol curve following gastric and duodenal administration of alcoholic beverages. G. Lolli (Atti R. Acad. Lincei, 1936, [vi], **24**, 523—526).—With fasting men, the height of the blood-alcohol curve and the rapidity of absorption are greatest after duodenal and least after oral administration of 0·5 c.c. of EtOH (in 20% aq. solution) per kg. body-wt.; gastric administration gives intermediate vals. F. O. H.

Examination for and determination of alcohol in blood *post-mortem*. KOHN-ABREST and L. TRUFFERT (Ann. Falsif., 1937, **30**, 210—216).—Blood (or the organ) is repeatedly distilled and the final distillate treated with K_2CO_3. The vol. of the EtOH which separates is measured in a graduated elongation of the collecting flask. Phenolphthalein is added to facilitate measurement. If the material is putrified, a correction is applied for impurities included in the EtOH layer. E. C. S.

Technique and forensic significance of the detection of blood-alcohol by Widmark's method. W. NEUGEBAUER (Mikrochem., 1937, **22**, 145—158).—A review. J. S. A.

Transformation of adenosinetriphosphoric acid in nucleated erythrocytes. O. I. FEINSCHMIDT and A. I. TSCHERNIAK (Biochimia, 1937, **2**, 509—513).—The $H_4P_2O_7$- and H_3PO_4-P and glucose contents of turtle blood are respectively 4·0—4·8, 11·0—15·3, and 24—50 mg. per 100 c.c. during hibernation, and 8·2—10·8, 3·5—5·4, and 60—64 mg. during the summer. It is concluded that resynthesis of adenosinetriphosphoric acid is inhibited during hibernation. R. T.

Increase of blood-calcium after intravenous administration of glucose. S. C. SEN and P. N. CHAUDHURY (Indian J. Med. Res., 1937, **24**, 845—853).—The increase of blood-Ca produced in rabbits by glucose (I) is inhibited by injection of adrenaline (II) previous to or immediately after (I), and when established is slowly restored to normal by (II). (II) alone does not affect -Ca. The alkalinity of the blood is increased on injection of (I), and of (II) when -Ca is high, but falls to normal vals. simultaneously with -Ca. Alkali alone does not affect -Ca or the alkalinity. Blood-PO_4''' falls whenever -Ca rises. (I) possibly stimulates, whilst (II) inhibits, the effect of the pancreas on the parathyroids. R. N. C.

Changes in magnesium and calcium of blood-serum under different conditions of work. A. PLESCHTIZER (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 284—295).—Workers exposed to a brickworks dust containing Ca and Mg showed much more Ca and Mg in the blood-serum than workers not so exposed. Temp. differences and manual labour had only a small effect on the increase in serum-Mg. M. A. B.

Effects on the human electrocardiogram of the introduction of calcium and potassium into the blood. I. HARRIS and D. A. LEVIN (J. Physiol., 1937, **89**, 153—159).—Ca and K both reduce the heart-rate; their concns. cannot be correlated with the magnitude of the changes in the electrocardiogram. R. N. C.

Determination and the value of the erythrocyte–plasma chloride ratio. M. PAGET (Bull. Soc. Chim. biol., 1937, **19**, 787—799).—Errors in the determination due to the use of Na citrate and oxalate as anticoagulants, and isotonic glucose solution for washing the erythrocytes, are indicated. An improved technique in which polymerised Na anetholedisulphonate is used is described. A. L.

Blood-chloride. H. CHABANIER, C. O. GUILLAUMIN, M. LAUDAT, M. LÉVY, M. PAGET, and C. VAILLE (Bull. Soc. Chim. biol., 1937, **19**, 800—804).—A standard technique for the determination of blood-Cl′ based on previously described methods is recommended. A. L.

Blood chemistry of surviving parathyroidectomised dogs. E. I. EVANS, S. SZUREK, and R. KERN (Endocrinol., 1937, **21**, 374—379).—After parathyroidectomy, serum-Ca and -inorg. P can remain at tetany levels for 9 months. Changes in Na, K, Mg, and Cl′ are not significant. P. G. M.

Total osmotic concentrations in serum and aqueous humour. G. H. BENHAM, H. DAVSON, and W. S. DUKE-ELDER (J. Physiol., 1937, **89**, 61—63).—The mol. concn. of the serum of the cat is > that of the aq. humour. The mean mol. difference corresponds to a difference in osmotic pressure of 31—39 mm. of Hg. R. N. C.

Anti-fluorescent action of human serum on some fluorescein salts. F. ZUCKERANDL (Compt. rend. Soc. Biol., 1937, **125**, 804—806).—The anti-fluorescent power of normal serum is the same for the Na, K, Ca, or Mg salts of fluorescein. In cirrhosis and cancer there is no action on the Ca and Mg and on the Na and K salts, respectively. H. G. R.

Reversible neutralisation of the anthracidal power of serum by Congo-red. J. GORDON and N. WOOD (J. Hyg., 1937, **37**, 471—473).—Fresh Congo-red solution added to rabbit serum inactivates the anthracidal power. Adsorption of the dye on charcoal also removes the power from serum but such serum when added to serum inactivated with Congo-red regains its activity. W. L. D.

Hæmolytograph. M. VILLARET, L. JUSTIN-BESANÇON, and R. EVEN (Compt. rend. Soc. Biol., 1937, **125**, 871—872).—An apparatus to measure the kinetics of hæmolysis *in vitro* is described. H. G. R.

"Kinelysis." M. VILLARET, H. BÉNARD, L. JUSTIN-BESANÇON, and A. ABADI (Compt. rend. Soc. Biol., 1937, **125**, 872—874).—The rate of hæmolysis *in vitro* ("kinelysis") is approx. 75 sec. for a 20% suspension of normal cells and may be considerably increased in pathological conditions. H. G. R.

Hæmolytic "erythrodialysis." M. VILLARET, H. BÉNARD, L. JUSTIN-BESANÇON, and A. ABADI (Compt. rend. Soc. Biol., 1937, **125**, 875—876).—The discharge of electrolytes from the corpuscular protoplasm in isotonic solution under the action of hæmolysing substances ("erythrodialysis") is less for pathological than for normal erythrocytes. H. G. R.

Use of polymerised anetholedisulphonate as an anticoagulant in the determination of the alkaline reserve of blood-plasma. H. HIGOUNET (Bull. Soc. Chim. biol., 1937, **19**, 843—845).—No special precautions are necessary to avoid loss of CO_2 through contact with the air. A. L.

Relationship between alexin and the anti-complementary power of serum. L. NATTAN-LARRIER, L. GRIMARD, and J. DUFOUR (Compt.

rend. Soc. Biol., 1937, **125**, 850—853).—The development of anticomplementary power and the disappearance of alexin are not related. H. G. R.

Mode of action of *Bothrops atrox* venom on blood coagulation *in vitro*. C. J. Hanut (Arch. internat. Physiol., 1937, **44**, 329—350).—Oxalated plasma or fibrinogen solutions, free from proserozyme and cytozyme, are coagulated by venom of *B. atrox*. The action is augmented by proserozyme, serozyme, cytozyme, and $Ca^{\cdot\cdot}$. H. G. R.

Antitoxic properties of glutathione. Tetanus toxin. L. Binet, C. Jaulmes, and G. Weller (Compt. rend., 1937, **204**, 1761—1763).—Glutathione (I) (20 mg.) alone or with <5 mg. or >20 mg. of $NaHCO_3$ does not protect guinea-pigs against tetanus toxin, but with 5—20 mg. of $NaHCO_3$ affords complete protection. J. L. D.

Toxins of dysentery bacilli. Antitoxic protective power of sera obtained after injection of endotoxin-antigen-*O* of Shiga's and Flexner's bacilli. A. Boivin and L. Mesrobeanu (Compt. rend. Soc. Biol., 1937, **125**, 796—799).—Antibody-*O*, formed after injection of endotoxin-antigen-*O*, is sp. H. G. R.

Existence of a thermolabile and neurotropic toxin (exotoxin) in the Shiga bacilli. A. Boivin and L. Mesrobeanu (Compt. rend., 1937, **204**, 1759—1761; cf. this vol., 183, 197).—Dead cultures of the *S* form of Shiga's bacillus heated to 55° are 10 times as toxic to mice as those heated to 100°. The *S* form of Shiga's bacillus and the *R* and *S* forms of Flexner's bacillus have not similar properties. $CCl_3{\cdot}CO_2H$ ppts. the toxin from autolysed suspensions of Shiga's bacillus. The toxic properties are abolished in 0·5 hr. at 100° and by digestion with trypsin. J. L. D.

Glutathione as an antitoxin for diphtheria and tetanus toxins. H. Vincent (Compt. rend., 1937, **204**, 1693—1694).—Glutathione detoxicates diphtheria toxin at p_H 7·2—7·4 and at 38—39° in 2—4 days. The detoxication is less apparent with tetanus toxin. J. L. D.

Adsorption of antigens by antibodies or *vice versa*. III. Effect of electrolytes on the rate of flocculation of toxin-antitoxin mixtures of diphtheria and tetanus. B. N. Ghosh and N. N. Ray (Indian. J. Med. Res., 1937, **24**, 625—631).—The flocculating power of Na citrate (I), Na_2HPO_4, $Na_2C_2O_4$, and NaCl on diphtheria toxin-antitoxin mixtures decreased in the order named; urea and glucose do not cause flocculation. Purified and conc. diphtheria antitoxin flocculates with its toxin (II) in presence of (I) or Na_2HPO_4, the rate of flocculation depending on the concn. of the electrolytes and the potency of (II). Tetanus antitoxin also flocculates with its toxin in presence of (I), the balanced mixture flocculating most rapidly. R. N. C.

Antitetanus antibodies in normal horse serum. P. Condrea, H. Poenaru, and G. Dima (Compt. rend. Soc. Biol., 1937, **125**, 768—770). H. G. R.

Factors affecting the tuberculin test. W. E. Nelson, F. B. Seibert, and E. R. Long (J. Amer. Med. Assoc., 1937, **108**, 2179—2181).—Tuberculin is heat-stable and may be adsorbed on glass and rubber, thus giving misleading results unless care is taken in cleaning apparatus used. H. G. R.

Fixation of the complement reaction and blood-antihormones. R. Demanche, G. Laroche, and H. Simonnet (Compt. rend. Soc. Biol., 1937, **125**, 718—719).—Negative results in this reaction are not due to a low hæmolytic power of the serum. H. G. R.

Immunology of pepsin and pepsinogen. C. V. Seastone and R. M. Herriott (J. Gen. Physiol., 1937, **20**, 797—806).—Pepsin (I) antisera from pigs react with alkali-denatured (I) from pigs, oxen, and guinea-pigs but not from rabbits, chickens, and sharks. (I) antisera react with (I) and pepsinogen (II), but (II) antisera react with (II) and not with (I). Neither (I) nor (II) antisera react with the serum-proteins from the same species, nor do serum-protein precipitins with the homologous (I) or (II). After activation of (II), a substance reacting with (II) antisera persists; this is probably serologically distinct from (I) or (II). E. M. W.

Antigenic behaviour of serum-proteins with special reference to crystalbumin and seroglycoid. L. F. Hewitt (Biochem. J., 1937, **31**, 1047—1052).—The antigenic function of serum-albumin is due mainly to seroglycoid (cf. this vol., 164) and to traces of pseudoglobulin. Crystalbumin, which constitutes the bulk of the albumin fraction, is only very feebly antigenic. In blood-serum there are at least five sp. antigens, viz., euglobulin, pseudoglobulin, crystalbumin, seroglycoid, and probably mucoid. These differ in antigenic potency. P. W. C.

Effect of combination with diazo-compounds on the immunological reactivity of antibodies. H. Eagle, D. E. Smith, and P. Vickers (J. Bact., 1936, **31**, 65—66).—Gradual destruction of reactivity of antisera by coupling with diazo-compounds is due to progressive decrease in activity of all the antibody mols. and not to inactivation of an increasing proportion of the mols. Flocculating activity of diphtheria antitoxin was thus destroyed before an appreciable decrease in protective titre, *in vivo*, was apparent. Protein groups reacting with diazo-compounds probably include aliphatic NH_2, NH of histidine, tryptophan, proline, and hydroxyproline, and the OH of tyrosine. A. G. P.

Immunological properties of an artificial carbohydrate-protein antigen containing glycuronic acid. W. F. Goebel (J. Bact., 1936, **31**, 66).—A compound of the diazonium salt of *p*-aminobenzyl-β-glycoside of glycuronic acid (I) with foreign protein reacted with antipneumococcus horse sera types III and VIII. The corresponding compound containing glucose was inert. (I) is a common constituent of the sp. polysaccharide (II) of pneumococcus types III and VIII. Immunological cross reactions exhibited by the bacilli probably depend on the configuration of the uronic acid constituent of (II). The mechanism of this reaction and that with the artificial antigen are discussed. A. G. P.

Conjugation of sodium chloride with serum-proteins as indicated by interference-refractometry and its relation with the albumin : globulin ratio. N. Fiessinger, J. Zuckerandl, and de Wodzinska (Compt. rend. Soc. Biol., 1937, **125**, 801—803).—An indirect relation was observed between *n* and the albumin : globulin ratio, except in some pathological cases due to disturbances in NaCl metabolism. H. G. R.

Serological behaviour of metal–protein complexes from agglutinating sera. H. Diacono and R. Durand (Compt. rend. Soc. Biol., 1937, **125**, 828—831).—Agglutinins are not affected by treating the serum with $CuSO_4$ or $HgCl_2$ and may be recovered by dissolving the coagulum in aq. $Na_2S_2O_3$ or MgS_2O_3. H. G. R.

Preservation of hæmolytic antibodies in mercury–protein complexes obtained from guinea-pig's anti-sheep sera. H. Diacono (Compt. rend. Soc. Biol., 1937, **125**, 831—832).—A loss of 50% after 20 days and 100% after 2 months was observed. H. G. R.

Stabilisation of antitoxic proteins of serum with amides and denaturation with keten. H. Goldie (Compt. rend. Soc. Biol., 1937, **125**, 861—863).—Treatment with 10—20% aq. urea or NH_2Ac renders the protein incoagulable and stable to heat, the process being reversible if the reagent is removed by dialysis. The proteins are denatured by treatment with keten and the anaphylactogenic power of the serum is decreased. H. G. R.

Effect of arsenobenzenes on diphtheria toxin. H. Goldie (Compt. rend. Soc. Biol., 1937, **125**, 863—866).—The toxins are rapidly inactivated by small amounts (0·5—1%) of arsenobenzenes, the process being reversed by dialysis. H. G. R.

Liberation of histamine-like substance in allergic reactions caused by arsenobenzene in the guinea-pig. A. Simon and A. M. Staub (Compt. rend. Soc. Biol., 1937, **125**, 815—818). H. G. R.

Sterols, bile acids, and related natural compounds. K. Brunner (Pharm. Zentr., 1937, **78**, 421—431, 439—442).—A survey of present chemical and biological knowledge of the sterols, vitamin-*D*, bile acids, sexual hormones, cardiac glucosides, and saponins. E. H. S.

Ultimate composition of biological material. I. Aims, scope, and methods. D. A. Webb and W. R. Fearon. **II. Spectrographic analyses of marine invertebrates, and the chemical composition of their environment.** D. A. Webb (Sci. Proc. Roy. Dublin Soc., 1937, **21**, 487—504, 505—539).—I. A new source of error due to the effect of tissue salts in unmasking "latent" impurities in the graphite electrodes is reported. The activity of the organism as a geological agent is illustrated by analyses of peat ash at different depths, and biological discrimination between different elements is illustrated by analyses of seed ash and the ash of baker's and of brewer's yeast.

II. Analyses of a no. of animal and plant tissues and data for 25 elements are reported, with special reference to distribution and abundance, and to the limits of sensitivity of the method for each element. N. M. B.

Fat of the white mouse (*Mus musculus albinus*). J. Pritzker and R. Jungkunz (Pharm. Acta Helv., 1937, **12**, No. 1, 2 pp.).—Fat (15% of body-wt.) extracted from the viscera of one old female tame mouse was liquid at room temp. and had n^{40} 1·4408, acid val. 13·4, sap. val. 221·4, I val. (Hanus) 60·3, Reichert–Meissl val. 5·72, Polenske val. 1·1, unsaponifiable matter (Spitz–Honig) 0·31%. The insol. fatty acids had n^{40} 1·4624, mean mol wt. 271·5, and contained 15% of solid (saturated) acids. The I val. of the liquid acids was 90·7. E. L.

Nitrogenous extractives of scallop muscle. I. Isolation and structure of octopine. II. Constituents of the muscle. E. Moore and D. W. Wilson (J. Biol. Chem., 1937, **119**, 573—584, 585—588; cf. this vol., 295).—I. 6 kg. of the muscle of *Pecten magellanicus* yield approx. 19 g. of octopine (I), m.p. 261—264° (corr.), $[\alpha]_D^{24}$ +19·6° in H_2O [picrate, m.p. 226—230° (corr., decomp.); picrolonate, m.p. 237—239° (corr., decomp.)]. (I) with aq. $Ba(OH)_2$ gives urea and an *NH_2-compound*, $C_8H_{16}O_4N_2$, m.p. 256—257° (corr., decomp.).

II. The fresh muscle contains phosphoarginine and yields arginine together with (I). W. McC.

Cholesterol content of the nails of animals. K. Hotta and K. Takagi (J. Biochem. Japan, 1937, **25**, 109—111).—Tabulated data for various animals range from 0·078 (canary) to 0·483% (rabbit). In man, the content averages 0·362%. F. O. H.

Cryogenic method of preparing hydrosols of sterols and phospholipins. I. A. Remezov and M. I. Karlina (Biochimia, 1937, **2**, 537—542).—The material (sterol, lecithin) is ground to an impalpable powder with liquid N_2, and the powder is shaken with H_2O, to yield stable sols. R. T.

Influence of external conditions and of the physiological state of animals on cerebral phosphorus compounds. N. V. Boldireva (Biochimia, 1937, **2**, 543—548).—The total P content of frog brain is const. throughout the year, but its distribution varies, inorg., phosphagen-, and lipin-P rising, and protein-P falling, from winter to autumn. Analogous effects are obtained when hibernating frogs are placed in a warm environment during the winter. The total P content of fœtal rabbit brain rises gradually to a max. at birth, thereafter falling; inorg. and phosphagen-P are at a max. 10—11 days after birth, and lipin-P 4 months after birth, at which time protein-P is at a min. R. T.

Phosphatide content of the brain of hibernating animals in various functional states. M. I. Okun (Biochimia, 1937, **2**, 580—586).—At birth the brain of marmots contains 0·33% of unsaturated and 0·60% (dry wt.) of saturated phosphatide-P. After the age of 30—45 days these components are present in approx. equal amount. During hibernation the content of saturated phosphatides rises at the expense of unsaturated ones. R. T.

Polypeptides and amino-acids in the organism. Characterisation and methods of determination. A. LESURE (J. Pharm. Chim., 1937, [viii], **25**, 23—34, 62—73, 111—128).—A review.

Glucoproteins. V. Protein complexes of chondroitinsulphuric acid. K. MEYER, J. W. PALMER, and E. M. SMYTH. **VI. Preparation of chondroitinsulphuric acid.** K. MEYER and E. M. SMYTH (J. Biol. Chem., 1937, **119**, 501—506, 507—510).—V. The compounds of chondroitinsulphuric acid (I) with proteins are true salts which have a const. composition over a wide range of concn. of the components.

VI. (I) is extracted from cartilage with aq. $CaCl_2$ as the acid Ca salt, and nitrogenous impurities are removed by denaturation with $CHCl_3$ and amyl alcohol followed by adsorption on Lloyd's reagent. P. G. M.

Content of free amino- and carboxyl groups in certain proteins. M. S. REZNITSCHENKO (Biochimia, 1937, **2**, 559—570).—The no. of NH_2 groups determined by Linderstrøm-Lang's method is > that of CO_2H (Willstätter), in the case of certain proteins. The difference is due to $(NH_2)_2$-acids present in the proteins, and it is concluded that terminal α-NH_2 may be taken as equal in no. to CO_2H. The length of the polypeptide chain is hence derived, and corresponds in the cases of ovalbumin, glutenin, glutelin, and zein to that of a 7-, 8-, 10-, and 11-peptide, respectively. R. T.

Individuality of gliadin. A. G. KUHLMANN (Nature, 1937, **140**, 119—120).—Results of experiments on the peptisation of the proteins of gluten by EtOH are summarised. These, and other experiments, show that the gliadin of wheat is not a chemical individual. It represents an adsorption complex of at least two fractions, now named α- and β-gliadin. In its properties β-gliadin approaches glutenin. β-Gliadin dissolves as a result of interaction by means of adsorption with the more easily peptisable fraction, α-gliadin, which forms the main mass of Osborne's gliadin. L. S. T.

Mechanism of the action of neutral salts on protein. I. A. SMORODINCEV and S. A. PAVLOV (Bull. Soc. Chim. biol., 1937, **19**, 915—921).—The total N contents of the extracts of collagen and gelatin with *N*-NaCl, -KCl, -$CaCl_2$, and -$SrCl_2$ are 2—3 times that of the aq. extracts. The NH_2-N contents of the salt solution extracts are, however, < that of the aq. extracts, showing that no hydrolysis takes place. The solubility of the protein is affected by the nature of the cation and the anion of the salt. The variation of the ratio of NH_2-N when determined by the methods of Van Slyke and Sörensen may be due to the different enolising power of the salts on the peptide linkings. A. L.

Refractive index of hen ovalbumin. I, II. K. KONDO and H. IWAMAE (J. Agric. Chem. Soc. Japan, 1937, **13**, 537—545, 546—553).—I. The n and η for a definite amount of ovalbumin (I) in solution vary linearly with concn. n, η, and d for a definite amount of (I) in a solution of $(NH_4)_2SO_4$ vary with concn. of the latter.

II. n and d of aq. solutions of (I) vary with p_H and increase to a max. at the isoelectric point. On the acid and alkaline side of the latter they decrease suddenly, and then increase again. η varies inversely as n. Explanations are offered for these phenomena. J. N. A.

Isoionic reaction of hen ovalbumin. K. KONDO and H. IWAMAE (J. Agric. Chem. Soc. Japan, 1937, **13**, 554—557).—Ovalbumin (I) and its $(NH_4)_2SO_4$ complex both combine with H_2SO_4 and with NH_3. The isoionic reaction of (I) is dependent on $(NH_4)_2SO_4$, and if the effects of salts and (I) itself are zero the reaction of (I) is p_H 4·89 ± 0·02. J. N. A.

Silk fibroin. VI. Relative viscosity of fibroin and its component solution. H. KANEKO and Y. NAKAZAWA (J. Agric. Chem. Soc. Japan, 1937, **13**, 595—600; cf. B., 1937, 532).—The high η of solutions of silk fibroin (I) in conc. H_2SO_4 is due mainly to the special structure of the (I) micelle; this structure is gradually destroyed on keeping the solution, by rise of temp., or by addition of H_2O. The (I) component sols under similar conditions show low η. J. N. A.

Total sulphur in normal human keratinous tissues. P. VALDIGUIÉ and DACHARY (Compt. rend. Soc. Biol., 1937, **125**, 855—857).—The average vals. for total S in the hair and nails are 4·86 and 3·37%, respectively. Variations with colour, age, and sex are discussed. H. G. R.

Carotenoids of the chicken retina. G. WALD and H. ZUSSMAN (Nature, 1937, **140**, 197).—Three pigments, a purplish-red (astacene), a golden or orange xanthophyll, and a yellow or yellowish-green hydrocarbon, have been cryst. from retinal extracts; they are carotenoids, and in suitable solvents closely reproduce the colours of the retinal droplets in the cones. Astacene and the hydrocarbon pigment appear to be synthesised by the chicken. Spectral extinction curves are reproduced. L. S. T.

Visual purple system in fresh-water fishes. G. WALD (Nature, 1937, **139**, 1017—1018).—The behaviour of porphyropsin (I), a dark purple pigment extracted from the retina of fresh-H_2O fishes, on exposure to light has been investigated by following the absorption of light of (I) solutions under different conditions. Under the influence of light, (I) in the retina of the fish undergoes a cycle of changes similar to that taking place with rhodopsin, the corresponding visual purple pigment in mammals, birds, and certain marine fishes. The components of the two systems are quite different. L. S. T.

Absorption spectra of visual purple and of indicator-yellow. R. J. LYTHGOE (J. Physiol., 1937, **89**, 331—358).—The absorption spectrum of visual purple (I) is unaffected by p_H; the max. band is at 502 mμ. (I) is bleached by light outside the p_H range 5·2—10·0 to an intermediate substance, "transient orange," which then thermally decomposes to *indicator-yellow* (II), the alkaline form of which has a narrow band with a max. probably in the near ultraviolet, and the acid form a broad band with a max. at 430—440 mμ. Below p_H 6·1 the absorption curves of (II) are different from those at neutrality, apparently

owing to tautomeric change; the thermostability disappears between p_H 4·0 and 5·2. The reactions of (II) are completely reversible. (I) is slightly regenerated from bleached solutions between p_H 7·0 and 9·3. R. N. C.

Accessory photo-sensitive substance in visual purple regeneration. A. M. CHASE (Science, 1937, **85**, 484).—Visual purple (I) solutions bleached by violet and blue light show more regeneration than those bleached by green, yellow, and orange light. This suggests the existence of a blue-sensitive substance the decomp. of which is essential for regeneration of (I). L. S. T.

Diffusion coefficient and molecular size of visual purple. S. HECHT, A. M. CHASE, and S. SHLAER (Science, 1937, **85**, 567—568).—The diffusion coeff., determined by the method of Northrop and Anson, gives a probable val. of 0·0190 sq. cm. per day. The calc. radius of the mol. of visual purple (I) is then $6{\cdot}26 \times 10^{-7}$ cm., and the mol. vol. 623,000 and mol. wt. 810,000. (I) thus belongs to the carotenoid proteins. L. S. T.

Distribution and nature of the flavin contained in the skin of the eel. M. FONTAINE and R. G. BUSNEL (Compt. rend., 1937, **204**, 1591—1593; cf. this vol., 296).—Frozen or CH_2O-fixed sections show little green fluorescence and hence contain only traces of free flavin (I). Prolonged immersion in MeOH at 37° liberates (I) from a colloidal complex (probably Warburg's yellow enzyme). J. L. D.

Wing pigments of common white butterflies.—See A., II, 392.

Constitution of ch'an su (senso).—See A., II, 347.

Toad poisons. VII. Constituents of ch'an su and the constitution of cinobufagin and cinobufotalin. M. KOTAKE and K. KUWADA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, **32**, 79—82).—A $CHCl_3$ solution of an EtOH extract of ch'an su after treatment with Al_2O_3 (cf. Wieland *et al.*, A., 1936, 1252) gives cinobufagin, cinobufotalin, and γ-bufotalin. The structures of these substances are discussed in the light of previous work. J. L. D.

Bee poison. IV. Isolation of both components of the poison by dialysis. G. HAHN and H. LEDITSCHKE (Ber., 1937, **70**, [*B*], 1637—1644; cf. this vol., 200).—Both components are dialysable but at so widely differing rates that the isolation of both in a homogeneous state is possible. Component II is a basic substance which can be pptd. from aq. solution by alkali. It originates from the gland with the acid secretion. Component I is a (probably amphoteric) acid sol. in alkali, being formed from the gland with the alkaline secretion. Component II does not appear completely stable when heated with acids. The cramp-inducing properties of component I are weakened when it is heated in neutral solution. H. W.

Biochemistry of milk secretion. H. D. KAY (J. Soc. Arts, 1937, **85**, 841—857).—A lecture.

Rapid determination of lactoflavin in milk. C. H. WHITNAH, B. L. KUNERTH, and M. M. KRAMER (J. Amer. Chem. Soc., 1937, **52**, 1153—1154).—10 ml. of milk, treated with 15 ml. of 10% $CCl_3{\cdot}CO_2H$, are centrifuged for 30—60 min. at 2000 r.c.f., neutralised to Me-orange, diluted to $0{\cdot}12$—$0{\cdot}006 \times 10^{-6}$ g. of flavin per ml., and matched fluorometrically against standard solutions. Results are consistent among themselves and agree with biological tests (within 25%). R. S. C.

Fructose content of spinal fluid. R. S. HUBBARD and N. M. RUSSELL (J. Biol. Chem., 1937, **119**, 647—661).—The fructose (I) content of (pathological) cerebrospinal fluid, determined by Roe's method (A., 1934, 1379), is > that of blood taken at the same time and parallel with the total sugar content of the fluid. The probable formation of (I) from glucose is discussed. F. O. H.

Human parotid saliva. M. A. BASIR and T. S. RAMABHADRAN (Indian J. Med. Res., 1937, **24**, 911—916).—The saccharogenic power of parotid saliva is 6—8 times that of mixed saliva, although the physical properties of the two are alike. Hydrolysis is of the same order for sol. and amylum starch. The cardiac depressor substance in saliva is not acetylcholine. R. N. C.

Cholesterolytic power of bile. E. CHABROL, J. COTTET, and M. CACHIN (Compt. rend. Soc. Biol., 1937, **125**, 726—728).—The technique is not affected by various external factors and a min. concn. of cholalic acid of 1% is necessary. H. G. R.

Is the cholesterolytic power of bile a function of its cholalic acid content? E. CHABROL, J. COTTET, and M. CACHIN (Compt. rend. Soc. Biol., 1937, **125**, 728—730).—The cholesterolytic power is not solely dependent on the cholalic acid content of the bile. H. G. R.

Calcium in the hepatic and vesicular bile of the dog. J. CHEYMOL and A. QUINQUAUD (Compt. rend. Soc. Biol., 1937, **125**, 691—692).—Ca in the total solid matter of vesicular bile is 4·5 times that of hepatic. H. G. R.

Synthesis of sodium taurocholate and taurodeoxycholate.—See A., II, 342.

Effect of complete and partial hypophysectomy in adult albino rats on water, chloride, sodium, potassium, and sulphur metabolism. M. SANDBERG, D. PERLA, and O. M. HOLLY (Endocrinol., 1937, **21**, 346—351).—Polydipsia and polyuria occurring in hypophysectomised male rats are > those occurring in female rats. Urinary excretion of Cl′, Na, and K and total and neutral S rises after hypophysectomy, but is little changed after partial hypophysectomy. Fæcal S excretion is unchanged in either case. P. G. M.

Isolation of the natural urine porphyrins. H. FINK (Ber., 1937, **70**, [*B*], 1477—1482).—The presence of coproporphyrin I in normal urine is identified by the p_H–fluorescence curve and confirmed by its isolation by a process of adsorptive filtration. H. W.

Living animal cases of congenital porphyrinuria. P. J. FOURIE and C. RIMINGTON (Nature, 1937, **140**, 68).—The two most severe cases of five

cows affected each excrete 0·6 g. of coproporphyrin and 0·06—0·07 g. of uroporphyrin daily. They show signs of photosensitisation. L. S. T.

Porphyrins of the I and III series in congenital porphyrinuria. C. Rimington (Nature, 1937, **140**, 105—106).—Porphyrins similar to those found by Fischer *et al.* (A., 1926, 196) in a human porphyrinuric have been isolated from a bovine suffering from congenital porphyrinuria, and, in addition, coproporphyrin and uroporphyrin have been obtained from other tissues. The m.p. of the esters and chromatographic analysis indicate that small quantities of the series III pigments accompany those of series I excreted by congenital porphyrinurics. L. S. T.

Coal content of anthracotic lungs. E. Müller (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 316—318).—The minced and dried material is extracted with Et_2O and EtOH and digested with HCl. The residue is heated to approx. const. wt. at 160—180° and is then analysed for ash and C. M. A. B.

Polarographic investigations in serological cancer diagnosis. R. Brdička (Nature, 1937, **139**, 1020—1021).—When the sera are treated with alkali hydroxide, the height of the characteristic protein "wave" (cf. this vol., 205) increases in the carcinomatous serum < in normal serum. Denaturation with 0·05*N*-HCl produces a similar effect. Peptic cleavage of native and coagulated proteins shows an increase of the protein polarographic wave, and this increase is also smaller in carcinomatous cases. Acute inflammation and fever may also give a reaction similar to that of cancer. The polarographic effect of proteins is ascribed to the ·S·S· groups. L. S. T.

Carcinoma of the islets of Langerhans with hypoglycæmia and hyperinsulinism. R. W. Cragg, M. H. Power, and M. C. Lindem (Arch. Int. Med., 1937, **60**, 88—99).—A report of a case in which metastatic carcinoma of the islets did not interfere with their insulin-producing function. R. M. M. O.

Refractive index of cancerous sera. R. Jonnard (Bull. Soc. Chim. biol., 1937, **19**, 893—897).—The effect of 0·1 mg. of NaCl and KCl per c.c. on *n* of 14 sera is recorded. A. L.

Relation of vitamin-*D* to dental caries. F. W. Broderick (Brit. Dental J., 1937, **62**, 17—27).—Theoretical. An attempt to explain the effects of vitamins and hormones by their physico-chemical action on body-colloids. J. N. A.

Vitamins in dental diseases. R. Jeanneret (Z. Vitaminforsch., 1937, **6**, 250—264).—A review.

Phloridzin diabetes, phloridzin and related substances. I. Properties and colour reactions of phloridzin. II. Fate of phloridzin injected intravenously into the dog. III. Relation between molecular structure and diabetogenic action. IV. Mechanism of phloridzin glycosuria. A. Lambrechts (Arch. internat. Physiol., 1937, **44**, Suppl., 1—39, 40—91, 92—135, 136—162).—I. The colour reactions of phloridzin (I) are reviewed and restudied. The ultra-violet spectrum depends on p_H in a manner indicating a keto–enol transformation, and is compared with the spectra of phloretin, phlorin, and phloroglucinol. Spectrographic determination of these substances is described.

II. Injected (I) disappears at first rapidly and then more slowly, so that (I) is present in the blood throughout the period of glycosuria. It occurs mainly in the plasma, adsorbed on the proteins, with which it is pptd. by reagents, and from which it cannot be separated by ultrafiltration or extraction, except by combined pptn. and elution with excess of EtOH. (I) is fixed in all tissues and disappears at varying rates, most rapidly in muscle, in which its presence can never be demonstrated; yet muscle destroys it rapidly *in vitro* by a process which is apparently not enzymic. Small amounts of (I) pass into the urine.

III. The diabetogenic action depends on the presence in the mol. of a phenolic OH in association with a glucosidic O and is possessed by many diversely substituted derivatives and other phenolic glucosides. It is usually associated with a polyuria-stimulation. The two responses are quantitatively independent of each other.

IV. (I) raises the renal threshold for PO_4''' and also prevents resorption by the kidney tubules of several substances, *e.g.*, dyes, besides glucose. Colour reactions show it to be localised in the upper part of the renal tubule. In general it does not affect phosphatase action *in vivo*, nor does it inhibit *in vitro* calcification of the kidney. Its action on renal phosphatase *in vitro* is due partly to a direct inhibition, and partly to a displacement of p_H. Other glycosuria-provoking substances examined inhibit the enzyme irregularly in relation to their physiological action and several phenolic substances with no physiological action have a marked effect on the enzyme *in vitro*. Lundsgaard's hypothesis relating (I) glycosuria specifically to an interference with carbohydrate metabolism is rejected. R. M. M. O.

Carbon monoxide goitre. E. W. Baader (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 227—234). M. A. B.

***p*-Aminobenzenesulphonamide in treatment of *Bacterium coli* infections of the urinary tract.** M. Kenny, F. D. Johnston, and T. von Haebler [with A. A. Miles] (Lancet, 1937, **233**, 119—125).—Small oral doses of *p*-$NH_2 \cdot C_6H_4 \cdot SO_2 \cdot NH_2$ (I) effect the rapid disappearance of *B. coli* and pus cells, and remission of symptoms, in women with infections of the urinary tract. Toxic effects, such as sulphæmoglobinæmia, methæmoglobinæmia, and headache, sometimes appear. Oral administration of (I) renders urine bactericidal to certain members of the *B. coli* group. The bactericidal power approx. ∝ the (I) content. L. S. T.

Vitamin-*C* and infection; excretion of vitamin-*C* in osteomyelitis. M. A. Abbasy, L. J. Harris, and N. G. Hill (Lancet, 1937, **233**, 177—180).—Osteomyelitis causes a diminished rate of excretion of vitamin-*C* in the urine and a lowered response to test dose, apparently indicating an increased use of -*C* during the infective process. L. S. T.

Vitamin-*C* and infection; excretion of vitamin-*C* in pulmonary tuberculosis and in rheumatoid arthritis. M. A. ABBASY, L. J. HARRIS, and P. ELLMAN (Lancet, 1937, **233**, 181—183; cf. preceding abstract).—In pulmonary tuberculosis, the deficit in vitamin-*C*, shown by a lowered urinary excretion of -*C* and a smaller response to test doses, is considerable. The severity of the infection, the blood sedimentation rate, and the diminution in the urinary -*C* are correlated. In rheumatoid arthritis, there is also a lowered excretion of -*C*, and low excretions are associated with high blood sedimentation rates. L. S. T.

Vitamin-*C* and infection; influence of infection on the vitamin-*C* content of the tissues of animals. L. J. HARRIS, R. PASSMORE, and W. PAGEL (Lancet, 1937, **233**, 183—186; cf. preceding abstracts).—Guinea-pigs suffering from an acute infection with *Bacterium aertrycke* or *Pasteurella pseudotuberculosis* or from the effects of a diphtheria toxin showed a marked diminution in the vitamin-*C* content of the adrenal glands but not of the liver. In a more chronic infection with *Mycobacterium tuberculosis*, the -*C* content of the liver is also diminished. L. S. T.

Uranium nephrosis. A. T. MILHORAT and H. J. DEUEL, jun. (Arch. Int. Med., 1937, **60**, 77—87).—Glycosuria appears together with albuminuria and increased excretion of H_2O and Cl′ shortly after the administration. The glycosuria gradually disappears but the other symptoms persist until complete anuria sets in. Progressive decrease in total N excretion is followed by related increase in non-protein-N content of the blood, which, together with blood-sugar, increases sharply at the onset of anuria. R. M. M. O.

Blood-sugar of animals affected with rabies. P. REMLINGER and J. BAILLY (Compt. rend. Soc. Biol., 1937, **125**, 708—711).—An increase in blood-sugar with occasional glycosuria was observed. H. G. R.

Bone analysis in diagnosis of bone diseases of animals. J. MAREK, O. WELLMANN, and L. URBÁNYI (Mezög. Kutat., 1937, **10**, 149—158).—Although a mere determination of ash content is of no diagnostic val., the Ca : P and CaO : MgO ratios give immediate information not only of the presence of rickets but also of its cause, whether alkalotic or acidotic. E. C. S.

Phosphorus and calcium deficiency diseases as two ætiologically distinct entities. P. J. DU TOIT and A. I. MALAN (Nature, 1937, **140**, 153—154).—Experimental rickets produced in cattle, goats, sheep, pigs, and horses (indications) prove that insufficient dietary P is the causal factor in the production of rickets under conditions of vitamin-*D* sufficiency. Insufficient Ca in the diet produces not rachitic lesions but a different bone disease, viz., osteofibrosis. Osteoporosis is invariably associated with both diseases. L. S. T.

Mineralogic study of silicosis.—See A., I, 484.

Variations in serum-lipins and in the ratio of the total lipins to cholesterol in ictero-hæmorrhagic spirochætosis. P. NICAUD, M. LAUDAT, and J. GERBAUX (Compt. rend. Soc. Biol., 1937, **125**, 799—801).—An increase in the ratio occurs. H. G. R.

Polypeptidæmia in cases of gastro-duodenal ulcers. S. MARINO and A. SALADINO (Arch. Farm. sperim., 1937, **63**, 161—182).—The disease is associated with levels of blood-polypeptides > normal. F. O. H.

Interpretation of the disturbances in carbohydrate metabolism during acute experimental uræmia in rabbits. M. VILLARET, L. JUSTIN-BESANÇON, A. RUBENS-DUVAL, and P. BARBIER (Compt. rend. Soc. Biol., 1937, **125**, 736—738).—A decrease in liver-glycogen is accompanied by an increase in free and protein-bound sugar. H. G. R.

Value of glucose in human health and sickness. O. MÜHLBOCK (Z. Spiritusind., 1937, **60**, 213).—A review, including an account of the use of glucose in the treatment of wounds. I. A. P.

Impedance changes in muscle during contraction, and their possible relation to chemical processes. M. DUBUISSON (J. Physiol., 1937, **89**, 132—152). R. N. C.

Function of the gills of the mayfly nymph, *Cloeon dipterum*. C. A. WINGFIELD (Nature, 1937, **140**, 27).—The O_2 consumptions of normal and gill-less nymphs at different $[O_2]$ have been compared. At high $[O_2]$ the gills appear to play little or no part in respiration and aid O_2 consumption only when the O_2 content of the H_2O is low (<3 c.c. per litre). L. S. T.

Fasting metabolism of various breeds of hog. III. Metabolism and surface area. T. DEIGHTON (J. Agric. Sci., 1937, **27**, 317—331; cf. A., 1934, 683).—Metabolism in a state of inanition is a function of the power of the wt. rather than of the true surface area of the animal. Hogs born in the summer and autumn of one year exhibit two periods of max. metabolism, one immediately and one in the following summer. This is possibly due to the effect of light on thyroid activity produced by the intermediate action of the anterior pituitary. The view that nett energy is a statistical rather than a physiological const. receives further support. A. G. P.

Nutritive value of raw and pasteurised milk for mice. G. S. WILSON and I. MAIER (J. Dairy Res., 1937, **8**, 203—217).—Mice were fed on a biscuit diet supplemented by minerals (Fe, Cu, and Mn), yeastrel, and raw and pasteurised milks. No difference in growth, prolificacy, or successful rearing of litters was observed between the two groups, but the average wt. of young at weaning from does thus fed was significantly greater in the raw than in the pasteurised group. In breeding experiments, raw milk was significantly superior in regard to wt. of mice and the wt. of the young at weaning but the breeding performances were similar. On comparing the feeding of milk in an inverted tube as against an open vessel, the pasteurised group gave better, but not significant, wt. increases. The difference is ascribed to the different fat intakes under the two methods of feeding.

Second and third generations of milk–biscuit diets showed no deterioration in growth rate or fecundity. W. L. D.

Resistance to infection with *Bact. typhimurium* of mice fed on raw and pasteurised milk. G. S. Wilson (J. Dairy Res., 1937, **8**, 218—223).—Two groups of mice (500 in each) fed on a supplemented biscuit, with raw or pasteurised milk, diet were inoculated intraperitoneally and another two groups were fed orally with the organism. The nos. which died from sp. infection were : raw 51·8%, pasteurised 51·2% (inoculation), and raw 38·1, pasteurised 44·4% (feeding). The nos. which contracted infection were respectively 95·3, 91·6; 67·5, 66·0. The resistance to infection on both milk types was similar. W. L. D.

Influence of diet on resistance to infection. I. Effect of various diets on fertility, growth, and survival of mice. II. Effect on resistance of mice to bacterial infection. M. Watson (J. Hyg., 1937, **37**, 396—419, 420—444).—I. A diet of oats, milk, and H_2O grossly deficient for mice is more satisfactory on addition of bran, cod-liver oil, and Yeastrel. No improvement is obtained on adding an acid salt mixture but some on adding a alkaline salt mixture. Raising the protein and adding dried separated milk are further improvements. Gluten and casein fed to young mice in a mixed diet appear to be equiv. in val. Synthetic diets reduced fertility. Mice in corroded Zn cages showed a lower fertility than those in glass owing to Pb poisoning. Exclusion of light had no effect on the survival and growth of young mice.

II. Young mice fed on a dried separated milk, oatmeal, dextrin, flour-H_2O biscuit, coconut and cod-liver oils, Yeastrel, bran, milk, and H_2O are more resistant to *per os* infection of *Bact. typhimurium* than those on a diet with more oatmeal and dried milk, dextrin, and biscuit but with coconut oil omitted. W. L. D.

Balanced diets. I. S. P. Niyogi, V. N. Patwardhan, and R. G. Chitre (Indian J. Med. Res., 1937, **24**, 787—796).—The animal fat and protein contents of two Indian diets are low compared with a physiologically ideal diet, and they have also a very low lysine content. Effects on growth and reproductive power are examined. R. N. C.

Effect of amino-acids on the metabolism of various forms of muscular tissue. R. Crismer (Arch. internat. Physiol., 1937, **44**, 474—487).—Aliphatic NH_2-acids increase the frequency and amplitude of contraction of cardiac muscle and the production of lactic acid (I) by the myocardium. Phenylalanine decreases the contractility of rabbit heart and increases production of (I), but has a stimulating effect on the frog heart. H. G. R.

Absorption of amino-acids and their distribution in the body-fluids. C. Bolton and G. P. Wright (J. Physiol., 1937, **89**, 269—286).—Absorption of NH_2-acids (I) from the cat's intestine follows the diffusion law. In the process of rapid absorption of products of digestion (I) concn. in the efferent veins of the villus is $>$ in the efferent lymph. Van Slyke and Meyer's findings that a large proportion of (I) are broken down in the liver are confirmed. In the fasting or resting state, the liver continues to remove (I) from the blood passing through it. In starvation the muscular tissues appear to be supplying (I) to the blood. R. N. C.

Synthesis of creatinephosphoric acid in muscle and the "reaction-form" of sugar. O. Meyerhof (Naturwiss., 1937, **25**, 443—446).—With dialysed muscle-extract containing added cozymase, Mg, Mn, inorg. P_2O_5, and adenosinetri- and hexosedi-phosphoric acid (I), formation of lactic and phosphoglyceric acid (II) is primarily accelerated by presence of creatine (III). In appropriate fermentative systems, the acceleration of (II) formation from (I) by (III) equals that by glucose, indicating simultaneous formation of creatinephosphoric acid. The general course of carbohydrate transformation during yeast and muscle metabolism is discussed. F. O. H.

Metabolism of creatine. I. Micro-determination of creatine and creatinine. II. Conversion of arginine into creatine in the isolated rabbit heart. R. B. Fisher and A. E. Wilhelmi (Biochem. J., 1937, **31**, 1131—1135, 1136—1156).—I. A colorimetric method for determining 5—80 $\times$ 10^{-6} g. of creatinine (I) depends on the absorption of (I) from acid solution by fuller's earth and elution with alkaline picrate. The standard error of an individual determination is $\pm 0{\cdot}98 \times 10^{-6}$ g.

II. The isolated male rabbit heart, perfused with a modified Ringer–Locke solution, exhibits no change in total (I) content. When arginine (II) is added to the perfusate, the total (I) of hearts from post-pubertal animals increases to an extent which corresponds almost exactly with the amount of (II) which disappears, this increase in (I) being due solely to increase in creatine. No increase in (I) occurs with pre-pubertal animals. P. W. C.

Effect of external temperature on the metabolism of creatinine and creatine. E. F. Terroine, A. M. de la Bernardie, and P. Lelu (Compt. rend., 1937, **204**, 1757—1759; cf. A., 1923, i, 631).—Decrease in temp. (30° to 5°) lessens the excretion of creatinine (I) of adult rats by 30%. The excretion of creatine (II) is simultaneously increased. (II) (2 mg.) injected into rats kept at 10°, but not at 30°, is recovered in the urine as (I) or (II). Hence metabolism of (II) does not occur at temp. $<10°$. J. L. D.

Metabolism of purine-nitrogen in fish and batrachians. I. Catabolism in selachians. A. Brunel (Bull. Soc. Chim. biol., 1937, **19**, 805—826).—The aq. extract of the liver of *Raia clavata*, L., and *R. punctata*, Risso, pptd. with EtOH gives a prep. containing allantoicase, capable of hydrolysing allantoic acid to urea and glyoxylic acid (optimum p_H 7·0), and allantoinase which is sp. for allantoin (optimum p_H 7·5—7·6). Uroxanic and homoallantoic acids are not attacked, but *N*-methylallantoic acid is hydrolysed by the prep. A. L.

Regulators of nitrogenous metabolism. I. Adrenaline. M. T. Buchy. **II. Thyroxine.** E. F. Terroine and R. Bonnet (Arch. internat. Physiol., 1937, **44**, 139—173, 265—312).—I. Administration

of adrenaline to rats with a low endogenous metabolism of N causes an increase in protein (I) catabolism and creatinuria, whilst the purine (II) catabolism, the coeff. of oxidation of (I) and (II), and the coeff. of ammonuria are maintained at the same level.

II. Administration of thyroxine to animals (rats or pigs) on a carbohydrate diet frequently increases the sp. endogenous excretion of N but has no oxidising effect on the waste products of (I) or (II) metabolism. A rapid appearance of creatinuria was also observed. H. G. R.

Intermediary metabolism of tryptophan. XXV. Isolation of *d*-kynurenine. Y. KOTAKE, jun., and N. ITŌ (J. Biochem. Japan, 1937, **25**, 71—77; cf. A., 1936, 1544).—The urine of rabbits fed with *dl*- or *l*- but not *d*-tryptophan contains *d*-kynurenine, $[\alpha]_D^{17}$ +28·5°. F. O. H.

Cystinuria. V. Metabolism of caseinogen and lactalbumin. E. BRAND, R. J. BLOCK, B. KASSELL, and G. F. CAHILL. VI. Metabolism of the hydroxy-analogue of methionine (*dl*-α-hydroxy-γ-methylthiolbutyric acid). VII. Metabolism of *S*-methylcysteine, γ-thiobutyric acid, and γγ′-dithiodibutyric acid. E. BRAND, R. J. BLOCK, and G. F. CAHILL (J. Biol. Chem., 1937, **119**, 669—680, 681—687, 689—696; cf. A., 1935, 1153).—V. In a cystinuric patient, methionine (I) and cystine (II), fed as constituents of caseinogen and lactalbumin [(I) : (II) ratio 9 and 1, respectively], underwent quant. and qual. catabolism in the same way as when fed as free NH_2-acids and in the same ratios in which they occur in the proteins. The data support the view that (I) is partly catabolised by conversion into cysteine and that (II) excreted in cystinuria is derived mainly from dietary (I).

VI. The compound (which supports the growth of rats on a S-deficient diet) is only partly oxidised to inorg. SO_4'' but is largely excreted as extra (II) and undetermined neutral S. The course of catabolism is discussed.

VII. None of the compounds yields extra (II). The S of *S*-methylcysteine is oxidised to an extent < that in normal men, whilst γ-thiobutyric acid is partly oxidised and partly excreted as S·S compound, probably the corresponding disulphide. F. O. H.

Distribution of fat in the livers of depancreatised dogs maintained with insulin. I. L. CHAIKOFF and A. KAPLAN (J. Biol. Chem., 1937, **119**, 423—433).—The lipin content of the liver is increased in the depancreatised dog, but fatty acids are not uniformly distributed. The deviation in the contents of individual lobes from a mixed sample may reach 37%. P. G. M.

Effect of raw and autoclaved pancreas on the liver-lipins of the completely depancreatised dog maintained with insulin. A. KAPLAN and I. L. CHAIKOFF (J. Biol. Chem., 1937, **119**, 435—449; cf. this vol., 24),—A heat-labile factor exists in raw pancreas which produces a rise in blood-lipins of depancreatised dogs, along with a heat-stable factor which prevents fatty infiltration of the liver. The nature of the active factors is discussed. The level of fatty acids in the liver is >14% <16 weeks after pancreatectomy. P. G. M.

Effect of activity on the phospholipin and cholesterol content of muscle. W. R. BLOOR (J. Biol. Chem., 1937, **119**, 451—465).—Increased activity of muscle increases phospholipin (I) and cholesterol (II) contents and also the (I) : (II) ratio. P. G. M.

Phospholipin synthesis during fat absorption. C. ARTOM, G. SARZANA, C. PERRIER, M. SANTANGELO, and E. SEGRÈ (Nature, 1937, **139**, 1105—1106).—The synthesis of phospholipins during absorption of fat has been investigated in a rat fed on olive oil and radioactive Na phosphate. Some hr. after ingestion of the fat and radioactive P, relatively large quantities of the latter were detected in the phospholipins of the liver and of the gut. The kidneys showed a small but definite activity, whilst the heart, spleen, and skeletal muscle showed practically none (cf. this vol., 262). The rapid formation of phospholipins in liver and intestine during fat absorption must be regarded, not as a simple introduction of fatty acid radicals into the phospholipin mol., but as a complete synthesis starting, at least in part, from inorg. P. L. S. T.

Metabolism of fatty acids in the liver. K. KOYAMA (J. Biochem. Japan, 1937, **25**, 141—149).—Starvation in mice produces a decrease in the content of normal fatty acids (I) in the liver followed by a decrease in phosphatide-(I). With the former saturated, and with the latter unsaturated, (I) are principally metabolised. The decrease in (I) is inhibited by P poisoning. F. O. H.

Changes in weight and nitrogen content of adult worker bees on a protein-free diet. M. H. HAYDAK (J. Agric. Res., 1937, **54**, 791—796).—On a carbohydrate diet the dry matter and N content decreased, the greatest variation being observed in the abdomen and the least in the thorax. H. G. R.

Sexual variation in carbohydrate metabolism. VIII. Rate of absorption of glucose and of glycogen formation in normal and adrenalectomised rats. H. J. DEUEL, jun., L. F. HALLMAN, S. MURRAY, and L. T. SAMUELS. IX. Effect of age or sex difference in content of liver-glycogen. H. J. DEUEL, jun., J. S. BUTTS, L. F. HALLMAN, S. MURRAY, and H. BLUNDEN (J. Biol. Chem., 1937, **119**, 607—615, 617—620).—VIII. Absorption of glucose and glycogen formation in the liver of rats are not affected by adrenalectomy. The rates of the two processes in female rats are respectively > and < in males.

IX. The level of liver-glycogen in normal rats is max. (>8%) at the age of 39—40 days and then slowly decreases to an approx. const. level (4%) at 75 days. No sexual difference occurs at ages of 26—29 days or >17 months but at other ages the level in the male is > that in the female. F. O. H.

Carbohydrate metabolism of brain. IV. Brain-glycogen, free sugar, and lactic acid as affected by insulin in normal and adrenal-inactivated cats, and by adrenaline in normal rabbits. S. E. KERR, C. W. HAMPEL, and M. GHANTUS (J. Biol. Chem., 1937, **119**, 405—421; cf. this vol., 92).—Insulin (2—15 units per kg.) decreases glycogen (I) and free sugar in the brain of normal and adrenal-

inactivated cats. Adrenaline, in doses sufficient to cause loss of (I) from liver and skeletal muscle, does not affect the brain-(I) and -lactic acid of fasting rabbits. P. G. M.

Carbohydrate metabolism following irradiation of the pituitary. M. Pijoan and R. Zollinger (Endocrinol., 1937, **21**, 357—360).—Carbohydrate metabolism is unchanged by irradiation of the pituitary. P. G. M.

Carbohydrate metabolism in hypophysectomised rats. I. Relation of method of glucose administration to the blood-sugar. L. T. Samuels and H. A. Ball (Endocrinol., 1937, **21**, 380—386).—The rate of intestinal absorption of glucose is decreased by 36% in hypophysectomised rats. Glucose tolerance is normal when administered by stomach tube for the first 2½ weeks but thereafter becomes diabetic in type, as it does within 1 week when injected subcutaneously. P. G. M.

Coupling of dismutations with esterification of phosphate in muscle. D. M. Needham and R. K. Pillai (Nature, 1937, **140**, 64—65).—From the effect of $CH_2I{\cdot}CO_2'$, phloridzin, and AsO_4''' on the lactic acid formation in rabbit muscle extract it is deduced that the dismutation of triose phosphate with $AcCO_2H$, giving phosphoglyceric and lactic acids, is coupled with a synthesis of adenyl pyrophosphate (I) from adenylic acid and free PO_4'''. This coupled esterification of PO_4 probably plays an important part during the anaërobic recovery period when creatine phosphate is resynthesised. During this period heat output is low; the energy of dismutation may be retained and utilised in the endothermic synthesis of (I). L. S. T.

Glyceraldehyde and embryonic glucolysis. J. Needham and H. Lehmann (Nature, 1937, **140**, 198; cf. this vol., 306).—*l*- but not *d*-glyceraldehyde inhibits glucolysis. The inhibitory effect is complete at a concn. of approx. $2{\cdot}5 \times 10^{-3}M$. The apparent inhibition of glucolysis by *dl*-glyceraldehyde to an extent $>90\%$ is due to a slow enzymic formation of lactic acid (I) from glyceraldehyde itself. This process results from the non-enzymic formation of AcCHO, which is then converted into (I) by the glyoxalase present. L. S. T.

Intermediary carbohydrate metabolism in embryonic life. I. General aspects of anaërobic glucolysis. J. Needham and W. W. Nowiński. **II. Formation and removal of pyruvic acid. III. Pasteur effect and the Meyerhof cycle. IV. Distribution of acid-soluble phosphorus.** J. Needham, W. W. Nowiński, K. C. Dixon, and R. P. Cook. **V. Phosphorylation cycles. VI. Glucolysis without phosphorylation. VII. Nature of non-phosphorylating glucolysis.** J. Needham and H. Lehmann (Biochem. J., 1937, **31**, 1165—1184, 1185—1196, 1196—1199, 1199—1209, 1210—1227, 1227—1238, 1238—1254).—I. The anaërobic glycolytic mechanism of early chick embryonic life is systematically investigated. Autoglycolysis in the first week of development is small relatively to its max. glycolytic intensity and falls with increasing developmental age. It is not inhibitable with glyceraldehyde (I), F′, or HSO_3' and it does not exceed the carbohydrate stores of the embryonic tissues. Besides glucose, mannose is the only carbohydrate glycolysed to any substantial degree and the decline of mannolysis with age follows exactly that of glucolysis. Glucosamine, fructose, galactose, sorbose, pentoses, di- and tri-saccharides, and usually all phosphorylated hexoses and glycogen are not utilised by the embryo. Substrate preference is probably not due to differences in permeability and embryo, like brain and tumour tissues, is predominantly a glucolysing system. The phosphorylation mechanism of glucose metabolism is not established even in muscle of chicks on the 15th day of development. Glucolysis is powerfully and specifically inhibited by *dl*-(I), the inhibition being partly reversible by pyruvate. Glucose remains intact during this inhibition. Methylglyoxalase is present in the embryo in the fully activated form and is not inhibited by (I). Addition of glutathione does not increase glucolysis by intact embryos.

II—IV. During glucolysis, AcCHO accumulates in small amounts and the amount is not increased by employing pulp the glucolytic activity of which has been decreased by dialysis. $AcCO_2H$ (II) accumulates during autoglycolysis and glucolysis. The intensity of (II) formation reaches a max. after about ½ hr. glucolysis and then progressively falls off. At later stages (10th day) the rate of (II) formation is about the same although by this time uric acid excretion is established. Aërobically some lactate may be oxidised to (II). (II) formation during glycolysis is not affected by addition of vitamin-B_1. In the onset of glycolysis after substrate deprivation there is an induction period which is abolished by addition of (II) or methylene-blue. The rates of aërobic and anaërobic glycolysis and the rate of oxidative disappearance of lactic acid in the chick embryo are measured. The rate of such oxidative disappearance is insufficient to account for the effect of O_2 in reducing glycolysis, the metabolism thus resembling that of cerebral cortex. The K effect is absent in embryo, which thus differs from brain. The Pasteur effect is exhibited in the metabolism of mannose as well as of glucose. Small amounts of inorg. P, hexose diphosphate (III), and residual Ba-precipitable P are present at the 5th day of development. A very considerable amount of P is present in a form not precipitable by Ba, very resistant to acid hydrolysis, and not fermentable by yeast. The P distribution is also measured after varying periods of *in vitro* glucolysis. After a period of glucolysis inhibited by F′, there was no accumulation of (III) or of phosphoglyceric or glycerophosphoric acids as occurs in muscle under similar conditions, the only change being an accumulation of inorg. P. The various P fractions in embryo have little to do with carbohydrate breakdown.

V—VII. Co-enzyme I (cozymase of Harden and Euler) could not be detected in the chick embryo but co-enzyme II (hexose monophosphate codehydrogenase of Warburg) is present probably throughout development. P-transporting co-enzyme is present in small amounts. When P-transporters, *e.g.*, adenylic acid (IV), adenyl pyrophosphate (V), or

cozymase, are added to intact embryo pulp along with glycogen (VI) or hexose diphosphate (VII) a very slight amount of breakdown of these substances may occur but the effect is never of long duration and glycolysis quickly falls again. Addition of Mg makes no difference to this effect. Aldolase (zymohexase) which converts (VII) into triose phosphate (VIII) is present in embryo, (VIII) accumulating since the enzyme system is unable to convert (VII) into phosphoglyceric acid (IX). Enzymes effecting the reversible transformation of (IX) into phosphopyruvic acid (X), the transport of PO_4 from (X) to (IV), and the dephosphorylation of (V) with formation of phosphagen or inorg. PO_4 are all present in the embryo but the enzymes effecting esterification of (VI) are absent. The glucolytic rate is not affected either by addition of inorg. PO_4 or by its almost complete removal by Ca or Be or by addition of (V), (IV), or cozymase or by their removal by dialysis. With 0·005*M*-NaF, the conversion of (IX) into (X) is completely suppressed, but glucolysis is only 45% suppressed. In all cases F′ and (I) inhibitions are exactly the same whether hexokinase is present or absent, and it is concluded that two paths of carbohydrate breakdown exist (a very active non-phosphorylating glucolysis and a weak phosphorylating mechanism similar to that in muscle) and that breakdown in the living embryo goes on wholly without phosphorylation. Inhibition of glucolysis by *dl*-(I) is partly reversed by presence of (VII) which is converted into (VIII), the latter then combining with (I) to form hexose monophosphate. Glucolysis is inhibited with dialysed pulp and activity 80% restored by addition of glutathione (XI) whether the methylglyoxalase present has been irreversibly inactivated or not, suggesting that AcCHO is not an intermediate in glucolysis. (XI) cannot be replaced by cysteine, ascorbic acid, vitamin-B_1, or (II). Gluconic acid, glycerol, glyceric acid, (II), and $CO(CH_2{\cdot}OH)_2$ are not intermediates in non-phosphorylating glucolysis, but optically active (I) cannot yet be excluded. P. W. C.

Oxidation of C_4 dicarboxylic acids by tissue. E. Annau and F. B. Straub (Z. physiol. Chem., 1937, **247**, 252—257; cf. this vol., 127; Innes, A., 1936, 1547; Stare and Baumann, this vol., 61).—The O_2 uptake of pigeon breast muscle is increased by addition of physiological amounts of fumaric acid (I) which are not attacked by the tissue. $AcCO_2H$ added at the same time reduces the uptake by suppressing the catalytic action of (I). When excess of (I) is added part (max. 20—30%) undergoes oxidation. Quantitatively C_4 dicarboxylic acids are not important intermediate products of tissue metabolism. W. McC.

Metabolism of lactic and pyruvic acids in normal and tumour tissues. III. Rat liver, brain, and testis. IV. Formation of succinate. K. A. C. Elliot, M. E. Greig, and M. P. Benoy. **IV.** K. A. C. Elliot and M. E. Greig (Biochem. J., 1937, **31**, 1003—1020; 1021—1032; cf. A., 1935, 1273).—III. In liver-tissue lactate (I), pyruvate (II), and acetate (III) are oxidised; succinate (IV) is converted into fumarate (V) and partly into malate (VI). In brain and testis (I) and (II) are oxidised, (IV) is oxidised to (V) and (VI), and these are further oxidised to some extent. (III) is not appreciably oxidised by brain and testis but is slowly oxidised by testis in presence of glucose. Under anaërobic conditions testis produces an acid, not lactic, and is the only tissue tried which shows a considerable metabolism of (II), the reaction involving a dismutation giving (I), (III), and CO_2. In liver, brain, kidney, and in tumours, only a slight CO_2 evolution occurs. Liver and brain slices show a rapid aërobic glycolysis during the first few min. after introduction into fresh medium.

IV. Modified applications of the method of Moyle (A., 1924, i, 791) and of Gözsy (A., 1935, 1406) for determining (IV) in tissue extracts are described. In kidney cortex, (II) is converted into (IV) and accumulates in large amounts, when its further oxidation is inhibited by malonate (VII), the (IV) being isolated and identified. With other tissues, the amount of (IV) formed is smaller. Manometric experiments show that (VII) inhibits oxidation of (IV) by at least 90% in tissue slices and decreases the rate of metabolism of (II) and (VI) in kidney slices to the same extent. A considerably larger amount of (IV) is produced from (VI) and from oxaloacetate than from (II) in kidney cortex and small amounts of (IV) are formed from (III) in kidney and liver. The mechanism of the changes involved is discussed. P. W. C.

Water metabolism in relation to the menstrual cycle. P. L. Krohn and S. Zuckerman (J. Physiol., 1937, **88**, 369—387). R. N. C.

Salt and water metabolism of nephrectomised rabbits. I. Effect of injection of water or glucose solutions. W. J. O'Connor (Austral. J. Exp. Biol., 1937, **15**, 97—107).—Na and Cl are capable of entering the blood and extracellular tissue fluids, being liberated from some depôt when these fluids are diluted by hypotonic injections of salt-free H_2O. In the absence of kidneys the animal cannot, however, regulate its blood vol. The adjustment is accompanied by hyperpnœa. R. M. M. O.

Metabolism of water, chloride, potassium, sodium, calcium, magnesium, and phosphorus in adrenalectomised rats. M. Sandberg, D. Perla, and O. M. Holly (Endocrinol., 1937, **21**, 352—356).—Ca and Mg retention is unchanged after adrenalectomy. H_2O intake is const. but rises during NaCl treatment; % retention of Cl′ remains unchanged, since urine vol. increases. The % of K retained falls, but urinary and fæcal P excretion is slightly increased. The significance of the changes is discussed. P. G. M.

Influence of training on the calcium and magnesium content of rabbit, pigeon, and chicken muscles. P. A. Verbolovitsch (Biochimia, 1937, **2**, 571—579).—The Ca and Mg contents of the muscles show a slight rise and fall, respectively, after training. The effect is greatest in the case of chicken muscles. R. T.

Elimination of molybdenum in the bile. F. Caujolle (Bull. Soc. Chim. biol., 1937, **19**, 827—836).—After intravenous injection of NH_4 molybdate

into dogs, the Mo is eliminated as MoO_4'' in the bile and urine. A. L.

Structure of substances, natural and synthetic, and their reactions on the body. E. C. Dodds (Lancet, 1937, **233**, 1—5).—An address. L. S. T.

Regulation of vital phenomena by traces of substances. M. Betti (Atti R. Accad. Lincei, 1936, 4, 498—507).—A lecture on the rôle of metals, vitamins, and hormones. F. O. H.

Pharmacological experiments on mammalian voluntary muscle, in relation to the theory of chemical transmission. Z. M. Bacq and G. L. Brown (J. Physiol., 1937, **89**, 45—60). R. N. C.

Phenomenon of partial racemism as the heuristic principle of the interpretation of physiological specificity observations. H. Lettré (Angew. Chem., 1937, **50**, 581—588).—A consideration of additive compounds of optically active substances, racemates, and partial racemates, the reaction between chemically defined antigens and their antibodies, the stereochemical specificity of enzymes, the differences in the physiological activity of optical antipodes, and the significance of the occurrence of optically active substances in biological conditions. H. W.

Production of local depressions in the development of *Drosophila* pupæ. A. A. Wolsky (Nature, 1937, **139**, 1069—1070).—By means of partial illumination in presence of CO, these depressions can be induced in regions that are not illuminated. Respiration of the pupæ is depressed by CO, an effect that is reversible, to a certain extent, in light. This is interpreted as a dissociation, under the influence of light, of the compound formed between CO and the Fe-containing respiratory enzyme. L. S. T.

Application of artificial radioactivity in therapeutics. A. Lafay and B. Lafay (Compt. rend., 1937, **204**, 1593—1594).—Intravenously injected NaI which has been bombarded with neutrons (cf. A., 1934, 1151), and consequently emits β-rays, is as beneficial in the treatment of rheumatism as meso-Th′, Th-*X*, and Rn. Deep-seated cancerous growths are treated more effectively by this method than by deep *X*-ray therapy. Accumulation of radioactive NaI in the growths enables them to be readily located. J. L. D.

Retention of radioactive substances in the body of rats and the lethal dose. F. Běhounek and F. V. Novák (Nature, 1937, **140**, 106).—With 10% glucose solution as a vehicle 0·5 to 14 millicuries of Rn are eliminated from the body of rats in 30 min., irrespective of the method of injection (intermuscular or subcutaneous). With an emulsion of W in olive oil, several hr. are necessary. In both cases, elimination is effected mainly by breathing. A dose of 14 millicuries does not even disturb the basic vital functions. With the W emulsion the 14 millicurie dose corresponds with approx. 17×10^6 ergs of energy absorbed. In the case of Po injections the lethal dose is reached at an average absorbed energy of approx. 6×10^6 ergs. L. S. T.

Biological effects of slow electrons. F. S. Cooper and S. H. Hutner (Physical Rev., 1936, [ii], **49**, 480).—Preliminary. The effect of evacuation to 10^{-3} to 10^{-5} mm. on the spores of *Nephrolepis*, *Polypodium*, *Scolopendrium*, and *Neurospora* is recorded. L. S. T.

Production of mutations by neutrons. M. Nagai and G. L. Locher (Nature, 1937, **140**, 111—112).—Adult males of *Drosophila melanogaster* treated with fast neutrons from a Ra–Be source show a larger proportion of mutations than untreated flies. L. S. T.

Effects of alcohol as influenced by blood-sugar. H. W. Haggard and L. A. Greenberg (Science, 1937, **85**, 608—609).—In rats and in man the increase in blood-sugar following a meal lessens the pharmacological effect of alcohol that has been absorbed. The lethal concns. of alcohol (commercial spirits) in the blood of rats determined for different sugar levels show that the toxicity of alcohol varies inversely as the concn. of sugar. The modifying effects of sugar on the action of alcohol appear to be connected with the combustion of the latter in the tissues. L. S. T.

Pharmacology of gallic acid. II. Effect of gallic acid on the diuresis due to hypertonic sodium chloride solutions. M. Filomeni (Arch. Farm. sperim., 1937, **63**, 193—224).—Rabbits which have been intravenously injected with *N*-NaCl (which increases aq. and reduces NaCl-diuresis), when further injected with gallic acid (0·01—0·15 g. per kg.) show a 38% increase in aq., and a negligible increase in NaCl-, diuresis. E. W. W.

Pharmacology of gallic acid. III. Effect on diuresis following intravenous injection of water. M. Filomeni (Arch. Farm. sperim., 1937, **64**, 1—52; cf. preceding abstract).—With rabbits continuously injected with 0·5 c.c. of H_2O per kg. per min. until death occurs, the vol. of urine and amount of NaCl excreted and the survival period are increased by intravenous injection of gallic acid. F. O. H.

Hyperglycæmia following adrenalectomy. T. Ozaki (J. Biochem. Japan, 1937, **25**, 133—139).—Intravenous injection of cholesterol (I) into rabbits causes parallel increases in the blood-sugar (Hagedorn–Jensen), -(I), and -cholesteryl esters which persist for approx. 8 hr. The bearing of the data on the hyperglycæmia following adrenalectomy is discussed. F. O. H.

Alcohol content of the water of interstitial fluid and protoplasm of an aquatic animal and that of the medium surrounding it. Experimental demonstration in the frog. M. Nicloux (Compt. rend., 1937, **204**, 1532—1535).—The urine and H_2O of plasma, interstitial and tissue fluid, and protoplasm of a frog immersed in 0·2% aq. EtOH contain the same concn. of EtOH as the external medium. J. L. D.

Partial permeability to alcohol of the isolated skin of the frog. G. Fontès (Compt. rend. Soc. Biol., 1937, **125**, 900—903).—The undamaged skin is only partly permeable to EtOH, max. equilibrium vals. of 0·93 being attained (cf. this vol., 132). H. G. R.

Cetyl alcohol as an enteric coating material. L. M. Mills (J. Amer. Pharm. Assoc., 1937, **26**, 479—482).—Tablets of $BaSO_4$ coated with cetyl alcohol (I), (I) + shellac, and (I) + mastic passed intact through the human stomach and disintegrated in the intestine to an extent of approx. 81, 71, and 98%, respectively. F. O. H.

Renal excretion of acid dyes in *Astacus fluviatilis*. P. Gérard (Bull. Acad. roy. Belg., 1937, [v], **23**, 456—463).—The results of examination of the kidney apparatus in crayfish following injection of various acid dyes are discussed with reference to renal permeability. J. N. A.

Calcium creosotate. II. Comparative *in-vitro* efficiency of calcium creosotate and guaiacolate and creosote as bactericidal agents. III. Elimination of volatile phenols in rabbit's urine after administration of "calcium creosotate solution" and after creosote solution. E. J. Fellows (J. Pharm. Exp. Ther., 1937, **60**, 178—182, 183—188).—II. Ca creosotate (I) is effectively bactericidal at higher dilutions than creosote (II) or Ca guaiacolate.

III. Given orally to rabbits, (I) produces more phenol in the urine than (II); hence the absorption in the body of phenols from (I) is probably at least as efficient as from (II). E. M. W.

Experimental assessment of the therapeutic efficacy of amino-compounds with special reference to *p*-benzylaminobenzenesulphonamide. L. E. H. Whitby (Lancet, 1937, **232**, 1517—1519).—The following compounds are effective in the oral treatment of streptococcal infections in mice: *p*-$NH_2{\cdot}C_6H_4{\cdot}SO_2{\cdot}NH_2$ (I), *p*-$CH_2Ph{\cdot}NH{\cdot}C_6H_4{\cdot}SO_2{\cdot}NH_2$ (II), 4 : 4′-diaminobenzenesulphonanilide tartrate (III), and 4 : 3′-diaminobenzenesulphonanilide (V). Of the sol. compounds, prontosil (sol.) and Na_2 *p*-(γ-phenylpropylamino)benzenesulphonamide-αγ-disulphonate (IV) are equally less efficient than the above. (I) and (III) are equally effective against meningococcus in mice; (II) and (IV) are inactive in experimental infections. With pneumococcus type I, (III) and (V) have a definite protective action, but (I), (II), and (IV) have no action in preventing death. L. S. T.

Antiseptics and anthelmintics. III. Pharmacology of certain flavones with special reference to their anthelmintic action. H. S. Mahal (Proc. Indian Acad. Sci., 1937, **5**, B, 186—194).—7-Hydroxy- and 7-hydroxy-6-hexyl-flavone, chrysin, genkwanin, calycopterin, and 4-methylumbelliferone exhibited no anthelmintic, germicidal, or antiseptic activity. They inhibited the movement of isolated rabbit gut and uterus, lowered blood pressure in dogs, and inhibited the beat of isolated frog heart. A. G. P.

Spermicidal powers of chemical contraceptives. VII. Approved tests. J. R. Baker, R. M. Ranson, and J. Tynen (J. Hyg., 1937, **37**, 474—488).—Consistently reliable results are given by a test on human semen at 37°. The efficiency of a commercial product depends on its rate of diffusion, acidity or alkalinity, and the rate of disintegration. A special test for diffusion is described. A method of determining the p_H of human semen is given (mean 7·8; range 7·4—8·4). The mean ejaculated vol. is 3·9 ml., which requires 0·31 ml. of 0·1*N*-HCl for neutralisation. W. L. D.

Cleavage of certain azo-compounds in the animal organism and the allergic phenomena produced by sulphonamidochrysoidine. F. Nitti and D. Bovet (Bull. Soc. Chim. biol., 1937, **19**, 837—842).—A study of the allergic phenomena produced by sulphonamidochrysoidine and 1 : 2 : 4-$C_6H_3(NH_2)_3$ shows that certain azo-compounds such as derivatives of *p*-$NH_2{\cdot}C_6H_4{\cdot}SO_2{\cdot}NH_2$ are readily reduced by the organism and may sensitise the organism as a result of the cleavage products formed. A. L.

Acetylcholine metabolism of a sympathetic ganglion. G. L. Brown and W. Feldberg (J. Physiol., 1936, **88**, 265—283).—Prolonged preganglionic stimulation causes an initially high output of acetylcholine (I) from the perfused superior cervical ganglion of the cat, but this falls rapidly to a steady low val. Synthesis of (I) appears to take place, and is unaffected by eserine. The amount of extractable (I) or choline from a ganglion is not significantly altered. R. N. C.

Action of eserine and related compounds and of acetylcholine on the central nervous system. A. Schweitzer and S. Wright (J. Physiol., 1937, **89**, 165—197). R. N. C.

Action of acetylcholine, prostigmine, and related substances on the knee-jerk. A. Schweitzer and S. Wright (J. Physiol., 1937, **89**, 384—402). R. N. C.

Action of acetylcholine on denervated mammalian and frog's muscle. G. L. Brown (J. Physiol., 1937, **89**, 438—461). R. N. C.

Mechanism of sensitisation to acetylcholine. E. Kahane and J. Lévy (Compt. rend., 1937, **204**, 1752—1754; cf. this vol., 265).—Eserinised leech muscle only partly destroys acetylcholine (I) in Ringer's fluid, so that the site of action of eserine (II) is not located outside the muscle. A very small portion of the esterase is inhibited because an inactive form diffuses from the muscle; after repeated washing, active esterase once more diffuses out and the hypersensitivity of the muscle to (I) is abolished. The sensitising effect of (II) is > suppression of the activity of the esterase. J. L. D.

Acetylcholine and choline-esterase in invertebrates. Z. M. Bacq (Arch. internat. Physiol., 1937, **44**, 174—189).—Acetylcholine (I) has a contractile effect on the muscles of worms, sipunculi, molluscs, and echinoderms and choline-esterase (II) is present in the tissues and body-fluids. (I) is without effect on actinia and crustaceans and (II) is present in the muscle but not in the blood of the latter. H. G. R.

Insensitivity of the cervix uteri to oxytocin. W. H. Newton (J. Physiol., 1937, **89**, 309—315). R. N. C.

Chemical agent in the sympathetic control of retraction of the nictitating membrane of the cat. J. Secker (J. Physiol., 1937, **89**, 296—308). R. N. C.

Effects of ether on brain oxidations. M. Jowett and J. H. Quastel (Biochem. J., 1937, **31**, 1101—1112).—The respiration of slices of cerebral cortex (rat, guinea-pig) with glucose (I), fructose, pyruvate, lactate (II), or glutamate as substrate is inhibited by Et_2O; with succinate and some other substrates, inhibition is slight. The inhibition is progressive, irreversible when large, and tends to be larger when [K$^+$] is low. The inhibitory action of Et_2O on oxidation of (I) or (II) has a high temp. coeff. (about 6 for 10°). The brain of anæsthetised rats has a normal *in-vitro* respiration. The effects on liver respiration are not so significant. The bearing of the findings on Et_2O anæsthesia is discussed. F. O. H.

Relation of barbital and phenobarbital to granulocytopenia. J. C. Kopet and F. J. Goodrich (J. Amer. Pharm. Assoc., 1937, **26**, 483—485).—The two drugs (diethyl- and phenylethyl-barbituric acids) do not permanently decrease the no. of circulating granulocytes in the peripheral blood of rabbits. F. O. H.

Comparison of ultra-short-acting barbiturates, nembutal, and tribromoethanol. H. W. Werner, T. W. Pratt, and A. L. Tatum (J. Pharm. Exp. Ther., 1937, **60**, 189—197).—Toxicity and duration of action of five barbiturates and tribromoethanol are compared. E. M. W.

Pharmacology of thiobarbiturates. O. M. Gruhzit, A. W. Dox, L. W. Rowe, and M. C. Dodd (J. Pharm. Exp. Ther., 1937, **60**, 125—142).—Six thiobarbituric acids possess anæsthetic properties when given intravenously, intraperitoneally, or orally to rats and dogs. Data are given of min. anæsthetic and lethal doses and of effects on respiration and cardiac function. E. M. W.

Variation of the mode of action of local anæsthetics on the motor nerve with chemical type. Cocaine and its substitutes; percaine. J. Régnier and A. Quevauviller (Compt. rend. Soc. Biol., 1937, **125**, 720—723).—The action of cocaine and novocaine differs from that of percaine. H. G. R.

Comparative effect of various morphine salts, injected intravenously, on cocaine local anæsthesia. J. Régnier and S. Lambin (J. Pharm. Chim., 1937, [viii], **25**, 533—537).—The effect of different salts of morphine in causing "renewal" of anæsthesia is in the order phenylbutyrate > phenylpropionate > benzoate > hydrochloride = tartrate > citrate > gluconate. J. N. A.

Local anæsthetics.—See A., II, 386.

Effect of purine bases and their derivatives on ureteral peristalsis. C. Cella and I. D. Georgescu (Compt. rend. Soc. Biol., 1937, **125**, 760—762).—Caffeine, theobromine, and theophylline increase the rate of peristalsis. H. G. R.

Action of vascular medicaments on the permeability of arteries. L. Zettler (Arch. exp. Path. Pharm., 1937, **185**, 141—152).—Tables show the decrease of permeability of surviving arteries induced by Ca and nicotine and the increase of permeability due to purine and Hg diuretics and to $NaNO_2$. P. W. C.

Changed activity of morphine in rickets. C. Amsler (Arch. exp. Path. Pharm., 1937, **185**, 263—266).—The central nervous system of young, growing white rats is so altered when the animals are rendered rachitic by feeding a McCollum diet that the narcotising action of morphine is decreased and the stimulant activity increased in about one third of the animals. P. W. C.

Chemistry of Indian opium. H. B. Dunnicliff (Nature, 1937, **140**, 92—93). L. S. T.

Mechanism of strychnine action. I. Physiological evaluation. A. Viehoever and I. Cohen (Amer. J. Pharm., 1937, **109**, 285—316).—The use of *Daphnia magna* as a test animal affords accurate determination of concn. and confirms that chemically pure samples of different origin show uniformity in their action (cf. Ward *et al.*, A., 1936, 1295). R. M. M. O.

Circulatory and pulmonary effects of the venom of the Australian copperhead (*Denisonia superba*). W. Feldberg and C. H. Kellaway (Austral. J. Exp. Biol., 1937, **15**, 81—95).—The effects are due to cell injury and to secondary reactions to the histamine thus liberated. R. M. M. O.

Pharmacological and toxic actions of *d*- and *l*-miotine. A. C. White and E. Stedman (J. Pharm. Exp. Ther., 1937, **60**, 198—223).—The toxicities and actions on various systems, isolated organs, and tissues of *d*- and *l*-miotine are compared for many species of animals. *l*-Miotine has the stronger effect in most cases. No direct relationship is observed between toxicity and relative power of inhibiting serum-choline esterase. E. M. W.

Opposite effects of two alkaloids of the same vegetable drug. E. Bizet and Raymond-Hamet (Compt. rend., 1937, **204**, 1754—1756).—The effect on carotid pressure and kidney vol. (dog) of adrenaline injection following injection of quebrachamine sulphate is opposite to that following injection of quebrachine hydrochloride. J. L. D.

Pharmacology of metasynephrin. E. M. Boyd (J. Pharm. Exp. Ther., 1937, **60**, 174—177).—Metasynephrin (I) is more stable in solution than adrenaline (II) and less toxic to mucous surfaces than (II) or ephedrine. (I) and (II) are similar in pharmacological action. E. M. W.

"Amphiporine" and "nemertine": poisons obtained from nemertines. Z. M. Bacq (Arch. internat. Physiol., 1937, **44**, 190—204).—"Amphiporine," obtained from the tissues of *Amphiporus* and *Drepanophorus*, is an alkaloid with nicotine-like action, whereas "nemertine" has no such action but excites the muscle–nerve prep. of the crab. H. G. R.

Transfer of some drugs into mothers' milk. T. A. G. Haanappel (Pharm. Weekblad, 1937, **74**, 871—880).—The I content of human milk rose to $2{\cdot}5 \times 10^{-5}$ g. per c.c. after administration of 1 g. of NaI. The sample was evaporated with K_2CO_3, ignited, extracted with EtOH, and the I determined in the dried extract by the NaN_3–Br–H_2SO_4 method. Small amounts of Br are conveniently determined

colorimetrically as eosin by treatment with fluorescein and NH_2Cl solution at p_H 5·5—5·6. The Br content of milk is very high, 0·6 mg. per c.c. after administration of large doses of NaBr (6·5 g. in 2 days). Only traces of As (1×10^{-7} g. per c.c.) appear in the milk after administration of 35 mg. of As_2O_3. Quinine is determined nephelometrically with Valser's reagent (HgI_2–KI) or by the fluorescence in ultra-violet light. Milk contains 1×10^{-6} g. per c.c. 3 hr. after administration of 250 mg. of quinine and none after 12 hr. *o*-$OH{\cdot}C_6H_4{\cdot}CO_2H$ and *o*-$OAc{\cdot}C_6H_4{\cdot}CO_2H$ are determined colorimetrically with $FeCl_3$. The max. content observed was 0·35—0·45 mg. per 100 c.c. 12 hr. after administration of 1 g. of *o*-$OH{\cdot}C_6H_4{\cdot}CO_2Na$. S. C.

Chemico-toxological detection of thymol. L. Pilati (Boll. Chim. farm., 1937, **76**, 301—302, 305).—Tissues suspected of containing thymol (I) are treated with NaOH–EtOH, and excess of EtOH; dil. H_2SO_4 is added to the evaporated filtrate, and the (I) in the evaporated Et_2O extract (after distillation in H_2O if necessary) is detected by its odour. When treated in H_2SO_4 with CH_2O, (I) gives violet streaks passing to a maroon coloration; such colour reactions of other phenols are recorded. E. W. W.

Relationship between the action of convulsive poisons and disturbance of tissue respiration. I. Pyramidone convulsions in frogs after administration of subnormal doses of pyramidone and hydrocyanic acid. R. Labes, K. Wedell, and O. Lippross (Arch. exp. Path. Pharm., 1937, **185**, 125—140).—In frogs, injection of half the normal convulsive dose of pyramidone (I) (0·23 c.c. of a 4% solution) is sufficient to cause convulsions if 0·045 c.c. of a 0·75% NaCN solution is injected either simultaneously with or earlier than the injection of (I). P. W. C.

Distribution of chloroform and chloral hydrate during experimental chloral hydrate poisoning. (A) Oral, rectal, and peritoneal administration. (B) Subcutaneous and intravenous administration. C. Bonciu and N. Ioanid (Compt. rend. Soc. Biol., 1937, **125**, 771—774, 775—778).—The bile and blood of rabbits contain > the other organs, the vals. for which are variable. No appreciable differences were observed with varying degrees of poisoning. H. G. R.

Action of certain enzyme poisons on the frog's auricle. A. S. Dale (J. Physiol., 1937, **89**, 316—329).—CN' in sufficient concn., H_2S, and NaN_3 show actions similar to complete deprivation of O_2 on the frog's auricle poisoned with $CH_2I{\cdot}CO_2H$. The O_2 uptake of the auricle is not completely abolished by CN' in concns. up to $M/150$. R. N. C.

Diagnosis of chronic benzene poisoning. Friemann (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 278—283).—Poisoning by C_6H_6 is frequently accompanied by diminished urinary elimination of vitamin-*C*. M. A. B.

Testing the liver function in mercury workers. D. G. Tallenburg (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 305—315).—Clinical tests on blood and urine show disturbance of liver function even in apparently healthy workers. M. A. B.

Chronic mercury and amalgam poisoning. A. Stock (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 388—413).—The Hg content of various rocks and soils, natural waters, foodstuffs, and human excreta and blood is determined. Data are given showing the distribution of Hg in different organs of the dog after exposure to air containing Hg. Hg is much more toxic when absorbed through the respiratory tract than through the alimentary canal and as little as $10—20 \times 10^{-6}$ g. per cu. m. in the air will produce definite symptoms in man after exposure for a few hr. per day for several weeks. Poisoning may even be caused by the amalgam in teeth-stopping. M. A. B.

Lead-poisoning risks in type-setting. E. Lederer (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 331—377).—Chemical data together with Pb analyses of urine of workers, of dust and of washing-H_2O in printing works are recorded and discussed. M. A. B.

Liver affections in lead poisoning. K. Fellinger (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 414—420).—Relations between Pb poisoning, the level of serum-bilirubin and -cholesterol, and galactose metabolism are examined. M. A. B.

Gas analysis apparatus. W. Wirth and W. Tamm (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 427—429).—Apparatus for sampling gases in toxicological work is described. M. A. B.

Fluorine poisoning in cryolite workers. K. Roholm (Arch. Gewerbepath. Gewerbehyg., 1936, **7**, 255—277).—The air of factories using cryolite contains about 35 mg. per cu. m. Some of this is absorbed through the alimentary canal, but not through the respiratory tract, and may cause disturbed mineral metabolism with increased calcification of bones. M. A. B.

Immunity of certain insects to selenium poisoning. S. F. Trelease and H. M. Trelease (Science, 1937, **85**, 590).—Weevils and seed-chalcids are able to complete their life cycles in seeds of *Astragalus bisulcatus* containing 1475 p.p.m. of Se. The bodies of the weevils contained 65 p.p.m. of Se. L. S. T.

Effect of cystine on toxicity and trypanocidal activity of neoarsphenamine. A. E. Jurist and W. G. Christiansen (J. Amer. Pharm. Assoc., 1937, **26**, 497—501).—The toxicity in rats is not changed by oral administration (after 24 hr.) of cystine whilst the trypanocidal efficiency is significantly reduced. F. O. H.

Action of poisons on the isolated heart-muscle strip of the frog. III. Action of metallic salts. K. Mezey (Arch. exp. Path. Pharm., 1937, **185**, 153—177; cf. A., 1936, 1295).—A table shows the min. active concn. of the chlorides of 38 elements, including most of the rarer elements, on the heart-muscle strip, and a second table indicates the proportionate min. active cation concn. starting with

Cs = 1. The degree of activity follows the accompanying schemes: Cs<Li<Na<Rb<K; Sr<Ca<Ba; Mg<Zn<Cd<Be; Tl<Ce<Zr<Th<La<Al<Ti<Nd<Y; Cr<Pb<Sn<Bi<U<W; Fe<Co<Mn<Ni. P. W. C.

Histophysiology of pulmonary lipins. Fatty lungs in poisoning. L. Binet, J. Verne, and J. L. Parrot (Compt. rend. Soc. Biol., 1937, **125**, 712—714).—Accumulation of lipins in the lung follows fungal infection or P poisoning. H. G. R.

Determination of the toxicity of medicinal substances. J. Régnier, S. Lambin, and E. Szollœsi (Bull. Sci. Pharmacol., 1937, **44**, 81—108).—Methods of testing substances of which only a small quantity is available are discussed. Data are given of the toxicity towards mice of some new salts of novocaine and morphine. L. D. G.

Schütz-Borissov law for enzymes. O. Bodansky (Science, 1937, **86**, 52—53).—A discussion. L. S. T.

Alcohol dehydrogenase of turnips. S. Yamagata and M. Nagahisa (Acta. Phytochim., 1937, **9**, 115—122).—Treatment of the expressed juice with EtOH–Et_2O at <0° gives a white enzyme powder which remains active for months if preserved in a desiccator. It rapidly loses its activity in H_2O at room temp. but not at 0° and is almost completely inactivated at 55° for 30 min. It is indifferent towards $CH_2I{\cdot}CO_2Na$, NaF, and KCN but strongly inhibited by $NH_2{\cdot}CO_2Et$. Formate, lactate, succinate, malate, citrate, aspartate, glycine, and glutarate are useless as H-donators. Glutamate is more active than EtOH but the position of glucose and glycerophosphate is uncertain. BuOH appears particularly suitable. The action depends on the concn. of the substrate. The optimal p_H is 7—7·5. The necessity of a codehydrogenase for the activity of the dehydrogenase is shown. The participation of the flavin enzyme in this dehydrogenation is probable. H. W.

Malic dehydrogenase. K. Laki (Biochem. J., 1937, **31**, 1113—1115).—Muscle (horse) preps., which are poor in fumarase, dehydrogenate malate (I) faster than fumarate (II). This supports the view that (I) is dehydrogenated as such and not as (II) (cf. Green, this vol., 29). F. O. H.

Identity of lactic and malic dehydrogenases. N. B. Das (Biochem. J., 1937, **31**, 1116—1123).—Lactic and malic dehydrogenases occur in pigeon's heart-muscle and pig's kidney, liver, and heart. Both are inhibited by oxalacetic acid (I), H_3AsO_3, and $CH_2I{\cdot}CO_2H$ but F' and $AcCO_2H$ (II) inhibit only lactic dehydrogenase. Malic dehydrogenase (which is activated by cozymase free from adenylic acid) is more readily inhibited by (I) than lactic dehydrogenase is by (II). The max. concn. of malic is much < that of lactic acid. In presence of glutamic acid, which combines with (I), the relative velocities of dehydrogenation are approx. equal. No summation or addition occurs with the two substrates together. The enzymes are not separable by adsorption with kaolin. F. O. H.

Inhibition of succinic and lactic–malic dehydrogenases. N. B. Das (Biochem. J., 1937, **31**, 1124—1130).—The inhibition of dehydrogenation of lactic acid (I) by $AcCO_2H$ (II) is > that of hydrogenation of (II) by (I); this is also true for the corresponding reactions of malic (III) and oxalacetic acid (IV), but the reverse applies when succinic (V) and fumaric acid (VI) are used, respectively. Malonic acid (VII) inhibits dehydrogenation of (I) more strongly than hydrogenation of (II); the reverse holds for the cases of (III) and (IV), respectively. (IV) and (VII) inhibit dehydrogenation of (V) more readily than hydrogenation of (VI), whilst (I) and (III) are without effect on both enzymic processes. The bearing of the results on the theory of tissue respiration is discussed. F. O. H.

Dehydrogenation of pyruvic acid. E. Annau and I. Mahr (Z. physiol. Chem., 1937, **247**, 248—251; cf. this vol., 127).—In presence of a dehydrogenase of high activity occurring in pigeon breast muscle and pig kidney $AcCO_2H$ decolorises methylene-blue. The dehydrogenating system consists of an enzyme and a thermostable activator (resists temp. of 80°), not identical with Warburg's yellow enzyme, cozymase, or adenosine triphosphate, which accelerates the dehydrogenation but has no effect on the dehydrogenation of lactic acid. W. McC.

Cell structure and enzymic activity. J. Yudkin (Biochem. J., 1937, **31**, 1065—1068).—The decrease in activity of the glucose dehydrogenase of *Bact. coli* by freezing and thawing, and of the glucose and lactic dehydrogenases of *Micrococcus lysodeikticus* by lysis with egg white, are not restored by addition of the co-enzyme necessary for their action. In these instances the effect is not therefore due merely to dilution but the enzymes appear to be linked in some way with the structure of the cell. P. W. C.

Ascorbic acid oxidase in plant and animal tissues. R. K. Chakraborty and B. C. Guha (Indian J. Med. Res., 1937, **24**, 839—843).—The oxidase (I) contents of a no. of plant tissues are given. Cucumber shows the highest val. (I) is produced in gram on germination. It is apparently absent from animal tissues. R. N. C.

"Ascorbic acid oxidase" and copper. E. Stotz, C. J. Harrer, and C. G. King (J. Biol. Chem., 1937, **119**, 511—522).—Substances (*e.g.*, $NEt_2{\cdot}CS_2H$, 8-hydroxyquinoline) which specifically inhibit the catalytic action of Cu likewise inhibit, to approx. the same extent, that of the supposed ascorbic acid oxidases (I) of vegetable juices (*e.g.*, cabbage, cauliflower) as well as that of Cu-gelatin and Cu-albumin compounds, but do not affect the action of nicotine–hæmochromogen. Inorg. Cu when mixed with protein assumes properties (*e.g.*, catalytic effect optimal at particular p_H, inactivation by heat and acid, relation between rate of action and concn. of substrate) similar to those of (I). Possibly (I) are Cu complexes in which Cu is bound as in the Cu compounds of biuret and of hæmatoporphyrin which also catalyse oxidation of ascorbic acid. W. McC.

Reversible oxidation and reduction of co-enzyme I. D. E. Green and J. G. Dewan (Biochem. J., 1937, **31**, 1069—1073).—Reduced coenzyme I (I) is oxidised completely by pyruvate, oxaloacetate, and fumarate, and partly by acetoacetate, in the presence of their respective dehydrogenases. The equilibrium between oxidised and reduced (I) is very much in favour of the former. (I) is reduced by malate, lactate, and β-hydroxybutyrate (II) but the enzymic method never gives complete reduction even when the equilibrium is shifted to the side of reduced (I) by ketone fixatives. α-Glycerophosphate in the presence of its dehydrogenase, contrary to Euler *et al.* (this vol., 142), does not reduce (I). The presence of a (I) oxidase in pig heart muscle is shown spectrophotometrically. The oxidase is completely inhibited by 0·02*M*-CN′. Reduced (I) is completely oxidised by MeCHO in the presence of liver mutase, but reduction of oxidised (I) could not be established although its possibility was not excluded. The potential of (I) is about the same as that of the (II) system. The oxidation of reduced (I) by methylene-blue is almost complete. E. A. H. R.

Co-enzyme linked reactions between dehydrogenase systems. J. G. Dewan and D. E. Green (Biochem. J., 1937, **31**, 1074—1085).—Co-enzyme I (I) functions as a carrier for the oxidation of β-hydroxybutyrate by fumarate (II), oxaloacetate, (III), pyruvate, acetoacetate, and MeCHO, and for the dismutation of (II) to succinate and (III) in the presence of the appropriate enzymes. All the reactions conform to the mechanism, reductant *A* + (I) + dehydrogenase *A* → oxidant *A* + reduced (I); oxidant *B* + reduced (I) + dehydrogenase *B* → reductant *B* + (I). Manometric methods for the determination of succinic, lactic, and malic acids are described. E. A. H. R.

Enzymic dehydrogenation of trideuteroacetic acid.—See A., II, 365.

Peroxidase systems of plants. S. Huszák (Z. physiol. Chem., 1937, **247**, 239—247).—Peroxidase (I) and catalase (II) [but not ascorbic acid oxidase (III)] are inactivated by 0·001*M*-NH_2OH and 0·001*M*-$NHPh{\cdot}NH_2$. (III) loses activity more rapidly on keeping than do (I) and (II) and is destroyed in 5 min. by heating at 70°, by very low concns. of HCN and H_2O_2, and by EtOH, $COMe_2$, and Et_2O. (I) does not accelerate the oxidation of ascorbic acid (IV) by H_2O_2 but if very low concns. of benzopyran dye containing two phenolic *o*-OH are added oxidation proceeds very rapidly. In mixtures of (II) [in concns. of the same order as those found in plants rich in (II)], (I), dye, 1 mol. of (IV), and 1 mol. of H_2O_2 90% of the H_2O_2 is consumed in oxidising (IV). In fruit juices and pulped vegetable tissues from "peroxidase" plants O_2 with (III) reversibly oxidises 1 mol. of (IV) with production of 1 mol. of H_2O_2. H_2O_2 with (I) then oxidises the dye which likewise reversibly oxidises 1 mol. of (IV). W. McC.

Peroxidases. II. Determination of the purpurogallic index by a photometric method. III. Kinetics of the action of horseradish peroxidase with the leuco-base of malachite-green as substrate. IV. Absence of fluorescence of solutions of horseradish peroxidase in ultra-violet light. V. Determination of peroxidase activity. G. Bosson (Arch. internat. Physiol., 1937, **44**, 212—215, 219—229, 230—231, 436—443).—II. The colour developed in Willstätter and Stoll's method is measured by means of a Pulfrich photometer.

III. The activity ∝ the concn. of the enzyme and of the substrate. At p_H 3 the activity is checked without the destruction of the enzyme.

IV. The carrier group of peroxidase is dissimilar from that of catalase since fluorescence in ultra-violet light is not obtained (cf. A., 1933, 92).

V. The method depends on the time required for the development of a certain depth of colour in leuco-malachite-green. An arbitrary unit of peroxidase activity is described. H. G. R.

Influence of monochromatic light on action of yeast catalase. I, II. R. Murakami (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 429—434, 435—438).—I. More H_2O_2 is decomposed in yellow than in violet light. The stimulating effect decreases with intensity of light.

II. Using light of the same λ, the decomp. of H_2O_2 increases with light intensity. J. N. A.

Plant catalase. N. T. Deleano, N. Popovici, and I. Ionesco (Bull. Soc. Chim. biol., 1937, **19**, 898—910).—The catalase content of germinating maize, wheat, and oat seedlings increases until the tenth day and then decreases slowly, reaching a const. val. The max. activity occurs at the tip of the stem. A. L.

Choline-esterase in voluntary frog's muscle. A. Marnay and D. Nachmansohn (J. Physiol., 1937, **89**, 359—367).—Choline-esterase (I) is determined in muscle by measurement of the rate of anaërobic hydrolysis of acetylcholine. Hydrolysis by chopped frog's muscle is only slightly < by intact muscle. Results are given for hydrolysis by guinea-pig tissues. R. N. C.

Choline-esterase in invertebrate muscles. Z. M. Bacq and D. Nachmansohn (J. Physiol., 1937, **89**, 368—371).—The rates of hydrolysis of acetylcholine by crustacean, mollusc, and echinoderm muscles are of the same order, whilst that by sea-leech muscle is slightly less. The sphincter muscle of the sea-anemone contains no esterase. The rate of hydrolysis by the brain ganglion of *Eusepia* is 10 times as great as by muscle. R. N. C.

Choline-esterase in sympathetic ganglia. F. T. von Brücke (J. Physiol., 1937, **89**, 429—437).—Choline-esterase in the normal cervical sympathetic ganglion of the cat is > in the normal vagus ganglion or the cervical portion of the sympathetic nerve; it disappears completely on section of the preganglionic fibres. R. N. C.

Lipase. II. R. Itoh (J. Biochem. Japan, 1937, **25**, 167—176; cf. A., 1936, 1419).—The hydrolytic action of *Ricinus* lipase is accelerated, and the synthetic action is retarded, by reduced glutathione (I), cysteine, and ascorbic acid, substances which do not reactivate the lipase inactivated by oxidation.

The oxidised activator (A., 1936, 895) is partly reduced by (I). The reduced, but not oxidised, activator forms H_2O-sol. mol. compounds with cholic acid derivatives. Esterification of various fatty acids and alcohols by the lipase was investigated. F. O. H.

Urease. J. B. Sumner (J. Chem. Educ., 1937, **14**, 255—259).—The history of events leading up to the prep. of cryst. urease is given. L. S. T.

New sources of urease for determination of urea. M. Damodaran and P. M. Sivaramakrishnan (Biochem. J., 1937, **31**, 1041—1046).—Jack-bean or soya-bean urease with blood and liver gives abnormally high vals. due probably to the formation of "extra urea" from protein bases present. These errors are greatly increased by increasing the time of reaction or the concn. of enzyme. The seed of the water melon *Citrullus vulgaris* is shown to be a potent source of urease which determines urea quantitatively even in blood and liver. P. W. C.

Influence of monochromatic light on the action of soya urease. II. R. Murakami (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 439—443; cf. this vol., 97).—The amount of NH_3 formed from urea increases with the intensity of light of the same λ, but varies inversely as λ. J. N. A.

Crystalline urease. I. M. Kitagawa and M. Fujii (J. Agric. Chem. Soc. Japan, 1937, **13**, 621—628).—Cryst. urease (I) could be obtained from the American "erect" variety of Jack bean, but not from the "twining" variety. Cryst. (I) cannot be obtained from the 31·6% $COMe_2$ extract of the bean unless the (I) units (*i.e.*, mg. of NH_3-N produced at 20° in 20 min.) in the extract are >58. The Jack bean probably contains two kinds of (I), one of which is cryst. and easily sol. in dil. $COMe_2$ or H_2O, whilst the other is amorphous and less sol. The ratio of the amounts of the two kinds differs with the origin of the bean. J. N. A.

Histozymes. H. Akizuki (J. Biochem. Japan, 1937, **25**, 43—59).—Glycerol extracts of pig's kidney contain three "histozymes" which hydrolyse benzoyl-acetic acid (I), -asparagine, and -tyrosine, respectively, are differentiated by their lability to heat, and separated by adsorption on $MgCO_3$, $CaCO_3$, etc. or by fractional pptn. Extraction of kidney with 10% aq. sucrose affords only the histozyme hydrolysing (I). The action of the histozymes on NH_2-acid derivatives and the comparative action of trypsin were determined. F. O. H.

Carboxypeptidase. II. Partial purification of pro-carboxypeptidase. III. Determination of carboxypeptidase and pro-carboxypeptidase. M. L. Anson (J. Gen. Physiol., 1937, **20**, 777—780, 781—786; cf. this vol., 312).—II. Pro-carboxypeptidase (I) is partly purified by fractional pptn. with $(NH_4)_2SO_4$. Experiments on activation of the product are described.

III. Carboxypeptidase is determined by CH_2O titration using either chloroacetyltyrosine or a peptic digest of edestin as substrate. The same method is used for (I) after activation with trypsin. E. M. W.

Reaction mechanism of some proteolytic enzymes. J. Weiss (Chem. and Ind., 1937, 685).—A review suggesting theoretical mechanisms for the action of papain and cathepsin and for that of urease. R. M. M. O.

Secretion of proteases by gelatin-liquefying bacteria. A. I. Virtanen and O. Suolahti (Enzymologia, 1937, **2**, 89—91).—The protease of gelatin-liquefying bacteria is excreted by the living cells. After 10 hr. growth the protease of *B. fluorescens liquefaciens* is found almost entirely in the medium, none being present in the cells (cf. Gorbach and Pirch, this vol., 68). E. A. H. R.

Action of enzyme extracts on soluble keratin. II. Papain type. P. G. Castellino (Arch. Ist. Biochim. Ital., 1937, **9**, 171—174; cf. A., 1936, 379).—Preps. of autolysed guinea-pig's skin (in presence or absence of NaSH or KCN) or of psoriatic crusts (man) have no action on caseinogen or sol. keratin in PO_4''' buffer at p_H 7·4. F. O. H.

Koji amylase. IX. β-Amylase in koji. Y. Tokuoka (J. Agric. Chem. Soc. Japan, 1937, **13**, 586—594; cf. this vol., 67).—An improved prep. of α-amylase from koji is described. If koji is ground with H_2O, and EtOH added to 50%, then 75% EtOH ppts. from the filtrate an enzyme prep. which contains no α-amylase but hydrolyses starch. A solution of β-amylase is also obtained by elution of the adsorbed enzymes on koji residues with 1% NaCl. J. N. A.

Production of glucosone from carbohydrates by enzymic action. C. R. Bond, E. C. Knight, and T. K. Walker (Biochem. J., 1937, **31**, 1033—1040).—Cultures of *Aspergillus parasiticus*, Speare, and of an unnamed species belonging to the *A. flavus-oryzæ* group after plasmolysis by PhMe, PhBr, or $CHCl_3$ converted glucose (I) in dil. aq. solution into glucosone (II). The optimum conditions are 1·5% PhMe, 0·5—1% (I), temp. 30°, p_H 6, and time of incubation 4—6 days. Starch, maltose, and sucrose gave better yields of (II) than did (I). P. W. C.

Pyruvic acid dehydrogenation, vitamin-B_1, and cocarboxylase. F. Lipmann (Nature, 1937, **140**, 25).—Addition of cocarboxylase to $COMe_2$-treated lactic acid bacteria, which had thereby lost the ability to dehydrogenate $AcCO_2H$, restores their power of oxidation. The addition of vitamin-B_1 was without effect, but the addition of a prep. of flavin phosphate from heart with the cocarboxylase gave an increased activation. PO_4''' is essential to the dehydrogenation. L. S. T.

Synthesis of cocarboxylase from vitamin-B_1. K. G. Stern and J. W. Hofer (Science, 1937, **85**, 483—484).—When treated in the cold with $POCl_3$, synthetic cryst. vitamin-B_1 yields (1·5%) a compound that exhibits the properties of cocarboxylase (I). The results support the finding of Lohmann and Schuster (this vol., 97) that (I) represents a diphosphoric ester of -B_1. L. S. T.

Crystallisation of lysozyme. E. P. Abraham and R. Robinson (Nature, 1937, **140**, 24).—A photomicrograph of dodecahedra (?) of lysozyme,

mol. wt. (provisional) approx. 18,000, is reproduced. The ultra-violet absorption spectrum indicates the presence of 4·4% of tyrosine and 2·2% of tryptophan residues in the mol. L. S. T.

Influence of respiration on the permeability of the yeast cell to fluoride. J. RUNNSTRÖM, A. RUNNSTRÖM, and E. SPERBER (Naturwiss., 1937, **25**, 474).—The surface of respiring yeast cells is not or only slightly permeable to F′ but becomes permeable when the respiration is depressed by washing, anaërobic conditions, etc. Permeability to F′ under aërobic conditions is with beer yeast ⩾ with baker's yeast. P. W. C.

Factor-*Z* in wheat flour. R. GEOFFROY and G. LABOUR (Bull. Soc. Chim. biol., 1937, **19**, 922—930).—The increased rate of fermentation of wheat extracts by yeast observed after 4 hr. also occurs when the extracts are treated with animal C, phosphotungstic acid, or colloidal Fe, or extracted with EtOH to remove any factor-*Z* (cf. Borchardt and Pringsheim, A., 1934, 1035) which may be present. The activation is due to the multiplication of the yeast cells. A. L.

Property of vegetable cells of excreting neutral-red after accumulating it in their vacuoles. A. GUILLIERMOND and R. GAUTHERET (Compt. rend., 1937, **204**, 1520—1523).—*Saccharomyces ellipsoideus* takes up neutral-red (I) at p_H 8·2 (cf. this vol., 334) and voids it in 2·5 hr. Springer's yeast reacts similarly. At p_H 5 there is an initial large decrease in the concn. of (I) due to adsorption on the intercellular membranes; this effect is smaller at $p_H > 5$ and the mortality amongst the cells is lower. J. L. D.

Fermentation of glucose by yeast. R. GUILLEMET and H. LEROUX (Compt. rend. Soc. Biol., 1937, **125**, 903—905).—The secondary products of fermentation bear an inverse relationship to the quantity of yeast employed. H. G. R.

Fermentation products of *S* and *R* forms of yeasts. F. W. FABIAN and L. J. WICKERHAM (J. Bact., 1936, **31**, 31—32).—*S* forms of *Saccharomyces cerevisiæ*, *S. aceris-sacchari*, *Pichia alcoholophila*, and *Willia anomala* produced EtOH more quickly and in larger amounts than did the *R* forms. Production of volatile acids was very variable according to species, form, and medium. Ester production fluctuated less and was in general greatest when the O_2 supply was sufficient to maintain normal growth. Esters are probably produced within the cells during fermentation and not by endoenzymic or chemical combination of the alcohol and acids appearing in the substrate. Interconversion of *S* and *R* forms is influenced by the medium used. A. G. P.

Mechanism of the action of the several cytochrome components in cell respiration. H. TAMIYA and Y. OGURA (Acta Phytochim., 1937, **9**, 123—158).—Under kinetic-stationary conditions (continuous passage of a gas mixture of defined O_2 content) the oxidised and reduced forms of the individual cytochrome components in yeast cells are invariably present in the relationship: reduced *b* component/oxidised *b* component > reduced *a*/oxidised *a* component > reduced *c*/oxidised *c* component; this is true also in the presence of varied amounts of HCN. The ratio, reduced form/oxidised form, of the individual cytochrome components increases with diminution of the ratio, amounts of O_2/dehydrogenase activity, or with increase in amount of added HCN until finally all cytochrome components are practically reduced. Observations recorded indicate that in the mechanism of cell respiration the three cytochrome components are not directly or indirectly oxidised by O_2 or reduced by the dehydrogenase system independently of one another. Cytochrome-*c* has the highest and -*b* the lowest normal redox potential. The mechanism of yeast respiration is therefore, O_2 → O_2-transporting enzyme → indophenol oxidase → *c* → *a* → *b* → dehydrogenase system, which explains satisfactorily all oxido-reductive phenomena of the cytochrome components. The oxido-reductive function of *a* can be restricted by various chemically inert, surface-active substances so that with continuous aëration *c* can be stabilised in the oxidised and *b* in the reduced condition. The above theory explains the dependence of the various cytochrome types of micro-organisms on the O_2 requirement. H. W.

First phase of fermentation by yeast. R. WILLSTÄTTER and M. ROHDEWALD (Z. physiol. Chem., 1937, **247**, 269—280; cf. this vol., 247).—In the first stage of the fermentation of glucose (I) and maltose (II) by yeast, before evolution of CO_2 begins [6—8 min. for (I), 6—15 min. for (II)], the sugar which disappears is quantitatively or almost quantitatively converted into glycogen, which subsequently undergoes degradation. Hence (I) and (II) (and possibly other fermentable sugars also) are not directly fermentable and the first stage of fermentation is not a phosphorylation. W. McC.

Temperature coefficient of velocity of alcoholic fermentation. J. V. MEDVEDEV (Biochimia, 1937, **2**, 514—520).—The energy of activation *E* falls gradually, and the temp. coeff. *Q* of the reaction of alcoholic fermentation by live yeast more rapidly, with rising temp. from 5° to 40°; experimental vals. of *Q* agree with those calc. from 4·55 log $Q = 10E/T + (E_1 - E_2)/T^2$, where E_1 and E_2 represent *E* at temp. T_1 and T_2, and *E* and *T* are the mean vals. for a given temp. range. R. T.

Beha moisture meter [for yeast etc.].—See A., I, 480.

Production of vitamin-*C*-like reducing substances by mould fungi. J. FUKUMOTO and H. SHIMOMURA (J. Agric. Chem. Soc. Japan, 1937, **13**, 613—620).—*Aspergillus cellulosæ*, *A. fumigatus*, *A. niger*, *A. nidulans*, *A. melleus*, *Penicillium glaucum*, and *P. luteum* all produce substances which reduce 2 : 6-dichlorophenol-indophenol and I. None had any physiological effect like that of vitamin-*C*. J. N. A.

Physiological and biochemical investigations of *Aspergillus itaconicus*. II. K. KINOSHITA (Acta Phytochim., 1937, **9**, 159—187; cf. A., 1932, 92).—The organism grows badly in the customary media but freely in those containing 20—30% of

sugar or 2*N*-KCl. It flourishes moderately in 4*N*-KCl. The depression of the f.p. of the expressed juice of the mycelium grown in solutions of high concn. is invariably great but the osmotic coeff. (osmotic pressure of the juice/osmotic pressure of the external medium) is $\ll 1$. Possible reasons for this discrepancy are discussed. Mycelium grown in solutions of high concn. shows a change of form, notably thickening of the hyphæ, and the production of a hemicellulose-like material at the outer membrane layers. Mycelium grown in highly conc. KCl is never adapted to excessive K adsorption. In media containing KNO_3 as N source adsorption of K is parallel with resorption of NO_3'. H. W.

Molecular constitution of terrein, a metabolic product of *Aspergillus terreus*, Thom.—See A., II, 379.

Molecular constitution of geodin and erdin, metabolic products of *Aspergillus terreus*, Thom.—See A., II, 385.

Sclerotial formation in *Rhizoctonia solani* as affected by nutritional and other factors. W. B. Allington (Phytopath., 1936, **26**, 831—844).—Sclerotia formed most readily in low-carbohydrate–high-N media, and their production was favoured by different N sources in the descending order, $Ca(NO_3)_2$, asparagine, NH_4NO_3, urea, $NaNO_3$. No differences in sclerotial development were observed with glucose, sucrose, or potato starch as C sources. Glycerol and lactic acid were not readily utilised by the fungus. *R. solani* caused changes in the p_H of media, the nature of which was influenced by the N source. Growth and formation of sclerotia were favoured by p_H 7·0 (approx.). The organism tolerated acid but not alkaline conditions. A. G. P.

Root nodule bacteria of leguminous plants. XIX. Influence of various factors on excretion of nitrogenous compounds from the nodules. A. I. Virtanen, S. von Hausen, and T. Laine (J. Agric. Sci., 1937, **27**, 332—348; cf. A., 1936, 640).—Excretion of NH_2-N does not occur in uninoculated legume roots growing in an NO_3' medium. Further evidence is advanced favouring the view that NH_2-acids excreted from inoculated roots are derived from N fixed by nodule bacteria and not from the breakdown of plant protein. Excretion is observed in media (cellulose, kaolin, soil) capable of absorbing the acids and is less readily detected in aq. media. The % of the fixed N which is excreted varies with the strain of nodule organism, with the quantity of nutrient available, and with the amount of sand used in the culture. The air content of the medium affects the amount of N fixed but not the proportion of this which is excreted. A. G. P.

Factors controlling pigment production by *Mycobacterium phlei*. M. A. Ingraham (J. Bact., 1936, **31**, 18—19).—The organism may contain ten carotenoid pigments, including α- and β-carotene kryptoxanthene and esters of lutein, zeaxanthene, and azafrin. On a glucose–asparagine medium pigmentation is small but is markedly increased by addition of simple alcohols, glycols, or glycerol. In the absence of these supplements cells remained white under alkaline (p_H >8·0) conditions. Excessive proportions of K, PO_4''', $Cu^{\cdot\cdot}$, or Fe^{III} restricted accumulation of pigment. $Cu^{\cdot\cdot}$ and Fe^{III} were quantitatively adsorbed on the surface of the cells. A. G. P

Lipins of acid-fast soil bacilli. H. Kameda (J. Biochem. Japan, 1937, **25**, 113—131).—Data for the contents of lipin-P and -N, differentiated by their solubility in light petroleum, Et_2O, and EtOH, in a strain of acid-fast soil bacilli grown in a glycerol-containing medium, at various periods are tabulated. In the petrol-sol. fraction the N : P ratio tends to increase with growth whilst in the EtOH-sol. fraction the ratio tends to remain const. The data are compared with those for other types of bacilli. F. O. H.

Identity of "*Bacterium X*" (Brown) and "*Bacterium C*" (Chapman). J. L. Shimwell and W. F. Kirkpatrick (J. Inst. Brew., 1937, **43**, 339—342).—Cultures of these organisms examined probably represent strains of *Bacillus cereus*, Frankland, and are distinguished as var. *arborescens* and var. *rubicundus*, respectively. It is unlikely that the "*Bacterium X*" now employed in determination of hop antiseptic val. is identical with that originally employed by Brown. The characters of the two strains and of *B. cereus* are described. I. A. P.

Metabolism of the purple bacteria. I. Photosynthesis in the sulphur-free, purple bacterium, *Rhodobacillus palustris*. II. Carbon dioxide assimilation of *R. giganteum*. H. Nakamura (Acta Phytochim., 1937, **9**, 189—229, 231—234).—I. In the presence of O_2, *R. palustris* develops in light or in darkness whilst in its absence development occurs only in light. Absorption of O_2 during aërobic respiration is greatly hindered by irradiation and the effect is increased by CO_3''; in some cases a small positive O_2 pressure is observed. It appears, therefore, that *Rhodobacillus* produces in light an assimilation product (I) which is immediately consumed by O_2 respiration. The latter is essential for growth so that this does not occur in the dark in the absence of O_2. The amount of (I) produced is < that of the O_2 required for respiration, and O_2 production in assimilation represents merely a diminution of the O_2 consumption. Illumination also increases the time required for the decolorisation of methylene-blue. Under aërobic conditions the organism reduces CO_2 with aid of mol. H_2. Infra-red light, notably the rays of shorter λ, is utilised in the assimilation of CO_2. Separation of O_2 during assimilation is prevented by addition of 0·0005*M*-NH_2OH whereas respiration is not restricted. *Rhodobacillus* contains considerable amounts of catalase which is restricted by NH_2OH. Catalase participates in the photosynthesis (in absence of H_2S or fatty acids) and causes evolution of O_2 by fission of H_2O_2. HCN and $NH_2{\cdot}CO_2Ph$ restrict assimilation and respiration whilst pyrogallol, pyrogallol-*o*-carboxylic acid, and gallic acid inhibit only assimilation. CO is without action on either process. Peptone and the lower fatty acids are the most suitable substrates for respiration. Addition of H_2S or fatty acids modifies

the assimilation processes of *R. palustris* since, in place of O_2, S or oxidation products of the acids are formed in amount dependent on the CO_2 reduction. The organism contains dehydrogenases sp. towards the lower fatty acids. In presence of H_2S or fatty acids, reduction of CO_2 occurs through H atoms from H_2O and the residual OH reacts as such (or after combination to H_2O_2) with H_2S or with the H atoms formed by dehydrogenation of the fatty acids. *R. palustris* contains also hydrogenases which render mol. H_2 available for the reduction of methylene-blue, NO_3', or other acceptors, and which reduce OH radicals (or H_2O_2) to H_2O with aid of mol. H_2, thus explaining the CO_2 assimilation with consumption of H gas. Thiorhodaceæ and Anthrorhodaceæ can be cultivated in org. media free from H_2S when the cells accumulate S granules. Differences between the two types of purple bacteria are not abs. and their apparent forms probably depend on the particular chemical conditions of their origin. The primary photochemical reaction in the CO_2 assimilation of purple bacteria is identical with that of green plants since H_2O mols. function as H donators to the CO_2 reduction. H_2S and fatty acids are involved only in the subsequent changes. High vals. are observed for the sp. photochemical action in the photosynthesis of the bacteria in the infra-red. The reduction of each mol. of CO_2 probably requires four light quanta.

II. Peptone, sucrose, glycerol, lactate, formate, acetate, propionate, and butyrate are suitable sources of C for heterotrophic culture. S_2O_3'', in presence of such org. substances (particularly fatty acids), causes marked acceleration of development. H_2S or other oxidisable S compound is essential for autotrophic culture. In light and in presence of fatty acids *Rhodospirillum* causes distinct CO_2 assimilation which is considerably increased by S_2O_3''. In light in the sole presence of H_2S or S_2O_3'' the organism is able to reduce CO_2 at the expense of the S compounds. The metabolism of *Rhodospirillum* is therefore identical with that of *Rhodobacillus* with the exception that the latter can only utilise H_2S and other S compounds after a considerable period of acclimatisation. The mechanism of the assimilative metabolism is similar. H. W.

Oxidation–reduction potentials of certain anaërobic and facultative anaërobic bacteria. I. E_h : p_H relationship ; double reversion of potential during the apparent logarithmic phase. II. Differentiation of *Lactobacilli* of intestinal and buccal origin. R. W. H. Gillespie and L. F. Rettger (J. Bact., 1936, **31**, 14—15).—I. Changes in reduction potential with difference in p_H of cultures of *Lactobacilli* in unbuffered media are examined. Reversion of E_h during the development of the organisms occurs at the period of most rapid change of p_H. The final p_H of cultures of various organisms differed for different strains.

II. In buffered low-carbohydrate media different strains of *Lactobacilli* caused little change in p_H, but the final reduction intensity of oral and intestinal strains diverged sufficiently to permit differentiation by means of indicators. A. G. P.

Phosphoglyceric acid in the dissimilation of glucose by *Citrobacter freundii*. C. H. Werkman, E. A. Zoellner, H. Gilman, and H. Reynolds (J. Bact., 1936, **31**, 5).—Phosphoglyceric acid occurs amongst the intermediate products of the dissimilation of glucose; it is converted by *C. freundii* into $AcCO_2H$. A. G. P.

Aërobic dissimilation of lactic acid by propionic acid bacteria. H. G. Wood, C. Erb, and C. H. Werkman (J. Bact., 1936, **31**, 5—6).—At 30° and p_H 6·0 non-proliferating *Propionibacterium arabinosum* converts lactic acid into $AcCO_2H$ (I), AcOH, $EtCO_2H$ (II), and CO_2. (I) is probably an intermediate in the dissimilation of (II). A. G. P.

Biolysis, or fission of gelatin by pure cultures of living bacteria. V. S. Sadikov and E. L. Remennikova (Biochimia, 1937, **2**, 549—558).—12—43-day cultures of *B. proteus* in 5% gelatin (I) are passed through Berkefeld or Chamberland filters, and broth, broth–peptone–(I), or (I) media are inoculated with the filtrates. Pure cultures of *B. proteus* are thus obtained after the lapse of a latent period (10—34 days), showing that transformation of the bacteria into an ultrafilterable form takes place in gelatin (but not other) cultures. The NH_2-acid-N of (I) cultures is at a max. in 6- and of NH_3-N in 8-month cultures. The NH_3-N of sterile (I) hydrolysates does not vary with time, whilst the NH_2-acid-N rises continuously during 8 months at 37°. R. T.

Occurrence and biological production of *l*(—)-glutamic acid. V. Bruckner and G. Ivánovics (Z. physiol. Chem., 1937, **247**, 281—284; cf. this vol., 250).—*Bacillus mesentericus* (and certain other bacilli), propagated in a medium containing *l*-asparagine or *d*-glutamic acid as N source, produces a polypeptide-like substance which gives a difficultly sol. Cu salt hydrolysed by HCl with production of good yields of *l*(—)-glutamic acid. W. McC.

Formation of 7-hydroxy-3 : 12-diketocholanic acid from dehydrocholic acid by *B. coli communis*. T. Fukui (J. Biochem. Japan, 1937, **25**, 61—69).—The above conversion occurs with cultures at 37—38° in 6 months. F. O. H.

Hydrogen sulphide production as a differential test in the colon group. R. Vaughn and M. Levine (J. Bact., 1936, **31**, 24).—The concn. of agar used in media markedly influences H_2S production by different strains of the organism. All strains give positive results in presence of cysteine. The concn. of peptone is not a significant factor. A. G. P.

Fermentation of acetylmethylcarbinol by the *Escherichia–Aërobacter* group and its significance in the Voges–Proskauer reaction. R. P. Tittsler (J. Bact., 1936, **31**, 21).—Failure to obtain positive Voges–Proskauer tests in old cultures of *A. aërogenes* and *A. oxytocum* is due to actual fermentation of CHAcMe·OH. A. G. P.

Effect of minimal amounts of heterobacteria on the degree of fever induced by influenza bacillus. S. Nukada and T. Yoshii (Arch. exp. Path. Pharm., 1937, **185**, 178—183).—Injection of dead influenza bacillus into rabbits subsequent to

an injection of min. amounts of typhus or proteus did not result in fever; subsequent to pyocyaneus or paratyphosus *A* and *B* led to no or only slight fever; after pneumococcus or staphylococcus showed slightly higher rise in temp. than did normal rabbits; after meningococcus, gonococcus, and Shiga bacillus showed as great or greater temp. rise than did normal rabbits; after streptococcus, coli, cholera vibrios, etc. showed a rise of temp. identical with that of normal animals. The action of *B. proteus* in depressing the fever is still considerable 24 and even 48 hr. after injection but disappears 96 hr. after injection. P. W. C.

Lipins of tubercle bacilli. XLVIII. Phthiocerol in the wax from strains of human tubercle bacillus. XLIX. Colorimetric determination of phthiocol. R. E. Reeves and R. J. Anderson. **L. Phthiocerol in the wax of bovine tubercle bacillus.** J. Cason and R. J. Anderson (J. Biol. Chem., 1937, **119**, 535—541, 543—547, 549—551; cf. this vol., 318).—XLVIII. The wax of four recently isolated strains of the bacillus contains phthiocerol (I) (isolated by a simplified procedure), a H_2O-sol. carbohydrate, and small amounts of glycerol.

XLIX. Phthiocol, which is present in the wax of three of the strains, yields a red colour with dil. aq. $NaHCO_3$ and is determined colorimetrically ($<0{\cdot}4$ mg.; error $\pm5\%$) or with a spectrophotometer ($<0{\cdot}05$ mg.).

L. (I) occurs in the wax of the bovine bacillus. The carbohydrate of this wax differs from that of the wax of the human bacillus. W. McC.

Chemical composition of the active principle of tuberculin. XX. Comparative yield, potency, specificity, and acid–base-combining capacity of proteins from five human tubercle bacilli culture filtrates and other acid-fast bacilli. F. B. Seibert (J. Amer. Chem. Soc., 1937, **59**, 958—963; cf. A., 1936, 1403).—Five strains of human tubercle bacilli gave similar (0·2 g. per litre of culture) yields of protein, four of which had 14% and one 15% of N, but all were similar in potency and in acid–base-combining capacity at p_H 2—11 (determined by electrometric titration) and behaved identically in the precipitin test. They are readily distinguished from proteins of other acid-fast bacilli. R. S. C.

Relation of certain respiratory enzymes to the maximum growth temperatures of bacteria. O. F. Edwards and L. F. Rettger (J. Bact., 1936, **31**, 12—14).—The presence of a thermostable peroxidase, an indophenol-oxidase, and a succino-dehydrogenase is demonstrated in numerous species of bacilli. Max. and min. temp. of growth of the organisms are correlated with the temp. of destruction of the enzymes. A. G. P.

Protein-sparing action of carbohydrates in relation to anaërobic identification. R. S. Spray and A. R. Stanley (J. Bact., 1936, **31**, 27).—Evidence is obtained supporting the hypothesis of the " protein-sparing " effect of fermentable carbohydrates. A. G. P.

Activity of bacteriophage in lactic streptococci. H. R. Whitehead and G. J. E. Hunter (J. Path. Bact., 1937, **44**, 337—347).—Under certain conditions of growth in milk phages arise spontaneously. From each streptococcal type a series of resistant cultures and secondary phages can be obtained. Phages are probably products of the organism. W. L. D.

Isolation of a crystalline protein possessing the properties of aucuba mosaic virus. W. M. Stanley (J. Bact., 1936, **31**, 52—53).—The method of isolation and general character of the product are described (cf. A., 1935, 1181). A. G. P.

Virus molecules. J. G. Bald (J. Austral. Inst. Agric. Sci., 1937, **3**, 93—96).—A review. A. G. P.

Aggregation of virus particles. J. G. Bald and G. E. Briggs (Nature, 1937, **140**, 111).—Dilution–infection data indicate that virus particles of the tobacco mosaic group, even in dil. solution, may form end-to-end chain aggregates (cf. this vol., 228). L. S. T.

Determination of the relative concentrations of the viruses of the ordinary and yellow tobacco mosaics and of tomato spotted wilt by the primary lesion method. R. J. Best (Austral. J. Exp. Biol., 1937, **15**, 65—79).—The limiting frequency of lesions obtained with conc. preps. depends on technique and conditions but the decrease associated with dilution, plotted as a dilution curve, follows in all cases a regular though complex course, which can be used for determination in a region in which dilution approx. $\propto$ no. of lesions. R. M. M. O.

Serological tests with Stanley's crystalline tobacco-mosaic protein. K. S. Chester (Phytopath., 1936, **26**, 715—734).—Several viruses examined (including tobacco mosaic) gave no anaphylactic reaction but proteins of healthy tobacco plants gave strong reactions. Proteins of healthy tobacco and tomato plants were serologically similar. Cross-reactions between healthy plant proteins and the cryst. mosaic protein are ascribed to contamination of the latter with protein serologically allied to or identical with the healthy protein. Precipitin reactions of sera of sensitised guinea-pigs show differences in the mechanism of the action of healthy and mosaic proteins although the same antibody may be concerned in both. A. G. P.

Separation and analysis of virus strains by means of precipitin tests. K. S. Chester (Phytopath., 1936, **26**, 778—785).—Serological differences are demonstrated among strains of tobacco-mosaic virus. A. G. P.

Liberation of neutralised virus and antibody from anti-serum–virus precipitates. K. S. Chester (Phytopath., 1936, **26**, 949—964).—Virus-immune serum from which antibodies for healthy tobacco protein had been removed was purified by elimination of proteins insol. in 30% and those sol. in 43% saturated $(NH_4)_2SO_4$. Pseudoglobulins rendered insol. in H_2O by heating to 57° were also removed. The resulting liquid after dialysis had an almost undiminished virus-antibody content but a much lower non-sp. inhibitory action. The inhibitory property of normal serum is distributed

among all protein fractions. Neutralised mixtures of mosaic virus juice and immune serum obtained by titration, coupled with precipitin tests, contained no free virus or serum, as shown by chemical, physical, and serological tests, but on digestion with pepsin showed destruction of antibodies, partial retention of virus, and increased infectivity. Similar partial digestion of virus-free immune serum yielded no infective material. Acidification (p_H 4·8) of neutral ppts. of potato "*X*" virus with its sp. serum causes dissolution of the ppt. and the appearance of free antibody in the supernatant liquid. A unit of the antibody combines with and is saturated by any no. of units of antigen from 1 to 8. A. G. P.

Kinetics of formaldehyde disinfection of vaccinia virus. E. V. Keogh (Austral. J. Exp. Biol., 1937, **15**, 109—112).—A logarithmic law similar to that for bacteria is maintained within the range of experimental accuracy. R. M. M. O.

Bactericidal and destructive effects of Dakin's solution on tubercle bacilli. B. H. Y. T'ang (Chinese Med. J., 1937, **52**, 77—84). L. D. G.

Effectiveness of hot hypochlorites of low alkalinity in destroying *Mycobacterium tuberculosis*. S. M. Costigan, J. W. Yates, W. A. Hadfield, and E. C. McCulloch (J. Bact., 1936, **31**, 6).—Lethal concns. are examined in relation to temp. and to speed of killing the organisms. A. G. P.

Evaluation of mercurial antiseptics in the presence of serum. D. E. Smith and E. J. Czarnetzky (J. Bact., 1936, **31**, 7—8).—Metaphen, merthiolate, mercurochrome, and $HgCl_2$ combine with serum-proteins to form non-antiseptic compounds. A. G. P.

Effect of sodium selenite on growth of bacteria and its use as a basis for enrichment media for isolation of typhoid bacilli from fæces, water, milk, etc. E. Leifson (J. Bact., 1936, **31**, 26—27).—Differential inhibitory effects of Na_2SeO_3 on the growth of various species are examined. Typhoid and dysentery bacilli are relatively resistant and may be separated by this means. A. G. P.

Antistreptococcal action of organic sulphides. E. Fourneau, J. Tréfouël, F. Nitti, D. Bovet, and (Mme.) J. Tréfouël (Compt. rend., 1937, **204**, 1763—1766).—4 : 4′-Di- and 2 : 4 : 2′ : 4′-tetra-nitrodiphenyl sulphide protect mice against streptococcal infection which, in controls, is fatal in 24 hr., but are only 0·25 times as active as *p*-$NH_2{\cdot}C_6H_4{\cdot}SO_2{\cdot}NH_2$ (I) (cf. this vol., 99). 4 : 4′-Dinitrodiphenyl disulphide is 4—8, and the -sulphone 10 times, as active as (I); Ph_2S_2 and 2 : 2′-dinitrodiphenyl disulphide are inactive. J. L. D.

Sterilising action of acids. VIII. Relationship between stereochemical constitution of fatty acids and physiology of bacteria. I. Isomeric *cis–trans* acids. II. Optically active acid isomerides. S. Tetsumoto (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 369—382, 458—466).—I. The sterilising action of *cis*-fatty acids on bacteria is > that of the *trans*-acids.

II. The action of optically active acids is > that of the inactive acids. Salts of *dl*-lactic, *dl*-malic, *dl*- and *meso*-tartaric acids have approx. the same action. J. N. A.

Bactericidal action of mixtures of phenol and merthiolate. C. R. Falk and S. Applington (J. Bact., 1936, **31**, 8—9).—The action of mixtures of varying composition on a no. of pathogenic organisms is examined at different temp. A selective action of the individual preservatives is recorded. A. G. P.

Action of phenolic substances on bacteria. Influence of chemical constitution. Effect of salicylic acid, salicylaldehyde, and saligenin and their mono- and di-halogen derivatives. P. Delauney (J. Pharm. Chim., 1937, [viii], **25**, 545—560; cf. this vol., 183).—Using *Staphylococcus pyogenes aureus* and *B. subtilis* the bacteriostatic activities of *o*-$OH{\cdot}C_6H_4{\cdot}CO_2H$ and its halogen derivatives are distinctly < that of PhOH (I), except in the case of the 3 : 5-I_2-acid, which is twice as active to *S. pyogenes aureus* and three times as active to *B. subtilis*. The activity of the halogenated aldehydes is in the order Cl<Br<I, and they are all 10—40 times as active as (I). The alcohols are all more active than (I), the Br-derivatives having greatest activity. In their bactericidal action, using the "direct" method, none of the compounds completely destroyed *B. subtilis*. With the "centrifugal" method, the Br_2- and I_2-acids were more active than (I), the aldehydes did not give reliable results, and the alcohols were more active except in the case of *o*-$OH{\cdot}C_6H_4{\cdot}CH_2{\cdot}OH$ and its 5-Cl-derivative. All the substances were dissolved in 1 mol. of NaOH. J. N. A.

Bactericidal properties of certain plant juices. J. M. Sherman and H. M. Hodge (J. Bact., 1936, **31**, 96).—Expressed juices of cabbage heads and turnip roots contain a mildly germicidal substance which is destroyed by heating at 60° for 10 min., is separated by a Berkefeld *N* filter but not by a *V* candle, and is adsorbed by activated C. A. G. P.

Preparation and properties of silicic acid jellies for pure culture isolation of bacteria. J. H. Hanks and R. W. Weintraub (J. Bact., 1936, **31**, 29—30).—Standard conditions of prep. are ensured by mixing appropriate indicators with 6% aq. Na silicate and 0·5*N*-HCl and mixing these in proportions to produce the desired p_H. Changes of p_H during dialysis and autoclaving, and effects on these of time, temp., etc., are examined. Gels prepared with NH_4 salts showed relatively small fluctuations in p_H. A. G. P.

Effect of certain hormones on the activity of the uterine muscle of the guinea-pig. G. H. Bell and J. M. Robson (J. Physiol., 1937, **88**, 312—327). R. N. C.

Effect of adrenaline on muscle-glycogen in adrenalectomised, thyroidectomised, and hypophysectomised rats. J. B. Collip, D. L. Thomson, and G. Toby (J. Physiol., 1936, **88**, 191—198).—Adrenaline causes a reduction of muscle-glycogen (I) in adrenalectomised animals > in normal animals without producing hyperglycæmia. In thyroidectomised animals hyperglycæmia appears without appreciable reduction of (I), whilst in hypophys-

ectomised animals, whether or not fed with desiccated thyroid, neither (I) mobilisation nor hyperglycæmia occurs, unless the animals are previously treated with anterior pituitary extract. R. N. C.

Adrenaline and the blood-lactic acid level in hypophysectomised rabbits. O. Cope and R. H. Thompson (J. Physiol., 1937, **88**, 417—424).—Complete hypophysectomy does not alter significantly the rise of blood-lactate (I) induced by subcutaneous injection of adrenaline (II), which is hence still able to cause breakdown of muscle-glycogen. Hypophysectomised animals fasted until the blood-sugar is <40 mg. per 100 c.c. show no significant increase of (I), so that the amount of (II) released into the circulation in response to the hypoglycæmia must be negligible. R. N. C.

Action of adrenaline on the knee-jerk. A. Schweitzer and S. Wright (J. Physiol., 1937, **88**, 476—491). R. N. C.

Relationship between the blood-calcium level and the effect of intravenous injections of adrenaline in the dog. F. Dwelshauvers (Arch. internat. Physiol., 1937, **44**, 313—328).—The hypotensive and vasoconstrictive activities of adrenaline are augmented by high blood-Ca (I) and the presence of parathormone in the blood, but during the period of activity (I) is diminished. H. G. R.

Central nervous origin of post-insulin hyperadrenalinæmia. J. La Barre and R. Saric (Arch. internat. Physiol., 1937, **44**, 459—473).—The adrenaline (I) content of dog's adrenal venous blood can be increased by perfusion of the encephalic nervous centres with the blood of another animal rendered hypoglycæmic by insulin treatment. This discharge of (I) is rapidly decreased if the blood-sugar of the perfusing blood is increased by prior injection of glucose. H. G. R.

Disappearance of injected adrenaline in the animal body. S. S. Weinstein and R. J. Manning (Science, 1937, **86**, 19—20).—Adrenaline is not destroyed by the blood nor to any significant extent by sp. organs. It probably passes rapidly through the capillaries into the tissues, where it is oxidised to a physiologically inactive substance, possibly protocatechuic acid. L. S. T.

Value of extracts of adrenal cortex in the treatment of Addison's disease. J. F. Wilkinson (Lancet, 1937, **233**, 61—70).—These extracts (cortin and eucortone) are of val. High blood-urea quickly returns to normal with a simultaneous disappearance of albumin from the urine; blood-$Na^{\cdot}$, -Cl', and -PO_4''' return to normal. The extracts have no effect on the hypochromic microcytic anæmia frequently present, and the basal metabolic rate is also unaltered. L. S. T.

Standardisation of cortical extracts by the use of drakes. E. Bülbring (J. Physiol., 1937, **89**, 64—80). R. N. C.

Cholesterol and the adrenal cortical hormone. O. Rosenheim and H. King (Nature, 1937, **139**, 1015).—Mild oxidation of the 3-acetate (or -benzoate) of *cis*-$\Delta^{5\ 6}$-cholestene-3 : 4-diol (I) yields (?) the oxide of 4-ketocholestenol 3-acetate (or -benzoate), hydrolysed to a highly reactive reducing substance (II) ("diosterol") $C_{27}H_{42}O_2$, having the typical grouping ·C:C(OH)·CO· of diosphenol and identical with the substance $C_{27}H_{42}O_2$ of Inhoffen (A., 1936, 1104) and Butenandt and Schramm (*ibid.*, 1512). (I); its immediate oxidation products may be steps in the biological formation from cholesterol (III) of the labile cortical hormone of the adrenals. (III) is converted into (I) by treatment of its dibromide with AgOAc in C_5H_5N at room temp. L. S. T.

Constituents of the adrenal gland. IX.—See A., II, 380.

Relation of the pituitary to liver-glycogen production and utilisation. O. Cope (J. Physiol., 1937, **88**, 401—416).—The reduction of glycogen (I) production on hypophysectomy first noted by Houssay *et al.* is observed in young rabbits. Blood-sugar in the fasting state is maintained until liver-(I) from exogenous sources becomes depleted, when it falls rapidly to convulsive levels. Glucose (II) utilisation is unaffected and (II) given intravenously is readily converted into liver-(I). Adrenaline and insulin do not cause storage of (I) in the liver. Utilisation of lactate given intravenously is probably impaired. Muscle-(I) is unaffected when liver-(I) is depleted. R. N. C.

Species variation in thyrotropic activity of the pituitary gland. I. W. Rowlands (J. Physiol., 1936, **88**, 298—304). R. N. C.

Influence of pituitary thyrotropic hormone on the vitamin-*C* content of the adrenals and liver of guinea-pigs. A. Loeser and V. M. Trikojus (Arch. exp. Path. Pharm., 1937, **185**, 227—234).—The vitamin-*C* content of the adrenals of guinea-pigs decreases and simultaneously that of the liver increases under the action of the hormone. The effect is, however, small and disappears with prolonged action, the adrenal -*C* content becoming > normal. P. W. C.

Ovulation induced out of season. R. Rugh (Science, 1937, **85**, 588—589).—The technique of inducing ovulation in frogs during the non-breeding season by injection of the anterior pituitary hormone is described. In *Rana pipiens* the average male anterior pituitary is 16% heavier than and 60% as potent as the average female gland in this respect. L. S. T.

Renal circulation and secretion of the dog, with special reference to the effect of pituitary (posterior lobe) extract. H. Handovsky and A. Samaan (J. Physiol., 1937, **89**, 14—31). R. N. C.

State in the blood and excretion by the kidney of the antidiuretic principle of posterior pituitary extracts. H. Heller (J. Physiol., 1937, **89**, 81—95).—Pituitrin (I) is adsorbed by some colloidal constituent of rabbit's blood *in vitro*. (I) injected intravenously into rabbits is retained to a considerable extent, the proportion excreted diminishing as the amount injected is increased. The kidney is able to liberate the adsorbed (I). R. N. C.

Effect of progesterone on lactation in the rat. S. J. Folley and S. K. Kon (Nature, 1937, **139**,

1107).—When given to the lactating rat, relatively high doses of progesterone neither inhibit established lactation nor increase milk secretion as judged by the rate of growth of sucklings. L. S. T.

Effects on ovariectomised rats of progesterone alone and in combination with the other sexual hormones. V. KORENCHEVSKY and K. HALL (Nature, 1937, **140**, 154).—Injection of progesterone (I) alone produced only slight changes in the uterus and vagina, but in certain combinations with small amounts of œstrone (II) or œstradiol the histological structure showed typical progestational changes. The addition of various doses and combinations of testosterone or its propionate and Δ^4-androstenedione to (I) and (II) improved general development in the uterus and vagina. L. S. T.

Action of progesterone on the uterus of the rabbit and its antagonism by œstrone. J. M. ROBSON (J. Physiol., 1936, **88**, 100—111). R. N. C.

Gravimetric determination of sodium pregnanediol glycuronate (an excretion product of progesterone). E. H. VENNING (J. Biol. Chem., 1937, **119**, 473—480; cf. A., 1936, 1564).—Urine (containing 20—40 mg.) is extracted with BuOH and the extracts are evaporated to dryness. The residue is taken up in 0·1*N*-NaOH, and the solution again extracted with BuOH. The extract is washed with H_2O and evaporated to dryness. 5 c.c. of H_2O are added to the residue, which is then warmed to 50° and 95 c.c. of $COMe_2$ are added. The ppt. which settles overnight at 5—10° is collected, dissolved by warming with a few drops of H_2O and sufficient EtOH, filtered, evaporated, and the residue weighed. The % recovery for different levels of the glycuronate is given. P. G. M.

Œstrogenic activity of *p*-hydroxypropenylbenzene (anol). E. C. DODDS and W. LAWSON (Nature, 1937, **139**, 1068—1069).—The high activity previously reported (this vol., 229) appears to be due to a substance, possibly a polymeride of anol, from the mother-liquor occasionally separating with the anol. Large doses of all preps. of anol, however, are active. L. S. T.

Œstrogenic substances in the Dead Sea. B. ZONDEK (Nature, 1937, **140**, 240).—A sandy mud from the Dead Sea possesses œstrogenic activity, The surface H_2O is free from œstrogenic substances. but the deep sea H_2O contains 100 mouse units per litre. Salt manufactured from the Dead Sea contains a similar amount. Male sex hormones and progesterone could not be detected. The mud contains a yellow dye of the lyochrome group. L. S. T.

Œstrous reactions, including mating, produced by triphenylethylene. J. M. ROBSON and A. SCHÖNBERG (Nature, 1937, **140**, 196).—These effects have been produced in ovariectomised mice and in hypophysectomised rabbits. The œstrogenic activity of C_2HPh_3 is approx. 10^{-4} of that of œstrone, but effects are of marked duration. L. S. T.

Œstrogenic hormones in the ovaries of swordfish. A. I. WEISMAN, D. I. MISHKIND, I. S. KLEINER, and C. W. COATES (Endocrinol., 1937, **21**, 413—414).—Less than 6 rat units of œstrogenic hormone were extracted from 10 lb. of swordfish ovaries. P. G. M.

Comparative action of injections of œstrin and a combination of œstrin and anterior pituitary-like substance on the anterior pituitary. J. M. WOLFE (Anat. Rec., 1937, **68**, 237—248). R. N. C.

Biogenesis of primary sex hormones. I. Fate of œstrins injected into the rabbit. G. PINCUS and P. A. ZAHL (J. Gen. Physiol., 1937, **20**, 879—893).—The extraction and determination of œstrone (I) and œstriol (II) from rabbit's urine is described. Injections of (I) and (II) into rabbits under varying conditions show that œstrone is converted into œstriol in the uterus and that progesterone facilitates the reaction. Some conversion of œstrone into œstradiol is indicated. E. M. W.

Effect of continued theelin injections on the body growth and organ weights of young female rats. C. B. FREUDENBERGER and F. W. CLAUSEN (Anat. Rec., 1937, **68**, 133—144). R. N. C.

"Sodium-retaining effect" of the sex hormones. G. W. THORN and G. A. HARROP (Science, 1937, **86**, 40—41).—Subcutaneous injection of œstradiol (I) results in a marked decrease in the renal $Na^{\cdot}$ excretion and a reduced urine output in a normal male dog. Continued injections of œstrogenic material into normal male and female dogs does not prevent an ultimate return of $Na^{\cdot}$ excretion to a normal level. Comparison of the Na-retaining effect of different sex hormones shows that (I) and progesterone are the most active substances in this respect. Pregnanediol also produces this retention. A single injection of (I) in Addison's disease resulted in retention of $Na^{\cdot}$, Cl', and H_2O. L. S. T.

Vaginal hydrogen-ion concentration in monkeys injected with œstrone. R. M. RANSON and S. ZUCKERMAN (J. Physiol., 1937, **89**, 96—98).—The vaginal p_H falls between 5·2 and 8·7. It is independent of the amount of œstrone given or the period of injections, but in individual animals it appears to remain const. under different conditions of injection. R. N. C.

Effect of female sex hormones on the oxygen consumption of normal rats, and on the tolerance to desiccated thyroid. D. N. DANFORTH, R. R. GREENE, and A. C. IVY (Endocrinol., 1937, **21**, 361—367).—Large doses of œstrone, œstriol, emmenin, progesterone, and the gonadotropic factor of pregnancy urine exert little effect on the O_2 consumption of female rats, but decrease the effect of feeding desiccated thyroid. P. G. M.

Pregnane-3 : 17 : 20-triol from the urine of women showing the adreno-genital syndrome. G. C. BUTLER and G. F. MARRIAN (J. Biol. Chem., 1937, **119**, 565—572).—The urine of two women showing the syndrome (but not that of one of them after removal of the enlarged adrenal, that of normal men, or that of normal pregnant or non-pregnant women) contained *pregnane*-3 : 17 : 20-*triol*, m.p. 243—244° (*diacetate*, m.p. 136·5°), oxidised by $Pb(OAc)_4$ to MeCHO and 3-*epi*hydroxyætiocholan-17-one. Pregnanediol was also present. W. McC.

Functional relationship between the ovarian hormones of primates. R. Courrier and G. Gros (Compt. rend. Soc. Biol., 1937, **125**, 746—748).—Folliculin is readily dominated by progestin and has no anti-luteinising action on the endometrium. H. G. R.

Changes in relative amounts of follicle-stimulating and luteinising hormones in the pituitary of the female rat. S. L. Leonard (Endocrinol., 1937, **21**, 330—334).—Castration of female rats increases the follicle-stimulating hormone (I) > the luteinising hormone (II). Subsequent œstrone (III) treatment reduces (II) to <, and (I) almost to, normal. (III) decreases the response of immature female rats to (I) but not to (II). P. G. M.

Comparative action of gonad-stimulating hormones on the rat ovary. H. L. Fevold, F. L. Hisaw, and R. O. Greep (Endocrinol., 1937, **21**, 343—345).—Continued administration of follicle-stimulating hormone (I) produces luteinisation of the ovaries of normal immature rats but not those of hypophysectomised rats. Tannic acid and $Cu(OAc)_2$ do not alter the quant. nature of the response to either (I) alone or (I) + luteinising hormone. P. G. M.

Test for ovarian follicular hormone and other œstrogens. E. Allen, G. M. Smith, and W. U. Gardner (Endocrinol., 1937, **21**, 412—413).—The material to be tested and 0·1 mg. of colchicine in aq. solution are injected in this order within a few hr. in spayed mice or rats and, 9½ hr. after the latter injection, a specimen of vaginal wall is taken for sectioning. Frequent mitoses in the basal layers indicate a positive result. P. G. M.

Determination of folliculin in ovarian powders. A. Choay (Compt. rend. Soc. Biol., 1937, **125**, 857—858).—The solids extracted by boiling EtOH are treated with $COMe_2$ and the $COMe_2$-sol. substance is dissolved in oil and tested on ovariectomised rats. Samples examined contained approx. 20 international units per g. H. G. R.

Inhibition of the gonadotropic activity of pregnancy urine extract by the serum of rabbits injected with an extract of male urine. P. de Fremery and B. Scheygrond (Nature, 1937, **139**, 1015—1016).—Enlargement of the uterus, œstrus, and luteinisation, produced by injection of a prep. from urine of pregnancy into immature female rats, are completely inhibited by simultaneous injection of antigonadotropic serum obtained by repeated injection of a negligibly gonadotropic extract of human male urine into a rabbit. L. S. T.

Antagonistic action of testosterone and folliculin on the capon's comb. P. Gley and J. Delor (Compt. rend. Soc. Biol., 1937, **125**, 813—815).—This is observed if the dose of folliculin is 5 times that of testosterone. H. G. R.

Biological properties of some new derivatives of testosterone. R. Deanesly and A. S. Parkes (Biochem. J., 1937, **31**, 1161—1164).—Testosterone-oxime and its propionate are only slightly active compared with testosterone (I) and its propionate on either capons or castrated rats. The diacetate of the enolic form of (I) shows activity similar to that of (I) 17-monoacetate. P. W. C.

Specific vaso-dilating and plain-muscle stimulating substances from accessory genital glands in man and certain animals (prostaglandin and vesiglandin). U. S. von Euler (J. Physiol., 1936, **88**, 213—234).—Prostaglandin (I), obtained from human prostate and seminal vesicles and sheep vesicular gland, is sol. in H_2O, EtOH, and $COMe_2$, and in Et_2O and $CHCl_3$ at an acid p_H. It is stable at p_H 1—7, but is destroyed by more conc. acid, alkali at all concns., and free halogens. It migrates to the anode in cataphoresis experiments. Vesiglandin, obtained from monkey prostate and vesicular glands, resembles (I) in solubility, but is less stable in acids and alkalis. R. N. C.

Reticulo-endothelial system and the concept of the "anti-hormone." A. S. Gordon, W. Kleinberg, and H. A. Charipper (Science, 1937, **86**, 62—63).—A comparison of the response of immature splenectomised and normal female rats to daily injections of pregnancy urine extract shows a connexion between reticulo-endothelial activity and the development of refractoriness to heterozoic endocrine extracts; the antagonistic substances produced in response to chronic treatment with such extracts are thus probably antibody-like. L. S. T.

Early work on insulin. F. G. Banting (Science, 1937, **85**, 594—596).—An address. L. S. T.

Crystalline insulin. X. Time course of insulin inactivation by normal blood. H. Kohl, H. Selbach, and A. Janning (Arch. exp. Path. Pharm., 1937, **185**, 212—220).—Inactivation of insulin by the blood of normal adults is complete after about 22 hr. (normal physiological variation 13—30 hr.) and varies with age: < 20 years, 28 contact hr.; 20—60 years, 21—22 hr.; >60 years, 18 hr. P. W. C.

Two crystalline modifications of insulin. D. Crowfoot (Nature, 1937, **140**, 149—150).—*X*-Ray examination shows that the crystal structures of the prismatic, birefringent crystals is the same as that of the rhombohedral crystals; thus the two forms are not polymorphic. The *X*-ray pattern of the prismatic form differs only by showing a more marked diffuse ring with a spacing of approx. 4·5 A., a val. possibly characteristic of the presence of amorphous matter, which may be responsible for the change in cryst. form. L. S. T.

Structure of insulin. D. M. Wrinch (Science, 1937, **85**, 566—567).—The structure of insulin (I) is described in terms of the cyclol theory of protein structure. The view that cryst. (I) contains certain metals as combined constituents and not as impurities, and the fact that the optimum acidity for the crystallisation of (I) in presence of certain metals is p_H 6·0—6·2, are explained. L. S. T.

Ultrafiltration of insulin of varying purity through membranes of graduated porosity. F. Schmid and A. Riegert (Compt. rend. Soc. Biol., 1937, **125**, 881—884).—No separation of the active principle from impurities was effected. H. G. R.

Course of carbohydrate metabolism in various vascular regions after injection of glucose, insulin, and adrenaline. F. Meythaler and A. Brüning (Arch. exp. Path. Pharm., 1937, **185**, 203—211).—A series of curves shows the effect in dogs on the sugar content of blood from the vena portæ, cava hepatica, and the femoral artery of intravenous injection of glucose (I), insulin (II), and adrenaline (III). After (I), the blood-sugar vals. increased in all cases, the increase being least in the hepatic vein, indicating retention of sugar in the liver. After (II), the liver to a slight extent mobilises sugar whereas all other organs increase their retention of sugar. After (III), increased mobilisation of glycogen occurs in the liver. P. W. C.

Experimental parathyroid insufficiency. I. Mineral constituents of dog's serum in acute and latent tetany. II. Adsorbable fraction of serum-calcium in acute and chronic parathyroid insufficiency. III. Effect of insulin on the blood-calcium of the normal dog and in latent tetany. F. Mathieu (Arch. internat. Physiol., 1937, **44**, 516—528, 529—534, 535—541).—I. In latent tetany (7—10 months after thyroparathyroidectomy) blood-Ca can be as low and inorg. P as high as in the acute form. Serum-Mg is decreased in the acute but normal in the latent form. No variation in Na or K is observed in either case.

II. In both acute and latent tetany blood-Ca absorbable on $BaSO_4$ is increased.

III. Blood-PO_4''' and -Ca absorbable on $BaSO_4$ are decreased in tetany after injection of insulin but little increase in blood-Ca was observed. H. G. R.

Fatty acids, lipin-phosphorus, and cholesterol in duck's blood after thyroidectomy and injection of pituitary anterior lobe extract. J. Benoit and S. B. Bogdanovitch (Compt. rend. Soc. Biol., 1937, **125**, 891—894).—A considerable increase in the levels of fatty acids, lipin-P, and cholesterol occurs after thyroidectomy. H. G. R.

Metabolism of a dwarf under treatment with growth hormone. H. C. Struck and S. A. Szurek (Endocrinol., 1937, **21**, 387—393).—Administration of growth hormone and vitamin-*D* to a dwarf produced no noticeable change in condition except increase in wt. N was retained but Ca and P balances were unchanged. P. G. M.

Thymocrescin and vitamins. L. Asher (Z. Vitaminforsch., 1937, **6**, 265—266).—The hormonal character of thymocrescin (cf. Bachmann, A., 1934, 565) is discussed. F. O. H.

Vitamin content of marine oils.—See B., 1937, 807.

Photo-electric method for measuring vitamin-*A*. R. L. McFarlan, J. W. Reddie, and E. C. Merrill (Ind. Eng. Chem. [Anal.], 1937, **9**, 324—326).—A photo-electric apparatus for the determination of the light absorption of fresh liver oils in the 3280 A. region is described. F. N. W.

Comparison of spectrophotometric and biological assays for vitamin-*A*. C. L. Barthen and C. S. Leonard (J. Amer. Pharm. Assoc., 1937, **26**, 515—524).—Data are given for a large no. of cod-liver oils. The adoption of the spectrophotometric method is recommended for U.S.P. assays. F. O. H.

Aqueous colloidal solutions of vitamin-*A*. A. Ratschevski (Z. Vitaminforsch., 1937, **6**, 203—206).—The purified -*A* prep. is dissolved in absence of O_2 in a min. of EtOH, cooled to −15°, separated from sterols, and the resulting solution mixed with a little H_2O and evaporated free from EtOH. This yields a colloidal aq. solution containing up to 6250 international units per c.c. F. O. H.

Contents of carotene and vitamin-*A* in leprous sera. I. Ikegaki (Z. Vitaminforsch., 1937, **6**, 206—209).—The carotene content is reduced in lepra nervorum, maculosa, and tuberosa, but the -*A* content is reduced only in the first two. F. O. H.

Spectrophotometric method of assaying vitamin-*A* and carotene; vitamin-*A* activity of Indian foodstuffs. N. K. De (Indian J. Med. Res., 1937, **24**, 737—749).—Vitamin-*A* can only be extracted quantitatively by EtOH from a light petrolem solution containing carotene (I), if the mixture is first saponified and extracted 7—10 times; foreign materials affect the partition coeff. of -*A* between the two solvents. Adsorption on C removes many impurities without causing loss of -*A*. Both -*A* and (I) are highly unstable to light in $CHCl_3$, which is not recommended for use in spectrophotometric work. Evidence in support of the validity of the technique and the -*A* and (I) contents of 70 foodstuffs are given. R. N. C.

Assimilation of vitamin-*A* and carotene by rats from some common foods: conversion factor, I.U./*E*., proposed by the International Vitamin Conference. N. K. De (Indian J. Med. Res., 1937, **24**, 751—766).—Absorption of vitamin-*A* from the intestine after ingestion of a no. of foods is almost complete, but only 45—65% of the carotene (I) is retained. (I) absorption is not significantly affected by differences in body-wt., or in dietary fat, salts, or -*B*. (I) appears to be utilised best when fed in an oil solution. The val. 1600 is probably appropriate for the conversion factor I.U./*E*. R. N. C.

Carotene content of some common Bengali foodstuffs. B. Ahmad, D. N. Mullick, and B. N. Mazumdar (Indian J. Med. Res., 1937, **24**, 801—806).—Carotene is present in large quantities only in vegetables, particularly those of the leafy type. R. N. C.

Absorption of carotene and vitamin-*A* in man. H. E. C. Wilson, S. M. Das Gupta, and B. Ahmad (Indian J. Med. Res., 1937, **24**, 807—811).—Absorption of carotene does not appear to be affected by cooking the food. Absorption on a fat diet is > without fat; β-carotene may be absorbed preferentially. A highly conc. extract of vitamin-*A* is absorbed completely. R. N. C.

β-Carotenal.—See A., II, 378.

Dynamics of carbohydrate metabolism in dogs and pigeons suffering from avitaminosis-*B*.

M. S. Levinson (Z. Vitaminforsch., 1937, **6**, 209—227).—The nervous disturbances due to avitaminosis-*B* are preceded by disturbances in carbohydrate metabolism. In pigeons, increased levels of blood-sugar and -lactic acid occur. Blood-ketones increase and liver-glycogen diminishes. F. O. H.

Antiberiberi action of phenanthrene derivatives. J. Sánchez-Rodriguez and J. M. Sardá (Z. Vitaminforsch., 1937, **6**, 193—203).—The appearance of polyneuritic symptoms in pigeons on a vitamin-*B*-free diet is delayed by injection of substances of the *cyclo*pentenophenanthrene type (*e.g.*, male and female sex hormones, vitamin-*D*). F. O. H.

Vitamin-B_1 and fatty livers. E. W. McHenry (J. Physiol., 1937, **89**, 287—295).—Oral administration of vitamin-B_1 to rats on a low-choline diet causes an increase in liver-fat (I). Without -B_1, (I) is increased until the stores of -B_1 are exhausted, when it falls; it is increased again by -B_1. The increase of (I) on administration of -B_1 is still exhibited when dietary fat is increased, or when the diet is fat-free and high in carbohydrate. R. N. V.

Vitamin-B_1 content of some common Indian foodstuffs. H. E. C. Wilson, B. Ahmad, G. Ray, and R. C. Guha (Indian J. Med. Res., 1937, **24**, 813—816).—Vitamin-B_1 is high in cereals but relatively low in vegetables. R. N. C.

Determination of aneurine (= vitamin-B_1) in urine by the thiochrome method. J. Goudsmit and H. G. K. Westenbrink (Nature, 1937, **139**, 1108—1109).—Jansen's method for aneurine (this vol., 77) has been applied to human urine (data tabulated). The results agree with those obtained by Harris and Leong (A., 1936, 904) using the bradycardia method. L. S. T.

Stability of ascorbic and dehydroascorbic acids. V. A. Engelhardt and V. N. Bukin (Biochimia, 1937, **2**, 587—601).—Irreversible transformation of ascorbic acid (I) is not catalysed by substances (Cu, ascorbase) catalysing conversion of (I) into dehydroascorbic acid (II); the reaction is not one of oxidation, since it takes place with equal velocity in presence or absence of O_2. (I) is relatively thermostable, but (II) is irreversibly inactivated at 60° (10 min. at p_H 7), and instantaneously at 100°. (II) is also rapidly inactivated at high p_H at room temp. (90% destruction at p_H 9 in 10—20 min.). Analogous results are obtained for solutions of plant-cell constituents containing (I) and (II). R. T.

Coupled oxidation of ascorbic acid and hæmchromogens. R. Lemberg, B. Cortis-Jones, and M. Norrie (Nature, 1937, **139**, 1016—1017).—The catalysis of the oxidation of ascorbic acid (I) at a p_H <7 by hæmochromogens is confirmed (cf. A., 1936, 390). Under these conditions, hæmochromogens also undergo oxidation to verdohæmochromogen. The coupled oxidation of (I) and C_5H_5N hæmochromogen has been studied and its mechanism is discussed. L. S. T.

Effect of anions on the oxidation of vitamin-*C*. N. Bezssonoff and M. Woloszyn (Compt. rend. Soc. Biol., 1937, **125**, 884—886).—The rate of oxidation varies with the anion present in the order $PO_4''' > NO_3' > OAc' > Cl'$. H. G. R.

Mannose as a possible precursor of ascorbic acid in the tissues of the rat. J. R. Hawthorne and D. C. Harrison (Biochem. J., 1937, **31**, 1061—1064).—The synthesis by Guha and Ghosh (A., 1935, 131, 416, 903) of ascorbic acid (I) from mannose (II) when minced rat liver is incubated in Ringer-PO_4''' solution in presence of O_2 could not be confirmed. Intravenous or subcutaneous injection of (II) into rats produced no increase in the (I) content of the liver. P. W. C.

Histological study of renal elimination of ascorbic acid. A. Giroud and C. P. Leblond (Anat. Rec., 1937, **68**, 113—126).—Ascorbic acid (I) is detected histologically in animal organs by injection of acid $AgNO_3$ into the aorta immediately after bleeding. (I) is present in the kidneys of a no. of animals. It disappears progressively from the kidneys of guinea-pigs deprived of vitamin-*C* in their food, but remains in the kidneys of rats. A single intravenous injection of 50 mg. of (I) into the guinea-pig raises kidney- and urinary (I) to very high vals. (I) is found only in the cells of the proximal convoluted tubule and the descending branch of Henle's loop. R. N. C.

Thyroid and adrenal glands during experimental scurvy and vitamin-*C* treatment. M. M. May (Z. Vitaminforsch., 1937, **6**, 239—250).—In guinea-pigs, scurvy is accompanied by increased activity and characteristic histological changes in the thyroid and by a widening of the adrenal cortex. These symptoms disappear on treatment with vitamin-*C*, which also increases the lipin content of the adrenal cortex. F. O. H.

Vitamin[-*C*] content of *Hibiscus sabdariffa*, L. G. Lorenzini (Arch. Ist. Biochim. Ital., 1937, **9**, 123—130).—Titration with I or 2 : 6-dichlorophenol-indophenol indicates a content of 0·385—0·580% in the dried plant, but tests on scorbutic guinea-pigs indicate complete absence of vitamin-*C*. F. O. H.

Determination of ascorbic acid in tissues. P. Meunier (Bull. Soc. Chim. biol., 1937, **19**, 877—892).—The method depends on the study of the kinetics of the decolorisation of the indophenol reagent by the material and is applied to fruit juice, urine, plasma, and animal organs. The effect of interfering substances is eliminated by extrapolation of the curve of the rate of decolorisation back to zero time. A. L.

Chemical activation of sterols. III. Activation of cholesterol. IV. Activation of cholesterol and cholesterilene by various reagents. J. C. Eck and B. H. Thomas (J. Biol. Chem., 1937, **119**, 621—630, 631—640; cf. this vol., 156).—III. Cholesterol (I) acquires antirachitic properties on heating with H_2SO_4, H_2SO_4–SO_3, $SO_3H{\cdot}CH_2{\cdot}CO_2H$, or $ClSO_3H$ in AcOH. SO_2 is evolved. With H_2SO_4 max. potency is obtained with (I) 0·001, H_2SO_4 0·002, and Ac_2O 0·0025 g.-mol. in 4 c.c. of AcOH at 85—90° for 3 hr. The treatment does not produce a provitamin-*D* which can be activated by ultraviolet irradiation.

IV. (I) is activated by heating with $KHSO_4$, $CuSO_4$, $ZnCl_2$, $AlCl_3,6H_2O$, P_2O_5, $CCl_3{\cdot}CO_2H$, $AlCl_3$ in C_6H_6, or H_3PO_4 in Ac_2O, cholesterilene by heating with $KHSO_4$, NH_4HSO_4, P_2O_5, or HCl–Et_2O. F. O. H.

Mode of action of vitamin-*D*. V. Absorption of phosphates from isolated loops of the small intestine in the rat. R. Nicolaysen (Biochem. J., 1937, **31**, 1086—1088; cf. this vol., 104, 156).—KH_2PO_4 and Na glycerophosphate are absorbed equally well in normal and vitamin-*D*-deficient rats. The rate of absorption $\propto [PO_4'''']$ in the lumen and is uninfluenced by $CH_2I{\cdot}CO_2'$ poisoning. Absorption of inorg. PO_4''' is independent of esterification with glucose. Esterified PO_4''' is absorbed largely without hydrolysis. Hydrolysis in the intestinal lumen occurs only at $p_H >$ normal. E. A. H. R.

Irradiation of compounds of the ergosterol type.—See A., II, 376.

Crystals with vitamin-*K* potency. H. J. Almquist (Nature, 1937, **140**, 25—26).—Vitamin-*K* has been obtained in a cryst. fraction isolated by cooling mol. distillation concentrates in MeOH with solid CO_2. The cryst. fraction is approx. 8 times as potent as the vitamin-containing mother-liquor. L. S. T.

Vitamin-*P* test. A. Bentsáth and N. B. Das (Z. physiol. Chem., 1937, **247**, 258—261; cf. this vol., 234).—Vitamin-*P* prolongs the life of guinea-pigs on a scorbutic diet only when they have previously received diet completely adequate in all essentials or when deficiencies, not necessarily reflected in diminished growth, have been made good. Some winter diets may cause such deficiencies. W. McC.

Growth of *Lemna minor*. E. J. Winter (Nature, 1937, **139**, 1070—1071).—Growth in a colony is exponential, but the rate of production of daughter fronds from a parent is a hyperbolic function of time. L. S. T.

Short periodic growth cycle and a secular variation in *Lemna minor*. H. Dickson (Nature, 1937, **140**, 112).—Certain deviations from the ordinary compound interest law of frond increase for *L. minor* grown under const. conditions in which light, temp., and culture solution were controlled have been established. L. S. T.

Action of heat, light, and radiations on plants.—See B., 1937, 821.

Wave-lengths of radiation in the visible spectrum promoting germination of light-sensitive lettuce seed. L. H. Flint and E. D. McAlister (Smithsonian Misc. Coll., 1937, **96**, No. 2, 8 pp.).—Light of λ 5200—7000 A. promotes germination of sensitive lettuce seed, longer λλ being the more effective (crit. λ 6700 A.). The most active radiation is that most abundantly absorbed by chlorophyll (I) in the same region. (I) probably occurs in the seed. A. G. P.

Influence of light on the inflow of nutrient substances in plants. T. T. Demidenko and V. P. Golle (Compt. rend. Acad. Sci. U.R.S.S., 1937, **15**, 375—380).—Transference of "long-day" plants to "short-day" conditions induces much vegetative growth. Increasing the period of illumination of short-day plants increases the period of vegetative growth and the crop yield. Elimination of nutrients by short-day plants increases with the "day" period. Intake of minerals is probably related to the extent of photosynthesis. A. G. P.

Movement of assimilate in tomato seedlings. B. D. Bolas and D. W. Goodall (Ann. Rept. Exp. Res. Sta. Cheshunt [1936], 1937, 82—87).—Respiration of young tomato leaves is very high. Translocation of assimilate from older leaves of high photosynthetic activity to young rapidly growing leaves takes place throughout the day and night, the flow probably reaching a max. during afternoon and evening. Only a small proportion of the daily increase in dry matter of very young leaves is due to direct photosynthesis. A. G. P.

Seasonal and diurnal changes in water content of tomato seedlings. (Ann. Rept. Exp. Res. Sta. Cheshunt [1936], 1937, 92—96).—Annual variation in H_2O content (max. in spring and min. in autumn) affects all leaves similarly. Diurnal changes are small except in young leaves in summer (min. in evening and max. in early morning). Infection with mildew probably occurs most readily when leaves are fully turgid. A. G. P.

Upward transport of minerals through the phloëm of stems. F. G. Gustafson and M. Darken (Science, 1937, **85**, 482—483).—Experiments with *Sedum praealtum* and *Bryophyllum calycinum*, using activated red P as indicator, show that the activated P is transported as PO_4''' up the stem of a plant through the phloëm. L. S. T.

Wettability of the cellulose walls of the mesophyll in the leaf. D. H. Bangham and F. J. Lewis (Nature, 1937, **139**, 1107—1108).—Surfaces of the mesophyll of *Ficus elastica* have only a small adhesion to H_2O, but the outer tissues of the fine lateral veins have a much greater adhesion energy. Org. liquids such as C_6H_6, $CHCl_3$, Et_2O, and essential oils, but not H_2O, infiltrate rapidly into the mesophyll air-space system by capillarity. Transpiration does not occur from a liquid film of H_2O on the cell walls of the mesophyll. L. S. T.

Chlorosis of rice induced by iron deficiency. E. C. Tullis and E. M. Cralley (Phytopath., 1936, **26**, 111).—The general effects of Fe chlorosis are examined. Varietal differences in susceptibility were considerable. A. G. P.

Pigmentation in the root of the cotton plant. H. V. Jordan, D. R. Ergle, J. H. Hunter, and J. E. Adams (Science, 1937, **86**, 60—61).—Field experiments indicate a general correlation of this pigmentation with the physiological age of the plant, the reaction of the soil, the effect of fertilisers, and the incidence of cotton root rot. L. S. T.

Root system of sugar-cane. IV. Absorption and exudation of water and mineral substances. H. Evans (Empire J. Exp. Agric., 1937, **5**, 112—124; cf. A., 1936, 121).—The rate of development of the root system of young canes (but not in more

mature stools) is probably the limiting factor in mineral intake. In very dry conditions normal absorption practically ceases, except in the case of K which accumulates rapidly under these conditions. Analyses of exudates from cut roots are notable for their high SiO_2 content. Exudates from surface, buttress, and deep roots showed characteristic differences in composition, especially in org. matter contents. There is no evidence of a marked distinction between feeding and anchoring roots. All actively absorb nutrient material. A. G. P.

Composition of avocado fruits. A. R. C. Haas (J. Agric. Res., 1937, **54**, 669—687).—The acidity of the fruit pulp increases towards the skin, possibly because of the more easy removal of CO_2 from the better aërated tissue. By comparison with the tip halves the stem halves of fruit usually contain more sugar, Ca, S, and Cl and less dry matter, ash, K, Mn, total N, and NO_3'. Varietal differences in this respect are recorded. With advancing maturity the sugar content of the pulp diminishes and there is a decrease in % of Na in the ash and an increase in the % of inorg. P and Mn in the pulp. A notably high proportion of Cu occurs in the pulp and skin of the Anaheim variety. A. G. P.

Fruit-bud studies. III. Sultana: relations between shoot growth, chemical composition, fruit-bud formation, and yield. J. E. Thomas and C. Barnard (J. Counc. Sci. Ind. Res. Australia, 1937, **10**, 143—157).—Fruit-bud formation is closely associated with starch accumulation in annual wood but not with the N content. Accumulation of starch is related to the time of max. growth rather than to the rate of growth, whereas accumulation of N depends on the max. growth rate > on the time of growth. Fertility of canes is directly correlated with the time of max. growth, *i.e.*, with the time of inflexion of the growth curve. The current year's crop restricts shoot growth and starch accumulation. A. G. P.

Comparative efficiency of free and combined nitrogen for nutrition of the soya bean. W. W. Umbreit, F. S. Orcutt, and P. W. Wilson (J. Bact., 1936, **31**, 92—93).—Plants grown under conditions favouring excessive carbohydrate synthesis (intense sunlight, adequate CO_2 supply, drought) require artificial supplies of combined N for normal growth, or must be shaded to restrict formation of carbohydrate. Under conditions permitting optimum carbohydrate synthesis assimilation of free N_2 and subsequent growth are more rapid than in uninoculated forms supplied with NH_4NO_3. With sub-optimal synthesis of carbohydrate differences in efficiency of fixed and free N diminish. In carbohydrate-deficient plants inoculation was inferior to a supply of fixed N. A. G. P.

Diffusion of nitrogenous compounds from healthy legume nodules or roots. C. A. Ludwig and F. E. Allison (J. Bact., 1936, **31**, 93—94).—Mixed sand-cultures of inoculated legumes and non-legumes failed to show stimulated growth of the legume or the appearance in the medium of N compounds excreted from nodules. A. G. P.

Metabolism of organic acids of tobacco leaf during culture. G. W. Pucher, A. J. Wakeman, and H. B. Vickery (J. Biol. Chem., 1937, **119**, 523—534; cf. A., 1934, 710; this vol., 328).—In excised leaves exposed to light in H_2O, dil. aq. glucose, or nutrient salt solution [$(NH_4)_2SO_4$ as N source] the total acidity and the contents of $H_2C_2O_4$, malic (I) and citric acid (II) change only slightly. In the dark the (I) content diminishes greatly and the (II) content increases, the additional (II) probably being derived from (I); the $H_2C_2O_4$ and total acidity remain unchanged. W. McC.

Physiology of the metabolism of algæ. II. Substitutes for oxygen respiration of fresh and sea-water algæ. III. Distribution of flavins in marine algæ. A. Watanabe (Acta Phytochim., 1937, **9**, 235—254; 255—264).—II. Respiration of *Chlorella ellipsoidea* is increased by addition of aldehydes, polyhydric alcohols, carbohydrates, NH_2-acids, and certain carboxylic acids particularly those of the aliphatic series. In general, aldehydes, mono- and poly-hydric alcohols, and carbohydrates do not appreciably increase the respiration of the green, brown, and red sea algæ, the case of mannitol and the brown algæ being exceptional. Respiration of Chlorophyceæ and Phæophyceæ is distinctly increased by addition of NH_2-acids and fatty acids, whereby the mol. size of the latter substances appears determinative. With *Chlorella*, green and brown sea algæ max. action occurs with acids containing 8—10 C. *iso*-Acids are invariably less effective than the corresponding *n*-acids. Certain unsaturated fatty acids, OH- and CO-monocarboxylic acids distinctly increase the respiration of green and brown sea algæ whereas di- and tri-carboxylic acids have very little effect. Respiration of Rhodophyceæ is increased to some extent by NH_2-acids, most distinctly in the case of *Gracilaria confervoides*.

III. Flavins are widely distributed among red, brown, and green marine algæ, the average content of 57 species being $0{\cdot}18 \times 10^{-6}$ g. per g. (dry wt.). The highest content ($1{\cdot}10$ or $1{\cdot}07 \times 10^{-6}$) is shown by *Iridoea pulchra* and *I. laminaroides*, respectively, whilst $0{\cdot}65 \times 10^{-6}$ is present in *Heterochordaria abietina*. The flavin (I) content of brown and green is usually < that of red species. In red and brown types 57—96% of the total (I) is present as flavoprotein. The (I) is well maintained in the dried technical products. H. W.

Gaseous metabolism of pollen. I. K. Okunuki (Acta Phytochim., 1937, **9**, 267—285).—Gaseous metabolism does not occur or is limited in pollen grains enclosed in the anther but sets in vigorously under germinable conditions. Pollen remains viable in a desiccator for about six months but dies in room air after two months. In preserved pollen germinative capacity is lost before the power to respire or ferment. Fresh pollen cannot germinate in anaërobiosis but can ferment glucose, giving equiv. amounts of EtOH and CO_2. Gaseous metabolism of pollen is more rapid in agar than in liquid media. On agar in the absence of glucose (I) the gas reaction of *Camellia* pollen diminishes continuously with time whereas in presence of (I) it increases during 3—4 hr.

and then declines. With the pollen of *Lilium* species rapid diminution is observed even in presence of (I). Utilisation of sugars is in the order (I) > fructose > sucrose > galactose > maltose > lactose > xylose > arabinose. Respiration of pollen is restricted by mannose. Various salt ions restrict the respiration and more strongly inhibit the germination of pollen or growth of the pollen tubes. With different types of pollen there is a distinct parallelism between restriction of O_2 intake and growth of the tubes. With the pollen of *Lilium auratum* $Ca^{\cdot\cdot}$ encourages growth and respiration. H. W.

Phototropic response and carbon dioxide assimilation of plants in polarised light. E. S. Johnston (Smithsonian Misc. Coll., 1937, **96**, No. 3, 7 pp.).—No evidence was obtained that polarised differed from non-polarised light in the phototropism or photosynthesis of *Avena* seedlings. A. G. P.

Influence of light and carbon dioxide on photosynthesis. E. L. Smith (J. Gen. Physiol., 1937, **20**, 807—830).—An optical system producing a high intensity is described. Measurements of the rate of photosynthesis are discussed mathematically (cf. A., 1936, 1433). A complex reaction mechanism involving > one photochemical action is suggested. E. M. W.

Active principles in plant growth. F. Kögl (Naturwiss., 1937, **25**, 465—470).—A lecture summarising recent advances in knowledge of plant hormones, bios, biotin, auxin *A*, β-indolylacetic acid, etc. P. W. C.

Environmental conditions influencing the development of tomato pockets or puffs. A. C. Foster and E. C. Tatman (Science, 1937, **86**, 21—22).—A summary of the chief results obtained in a study of the effects of soil-H_2O, relative proportion of mineral nutrients, temp., and length of day period on the development of tomato pockets. L. S. T.

Galls produced by plant hormones, including a hormone extracted from *Bacterium tumefaciens*. N. A. Brown and F. E. Gardner (Phytopath., 1936, **26**, 708—713).—Gall formation in a no. of plant species by indolyl-acetic and -propionic acids necessitated preliminary wounding. In many cases a lanoline prep. of growth-substance extracted from *B. tumefaciens* by Et_2O was more active than the above acids in producing galls. A. G. P.

Effect of various hormones on the growth of plantules and development of their roots. R. Castan and P. Chouard (Compt. rend. Soc. Biol., 1937, **125**, 751—754).—Growth of the principal root of *Cucumis melo* is slightly, and that of the secondary roots considerably, decreased by insulin. Heteroauxin greatly inhibits growth of the principal root. H. G. R.

Distribution of substances acting as vegetable auxins in the organs of the guinea-pig. H. Berrier (Compt. rend. Soc. Biol., 1937, **125**, 743—745).—The organs of excretion are the richest sources. H. G. R.

Colchicine, "phytocarcinomata," and plant hormones. L. Havas (Nature, 1937, **140**, 191—192; cf. this vol., 239).—Colchicine inhibits the growth of tumours produced in tomato plants by inoculation with *B. tumefaciens*. Comparison with the inhibition produced by removal of the flowers, exclusion of light from the terminal buds, and administration of palmitic acid indicates that (I) acts through intervention of the plant hormones. L. S. T.

Xylenol method for determining nitrate-nitrogen and its use in studying the physiology of the sugar-beet.—See A., I, 475.

Micro-determination of nitrate in plant material, expecially *Beta vulgaris*, by the xylenol method. F. Werr (Z. wirts. Zuckerind., 1937, **87**, 355—374).—The technique previously described (A., I, 475) is further modified to deal with 2—50 × 10^{-6} g. of NO_3-N per sample with an accuracy of ±5%. Data for expressed sap of beet leaves are given. A. G. P.

Determination of phosphate in plant extracts. E. Michel-Durand (Bull. Soc. Chim. biol., 1937, **19**, 931—937).—The $CCl_3{\cdot}CO_2H$ extract of the material is treated with sodium molybdate, the PO_4''' complex shaken out with Et_2O, and the PO_4''' pptd. from the aq. extract after removal of the Et_2O with MgO mixture. A. L.

Ash, calcium, and phosphorus content of some common Bengali foodstuffs. H. E. C. Wilson, B. Ahmad, and D. N. Mullick (Indian J. Med. Res., 1937, **24**, 797—800).—Ca is highest in milk and milk products, and low in vegetables, except cabbage, bhindi, and spinach. Ca and P in atta and the dals are > in rice. R. N. C.

Analysis of carbohydrates of the cell wall of plants. III. Determination of methylpentoses: factors influencing the decomposition of methylfurfuraldehyde during distillation. C. R. Marshall and F. W. Norris (Biochem. J., 1937, **31**, 1053—1060).—When methylfurfuraldehyde (I) is distilled in HCl solution using the Tollens procedure, about 27% is destroyed, partly by oxidation (the yield is greater in N_2) but chiefly by the action of HCl which becomes more marked as its concn. increases. It is more satisfactory to distil in the presence of salt, which stabilises the acid concn. The yield of (I) from methylpentoses is not only affected by oxidation and [HCl] but varies with the configuration of the sugar. Rhamnose appears to decompose more readily than do pentoses. P. W. C.

Fatty acids associated with banana starch. L. Lehrman and E. A. Kabat (J. Amer. Chem. Soc., 1937, **59**, 1050—1051).—Hydrolysis of purified banana starch reveals the presence of 0·2% of combined fatty acids, including palmitic, oleic, linoleic, and linolenic acid, and phytosterol, but no glycerol. R. S. C.

Wax-like constituents of the cuticle of the cherry, *Prunus avium*, L. K. S. Markley and C. E. Sando (J. Biol. Chem., 1937, **119**, 641—645).—The light petroleum extractives (0·8% of the dried skin) include linoleic, oleic, palmitic, stearic, and acids > C_{18}, glycerol, and hydrocarbons (mainly nonacosane). The Et_2O extractives include *d*-glucosidylsitosterol and ursolic acid. F. O. H.

Seeds of *Cichorium intybus*, L. Constituents of the oil from the seeds. R. N. Misra and S. Dutt (J. Indian Chem. Soc., 1937, **14**, 141—143).—Extraction of the crushed seeds with C_6H_6 gives an oil having d_4^{32} 0·9229, n_D^{30} 1·3795, f.p. −11°, acid val. 11·2, sap. val. 193·1, Ac val. 14·8, I val. 95·6, Hehner val. 93·9, unsaponifiable matter 1·7%. Saponification gives fatty acids, m.p. 35—38°, d_4^{40} 0·8931, neutralisation val. 192·5, mean mol. wt. 291·4, I val. 104·8. By the Twitchell method the fatty acids consist of 21·7% of saturated (mainly stearic and palmitic) and 78·3% of unsaturated (mainly oleic and linoleic) acids. The unsaponifiable portion gives a phytosterol, m.p. 131—133°. D. J. B.

Sugar cane wax. I. Phytosterols. T. Mitui (J. Agric. Chem. Soc. Japan, 1937, **13**, 494—501).—C_6H_6 extraction of press-cake gave 8% of wax which contained 0·14% of stigmasterol and 0·77% of sitosterol. J. N. A.

Components of *Psoralea corylifolia*, Linn. T. R. Seshadri and C. Venkatarao (Proc. Indian Acad. Sci., 1937, **5**, A, 351—356).—From the pericarp, by extraction of the entire seeds with Et_2O, were obtained an alkali-sol. resin, volatile essential oil, and non-volatile terpenoid oil, and from the crushed kernel, by extraction with light petroleum, a mixture of psoralen and *iso*psoralen and a fixed oil from which a sterol (probably phytosterol), m.p. 126—128°, was isolated as acetate. A. Li.

Constituents of *Cratægus oxyacantha*, L. H. Dieterle and O. Dorner (Arch. Pharm., 1937, **275**, 428—437).—Cratægusic acid is shown by hydrolysis and resynthesis to be æsculin. Its extraction from the bark and berries of *C. oxyacantha*, L., is described. The berries contain phlobaphens, a saponin, and an oil, f.p. 14—15°, acid val. 32·7, sap. val. 169·1, ester val. 136·4, *d* 0·9172. The bark contains $H_2C_2O_4$ (no other org. acids), phlobaphens, and an oil, f.p. 16—17°, *d* 0·923, which yields oleic, stearic, palmitic, and myristic acid. R. S. C.

Isolation of *p*-coumaric acid from green tea.—See A., II, 377.

Proteins of Indian foodstuffs. X. *In-vitro* digestion of globulins from aconite bean (*P. aconitifolius*, Jacq.) and Bengal gram (*Cicer arietinium*, L.). K. Bhagvat (J. Indian Inst. Sci., 1937, **19**, A, 67—73; cf. A., 1936, 913).—The rate of digestion of these globulins with trypsin, as indicated by the rate of appearance of total and NH_2-N, arginine (I), tyrosine, tryptophan, and diketopiperazine rings in solution, is ≪ that of caseinogen. Peptic digestion is more rapid than tryptic. The globulins contain 15·73 and 20·22% of (I), respectively. E. C. S.

Nutritional chemistry of flowers. I. Vitamins and proteins in wistaria flowers (*Kraunhia floribunda*, Taub., var. *typica*, Mak.). K. Kondo and S. Shinano (Bull. Agric. Chem. Soc. Japan, 1937, **13**, 467—472).—Wistaria flowers contain protein conjugated with carbohydrates and colouring matter, together with vitamins-*A*, -*B*, and -*E*. J. N. A.

Saponins of Chinese drug San-ch'i, *Aralia bipinnatifida*.—See A., II, 384.

Sesquicryptol, a sesquiterpene alcohol in essential oil of Japanese Suji (*Cryptomeria japonica*, Don) leaves.—See A., II, 381.

Hydroxytriterpene acids from Somali incense.—See A., II, 382.

Constitution of the scoparoside (scoparin) of *Sarothamnus scoparius*.—See A., II, 347.

Vegetable heart poisons. Oleandrin.—See A., II, 369.

Glucosides of the oleander.—See A., II, 369.

Optically active salsoline and two new alkaloids of *Salsola Richteri*.—See A., II, 394.

Alkaloids of *Veratrum album*. I.—See A., II, 394.

Physiology of sheep tapeworm, *Moniezia expansa*. R. A. Wardle (Canad. J. Res., 1937, **15**, D, 117—126).—The longevity and H_2O and polysaccharide contents of *M. expansa* in various nutrient saline media indicate that these media are unsuitable for tapeworm cultivation *in vitro*. E. M. W.

Zones of oxidation in the living cell demonstrated by the cobalt salt method. P. Joyet-Lavergne (Compt. rend., 1937, **204**, 1588—1590).—The chondriosomes and nucleoli of the epidermal cells of different plants and certain animal cells oxidise Co salts so that the regions concerned acquire a green stain. J. L. D.

Use of buffered solutions in staining : theory and practice. R. Craig and C. Wilson (Stain Tech., 1937, **12**, 99—109).—The importance of p_H in staining with Fe hæmatoxylin, malachite-green, and eosin Y is emphasised. A method for staining in alcoholic buffer solutions is given. E. M. W.

***X*-Ray intensifying screens in structure analysis.**—See A., I, 479.

Colorimetric determination [of cholesterol] by the Liebermann–Burchard reaction.—See A., II, 360.

Determination of tyrosine in vegetable substances. Y. Raoul (Bull. Soc. Chim. biol., 1937, **19**, 846—858).—The material is extracted with EtOH and then with Et_2O, and hydrolysed with 20% aq. NaOH. Tryptophan is pptd. with $HgSO_4$ and the tyrosine determined colorimetrically after addition of aq. $NaNO_2$. A. L.

Comparative determination of nitrogen by the "Dumas" and Kjeldahl methods. I. Alquier and M. Sirot (Bull. Soc. Sci. Hyg. Aliment., 1937, **25**, 48—69).—The vals. obtained by the two methods on blood, flour, etc. differ by ≯4·5%, those with the Dumas method being slightly too high, those with the Kjeldahl slightly too low. Conditions for ensuring the greatest accuracy in the latter method are laid down. E. C. S.