

BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

JUNE, 1937.



Chemotactic reaction of leucocytes to foreign substances in tissue culture. R. CHAMBERS and C. G. GRAND (J. Cell. Comp. Physiol., 1936, 8, 1—19).

—A strongly positive chemotactic effect was shown by sucrose, maltose, lactose, fructose, glucose, glycogen, starch, agar, gum arabic, and cellulose (I), a negative effect by Na and K palmitate and oleic acid, no effect by NaCl, CaCl_2 , Tyrode solution, Ringer's solution, olive oil, stearic acid, Mg and Ca palmitate, C, quartz, washed MnO_2 , silk, or sandarac gum. In the absence of serum, starch and (I) were neutral. M. A. B.

Tension at the surface of macrophages. H. SHAPIRO and E. N. HARVEY (J. Cell. Comp. Physiol., 1936, 8, 21—30).—Determination of the centrifugal force necessary to pull oil globules through the surface shows the max. γ of about 2 dynes per cm. at 23—28° for rabbit leucocytes in Ringer-Locke solution or dil. serum. For frog leucocytes the val. was about 1.3 dynes per cm. M. A. B.

Action of some carcinogenic substances on blood-leucocytes. E. TASCHNER, M. SPRITZER, G. GOTTLIEB, and D. LAZAR (Compt. rend. Soc. Biol., 1937, 124, 957—960).—A decrease in the leucocyte count is observed in mice. H. G. R.

Oxidative resynthesis of adenosine triphosphate in leucocytes. M. N. LIUBIMOVA (Biochimia, 1937, 2, 367—382).—In rabbit leucocytes adenosine triphosphate (I) is resynthesised during respiration. There is no relation between glycolysis and resynthesis of (I). Respiration of the leucocytes is depressed by $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ and is not restored by addition of lactate. 0.01N-KCN restricts glycolysis, but does not completely stop respiration. In cells stained with neutral-red the decrease in the (I) content when "paranecrosis" begins and the increase when normal conditions are restored are observed. W. McC.

Permeability, sugar distribution, and glycolysis in erythrocytes. A. I. KOLOTILOVA and V. A. ENGELHARDT (Biochimia, 1937, 2, 387—401).—The sugar content of erythrocytes represents the resultant of the rate of penetration of sugar and the rate of glycolysis within the cells. Erythrocytes of the pig are totally impermeable to sugar, human erythrocytes are perfectly permeable, and those of other species are intermediate. In man the rate of penetration is \gg the rate of glycolysis. Hence glycolysis has little effect on the sugar content. When glycolysis is inhibited by F, $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$, or otherwise the distribution of sugar between erythrocytes and the surrounding medium eventually attains equilibrium.

Penetration of non-fermentable sugars is similar but is not affected by F'. W. McC.

Changes in the adenosine triphosphate content of pigeon erythrocytes. A. A. BAEV (Biochimia, 1937, 2, 454—478).—Anaërobic dephosphorylation and deamination of adenosine triphosphate (I) in the erythrocytes occur because of the absence of PO_4''' donator and acceptor. Part of the NH_3 and PO_4''' liberated is not derived from (I). The erythrocytes contain small variable amounts of adenylic acid which is rapidly deaminated under anaërobic, but not under aërobic, conditions. The products of anaërobic breakdown of (I) do not undergo subsequent re-amination under aërobic conditions. Partial aërobic breakdown of (I), not accompanied by glycolysis, is caused by addition of F' or $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ and to a smaller extent by deprivation of glucose. W. McC.

Mechanism of the liberation of the nucleus and behaviour of a suspension of isolated nuclei. N. YAKUSIZI (Keijo J. Med., 1936, 7, 521—582).—The liberation of the nuclei of leucocytes and nucleated erythrocytes by hæmolytic agents (e.g., saponin, digitonin) under varying conditions of inorg. salt concn. etc. and the properties of the resulting suspensions of nuclei were investigated. W. O. K.

Individual differences in the degree of hæmolysis and the factors which determine them. Y. EGAMI (Keijo J. Med., 1936, 7, 596—611).—Ease and difficulty of hæmolysis by hypo- and hyper-tonic solutions, respectively, and high vals. for depression of f.p. by the corresponding serum are (as are also the collated converse properties) associated phenomena in blood corpuscles (ox). W. O. K.

Resynthesis of adenosinetriphosphoric acid in the oxidation of α -keto- and -amino-acids in nucleated erythrocytes. V. A. SEVERIN (Biochimia, 1937, 2, 60—69).—The O_2 intake of washed pigeon erythrocytes is raised by alanine, glutamic acid, α -keto-butyric and -glutaric acid, but not by glycine, valine, leucine, phenylalanine, or $\text{CH}_2\text{Ph}\cdot\text{CO}\cdot\text{CO}_2\text{H}$. At the same time, resynthesis of adenosinetriphosphoric acid is intensified. R. T.

The erythrocyte and its relation to blood pressure. H. MCG. DOLES (Virginia Med. Monthly, 1935, 62, 489—496).—Enlargement of erythrocytes in hypertension is probably due to increased Fe possibly associated with kidney damage. During treatment of nephritis there is increase in erythrocyte count associated with decrease in cell size and in

hæmoglobin and Fe content. Plasma- and urinary Fe should be determined in hypertension.

CH. ABS. (p)

Individual differences in the permeability of the erythrocytes of rabbits. Effect of bleeding. S. L. ØRSKOV (Biochem. Z., 1937, 290, 235—240; cf. A., 1935, 1260).—The rate at which erythrocytes (rabbit) are permeated by glycerol (I) is subject to great individual variations not observed when thio-urea (II) replaces (I). With (I), but not with (II), the rate is very greatly increased by bleeding, the val. returning to normal 50—120 days after the normal hæmoglobin level is restored. Possibly the increased rate is due to the more rapid permeation of newly produced erythrocytes. The rate of permeability by (I) of erythrocytes from dogs is not increased by bleeding.

W. McC.

Hæmoglobin function during the life history of the bullfrog. F. H. MCCUTCHEON (J. Cell. Comp. Physiol., 1936, 8, 63—81).—The O_2 dissociation curve of the hæmoglobin (I) changes from a rectangular hyperbola in the tadpole to a sigmoid curve in the adult and at the same time shifts towards the right. In tadpoles "loading capacity" increased with decrease in p_H below the normal physiological range. In adult tadpoles at p_H 6.80 "loading capacity" decreased and "unloading capacity" increased; at p_H 6.47 both increased. O_2 capacity was higher in adult than in tadpole blood and was max. in frogs of intermediate size. At the max. O_2 capacity the O_2 dissociation curve of the tadpole was farthest to the right.

M. A. B.

Action of an electric current on hæmoglobin in presence of electrolytes. R. DUVAL (Compt. rend., 1937, 204, 728—730).—The behaviour of hæmoglobin in H_2O or aq. 10% KCl, KI, K_2SO_4 , or NH_4OAc in a U-tube cataphoresis apparatus is described.

F. O. H.

Denaturation of hæmoglobin. H. F. HOLDEN (Austral. J. Exp. Biol., 1937, 15, 43—48).—Hæmoglobin can be denatured in an atm. of H_2 by 0.1N-HCl, EtOH, and $o-OH-C_6H_4-CO_2Na$. Renaturation (60—95%) is effected by 0.1N-NaOH in the first case and by H_2O in the other cases.

J. N. A.

Reaction of nitric oxide with hæmoglobin and methæmoglobin. D. KEILIN and E. F. HARTREE (Nature, 1937, 139, 548).—When mixed with NO, solutions of oxyhæmoglobin reduced to hæmoglobin (I) by evacuation become red and show wide, diffuse bands at 574.5 and 536 m μ . The same result is obtained in presence of an excess of $Na_2S_2O_4$ added at different stages of the reaction. The compound NO-(I) is very stable and is only slowly oxidised by $K_3Fe(CN)_6$ to methæmoglobin (II). An acid solution of (II) turns red with NO and its absorption spectrum is replaced by bands at 568 and 531 m μ . The compound NO-(II) is obtained in presence of a large excess of $K_3Fe(CN)_6$. SO_3^{--} on combining with the NO liberates acid (II). KCN can replace NO in the compound, which is thus much less stable than NO-(I).

L. S. T.

New blood-pigment: pseudo-methæmoglobin. N. H. FAIRLEY (Nature, 1937, 139, 588).—

The plasma of severe cases of blackwater fever contains a new pigment, ψ -methæmoglobin (I), which has hitherto been mistaken for methæmoglobin (II), and from which it can be distinguished chemically and spectrographically. It is readily produced *in vitro* from plasma and hæmoglobin by incubation for 48 hr. at 37—40°. It is also formed from (II), prepared by treating laked corpuscles with $K_3Fe(CN)_6$, and plasma by a similar method. The results indicate that in any severe intravascular hæmolysis it is (I) and not (II) which is formed.

L. S. T.

Cytochrome-C. II. Synthesis from protoporphyrin. H. KATAGIRI, K. MASUDA, and T. HEMEMOTO (J. Agric. Chem. Soc. Japan, 1937, 13, 206—207; cf. this vol., 119).—Pyridine-hæmochromogen of the porphyrin-C obtained from blood hæmin has absorption bands at 550 and 521 m μ , whilst the corresponding nicotine compound has bands at 551 and 523 m μ . These hæmochromogens resemble cytochrome-C in their behaviour towards air and reducing agents.

J. N. A.

Stability of colloid osmotic pressure and of serum-protein. K. YANAGI (J. Clin. Invest., 1935, 14, 853—862).—In sera of normal protein content the pressure once developed (osmometer) remained const. for 16—18 hr. With low-protein sera, the pressure increased to a max. in 3—5 hr. and subsequently declined. Similar instability resulted from diluted (saline) normal sera. Concn. of hypoproteinæmic sera by ultrafiltration produced stable pressures.

CH. ABS. (p)

Protein-sugar, protein content, and carbohydrate index of sera and body-fluids of different animals. B. LUSTIG and T. ERNST (Naturwiss., 1937, 25, 89, and Biochem. Z., 1937, 289, 365—389).—Vals. are given for the relative amounts of carbohydrate associated with serum- and body-fluid-proteins in different organisms. They diminish as the protein content increases and with ascent of the evolutionary scale from coelenterata to mammalia. The index is the no. of g. of protein-N per g. of protein-sugar.

F. A. A.

Opossum (*Trichosurus vulpecula*). I. Blood analyses and lipin glandular constituents in normal and lactating opossums. II. Effects of splenectomy, adrenalectomy, and injections of cortical hormone. D. ANDERSON (Austral. J. Exp. Biol., 1937, 15, 17—23, 24—32).—I. Sugar (I), total P, non-protein-N (II), and lipins (III) in opossum blood, and (III) in glands are determined. Cells contain 60% as much (I), and > twice as much (II), as plasma; vals. increase with age. The liver has less cholesterol (IV) than other organs and the adrenals contain more (III), (IV), and fatty acids than other glands. During lactation the dry wt. of the adrenals increases, (II) and (III) are unchanged, but there is marked hyperglycemia.

II. Splenectomy decreases blood-(III) and -(IV), and increases -(II) and -lipin-P. Adrenalectomy increases liver-(IV). Administration of cortical hormone decreases liver-(IV) and increases lipin-P and fatty acids in liver and spleen, increases (I) and (II) in blood, and alters the distribution of (II) between cells and plasma.

J. N. A.

Blood composition in summer and winter of *Helix pomatia*. B. LUSTIG, T. ERNST, and E. REUSS (Biochem. J., 1937, 290, 95—98).—In summer the blood of the snail *H. pomatia* contains 2.4% of protein (97.7% globulin), no cholesterol, the residual N and free sugar contents are small, the protein-sugar is high, electrolytes consist chiefly of Na and Cl, the K and Mg vals. are the same, and the Ca val. > and P_2O_5 val. < in mammals. In winter sleep the K is unchanged, the Na, Cl, Ca, albumin, residual N, Mg, and inorg. P are increased by 15.3, 40.7, 57.86, 68.3, 104, 158, and 12.2%, respectively. The large increase in Mg is probably the cause of winter sleep.

P. W. C.

Normal level of phosphorus-containing blood constituents in amphibians and reptiles. R. SALGUES (Compt. rend., 1937, 204, 524—525).—Analyses of the total P and various P fractions in the blood of some amphibians and reptiles are recorded.

W. O. K.

Histamine in cotton dust and in the blood of cotton workers. E. HAWORTH and A. D. MACDONALD (J. Hyg., 1937, 37, 234—242).—Histamine (as picrate and hydrochloride) has been isolated from cotton dust. The histamine content of the blood of card-room workers was > that of students and of elderly chronic bronchitis patients.

W. L. D.

Presence of histamine in normal human blood. G. UNGAR, J. L. PARROT, and A. POCOULÉ (Compt. rend. Soc. Biol., 1937, 124, 1202—1203).—The blood contains approx. 30×10^{-6} g. per litre, representing only a small proportion of the glyoxalines.

H. G. R.

Determination of carotene in small amounts of blood. W. HALDEN and G. K. UNGER (Mikrochem., Molisch Festschr., 1936, 194—200).—The serum from 1—1.5 c.c. of blood is coagulated with an equal vol. of EtOH. The liquid is extracted with two vols. of light petroleum, and carotene in the extract is determined photometrically by filtered light. The petroleum solution is stable.

J. S. A.

Determination of cholesterol. W. M. SPERRY (J. Biol. Chem., 1937, 118, 377—389).—The micro-method of Schoenheimer and Sperry (A., 1934, 1240) with minor variations in procedure gives vals. for free cholesterol in blood-serum not differing significantly from those obtained by the Windaus macro-method.

R. M. M. O.

Action of carbon monoxide on oxysterol in blood. I. T. H. TANG and Y. H. CHAO (J. Chinese Chem. Soc., 1937, 5, 6—7).—Chemical and spectroscopic examination of the dried residues from the EtOH-ligroin extracts of normal ox-blood and blood poisoned by CO shows that the oxysterol of normal blood is different from the cholesterol product in CO-poisoned blood.

J. W. B.

Blood-sugar and sugar storage in the de-pancreatised dog. A. BAISSSET, L. BUGNARD, J. LANSAC, and L. SOULA (Sang, 1936, No. 5, 537—561).—I. Excess of glucose (I) introduced into the circulation is removed from the blood whether it contains insulin (II) or not. The only difference

between the normal and depancreatised dog is that the initial level in the latter is three times that in the former.

II. In the depancreatised dog, following intra-venous injection of (I), arterial blood-sugar is first >, then equal to, and finally < that of venous blood. The sugar always returns to the habitual level.

III. Injection of (II) into a depancreatised dog does not significantly affect the reaction to intra-venously injected (I). The final blood-sugar level is always equal to, or slightly <, the original. (II) affects only this level.

NUTR. ABS. (m)

Effect of experimental peripancreatic sympathectomy on the basal blood-sugar. M. SENDRAIL and M. CAHUZAC (Compt. rend. Soc. Biol., 1937, 124, 1088—1090).—In the post-operative period, hyper- then hypo-glycæmia were observed; this was followed by prolonged hyperglycæmia, with a max. after about 20 days, after which prolonged hypoglycæmia lasting several months occurred.

H. G. R.

Effect of castration and low external temperature on blood-sugar in cockerels. F. KUBESSA (Arch. wiss. pr. Tierheilk., 1936, 71, 76—82).—In cockerels 4—5 months old, castration produced a decrease averaging 34% in the sugar content of the blood, the effect persisting for < 3 weeks. The body temp. was scarcely affected. The increase in blood-sugar produced by exposure to a temp. of -1° to -4° for 4 hr. averaged 4% in non-castrated and 8% in castrated cockerels.

NUTR. ABS. (m)

Hyperglycæmia caused by bleeding. F. KINDL (Arch. wiss. pr. Tierheilk., 1936, 71, 83—88).—Hyperglycæmia in dogs is detectable after 25%, and distinct after 33%, of the total blood is withdrawn. The extra sugar is probably transferred from the glycogen depôts to the blood. The H_2O content also increases.

NUTR. ABS. (m)

Effect of acetylcholine on the blood-sugar of the adrenalectomised dog. F. JOURDAN and J. VIAL (Compt. rend. Soc. Biol., 1937, 124, 1111—1112).—The blood-sugar fluctuates on either side of the initial val.

H. G. R.

Effect of inorganic salts on blood-sugar of rabbits. T. OGAWA (Mitt. med. Akad. Kioto, 1936, 18, 177—204).—In rabbits the blood-sugar was increased by the injection of Mg salts and of PO_4''' ; Na and K salts had little effect. The amount of combined sugar in the blood did not change appreciably on injection of any one of these salts. $MgCl_2$ was more toxic than $MgSO_4$.

NUTR. ABS. (m)

Comparative determinations of urea in the blood and in the pericardiac fluid of *Rhombus maeoticus* and *Trygon pastinaca*. P. JITABU (Ann. Sci. Univ. Jassy, 1935, 20, 477—479).—The urea concn. (determined by NaOBr) is the same in blood and in pericardiac fluid. Vals. were, *T. pastinaca* 2.05 g. and *R. maeoticus* 0.025 g. per 100 c.c.

J. W. B.

Variations in blood-urea and -chloride during obstruction of the small intestine in the dog. O. GILSON (Compt. rend. Soc. Biol., 1937, 124, 1254—

1256).—Urea is increased after the operation and Cl⁻ decreases shortly before the death of the animal.

H. G. R.

Ammonia formation in shed blood and a characteristic deaminase of the blood stream. E. J. CONWAY and R. COOKE (*Nature*, 1937, 139, 627).—In the shed blood of man, rabbit, and bird, the formation of NH₃ occurs in a succession of well-marked stages. In rabbit's blood, the optimum p_H is 8.7 and NH₃ formation ceases at a concn. of 5% NaCl. The plasma and red corpuscles of the blood of man, fowl, frog, and lug worm contain a powerful enzyme which liberates NH₃ from adenosine at room temp. The nucleated corpuscle of the fowl can deaminate adenine, guanine, and cytosine readily at room temp.

L. S. T.

Determination of chloride in blood. K. LANG (*Biochem. Z.*, 1937, 290, 289—290).—The accuracy of Votoček's method (A., 1918, ii, 272) is increased by using diphenylcarbazone (I) or a substituted (I) as indicator in place of Na nitroprusside. W. McC.

Chloride and total osmotic pressure in the blood of marine teleosts. A. L. GRAFFLIN (*Biol. Bull.*, 1935, 69, 245—258).—In fish examined there was no correlation between plasma-Cl and the f.p. depression of whole blood. CH. ABS. (p)

Determination of serum-calcium. C. W. EDMUNDS (*J. Amer. Pharm. Assoc.*, 1937, 26, 259).—Ca is pptd. from the serum (2 c.c.) by (NH₄)₂C₂O₄ and the ppt. is washed with dil. aq. NH₃, dissolved in N-H₂SO₄, and titrated with 0.01N-KMnO₄, the determination being performed in a 15-c.c. centrifuge tube.

F. O. H.

Determination of serum-calcium by titration with ceric sulphate. E. KATZMAN and M. JACOBI (*J. Biol. Chem.*, 1937, 118, 539—544).—0.2 mg. of Ca as CaC₂O₄ can be determined by titration with standard Ce(SO₄)₂, with ICl as catalyst and *o*-phenanthroline as indicator. The % deviation of a single determination from the mean is 0.4. J. N. A.

Content of water in the blood of 1069 normal adult men. K. KURODA, T. RYÔ, and R. EBINA (*Keijo J. Med.*, 1936, 7, 612—643).—A statistical study of observations on Japanese soldiers.

W. O. K.

Hibernation. O. POLIMANTI (*Protoplasma*, 1936, 25, 461—464).—In *Bufo* and *Rana* the average p_H of the blood, organs, and tissues was 7.45 during activity, 7.6 during dormancy, and 7.9 during awakening. M. A. B.

Coefficient of retention of Congo-red in rabbit's plasma (method of Adler and Reimann). P. CARNOT, R. CACHERA, and T. MELIK-OGANDJANOFF (*Compt. rend. Soc. Biol.*, 1937, 124, 938—941).—The mean coeff. of retention is 56.2%. H. G. R.

Convenient tonometer for the equilibration of blood. L. IRVING and E. C. BLACK (*J. Biol. Chem.*, 1937, 118, 337—340).—The instrument is described. By equilibrating at a temp. above that of filling the tonometer an excess of pressure is developed which is used for forcing the liquid into the pipette.

R. M. M. O.

Microcrystallographic identification of blood spots *in situ*. A. RAITZIN (*Rev. asoc. med. argentina*, 1935, 49, 1115—1122).—The method employs the Leitz ultrapak and the formation of cryst. hæmin hydrochloride. CH. ABS. (e)

Effect of light on the decomposition and the detection of blood in connexion with forensic examinations. K. J. HOMMES (*Pharm. Weekblad*, 1937, 74, 396—420).—Blood stains were exposed to direct and diffuse sunlight on various substrates, and submitted to detection tests. The guaiacol test failed on Zn and Sn after a short exposure to direct sunlight and on silk after a moderate exposure. Fe and Cu gave a positive test in the absence of blood. The hæmochromogen and hæmin crystal tests became indefinite on silk and cotton after a short exposure to direct sunlight and on filter-paper after a longer exposure. Similar results were obtained in diffuse light, and in the dark with exposures of >1 year. Excellent crystals were obtained on wool. Blood soon loses its solubility in H₂O on Zn, Cu, Ag, painted wood, and silk. The substrate has a marked effect on the changes occurring in blood stains on ageing; thus stains on wool are affected < those on other fabrics. Blood is quickly converted into methæmoglobin and more slowly into hæmochromogen and finally hæmatin. Human blood and pigs' blood are similar, both being decomposed most rapidly by light of λ 480—545 m μ and least by infra-red light (>580 m μ). Stains are best photographed by infra-red rays and a study has been made of the absorption spectrum of oxyhæmoglobin over the range 635—1335 m μ . S. C.

Gelation of whole blood. W. KOPACZEWSKI and R. PAILLE (*Compt. rend.*, 1937, 204, 726—728).—Whole blood (horse; in vessels coated with paraffin wax) slowly gels at 37° in presence of <60% (>48 hr.) or 0.125—2.0% (5—180 min.) of lactic acid; intermediate concns. cause immediate gel formation.

F. O. H.

Blood coagulation. V. Coagulation by proteolytic enzymes. H. EAGLE and T. N. HARRIS (*J. Gen. Physiol.*, 1937, 20, 543—560).—Both crude and cryst. trypsin (I) may cause the coagulation of the blood or plasma of men, dogs, rabbits, guinea-pigs, and horses. Coagulation occurs only within a narrow optimum zone of (I) concn. (I) does not coagulate fibrinogen (II), but reacts with plasma pro-thrombin (III) to form thrombin (IV). It is suggested that the system Ca + platelets contains a proteolytic enzyme with a sp. affinity for (III). Papain also coagulates blood, not by activation of (III) but by direct action on (II) to form a fibrillar gel resembling fibrin. If this clot is fibrin, (IV) may also be a proteolytic enzyme with a sp. action on (II). E. A. H. R.

Fibrinolysis. VI. Relation of thrombolysin and thromboligin to blood coagulation. M. ROSENMAN (*Biochem. Z.*, 1937, 290, 213—224; cf. A., 1936, 1556).—Thromboligin (I) slightly stimulates the coagulation but the effect is not \propto the (I) concn. Heparin is less effective as an inhibitor of fibrinolysis than is (I). Thrombolysin (II) inhibits coagulation even in presence of added thrombin or thrombokinase, the effect running parallel to the

fibrinolytic effect and increasing with increase in time of action. Other factors involved in coagulation have no appreciable effect on fibrinolysis; they cannot be replaced by (I) or (II). W. McC.

Synthetic immunochemistry.—See A., II, 268.

Production of antibodies *in vitro*. R. C. PARKER (Science, 1937, 85, 292—294).—Positive results were obtained with rabbit spleens when the antigen was allowed to remain in the animal for < two or three days, and negative when this period was shortened. L. S. T.

Formation of normal antibodies. Different grades of isoagglutinins with uniovular triplets. F. OTTENSOOSER and W. TOBLER (Z. Immunitäts., 1937, 90, 65—70).—Differences in isoagglutinin titre occur in young uniovular triplets. C. R. S.

Action of heat on the anti-complementary power of human serum. L. NATTAN-LARRIER, L. GRIMARD, and J. DUFOUR (Compt. rend. Soc. Biol., 1937, 124, 1144—1146).—Human serum, like rabbit- and dog-serum, with a low anti-complementary power shows an increase on heating to 56—62°. H. G. R.

Stabiliser for Schick [diphtheria] toxin. A. T. GLENNY and M. F. STEVENS (Brit. Med. J., 1937, 709—710).—Human serum is a suitable stabiliser to replace the customary peptone, which causes allergic reactions. A. G. P.

Antitoxin stabilised by formaldehyde and isolated from antidiphtheria serum by sodium β -naphthylamine-4 : 6 : 8-trisulphonate. H. GOLDIE (Compt. rend. Soc. Biol., 1937, 124, 1215—1218).—80% of the antitoxic power can be recovered by this process, the active fraction being free from serum-albumin and stable to heat at 70°.

H. G. R.

Toxins of dysenteric bacteria. Toxic principles of the bacillus of Flexner. A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 124, 1078—1081).—The *R* and *S* forms of Flexner's bacillus produce neither endotoxin nor exotoxin, whilst the *S* form produces only enterotropic endotoxin; the corresponding forms of Shiga's bacillus produce neurotropic exotoxin (I) and (I) and enterotropic endotoxin, respectively. H. G. R.

Protective antitoxic power of the sera obtained from animals injected with sugar-lipin endotoxins. A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 124, 1092—1094).—The specificity of the anti-endotoxin serum is similar to that shown in the somatic agglutination of the bacteria and in the pptn. of the sugar-lipin endotoxin. H. G. R.

Method for rapid and intensive production of tetanus antitoxin. G. RAMON, E. LEMÉTAYER, and A. MUSTAFA (Compt. rend. Soc. Biol., 1937, 124, 895—898). H. G. R.

Tetanus toxoid. III. Antitoxic response in guinea-pigs immunised with tetanus alum-precipitated toxoid followed by tetanus spores. F. G. JONES and W. A. JAMIESON (J. Bact., 1936, 32, 33—40).—Injection of the toxoid gives protection (within 2 months) against massive doses of tetanus

spores. These doses do not accelerate antitoxin production in animals previously immunised with the toxoid. A. G. P.

Identification of the hæmagglutinin of the jack bean with concanavalin-A. J. B. SUMNER and S. F. HOWELL (J. Bact., 1936, 32, 227—237).—The prep. and properties of concanavalin-A (I) are discussed and its identity with the hæmagglutinin is established. The ppt. formed by (I) with glycogen (II) contains 44—79% of (I) according to the relative proportions present. Agglutination is regarded as a reaction between (I) and the stromata (possibly glyco-protein constituents) of erythrocytes to produce a hydrophobic colloid. The charge on the colloid is neutralised by salts, resulting in the clumping of the formed elements (cf. A., 1936, 768). A. G. P.

Extraction of holosido-haptens of the tubercle bacillus and their chemical properties. C. IONESCU-MIHAIESTI, A. DAMBOVICEANU, and C. LEONIDA-IOAN (Compt. rend. Soc. Biol., 1937, 124, 973—976).—The $\text{CCl}_3\text{-CO}_2\text{H}$ extract of the culture medium after prolonged dialysis is rich in, whilst that of the bacilli contains little, polyholosides.

H. G. R.

Specificity of the acid-soluble holosido-haptens of the tubercle bacillus. C. IONESCU-MIHAIESTI, C. LEONIDA-IOAN, and A. DAMBOVICEANU (Compt. rend. Soc. Biol., 1937, 124, 976—978).—The haptens prepared by $\text{CCl}_3\text{-CO}_2\text{H}$ extraction show no complete antigenic power *in vivo*, but the reactions on subcutaneous administration to tubercular subjects are sp. for the type of organism used. H. G. R.

Photometric and chemical investigation of blood groups. J. GRÓH, L. SZÉLYES, and M. WELTNER [with P. BALINT, G. CSERMÁK, J. KOVÁCS, and J. SIMON] (Biochem. Z., 1937, 290, 24—38).—Well-defined differences exist between the absorption spectra of serum-globulins (I) of blood groups *A* and *B*, the absorption max. increasing considerably in alkaline solution with (I)-*A* but not with (I)-*B*. The (I)-fractions of blood group *O* differ with sex. With immunised sheep the (I) of anti-*A*-immune sera belong to type *A* (increased absorption in alkaline solution), those of anti-*B*-sera to type *B*. No difference in NH_2 -acid content could be detected in the (I) and albumins of different blood groups and the spectroscopic difference is probably due to isomerism in the protein. P. W. C.

Mineral composition of muscles of marine animals. K. BIALASZCZEWICZ and C. KUPFER (Acta Biol. exp., 1935, 9, 228—235).—There is no significant difference between the K, Na, Mg, and Ca contents of the ash of muscles of certain marine and fresh- H_2O animals. NUTR. ABS. (m)

Zinc content of muscles of various animals. P. V. SIMAKOV (Biochimia, 1936, 1, 685—691).—The Zn content, in mg. per 100 g. of dry substance, is : earthworm 28.46, mollusc foot 26.5, mantle 105.2, frog 8.6, fish 3.3—4.2, chicken (red) 14.1, (white) 2.9, human pectoral muscle 11.9. R. T.

Biochemistry of the placenta. Y. FURUHASHI (Japan. J. Med. Sci., 1937, II, 3, 227—237).—Data for the content of Na^+ , K^+ , Mg^{++} , Ca^{++} , Cl^- , S, and P

at various stages of development of the placenta (rabbit) are tabulated. Retention of blood-Ca, but not of -Cl', occurs. F. O. H.

Distribution of calcium and magnesium in organs and tissues after administration of bile acids. M. IWADÔ (Arb. med. Fak. Okayama, 1936, 5, 85—90).—Subcutaneous injection of Na cholate appears to increase the content of Ca in the brain, heart, liver, kidney, and muscles of rabbits but individual variations are very great. The Mg contents are tabulated. NUTR. ABS. (m)

Nature of union of sodium and potassium in the grey matter of the brain. L. M. GEORGIEVSKAJA (J. Physiol. U.S.S.R., 1935, 19, 571—574).—Na and K probably occur in brain in salt-like combinations. CH. ABS. (p)

Total ash of sheep's bones as an index of calcification. S. W. JOSLAND (New Zealand J. Sci. Tech., 1937, 18, 665—668).—The ash content of the head of the femur and of the proximal epiphysis of the humerus is a criterion of calcification in sheep. Calcification is complete in lambs 4—6 months old. A. G. P.

Structure of bones. V. CAGLIOTI (Atti V Congr. Naz. Chim., 1936, 1, 320—330).—X-Ray measurements of ox bones show that the inorg. part has the approx. composition $3\text{Ca}_3(\text{PO}_4)_2 \cdot \text{CaCO}_3 \cdot x\text{H}_2\text{O}$, with the hexagonal structure of hydroxyapatite, a 9.2, c 6.9 Å., the c axis being oriented parallel to the length of the bone. The org. part consists of polypeptide chains, supported and stretched by the inorg. crystallites. On decalcification the residual org. portion gives the X-ray pattern of stretched collagen. O. J. W.

Altmann-Gersh and freezing-drying method. II. Mechanism of secretion of hydrochloric acid in the gastric mucosa. N. L. HOERR (Anat. Rec., 1936, 65, 417—435).—In the mucosa, the parietal cells are alkaline but the contents of the crypts are acid. The acidity increases up the lumen, being most marked at the level of the neck cells. The secretion of the parietal cells is a protein combined with HCl, which is set free by hydrolysis in the lumen. NUTR. ABS. (m)

Surface membranes of muscle fibres. W. L. FRANCIS (Proc. Roy. Soc., 1937, B, 122, 140—154).—The p.d. observed when solutions approximating in composition to the interior of the muscle fibres are applied to the outside of the muscle (frog sartorius) show that a p.d., amounting to 10—20 mv., exists across the inner and outer surfaces of the membrane of the muscle fibres. Differences in $[\text{K}^+]$ are largely, but not wholly, responsible for this. F. A. A.

Redox polarity of the amphibian egg and its relationship to the bioelectric polarity of the egg. W. A. DORFMAN (Protoplasma, 1936, 25, 427—434).—The unfertilised egg shows a polar distribution of loci having different aerobic reduction potentials and different p_{H} vals. The reduction potentials are more negative where the p_{H} is lower, although the r_{H} vals. are practically the same at both poles. M. A. B.

Amphibian organisation centre. V. Distribution and nature of glycogen in the amphibian

embryo. N. G. HEATLEY and P. E. LINDAHL. VI. Inductions by the evocator-glycogen complex in intact embryos and in ectoderm removed from the individuation field. N. G. HEATLEY, C. H. WADDINGTON, and J. NEEDHAM (Proc. Roy. Soc., 1937, B, 122, 395—402, 403—412).—V. Total glycogen (I), lyo-glycogen (II), and desmo-glycogen (III) and determined in the amphibian embryo around the period of gastrulation. Before gastrulation (I) concn. is highest at the animal and lowest at the vegetal pole. During gastrulation total (I) decreases slightly throughout the embryo, but markedly in the material invaginating through the dorsal lip of the blastopore. (III) does not decrease in one region more than in another and is therefore not identical with the fraction of (I) to which the evocator is attached.

VI. Both (II) and (III) preps. produce neural inductions in the amphibian embryo. The distinction between evocation and individuation has been studied by implanting evocator into isolated pieces of competent ectoderm. E. A. H. R.

Glutathione in [pathologically] altered liver. L. BINET, G. WELLER, and H. GOUDARD (Compt. rend. Soc. Biol., 1937, 124, 1141—1143).—Glutathione is reduced by ligation of the bile duct, toxic hepatitis (CHCl_3 , EtOH, and As), and fatty degeneration. H. G. R.

Free and combined acetylcholine in the brain. E. CORTEGGIANI (Compt. rend. Soc. Biol., 1937, 124, 1197—1198).—If sheep's brain is heated to 70°, a three-fold increase in the acetylcholine content, due to decomp. of a complex, is observed. This increase is similar to that observed with $\text{CCl}_3 \cdot \text{CO}_2\text{H}$ or COMe_2 treatment. H. G. R.

Content of phosphorus compounds in the brain of animals. N. V. BOLDIREVA (Biochimia, 1937, 2, 216—229).—The lipin and total P contents of the invertebrate brain are < those of the vertebrate. The nerve centres of snails and the brain of the tortoise contain only minute proportions of inorg. P and phosphagen (I) but the proportions of these forms of P in the nerve centres of the cockroach are > in those of some vertebrates. The protein-P contents of vertebrate and invertebrate brains are similar but that of birds is low. Male brains contain more inorg. P and (I) and less lipin and total P than do female brains. W. McC.

Histological studies on lipins. I. Osmic acid as a microchemical reagent with special reference to lipins. II. Cytological analysis of the liposomes in the adrenal cortex of the guinea-pig. N. L. HOERR (Anat. Rec., 1936, 66, 149—171, 317—342).—I. Reduction of OsO_4 by lipins (I) does not necessarily occur when frozen sections or embedded material is used, although the pure (I) may cause reduction. Reduction is max. with oleic acid or olein mixtures, the best reaction with tissues being obtained after fixation in CH_2O -Zenker or Regnaud's fluid and mordanting with $\text{K}_2\text{Cr}_2\text{O}_7$. OsO_4 is also reduced by tissue reducing agents other than (I); it oxidises (I) to products insol. in (I) solvents, but prolonged treatment restores the solubility.

II. The morphological evidence does not sub-

stantiate any of the theories on the function of cortical (I). R. N. C.

Effect of diet on the composition of feathers. Cholesterol content. R. SALGUES (Compt. rend. Soc. Biol., 1937, 124, 923—925).—The cholesterol content is greatest in the coloured plumage and decreases with the age of the bird. H. G. R.

Marine products. V. Stigmasterol in molluscs. W. BERGMANN (J. Biol. Chem., 1937, 118, 499—501; cf. A., 1934, 404).—In addition to oyster-sterol (I), the oyster, *Ostrea virginica*, contains small amounts of stigmasterol (II), the amount of which undergoes seasonal variation. (I) differs from (II) only in the position of the double linking, for it does not give $\text{CHEtPr}^\beta\text{-CHO}$ or a similar product on treatment with O_3 . J. N. A.

Sterols of the starfish.—See A., II, 148.

Chitin and cellulose.—See A., II, 233.

Isolation of cyclopeptides from the proteins of the mollusc *Pecten islandicus*. V. S. SADIKOV and R. J. KRISTALLINSKAJA (Biochimia, 1937, 2, 146—150).—Extraction of the products of hydrolysis of the proteins for 10 min. (4% H_2SO_4 at 220—225°) with Et_2O and CHCl_3 yields cycloisovalylisovalyl-leucine. W. McC.

Composition of the muscle of marine animals. V. Protein of the muscle of *Octopus vulgaris*, Lam. VI. Nitrogenous extractives of the muscle of *Palinurus vulgaris*, Latr. A. CARTENI and A. MORELLI (Quad. Nutrizione, 1936, 3, 225—226, 227—228).—V. 100 g. of the protein of the muscle of *O. vulgaris* contain: total N 15.96, amide-1.17, humin-0.38, arginine-2.55, histidine-0.26, cystine-0.38, lysine-2.27, NH_2 -N of the filtrate 8.77, and non- NH_2 -N of the filtrate 0.10 g.

VI. 100 g. of the fresh tissue of *P. vulgaris* contain: total extractive N 1.0375, NH_3 -7.27, purine-8.34, albumin-4.73, creatine- and creatinine- nil, N of other bases 44.66, NH_2 -acid-18.49, polypeptide-3.07, urea-N 12.70, undetermined N 0.74 g.

NUTR. ABS. (m)

Isolation of amino-acids, peptides, and cyclopeptides from protein hydrolysates. V. S. SADIKOV (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 313—315).—In order to avoid further decomp., protein hydrolysates containing large amounts of cyclic product etc. are separated thus: the H_2SO_4 is neutralised by $\text{Ca}(\text{OH})_2$, the CaSO_4 paste is dehydrated with EtOH and calcined gypsum (I), and extracted with Et_2O , CHCl_3 , and EtOAc (extract cyclopeptides), then with MeOH (removes Ba salts of many NH_2 -acids) and H_2O (extracts Ca salts of various NH_2 -acids); the residue is digested with H_2SO_4 and the extract neutralised with CuCO_3 and evaporated; this residue is dehydrated by EtOH and (I) and extracted with MeOH and COMe_2 (to remove various Cu salts and primary decomp. products); a final extraction with H_2O or dil. AcOH may be needed. Other salts may also be used. For hydrolysates containing mainly NH_2 -acids: the CaSO_4 paste is heated in dil. acid with an excess of urea or KCNO , the uramino-acids thus giving hydantoins; the H_2SO_4 is then neutralised with $\text{Ca}(\text{OH})_2$ and

evaporated; the residue, dried at 50° is dehydrated with EtOH ; the EtOH extract is dried by (I) and evaporated, the residue thus obtained being extracted with Et_2O (removes cyclopeptides), CHCl_3 , EtOAc , MeOH , and COMe_2 (to remove cyclic compounds and hydantoins); the CaSO_4 powder is boiled with C_6H_6 , BuOH , 1% $\text{C}_5\text{H}_5\text{N}$ - or NaOH-EtOH , and, if necessary, H_2O , and aq. acid, alkali, or NH_3 . Hydantoins are reconverted into NH_2 -acids by MgO . R. S. C.

Dissociation of ovalbumin in urea solvent. J. W. WILLIAMS and C. C. WATSON (Nature, 1937, 139, 506—507).—Sedimentation diagrams of ovalbumin (I) in H_2O buffered at p_H 6.0 and in 50% aq. urea indicate that in the latter case (I) is dissociated into a mol. ($S_{20} = 2.5 \times 10^{-13}$ cm. per sec. per dyne) of approx. half the mol. wt. found in H_2O . The dissociation appears to be reversible. L. S. T.

Chemical structure of wool. I. Purification of keratin. E. D. STACHEEVA-KAVERZNEVA and N. I. GAVRILOVA (Biochimia, 1937, 2, 19—27).—Pancreatin-enterokinase digestion of wool separates it into digestible pericellular substance and undigested cells, containing respectively S 1.65—2.25 and 3.05, and N 16.3 and 14%. The N content of the HCl hydrolysates of the two fractions is distributed as follows: NH_2 -groups 17.1 and 9.1, arginine 20.4 and 9.7, cystine 3.94 and 2.85, histidine 4.36 and 1.02, lysine 6.6 and 3.6, (NH_2)-acids 52.7 and 69.4, and (NH_2)-acids 48.5 and 38.9%. The ratio cystine-S/total S falls from 97.2% in the wool to 66.7% in the residue, pointing to transformation, possibly oxidative, of cystine during digestion. R. T.

Constitution of the keratin molecule. J. B. SPEAKMAN and F. TOWNEND (Nature, 1937, 139, 411—412).—The glutamic and aspartic acid contents of Cotswold wool and seagull quill support the "salt-linkage" theory developed to account for the elastic properties of wool fibres in solutions of varying acidity. L. S. T.

Racemisation curves of proteins of the muscles of certain invertebrates. I. LEONTEEV and K. MARKOVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 441—443).—Proteins were extracted by 0.5N- NaOH from the muscles of *Potamobius fluviatilis*, L., *Cucumaria frondosa*, Gunn., and *Pecten islandicus*, Müll. Their racemisation curves and chemical and physical characteristics are substantially the same. P. W. C.

Isolation of muscle nuclei. G. CROSSMON (Science, 1937, 85, 250).—A method for the isolation of the nuclei of smooth, striated, and cardiac muscle is described. L. S. T.

Bleaching of visual purple in solution. G. WALD (Nature, 1937, 139, 587—588).—Curves of the changes in the absorption spectrum of a solution of visual purple after exposure to light and then after keeping show the generally-accepted view, that the orange colour which is formed on exposure to light is due to a mixture of unbleached visual purple and final yellow product, to be incorrect. The orange colour is a new pigment that fades to yellow retinene in darkness. L. S. T.

Carotenoid pigments in the eyes and "liver" organs of invertebrates. E. LÖNNBERG (Ark. Zool., 1935, 28, A, No. 4, 14 pp.; No. 6, 4 pp.).—The eyes of birds belonging to the groups *Lari*, *Gressores*, *Limicolæ*, *Galli*, *Accipiteres*, *Passeres*, *Anseres*, *Striges*, and *Alectorides* and of fishes contain xanthophyll (I) or a carotenoid closely resembling it. Possibly (I) is related to the visual purple, its concn. being highest where great sensitivity to light is indispensable. The liver organs of molluscs and crustacea and the hepatic diverticula of sea stars contain a carotenoid similar to or identical with (I).

NUTR. ABS. (m)

Preparation of pure cytochrome C from heart muscle and some of its properties. D. KELLIN and E. F. HARTREE (Proc. Roy. Soc., 1937, B, 122, 298—308).—Cytochrome C (I) is extracted from finely minced heart muscle with $\text{CCl}_3\text{CO}_2\text{H}$ and the extract fractionally pptd. with $(\text{NH}_4)_2\text{SO}_4$. Pure (I) so prepared contains 0.34% Fe and has a mol. wt. of 16,500. (I) reacts with O_2 and CO only at $p_{\text{H}} > 12$. Reduced and oxidised (I) are Fe^{II} and Fe^{III} compounds. A reversible change in the absorption spectrum of oxidised (I) occurs on heating. (I) does not combine with CN' , S'' , F' , azide, or peroxides, but oxidised (I) forms a reversible compound with NO. Some of the NH_2 -acids in (I) are determined.

E. A. H. R.

Colour reaction and iodometry of oxidisable [plant and animal] substances. I. M. KONISHI (Okayama-Ig. Zasshi, 1935, 47, 1043—1057).—The colour reaction and iodometry of aq. extracts and expressed juice of plant and animal tissues are, in general, parallel but the intensity of reaction differs in different tissues. Oxidisable substances are converted into EtOH , COMe_2 , and CN compounds but not into Et_2O : they are precipitable by neutral $\text{Pb}(\text{OAc})_2$ or phosphotungstic acid, labile toward sunlight and H_2O_2 , absorbable by C but not by clay, and diffusible through membranes. The glutathione (I) content of plant tissues is < that of animal tissues. The I consumption of (I) is < that of (I)-containing oxidisable substances.

CH. ABS. (p)

Porphyria. I. Fox-squirrel, *Sciurus niger*. W. J. TURNER (J. Biol. Chem., 1937, 118, 519—530).—Current knowledge of porphyrias is reviewed. *S. niger* has a physiological porphyria extending into adult life, and uroporphyrin I (I) was extracted from the bones. The urine contained a small amount of coproporphyrin (II) and a metal complex, apparently of (I). (II) and protoporphyrin were present in the faeces.

J. N. A.

Nature of the substance(s) producing pain in contracting skeletal muscle: bearing on angina pectoris and claudication. L. N. KATZ, E. LINDNER, and H. LANDT (J. Clin. Invest., 1935, 14, 807—821).—The pain-producing substance is a product of muscle metabolism, is non-volatile and acidic; it diffuses into and out of the blood stream, may be transported from other body regions, and loses activity during training, possibly by lowering the buffer action of the muscle.

CH. ABS. (p)

Heparin: a mucoitinpolysulphuric acid. E. JORPES and S. BERGSTRÖM (J. Biol. Chem., 1937,

118, 447—457).—Some experiments on the acid hydrolysis, brucine fractionation, Ac and hexuronic acid contents of heparin (I) are described. (I) is not a definite chemical compound but a mucoitin polysulphuric ester containing at least a trisulphuric ester mixed with di- and mono-esters. The latter can be separated from the former as sol. brucine salts. The anticoagulating power of (I) must be due to its very strong ionic charge in combination with its mol. size.

P. W. C.

State of activity of callicrein of the gastric glands and of the external secretion in dogs. E. WERLE (Biochem. Z., 1937, 290, 129—134).—Callicrein (I) exists in the pancreas for the most part in an active form and a method avoiding autolytic processes is described which permits the separation of inactive (I). (I) is activated by the action of a thermolabile agent present in the intestinal mucosa. Inactive (I) is probably not present in the salivary glands.

P. W. C.

Bee poison. III. Division into two components. G. HAHN and H. LEDITSCHKE (Ber., 1937, 70, [B], 681—684; cf. this vol., 9, 57).—Dialysis of the portion of bee poison sol. in 60% EtOH and largely free from inactive ballast permits separation into a dialysable material (I) which produces cramp and a non-dialysable portion (II) which is toxic without causing cramp. (I) is inactivated by heating at 90—100° for 2 hr. at p_{H} 4 or 12.6, whereas (II) remains unaffected.

H. W.

Action of lachesis venom. G. ESCOBAR (Semana méd., 1935, II, 1479—1484).—The venom is a greenish opalescent, acid liquid having d 1.03. It is stable and of low toxicity taken orally. It is inactivated at 65°, and contains protein, fat, Cl' , PO_4''' , Ca, NH_4 , and Mg. Its activity in solution is destroyed by light but the dried product is unaffected.

CH. ABS. (p)

Effect of feeding seaweed on the iodine content of milk and dairy products. G. LUNDE and K. CROSS (Norsk Mag. Laegevidenskaben, 1936, 97, 377—394).—In cows receiving a supplement of 0.1—0.5 kg. of chopped dried seaweed daily the yield of milk and its fat content show negligible increases. <10% of the I of the fodder is normally excreted in the milk. The I content of the milk rises to a max. of 3.25 mg. per litre. The max. daily excretion of I in the milk is 40 mg. Approx. 90% of the I excreted in the milk is free, 3.8% is linked to the fat, and 6% to the protein. The fat of the milk of seaweed-fed cows contains approx. three times as much I as the fat of the milk of the controls. Consumption of the seaweed causes a seven-fold increase in the I content of the proteins, a ten-fold increase in that of the cheese, and a five-fold increase in that of the butter.

NUTR. ABS. (m)

Distribution of phosphorus compounds in cows' milk. P. A. KOMETIANI and T. E. TZULADZE (Biochimia, 1936, 1, 692—698).—Milk does not contain labile P compounds other than the complex $\text{Ca}_3(\text{PO}_4)_2$ -casein. A difficultly hydrolysable fraction is recognised, but not identified.

R. T.

Potassium in the milk of normal women. A. LEULIER, L. REVOL, and R. PACCARD (Compt. rend. Soc. Biol., 1937, 124, 1114—1115).—The average vals. for morning, midday, and evening milks are 0.052, 0.059, and 0.054%, respectively.

H. G. R.

Effect of light on the vitamin-C of milk. S. K. KON (Science, 1937, 85, 119—120).—Under the action of light and in presence of O_2 , the ascorbic acid (I) of milk undergoes reversible oxidation, probably to dehydroascorbic acid. Visible light of short λ (blue and violet) is mainly responsible for the reaction. The reversible reaction is unimol., and the reversibly oxidised product is biologically active. It decomposes spontaneously, without the action of light, to give a substance which fails to decolorise the indophenol reagent even after treatment with H_2S , and is biologically inactive. Synthetic (I) added to milk behaves in the same way. Pasteurisation by the holder method destroys the reversibly oxidised but does not affect the reduced form of (I) in milk. The amount of destruction of (I) by pasteurisation in absence of catalytic metals depends on the previous exposure of the milk to light.

L. S. T.

Vitamin-C in pasteurised milk. W. J. DANN and G. H. SATTERFIELD (Science, 1937, 85, 178—179).—Sharp's conclusions (this vol., 78) are criticised, and harmful effects of pasteurisation are discussed. In certain cases, the 2:6-dichlorophenol-indophenol titration is untrustworthy for the determination of vitamin-C in milk >3 days old.

L. S. T.

Proteins of milk at different periods of lactation. A. BIEBER (Riv. Clin. pediat., 1936, 34, 712—726).—The protein content of breast-milk is approx. const. throughout lactation.

NUTR. ABS. (m)

Heat-denaturation of milk-albumin and -globulin. S. J. ROWLAND (J. Dairy Res., 1937, 8, 1—5).—Heat-denaturation of milk-albumin plus -globulin was rapid at temp. >75°. At 80°, 90°, 95°, and 100° complete pptn. occurred in 60, 30, 10—15, and 5—10 min., respectively. No increase in non-protein-N occurred on heating to 100°, but continued heating at 95—100° formed some proteose. Appreciable hydrolysis of protein occurred at 115—120°.

W. L. D.

Mastitis. IV. Composition of milk affected by latent mastitis. A. C. DAHLBERG, J. J. KUCERA, J. C. HENNING, and G. J. HUCKER. **V. Presence of mastitis streptococci in mammary tissue.** G. J. HUCKER (N.Y. State Agric. Exp. Sta., Tech. Bulls. 239 and 241, 1936, 16 pp., 21 pp.).—The compositions of milk from healthy and from infected udders showed only slight differences regardless of the degree of infection as long as the milk remained normal in appearance. The slight changes consisted of decreases in lactose, d , solids-not-fat, and curd tension and increases in Cl and albumin. Mastitis milk of normal appearance is also normal in chemical composition.

W. L. D.

Structure of milk-air interface. N. KING (Milch. Forsch., 1937, 18, 331—338).—Microscopic observations in reflected light prove that fat globules

concentrate at the interface. This peculiarity is enhanced in milk with an oxidised flavour. The concn. of fat globules on the surface is favoured by freezing milk. Surface-active reagents poured on a milk surface are of two kinds, viz., those which spread evenly over the surface (oleic acid, triolein and soaps) and diminish the no. of milk fat globules and those which increase the concn. of globules at the surface ($BuOH$, $C_5H_{11}OH$, and CH_2PhOH).

W. L. D.

Tryptophan reaction in the cerebrospinal fluid. J. SPILLANE (Lancet, 1937, 232, 560—561).—In a clear cerebrospinal fluid a positive reaction is characteristic of tuberculous meningitis. The tryptophan may be synthesised by the tubercle bacilli in the fluid.

L. S. T.

Albumins in cerebrospinal fluid. H. MANGELSCHOTS (Compt. rend. Soc. Biol., 1937, 124, 1019—1022).—Pptn. with CCl_3CO_2H gives a higher val. for the albumin (I) content than that obtained by the precipitin method. The increase of (I) in meningitis is due to infiltration of serum-(I).

H. G. R.

Phenols in biological fluids and their relation to phenolæmia. M. F. CASTEX and A. F. ARNAUDO (Rev. assoc. med. Argentina, 1935, 49, 1063—1070).—The concn. of phenols in ascitic and pleural fluids (Theis and Benedict's method) is the same as that in blood.

CH. ABS. (p)

Nature of the so-called droplets found between the rod outer segments of vertebrate eyes. S. R. DETWILER and R. L. ZWEMER (Anat. Rec., 1937, 67, 295—303).—The droplets are lipin, and probably kephalin.

R. N. C.

Lachrymal elimination of sodium chloride. D. MICHAEL (Ann. Oculist., 1936, 173, 715—734).—The average NaCl content of tears from healthy eyes was 0.823%. The content fell in acute and rose in chronic diseases of the eye. Stimulation of the sympathetic nerve increased and that of the vagus nerve decreased the content. Ingestion of large amounts of NaCl increased the content whilst the action of diets poor in NaCl was variable. Lachrymal elimination of NaCl in both eyes was diminished by unilateral pericarotid sympathectomy. Increase in temp. produced by intramuscular injection of milk was paralleled by increase in the lachrymal NaCl content, which remained high, however, after the temp. had fallen.

NUTR. ABS. (m)

Presence of a variable quantity of bromine in human saliva. G. VITTE (Compt. rend. Soc., Biol., 1937, 124, 1227—1228).—Br is always present, but to a variable extent, in saliva.

H. G. R.

Hormone content of saliva, using the bitterling test. A. I. WEISMAN (Endocrinol., 1936, 20, 864—865).—The salivas from normal males and females and pregnant women contain no male hormone.

R. N. C.

Salivary and stomach secretion of *Anopheles* and other mosquitoes. A. DE BUCK (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 217—223).—The hæmagglutinin and anticoagulin in the salivary secretion of *A. maculipennis* are present in

the median acinus. The mid-gut of *Culex pipiens* and *Theobaldia annulata* contains a coagulin. In neither case was activity lost on prolonged drying or by dry heating at 99° but was destroyed by wet heating to 50°.

A. G. P.

Standards for determining the suitability of bile specimens for detection or release of typhoid carriers. F. C. FORSBECK and H. C. HOLLON (Amer. J. Publ. Health, 1937, 27, 253—260).—Max. confidence may be placed in a negative laboratory report on bile in the above connexion, if it is amber, clear, viscous, and alkaline, provided it was obtained following MgSO_4 stimulation and was protected in buffered broth.

O. M.

Gastric digestion of soya-bean flour. L. SHOPTAW, D. L. ESPE, and C. Y. CANNON (J. Dairy Sci., 1937, 20, 117—128).—In comparing a soya-bean gruel (soya-bean flour : H_2O = 1 : 9) with whole and skim milk for calf feeding, the amount of gastric juice secreted per $\frac{1}{2}$ hr. and the amount of free and total acidity of the gastric contents were the same for each liquid food. The gruel leaves the stomach more rapidly than milk curd. Failure of calves to thrive on soya-bean gruel is not due to diminished gastric secretion.

W. L. D.

Intubation of human small intestine. IV. Chemical characteristics of intestinal contents in fasting and as influenced by administration of acids, alkalis, and water. W. G. CARR, W. O. ABBOTT, and A. B. SAMPLE (J. Clin. Invest., 1935, 14, 893—900).—After fasting, acidity is greatest in the duodenum, the reaction becoming neutral or alkaline in the ileum. Reaction and HCO_3^- content are related. The duodenal contents if acid or tending towards neutrality are hypertonic, but if neutral or alkaline tend towards the isotonic state of the ileal contents. After oral administration of acid, stomach contents passing into the duodenum are neutralised by HCO_3^- and become isotonic. Ingestion of isotonic HCO_3^- causes more rapid stomach evacuation than does that of hypertonic HCO_3^- . Administration of 400 c.c. of H_2O causes passage of stomach contents into the duodenum sufficiently rapidly to render the contents of the latter acid and to depress the osmotic pressure. CH. ABS. (p)

Ammonia content, p_{H} , and carbon dioxide tension in the intestine of dogs. R. C. HERRIN (J. Biol. Chem., 1937, 118, 459—470).—Acidosis produced in dogs by a fat diet or administration of CaCl_2 and HCl resulted in a 6—32% reduction of the concn. of fixed base in the succus entericus. Acidosis did not increase the NH_3 content of the juice although urinary NH_3 increased to 2—9 times normal. The juice is acid, p_{H} 6—6.7, and the corresponding CO_2 tension 30—279 mm. Hg. Diets containing various amounts of protein with accompanying change of intestinal NH_3 concn. did not materially change the p_{H} or CO_2 content of the succus entericus or jejunal contents.

P. W. C.

Occurrence of small amounts of cobalt in human urine. R. DUVAL and J. M. LE GOFF (Compt. rend., 1937, 204, 817—818).—Co ($>0.05 \times 10^{-6}$ g.), when present as a simple salt, is pptd. from urine

by 1 : 2- $\text{NO} \cdot \text{C}_{10}\text{H}_8 \cdot \text{OH}$ in AcOH ; when present as a complex salt, Co is first separated by electrolysis and dissolved from the Pt electrodes. F. O. H.

Change in electrolytes of urine following injection of parathyroid extract. R. ELLSWORTH and W. M. NICHOLSON (J. Clin. Invest., 1935, 14, 823—827).—Injection of the extract increased the alkalinity and the inorg. P, HCO_3^- , Na, and K contents. NH_4^+ decreased. CH. ABS. (p)

Urea secretion. IX. Comparison of urea clearances calculated from the excretion of urea, of urea plus ammonia, and from nitrogen determination by hypobromite. D. D. VAN SLYKE, I. H. PAGE, A. HILLER, and E. KIRK (J. Clin. Invest., 1935, 14, 901—910; cf. A., 1933, 1181).—When the proportion of urea in the urea + NH_3 fraction of human urine is decreased by NH_4Cl -acidosis and by low-protein diet, the urea clearance, calc. from the rate of excretion of urea alone, underwent a parallel reduction. When vals. for excreted urea + NH_3 are substituted for urea the calc. clearances remain at the usual levels. The work of the kidneys is best indicated by the combined excretion of urea + NH_3 .

CH. ABS. (p)

Micromethod for [determining] blood-urea; automatic urine collector for urea clearance in infants. L. E. FARR (J. Clin. Invest., 1935, 14, 911—913).

CH. ABS. (p)

Elimination of histamine and its absence from normal urine. G. UNGAR and A. POCOULÉ (Compt. rend. Soc. Biol., 1937, 124, 1204—1206).—Histamine is eliminated in certain digestive secretions (gastric juice and bile) and not in the urine. H. G. R.

Coefficients of correlation between the nitrogenous constituents of the urine after ingestion of low, normal, and high protein diets. H. H. BEARD (Human Biol., 1935, 7, 419—429).—The metabolic relations between total N and urea-, NH_3 -, uric acid-, (I), and creatinine- (II) -N are close when a diet rich in protein is ingested. The relation between the excretion of urea-N and (I)- and (II)-N indicates a possible exogenous source of these substances. There is also a close relation between (I)- and (II)-N. It is possible that the greater is the intensity of NH_3 -acid metabolism per unit of time the more are these substances derived from exogenous sources.

NUTR. ABS. (m)

Determination of oxalic acid in urine. S. OIKAWA (Japan. J. Med. Sci., 1937, II, 3, 211—216).—The urine (2 c.c.) is treated with 8 c.c. of 3% $\text{CCl}_3 \cdot \text{CO}_2\text{H}$ and 5 c.c. of the filtrate are pptd. with aq. $\text{NaOH} \cdot \text{CaCl}_2$. The ppt. is washed with dil. NaOH , dissolved in 10% AcOH , repptd. with CeCl_3 , and the ppt. is washed with 1% NaCl , dissolved in 10% H_2SO_4 , and treated with 0.01N- KMnO_4 , excess of which is determined iodometrically. The use of a centrifuge tube with a diverticulum is essential (cf. Maugeri, A., 1933, 850).

F. O. H.

Daily excretion of oxalic acid in urine. S. OIKAWA (Japan. J. Med. Sci., 1937, II, 3, 217—219).—The 24-hr. excretion of $\text{H}_2\text{C}_2\text{O}_4$ in adults is approx. 30—40 mg.

F. O. H.

Renal elimination of bilirubin. A. E. RAICES and C. V. SUAREZ (Rev. med. quir. patol. femenina, 1935, 5, 559—577).—Urinary elimination of bilirubin (I) is abnormal and depends on the (I) concn. in blood. No threshold for (I) elimination by kidneys was found.

CH. ABS. (p)

Proteinuria. "Albuminuria." J. BING (Acta med. scand., 1936, 89, Suppl. 76, 151 pp.).—Urinary albumin (I) and globulin excretion varies with the creatinine clearance. The calc. average protein (II) content of the glomeruli is const. under const. experimental conditions, but different vals. are found in different individuals. The degree of proteinuria depends on the filtration val. and on the permeability of the glomerular membrane. There is parallelism under const. conditions between (II) excretion, urea excretion, and cholesteroluria. The relative urinary (I) content depends on the relative (I) content of the blood and on the ratio of the relative (I) contents of blood and urine. The dietary (I) content affects the permeability of the glomerular membrane. The relative urinary (I) content varies little in the various forms of Bright's disease.

NUTR. ABS. (m)

Excretion of calcium. H. CHRISTIANSEN (Diss., Copenhagen, 1936, 108 pp.).—Ca absorption is controlled by intestinal p_H . In fasting rabbits and rats on a Ca-free diet, there is a steady but somewhat variable excretion of Ca from the gut. Of this a const. small part is derived from bile. Intravenous injection of CaCl_2 in a goat did not affect bile-Ca. Prolonged slow intravenous injection of CaCl_2 (13—103 mg. per hr.) into rabbits and goats causes no increase in faecal Ca excretion. Urinary Ca excretion increased, 15—35% of the injected Ca being thus excreted in rabbits, and 6—11% in goats. Thus faecal Ca represents unabsorbed dietary Ca plus a small proportion derived from bile and other intestinal secretions only; there is no active excretion into the gut. Only very small increases in serum-Ca occur and the Ca content of soft tissues (other than kidney) does not increase. Subcutaneous injections of CaCl_2 and Ca gluconate cause severe uræmia and extensive deposition of Ca in the kidneys.

NUTR. ABS. (m)

Reaction of the faeces of children. I. Determination of faecal p_H . Effect of diet. II. Cause of faecal p_H . R. PACHIOLI and V. MENGOLI (Pediatrics [Riv.], 1935, 43, 617—641, 1025—1045).—I. The p_H of the fresh faeces of breast-fed infants was 4.8—6.9 (average 5.6). In children on a diet of cow's milk, cereal, or bread the vals. were 6.03—7.60. In children > 2 years old on a mixed diet, the vals. were 6.3—8.1 (average 7.21).

II. Faecal p_H is determined by the nature of the fermentable material, the buffering power of the ingested food, the bacteria, the absorptive and secretory power, and motility of the intestine, and the original acids, Ca, and PO_4''' which act as buffers in the faeces.

NUTR. ABS. (m)

Faecal flora and the line test of normal, rachitic, and healing rachitic rats. H. FRIEDMANN (J. Nutrition, 1936, 12, 165—172).—In all these cases the faecal p_H reflected changes in bacterial flora and, with known diets, served as an index of the tendency

towards rickets or healing. Rachitic stools were alkaline and contained fewer *B. coli* than did the acid stools of normal and healing rats. Vitamin-D in pasteurised and certified milk and that in irradiated ergosterol effected similar changes in rat faeces.

A. G. P.

Sweating and the permeability of the human skin. Report to the committee on "the control of atmospheric conditions in hot and deep mines." A. G. R. WHITEHOUSE (Trans. Inst. Min. Eng., 1937, 93, 18—36).—Curves show that the loss in wt. of a subject by osmotic passage of H_2O through the skin is negligible in ordinary H_2O baths at 91—93° F., is considerable in salt H_2O baths, and still greater in air, both naked and clothed. Increased air temp. leads to increased loss of H_2O due to increased circulation and gaseous exchange through the skin. The intact human skin is completely impermeable to electrolytes in simple solution, but non-ionised I is absorbed. The amount of sweating is not only due to rise in body temp. but is also facilitated by the performance of work, due probably to the effect of some product of metabolism. Sweat usually contains Cl' 0.1—0.2%, K 0.014—0.026%, SO_4''' 0.004%, lactic acid 0.07—0.13%, urea 0.023—0.046%, and traces of Ca, Mg, sugar, uric acid, and creatinine. Sweat from the leg and lower part of the back had a p_H of 4.6, from the chest 5.2, and from face and armpits 7.0. The acidity decreases with washing of the surface, sweat owing its acidity to contact with the skin, the surface of which is normally strongly acidic.

P. W. C.

Gastric pepsin in various diseases. C. R. MULLINS and C. A. FLOOD (J. Clin. Invest., 1935, 14, 793—797).—Variations in peptic activity of gastric contents in diseases are examined.

CH. ABS. (p)

Oxalic acid metabolism in some diseases. S. KAMIYA (Japan. J. Med. Sci., 1937, II, 3, 163—169).—Normal human blood contains 0.003—0.004% of $\text{H}_2\text{C}_2\text{O}_4$ (Suzuki, A., 1934, 1122) but the level is often increased in certain diseases (e.g., hepatic cirrhosis, syphilis, beri-beri, hypertension).

F. O. H.

Resistance to proteolysis found in blood-serum of aborting women. E. SHUTE (J. Obstet. Gynaecol. Brit. Empire, 1935, 42, 1071—1084).—In many cases of spontaneous abortion the serum showed high resistance to the proteolytic action of commercial trypsin, notably to its protease fraction. A small proportion of pregnancies and self-induced abortion showed similar effects. Spontaneous abortion may be provoked by excessive ability of normal blood to impede proteolysis. Maternal resistance is not due to serum-antitrypsin.

CH. ABS. (p)

Is œstrin the cause of resistance to proteolysis found in serum of aborting women? E. SHUTE (J. Obstet. Gynaecol. Brit. Empire, 1935, 42, 1085—1095).—A substance resembling œstrin occurs in normal blood and causes resistance to proteolysis in spontaneous abortion. The concn. of this substance in placentas of aborting women is > in more mature placentas.

CH. ABS. (p)

Relation between hypochromic anæmias and iron-deficiency. J. F. BROCK (Brit. Med. J., 1937, 315—320).—Effects of Fe therapy are recorded and the importance of excessive dosages of Fe in some cases is emphasised. A. G. P.

Relation of calcium and iron to the erythrocyte and hæmoglobin content of blood of rats consuming a mineral-deficient ration. J. M. ORTEN, A. H. SMITH, and L. B. MENDEL (J. Nutrition, 1936, 12, 373—385).—Polycythæmia and anæmia in rats caused by feeding rations deficient in inorg. salts are alleviated by a complete salt supplement, are partly prevented by CaCO_3 and (less uniformly) by FeCl_3 . No other constituent of the salt mixture (with the possible exception of P) is concerned in these changes. A. G. P.

Treatment of severe iron deficiency and hæmorrhagic anæmia. Restoration of iron reserves. G. FONTES and L. THIVOLLE (Sang, 1936, No. 2, 144—177).—In normal adult dogs the partition of Fe is approx. as follows: 44% as hæmoglobin (I), 11% in liver and spleen, and 44% in other tissues and organs. Repeated bleedings cause reduction in the Fe contents of the liver, spleen, skeleton, skin, and viscera, but scarcely affect that of muscle. Hence tissue-Fe, other than that of muscle, appears to act as a reserve that can be used for blood production. After six weeks' treatment with Fe and Cu caseinate, blood-Fe is normal but tissue-Fe, other than that of muscle, is low. Liver and spleen show no reserves. After treatment for 5—12 months with Fe caseinate alone, tissue-Fe increases to 50% of its normal val. Increase of dosage does not affect the result. The urinary C:N ratio, which is high in anæmia, is restored to normal by the Fe administration and storage of N occurs. In severe secondary anæmia in man, Fe and Cu with tryptophan and histidine should be given until the (I) level is normal, after which Fe treatment should be continued for a long time. NUTR. ABS. (m)

New factor in the production and cure of certain macrocytic anæmias. L. WILLS, P. W. CLUTTERBUCK, and B. D. F. EVANS (Lancet, 1937, 232, 311—314).—Two factors, one sol. and one insol. in saturated $(\text{NH}_4)_2\text{SO}_4$, have been separated from the liver extract campolon. When administered parenterally, the sol. fraction is curative in the nutritional macrocytic anæmia of rhesus monkeys; the insol. fraction, which contains the anahæmin (I) present in campolon, is inactive in the monkey anæmia, as are also the commercial preps. of (I), but is curative in pernicious anæmia. Similar fractionation of the alcohol-sol. fraction of acidified aq. yeast extracts yields an insol. fraction inactive in monkey anæmia and a sol. active fraction. Both factors appear to be necessary for hæmopoiesis in man and rhesus monkeys, but in the production and cure of the nutritional anæmia of the monkey it is the sol. fraction which is mainly concerned. The possible relationship of the new factor to the vitamin- B_2 complex is discussed. L. S. T.

Synovial fluid in chronic arthritis. D. H. COLLINS (J. State Med., 1935, 43, 652—657).—Pathological examination of the fluid in arthritis

should include determination of sugar (lowered with bacterial contamination), protein (high, with high cellular content), and polymorphonuclear leucocytes (varying with type of arthritis). CH. ABS. (p)

Riboflavin deficiency in dogs. W. H. SEBRELL, R. H. ONSTOTT, and D. J. HUNT (U.S. Publ. Health Rep., 1937, 52, 427—433).—A special rice-bran filtrate rich in the "filtrate factor" and free from riboflavin showed curative action in black-tongue of dogs. Some evidence is presented that riboflavin is essential in the diet of dogs. W. L. D.

Report of chemistry section. B. C. ASTON (New Zealand Dept. Agric. Ann. Rep., 1934—1935, 60—65).—Livers and blood of bush-sick sheep were not deficient in Cu. Prolonged drenching of healthy sheep with CuSO_4 induced bush sickness. Some cases of sickness were temporarily cured by administration of As. The As contents of grass were the same (0.1—0.7 p.p.m.) in sick and healthy areas.

Analyses of pampas grass are recorded.

A renal calculus from sheep contained Ca phosphate with smaller amounts of SiO_2 , uric acid, and pigment. Others from cows contained Mg NH_4 phosphate, fat, and pigment in one case, and SiO_2 , CaCO_3 , cystine, and Ca phosphate in another. CH. ABS. (p)

"Trace elements" in relation to bush sickness. E. M. WALL (New Zealand J. Sci. Tech., 1937, 18, 642—650).—Recorded beneficial effects of Fe NH_4 citrate preps. and of limonite in bush sickness are attributed to their Co contents. Highly purified samples have no action unless Co is added. Probably catalytic trace elements other than Cu and Co (e.g., Mn, Ni, or Zn) are necessary for the effective utilisation of Fe in soil and pasture by sheep. A. G. P.

Cobalt content of limonites used in the treatment of bush sickness. K. J. McNAUGHT (New Zealand J. Sci. Tech., 1937, 18, 655—661).—The deficiency of Co (determination described) in soils of bush-sick areas is confirmed. The curative efficiency of limonites is paralleled by their Co contents. A. G. P.

Sodium and potassium metabolism. Effect of potassium on sodium and water balances in normal subjects and patients with Bright's disease. E. M. MacKAY and A. M. BUTLER (J. Clin. Invest., 1935, 14, 923—939).—Ingestion of 5—10 g. of KCl daily did not affect the excretion of Na or œdema fluid, and in Bright's disease had no appreciable effect on Na retention and development of œdema. CH. ABS. (p)

Dietary protein in hæmorrhagic Bright's disease. II. Effect of diet on serum-proteins, proteinuria, and tissue-proteins. E. H. KEUTMANN, S. H. BASSETT, G. E. JULIAN, C. H. PRESENT, and H. E. VAN ALSTINE (J. Clin. Invest., 1935, 14, 871—878).—Protein balances in patients with Bright's disease receiving a basal diet + protein indicate previous depletion of tissue-protein. Small supplements of egg-white or serum-protein were more efficient than large supplements in this respect. Lactalbumin and liver-protein were equally utilised. Increased protein intake caused increased albuminuria.

CH. ABS. (p)

(A) Inverse relation between growth and incidence of cataract in rats given graded amounts of foods containing vitamin- B_2 . P. L. DAY and W. J. DARBY. (B) Blood-sugar in rats rendered cataractous by dietary procedures. P. L. DAY (J. Nutrition, 1936, 12, 387—394, 395—404).—(A) Rate of growth and incidence of cataract were inversely related. Small amounts of vitamin- B_2 prevent the appearance of cataract.

(B) Cataract produced by- B_2 deficiency is associated with sub-normal blood-sugar levels and differs from that resulting from feeding lactose or galactose.

A. G. P.

Effect of X-rays on the carcinogenic action of methylcholanthrene. E. TASCHNER, G. GOTTLIEB, and M. SPRITZER (Compt. rend. Soc. Biol., 1937, 124, 955—956).—Small doses of X-rays inhibit, and larger doses accelerate, the carcinogenic action in mice.

H. G. R.

Chemotherapy of cancer by complex soluble salts of copper and titanium with ascorbic or dehydroascorbic acid. F. ARLOING, A. MOREL, and A. JOSSERAND (Compt. rend., 1937, 204, 824—825; cf. A., 1936, 100).—Positive clinical results were obtained with Ti-Na complex salts of ascorbic and dehydroascorbic acid (I) and with Cu^{II} -Na complex salt of (I).

F. O. H.

Application of the polarographic effect of proteins in cancer diagnosis. R. BRDIČKA (Nature, 1937, 139, 330).—The polarographic protein effect, consisting of a characteristic wave on the current-voltage curve, is always greater with normal than with carcinomatous serum.

L. S. T.

Nature of the causative agent of the Rous fowl sarcoma. E. M. FRAENKEL and C. A. MAWSON (Nature, 1937, 139, 282).—Deposition of the agent from extracts of Rous sarcoma by centrifuging at 15,000 r.p.m. has been confirmed, but a satisfactory correlation between the no. of elementary bodies in different active preps. and the infectivity of the extracts has not been obtained. Only a small % of the elementary bodies visible in the extract can be associated with its activity; the active agent may be adsorbed on the surface of such particles. Tumours were not obtained by injection of COMe_2 extracts of fresh tumour or dried sarcoma powder (cf. A., 1936, 1406), but the residue left after extraction of dried powder retains its carcinogenic properties. L. S. T.

Preparation of an active agent from inactive tumour extracts. A. CLAUDE (Science, 1937, 85, 294—295).—The active agent of chicken tumour I can be separated from its own inhibitor by high-speed centrifuging.

L. S. T.

Excessive dental calculus formation. J. N. FINNI and J. S. GOTTLIEB (Dental Cosmos, 1935, 77, 1173—1176).—Calculi enveloping crowns of lower teeth contain CaCO_3 , CaC_2O_4 , Ca phosphate, and mucin.

CH. ABS. (p)

Facial dermatitis in sheep in New Zealand. Photosensitivity of unpigmented skin. C. S. M. HOPKIRK (New Zealand J. Agric., 1936, 52, 98—103).—The dermatitis in South Island is attributed to consumption of a particular plant, probably a species

of *Hypericum*. In North Island the disease is associated with liver damage and the absorption of a fluorescent substance (produced by breakdown of chlorophyll) which sensitises the skin to light. A. G. P.

Protamine-zinc-insulin and other mixtures of zinc and insulin in diabetes mellitus. I. M. RABINOWITCH, J. S. FOSTER, A. F. FOWLER, and A. C. CORCORAN (Canad. Med. Assoc. J., 1936, 35, 239—252).—Protamine-Zn-insulin has a more prolonged hypoglycæmic effect than protamine-insulin in acute experiments and in diabetics on diet. The average blood-sugar vals. of 10 diabetic patients were 0.285, 0.189, and 0.131 mg. per 100 ml., respectively, after treatment with insulin, protamine-insulin, and protamine-Zn-insulin. Diabetics under treatment with protamine-Zn-insulin showed the most satisfactory levels of blood-cholesterol. Probably the addition of Zn increases the sensitivity of the diabetic to insulin.

NUTR. ABS. (m)

Relation of blood-glucose to concentration of lactose in milk of lactating diabetic women. E. TOLSTOI (J. Clin. Invest., 1935, 14, 863—866).—Lactose in the milk remained at a remarkably const. level despite marked variation in blood-glucose.

CH. ABS. (p)

Temperature of glucose solution and "super-abundance" diabetes. M. WIERZUCHOWSKI (Compt. rend. Soc. Biol., 1937, 124, 1136—1138).—This form of diabetes (cf. A., 1935, 1008) is produced by intravenous injection of glucose in the dog above the limit of assimilation, a temp. of 26° being the most suitable.

H. G. R.

Vitamin- B_1 and diphtheria. B. A. PETERS and R. N. CUNNINGHAM (Lancet, 1937, 232, 563—564).—The stage of glycolysis in which vitamin- B_1 is concerned is not affected by the diphtheria toxin, and no benefit arises from its administration. L. S. T.

Summer encephalitis in Japan. S. NAKA, N. OKUMURA, and G. KAKIHARA (Fukuoka Ikwa. Zasshi, 1934, 27, 1499—1522).—Blood-acidosis was high in the delirious and comatose state but inclined to alkalosis during convalescence. Blood- p_H was not appreciably lowered. In the spinal fluid, p_H was raised, residual N was greatly and albumin slightly increased.

CH. ABS. (p)

Genesis of thyroid protein: clinical assays of artificial thyroid protein in human myxoedema. W. T. SALTER and J. LERMAN (Endocrinol., 1936, 20, 801—808).—The thyroglobulin (I) extracted from human thyroid glands from a non-endemic goitre district has only $\frac{1}{3}$ of its I combined as thyroxine (II). The non-(II) ("di-iodotyrosine") fraction is converted by pepsin under appropriate conditions into an artificial protein resembling (I) chemically and clinically. The non-(II) fraction probably represents a chemical precursor of (II).

R. N. C.

Treatment of arterial hypertension with octyl alcohol. C. R. BELGRANO (Semana méd., 1935, II, 1073—1080).—Intravenous injection of the alcohol (1:10,000) caused a slight hydræmia and a decrease in blood-urea and -Cl.

CH. ABS. (p)

Mandelic acid in treatment of urinary infections. D. M. LYON and D. M. DUNLOP (Brit. Med. J., 1935, II, 1096—1097).—Na mandelate produced urinary antiseptis. CH. ABS. (p)

Survival of marmots after nephrectomy and adrenalectomy. S. W. BRITTON and H. SILVETTE (Science, 1937, 85, 262—263).—Summer-nephrectomised marmots show considerable reductions in serum-Na and -Cl and more marked rises in blood-urea than the winter-operated animals. L. S. T.

Isoglycaemic curves in obesity. P. B. LANDABURE and J. A. PANGARO (Semana méd., 1935, II, 1293—1298).—Administration of sugar to obese persons induces a diabetic glucose curve in some cases. In others, usually young persons with endocrine disturbance, there is little or no hyperglycaemia and vals. return to normal or to lower levels. CH. ABS. (p)

Glaucoma and oedema. H. SCHROEDER (Eye, Ear, Nose and Throat Monthly, 1935, 14, 369—373).—Relations between glaucoma and vitamin-B deficiency, NaCl, nutritional and angioneurotic oedema are discussed. CH. ABS. (p)

Isolation of a homogeneous heavy protein from virus-induced rabbit papillomas. J. W. BEARD and R. W. G. WYCKOFF (Science, 1937, 85, 201—202).—A protein of high mol. wt., sedimentation const. approx. 250×10^{-13} cm. per sec. per dyne, has been isolated by ultracentrifuge from the virus-induced warty masses from cottontail rabbits. The protein contains approx. 15% of N and is completely coagulated at 66—67°. It is several thousand times as infectious as the wart tissues from which it is derived. L. S. T.

Phlyctenular disease and vitamin deficiency. L. G. REDDING (Pennsylvania Med. J., 1935, 39, 173—175).—The disease is associated with vitamin-A deficiency and is successfully treated with large doses of cod-liver oil. CH. ABS. (p)

Defensive rôle of bilirubinæmia in pneumococcal infection. NAJIB-FARAH (Lancet, 1937, 232, 505—506).—The blood of patients suffering from acute rheumatism contained abnormal amounts of bilirubin (I). Growth of virulent pneumococci in rabbit or human sera is inhibited by addition of (I). Some varieties of pneumococcus are agglutinable and sol. in solutions of (I), whilst others are not. Solubility \propto virulence. L. S. T.

Effect of polyneuritis in chicks on the *in vitro* rate of removal of pyruvate injected intravenously. W. C. SHERMAN and C. A. ELVEHJEM (J. Nutrition, 1936, 12, 321—328).—The amount of NaHSO_3 -fixing substance in chick blood is not increased by avitaminosis- B_1 ; that of fæces increases in polyneuritis. Intravenously injected pyruvate (I) is removed from the blood rapidly in normal, but slowly in polyneuritic, chicks. Polyneuritis is associated with a disturbance of the metabolism of (I) in the tissues. A. G. P.

Effect of occupation on blood-phosphate and -calcium in pregnancy. G. ИОНОК and G. ТОУ-САИТ (Rev. Hyg. Méd. prév., 1936, 58, 435—453).—Occupation influences the Ca, total P, and inorg. P

of the blood of pregnant women. Changes are most noticeable when the hrs. of employment are long, where the work is arduous, and, in some cases, where chemicals are handled. NUTR. ABS. (m)

Changes in inorganic phosphate content of the blood in pregnancy. S. LEHWIRTH (Zentr. Gynäkol., 1936, 60, 1882—1885).—In pregnancy until the 7th month there is an increase averaging 26% > normal val. for the blood-inorg. PO_4''' , and in the last stages there is a further increase to an average of 44% > normal. During the 10-day period *post partum* there is a gradual fall in the val. to about 34% > normal. NUTR. ABS. (m)

Potassium metabolism in normal and toxæmic pregnancy. F. SZÜSZ (Zentr. Gynäkol., 1936, 60, 2310—2313).—In each case 5 ml. of sterile 3% aq. KCl were injected into the cubital vein. In pregnancy toxæmia the K' content of the whole blood fell by about 15% within 30 min. and then rose to approx. the normal level at 60 min. In normal pregnancy half the cases examined showed similar changes, whereas in the other half the K' rose by approx. 10—20% and then fell slowly. After the cessation of the toxæmia the curves showed a rise similar to that for the second half of normal cases. NUTR. ABS. (m)

Blood-polypeptides in the pregnant woman and the foetus. G. LEGRAND (Brux. méd., 1936, 16, 1131—1137).—During pregnancy the large polypeptide mols. of maternal serum are replaced by simpler mols. which are readily dialysable and can be used by the foetus. During labour and the puerperium there is an increase in blood-polypeptides secondary to absorption of protein. NUTR. ABS. (m)

Addis sediment count and blood-urea clearance test in normal pregnant women. C. A. ELDEN and J. W. COONEY (J. Clin. Invest., 1935, 14, 889—891).—The lower limit of normal urea clearance is somewhat smaller in pregnant than in non-pregnant women. CH. ABS. (p)

Serum-calcium in the psychoses. I. ATKIN (Lancet, 1937, 232, 439—440).—Ca levels associated with various psychoses are recorded. L. S. T.

Calcium and phosphorus metabolism in intractable rickets. W. J. HIGHMAN, jun., and B. HAMILTON (J. Pediat., 1936, 9, 56—61).—In a 10-year-old girl with marked rickets since the age of 2 years the chief disorder of metabolism was marked loss of P in the fæces. Increase of P intake caused a fall in fæcal P but only with 100 drops of viosterol (I) daily was there retention. On a low-Ca diet with 30 drops of (I) daily there was Ca equilibrium. Possibly inability to utilise vitamin-D was the cause of the condition. NUTR. ABS. (m)

Variation in the phosphorus and carbohydrate derivatives of rat's muscle during experimental rickets and its cure. R. DUFFAU (Compt. rend. Soc. Biol., 1937, 124, 1194—1197).—An increase in PO_4''' , which is considerably augmented if H_3PO_4 or Na β -glycerophosphate is fed, and a decrease on vitamin-D therapy were observed. Little variation in the labile P compounds, carbohydrate derivatives, or lactic acid occurred. H. G. R.

Rachitogenic diets. A. L. BACHARACH (Z. Vitaminforsch., 1937, 6, 129—140).—The intensity of the rickets, the regularity of this intensity, and the response to antirachitic treatment differ considerably in the rickets produced in rats by diet 2965 of Steenbock and the modified diet 401 of Pappenheimer (Jephcott and Bacharach, B., 1926, 718). Bone composition appears to be influenced by differences in age and sex. F. O. H.

Mineral content of blood and bones in experimental scurvy in guinea-pigs. H. KAPP and A. SCHETTY (Biochem. Z., 1937, 290, 58—61).—Tables show the changes of K, Ca, Mg, Cl', and PO_4''' contents of blood and bones of guinea-pigs during establishment of scurvy. Well-defined and regular changes do not occur, but a decrease of blood-K is usual and probably related to anaemia and consequent loss of K-rich erythrocytes. Very slight decreases of Ca and PO_4 appear in bones, but the essential changes must be in the org. structure. P. W. C.

Occurrence of silicosis in the manufacture of silicon alloys. T. BRUCE (J. Ind. Hyg., 1937, 19, 155—162).—Workmen in two different Swedish plants manufacturing Si alloys show early silicosis, due to finely divided SiO_2 in the atm., after 4 and 14 years respectively; this variation is attributed to differences in the efficiency of exhaust-hoods etc. F. A. A.

Quartz in industrial dusts and deposits on human lung tissues; X-ray diffraction, chemical and spectrographic studies. V. HICKS, O. McELROY, and M. E. WARGA (J. Ind. Hyg., 1937, 19, 177—186).—Data are given for the occurrence of various elements, and the amounts of Si and SiO_2 , in dusts collected from different sources, and in deposits obtained, after trypsin digestion, from human lung tissue, in Pittsburgh. SiO_2 may be detected in X-ray analysis of lung tissue diagnosed clinically as non-silicotic, and in which the SiO_2 content, determined chemically, is only 0.14% of dried material. F. A. A.

Silicosis. W. D. McNALLY and W. L. BERGMAN (Ind. Med., 1935, 4, 61—65).—Fibrosis in silicosis may result from the action of NaF in the blood on SiO_2 . Dusts become more harmful as their SiF_4 content is increased. CH. ABS. (p)

Report of Wallaceville veterinary laboratory. C. S. M. HOPKIRK (New Zealand Dept. Agric. Ann. Rept., 1934—1935, 25—31).—Composition of rumen gases in tympany of dairy cows is examined. No excessive amounts of HCN appeared in the case of bloated cows.

Grass staggers was corr. by increasing the blood-Mg by feeding dolomite (I). MgSO_4 was more effective than (I) in increasing the Mg content of herbage. Affected animals showed normal amounts of Mg in milk and bones but urinary Mg was low.

Sheep affected with Morton Mains disease had subnormal blood-P and -total solids but normal -Ca and -Mg.

Vitamin-D contents of eel body, ling liver, proper liver, and red cod-liver oils were, 47, 500, 2250, and 10 international units per g., respectively. Whale body oil contained no -D. The -A content of fresh grass
O (A., III.)

was > that of hay; -D contents were the same in both. CH. ABS. (p)

Arsenic-detoxin compounds. W. A. COLLIER and M. J. VERHOOG (Z. Immunitäts., 1937, 90, 43—57).—Among compounds of hydrolysed keratin with hydroxy-, amino-, and aminohydroxy-phenylarsenoxides one (As XIII) showed therapeutic activity > that of neosalvarsan against recurrent fever, dourine, and nagana. The prophylactic effect is small. A series of Sb compounds analogous to the As compounds has notably less effect on nagana. C. R. S.

Lipin content of caseous tubercles. S. NARASAKA and M. NAITO (Japan. J. Med. Sci., 1937, II, 3, 189—194).—The contents of total fatty acid and total and free cholesterol of caseous tubercles in man (kidney, lymphatic gland) are >, whilst that of lecithin is <, those of the surrounding tissue. F. O. H.

Chemotherapy of typhoid and some other non-streptococcal infections in mice. G. A. H. BUTTLE, H. J. PARISH, M. McLEOD, and D. STEPHENSON (Lancet, 1937, 232, 681—685).—Early oral administration of $p\text{-NH}_2\text{-C}_6\text{H}_4\text{-SO}_2\text{-NH}_2$ (I) prevents or delays the development of septicæmia and death in mice infected with *B. typhosum*, *B. paratyphosum* B., *B. aertrycke*, Friedländer's bacillus, and pneumococcus, according to the nature of the organism. (I) has an inhibitory effect on the multiplication of small nos. of certain of these organisms in broth medium and in de-leucocytized blood. L. S. T.

Base changes in the alkalosis produced by treatment of gastric ulcer with alkalis. C. L. COPE (Clin. Sci., 1936, 2, 287—300).—The treatment caused increase in the total base content of the serum and the serum-Ca val. reached 16 mg. per 100 ml. This was accompanied by increase in serum-P to 6 and in serum-Mg to 2.8 mg. per 100 ml. The symptoms usually disappeared with return of the inorg. constituents of the blood to normal levels. N retention persisted longer. NUTR. ABS. (m)

Sodium and chlorine in extrarenal uræmia. P. SCHOORL (Tijdschr. Diergeneesk., 1936, 63, 1112—1114).—On the basis of the successful treatment of the uræmia of Addison's disease with Na salts but not with chlorides other than NaCl and experimental production of uræmia in rats on a diet deficient in Na it is suggested that it is primarily Na⁺ that is concerned with N metabolism. NUTR. ABS. (m)

Biochemistry and reversibility in evolution. J. NEEDHAM (Biochimia, 1937, 2, 479—488).—A review. W. McC.

Bio-catalysis. I—III. R. BRINKMAN (Chem. Weekblad, 1937, 34, 215—217, 251—252, 284—285).—Review and discussion of respiration, autoxidation, etc. S. C.

Relation of season, sex, and weight to basal metabolism of the albino rat. T. C. SHERWOOD (J. Nutrition, 1936, 12, 223—236).—Basal metabolism in adult rats shows seasonal variations, with slightly lower vals. in summer. The decline in heat production measured in cal. per kg. is > when measured in cal. per unit surface area. Heat production is more variable in males than in females. Basal

metabolic rates are substantially the same in young rats in both sexes, show sexual differences during active sexual life, and subsequently approach a common val. A. G. P.

Reproduction in cattle. II. Influence of environmental factors. J. ANDERSON (Empire J. Exp. Agric., 1936, 4, 197—207).—The duration and periodicity of oestrus are unrelated to the composition of pasture, rainfall, or temp., but are probably related to the amount of sunshine. A. G. P.

Metabolism of Eskimos in the Canadian eastern Arctic. I. M. RABINOWITCH and F. C. SMITH [with E. V. BAZIN and M. MOUNTFORD] (J. Nutrition, 1936, 12, 337—356).—In Eskimos the non-protein-N of blood was $>$ in other races. No glucose or COMe_2 appeared in urine and blood-sugar-time curves indicate difficulty in utilisation of carbohydrates. Fat metabolism probably differs from that of other races. Basal metabolic rates are high. Urines contain much Mg but no Pb. Urinary Cu in flesh-eating tribes is $>$ in those using a mixed diet. A. G. P.

Physiology of severe muscular work. O. BANG, O. BØJE, and M. NIELSEN [with E. H. CHRISTENSEN, A. KROGH, and J. LINDHARD] (Skand. Arch. Physiol., 1936, 74, Suppl. 10, Pt. 1, 208 pp.).—In trained subjects, during 1 hr. work, the blood-sugar (I) remains steady or rises slightly. Immediately after work (I) rises for some min. and then falls to $>$ resting level. In untrained subjects such work causes a fall in (I). Sufficiently prolonged moderate work causes hypoglycaemia and, at a level of 60 mg. per 100 ml., typical symptoms appear which hinder further work. If glucose (II) be then given, capacity for work is restored, though the R.Q. gives no indication of (II) utilisation by the muscles. A diet rich in carbohydrate given for several days before the experiment delays the onset of the hypoglycaemia caused by work but a diet of fat diminishes the capacity for work. (I) of the venous blood from the working muscles is 6—10 mg. per 100 ml. $<$ that of the arterial blood. The fermentable (I) may fall to 15 mg. per 100 ml. as the result of hard work. There is no relationship between (I) changes and the alkali reserve, the Et_2O -sol. acids of the blood, or the body temp.

Moderately severe work causes an initial rise in blood-lactate (III), which reaches a max. in 5 min., and then falls steadily to, or below, the basal level. Training diminishes the initial rise. Since this occurs with work of short duration, the rise is probably due solely to the anaerobic conditions which obtain during the initial stages of muscular activity. When the steady state is reached, phosphagen resynthesis is accomplished by oxidative processes and no lactic acid is then produced.

Increased ventilation is accompanied by lowered alveolar CO_2 tension, lowered $[\text{H}^+]$ of the blood, and little change in (III). The increased ventilation of slight and moderate work is unaccompanied by much change in alveolar CO_2 or blood- $[\text{H}^+]$, and, in max. work with its even greater ventilation, the alveolar CO_2 and $[\text{H}^+]$ may be $<$ in light or moderate work. Increasing the O_2 tension of the inspired air diminishes

ventilation in spite of a rise in alveolar CO_2 and $[\text{H}^+]$. Hence changes in lung ventilation are due to changes in the excitability of the respiratory centre to CO_2 and not to changes in alveolar CO_2 tension or $[\text{H}^+]$. Experimental determination of the excitability of the respiratory centre during muscular work, prolonged O_2 lack, and prolonged NH_4Cl acidosis shows that the increased ventilation is a measure of the increased excitability. A defined change in blood- $[\text{H}^+]$, produced by breathing CO_2 , causes a much greater increase in ventilation than the same $[\text{H}^+]$ change produced by acidosis. NUTR. ABS. (m)

Chemical and energy metabolism during development of insects. II. Ratio of heat production to respiratory processes during postembryonic development (*Lymanthria dispar*, L., and *Bombyx mori*, L.). N. BALSAM (Acta Biol. Exp., 1933, 8, 59—72).—During growth of the caterpillars there is high evolution of heat with low respiration, the latter decreasing further during moulting. Heat evolution of pupæ is half that of larvæ. CH. ABS. (p)

Specific dynamic action of glycine intravenously administered to nephrectomised dogs. A. G. EATON, S. C. CORDILL, and J. L. GOVAUX (J. Nutrition, 1936, 12, 113—120).—The sp. dynamic action of glycine, expressed as cal. per millimol. deaminised, is the same in anaesthetised (Na amytal) and in unanaesthetised dogs, and is independent of the size of the dog. The kidney is not responsible for any appreciable amount of the sp. action. A. G. P.

Metabolism of the isolated heart of dogs related to age. A. E. COHN and J. M. STEELE (J. Clin. Invest., 1935, 14, 915—922).—In heart-lung preps. O_2 consumption decreased with age. CH. ABS. (p)

Changes in gaseous metabolism with age in the sciatic nerve of the rat. S. N. KAGANOVSKAJA and J. L. KAHN (Biochimia, 1937, 2, 494—498).—The respiration of the nerve increases during the first 2 days after birth but subsequently decreases, the O_2 consumption falling until the 45th day, and remaining const. until the 60th day. The mean val. of the R.Q. is about 0.75 during the first month and about 0.8 during the second. W. McC.

Effects of low oxygen pressures on frog cardiac tissue. A. J. CLARK and G. KINGISEPP (Quart. J. Exp. Physiol., 1935, 25, 279—289).—Activity in the normal and $\text{CH}_3\text{I}-\text{CO}_2\text{H}$ -poisoned sinus is maintained by an O_2 pressure of 20 mm. Hg. Warburg's formula does not hold for low pressures. Effects of asphyxia on the functions of the heart can be correlated with differences in metabolic rates. CH. ABS. (p)

Respiration curve of isolated frog muscle. V. A. BELITZER, M. A. ZJUKOVA, and A. J. FALK (Biochimia, 1937, 2, 28—37).—The high O_2 intake of freshly isolated muscle is associated with synthesis of phosphagen. R. T.

Aerobic cycle of chemical transformations in muscle. V. A. BELITZER, M. A. ZJUKOVA, and A. J. FALK (Biochimia, 1937, 2, 38—46).—The O_2 intake of

resting frog muscle is inversely \propto its phosphagen (I) content. Resting metabolism consists in combustion of lactic acid or other metabolites, the energy thus produced serving for resynthesis of (I), and the intensity of the latter process \propto content of degradation products of (I). The metabolism thus differs from that of working muscle in not involving glycolytic processes. R. T.

Distribution of flavin in the tissues of mammals in relation to their residual respiration in presence of cyanides. A. GOURÉVITCH (Compt. rend., 1937, 204, 526—528).—The flavin (I) content of various organs of the rat and of Jensen sarcoma runs parallel with the residual uptake of O_2 following poisoning of the tissue by CN' . On the assumption that the residual O_2 uptake is entirely dependent on the (I) system, one mol. of (I) transports 15—44 mols. of O_2 per min. W. O. K.

Recent advances in nutrition. E. V. MCCOLLUM (Pennsylvania Med. J., 1935, 39, 61—65).—The significance of vitamins, inorg. constituents, and NH_3 -acids in nutrition is discussed. Pellagra is associated with deficiency in dietary flavin, which is indispensable and is not the antidermatitis factor B_2 . CH. ABS. (p)

(A) Blood and tissues in nutritional muscular dystrophy. (B) Metabolism in nutritional muscular dystrophy. S. MORGULIS and H. C. SPENCER (J. Nutrition, 1937, 12, 172—190, 191—204).—(A) Differences in sugar-tolerance curves of rabbits and man suffering from muscular dystrophy are established. In the fasting blood of diseased rabbits sugar, lactic acid, total acid-sol. P, and the partition of its fractions were unchanged, but lipin-P and cholesterol were $>$ normal and returned to normal during recovery. In skeletal muscle the concn. of glycogen and the abs. amount of acid-sol. P were $<$ normal although the P partition was not greatly altered. Creatine diminished in diseased muscle but the % esterified as phosphogen increased. Cholesterol increased in skeletal muscle, diminished in liver, lung, and spleen, and was unchanged in heart, stomach, intestine, brain, and kidney.

(B) Changes in body-wt., in various urinary constituents, and in the N balance during the onset, crit. and progressive stages of dystrophy and during recovery are recorded. A. G. P.

Nourishment and excretion of the suckling. Y. FURUHASHI (Japan. J. Med. Sci., 1937, II, 3, 239).—Data are given for the composition of the mother's milk and for the body-wt., growth, and urinary constituents of a child during the first 35 weeks of life. F. O. H.

Nutritional aspects of milk pasteurisation. E. V. MCCOLLUM (Publ. Health News, N.J. Dept. Health, 1935, 19, 387—389).—Raw milk has not been proved superior to pasteurised milk in infant feeding. It is less easily digested. CH. ABS. (p)

Effect of increasing the base excess of a ration on the acid-base equilibrium, health, and yield of milch cows. E. BROUWER (Bied. Zentr. [Tierernähr], 1935, B, 7, 463—495).—Addition to the ration of a basic supplement (containing CO_3'' , HCO_3' ,

PO_4''' , Na, K, Ca, and Mg in the same ratio as in the original ration) increased the p_H and CO_3'' but decreased the org. acid contents of the urine. Total CO_3'' in blood plasma was only slightly increased and the general health, yield and composition of milk were unaffected. A. G. P.

Effects of various levels of lucerne meal on the development of body organs of cockerels. F. R. SAMPSON and F. E. MUSSEHL (Poultry Sci., 1936, 15, 304—306).—Of the sections of the digestive tract only the small intestine was affected (lengthened) by feeding high levels of lucerne meal. A. G. P.

Activity of yeast extract in the prevention of renal hypertrophy caused by high-protein diets. B. B. LONGWELL, R. P. JOHNSTON, and R. M. HILL (J. Nutrition, 1936, 12, 155—164; cf. A., 1933, 433).—Young rats receiving dietary cystine $>$ the amount necessary for optimum growth developed renal hypertrophy. Supplementary feeding of yeast extracts had a corrective action. Neither tikitiki extract nor autoclaved liver entirely prevented the hypertrophy but had an inhibitory action when given together. A. G. P.

Supplemental value of peanuts to the laying ration [of hens]. D. F. KING and G. J. COTTIER (45th Ann. Rep. Alabama Agric. Exp. Sta., 1934, 23—24).—Peanut meal used as sole protein supplement caused deposition of much softer body-fat in hens than did skim milk. Addition of skim milk to the peanut ration in amounts to provide 50% of the supplementary protein increased body wt. and improved the yield, size, and quality of eggs. CH. ABS. (p)

Effect of supplementing the diet with different forms of sulphur on the wool of merino sheep. C. M. VAN WIJK, M. L. BOTHA, and J. G. BEKKER (Onderstepoort J. Vet. Sci., 1935, 5, 177—178).—Prolonged daily administration of cystine, sulphates, KCNS, or S had no effect on the wool. CH. ABS. (p)

Effect of overfeeding on protein metabolism of man. I. Effect of superimposing raw and boiled milks on an adequate diet II. Superimposition of beef (or soya flour) + lactose + butter, equivalent to a litre of milk, on an adequate diet. D. P. CUTHBERTSON, A. MCCUTCHEON, and H. N. MUNRO. III. Protein-saving effect of carbohydrate and fat superimposed on an adequate diet. D. P. CUTHBERTSON and H. N. MUNRO (Biochem. J., 1937, 31, 681—693, 694—705).—I, II. Addition of 1 litre of milk per day to a diet adequate for maintenance in adolescents or adults causes retention of S (53%) and N (54%), whether the milk is raw or boiled. Considerable N retention also occurs when an equiv. amount of beef (or soya flour) + lactose + butter is superimposed, and this is evenly eliminated on discontinuance of overfeeding.

III. Carbohydrate has a greater N- and S-saving effect than fat. Addition of glucose equiv. in calorific val. to 54% of that of the basal diet reduces the N and S output by about 35%. P. G. M.

Nutrition of tissue cells. A. FISCHER (Hospitalstidende, 1936, 79, 841—853).—Heparin (I) is a

carbohydrate-glycuronic acid compound which unites with proteins stable near or on the acid side of their isoelectric points. Thus it prevents coagulation, since it combines with the coagulant (thrombokinase, thrombin) and prevents the chain reaction between the coagulant and the plasma-protein, with denaturation, to form a coagulum. (I) inhibits cellular growth in the same way by combining with the growth-promoting substances, *e.g.*, of embryonic tissue extracts. Intact cell surfaces have strong coagulating power and fix large protein mols. In tissue cultures, growth-promoting substances are associated with such mols. Denaturation accompanies fixation and the proteins are then subject to enzymic action. Such contact digestion, which is of great importance in lower animals, occurs in the digestive tract of the dog. The process is not necessarily the same as phagocytosis. The presence of the cell surface is essential; fixation of proteins to it is followed by dissolution of surface membrane and of proteins. The mols. of which cell surfaces are built have a definite chemical orientation. They are chiefly protein and lipid in nature and so arranged that there is a large no. of free CO_2H and NH_2 groups at the outside. When the acid groups of circulating proteins are bound, denaturation occurs with liberation of H_2O -sol. groups and decrease in solubility. The resulting product has a definite structure dependent on the nature of the cell surface and is probably cryst.

NUTR. ABS. (m)

Protein digestion of wood-boring insects. H. S. HOPF (*Nature*, 1937, 139, 286—287).—N contents of the frass of wood-boring insects and of the wood on which they feed are compared. L. S. T.

Change in the concentration of ovoglobulin in egg white during egg formation. J. S. HUGHES and H. M. SCOTT (*Poultry Sci.*, 1936, 15, 349—351).—The % of ovoglobulin (I) in the inner and outer layers of egg white is greater in laid than in uterine eggs, the difference being more marked in inner layers. (I) probably does not pass into the egg through the shell membranes. The apparent increase in the proportion of (I) pptd. by 1.5% aq. Na_2SO_4 is accompanied by increased η in the white and results from changes in the solubility of egg-proteins after deposition. A. G. P.

Nitrogen and creatine metabolism in relation to environmental temperature and thyroid function. M. BODANSKY and V. B. DUFF (*Endocrinol.*, 1936, 20, 822—830).—Exposure of normal rats to cold causes a rise in excretion of N, creatine (I), and guanidinoacetic acid; the increases in endogenous and total protein metabolism seem to be related to thyroid activity. Thyroxine (II) or exposure to cold causes abnormal fluctuations in total creatinine excretion, which may represent an unsteady state of endogenous metabolism. The adrenals and thyroid are probably interrelated in the control of N and (I) metabolism; the depressions of the latter at high temp. are only moderately augmented by (II).

R. N. C.

Amino-acid clearance. E. KIRK (*Acta med. scand.*, 1936, 89, 450—453).—The NH_2 -acid clearance increases considerably with increasing concn. of NH_2 -

acid in the plasma. The concn. of urinary NH_2 -N when the urine vols. are large may be < the concn. in the plasma, indicating tubular re-absorption of NH_2 -acids.

NUTR. ABS. (m)

Amino-acid and ammonia metabolism in liver diseases. E. KIRK (*Acta med. scand.*, 1936, 89, Suppl. 77, 147 pp.).—There is no essential difference in deaminative power between healthy persons and persons with liver disease. In cirrhosis of the liver blood- NH_3 vals. are abnormally high. This is due not to impaired urea synthesis but possibly to a collateral portal circulation avoiding the liver.

NUTR. ABS. (m)

Production of amino-acids by intermolecular transfer of amino-groups. I. Metabolism of ℓ (+)-glutamic acid in muscle. A. E. BRAUNSCHEIN and M. G. KRITZMAN (*Biochimia*, 1937, 2, 242—262).—In minced muscle under aerobic conditions NH_2 from ℓ (+)-glutamic acid (I) reacts with AcCO_2H arising from oxidation of lactic acid (II) giving alanine (III). AcCO_2H added or produced by glycolysis reacts similarly. The breakdown of (I) is not accompanied by change in the NH_3 , NH_2 -N, or total N contents of the muscle. The (I) content of minced pigeon muscle at 37° , under anaerobic conditions and in presence of $\text{CH}_2\text{Br}\cdot\text{CO}_2\text{H}$ decreases by 10—20% in 3 hr., succinic acid (IV) in approx. theoretical yield being produced. The (II) content remains unchanged. Under aerobic conditions there is a 40—60% decrease in the (I) content, small amounts only of (IV) accumulate, an equiv. of (II) disappears, and an equiv. of (III) is produced. Anaerobic breakdown of (I) is increased to 40—60% by addition of AcCO_2H . Probably the transfer of the NH_2 of (I) occurs in tissues other than muscle, α -keto-acids other than AcCO_2H also acting as acceptors. Aspartic acid and possibly other NH_2 -acids also act as NH_2 -donators. W. McC.

Biochemical changes in the fatigued organism. Effect of muscular exercise on the amino- and residual nitrogen contents of the blood. J. M. HEFTER and V. M. KIRJAN (*Biochimia*, 1937, 2, 499—505).—In untrained rabbits, exercise for 5 min. increases the NH_2 -N and residual N contents of the blood. The corresponding changes for trained rabbits are smaller and those for rabbits exercised to complete exhaustion are greater. In man intense exercise of short duration causes no appreciable increase in the vals. W. McC.

Formation of histamine in the organism. P. HOLZ and R. HEISE (*Naturwiss.*, 1937, 25, 201).—A substance (probably histamine) which lowers the blood pressure of cats is formed on incubation for 12—24 hr. under PhMe at 37° of guinea-pig's liver or kidney with histidine. Kidney is 4—6 times more active than liver, whilst skeletal muscle, spleen, and pancreas are without such activity. P. W. C.

Effect of creatine on muscle respiration. V. A. BELITZER (*Biochimia*, 1937, 2, 332—343).—Creatine added to sliced frog muscle (0.4—0.8 g. per 100 g.) acts as a PO_4''' acceptor, doubling the intensity of respiration in 30 min. At the same time the phosphagen (I) content of the muscle increases.

Addition of $\text{CH}_3\text{Br}\cdot\text{CO}_2\text{H}$ (1 : 20,000) does not prevent these changes, but under anaerobic conditions the extent of (I) synthesis is very greatly diminished. Added creatinine and phosphocreatine do not increase the respiration. W. McC.

Biochemistry of excretion of indole and of production of indican. F. BÖHM [with G. GRÜNER and E. BÖHM] (Biochem. Z., 1937, 290, 137—171).—Indole (I) administered to man and animals in amounts \gg a certain limiting dose (varying with the species of animal) is quantitatively excreted as urinary indican (II). (I) above the limit is excreted in the urine partly as a non-volatile substance (5 : 6-dihydroxyindole?). With few exceptions (e.g., indoxyl, indolealdehyde) only those derivatives of (I) having positions 2 and 3 free are converted into (II) in the animal body. *o*-Nitrophenyl (but not *o*-aminophenyl) compounds having an acetylenic side chain (e.g., *o*-nitrophenyl-propionic acid or -acetylene) and *o*-nitroacetophenone are also converted into (II) in the body but these are not first converted into (I). W. McC.

Krebs' theory of urea production. E. S. LONDON and A. K. ALEXANDRI (Biochimia, 1937, 2, 304—311).—Experiments on angiotomised dogs do not confirm the theory (A., 1932, 1059). W. McC.

Metabolism during muscular work. I. Fat metabolism. A. CHARIT and A. SCHRETTTER (J. Physiol. U.S.S.R., 1935, 19, 540—548).—During work the fat content of arterial blood diminishes by an average of 15—16% compared with that during rest. Fat is required not by muscles but by other organs during work. CH. ABS. (p)

Effect of unsaturated linkings and free alcoholic groups on pancreatic digestion of glycerides of higher fatty acids. G. PERETTI (Arch. Fisiol., 1936, 36, 113—120; cf. A., 1936, 1018).—The rate of hydrolysis *in vitro* by pancreatic lipase of various unsaturated fats was independent of their degree of unsaturation. The rate for olein was $<$ that for diolein, which was hydrolysed more slowly than were the fats. Hence the free alcoholic group probably inhibits the action of the enzyme. NUTR. ABS. (m)

Mechanism of absorption of fats and lipins. C. JIMENEZ DIAZ, F. BIELSCHOWSKY, and H. J. CASTRO MENDOZA (Ann. Méd., 1936, 39, 449—460).—In a case of spontaneous chyluria, after large doses of cod-liver oil, only traces appeared in the urine during the first 3 hr., the max. absorption and excretion occurring at 4—7 hr. Frequently high fat content of the urine was accompanied by low blood-fat and *vice versa*, a nervous mechanism being postulated to explain the phenomenon. In blood the cholesterol (I) vals. fluctuated in the same manner as the total fat vals. but in urine the ratio (I) : total fat was 1 : 8.8—1 : 33. Since similar variations occur in lymph the chyluria was possibly due to the communication of urinary and lymphatic channels. The ratio (I) : cholesterol ester was 52.4—63% in urine and 60—74.5% in blood. (I) apparently traverses the intestinal wall in a form resembling that in blood, esterification being effected without direct action of the hepatic cell. NUTR. ABS. (m)

Biochemistry of *Leptinotarsa decemlineata*, Say, during hibernation. R. G. BUSNEL and A. DEILHON (Compt. rend. Soc. Biol., 1937, 124, 916—917).—A marked increase in the lipins was observed preceding hibernation, there being a very gradual decrease during the period of hibernation followed by a rapid decrease during the return to normal.

H. G. R.

Cholesterol metabolism in children with and without endocrine dysfunctions. M. MOLITSCH and S. POLJAKOV (Arch. Pediat., 1936, 53, 613—616).—The total cholesterol (I) content of the serum of normal boys was 81—204 mg. per 100 ml. In 85% of these boys the val. was 100—160 mg., whilst the average for normal boys and boys with endocrine dysfunctions was 130.7 mg. No correlation was found between (I), basal metabolism, and mental level. The fat content of the diet affected the (I) level. NUTR. ABS. (m)

Experimental production of cholesterosis of the gall bladder : cholesterol absorptive properties of the gall bladder wall. L. M. ROUSSELOT and L. BAUMAN (Surg. Gynecol. Obstet., 1935, 61, 585—590).—Solutions of cholesterol (I) in aq. bile salts placed in the gall bladder of dogs were absorbed. No change occurred in the (I) content of the bladder wall. CH. ABS. (p)

Spectroscopic investigation of permeability. Application in hyperthyroidism. J. FROMAN (Biochem. Z., 1937, 290, 241—247).—Methämoglobin (I) is injected into the abdominal cavity of rabbits and the course of absorption of (I) is then followed by spectrophotometric determination of (I) in the blood. In hyperthyroidism the rate of absorption is high.

W. McC.

Vital staining of bones with madder. D. RICHTER (Biochem. J., 1937, 31, 591—595).—When pure specimens of alizarin, ruberythric acid, purpurin, and purpurin-3-carboxylic acid (I) were fed to young rats and pigeons, only (I) gave carmine-stained bones typical of madder-staining. Feeding (I) glucoside (galiosin) had the same effect. The colouring matter of madder-stained bones is extracted, after digestion with HCl, with PhMe and identified spectroscopically as (I) by absorption bands at 565, 532 and 495 m μ .

P. W. C.

Phenolphthalein studies. B. FANTUS and J. M. DYNIEWICZ (J. Amer. Med. Assoc., 1937, 108, 439—443).—Phenolphthalein (I) is excreted in both free and combined forms. The latter, always present in greater amount than the former, can be hydrolysed by prolonged heating with acid. (I) does not cause albuminuria in medicinal doses. P. G. M.

***p*-Aminobenzenesulphonamide.** Absorption, excretion, and determination in blood and urine. E. K. MARSHALL, jun., K. EMERSON, jun., and W. C. CUTTING (J. Amer. Med. Assoc., 1937, 108, 953—957).—*p*- $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$ (I) is excreted in both free and combined forms. Total (I) can be determined after hydrolysis with dil. HCl by a method based on the formation of an azo-dye on coupling diazotised (I) in acid solution with $\alpha\text{-C}_{10}\text{H}_9\text{-NMe}_2$. In dogs (I) is excreted only in the free form. (I) is

also present in the cerebrospinal fluid in concn. similar to that in blood after oral administration.

P. G. M.

Acetylation of *p*-aminobenzenesulphonamide in the animal organism. E. K. MARSHALL, jun., W. C. CUTTING, and K. EMERSON, jun. (*Science*, 1937, **85**, 202—203).—In man and in the rabbit, but not in the dog, the conjugated compound found in the urine after oral administration of $p\text{-NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot\text{NH}_2$ is mainly the Ac derivative.

L. S. T.

Carbohydrate metabolism of the frog. I. Blood-sugar of the frog in summer. II. Glycogen in the liver of the frog in summer. H. S. LEE (*J. Chosen Med. Assoc.*, 1936, **26**, 24, 24—25).—I. The blood-sugar level of the frog in summer was 14—43 mg. per 100 ml. and was not changed by injection of adrenaline (I) or insulin or by exposure to heat or cold or by forced movement.

II. The liver of the frog in summer contained 0.663—0.849% of glycogen; this val. was lowered by administration of (I) and strychnine but to a smaller extent than in warm-blooded animals. It was increased on exposure to cold.

NUTR. ABS. (m)

Metabolism of glycerol and hepatic function. J. A. LEDERER (*Rev. belge Sci. méd.*, 1936, **8**, 373—399).—The glycogen (I) content of liver pulp from healthy dogs and rabbits and from dogs poisoned with P is greatly increased *in vitro* by addition of glycerol (II). Insulin, added at the same time, causes further slight increase. The (I) content of dog's liver is slightly reduced by perfusion with blood containing 1.2% of (II) although the sugar content of the blood is increased and part of the (II) disappears from the blood. The (I) content of the livers of rats, rabbits, and dogs is greatly increased by administration of (II). In healthy and diabetic dogs intravenously injected (II) disappears to the extent of 80% from the blood in 5 min. and the sugar content of the blood is slightly increased. In healthy and Eck fistula dogs and in healthy persons and those suffering from liver disease, ingestion of (II) causes slight increase in blood-sugar. The amount of (II) eliminated in the urine following ingestion of (II) is slightly greater in diseased than in healthy persons. NUTR. ABS. (m)

Centre of carbohydrate metabolism in the dog deprived of humoral and cerebral sugar regulators. A. LE GRAND, J. COUSIN, and P. LAMIDON (*Compt. rend. Soc. Biol.*, 1937, **124**, 1231—1233).—A transitory hyperglycæmia is observed after local stimulation of the floor of the fourth ventricle in the decerebrate dog with the thyroid, adrenal, pancreatic, and pituitary glands removed. H. G. R.

Transformation of adenosine triphosphate in invertebrate muscle. D. FERDMAN, O. FEIN-SCHMIDT, and M. OKUN (*Biochimia*, 1937, **2**, 168—180).—The total $\text{NH}_3\text{-N}$ and NH_3 contents of the claw muscle of fresh-water crayfish remain unchanged during work but the adenosine triphosphate (I) content decreases and the adenylic acid (II) content increases. The inorg. $\text{P}_2\text{O}_7^{4-}$ content of 100 g. of the resting muscle is 0—5 mg., whilst that of the fatigued muscle is 5.1—12.3 mg. (I) is synthesised

and the inorg. $\text{P}_2\text{O}_7^{4-}$ content decreases during recovery. During autolysis (I) is dephosphorylated and (II) (but not inorg. $\text{P}_2\text{O}_7^{4-}$) accumulates. Freezing of the muscle in liquid air causes production of NH_3 but does not affect the (I) content. W. McC.

Oxidation coefficient of lactic acid in the animal world. V. BORSUK (*J. Physiol. U.S.S.R.*, 1935, **19**, 549—562).—The decomp. and resynthesis of glycogen in invertebrates is examined.

CH. ABS. (p)

Enzymic formation of lactic acid in heart muscle. S. OCHOA (*Biochem. Z.*, 1937, **290**, 62—70).—Heart muscle tissue and its extract form lactic acid (I) by the same series of reactions as does skeletal muscle, but the yield of (I) is smaller and the intermediate reactions occur to a smaller extent. The AcCHO mechanism plays no greater rôle than in ordinary muscle.

P. W. C.

Lactate and pyruvate in blood and urine after exercise. R. E. JOHNSON and H. T. EDWARDS (*J. Biol. Chem.*, 1937, **118**, 427—432).—The lactic acid (I) and AcCO_2H (II) (isolated as 2:4-dinitrophenylhydrazones) recovery curves for blood and urine in young men after strenuous exercise are similar in shape but (II) is present to a much smaller extent than is (I). This gives support in experiments *in vivo* to the Embden-Meyerhof scheme of muscle glycolysis (*A.*, 1936, 1406).

P. W. C.

Metabolism of ketonic acids in animal tissues. H. A. KREBS and W. A. JOHNSON (*Biochem. J.*, 1937, **31**, 645—660).— AcCO_2H (I) is metabolised by animal tissues to AcOH , CO_2 , and lactic, succinic, and β -hydroxybutyric acid. Octyl alcohol, As_2O_3 , and $\text{CH}_3\text{I}\cdot\text{CO}_2\text{H}$ inhibit the dismutation of (I), whilst reduced glutathione, insulin, glucose, 0.02M-*dl*-lactate, acetate, fumarate, glutamate, malonate, and tartrate, and NH_4Cl have no effect. Other ketonic acids behave similarly to (I). Ketonic compounds are intermediates in both fat and carbohydrate metabolism.

P. G. M.

Decomposition of α -keto-acids in the animal organism. P. E. SIMOLA and K. PUUTULA (*Suomen Kem.*, 1937, **10**, B, 7—8).—Anaerobic CO_2 evolution from rat brain, kidney, and liver is increased by addition of AcCO_2H and $\text{CO}_2\text{H}\cdot[\text{CH}_2]_2\cdot\text{CO}\cdot\text{CO}_2\text{H}$, whilst aerobic brain and kidney show a greatly increased O_2 uptake. Anaerobic decomp. of the acids is due to carboxylase, and the aerobic to a sp. oxidase system.

M. H. M. A.

Post-mortem change in liver. K. MOMONOI (*Okayama-Ig-Zasshi*, 1935, **47**, 1480—1495).—Residual N, P, and S in rabbit liver increased with time after death (until 40—50 days) at rates which varied with environmental conditions.

CH. ABS. (p)

Effect of the intake of calcium on the blood-iodine level. J. THOMPSON (*Endocrinol.*, 1936, **20**, 809—815).—Blood-I is decreased in rats by Ca in the diet, dietary I being kept const. Dietary I when high shows no close relation to blood-I, and its variation does not affect serum-Ca. Disturbance of the Ca:I ratio of the diet beyond certain limits causes symptoms resembling goitre in rats on I-poor diets, and

iodism in animals given much I and little Ca. Blood-I is not the determining factor in iodism. R. N. C.

Nutritional and biochemical effects of a low-calcium diet on sheep. I. Nutritional. II. Biochemical. III. Analyses of bones. M. C. FRANKLIN (Univ. Cambridge, Inst. Animal Path., Fourth Rep. of Director, 1934—35, 111—178).—Ewes ate approx. 700—800 g. of maize and 150—200 g. of hay daily and lambs about 3100 g. of maize and 1400 g. of hay weekly. The daily CaO intake of the sheep was 1.36—2.75 g. (sheep require 5—7 g. daily). The wt. increase of the lambs was very slow. Sheep adapt themselves very quickly to a mineral-deficient ration and such deficiency does not affect the digestibility of the org. constituents. The ration lowers the blood-Ca, raises the inorg. P and Mg of the blood, and reduces the content of inorg. constituents in the bones. The ratio of diffusible to non-diffusible Ca in the blood is unaltered. NUTR. ABS. (m)

Bile acids in calcium metabolism. X. Calcium and potassium contents of the liver of splenectomised rabbits. M. IWADÔ (Arb. med. Fak. Okayama, 1936, 5, 91—95).—After splenectomy the Ca and K contents of the liver of rabbits appear to increase. Individual variations are large.

NUTR. ABS. (m)

Biochemistry of copper. XIII. Changes in blood-copper during experimental hæmolytic anæmia. XIV. Accumulation of copper in the mongolian spot. S. NARASAKA. XV. Blood-copper and sexual phenomena. U. SARATA. XVI. Copper content of black and white hairs of aged people. H. YOSIKAWA. XVII. Copper and the pigmentation of leaves and flowers. XVIII. Variations in copper content of assimilative and reproductive organs during the development of plants. U. SARATA. XIX. Influence of copper on the oxidation quotient of urine. S. YOSIDA (Japan. J. Med. Sci., 1937, II, 3, 159—162, 175—178, 179—187, 195—196, 197—205, 207—210, 221—226; cf. A., 1936, 239).—XIII. Anæmia induced in rabbits by injection of $\text{NHPh}\cdot\text{NH}_2$ is accompanied by an increased blood-Cu to an extent approx. \propto that of the anæmia.

XIV. The mongolian spot of the skin of infants dying at birth is associated with a Cu content $>$ that of the normally pigmented skin.

XV. The blood-Cu is increased above normal vals. in hens during brooding and in dogs during œstrus and gestation; the distribution of Cu between cells and plasma is unchanged.

XVI. Depigmentation of hair with old age is associated with a diminution of Cu content.

XVII. Data for the distribution of Cu in different parts of various plants are tabulated. With a type of cabbage, the highest Cu content occurs in the young centre leaves whilst the green outer leaves contain $<$ the white inner leaves. A relationship appears to exist between Cu content and pigmentation of leaves and flowers, but the differences in distribution of Cu in chlorotic and variegated plants are not regular.

XVIII. Data for the Cu content of different parts of *Pæonia moutan* during growth and maturity indicate considerable fluctuations during the growth of

the fruit and that Cu plays an important rôle in the reproductive processes.

XIX. The oxidation quotient (Muller, A., 1927, 996) of the urine of rabbits is not affected by intravenous injection of 0.2 mg. of Cu (as aq. CuSO_4) per kg. The quotient increases after feeding. F. O. H.

Assimilation of iron in the course of embryonic development of chicken. A. SZEJNMAN-ROZENBERG (Acta. Biol. exp., 1933, 8, 32—44).—The daily abs. increase in Fe assimilation of the whole chick embryo shows max. on the 12th and 18th days and a min. in 15—16 days, at which Fe imbibition is completely inhibited. This inhibition coincides with intensive increase in dry matter and albuminoids. The ratio of Fe in body : Fe in membrane shifts continuously in favour of the body. The % of Fe in liver is approx. the same as that in the whole embryo. Approx. 96% of the Fe in the egg is assimilated during hatching. CH. ABS. (p)

Iron metabolism and hæmatopoiesis in the dog after total gastrectomy. G. FONTÈS, J. KUNLIN, and L. THIVOLLE (Sang, 1936, No. 4, 433—445).—After gastrectomy there is an immediate decrease in wt. and in the hæmoglobin (I) and erythrocyte content of the blood, then rapid recovery of all three without reaching initial levels (this stage lasts approx. 6 months), and finally gradual decrease of wt. and blood indices, (I) content decreasing more rapidly than erythrocyte content so that a progressive hypochromic anæmia develops. At death, at 11—14 months, there is no Fe reserve in liver or spleen. Addisin, if it exists, is not necessary for blood formation. It is the absence of gastric HCl which, through failure of ionisation of Fe, leads to secondary hypochromic, not to pernicious, anæmia. Achylia causes hypochromic, but cannot explain the occurrence of pernicious, anæmia.

NUTR. ABS. (m)

Significance of chlorides in tissues and animals L. IRVING and J. F. MANERY (Biol. Rev., 1936, 11, 287—310).—All or almost all the Cl of animal tissue is ionisable chlorides, chiefly of Na and K. The animal organism contains no appreciable reserves of Cl' and Cl' depletion rapidly leads to serious disorders which can often be checked by administration of NaCl. During embryonic development the Cl' concn. of the tissues decreases, but that of bases probably remains const., the loss of Cl' being balanced by production of new HCO_3' , PO_4''' , and protein. Decrease in Cl' concn. accompanies specialisation of function, the concn. in adult tissues and fluids being inversely \propto their degree of specialisation. Theories of membrane equilibria do not explain the loss of Cl' during growth. Cl' does not participate in oxidative reactions but acts as a relatively inert complement to other anions. The Cl' concn. in tissues and fluids is a useful initial indicator of the electrolyte composition of a system or of change in this composition. Tables showing the Cl' , total base, and H_2O content of tissues and fluids, the electrolyte composition of tissues, and the changes in Cl' content during early development are given, and two figures show the anionic composition of tissues, fluids, and developing eggs. NUTR. ABS. (m)

Phosphorus in the early development of the frog. M. A. ZIELIŃSKI (Acta Biol. exp., 1935, 9, 131—144).—The inorg. PO_4''' content of 100 unfertilised frogs' eggs was 0.004 mg. For the first 60—80 hr. after fertilisation this increased at the expense of the labile P, while the total acid-sol. P remained const. After this time, which coincided with the commencement of increased activity of the tadpole, all the P fractions increased.

NUTR. ABS. (m)

Phosphorus deficiency metabolism and food utilisation in beef heifers. M. KLEIBER, H. GOSS, and H. R. GUILBERT (J. Nutrition, 1936, 12, 121—153).—P deficiency had no influence on body-temp., digestibility and availability of food energy, R.Q., or fasting metabolism but decreased the partial efficiency of energy utilisation and the efficiency of food protein in sparing body-protein. The total efficiency of energy utilisation was decreased mainly by lowering the appetite and also by decreasing the partial efficiency but without influencing fasting catabolism.

A. G. P.

Rôle of phosphate in the anaërobic metabolism of muscle. J. WAJZER and R. LIPPMANN (Compt. rend. Soc. Biol., 1937, 124, 1090—1091).—The rôle of PO_4''' is antagonistic to that of K^+ . H. G. R.

Use of isotopes as indicators in biological research. A. KROGH (Science, 1937, 85, 187—191).—An address. L. S. T.

Exchange of hydrogen between the free water and the organic substances in the living organism. A. KROGH and H. H. USSING (Skand. Arch. Physiol., 1936, 75, 90—104).—The exchange of H for D in ovalbumin *in vitro* and in sprouting peas, frogs, rats, and mice was studied by supplying D_2O and determining the ratio of D_2O in the water formed by combustion of the dry tissue to that in the free H_2O of the fresh tissue. In all cases the $[\text{D}_2\text{O}]$ of the free water was the same in all tissues. In most tissues equilibrium was attained in a few days and was maintained for a long time in tissues kept cold. In the living organism a change in $[\text{D}_2\text{O}]$ was fairly rapidly followed by establishment of the new equilibrium except in the muscles, where absorption of D_2O proceeded slowly. The rate was increased in muscles by muscular activity. Possibly the muscle proteins take part in the mechanism of contraction, one or a few at. groups reacting in such a way that exchange can occur. Subsequent internal changes in the protein mol. then permit repetition of the exchange. In the animal body little or no exchange occurs in the fats and hence it is in the proteins that the process chiefly occurs.

NUTR. ABS. (m)

Supersonics in chemistry [biological effects].—See A., I, 319.

Phosphatide auto-complex conservates as ionic systems and their relation to the protoplasmic membrane. II.—See A., I, 301.

Biological effect of centimetre waves. S. J. TURLIGUIN (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 433—436).—The oscillations of a generator of frequency 1.5×10^{10} cycles ($\lambda = 2$ cm.) accelerated the growth of asters by 20—45%.

P. W. C.

Biological action of radiation from radioactive substances. II. Effect of β - and γ -radiation from monazite sand and samarskite on the rate of growth and the œstrus cycle of mice. Y. KIMURA (Sci. Papers Inst. Phys. Chem. Res. Tokyo, 1937, 31, 229—243; cf. A., 1935, 1539).—Growth is retarded by the β - and γ -radiations from monazite sand, but not by those from samarskite. There is no effect on the œstrus cycle. J. L. D.

Influence of ultra-violet irradiation on frog and *Limulus* hearts subjected to potassium excess. S. A. GUTTMAN (J. Cell. Comp. Physiol., 1936, 8, 37—40).—Hearts which had stopped beating through application of excess of K could be started again by ultra-violet irradiation; those stopped by excess of Ca could not. Possibly the ultra-violet light causes a change in permeability and a shift in the K—Ca equilibrium. M. A. B.

Effect of potassium on cold blocking of spider crab nerve. H. N. ETS (J. Cell. Comp. Physiol., 1936, 8, 101—108).—Immersion of the nerve in NaCl-KCl-CaCl_2 solution containing 0.066% of KCl (normal solution) lowered the temp. of blocking, the extent of lowering depending on time of immersion. For a given time of immersion, blocking temp. was higher with a higher [KCl]. With 0.310% KCl loss of irritability occurred; this effect could be reversed by placing in the normal solution again. M. A. B.

Variation in the concentration of potassium and calcium ions in cholinergic and adrenergic perfusates obtained by stimulation of the vago-sympathetic trunk. N. GAVRILESCU and N. IONESCU (Compt. rend. Soc. Biol., 1937, 124, 971—972).— $[\text{K}^+]$ is increased by vago-sympathetic stimulation, the increase being greater in the cholinergic perfusate. H. G. R.

Effect of sodium chloride on the imbibition of natural organic colloids in solutions of non-electrolytes. D. KOHLER (Compt. rend. Soc. Biol., 1937, 124, 1086—1088).—The coeff. of imbibition of *Laminaria* in a mixture of NaCl and non-electrolyte is < the calc. val. or the val. for the separate constituents. On varying the ratio of the constituents, a min. val. for the coeff. is obtained. H. G. R.

Detection of gold in brain and foetuses of animals injected with Sanocrysin. W. J. ROBERTS (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 207—216; cf. A., 1935, 1290).—The distribution of Au in treated rabbits, rats, and mice is examined. The transport of Au in the body is discussed.

A. G. P.

Effects of a high manganese content in the diet of animals with special reference to lactation tetany. F. BLAKEMORE, J. A. NICHOLSON, and J. STEWART (Vet. Rec., 1937, 49, 415—422).—Pasture grasses associated with outbreaks of lactation tetany contained abnormally large proportions of Mn. Oral administration of sub-lethal doses of Mn decreased blood-Mg and increased blood-Mn. Repeated treatment with Mn did not depress blood-Mg indefinitely.

A. G. P.

Mercury inunctions. T. SOLLMAN, H. N. COLE, and N. F. SCHREIBLER (Arch. Dermatol. Syphilol.,

1935, 32, 242—257).—Metallic Hg in 50% ointments was the most effective. Hg oleate was as well absorbed. Colloidal Hg was not absorbed. Urinary excretion of Hg⁺ was greater in whites than in negroes.

CH. ABS. (p)

Influence of metallic compounds on growth and histological picture of fibroblast cultivated *in vitro*. Y. NAKAZAWA (*Folia Pharmacol. Japon.*, 1935, 21, 49—69).—Small concns. of NiCl₂, CoCl₂, MnSO₄, alum, and Na₂WO₄ increase, and larger concns. decrease, the growth of fibroblast. K₂CrO₄ is inhibitory at all concns.

CH. ABS. (p)

Effect of asphyxia on the sinus and conducting tissue of the frog heart. G. KINGISSEPP (*Quart. J. Exp. Physiol.*, 1935, 291—302).—Differences in the effects of asphyxia in normal and CH₂I·CO₂H-poisoned hearts are attributable to the production of lactic acid in the former but not in the latter case.

CH. ABS. (p)

Effect of organic ions on the membrane potential of nerves. W. WILBRANDT (*J. Gen. Physiol.*, 1937, 20, 519—541).—Increased osmotic pressure raises, and decreased osmotic pressure lowers, the resting potential of frog's sciatic nerve in accordance with the assumption of a membrane potential. Both cations and anions have a definite effect on this potential. The efficacy of org. cations ranges between that of Na and K, that of both org. and inorg. anions being much weaker. The effect of anions shows that the nerve membrane is not completely permeable to anions whilst it is highly permeable to cations.

E. A. H. R.

Influence of certain hydrotropic and other substances on fat absorption. M. H. IRWIN, J. WEBER, and H. STEENBOCK (*J. Nutrition*, 1936, 12, 365—371).—Ingestion of considerable amounts of H₂O, bile salts, NaOBz, EtOH, peptone, sucrose, KCl, CaCl₂, NaH₂PO₄, glycerol, or Na glycerophosphate decreases the rate of fat absorption by rats. Small amounts had little effect.

A. G. P.

Hypoglycæmic action of pyruvic acid. S. KAMIYA (*Japan. J. Med. Sci.*, 1937, II, 3, 171—173).—Small doses (0.1—2.6 g.) of AcCO₂H, intravenously injected, lower the blood-sugar in rabbits.

F. O. H.

Action of "βγ-hexenol," a constituent of raw leaves of *Thea sinensis japonica*; comparison with hexyl alcohol. I. General toxic manifestation: action on cold- and warm-blooded animals. S. MURAKAMI (*Folia Pharmacol. Japon.*, 1935, 21, 131—140).—Intravenous administration of "βγ-hexenol" as an emulsion in gum acacia decreases respiration and voluntary movements. Its action resembles that of hexyl alcohol.

CH. ABS. (p)

Effects on the rabbit of repeated large intravenous doses of glucose. H. E. HARDING (*Guy's Hosp. Rep.*, 1935, 85, 372—376).—Repeated heavy injections of glucose (I) produced severe loss in wt. of rabbits due to dehydration of the tissues. This was prevented by oral administration of dil. saline solution. Changes in blood-sugar following the injections are recorded; of the injected (I) 80—90% was retained.

CH. ABS. (p)

Relationship between cholesterol and vascular sclerosis. S. ZURUKZOGLU and O. MÜNDEL (*Z. Vitaminforsch.*, 1937, 6, 125—129).—Inunction of rabbits with cholesterol-vaseline-turpentine ointment produces slight thickening of the intima and fat deposition in the intima and interna elastica of the aorta, whilst that with lanolin produces calcification of the aorta. The effects are accentuated by ultra-violet irradiation (cf. Gordonoff *et al.*, A., 1933, 435).

F. O. H.

Calcium deposits in nerve cells of white rats after injections of urea and cholesterol. R. C. MACCARDLE (*Anat. Rec.*, 1936, 67, 81—85).—Intraperitoneal injections of cholesterol (I) or urea cause Ca deposition in the ganglion cells of the medulla oblongata and the motor cells of the spinal cord. Cryst. (I), and possibly urea, are deposited in cytoplasmic vacuoles. Ca deposition is usually preceded by fatty accumulation, but Ca soap formation cannot be detected. Urea is considered to favour Ca pptn. by stimulating a higher alkalinity.

R. N. C.

Sulphæmoglobinæmia following sulphanilamide treatment. G. DISCOMBE (*Lancet*, 1937, 232, 626—627).—Case reports. Sulphæmoglobinæmia is a commoner result of treatment with p-NH₂·C₆H₄·SO₂·NH₂ than is generally recognised.

L. S. T.

Peptone shock. C. A. DRAGSTEDT and F. B. MEAD (*J. Pharm. Exp. Ther.*, 1937, 59, 429—436).—Histamine (I), or a substance closely resembling it, appears in the blood and occasionally also in the thoracic lymph of dogs as a result of peptone (II) shock. It is more probable that the shock is due to liberation of (I) from the tissues than to direct toxic action by (II).

W. McC.

Megakaryocytes in circulating blood of rabbits inoculated with benzene and with saponin. E. M. MEDLAR (*Folia Hematol.*, 1935, 53, 397—406).—Saponin causes a greater change in blood-picture than does C₆H₆. Megakaryocytes are markedly increased after a few days.

CH. ABS. (p)

Pharmacological action of coumarin. K. RAI (*Folia Pharmacol. Japon.*, 1935, 21, 86—101).—

CH. ABS. (p)

[Pharmacology of] phenolphthalein. Urine analysis. B. FANTUS and J. M. DYNIEWICZ (*J. Amer. Pharm. Assoc.*, 1937, 26, 236—239).—Administration of medicinal doses of phenolphthalein (I) to men is always followed by the occurrence of albumin and conjugated (I), but seldom of free (I), in the urine; with larger doses, the occurrence of free (I) is more frequent.

F. O. H.

Action of dinitrophenol and insulin on the metabolism of ethyl alcohol. H. W. NEWMAN and W. C. CUTTING (*J. Clin. Invest.*, 1935, 14, 945—948).—Dinitrophenol (1 in 5—20 × 10⁶) increased the rate of metabolism of EtOH by rat-liver tissue *in vitro*. Insulin (I) and (I)-free pancreatic tissue affect the oxidation of EtOH in the absence of liver tissue. The factor responsible for this action is discussed.

CH. ABS. (p)

Synergic calorogenic actions of adrenaline and dinitrophenol. V. E. HALL and P. E. CHAMBERLIN

(J. Pharm. Exp. Ther., 1937, 59, 451—457).—In anæsthetised cats, the increased rate of O_2 consumption caused by intramuscular injection of 1:2:4- $OH \cdot C_6H_3(NO_2)_2$ (I) is reinforced by previous or simultaneous infusion, at physiological rate, of adrenaline (II), the effect being $>$ the sum of the effects produced by (I) and (II) given separately.

W. McC.

Experimental convulsions induced by administration of thujone. Influence of the autonomic nervous system on these convulsions. H. M. KEITH and G. W. STAVRAKY (Arch. Neurol. Psychiat., 1935, 34, 1022—1040).—Sympathetic stimulants [adrenaline, pitressin, nicotine (I), histamine] increased and parasympathetic stimulants (acetylcholine, acetyl- β -methylcholine, pilocarpine, eserine) tended to prevent the convulsions. Atropine abolished the effect of parasympathetic drugs but had no action on convulsions. Large doses of (I) and ergotamine prevented the convulsions in some cases.

CH. ABS. (p)

Physiological action of 6-tetralon and its hydrogenated derivatives. H. R. KANITZ and H. BLESS (Arch. Hyg. Bakt., 1937, 117, 321—331).—6-Tetralon (2-ketotetrahydronaphthalene) when injected subcutaneously or given orally as bisulphite to rats causes a rapid lowering of body temp. to about 28° . 0.0005*M* is toxic but not lethal. A related anthracene derivative (1-oethracenon) possesses similar properties, but hydrogenated derivatives of anthracene and phenanthrene are inactive.

W. L. D.

Allergic phenomena produced by aromatic amines. F. NITTI, D. BOVET, and F. DEPIERRE (Compt. rend. Soc. Biol., 1937, 124, 1164—1166).—The activity of *p*- $C_6H_4(NH_2)_2$ is due to the reactivity of *p*-(NH_2) $_2$. It is decreased by electro-negative groups in the *o*-position and is either not affected or is increased by electro-positive groups.

H. G. R.

Therapeutic action of arsenobenzene associated with sodium dehydrocholate. L. JACCHIA and G. TRUFFI (Arch. Dermatol. Syphilis, 1934, 170, 550—571).—Na dehydrocholate has a favourable influence in As therapy.

CH. ABS. (p)

Application of hydrotropy to acceleration of hydrolysis of Yperite. B. ZAWADZKI (Przemysl Chem., 1935, 19, 239—245).—The solubility in H_2O and the degree of hydrolysis in solution of $(CH_2Cl \cdot CH_2)_2S$ (I) are greatly increased by bile salts, particularly in presence of $NaHCO_3$, which has no action in their absence. The solubility of (I) in horse serum is $<$ in H_2O , but is also increased by hydrotropic substances.

R. T.

Liver-glycogen in starvation. Effect of nucleic acid, bile acid, and insulin. Effect of nucleic acid with or without cholic acid on fasting blood-sugar. Production of bile acids in the dog. Effect of cholic acid and cholesterol on regeneration of glycogen in the liver after administration of egg white or edestin. T. FUKASE (Arb. med. Fak. Okayama, 1936, 5, 116—123, 124—128, 129—138, 139—144).—I. The glycogen (I) content of the liver in fasting rabbits is increased by administration

of cholic acid (II) by ingestion of nucleic acid (III), and by the simultaneous administration of (II) and (III). Injection of insulin produces a high (I) content.

II. (III) given alone by mouth to fasting rabbits has no effect on the blood-sugar level, but in conjunction with intravenous injection of (II) it appears to increase slightly the hypoglycæmic effect of (II). Parenteral administration of (III) does not affect the hyperglycæmic effect of ingested glucose.

III. In dogs with a bile fistula, ingestion of egg yolk, raw or cooked, or its Et_2O extract causes increased secretion of bile, the total dry wt., ash, and taurocholic acid content increasing. The $EtOH$ extract has the same effect, but to a smaller degree. Egg white has no influence on bile secretion.

IV. The production of (I) in the liver of fasting rabbits is stimulated by the ingestion of egg white or edestin (IV). Simultaneous ingestion of (II) increases the effect of the egg white but scarcely affects that of the (IV). Administration of cholesterol does not influence the effect of egg white.

NUTR. ABS. (m)

Synergy of adrenaline and acetylcholine on pulmonary blood vessels in rabbits. G. H. ETTINGER and G. E. HALL (Quart. J. Exp. Physiol., 1935, 25, 259—265).—In perfused blood vessels repeated injections of acetylcholine produce a condition in which the muscles fail to respond to the normal constricting influence. Sensitivity is restored by adrenaline, Ba, or histamine.

CH. ABS. (p)

Influence of certain fruits on faecal flora and intestinal reaction in diets of rats. W. B. ESSELEN, jun. (Food Res., 1937, 2, 65—72).—Addition of cranberry, bilberry, and apple to the diet reduced the nos. of faecal gas-producing organisms and *Escherichia coli*, decreased intestinal putrefaction (Bergeim Fe_2O_3 -reduction test), and increased the $[H^+]$ of the contents of the large intestine and cæcum.

E. C. S.

Fractionation of substances which intervene in the optical pigmentation of *Drosophila melanogaster*. Y. KHOUVINE and B. EPHRUSSI (Compt. rend. Soc. Biol., 1937, 124, 885—887).—The dialysable portion of the nitrogenous fraction obtained from an extract of the pupæ of *Calliphora erythrocephala* is most active.

H. G. R.

Manometric studies on the effect of tissue extract on calcium precipitation. A. LASNITZKI (Biochem. J., 1937, 31, 706—710).—Liver and kidney extracts and dil. serum inhibit Ca pptn. in aq. 0.018*M*- $CaCl_2$ containing $NaHCO_3$ and CO_2 in physiological concn. at 37° .

P. G. M.

Stimulating materials obtained from injured and killed cells. J. C. FARDON, R. J. NORRIS, J. R. LOOFBOUROW, and M. V. RUDDY (Nature, 1937, 139, 589).—Living cells injured or killed by ultra-violet light produce substances that stimulate respiration etc. Irradiated yeast, liver, kidney, and embryo tissues give active substances which pass through a Seitz filter or a dialysing membrane. The different degrees of potency with regard to stimulation of respiration, proliferation, and fermentation observed

suggest the existence of at least three substances responsible for the effects. L. S. T.

Vinyl ether anaesthesia in dogs. W. BOURNE and B. B. RAGINSKY (Brit. J. Anaesthesia, 1935, 12, No. 2, 62—69).—Liver function was not disturbed by the anaesthetic. CHEM. ABS. (p)

Vinyl ether obstetrical anaesthesia for general practice. W. BOURNE (Canad. Med. Assoc. J., 1935, 33, 629—632).—Given a closed system with O₂ vinyl ether gives satisfactory results. CH. ABS. (p)

cycloPropane: a new gas anaesthetic. Report of 120 cases. G. S. MECHLING (J. Oklahoma State Med. Assoc., 1935, 28, 436—439).—*cycloPropane* (I) is a safe inhalation anaesthetic. The explosive range with O₂ is 25–75 to 71–29 vol.-% of (I) and O₂, respectively. CH. ABS. (p)

Local anaesthetics from cytosine. H. R. ING and R. P. PATEL (J. Pharm. Exp. Ther., 1937, 59, 401—412; cf. A., 1937, II, 80).—The conversion of cytosine into its *N*-alkyl esters (7 tested) is accompanied by the development of local anaesthetic properties comparable with those of cocaine and by the disappearance of the nicotine-like properties. W. McC.

Synthesis of new local anaesthetics.—See A., II, 243.

Leucocytosis following inhalation anaesthesia. I. B. TAYLOR and R. M. WATERS (Anesthesia and Analgesia, 1935, 14, 276—281).—Effects of Et₂O, N₂O, C₂H₄, and *cyclopropane* are described. CH. ABS. (p)

Rôle of fats and lipins in blood during absorption of some indifferent narcotics. A. I. BRUSILOVSKAJA (J. Physiol. U.S.S.R., 1935, 19, 587—593).—The amounts of fats and lipins in blood of dogs and rabbits do not influence the absorption of C₆H₆ or benzene by the lungs, or the concn. of these in blood. CH. ABS. (p)

Effects of narcotics on tissue oxidations. M. JOWETT and J. H. QUASTEL (Biochem. Z., 1937, 31, 565—578).—The effect of luminal (I), chlorotone (II), and evipan on respiration of tissue slices is investigated. With brain, the respiration is more sensitive to (I) in presence of glucose, lactate (III), and pyruvate (IV) than of other substrates. The inhibition of respiration tends to be independent of time when [K⁺] is high and increases with time when it is low. The inhibition due to (II) develops rapidly and has no temp. coeff. The substrate concn. does not influence the inhibition of respiration and the variation of the inhibition with the narcotic concn. follows a sigmoid curve. With liver, kidney, and diaphragm, oxidation is inhibited both when no substrate is added and in presence of certain substrates, e.g., (IV). Narcotics inhibit the oxidation of butyrate by liver, of (III) to (IV) by brain, and the oxidative deamination of alanine by kidney. Narcotic concns. which produce narcosis *in vivo* are of the same order of magnitude as those which inhibit measurably the respiration of the cerebral cortex *in vitro*. P. W. C.

Chemotherapy of synthetic hypnotics. (SIR) U. N. BRAHMACHARI (J. Indian Chem. Soc., 1937, 14, 1—12).—A review (presidential address). E. W. W.

Delayed heat production of caffeinised frog muscles. G. SASLOW (J. Cell. Comp. Physiol., 1936, 8, 89—99).—0.02—0.05% caffeine-Ringer solution greatly increased the resting heat rate of frog sartorii in O₂ and the tension produced by stimulation. Little delayed heat was produced after a response; this may be due to utilisation of the energy from exothermic processes, continuously taking place at a very high level, to reverse other exothermic processes closer to the primary process in contraction. M. A. B.

Antagonism between atropine, acetylcholine, and acetyl-β-methylcholine on the dog's or cat's heart *in situ*. F. BAYLESS and H. HANDOVSKY (Compt. rend. Soc. Biol., 1937, 124, 988—991).—The antagonism between atropine and acetylcholine and its derivatives depends on the relative rates of decomp. and penetration of these substances. H. G. R.

Antagonism between acetylcholine and strychnine in the crayfish. V. BONNET (Compt. rend. Soc. Biol., 1937, 124, 996—998).—Acetylcholine antagonises strychnine only if it is injected first. H. G. R.

Influence of some drugs of the cocaine group *in vitro* on cultures of fibroblast. K. SAITO (Folia Pharmacol. Japon., 1935, 21, 1—12).—Cocaine, procaine, tropacocaine, alypine, and tutocaine depress growth of fibroblast. CH. ABS. (p)

Reaction of the embryonal chick heart to cocaine, procaine, tropacocaine, tutocaine, alypine, psicaine, and β-eucaine with special reference to the development of the heart. K. MIZUGAKI (Folia Pharmacol. Japon., 1935, 21, 102—113).—The drugs depress the 2-day embryonal heart and act more strongly as age increases. CH. ABS. (p)

Pharmacology of an alkaloid isolated from Chinese fengfangchi. L. P. KING and Y. K. SHIH (Bull. Nat. Acad. Peiping, 1935, 6, No. 3, 13—50).—The isolation of the alkaloid *fangchinine* (m.p. 218°, [α]_D²⁰ +268.7°, is described. The physiological action resembles that of other alkaloids of Menispermaceae but is more intense. CH. ABS. (p)

Influence of harmine on blood picture and hydrogen-ion concentration of rabbit blood. R. UCHIBASHI (Folia Pharmacol. Japon., 1935, 21, 76—85).—In normal rabbits harmine (I) decreases plasma-Ca and -p_H. Atropine has no influence on this action. No change occurs when (I) is given after yohimbine or after double splanchnectomy. CH. ABS. (p)

Metycaine. AXON. (J. Amer. Med. Assoc., 1934, 102, 456).—Metycaine, the hydrochloride of γ-2-methylpiperidinopropyl benzoate, is compared with procaine; intravenously it is about three times as toxic. CH. ABS. (p)

Action of medicines on auricular fibrillation. I. Influence of hydroquinine, hydroquinidine, quinine, and hydroquinidine-free quinidine on auricular fibrillation in cats. S. DE BOER and

H. H. J. HOLTOAMP. II. Action of hydroquinidine, quinidine, hydroquinine, and quinine. S. DE BOER and A. BROUWER (Proc. K. Akad. Wetensch. Amsterdam, 1936, 39, 266—271, 1937, 40, 77—82).—I. Previously recorded anti-fibrillation effects of quinine and quinidine are in part attributable to hydro-quinine and -quinidine present in earlier samples.

II. Quinine and quinidine are at least as effective in preventing auricular fibrillation in cats as the corresponding hydro-derivatives. M. H. M. A.

Detection of strychnine in carcasses and corpses. D. G. STEYN (Onderstepoort J. Vet. Sci., 1935, 5, 139—174).—A review and discussion.

CH. ABS. (e)

Potency of the cardiac glucosides calotropin, α -antiarin, emicymarin, folinerin, and sarmenocymarin. K. K. CHEN, R. C. ANDERSON, and E. B. ROBBINS (J. Amer. Pharm. Assoc., 1937, 26, 214—218).—Data for the pharmacological response in cats and frogs are tabulated. Calotropin has a potency equal to that of ouabain, α - is less potent than β -antiarin, folinerin has a high emetic action, whilst sarmenocymarin has a potency in cats similar to that of digoxin. F. O. H.

Constitution of marinobufagin, cinobufagin, and gamabufagin.—See A., II, 254.

Comparative toxicity and elimination of some constituents of derris. A. M. AMBROSE and H. B. HAAG (Ind. Eng. Chem., 1937, 29, 429—431).—The lethal oral dose of rotenone, per kg. body-wt., was 3.0 g. for rabbits, 0.6 g. for rats, and 0.06 g. for guinea-pigs. Toxic doses for guinea-pigs of other constituents were: deguelin 1.0 g., toxicarol 0.5 g., dehydrorotenone > 1.5 g., and dihydrorotenone 0.15 g. With rabbits and rats 1.5 g. of these substances showed little or no effect. Derris constituents are probably excreted unchanged in the faeces.

L. D. G.

New group of alimentary constituents (alitoxins) and their pathological effects. L. A. TSCHERKES (J. Physiol. Path. gén., 1936, 34, 808—814).—In mice on a diet consisting mainly of cereals or beans with addition of milk, yeast, and cod-liver oil, symptoms appeared similar to those of vitamin- B_2 deficiency and pellagra in man but which neither yeast nor $-B_2$ cure. Probably the cause is some sp. constituent (alitoxin) of foods. Some alitoxins are destroyed by heat, and all are destroyed by HCl.

NUTR. ABS (m)

Treatment of aspirin poisoning by intravenous sodium lactate solution. S. W. WILLIAMS and R. M. PANTING (Brit. Med. J., 1937, 550—552).—The toxicity of aspirin (I) is due to an acidosis and possibly to direct action of salicylic acid on the respiratory centre. Alkalis increase the absorability of (I). A. G. P.

Biological testing of tryparsamide. L. LAUNOY and M. PRIEUR (Bull. Soc. Path. exp., 1935, [v], 28, 389—398).—The tests depend on observations of survival periods. CH. ABS. (p)

Structure and toxicity of arsinic acids of the diphenylamine series.—See A., II, 267.

Toxicology of cobalt. F. CAUJOLLE and S. LAFFITE (J. Pharm. Chim., 1937, [viii], 25, 352—371).—Toxicity in dogs is produced only by large doses of Co salts. Urinary elimination is slow whilst the bile is an important vehicle of excretion. In severe Co poisoning, Co accumulates mostly in the liver, and, to a smaller extent, in pancreas, kidney, and brain. Methods for the determination of Co in tissues etc. are discussed. R. M. M. O.

Cobalt salts as prophylactic and therapeutic antidotes in cyanide poisoning. V. M. ROSHKOV, N. S. STEPANENKO, and K. M. USOVA (J. Physiol. U.S.S.R., 1935, 12, 582—584).— $\text{Co}(\text{NO}_3)_2$, CoCl_2 , and CoSO_4 act as antidotes for HCN poisoning in white mice. CH. ABS. (p)

Methæmoglobin builders as antidotes in fluoride poisoning. O. G. VINOGRADOVA and V. M. ROSHKOV (J. Physiol. U.S.S.R., 1935, 19, 585—586).—Methæmoglobin produced by injection of NaNO_2 into F-poisoned mice combines with F' and lowers blood- F' . CH. ABS. (p)

Chronic lead poisoning in early childhood. H. H. DONNALLY, C. A. SCHUTZ, and A. NIEMETZ (Virginia Med. Month., 1935, 62, No. 2, 83—89).—In cases examined Pb poisoning diminished the δ of the ends of rapidly-growing bones. X-Ray diagnosis was successful. CH. ABS. (p)

Acute mercury poisoning in a respiration chamber. H. CHRISTENSEN, M. KROGH, and M. NIELSEN (Nature, 1937, 139, 626—627).—Symptoms of Hg poisoning result from the presence of Hg spilled on the floor of badly ventilated rooms. L. S. T.

Effect of selenium-containing foodstuffs on growth and reproduction of rats of various ages. K. W. FRANKE and V. R. POTTER (J. Nutrition, 1936, 12, 205—214).—Resistance of rats to toxic wheat was high at the age of 21—42 days. Rats surviving toxic diets for considerable periods showed sub-normal growth and loss of reproductive power. Matings of animals which had both received toxic diets were completely infertile. A. G. P.

Formation of colloidal elements of the arsenic and tellurium groups by oxidation and reduction processes as the cause of poisoning of animal cell structures and enzymes by AsH_3 , H_2S , TeO_2 , etc. R. LABES (Kolloid-Z., 1937, 79, 1—10; cf. A., 1935, 1277).—Both AsH_3 and H_2S cause haemolysis of red blood corpuscles and abolish the excitability of a nerve-muscle prep. when O_2 is present, but not in its absence. Similar effects are produced by addition of colloidal solutions of As or S (Raffo). Addition of K_2TeO_3 to triturated muscle does not inhibit the oxidation of $p\text{-C}_6\text{H}_4(\text{NH}_2)_2$ by the oxidases present, but gradually destroys the activity of succinic acid dehydrogenase. It is inferred that the poisoning effect in both cases is due to the formation of the colloidal element, and that whereas AsH_3 and H_2S attack oxidising centres, TeO_2 poisons only reducing centres. F. L. U.

Mode of action of the protein of the yellow enzyme. E. HAAS (Biochem. Z., 1937, 290, 291—292).—The reactions between the yellow enzyme

and di- and tri-phosphopyridine nucleotide (I) have k 3×10^5 and $>3 \times 10^6$, respectively, but these vals. are zero if the protein-free enzyme is used. If the enzyme, followed by sufficient $\text{Na}_2\text{S}_2\text{O}_4$, partly to reduce the nucleotide (absence of O_2), is added to a large excess of (I) at neutral reaction and 0° , a red substance (II) is produced. (II) is not produced when the concn. of (I) is not proportionately very large or if the enzyme is replaced by its free active group or free protein. (II), which is apparently a flavin-protein nucleotide, exhibits absorption bands at 360 and 475 $\text{m}\mu$.

W. McC.

Biochemical hydrogenations. V. Enzymic hydrogenation of unsaturated compounds. F. G. FISCHER and H. EYSENBACH (Annalen, 1937, 529, 87—108; cf. A., 1935, 123; 1937, II, 225).—Hydrogenation of $\text{CHPh}\cdot\text{CH}\cdot\text{CH}_2\cdot\text{OH}$ or $\text{CHPh}\cdot\text{CH}\cdot\text{CHO}$ in presence of fermenting yeast occurs most rapidly at p_{H} 8.5. The clear solutions obtained by plasmolysis of pressed beer yeast with EtOAc or other media hydrogenate $\text{CHPh}\cdot\text{CH}\cdot\text{CH}_2\cdot\text{OH}$ or geraniol nearly as rapidly as an equal wt. of the living cells although they are much less active towards sugars. Dried yeast and its maceration extracts are similarly active. Evolution of CO_2 from the fermenting solutions usually ceases completely after addition of the unsaturated alcohol and is resumed weakly or not at all. Hydrogenation can therefore occur when the complete course of alcoholic fermentation is suppressed. Repression of the normal course of fermentation in two places (by $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$ or NaF , respectively) does not necessarily affect the rate of saturation of an olefine. There appear to be several available sources of H for the hydrogenation. Attempts are described with various combinations of purified enzyme preps. to determine which components of the H-transferring systems participate in the hydrogenation of olefines. It appears that the known H-displacements which immediately reduce codehydrogenases can also induce hydrogenation of the double linking; the yellow enzyme is invariably present but it is questionable whether it is necessary or not for ethylenic hydrogenation. The possible existence of particular "ethylenehydrogenases" which complete the final transition of H to the unsaturated substrate remains undecided but is assumed for the present. It is supported by experiments in which solutions of the enzyme, the ethylenic substance (crotyl alcohol, $\text{CHPh}\cdot\text{CH}\cdot\text{CH}_2\cdot\text{OH}$, geraniol, or citral but not citronellol or citronellal), and a suitable dye (Janus-red, methylene-violet, or rosinduline GG but not methylene-blue or indigo-carmin) are decolorised by $\text{Na}_2\text{S}_2\text{O}_4$ in absence of O_2 . If the enzyme is active towards the substrate, the solution becomes coloured until the leuco-compound is completely oxidised; otherwise it remains colourless.

H. W.

Codehydrogenases. I. Nature of growth factor "V." II. Physiological function of growth factor "V." A. Lvov and M. Lvov (Proc. Roy. Soc., 1937, 122, B, 352—359, 360—373).—I. The growth factor "V" required by *Hæmophilus parainfluenzæ* and obtained from yeast extract has properties in common with cozymase (I). V can be replaced by both (I) and Warburg's co-enzyme,

V and codehydrogenases (II), but not reduced (II), are thermolabile in alkaline solution. Organisms needing V for growth have lost the power to synthesise pyridine nucleotide phosphates. By means of a growth test with *H. parainfluenzæ* 4×10^{-9} g. of (II) is detectable.

II. A more detailed account of matter previously abstracted (cf. this vol., 36).

E. A. H. R.

Dehydrogenases of human placenta. T. THUNBERG (Biochimia, 1937, 2, 413—422).—The decolorisation of methylene-blue by human placenta is greatly stimulated by addition of succinic (I) and glycerophosphoric (II) acid, slightly stimulated by lactic, citric, glyceric, aspartic, glutamic, and hexosediphosphoric acid and leucine, and inhibited by $\text{H}_2\text{C}_2\text{O}_4$, malic and fumaric acid. Inhibition may be due to decomp. products of the added material. Decolorisation of thionine is stimulated by (I) and (II).

W. McC.

Components of succinate-fumarate-enzyme system. E. STOTZ and A. B. HASTINGS (J. Biol. Chem., 1937, 118, 479—498).—The prep. of a succinic dehydrogenase (free from fumarase) from ox heart is described. Oxidation of succinate by this enzyme was unimol. The enzyme consists of two factors: (a) the dehydrogenase factor which is sp. for the oxidation of succinate, is destroyed by heating at 55° for $\frac{3}{4}$ hr., is completely inhibited by SeO_3'' , and is not replaceable by dyes; and (b) the oxidase factor which activates O_2 , is destroyed by heating to 75° , is completely inhibited by CN' , and is replaceable by dyes, the extent of the replacement depending on their oxidation-reduction potentials. J. N. A.

Influence of various substances on the lactic acid dehydrogenase in heart muscle. I. YAMAMOTO (Fukuoka Ik. Zasshi, 1934, 27, 2767—2772).—The inhibitory effect of $\text{H}_2\text{C}_2\text{O}_4$ on the enzyme is independent of its action in pptg. Ca. NaF and Na citrate have no effect. Lactates of Na, Li, K, NH_4 , and Ca are readily oxidised. The dehydrogenase is inhibited by Ag, Hg, and Cu but unaffected by alkaloids, insulin, adrenaline, or nicotine.

CH. ABS. (p)

Hæmatin compound of peroxidase. D. KEILIN and T. MANN (Proc. Roy. Soc., 1937, B, 122, 119—133).—Horse-radish peroxidase preps. show an absorption of the methæmoglobin type (bands 645, 683, 548, 498 $\text{m}\mu$ in acid solution, 583 and 549 $\text{m}\mu$ in alkaline solution). These are derivatives of Fe^{III} . The behaviour and spectra of these substances on reduction, and of their compounds with NaF , KCN , H_2S , NO , NaN_3 , NH_2OH , and H_2O_2 are described. There is an approx. relation between enzymic activity and hæmatin (I) content, but other (I) compounds are present. The peroxidase-(I) compound is probably identical with the enzyme.

F. A. A.

Catalase and peroxidase activity of the liver cell. E. E. DUNN and S. MORGULIS (J. Biol. Chem., 1937, 118, 545—547).—The catalase activity of the rat liver cell in Tyrode's solution at 2° shows practically no variation from p_{H} 6.38 to 7.82. The results differ from those of Regenbogen.

J. N. A.

Constitution and mode of action of catalase. K. G. STERN (Biochimia, 1937, 2, 198—215).—A review. W. McC.

Catalase activation in living cells. III. K. YAMAFUJI (Biochem. Z., 1937, 290, 209—212; cf. A., 1936, 1296).—The catalase in aq. suspensions of yeast is activated by mitogenetic radiation from rabbit's blood, pulped silk-worm pupæ, and silk-worm's eggs. As regards their power to transmit the rays, glass and cryst. and fused SiO_2 do not differ greatly. Blood diluted with 0.001N-KCN does not differ from blood hemolysed with H_2O as regards mitogenetic action on yeast. W. McC.

Spectroscopy of catalase. K. G. STERN (J. Gen. Physiol., 1937, 20, 631—648).—The effect of reagents on the spectral absorption of catalase (I) indicates that (I) is resistant to oxidising [e.g., $\text{Fe}(\text{CN})_6'''$] and reducing agents. The hæmin group of (I) does not combine with CN' , S'' , NO , F' , and CO . (I) is therefore a Fe^{III} complex. The stability of the Fe^{III} in (I) towards reducing agents is due not to the structure of the porphyrin with which it is combined but to the protein component. E. A. H. R.

Differences between similar enzymes in relation to their origin. A. V. BLAGOVESHCHENSKI (Biochimia, 1937, 2, 154—167).—Catalase (I) from phylogenetically young plants has greater power to decrease the energy of activation of H_2O_2 decomp. than has (I) from phylogenetically old plants. Blood-(I) varies in quality according to the genus to which the animal belongs. The quality of (I) and of the proteolytic enzymes concerned in the autolysis of blood and tissues is higher in young than in old animals. W. McC.

Nomenclature of the enzymes acting on fumaric acid. K. P. JACOBSON (Compt. rend. Soc. Biol., 1937, 124, 1028—1030). H. G. R.

Aldehyde mutase. M. DIXON and C. LUTWAK-MANN (Nature, 1937, 139, 548—549).—Aldehyde mutase and aldehyde oxidase, hitherto believed to be identical, are distinct enzymes and have been separated. Their fundamental differences in behaviour are described. L. S. T.

Enzymic synthesis of carbohydrate chains. VII. Existence of carbolligase. A. KUZIN (Biochimia, 1937, 2, 70—81).—Yeast carbolligase preps. convert MeCHO into acetoin, the yield of which increases with rising $[\text{MeCHO}]$ to a max., and then falls. Higher yields are obtained in presence of CaCO_3 . Decarboxylation does not take place during the reaction. R. T.

Hypothetical existence of enzymes analogous to aspartase. K. P. JACOBSON and M. SOARES (Compt. rend. Soc. Biol., 1937, 124, 1026—1028).—Fixation of NH_2OH or N_2H_4 by fumaric acid in presence of liver juice in the absence of aspartase is enzymic and is not due to fixation of NH_3 after decomp. of the bases. H. G. R.

Specificity of the structure of aspartase. M. SOARES (Compt. rend. Soc. Biol., 1937, 124, 1030—1032).—The enzyme prep. from *B. coli* affects only the fixation of NH_2OH and N_2H_4 and not their Me derivatives. H. G. R.

Effect of tyrosinase on the oxidation and cardiac effects of adrenaline and tyramine. P. HEIRMAN (Compt. rend. Soc. Biol., 1937, 124, 1250—1251).—During the oxidation of adrenaline and tyramine with tyrosinase, a substance which inhibits the inotropism and chronotropism of the frog's heart is formed. H. G. R.

Occurrence of a phytin-splitting enzyme in the intestines of rats. V. N. PATWARDHAN (Biochem. J., 1937, 31, 560—564).—Enzyme preps. from the intestines of rats of all ages contain, in addition to glycerophosphatase, a phytase (optimum p_{H} 7.8) which liberates H_3PO_4 from Na inositol hexaphosphate, the action being accelerated by Mg^{++} . Intestines of guinea-pigs and rabbits yield inactive or feebly active extracts. P. W. C.

Placental enzymes. Phosphoesterase. D. P. DA CUNHA (Compt. rend. Soc. Biol., 1937, 124, 1023—1025).—A phosphoesterase occurs in human placenta. H. G. R.

Choline esterase in striated muscle. A. MARNAY and D. NACHMANSOHN (Compt. rend. Soc. Biol., 1937, 124, 942—944).—The concn. of the enzyme is greatest at the nerve endings. This is not observed in the pulverised muscle, probably on account of a diffusion process. H. G. R.

Properties of choline esterase in human serum. D. GLICK (Biochem. J., 1937, 31, 521—525).—The continuous titration method of Stedman (A., 1933, 315, 1081) is modified for examining the choline esterase activity in solutions containing only enzyme and substrate. The activity- p_{H} curve shows a max. at p_{H} 8.4—8.5. The affinity of the enzyme for acetylcholine is determined and the dissociation const. found to be 0.0011. The absence of excess substrate inhibition is confirmed. P. W. C.

Fungal enzymes. Proteolytic and carbohydrate-splitting enzymes. L. VAMOS (Zentr. Bakt. Par., 1936, I, 136, 80—84).—The proteolytic activity of extracts of culture media of *Achorion*, *Tricophyton*, and *Microsporon* spp. was in the (descending) order named. A. G. P.

Digestive enzymes of the Onychophora (*Peripatopsis* spp.). N. G. HEATLEY (J. Exp. Biol., 1936, 13, 329—343).—The p_{H} of the gut is 6.0—8.2 (usually approx. 7.0). Amylase, glycogenase, protease, and carboxypolypeptidase (I) are present in the salivary glands and invertase, maltase, lipase, esterase, aminopolypeptidase, (I), and dipeptidase in the gut. Gelatin is liquefied by the gut, but only at p_{H} 3.0. NUTR. ABS. (m)

Synthetic substrates for chymotrypsin.—See A., II, 234.

Enzymic activity of egg-white: its bearing on watery whites. E. VAN MANEN and C. RIMINGTON (Onderstepoort J. Vet. Sci., 1935, 5, 329—344).—Neither thick nor thin egg-white at p_{H} 5.5—8.5 undergoes autolysis at 37°. No proteolytic enzymes were detected at any p_{H} examined. The presence of two crepsin-like enzymes is demonstrated. The work of Balls and Swenson (B., 1934, 648) is criticised.

CH. ABS. (p)

Determination of papain with hæmoglobin. M. L. ANSON (J. Gen. Physiol., 1937, 20, 561—563).—Papain, after activation by CN' in strongly alkaline solution, may be determined by the hæmoglobin method used by Anson and Mirsky (A., 1934, 111) for trypsin. A papain unit is defined.

E. A. H. R.

Determination of cathepsin with hæmoglobin and the partial purification of cathepsin. M. L. ANSON (J. Gen. Physiol., 1937, 20, 565—574).—Cathepsin (I), the prep. of which is described, may be determined like trypsin by the Anson-Mirsky method (A., 1934, 111). Liver extracts contain, in addition to (I), other proteolytic enzymes which digest the products formed by (I). This further digestion, but not digestion by (I), is increased by cysteine and decreased by $\text{CH}_2\text{I}\cdot\text{CO}_2\text{H}$. Gelatin is digested only slightly by (I). A (I) unit is defined.

E. A. H. R.

Northrop's crystalline pepsin and Brücke's protein-free pepsin. H. KRAUT and E. TRIA (Biochem. Z., 1937, 290, 277—288; cf. Willstätter and Rohdewald, A., 1932, 881; Northrop, A., 1930, 1317).—Cryst. pepsin (I) prepared by Northrop's method and protein-free (I) prepared by the methods of von Brücke and Sundberg contain 15.5 and 8.2% of N, respectively, the first containing much, the second little or no, tyrosine and tryptophan. The two forms differ in the rate at which they hydrolyse caseinogen although the optimal p_{H} for the action of both is 2. Possibly the same active group occurs combined with different carriers in the two forms.

W. McC.

Substances affecting adult tissue *in vitro*. I. Stimulating action of trypsin on fresh adult tissue. II. A growth inhibitor in adult tissue. H. S. SIMMS and N. P. STILLMAN (J. Gen. Physiol., 1937, 20, 603—619, 621—629).—I. Trypsin, independent of its degree of purity, and papain stimulate the growth of adult tissue. The stimulation is due to proteolytic action. An inhibitory protein is probably digested.

II. A growth inhibitor can be separated from the fluid in which adult aorta tissue has been digested with trypsin by successive pptn. with EtOH and $\text{CaCl}_2\text{--NaOH}$. It is moderately thermostable, and is rendered sol. without destruction by moderate tryptic digestion. Its physical and chemical properties coincide with those of lactenin (Jones and Simms, A., 1930, 820). This tissue inhibitor is believed to play a rôle in limiting the growth of tissue in the adult animal.

E. A. H. R.

Degradation of starch by amylases. IV. Action of malt amylase on α -amylodextrin. K. BAILEY, R. H. HOPKINS, and (in part) D. E. DOLBY (Biochem. J., 1937, 31, 586—590; cf. A., 1936, 637).—When α -amylodextrin is degraded by malt amylase at room temp., there occur a relatively rapid reaction in which maltose is the principal sugar produced, α -dextrins and β -maltose being probably formed in equiv. reducing and mutarotatory proportions, and a relatively slow reaction, apparently linear, during which glucose is formed. There is no well-defined point of demarcation between these stages unless low

concn. of enzyme are employed. A new technique is described for determining the sense of mutarotation in enzyme-substrate mixtures of highly colloidal character.

P. W. C.

Taka-amylase. XVII. Maltase-free taka-amylase. XVIII. Product of saccharification, limit of decomposition, and reaction velocity coefficient of the decomposition of starch by taka-amylase. XIX. Saccharification of starch by takadiastase. T. KITANO (J. Soc. Chem. Ind. Japan, 1937, 40, 37—38B, 38—41B, 41—43B).—XVII. Taka-amylase (I), prepared free from maltase by adsorption methods, shows all the usual protein reactions. The p_{H} optimum (5.2 at 38°) depends on the temp. and increases with the duration of the enzymic reaction. Starch (II) on incubation with (I) loses its ability to form the blue I-compound before saccharification is appreciable. (I) is therefore α -amylase. (Cf. this vol., 96.)

XVIII. Incubation of (II) with (I) gives only maltose as an end product. The last stages of decomp. are very slow and the limit of decomp. depends on the (I) concn. This slow decomp. is not due to destruction of (I). Reaction velocity coeffs. (up to 65% decomp.) \propto (I) concn. and inversely \propto (II) concn. The coeff. increases 1.6—1.7-fold for every 10° rise in temp.

XIX. Reaction velocity coeffs. are given for the saccharification of (II) by takadiastase. A method is given for the determination of β -amylase activity in takamaltase.

E. A. H. R.

Effect of peptone, proteinases, and hydrogen sulphide on the amylase content of barley malt. T. CHRZĄSZCZ and W. ŚWIĄTKOWSKA (Biochem. Z., 1937, 290, 225—234; cf. A., 1936, 1024).—The amylase (I) content of extracts of malt and barley is increased in varying degrees by activation with peptone, papain, rennet, trypsin, and H_2S alone or in various combinations, the various factors in (I) (starch-liquefying, saccharifying, dextrin-producing) being affected to different extents. The increases are due to liberation of (I) and of activators of (I) and to alterations in the (I) mol. Accordingly, in order that (I) of max. activity may be obtained, the extracts must be treated with appropriate activators.

W. McC.

Relation between temperature and activity of the glycogenolytic enzyme of the liver of poikilothermic animals. E. TRIA (Atti R. Accad. Lincei, 1936, [vi], 24, 389—392).—The variation with temp. of the activity of hepatic amylase is not appreciably different for warm- and cold-blooded animals.

O. J. W.

Absence of invertase from mushrooms. N. N. IVANOV and E. V. DODONOVA (Biochimia, 1937, 2, 437—441; cf. Weidenhagen, A., 1931, 653).—Mushrooms contain no invertase.

W. McC.

Cozymase as ampholyte. O. MEYERHOF, P. OHLMEYER, and W. MOHLE (Naturwiss., 1937, 25, 172).—The isoelectric point of cozymase (I) is p_{H} 3.1; at lower p_{H} vals. (I) migrates towards the cathode. In the electrometric titration curve the titratable groups at p_{H} 2.2 and 4.0 probably correspond with

the residue of adenylic acid, and the adenine group, respectively. (I) is a "zwitterion." E. A. H. R.

Enzymic inactivation of cozymase. H. VON EULER and H. HEIWINKEL (Naturwiss., 1937, 25, 269).—Results showing the rapid inactivation of cozymase (I) after death in various animal tissues and in Jensen sarcoma are tabulated. The enzymic decomp. of (I) does not yield cophosphorylase as glycolysis activation is also destroyed. E. A. H. R.

Acid hydrolysis of cozymase. F. SCHLENK (Naturwiss., 1937, 25, 270).—Acid hydrolysis of cozymase yields a substance with cophosphorylase activity, probably identical with adenylic acid.

E. A. H. R.

Co-enzymes in muscle metabolism. D. M. NEEDHAM (Biochimia, 1937, 2, 489—493).—A review. W. McC.

Comparative biochemistry of muscular and electrical tissues. E. BALDWIN and D. M. NEEDHAM (Proc. Roy. Soc., 1937, B, 122, 197—219).—The electrical organ of the ray *Torpedo* contains enzymes capable of transferring phosphate (I) from phosphoglyceric acid to creatine, adenylic acid (II) acting as a carrier. Echinoid muscle contains enzymes capable of synthesising arginine- (III) and creatine-phosphoric acids (IV). Unstriated muscle of a holothurian can synthesise (III) but not (IV). Muscle extracts from both classes can transfer (I) from phosphopyruvic acid to (II). Among the Echinodermata, the muscles of the *Crinoidea* contain (III) but not (IV), and those of the *Ophiuroidea* (IV) but not (III). The bearing of this on the evolution of vertebrates is discussed; the more primitive phosphagen appears to be (III). F. A. A.

Are the phosphatases of bone, kidney, intestine, and serum identical? Use of bile acids in differentiation. O. BODANSKY (J. Biol. Chem., 1937, 118, 341—362).—The ratios of phosphatase (I) activities with various substrates varies for different preps. from a single tissue and so cannot be used for differentiation of enzymes from different tissues. Quinine and cinchonine at $1.25 \times 10^{-6}M$ and quinine at $19 \times 10^{-5}M$ had no clear inhibiting effect; $HgCl_2$ at $0.00125M$ inhibited slightly but not differentially. Bile salts differentiate intestinal (I) (practically unaffected) from bone- and kidney-(I) (reduced to 40—70% of the original activity according to particular tissue and salt used). This effect is unaltered by adding heat-inactivated extract of any tissue to enzyme from any other and thus implicates primarily the enzyme and not accompanying matter. Vals. calc. from inhibition of single (I) preps. are applicable to determine the inhibition of a mixed prep. Serum-(I) is also inhibited and serum does not protect bone- or kidney-(I). R. M. M. O.

Determination of phosphatase in blood containing fluoride. J. E. J. CRUSE and C. F. M. ROSE (Brit. J. Exp. Path., 1936, 17, 267—269).—Bodansky's method is applicable after removal of F^- by addition of caffeine Mg salicylate. F^- inhibits but does not destroy the enzyme. NUTR. ABS. (m)

Effect of mercury vapour on beer yeast. N. FLORESCO (Bul. Fac. Ştiinţe Cernăuţi, 1935, 8, 167—

171; Chem. Zentr., 1936, i, 2959).—Small amounts of Hg vapour activate and larger amounts inhibit fermentation and H_2O_2 decomp. of yeast. Removal of Hg after short exposure is followed by recovery of normal activity of the yeast. A. G. P.

Effect of the electric field of an argon tube on beer yeast. N. FLORESCO (Bul. Fac. Ştiinţe Cernăuţi, 1935, 8, 296—306; Chem. Zentr., 1936, i, 2959).—Fermentative activity and H_2O_2 decomp. by yeast are stimulated. A. G. P.

Kinetics of cell respiration. II. Parallelism between rate of oxygen consumption by *Saccharomyces Wanching* and change in optical rotation of glucose in boric acid buffers. III. Effect of ultra-violet light on rate of oxygen consumption by *S. Wanching*. P. S. TANG (J. Cell. Comp. Physiol., 1936, 8, 109—115, 117—123; cf. A., 1936, 896).—II. In H_3BO_3 buffer solutions the p_H -respiration curve shows a min., in contrast to the curves obtained in veronal- Na and PO_4''' buffers. The min. is correlated with the change in state of glucose in alkaline borate solutions as indicated by changes in α .

III. The % O_2 consumption decreases with increasing time of exposure according to a logarithmic curve. The small temp. coeff. of the process suggests that at least the primary effect of ultra-violet light is physical, although the secondary effects may be chemical. M. A. B.

Kinetics of the fermentation of yeast. G. EMÖDI and E. SÁRKÁNY (Biochem. Z., 1937, 290, 71—90).—The O_2 utilisation (x) of an amount of yeast (H) is related to the respiration time (t) using a variety of media (nutrient-free solutions, distilled H_2O , 1.5% KH_2PO_4 , 0.9% $NaCl$) by the expression $t = K_1(x/H)^2 + K_2x/H$, where K_1 , K_2 are consts. The oxyhæmoglobin (I) method always gives higher Q_{O_2} vals. than does the manometric method. The rate of respiration in nutrient-free media is independent of O_2 tension so long as the (I) spectrum is visible.

P. W. C.

Products of fermentation of the *S* and *R* forms of yeasts. F. W. FABIAN and L. J. WICKERHAM (J. Agric. Res., 1937, 54, 147—158).—Differences in the production of $EtOH$, volatile acids, and esters by *S* and *R* forms of *Saccharomyces cerevisiae*, Saaz, *S. uvarum*, *Pichia alcoholophila*, and *Willia anomala* are recorded. Ester production, which commenced 35—45 days after inoculation and was accompanied by disappearance of $EtOH$ and volatile acids, reached max. with an O_2 supply sufficient to maintain normal growth but was inhibited by deficiency or excess of O_2 . A. G. P.

Determination of glutathione in dried yeasts used medicinally. T. SABALITSCHKA (Mikrochem., Molisch Festschr., 1936, 387—392).—Free $\cdot SH$ glutathione (I) is determined by treating an aq. suspension of the yeast with 22% aq. thioisaliclic acid (II). The filtered liquid is treated with $KI +$ starch, and titrated with $0.001N-KIO_3$. Total (I) is determined by reducing a second portion of the filtrate with $Zn + H_2SO_4$ before titration. The I consumption other than that due to (I) is found by

extracting a second portion of yeast with 0.35% aq. CH_2O . The liquid is treated with (II), and titrated as before with KIO_3 . J. S. A.

Yeast (*Torula pulcherrima*) as a source of vitamin-D. E. P. KRATINOVA and A. I. POCHIL (Probl. Shivotnovodstva, 1935, No. 9, 93—100).—Treatment with yeast resulted in increase in the N content of silage. Increase of vitamin-D content occurred only after irradiation of the yeast. *Torula* yeast was the most satisfactory in laboratory experiments and in feeding experiments with chickens. Of the different foods silaged, pumpkins were most satisfactory. Use of the food treated with yeast lowered the % of rachitic chickens and the general mortality. NUTR. ABS. (m)

Subsidiary sterols from yeast. IV. Cryptosterol.—See A., II, 243.

Chemistry of mould tissue. XII. Isolation of arginine, histidine, and lysine from *Aspergillus sydowi*. D. W. WOOLLEY and W. H. PETERSON (J. Biol. Chem., 1937, 118, 363—370).—0.74% of the N in the mycelium is present as histidine (I), 2.7% as lysine (II), and 1.8% as arginine (III). These are min. vals. (III) can be isolated from aq. extracts of fresh tissue and from acid hydrolysates of the insol. residue but is destroyed in autolysis. It is mostly present in combined form. (I) and (II) can be isolated from the autolysate. R. M. M. O.

Lactic acid production by species of *Rhizopus*. S. A. WAKSMAN and I. J. HUTCHINGS (J. Amer. Chem. Soc., 1937, 59, 545—547).—Two species of *Rhizopus*, isolated from soil and from composts of decomp. org. matter, produced 60—70% of *d*-lactic acid (I) on a medium containing glucose (or starch), nutrient salts, and CaCO_3 . Inulin was slowly converted into (I). H. B.

Casein-degrading powers of the moulds of soft cheese. K. DREWES (Milch. Forsch., 1937, 18, 289—330).—The floral distribution (moulds, yeasts, lactic acid bacteria, and bacteria peculiar to cottage cheese) of the organisms is described. The micro-organisms mostly responsible for casein degradation and the ripening of the cheese were *Penicillium*, *Oidium*, thermo- and strepto-bacteria, micrococci, and various types of corynebacteria. Considerable evidence of symbiotic growth was obtained; e.g., corynebacteria and proteolytic micrococci hydrolysed casein in conjunction with moulds and mycoderma. With *Penicillium* in mixed culture 50—80% of the casein was degraded. W. L. D.

Tyrosine in diseased pedipalps. F. A. BANISTER (Nature, 1937, 139, 469—470).—Tyrosine has been identified by means of X-rays in museum specimens of pedipalps affected by actinomycosis. L. S. T.

Mechanism of cell elongation and the properties of the cell wall in connexion with elongation. IV. Molecular structure of chitin cell wall of sporangiophores of *Phycomyces* and its probable bearing on the phenomenon of spiral growth. A. N. J. HEYN (Protoplasma, 1936, 25, 372—396; cf. A., 1936, 414).—X-Ray diagrams of the chitin (I) of *Phycomyces* are almost identical with P (A., III.)

those of animal (I). The unit cell has *a* 9.7, *b* 10.4, *c* 4.6 Å. The *b* axis probably has an oblique position (13.5° from normal), the crystal form being rhombic or monoclinic. The acetylglucosamine residues are linked by glucoside linkings and the carbohydrate part of the mol. lies along the *b* axis. The protein side-chains lie in one plane with the glucose rings parallel to the *a* axis. The dimension of the *c* axis is determined by the transverse distances of the protein chains. In the cell wall of the sporangiophores the *b* axis forms an angle of 13.5° with the long axis of the wall. Spiral growth is probably due to slipping along crystal planes (plane of *b* and *c* axes) arranged obliquely to the length of the wall. M. A. B.

Nutritional requirements of the pathogenic mould *Trichophyton interdigitale*. W. A. MOSHER, D. H. SAUNDERS, L. B. KINGERY, and R. J. WILLIAMS (Plant Physiol., 1936, 11, 795—806).—In synthetic media certain NH_2 -acids are necessary for the growth of the mould. No single acid (except possibly leucine) is indispensable. Aspartic acid (or asparagine) and β -amino- α -hydroxybutyric acid notably favour growth; proline, valine, lysine, phenylalanine, and arginine are less necessary. Tryptophan and tyrosine are synthesised by the mould. All common sugars except lactose are utilised but mannose gives best growth. At least one of the growth-promoting substances, pantothenic acid, inositol, lactoflavin prep., and cryst. vitamin- B_2 , is necessary. Simultaneous supplies of the four substances markedly stimulate growth. K, NH_4 , Zn, Mg, Fe, Mn, Cu, Ca, PO_4''' , and SO_4'' are required and Cl' is beneficial. A. G. P.

Oxygen requirement of fungi. L. VAMOS (Zentr. Bakt. Par., 1936, I, 136, 76—80).—The O_2 requirements of some pathogenic fungi are examined. A. G. P.

Influence of the water and added substances and of p_H [of the substrate] on the growth of fungal cultures. H. H. RUSZEK (Zentr. Bakt. Par., 1936, I, 136, 120—124).—The source of H_2O , the nature of the peptone used, and the p_H of the medium affected the form, colour, and growth of various fungi. A. G. P.

Duration of acid reaction in digestive vacuoles of *Paramecium caudatum* as a function of the p_H of the external medium. M. CHEJFEC (Acta Biol. Exp., 1933, 8, 186—195).—Duration of the acid reaction (p_H 1.6—2.0) in the vacuoles is not greatly dependent on the p_H of the medium. In the same individual there is no synchronisation of p_H in different vacuoles. Acidity disappears from all vacuoles on death. CH. ABS. (p)

Mode of action of germanin in trypanosomiasis. N. VON JANCZO and H. VON JANCZO (Trop. Dis. Bull., 1935, 32, 22—24).—Bayer 205 (1 : 60,000) destroys all trypanosomes, after a latent period of 24 hr., causing athrepsis through interference with nutrition of the trypanosome. Arsenoxides act in a different manner and produce immediate effects. Germanin renders trypanosomes fit for phagocytosis by reticulo-endothelial cells. CH. ABS. (p)

Effects of arsenicals on *Trypanosoma cruzi* in tissue culture. C. A. KOFOID, E. McNEIL, and F. D. WOOD (J. Pharm. Exp. Ther., 1937, **59**, 424—428).— $\text{As}(\text{S} \cdot \text{C}_6\text{H}_4 \cdot \text{CO}_2\text{H} \cdot \text{o})_3$ (I) in concns. $< 0.000037M$ kills *T. cruzi*, Chagas, in embryonic rat's heart in 24 hr. The trypanocidal power of tryparsamide (II) is $<$ that of (I), and carbarsone (III) is slightly trypanocidal only after ultra-violet irradiation, which produces As_2O_3 from (II) and (III). The Brazilian strain of *T. cruzi* is more susceptible to the action of (I) than is the Californian strain. W. McC.

Growth-promoting activity of some sterols for *Trichomonas columbae*. R. CAILLEAU (Compt. rend. Soc. Biol., 1937, **124**, 1042—1044).—The activities of a series of sterols have been tabulated in relation to their structure. H. G. R.

Effect of the oxidation-reduction potential of the medium on the quantum yield of purple sulphur bacteria. D. I. SAPOSHNIKOV (Biochimia, 1937, **2**, 181—197).—The photo-reduction of CO_2 by the bacteria is optimal at r_H 14—16 and hence compensation of p_H and E_h is possible so long as the required r_H is maintained. Each quantum of light absorbed reduces 1 mol. of CO_2 . The thermodynamic connexion between the quantum yield and the r_H val. suggests that similar relations hold in the higher green plants. W. McC.

Nitrate reduction test and its significance in the detection of *Bacillus larvæ*. A. G. LOCHHEAD (Canad. J. Res., 1937, **15**, C, 79—86).—The ability of *B. larvæ* to accumulate NO_2' in a suitable medium containing carrot or turnip without added NO_3' affords a useful diagnostic character. Contamination by *B. orpheus* may interfere with this effect. Of 40 other N-reducing types tested in NO_3' -nutrient media only *Micrococcus* sp. and *Flavobacterium* sp. showed any accumulation of NO_2' with $[\text{KNO}_3]$ as low as 0.001%. L. D. G.

Vitality of bacteria. L. RUBENTSCHIK and S. S. CHAIT (Ann. Inst. Pasteur, 1937, **58**, 446—458).—Samples of black mud from a salt lake were examined after 33 years' storage in sealed tubes containing CO_2 and H_2 , respectively. Viability was approx. the same in each case. L. D. G.

Adsorption of bacteria in salt lakes. L. RUBENTSCHIK, M. B. ROISIN, and F. M. BIELJANSKY (J. Bact., 1936, **32**, 11—31).—Sediments from salt lakes, notably black plastic mud, adsorb bacteria, and retain this property after oxidation or autoclaving but not after HCl treatment. The nature of the adsorption process is examined. A. G. P.

Fermentation of cellobiose by bacteria. R. P. TITSLER and L. A. SANDHOLZER (J. Bact., 1936, **31**, 301—307).—Cellobiose was fermented by approx. 30% of the species examined. The use of this reaction in differentiating certain species is discussed. A. G. P.

Association and antagonistic effects of [soil] micro-organisms.—See B., 1937, 478.

Mechanism of nitrogen fixation by living forms. D. BURK (Biochimia, 1937, **2**, 312—331).—A review. M. McC.

Physiology of *Rhizobium*. V. Extent of oxidation of carbonaceous materials. O. R. NEAL and R. H. WALKER (J. Bact., 1936, **32**, 183—194; cf. A., 1936, 114).—The rate of O_2 consumption of *R. meliloti* and *R. japonicum* in carbohydrate (I) both increased until approx. $\frac{1}{2}$ of the amount required for complete oxidation of (I) was consumed, and later declined. This is ascribed to a transition from a (I) to a protein or fat metabolism, much of the un-oxidised (I) being used in the production of new cell tissue. Growth of *R. japonicum* on an arabinose was $>$ on a glucose substrate. A. G. P.

Influence of nitrogenous nutrients on acetone-ethyl alcohol fermentation.—See B., 1937, 486.

Growth of a butanol *Clostridium* in relation to the oxidation-reduction potential and oxygen content of the medium. G. KNAYSI and S. R. DUTKY (J. Bact., 1936, **31**, 137—149).—Under anaerobic conditions but in the presence of $\text{K}_3\text{Fe}(\text{CN})_6$ the organism grew in media having an oxidation-reduction potential of +0.335 volt. An O_2 tension sufficient to ensure a potential of +0.300 volt was inhibitory. A. G. P.

Activation of the butanol-acetone fermentation of carbohydrates by *Clostridium acetobutylicum* (Weizmann). C. WEIZMANN and B. ROSENFELD (Biochem J., 1937, **31**, 619—639).—Asparagine together with an unknown substance are necessary for normal fermentation in synthetic media. Baker's yeast is plasmolysed with EtOAc and autolysed for 48 hr. at 37° , the activating solution necessary for the fermentation in purely synthetic media being prepared by dialysis of the autolysate against distilled H_2O and concn. of the dialysate. No complex proteins, peptone, etc. are necessary since these are synthesised by the bacteria. It is not known whether or not the activator is a single substance. Lactoflavin and cozymase have no activating effect. P. G. M.

Fermentation of glucose [and pyruvic acid] with butyric acid bacilli. H. PELDÁN (Suomen Kem., 1937, **10**, B, 8).— CO_2 , H_2 , HCO_2H , lactic acid, and AcOH are formed from glucose or AcCO_2H , in a N_2 atm., glucose yielding also EtOH . Variation of p_H greatly alters the relative amounts of the products. In a CO_2 atm. $\text{Pr}^o\text{CO}_2\text{H}$ is also formed, mainly at the expense of HCO_2H and also, in the case of glucose media, at the expense of EtOH and AcOH . M. H. M. A.

Essential growth factors for propionic acid bacteria. I. Sources and fractionation. E. L. TATUM, W. H. PETERSON, and E. B. FRED. II. Nature of the Neuberg precipitate fraction of potato: replacement by ammonium sulphate or by certain amino-acids. E. L. TATUM, H. G. WOOD, and W. H. PETERSON (J. Bact., 1936, **32**, 157—166, 167—174).—I. Potato extract, orange juice, and yeast- H_2O stimulate fermentation of glucose and acid production by *Propionibacterium pentoaceticum*, No. 11. The potato extract was active only in presence of another factor which is supplied by EtOH - or H_2O -extracts of maize. The action of potato extract is due to essential growth

factors and not, primarily, to the available N or buffering capacity of the extract. Potato extract yields two active fractions neither of which is carbohydrate or is destroyed by mild treatment with H_2SO_4 or NaOH. One of these is probably an NH_2 -acid.

II. The action of potato extract is due to its NH_4^+ and asparagine contents. Urea, glutamic acid, or peptone can replace these but NH_2 -acids are less effective. The bacteria utilise NH_4 in the presence of the necessary growth factors. A. G. P.

Isolation and cultural characters of *Clostridium dissolvens*. J. HANZAWA and S. YOSHIMURA (J. Fac. Agric. Hokkaido, 1935, 39, 1—48).—The organism isolated from soil decomposed none of the common carbohydrates except cellulose, from which were produced H_2 , CO_2 , AcOH, BuOH, EtOH, and a pigment. Vitamin-B or the EtOH extract of faeces was essential for the growth of the organism.

CH. ABS. (p)

Laboratory culture of "sugar-factory gum." Effect of "accessory substance" on the growth of "sugar-factory gum." A. MONOYER (Compt. rend. Soc. Biol., 1937, 124, 1008—1014).—The gum can be produced by laboratory culture of the mixed organism (*B. vulgatus* and *Leuconostoc mesenteroides*), the process being continued for several years. H. G. R.

Effect of atmospheres of hydrogen, carbon dioxide, and oxygen, respectively, and of mixtures of these on growth of *Bacillus subtilis*. P. P. LEVINE (J. Bact., 1936, 31, 151—160).—Spores of *B. subtilis* do not germinate in pure H_2 or CO_2 or in mixtures of these. Their viability is, however, retained and growth recommences on introduction of O_2 , 4% of which in an atm. of CO_2 permits germination and vegetative development. Pure O_2 is neither toxic nor inhibitory to spores. In CO_2 - O_2 mixtures growth $\propto \text{O}_2$ content up to atm. proportions.

A. G. P.

Bacterial growth at constant p_{H} . Physiology of *Lactobacillus acidophilus*. L. G. LONGSWORTH and D. A. MACINNES (J. Bact., 1936, 31, 287—300).—Acid production by the organism is only slightly increased by comparatively large increases in O_2 and CO_2 tension. Max. apparent oxidation-reduction potential of the culture is associated with a min. rate of acid formation. The fermentation capacity per unit time per organism decreases rapidly as growth proceeds. The generation time increases as fermentation products accumulate at const. p_{H} . A. G. P.

Variability in activity of bacterial enzymes. II. Factors associated with viability and growth. W. R. WOOLDRIDGE and V. GLASS (Biochem. J., 1937, 31, 526—531).—The variation in dehydrogenase activity of suspensions of washed cells of *B. coli* grown for different periods (cf. A., 1936, 897) is not associated with a variation in number or size of cells, but may be related to their viability. The activities of formic, lactic, and succinic enzymes are relatively independent of viability but those for glucose and NH_2 -acids are affected by viability. During the lag phase in the growth of a bacterial

population, highly active dehydrogenase systems develop, max. activity being reached during the logarithmic phase. P. W. C.

Bacterial growth and constituents of urine. H. SCHÖNFELDER (Zentr. Bakt. Par., 1936, I, 136, 66—72).—Glycine (I) and urea, singly or in combination, cannot serve as simultaneous C and N sources for urinary organisms. The combinations NH_4Cl (II)—ketonic compounds—urea—creatinine [or cystine (III)] and (I)—(II)—urea—(III)—lactic acid did not permit growth. (II) was readily utilised by *B. coli* and *B. lactis aerogenes*, less readily by *Staphylococcus aureus* and *Enterococci*, and poorly by *S. albus* as a N source. High concns. of urea inhibit growth and saturated solutions are bactericidal. NH_2 -acids containing > 2 C, N and C ring compounds produce free growth. Growth of the organisms was unaffected by p_{H} in the range 5.0—8.4 but ceased at 4.2 and 9.4. A. G. P.

Action of hexamethylenetetramine on members of the colon and *aerogenes* group [of bacteria]. C. F. POE and J. H. WILLIAMSON (J. Bact., 1936, 32, 281—291).—*Aerobacter* tolerate higher concns. of $(\text{CH}_2)_6\text{N}_4$ (I) than do *Escherichia*. Toxicity of (I)-containing media increases with time and with rise of temp. owing to the formation of CH_2O . Media containing (I) cannot be used to differentiate the two groups of organisms. A. G. P.

Hydrogen sulphide production as a differential test in the colon group [of bacteria]. R. VAUGHN and M. LEVINE (J. Bact., 1936, 32, 65—73).—Nearly all strains of *Escherichia* and 75% of those of *Aerobacter* produce H_2S from cysteine. The application of these results to differential tests is examined. A. G. P.

Comparison between the adsorptive action of kaolin and kaolin-alumina mixture on faecal bacteria. W. SMITH (Lancet, 1937, 232, 438—439).—A suspension of kaolin (I) in $\text{Al}(\text{OH})_3$ gel is a better adsorbent than an equal wt. of (I) for faecal bacteria. *B. coli* can be completely removed. Change in $[\text{H}^+]$ or a bactericidal effect of the supernatant liquid does not explain the results. L. S. T.

Effects of electrolytes present in growth media on electrophoretic mobility of *Escherichia coli*. J. T. PEDLOW and M. W. LISSE (J. Bact., 1936, 31, 235—244).—The washing with H_2O of bacilli grown in peptone (I) or in (I)- CaCl_2 broth increases the migration velocity to a const. val. Washing organisms from (I)- Na_2SO_4 media at first increases and then decreases the migration velocity to the same const. val. The mobility of the organisms is not appreciably affected by the age of the culture or by changes in p_{H} during electrophoresis. A. G. P.

Bacterial culture utilising soaps as the source of carbon. E. POZERSKI (Compt. rend. Soc. Biol., 1937, 124, 1153—1155).—Na oleate cannot serve as a source of C for *B. coli*. H. G. R.

***B. coli* and alimentary disequilibrium.** R. LECOQ (Compt. rend. Soc. Biol., 1937, 124, 1192—1194).—Alimentary disequilibrium together with polyneuritic symptoms are observed in pigeons on a

sugar-rich diet with the addition of a high proportion of living *B. coli*, in spite of administration of yeast.

H. G. R.

Hydrogenation of crotyl alcohol by *coli* bacteria.—See A., II, 225.

Bacterial fermentation and the interconversion of hexoses in alkaline solution. A. G. WEDUM (J. Bact., 1936, 32, 175—182).—In mannose- Na_2HPO_4 solutions in which interconversion of hexoses had occurred (Spoehr and Strain, A., 1930, 196) there was no evidence of glucose or fructose in forms fermentable by *B. proteus* or *B. anthracis*.

A. G. P.

Nature of the substance of the membrane of the anthrax bacillus. G. IVÁNOVICS and L. ERDŐS (Z. Immunitäts., 1937, 90, 5—19).—The hapten of the membrane of the anthrax bacillus is characterised as an acid having no carbohydrate or protein constituents. It resembles that in many bacilli of the *mesentericus-subtilis* group.

C. R. S.

Cultural requirements of the fowl-coryza bacillus. O. W. SCHALM and J. R. BEACH (J. Bact., 1936, 31, 161—169).—All strains examined, regardless of age, required both the X and V factors for growth on artificial media.

A. G. P.

Modified tellurite medium for *Corynebacterium diphtheriae*. J. C. KERRIN and H. W. GAZE (J. Hyg., 1937, 37, 280—285).—The substitution of sucrose for glucose and the addition of Andrade's indicator improves McLeod's and Loeffler's media.

W. L. D.

Influence of optical activity on the utilisation of tryptophan for growth by diphtheria bacillus. L. C. BAUGUESS (J. Bact., 1936, 32, 299—302).—For growth purposes Yu's strain of the bacillus utilises *d*-, *l*-, and *dl*-tryptophan with equal efficiency.

A. G. P.

Cultural requirements of bacteria. VIII. Utilisation of glutamic acid by diphtheria bacillus. J. H. MUELLER (J. Bact., 1936, 32, 207—210; cf. A., 1936, 383).—Glutamic acid can act as principal N source for the bacteria. The growth efficiency of the *dl*- is approx. 50% of that of the *d*-acid.

A. G. P.

Purification and concentration of diphtheria toxin. I. Evaluation of previous methods: new procedure. II. Nature of the toxin. M. D. EATON (J. Bact., 1936, 31, 347—366, 367—383).—I. The method described is based on pptn. with NH_4 alum and CdCl_2 .

II. With progressive purification of the toxin the ratio of N to Lf units approaches a const. val. of 0.0005 mg. of N per unit. The highly purified toxin consists mainly of a protein which is not readily pptd. by acid at any p_H , and contains no cysteine-S and little or no tryptophan.

A. G. P.

Fermentation reactions of *Erysipelathrix rhusiopathiae*. A. W. DEEM and C. L. WILLIAMS (J. Bact., 1936, 32, 303—306).—Of the sugars examined only fructose, glucose, galactose, and lactose were fermented by all of the 37 strains tested.

A. G. P.

Determination of the growth factor for *Haemophilus Ducreyi*. A. LVOV and I. PIROSKY (Compt.

rend. Soc. Biol., 1937, 124, 1169—1171).—Hæmin cannot and pyridine-nucleotides (factor-V; cf. A., 1936, 1562) can be synthesised both by this organism and by *H. canis*.

H. G. R.

Cellular reactions to waxes of *Mycobacterium lepræ*. F. R. SABIN, K. C. SMITHBURN, and R. M. THOMAS (J. Exp. Med., 1935, 62, 771—786).—The crude wax from *M. lepræ* is a mixture of lipins and other materials. Cellular reaction to the wax includes the same type as that produced by tuberculo-polysaccharide, -phosphatide, and -wax. Leprosin possesses properties similar to those of the unsaponifiable matter from the tubercle bacillus. Cellular response to leprosinic acid and to the crystalline alcohols is of the same type (foreign-body giant cell).

CH. ABS. (p)

Effectiveness of hot hypochlorites of low alkalinity in destroying *Mycobacterium tuberculosis*. S. M. COSTIGAN (J. Bact., 1936, 32, 57—63).—The rate of destruction of the organism by the hypochlorite solution (50—200 p.p.m. of available Cl) at different temp. (50—60°) is determined.

A. G. P.

Influence of oxygen tension on respiration of pneumococci (type I). C. SCHLAYER (J. Bact., 1936, 31, 181—189).—Relations between respiration, growth, and O_2 tension are examined.

A. G. P.

Fermentative variability of *Shigella paradysenteriae*. H. J. SEARS and M. SCHOOLNIK (J. Bact., 1936, 31, 309—312).—Production of variant strains differing in ability to ferment lactose, sucrose, and raffinose is described. All variants exhibit the same sp. agglutinability as does the parent organism. Differences in variants survive *S* → *R* dissociation.

A. G. P.

Streptococci. I. Qualitative difference in resistance to various agents. G. H. CHAPMAN and W. B. RAWLS. II. Quantitative differences in resistance to sodium bicarbonate and hexylresorcinol. G. H. CHAPMAN and L. CURCIO. III. Preliminary attempts to correlate resistance to chemicals etc. with pathogenic effects. G. H. CHAPMAN, C. BERENS, and E. L. NILSON (J. Bact., 1936, 31, 323—331, 333—337, 339—346).—I. Resistance to the "bactericidal" action of dil. defibrinated guinea-pig blood is correlated with resistance to appropriate time/dilutions of Na_2CO_3 , NaHCO_3 (I), hexylresorcinol (II), PhOH, basic fuchsin, etc. Reduction in nos. of viable organisms by (II) (1 : 200,000) and by 0.3% aq. (I) was similar in practically all strains examined.

II. Quant. confirmation of the action of (I) and (II) is given. The factor determining resistance of smooth strains is non-sp. Measurement of the factor is suggested.

III. Relationships are indicated.

A. G. P.

Dismutation of pyruvic acid in *Gonococcus* and *Staphylococcus*. H. A. KREBS (Biochem. J., 1937, 31, 661—671).— AcCO_2H reacts anaerobically in *Gonococcus*, *S. aureus*, *S. albus*, and *Streptococcus faecalis*, yielding lactic acid, AcOH , and CO_2 . The rate of dismutation is increased (up to 10 times) in *S. aureus* and *Strep. faecalis* by addition of boiled yeast extract, the activating effect of which is probably due

to a mixture of substances, since no individual compound tried (Warburg's yellow enzyme and co-enzymes etc.) had as great an effect. Succinic acid is a by-product (1—2%) of the anaerobic metabolism of AcCO_2H .
P. G. M.

Nicotinic acid and the growth of *Staphylococcus aureus*. B. C. J. G. KNIGHT (Nature, 1937, 139, 628).—One of the growth factors present in the high-vac. distillate of yeast extract, which enables *S. aureus* to be grown on a special medium, can be replaced by nicotinic acid, prepared in different ways, or more effectively by its amide. L. S. T.

Relation between the chemical constitution of the somatic antigen and the Gram-staining of the bacteria. A. BOIVIN and L. MESROBEANU (Compt. rend. Soc. Biol., 1937, 124, 1176—1179).—Only sp. polysaccharides could be demonstrated with Gram-positive organisms, whilst with Gram-negative the sugar-lipin complex was present.
H. G. R.

Lysogenic modification of bacteria. G. PROCA (Compt. rend. Soc. Biol., 1937, 124, 981—983).—Active filtrates contain at least two factors, a growth factor and a bacteriolysin.
H. G. R.

Determination of reducing sugars in bacterial cultures. Colorimetric methods. D. KLEMME and C. F. POE (J. Bact., 1936, 32, 1—9).—Seven methods are compared. The Lewis-Benedict and to a smaller extent the Folin and Folin-Wu methods give high results in some cases, probably because other reducing substances are formed during bacterial growth. The Sumner, Folin-Wu, and dinitrophenol methods give best results for residual sugar in cultures. Fuller's earth, starch, norite, and basic Pb acetate, but not $\text{Hg}(\text{NO}_3)_2$, are effective clarifying agents for media prior to sugar determinations. Al_2O_3 cream is suitable when any but the Lewis-Benedict method is to be used. Sufficiently accurate results are generally obtainable without clarification.
A. G. P.

Detection of nitrate reduction [by bacteria]. H. J. CONN (J. Bact., 1936, 31, 225—233).—Methods for examining cultures for NO_2' , NH_3 , or N produced from NO_3' and the significance of these tests are discussed.
A. G. P.

Rôle of bacteria in autolysing tissue. J. R. REEVES and H. E. MARTIN (J. Bact., 1936, 31, 191—202).—Digests of fresh hog and ox liver contain resistant strains of sporing organisms which are not inhibited by changes in p_{H} or by customary germicides and preservatives. The possible influence of these organisms on the autolysis of digests is discussed.
A. G. P.

Bacterial pigmentation. I. Historical considerations. R. D. REID (J. Bact., 1936, 31, 205—210).
A. G. P.

Bacterial pigmentation. II. R. D. REID (Zentr. Bakt. Par., 1937, II, 95, 379—389).—The principal factor influencing pigmentation in a no. of species of bacteria is the amount and availability of the N supply. Starch and sugar increase pigmentation (probably by increasing general growth) when adequate N is available but have no influence

in the absence of N. Pigment formation is optimum at p_{H} 6.6—8.0 and is not facilitated by organo-metallic compounds.
A. G. P.

Changes in hydrogen-ion concentration of uninoculated nutrient broth during sterilisation and storage. K. HEICKEN (Zentr. Bakt. Par., 1936, I, 135, 513—521).—The p_{H} of broth tends to change towards neutrality during sterilisation and storage, the effect being most marked initially in highly alkaline preps. The change is attributed to CO_2 of the atm.
A. G. P.

Improved [bacteriological] laboratory apparatus. J. C. WILLETT (Amer. J. Publ. Health, 1937, 27, 346—348).—A Pb-lined tank and perforated Pb sheet baskets for acid cleaning of infected glassware and appropriate apparatus for a diphtheria outfit are described.
W. L. D.

Inactivation of a bacteriophage by immune serum and by bacterial polysaccharide. F. M. BURNET and M. FREEMAN (Austral. J. Exp. Biol., 1937, 15, 49—61).—A variant of Morison's type phage *H* showed, in addition to relative inability to be adsorbed by susceptible bacteria, no sensitivity towards inactivation by phage-inhibiting agent (I), increased heat-sensitivity, slightly increased susceptibility to inactivation by antiserum, and a higher titre in broth cultures. Phage *H* when treated with <inactivating amounts of antiserum showed decreased susceptibility to (I). Inactivation of phage *H* by (I) did not decrease its power to coat bacteria, nor affect its direct agglutination by antiphage serum. Results are discussed in terms of "active groups" on the phage surface.
J. N. A.

Characteristics of the lysin precipitable by alcohol in bacteriophagic lysates. I. LOMINSKI (Compt. rend. Soc. Biol., 1937, 124, 1068—1071).—With a modification of d'Herelle's technique, a bactericidal substance (I) (not a true lysin) has been prepared from a bacteriophage. (I) is activated by certain concns. of a bacterial suspension and has a zone of optimum activity.
H. G. R.

Air-borne plant virus. K. M. SMITH (Nature, 1937, 139, 370).
L. S. T.

Liquid crystalline preparations of cucumber viruses 3 and 4. F. C. BAWDEN and N. W. PIRIE (Nature, 1937, 139, 546—547; cf. this vol., 71).—Nucleoproteins of composition and properties similar to those obtained from solanaceous plants infected with tobacco mosaic virus have been isolated from cucumber plants infected with cucumber viruses 3 and 4. Infections of cucumber plants were obtained with 10^{-9} g. of these nucleoproteins and sp. ppts. with antiserum were obtained with $\frac{1}{2} \times 10^{-6}$ g. No infections of tobacco, tomato, *Nicotiana glutinosa*, or Golden Cluster beans could be produced. Differences in properties of these viruses from those of the tobacco mosaic virus are pointed out. The cucumber and tobacco viruses are serologically related, and only preps. thus related to tobacco mosaic virus show anisotropy of flow and form spontaneously birefringent solutions.
L. S. T.

Crystalline tobacco-mosaic virus. W. M. STANLEY (Amer. J. Bot., 1937, 24, 59—68).—A lecture. The protein character of the virus is discussed.

A. G. P.

Visible mesomorphic fibres of tobacco mosaic virus in juice from diseased plants. R. J. BEST (Nature, 1937, 139, 628—629; cf. this vol., 71).—Fibres are formed in the juice of mosaic-diseased tobacco plants after clarification by centrifuging and storage at $\sim 1^\circ$ for several months. The collapse of the fibres at the temp. of thermal inactivation of the virus, and other properties, indicate that the fibres constitute the virus or contain the virus as an essential constituent. These mesomorphic, flexible fibres probably consist of long chains of virus particles linked together by relatively weak linkings.

L. S. T.

Isolation of tobacco ring spot and other virus proteins by ultracentrifugation. W. M. STANLEY and R. W. G. WYCKOFF (Science, 1937, 85, 181—183).—A cryst. protein of high mol. wt., sedimentation const. $\sim 115 \times 10^{-13}$ cm. per sec. per dyne, possessing the properties of ring spot virus and differing from tobacco mosaic virus protein in physical, chemical, and serological properties, has been isolated by ultracentrifuging from Turkish tobacco plants with ring spot virus. Proteins of high mol. wt. are also shown by this means to be characteristic of latent mosaic of potato, severe etch, and cucumber mosaic viruses. The concns. of these different virus proteins in diseased Turkish tobacco plants show large differences.

L. S. T.

Adsorption of the sheep-pox virus on kaolin and animal charcoal. N. STAMATIN (Compt. rend. Soc. Biol., 1937, 124, 984—986).—Animal C is the better adsorbent, preferably used in an acid medium. Kaolin has no affinity for the virus.

H. G. R.

Recently-isolated strain of poliomyelitic virus. B. F. HOWITT (Science, 1937, 85, 268—270).—This strain possesses certain immunological properties combined with a slight difference in tissue reactions which suggest that not all strains of poliomyelitic virus are quantitatively or even qualitatively similar.

L. S. T.

Relation of certain viruses to the active agent of the Rous chicken sarcoma. J. W. JOBLING and E. E. SPROUL (Science, 1937, 85, 270—271).—Lipin extracts of the vaccinia and the tobacco mosaic viruses failed to reproduce disease, and are thus distinguished from the active, lipin fraction of the Rous chicken sarcoma.

L. S. T.

Effect of radium on bacteria. R. R. SPENCER (U.S. Publ. Health Repts., 1935, 50, 1642—1655).—The killing effects of β - and γ -rays are compared. Irradiation of bacteria may induce cultural and morphological changes.

CH. ABS. (p)

Action of ultra-violet light on spores and vegetative forms of *B. megatherium* sp. F. HERČÍK (J. Gen. Physiol., 1937, 20, 589—594).—The killing rate of both spores and vegetative forms of a strain of *B. megatherium* sp., after irradiation by ultra-violet light, is exponential. Twice as much incident energy is needed to kill the spores as the

vegetative forms. The absorbed energy per bacterium for 50% killing is calc.

E. A. H. R.

Oligodynamic action of silver. I. J. HEISS (Biochem. Z., 1937, 290, 99—103).—Ag wire placed in cultures of *Staphylococcus aureus* can be rendered oligodynamically active by contact with various activators, e.g., AgCl, AgNO₃, Ag₂O, CuCl₂.

P. W. C.

Is there a parallelism between the trypanocidal and the spirochæticidal effect of arsenobenzene compounds? I. VON VÁSÁRHELYI (Z. Immunitäts., 1937, 90, 19—28).—The relative trypanocidal effects of two arsenobenzene preps. were paralleled by their action on experimental syphilis in rabbits.

C. R. S.

Dissociation *in vivo* and *in vitro* of the bactericidal action of 8-hydroxyquinoline sulphate. M. AITOFF (Compt. rend. Soc. Biol., 1937, 124, 949—951).—The sulphate shows no anti-staphylococcic action in the rabbit on subcutaneous or intravenous injection.

H. G. R.

Increase in blood-lactic acid in the horse due to adrenaline. L. BLANCHARD (Compt. rend. Soc. Biol., 1937, 124, 944—946).—Small intravenous doses of adrenaline increase blood-lactic acid and -sugar by 61.24 and 43.19%, respectively, the effect disappearing 4 hr. after the injection.

H. G. R.

Diathermy and secretion of adrenaline. J. MICHEZ (Compt. rend. Soc. Biol., 1937, 124, 1006—1008).—Secretion of adrenaline in the dog is not affected by general diathermy but is increased when localised in the lumbar region.

H. G. R.

Synergism of adrenaline and pituitary hormone. Adrenaline glycogenolysis. L. KÉPINOV (Compt. rend., 1937, 204, 808—810).—Glycogenolysis does not occur when adrenaline (I) is added to the Locke-Tyrode solution after perfusion of frog's liver for >4 hr. Addition of fresh extracts of normal liver or muscle restores the glycogenolytic action of (I).

F. O. H.

Extracts containing cortin. F. A. HARTMAN and W. D. POHLE (Endocrinol., 1936, 20, 795—800).—Cortin (I) can be extracted from the adrenal cortex by COMe₂, C₆H₆, Et₂O, or EtOH, EtOH giving the best yield. Et₂O and EtOAc are better solvents than C₆H₆ and CHCl₃ for purification. An aq. extract can be prepared from the EtOH extract by alternate extractions with Et₂O and dil. EtOH, each solvent being distilled off *in vac.*, and the final residue taken up with H₂O. A glycerol (II) extract containing very little adrenaline is prepared by extraction with (II), pptn. with EtOH, filtration through crystallite, and removal of the EtOH. NaCl in the diet of adrenalectomised cats reduces their (I) requirements. The cat unit of (I) is defined.

R. N. C.

Effects of anterior pituitary extract and certain environmental conditions on the genital system of the horned lizard. C. H. MELLISH (Anat. Rec., 1936, 67, 23—33).

R. N. C.

Tumour growth in hypophyseal dwarfism. B. ZONDEK (Lancet, 1937, 232, 689—690).—Malignant tumours implanted in hypophyseal dwarf rats

grow as fast as those implanted in controls, showing that the growth hormone of the anterior pituitary has no important effect on the growth of malignant tumours. L. S. T.

Comparative action of pituitary extracts and of gonadotropic substances of the urine on ovulation in *Rana temporaria*. L. GALLIEN (Compt. rend. Soc. Biol., 1937, 124, 874—877).—Extracts prepared from urine of pregnancy are inactive, those obtained by extraction of ox pituitary gland with aq. NaCl are very active but not well tolerated by the animal, whilst excellent results are given by alkaline extracts of ox- or aq. NaCl extracts of frog-pituitary. The no. of eggs ovulated \propto the dose injected.

H. G. R.

Urinary excretion of gonadotropic hormone in cryptorchidism. J. H. HESS, R. H. KUNSTADTER, and W. SAPHIR (J. Amer. Med. Assoc., 1937, 108, 352—354).—Significant amounts of the hormone appeared in the urine in 5 out of 13 cases. The clinical significance of the phenomenon is discussed.

R. M. M. O.

Hypophyseal gonadotropic hormones and the luteinisation phenomenon in the rat. C. A. PFEIFFER (Anat. Rec., 1937, 67, 159—175).

R. N. C.

Changes in the action of ovarian hormone and of the gonadotropic fraction of the anterior pituitary effected by disturbance of the acid-base equilibrium. K. A. BOCK (Klin. Woch., 1935, 14, 1750—1753; Chem. Zentr., 1936, i, 2963).—Acidity in the tissue intensifies and alkalinity weakens the action of folliculin and prolan.

A. G. P.

Relation of the posterior pituitary to water exchange in the cat. W. R. INGRAM and C. FISHER (Anat. Rec., 1936, 66, 271—288).—Permanent polyuria results from complete removal of the stalk if the anterior lobe is left intact.

R. N. C.

Evaluation of the potency of oestrogenic substances. S. C. FREED and S. SOSKIN (Endocrinol., 1936, 20, 863—864).

R. N. C.

Effect of oestrogenic substances on the pituitary, adrenals, and ovaries. E. T. ELLISON and J. C. BURCH (Endocrinol., 1936, 20, 746—752).

R. N. C.

Relative duration of action of various esters of oestrone, oestradiol, and oestriol. A. S. PARKES (Biochem. J., 1937, 31, 579—585).—The duration of action of various esters of oestrone (I), oestradiol (II), and oestriol (III) is determined in terms of feminisation of the growing plumage of Brown Leghorn capons. Even massive doses of the free hormones given as a single injection have only a transient effect. The acetate of (I) is scarcely more effective. The diacetate and benzoate of (II) and the benzoate of (I) show increasingly prolonged activities without loss of intensity. The 3-benzoate 17-acetate of (II) shows prolonged activity with slight loss of intensity. The dibenzoate of (II) has a very low intensity but large doses may have a prolonged action. The triacetate of (III) has a low intensity and a transient effect.

P. W. C.

Cyclical fluctuations in oestrin threshold. S. ZUCKERMAN (Nature, 1937, 139, 628).—The threshold of a rhesus monkey to oestrogenic stimulation appears to vary in a cyclical manner, and the rhythmical rise in the oestrone threshold is due either to the cyclical liberation into the blood stream of a substance that neutralises oestrone or to an inherent cycle of the tissues.

L. S. T.

Simple aromatic oestrogenic agent with an activity of the same order as that of oestrone. E. C. DODDS and W. LAWSON (Nature, 1937, 139, 627—628).—*p*-Hydroxypropenylbenzene is such an agent. Its benzoate, m.p. 124°, is also active. The oestrogenic activities of other relatively simple org. substances not containing the phenanthrene nucleus are tabulated.

L. S. T.

Quantitative study of the anti-oestrogenic action of progestin, using crystalline hormones. R. COURRIER and G. COHEN-SOLAL (Compt. rend. Soc. Biol., 1937, 124, 961—964).—The concn. of progestin must be 200—400 times that of folliculin.

H. G. R.

Human corpus luteum and progestin. II. J. P. PRATT, E. C. HAMBLEY, O. KAMM, and D. A. MCGINTY (Endocrinol., 1936, 20, 741—745).—About 40 human corpora lutea yield one rabbit unit of progestin.

R. N. C.

Follicular hormone and ovulation inhibition. G. DAHLBERG (J. Obstet. Gynaecol. Brit. Empire, 1935, 42, 953—961).—The Zondek-Aschheim reaction is probably due to the fact that follicular hormone (I) is resorbed and consumed more quickly than is prolan. Hence the action of the latter predominates. The high % of (I) in mice is not continuously high enough to prevent ovulation.

CH. ABS. (p)

Synthesis of the female ovarian hormone "folliculosterone."—See A., II, 251.

Esters of the follicle hormone series.—See A., II, 199.

Endocrines in theory and practice. Chemistry and assay of male hormones. R. K. CALLOW and A. S. PARKES (Brit. Med. J., 1937, 456—458).—A review.

A. G. P.

Preparation of Δ^5 -3-epihydroxy-17-trans-hydroxyandrostene and 3-epihydroxy-17-trans-hydroxyætiocolane.—See A., II, 243.

Hormones of the androsterone group.—See A., II, 251.

Sterol ketones and sexual hormones. Sterols. VIII—XIII.—See A., II, 250.

Relation between site of injection of androsterone and the comb response of the fowl. A. W. GREENWOOD and J. S. S. BLYTH (Quart. J. Exp. Physiol., 1935, 25, 267—277).—Direct injection into capon's comb produced greater response than intramuscular injection in the pectoral region. Females showed less response than capons. Incompletely castrated males gave a marked and normal males no response.

CH. ABS. (p)

Relation between testosterone and folliculin. Quantitative study of their antagonism. R. COURRIER and G. COHEN-SOLAL (Compt. rend. Soc.

Biol., 1937, **124**, 925—928).—Testosterone acetate has no oestrogenic action in the castrated female but, like progesterone, antagonises the action of dihydrofolliculin on the vaginal epithelium if present in a 25-fold greater quantity. H. G. R.

Effect of testosterone propionate on mating. H. A. SHAPIRO (Nature, 1937, **139**, 588—589).—Administration of testosterone propionate to rats castrated before the beginning of sexual behaviour induces mating. L. S. T.

Hormonal stimulation of spermatogenesis in the testis of the ground squirrel. L. J. WELLS and C. R. MOORE (Anat. Rec., 1936, **66**, 181—200). R. N. C.

Effect of insulin on the blood-sugar during perfusion of the liver. N. FIESSINGER, H. BÉNARD, M. HERBAIN, L. DERMER, and G. BAREILLIER (Compt. rend. Soc. Biol., 1937, **124**, 952—954).—Of 6 samples of insulin, 3 produced hyperglycemia and 3 were without action on the blood-sugar (dogs). H. G. R.

Post-insulin blood-sugar after ligation of the pancreatic duct in dogs with glandular hyperfunction. P. HOUSSA (Compt. rend. Soc. Biol., 1937, **124**, 1252—1254).—The lowering of the blood-sugar by insulin is decreased if the pancreas (with ligatured duct) is stimulated by secretin. This is most marked 6—12 days after the ligaturing. H. G. R.

Protamine and insulin in the treatment of diabetes mellitus. I. M. RABINOWITZ, A. F. FOWLER, and A. C. CORCORAN (Canad. Med. Assoc. J., 1936, **35**, 124—129).—Protamine insulinate (I) keeps well and should be allowed to age for <5 days before use. Doses of 50 units of (I) decrease the blood-sugar to 0.06% but cause no hypoglycemia in healthy individuals. In some diabetic patients on diets high in carbohydrate, the disease is controlled by one daily injection of 40—100 units of (I). NUTR. ABS. (m)

Protamine insulin versus ordinary insulin. A. SIDONI, jun. (J. Amer. Med. Assoc., 1937, **108**, 1320—1327).—Ordinary insulin should be administered with protamine insulin since the latter is unable to oxidise the rapidly absorbed glucose in the diet. Fasting blood-sugar determinations should be supplemented by others 2 hr. after the meal. H. G. R.

Antigenic properties of insulin. J. H. LEWIS (J. Amer. Med. Assoc., 1937, **108**, 1336—1338).—Insulin is an active antigen without species specificity, its specificity being independent of that of the major constituents of the pancreas. Samples from different animals are closely related immunologically. H. G. R.

Hypophysectomy and the urinary excretion of phosphorus. L. BRULL (Compt. rend. Soc. Biol., 1937, **124**, 1242—1244).—The renal threshold of the dog for inorg. P, previously lowered by parathyroid hormone, is raised by hypophysectomy. H. G. R.

Physiology of mammary development and lactation. S. A. ASDELL, H. J. BROOKS, G. W. SALISBURY, and H. R. SEIDENSTEIN (Cornell Univ. Agric. Exp. Sta. Mem., 1936, No. 198, 32 pp.).—NaOH extracts of anterior sheep pituitary caused

mammary growth and secretion in virgin ovariectomised rabbits but did not affect immature male or female animals. Acid extracts did not affect mammary growth but induced lactation in dry parous ovariectomised rabbits. The active substance, prolactin (I), is relatively stable. Mammary growth and secretion are probably caused by different hormones. No oestrin occurred in urine of pregnant rabbits. Ovarian hormones probably affect mammary development directly and not through the pituitary. Injection of (I) into female goat kids induced milk secretion. Injection late in the lactation period of goats increased milk yields only when made at the stage of min. production and had no effect just after peak production. A. G. P.

Prolactin in mare's serum during pregnancy and lactation. C. P. LEBLOND (Compt. rend. Soc. Biol., 1937, **124**, 1062—1063).—Only traces of prolactin were found. H. G. R.

Detection of prolactin (lactogenic hormone of the pituitary gland). C. P. LEBLOND and E. ALLEN (Compt. rend. Soc. Biol., 1937, **124**, 1190—1191).—After intramuscular injection of prolactin into pigeons, cell-mitosis can be observed within 10 hr. in the crop, previous injection of colchicine having arrested the metaphase. H. G. R.

Sinus glands and hormonally controlled pigment metabolism of Crustacea. B. HANSTRÖM (Kungl. Svenska Vetens. Handl., 1937, **16**, No. 3, 97 pp.).—*Decapoda* contain a pigment-activating principle (I) produced generally in the optic pedicles, occasionally in the cephalic region. (I) appears to be related to sinus glands occurring in the species investigated. The hormonal character of (I) and its function in pigmentation phenomena in *Crustacea* are discussed. F. O. H.

Influence of vitamin-A, -B, and -D, anæmia, and fasting on the rate of fat absorption in rats. M. H. IRWIN, H. STEENBOCK, and A. R. KEMMERER [with J. WEBER] (J. Nutrition, 1936, **12**, 357—364).—Fat absorption was subnormal in avitaminosis-A, -B, and -D, in anæmia, and during fasting. Addition of the vitamins did not affect fat absorption in normal animals. The rate of fat absorption is influenced by the general nutritional state of an animal and may not be affected specifically by the vitamin supply. A. G. P.

Composition and vitamin studies of green soya beans. C. D. MILLER and R. C. ROBBINS (Hawaii Agric. Exp. Sta. Rept. [1933], 1934, 24—25).—The cooked beans (analyses recorded) are good sources of vitamin-A and -B₁ for rats and also contain -B₂. CH. ABS. (p)

Significance of beer yeast as a source of vitamins. F. HARREIS and H. SCHNEIDER (Woch. Brau., 1937, **54**, 116—117).—The importance of brewery yeast as a source of the vitamin-B complex and of ergosterol, and the physiological effects of -B and -D, are discussed. Irradiated yeast can cause no ill-effects in the human body, the effects of excessive amounts of -D being apparently neutralised by -B and/or glutathione. I. A. P.

Detection of vitamin-A, -C, and -D. R. WAIT (Pharm. Zentr., 1937, 78, 237—238).—Vitamin-A and -C produce a blue and -D a green colour when treated with a 1% solution of phosphomolybdic acid in AcOH. The reaction is sp. for the vitamins and if both -A and -D are present the green colour appears first and changes to blue. Aq. phosphotungstic acid is suggested as a reagent for the detection of -C; a blue colour is produced. E. H. S.

Fish-liver oils and vitamins.—See B., 1937, 464.

Colloidal solutions of carotene (pro-vitamin-A). A. RATSCHESKI (Z. Vitaminforsch., 1937, 6, 113—116).—Carotene (I) is dissolved in CS₂, COMe₂ [0.5—1.0 c.c. per mg. of (I)] is added, and the solution conc. at 100° until the residue gives a homogeneous colloidal solution [containing up to 0.2% of (I)] on addition of H₂O. F. O. H.

Vitamin-A and the visual function and phototropism of chickens. A. V. PLETNJEV (Z. Vitaminforsch., 1937, 6, 140—149).—The reaction of chickens to various light stimuli is related to the amount of vitamin-A in their food. The bearing of this phototropism on the concn. of visual purple in the retina (cf. Wald, A., 1934, 913) and the possibility of using the phenomenon as a basis for testing -A preps. are discussed. F. O. H.

Vitamin-A and fat metabolism. N. K. BASU (Z. Vitaminforsch., 1937, 6, 106—110).—Vitamin-A is not absorbed from the intestine of rats unless the diet contains a suitable (*i.e.*, unsaturated) fat or oil. This finding vitiates various theories (*e.g.*, that of Becker, A., 1934, 1251) of the rôle of unsaturated acids in nutrition. F. O. H.

Diagnosis of hypovitaminosis-A and -C by determination of the concentration of vitamin-A and -C in the blood. M. VAN EEKELN, A. EMMERIE, and L. K. WOLFF (Z. Vitaminforsch., 1937, 6, 150—162).—Methods of determining vitamin-A (Eekelen, A., 1936, 646) and -C (*ibid.*, 255) in blood are described. Hypovitaminosis-C is diagnosed by determining the amount of -C required to be administered before blood-saturation is reached. In determining -A in blood by means of SbCl₃, consideration must be given to carotenoids present. F. O. H.

Change in weight produced by the growth hormone in avitaminotic rats. E. MARGITAY-BECHT and E. WALLNER (Z. Vitaminforsch., 1937, 6, 119—125).—With rats of approx. const. wt. due to avitaminosis-A, administration of an alkaline extract of anterior pituitary lobe (A., 1934, 1144) produces no resumption of growth; hence avitaminosis-A is not related to pituitary function. F. O. H.

Determination of vitamin-A. E. M. HUME (Nature, 1937, 139, 467—468).—A preliminary report of the results obtained by the Accessory Food Factors Committee on vitamin-A standards. The factor found with halibut-liver oil for converting the results of spectroscopic tests into international units is 1470 with a range of 1400—1700. The val. 1600 previously recommended by the International Conference of 1934 is retained. Apparent discrepancies with con-

centrates are probably due to unsuspected deterioration in the course of biological tests. L. S. T.

Iodometric determination of vitamin-A. V. SOLJANIKOVA-NIKOLSKAJA (Z. Vitaminforsch., 1937, 6, 117—119).—Titration of colloidal solutions (0.0015—0.005%) of a vitamin-A concentrate in H₂O with 0.01N-I gives results approx. \propto the Carr-Price "blue unit" vals. F. O. H.

Vitamin-A, -B₁, and -B₂ content of raw and cooked yolk of hen's egg. L. DE CARO and A. LOCATELLI (Quad. Nutrizione, 1936, 3, 187—191).—Hen's egg-yolk contains per g. when raw, 88 international units of vitamin-A and 1 of -B₁ and, after 5—7 min. at 100°, 55 -A and 1 -B₁. The content of the -B₂ complex is 4 biological units per g. for both cooked and raw egg-yolk. NUTR. ABS. (m)

Vitamin-B₁ and carbohydrate metabolism. H. G. K. WESTENBRINK (Chem. Weekblad, 1937, 34, 246—249).—The relationship between the phenomena of vitamin-B₁ deficiency and those of carbohydrate metabolism in muscle and yeast is discussed. S. C.

Antineuritic potency of synthetic and natural crystalline vitamin-B₁ determined by the "bradycardia" method. P. C. LEONG and L. J. HARRIS (Biochem. J., 1937, 31, 672—680).—Specimens of natural and synthetic cryst. vitamin-B₁ have a potency of 2.8—3.0 $\times 10^{-6}$ g. per international unit. A statistical analysis of the accuracy of the method has been made. P. G. M.

Beriberi and vitamin-B₁ deficiency. B. S. PLATT and G. D. LU (Quart. J. Med., 1936, 5, 355—373).—The concn. of substances (I) which bind HSO₃' in body fluids (AcCO₂H, AcCHO) is used as criterion in the diagnosis of beriberi and other diseases involving deficiency of vitamin-B₁. Methods of determining (I) in blood, urine, and cerebrospinal fluid are given. In acute fulminating beriberi and also (slightly) in the subacute form, in those cases with most marked symptoms but not in the less severe ones the (I) content of the blood was increased. -A deficiency was sometimes present as a complication. NUTR. ABS. (m)

Blood-guanidine in experimental beriberi. A. PIANA (Pediatria, 1936, 44, 127—133).—In pigeons with beriberi, no important variations in the guanidine content of the blood are detected. NUTR. ABS. (m)

Preparation and chemical investigation of vitamin-B₁. H. KAKEFUDA (Fukuoka Ikwa-d. Zasshi, 1934, 27, 1849—1899).—To the Ag fraction of extracts of rice embryo is added PtCl₄ or picric acid and subsequently AuCl₃. By means of the COMe₂-EtOH combination method cryst. -B₁ was obtained. The protective dose for rats was 0.01 mg. and for pigeons 0.00258 mg. daily. On electrolysis -B₁ accumulates at the cathode. It contains S but no NH₂-N and gives a strong diazo-reaction. Activity is destroyed by ultra-violet but not by X-rays. CH. ABS. (p)

Accumulation of vitamin-B₁ in the animal organism. N. S. JARUSOVA (Z. Vitaminforsch., 1937, 6, 98—106; cf. A., 1936, 529).—The incidence of avitaminosis-B₁ in pigeons on a -B₁-free diet is

delayed by previous ingestion of large doses of $-B_1$; hence storage of $-B_1$ occurs in the body.

F. O. H.

Variation in the vitamin- B_1 activity of raw wheat germ. A. Z. BAKER and M. D. WRIGHT (J. Hyg., 1937, 37, 303—306).—The units of $-B_1$ per g. vary from 4 to 22.

W. L. D.

Reagent for vitamin- B_1 . B. NATMAN (Science, 1937, 85, 290).—A solution of BiI_3 in KI gives a characteristic orange-red ppt. with certain vitamin- B_1 products.

L. S. T.

Relation of vitamin- B_2 to hatchability of hens' eggs. R. M. BETHKE, P. R. RECORD, and D. C. KENNARD (J. Nutrition, 1936, 12, 297—307).—Inclusion of lucerne leaf meal, dried liver, or wheat germ in the ration improves the hatchability of eggs. The active substance in liver is H_2O -sol. and is destroyed by autoclaving with alkali but not with acid. It is probably vitamin- B_2 . $-B_4$ and $-E$ are not concerned in hatchability.

A. G. P.

Effect of the ration of the hen on the vitamin- B_2 content of eggs: distribution of vitamin- B_1 and $-B_2$ in normal eggs. R. M. BETHKE, P. R. RECORD, and F. W. WILDER (J. Nutrition, 1936, 12, 309—320).—Vitamin- B_1 occurs in yolk but not in white of egg. $-B_2$ is present in yolk and white in amounts which are the proportion in the ration. Embryonic development of the egg is influenced by its $-B_2$ content.

A. G. P.

Synthesis of flavin glucosides.—See A., II, 231.

Vitamin-C technique as a contribution to cytology. G. BOURNE (Anat. Rec., 1936, 66, 369—385).

R. N. C.

Vitamin-C and diphtheria toxin. A. SIGAL and C. G. KING (J. Pharm. Exp. Ther., 1937, 59, 468—473).—Buffered (p_{H} 6.4—7.4) solutions of the vitamin do not inactivate the toxin *in vitro* but the acidity of unbuffered solutions causes a not readily reversible inactivation.

W. McC.

Effect of ascorbic acid on constituents of blood. P. CIATTI and R. AUERBACH (Riv. Clin. Pediat., 1936, 34, 385—391).—In the serum of guinea-pigs scurvy causes an increase in total protein (I), a slight decrease in crystalloids, and a very slight increase in H_2O content. The increase in (I) is confined to the globulin (II); the albumin (III) decreases and the (I) quotient falls to 1.4. Administration of ascorbic acid to healthy guinea-pigs produces a slight decrease in (II) and a marked increase in (III).

NUTR. ABS. (m)

Storage of vitamin-C by normal adults following a period of low intake. P. H. O'HARA and H. M. HAUCK (J. Nutrition, 1936, 12, 413—426).—2200—2800 mg. of vitamin-C administered at the rate of 200 mg. daily was necessary to saturate the tissues after feeding a deficient diet for a month. Differences between intake and excretion during the replenishment period indicate a max. $-C$ reserve of 2500—3000 mg.

A. G. P.

Duality of oxidised forms and polarisation of vitamin-C indicated by the two reversible re-

actions with phosphomolybdic acid. N. BEZSONOFF and M. WOŁOSZYN (Compt. rend., 1937, 204, 819—821).—With phosphomolybdic acid (I), aq. ascorbic acid (II) yields blue and green solutions with E_h of 490 and 526 mv., respectively; this and the reactions of (I) with pyrocatechol and quinol do not support the dienol structure of (II), the constitution of which is discussed.

F. O. H.

Enzymic oxidation of ascorbic acid. V. A. ENGELHARDT and V. N. BUKIN (Biochimia, 1937, 2, 274—292).—Ascorbic acid oxidase (I) from cabbage leaves exhibits optimal activity at p_{H} 5.5—5.9. The amount of ascorbic acid (II) oxidised by (I) is independent of the (II) concn. probably because (I) acts indirectly, the limiting factor being the production of an intermediate compound which subsequently acts as H acceptor in the dehydrogenation of (II). The dehydrogenation is a reaction of zero order. CO in concns. $>95\%$ does not inhibit the action of (I). Phenolase (III) alone does not attack (II) but oxidises it rapidly in presence of pyrogallol (IV), the reaction being unimol. Here the rate of dehydrogenation of (II) by the quinone produced is $<$ the rate of oxidation of (IV) by (III) and is the limiting factor. The (II) system is not invariably involved in the respiration of plant tissues although in some cases the system could deal with all the H oxidised during respiration.

W. McC.

Oxidation of ascorbic acid (vitamin-C) in plants. M. GUDLET and E. KARDO-SISOJEVA (Compt. rend. Acad. Sci. U.R.S.S., 1937, 14, 307—311).—Plant tissue is comminuted, extracted with H_2O , and titrated by Tillmans' method before and after passage of H_2S and subsequently of O_2 , all operations (except the last) being performed in CO_2 . The contents of ascorbic acid (I), its convertible (II) and inconvertible (III) oxidised form in horse radish and dog rose are thus determined. Dog rose contains an enzyme which catalyses oxidation of (I) to (II), but not to (III); apple and horse-radish contain enzymes which catalyse both oxidations. The solid parts of the plant contain an enzyme which catalyses the change, (I) \rightarrow (III); the aq. extract contains a second enzyme, which catalyses only the reaction, (I) \rightarrow (II). Low and high (I) or (II) content of plants is in general correlated with presence or absence, respectively, of the enzymes. The presence of much (I) and (II) in horse-radish is due to inability of O_2 to permeate the cell walls and to the occurrence of the vitamin and enzymes in separate cells; after comminution the vitamin rapidly disappears.

R. S. C.

Oxidase systems of peroxidase plants. A. SZENT-GYÖRGYI (Biochimia, 1937, 2, 151—153).— H_2O_2 added to the system peroxidase (I)—ascorbic acid (II)—ascorbic acid oxidase (III) slowly oxidises (II) but has no other effect. If (I) and (III) are replaced by raw fruit juice, (I) of the juice rapidly oxidises (II). Hence the juice contains a substance which catalyses the oxidation of (II) by (I). Flavones (IV) which contain the group $\text{o-C}_6\text{H}_3(\text{OH})_2$ also specifically catalyse the oxidation, which proceeds thus: O_2 with (III) dehydrogenates (II) yielding an equiv. amount of H_2O_2 which, with (I), oxidises (IV) to the correspond-

ing quinones; these oxidise (II) and oxidised (II) is then reduced by activated H in the medium.

W. McC.

Stability of ascorbic acid in urine and in aqueous solution. Effect of conditions in the urinary tract. H. LUND and H. LIECK (Skand. Arch. Physiol., 1936, 74, 255—268).—The stability of ascorbic acid (I) in urine is determined by its O_2 tension and reaction. If the urine is alkaline, neutral, or slightly acid, oxidation of (I) may occur in the urinary tract before excretion. Hence $CaCl_2$ or NH_4Cl should be administered in order to produce a urine of p_H about 5 before the rate of urinary excretion of (I) is determined. Of the urinary constituents PO_4''' , creatine, and urea increase the rate at which (I) is oxidised, whereas Cl' , creatinine, and uric acid have a stabilising effect. Cl' counteracts the effect of PO_4''' when the PO_4''' concn. is equiv. to >80 mg. of P per 100 ml.

NUTR. ABS. (m)

Stabilisation of ascorbic acid by metaphosphoric acid.—See A., II, 228.

Distribution of vitamin-C in animal and plant tissues. I. A. FUJITA and T. EBIHARA (Biochem. Z., 1937, 290, 201—208).—Results of determinations by the authors' method are tabulated. In many animal tissues, $>80\%$ of vitamin-C is present in the reduced form but in blood $>94\%$, and in organs containing high proportions of blood-constituents, a considerable amount is oxidised. The green leaves and outer parts of vegetables and fruits contain more -C than do other parts. Much of the -C of leaves is oxidised but the reduced form predominates in oranges and lemons. Black tea contains no -C but green tea contains $>0.22\%$ ($>0.15\%$ of reduced -C).

W. McC.

Vitamin-C in fresh pineapple juice and in guavas. C. D. MILLER and R. C. ROBBINS (Hawaii Agric. Exp. Sta. Rept. [1933], 1934, 25).—The vitamin-C content of fresh guava juice was equal to and that of pineapple juice about half that of orange juice (guinea-pig assay).

CH. ABS. (p)

Determination of ascorbic acid in vegetables and fruits. O. FERNÁNDEZ and C. ALFAGEME (Rev. Sanid. Hig. publ., 1936, 11, 525—535).—The following vals. [mg. of ascorbic acid (I) per 100 ml. of juice for the first 6 items and per 100 g. of fresh tissue for the remainder] were obtained: Valencia oranges 42, Almeria oranges 53, grape fruit 26, tomato 18, mandarin 26, lemon 52, various kinds of apple 2.2—2.6, pears 2 (skin 10), strawberries 46, banana 4, green pimento 125, red pimento 236, paprika 106, cabbage 64, cauliflower leaves 134 (flower 77), lettuce 11, spinach 30, carrot leaves 69 (root 11). In all cases the (I) content of the peel and the outer leaves was approx. three times that of the juice and the inner leaves, respectively.

NUTR. ABS. (m)

Ascorbic acid content of bananas at three stages during ripening. R. M. LEVERTON (Food Res., 1937, 2, 59—63).—The ascorbic acid content of bananas from 21 hands at the green, yellow, and fully-ripe stages averaged, respectively, 0.061, 0.063, and 0.073 mg. per g. of pulp.

E. C. S.

Vitamin-C content of oranges and lemons. J. E. RICHARDSON, R. DAVIS, and P. SULLIVAN (Food Res., 1937, 2, 81—83).—On an average, one orange contains 20—30 mg., one lemon 18 mg., of -C.

E. C. S.

Ascorbic acid content of Manchuria paprika (*Capsicum annuum*, L., var. *grossum*, Sendt.). M. SUGIURA (J. Orient. Med., 1936, 25, 37).—The ascorbic acid (I) content of the paprika increases during ripening but diminishes on storage, exposure to air after rubbing, or removal of the capsaicin by extraction with Et_2O or treatment with $KMnO_4$. In ripe paprika the ratio (I) : glutathione (II) is 1.0 : 1.7; unripe pods are devoid of (II).

NUTR. ABS. (m)

Vitamin-C in gladiolus leaves. O. DISCHENDORFER (Arch. Pharm., 1937, 275, 242—255).—Gladiolus leaves contain 0.007—0.97% of *l*-ascorbic acid, shown by colour reactions to be contained in the sap. The "bound" vitamin is probably associated with the chlorophyll, since some grains of the latter are stained superficially and irregularly by acid $AgNO_3$.

R. S. C.

Determination of ascorbic acid. R. FERRARI and G. BUOGO (Arch. Fisiol., 1935, 35, 125).—The method of Emmerie and van Eekelen is simplified by substituting Zn powder for H_2S . This displaces the Hg and reduces the dehydroascorbic acid. With urine, blood, and tissue extracts, the modification gives satisfactory results.

NUTR. ABS. (m)

Determination of ascorbic acid. A. FUJITA and T. EBIHARA (Biochem. Z., 1937, 290, 172—181).—Greatest accuracy and a high degree of specificity are attained by rapid titration of 2 : 6-dichlorophenol-indophenol solution with a small vol. of ascorbic acid solution after deproteinisation, where necessary, with HPO_3 .

W. McC.

Colorimetric determination of vitamin-C with phospho-18-tungstic acid. I. Reduced vitamin-C. II. Total vitamin-C. A. FUJITA and T. EBIHARA (Biochem. Z., 1937, 290, 182—191, 192—200).—I. The phosphotungstic acid is reduced in buffered solution at p_H 3 by ascorbic acid (I) extracted from tissue with aq. HPO_3 , the colour produced being measured with a photometer. Reducing substances other than (I) are rendered inactive by addition of CH_2I-CO_2H . The degree of specificity is $>$ that of other methods. With animal tissues, the results are sometimes $<$ those obtained by the indophenol method.

II. (I) is extracted with $N-HCl$ and aq. $Hg(OAc)_2$, the extract being neutralised by addition of $NaOAc$ and $Pb(OAc)_2$, treated with H_2S , and freed from H_2S by evacuation, and (I) determined as above.

W. McC.

Comparison of biological and chemical methods for determination of vitamin-C in canned, strained vegetables and a study of its variation from year to year. F. HANNING (J. Nutrition, 1936, 12, 405—412).—Titration with 2 : 6-dichlorophenol-indophenol gives accurate vals. for vitamin-C and is reasonably in accord with biological assays. Year-to-year variations in the -C content of tomatoes, spinach, peas, and beans are considerable.

A. G. P.

Provitamin-D activity and structure. Addition of Grignard reagents to 7-ketocholesteryl acetate.—See A., II, 192.

Metabolism and mode of action of vitamin-D. II. Storage in different tissues *in vivo*. W. HEYMANN (J. Biol. Chem., 1937, 118, 371—376; cf. this vol., 46).—After excessive doses of viosterol vitamin-D is present in the following tissues of the male rabbit (in descending order of rate of depletion): brain, erythrocytes (cleared in 6 weeks), intestines, abdominal skin, lungs, kidneys, liver, blood-plasma (still present after 3 months). The duration of -D storage is not related to the lipin content of tissue. Consumption by the tissues is negligible and depletion probably occurs mainly by excretion. R. M. M. O.

Effect of vitamin-D intake of the hen on bone calcification in the chick. R. R. MURPHY, J. E. HUNTER, and H. C. KNANDEL (Poultry Sci., 1936, 15, 284—289).—Bone photographs show transmission of -D from hen to chick in a definitely quant. manner.

A. G. P.

Crystalline vitamin-D₃. F. SCHENCK (Naturwiss., 1937, 25, 159).—The *m*-dinitrobenzoate of vitamin-D₃ (A., 1936, 982) when hydrolysed affords -D₃, m.p. 82—84°, [α]_D²⁰ +83.3° in COMe₂. Max. absorption occurs at 265 m μ ; it further resembles -D₂ as it gives a yellow colour with SbCl₃ and has an equal antirachitic potency.

J. L. D.

Vitamin-P. A. BENTHÁTH, S. RUSZNYÁK, and A. SZENT-GYÖRGYI (Nature, 1937, 139, 326—327; cf. this vol., 46).—Hesperidin and the mother-liquor of citrin show properties ascribed to vitamin-P. Quercitrin has no -P activity. Experimental scurvy is the symptom of a mixed -C and -P avitaminosis. The pure -P avitaminosis has no clinical symptoms, but if -C and -P are simultaneously withheld, lack of -P greatly modifies the pathological condition.

L. S. T.

Factors influencing the incidence of dietary hæmorrhagic disease in chicks. H. J. ALMQUIST and E. L. R. STOKSTAD (J. Nutrition, 1936, 12, 329—335).—The anti-hæmorrhagic vitamin is present in fæces of chicks receiving a diet free from this vitamin. It is probably synthesised in the lower portion of the intestinal tract and to a further extent in droppings kept for 24 hr. The vitamin is transferred from hen to chicks and occurs in the yolk but not in the white of eggs. Very little is present in liver tissue of young normal chicks.

A. G. P.

Mathematical treatment of absorption by living protoplasts. B. RESÜHR (Protoplasma, 1936, 25, 435—460).

M. A. B.

Methods of research on the physical properties of protoplasm. W. SEIFRIZ (Plant Physiol., 1937, 12, 99—116).—A review.

A. G. P.

Determination of the molecular energy of protoplasm. IV. Determining the surface tension of the naked protoplast against a liquid medium. H. PFEIFFER (Protoplasma, 1936, 25, 397—403).—An expression is deduced from which γ can be calc. by simple measurement of the suction required to force the protoplast into a capillary tube.

M. A. B.

Differences in permeability in different tissues of one plant, and their presumed chemical origin. K. HÖFLER (Mikrochem., Molisch Festschr., 1936, 224—242).—The plasma of cells from the stalk skin of *Gentiana sturmiana* differs entirely in its permeability series from that of the corolla cells, and is of amidophilic type, with a more acid plasma, whilst that of the corolla cells is of basic glycerol type. The relation of the results to the chemical nature of the plasma boundary, and to processes occurring there, is discussed.

J. S. A.

Plasmolysis and permeability [of plant cells]. H. SCHMIDT (Jahrb. wiss. Bot., 1936, 83, 470—512).—In cells of low permeability, plasmolysis with aq. sucrose has little effect on the permeability to urea and glycerol; in high-permeability cells plasmolysis lowers the permeability. Penetration of urea into cells plasmolysed with salt solutions is influenced by the nature of the salt used, the general order of effectiveness being K, Na, Li, (fructose) Sr, Ba, Ca. Et₂O (1%), tannin (0.1%), MeOH (10%), and saponin (0.1%) lower the permeability of cells whether plasmolysed or not. The protoplasm of cells the permeability of which is not appreciably affected by plasmolysis, neutral salts, or narcotics is classed as "lipin-permeable" and of that which is markedly affected as "pore-permeable."

A. G. P.

Water relations and osmotic pressures in plant cells. T. A. BENNET-CLARK, A. D. GREENWOOD, and J. W. BARKER (New Phytol., 1936, 35, 277—291).—The "osmotic val." of the cell sap as determined by the plasmolytic method is > the osmotic pressure indicated cryoscopically, in certain tissues. In other tissues vals. are the same. The bearing of these facts on the flow of H₂O in tissues is discussed.

A. G. P.

Electrochemical methods in the study of plant cells. W. J. V. OSTERHOUT (Trans. Electrochem. Soc., 1937, 71, Preprint 9, 75—83).—Electrochemical methods enable vital processes to be studied with min. disturbance of the organism. The electrical properties of the thin protoplasmic surface layer which regulates cell metabolism have been investigated.

J. W. C.

Observations on chromosomes by dark field illumination and with ultra-violet light. H. HELLSTRÖM and H. VON EULER (Mikrochem., Molisch Festschr., 1936, 209—217).—The relation of the observations, and of effects of fixation with C₆H₅N, AcOH, etc., to the chemical nature of the chromosome substances are discussed.

J. S. A.

Effect of X-rays on *Zea mais*. M. A. RUSSELL (Plant Physiol., 1937, 12, 117—133).—Irradiation-growth curves for roots and shoots are determined and discussed.

A. G. P.

Effect of α -irradiation on extension growth [in seedlings]. H. EBSTER (Jahrb. wiss. Bot., 1936, 83, 423—438).—Exposure to α -rays inhibits cell elongation, phototropic and geotropic response to similar extents in darkened oat coleoptiles. Growth-substance is detectable in exposed coleoptiles when cell elongation has entirely ceased. The effect of irradi-

ation results from its action on the cell membrane rather than from the destruction of growth-substance.

A. G. P.

Effects of carbon arc light on chemical composition and vegetative propagation of tomato plants grown with a limited supply of nitrogen. J. W. MITCHELL (Plant Physiol., 1936, 11, 833—841).—During 10 days' growth in a N-free nutrient with daily exposure to a C arc for 12 hr. the total carbohydrate content of the aerial parts of tomato plants increased fourfold. In plants receiving a limited supply of N, sucrose, starch, dextrin, and the polysaccharides concerned in the thickening of cell walls accumulated rapidly at first and subsequently more slowly. The reducing sugar content varied but little. The decrease in rate of carbohydrate formation is partly due to lowered photosynthetic activity resulting from yellowing and abscission of leaves occurring under these conditions. A. G. P.

Dependence of carbon dioxide assimilation in a higher plant on the wave-length of radiation. W. H. HOOVER (Smithsonian Misc. Coll., 1937, 95, No. 21, 13 pp.).—Light from the whole of the visible spectrum activates photosynthesis, the limiting λ for which are 7200—7500 and 3650 Å. The λ -activity curve shows a principal max. at λ 6550 and a secondary max. at 4400 Å. Increased reflexion and transmission of radiation in the green region by plant leaves diminish the photosynthetic efficiency of green rays. A. G. P.

Effect of light on solanine synthesis in potato tubers. H. W. CONNER (Plant Physiol., 1937, 12, 79—98).—The method described for determining solanine (I) is based on the amount of sugar produced on acid hydrolysis. The increase in (I) content of tubers on irradiation with a Hg arc is accompanied by the appearance of anthocyanin in the shoots. Radiation of λ sufficient for glucose synthesis did not cause formation of (I) but induced chlorophyll (II) production. Ultra-violet rays (0.3 μ) induce formation of (I) but not that of (II). A. G. P.

Photoperiodic response of certain long- and short-day plants to filtered radiation applied as a supplement to daylight. R. B. WITHROW and J. P. BIEBEL (Plant Physiol., 1936, 11, 807—819).—Red radiation is the most effective in producing photoperiodic response in long- and short-day plants. Specially sensitive plants (*e.g.*, aster) may respond to blue light. Green radiation has little effect when used to prolong the day. A. G. P.

Effect of temperature on the responses of plants to photoperiod. R. H. ROBERTS and B. E. STRUCKMEYER (Science, 1937, 85, 290—291).—Temp. slightly $>$ or $<$ the usual range employed in greenhouse culture alter the responses of many plants that are generally considered to have a fixed reaction to relative length of daylight. L. S. T.

Effect of temperature on translocation from leaves. O. F. CURTIS and S. D. HERTY (Amer. J. Bot., 1936, 23, 528—532).—Transport of carbohydrates from bean leaves was restricted by lowering the temp. of the petioles to 0.5—4.5° but did not cease entirely at 0° to -2°.

Relation of reserves to cold-resistance in lucerne. J. J. MARK (Iowa Agric. Exp. Sta. Res. Bull., 1936, No. 208, 304—335).—Late cutting of lucerne prevented the normal accumulation of carbohydrate reserves and resulted in death of the plants during winter. Fission of protein is not a factor in cold-resistance. The presence of available reserves and a genetic ability to use these reserves are important factors contributing to winter hardiness.

A. G. P.

Frost-hardening mechanism of plant cells. G. W. SCARTH and J. LEVITT (Plant Physiol., 1937, 12, 51—78; cf. A., 1936, 1304).—Chemical changes associated with hardening include increased osmotic pressure, pptn. of colloids over a wider range of p_H , slightly decreased $[H^+]$ in the sap, and increased permeability of the cells to polar substances. Artificial change in the p_H of sap does not affect hardiness. The mechanism of protection of cells against mechanical injury by frost is discussed.

A. G. P.

Unfrozen water in apple shoots as related to winter hardiness. A. L. STARK (Plant Physiol., 1936, 11, 689—711).—Experimental data confirm the view that the capacity to retain H_2O in the unfrozen condition is associated with winter hardiness. In apple shoots the freezing process is partly reversible as in the case of inelastic gels. The proportion of H_2O unfrozen at -20° is not an adequate basis for characterising the hardiness of varieties.

A. G. P.

Lag in water absorption by plants in water culture with respect to changes in wind. J. D. WILSON and B. E. LIVINGSTON (Plant Physiol., 1937, 12, 135—150).—Effects of wind and of various solutions surrounding plant roots are examined.

A. G. P.

Distribution of the velocities of absorption of water in the onion root. H. F. ROSENE (Plant Physiol., 1937, 12, 1—19).—Apparatus for determining H_2O absorption by different root regions of the same intact root is described. Absorption gradients are examined.

A. G. P.

Hydration in fresh and dried red clover roots and shoots with reference to physical properties and chemical composition of tissue. G. A. GREATHOUSE and N. W. STUART (Plant Physiol., 1936, 11, 873—880).—Ohio and French varieties of red clover can be differentiated as to cold-hardiness by the unfreezable H_2O in fresh tissue or the rehydration of dried tissue. Factors influencing hydration capacity differ in roots and shoots. Readily available carbohydrates (sugar, starch, dextrin) are important factors. Pectins and pentosans are not concerned. Neither protein- nor non-protein-N is closely related to hydration capacity. Hydration depends on chemical composition as well as on the organisation of the living tissue.

A. G. P.

Growth of germ tubes of *Erysiphe* spores in deuterium oxide. R. PRATT (Amer. J. Bot., 1936, 23, 422—431).—The course of elongation of germ tubes is represented by a curve characteristic of an autocatalysed unimol. reaction. The initial stages of development were not affected by D_2O ; the later

stages and the final length attained were restricted, the final length reaching a limiting val. with 75% D_2O . D_2O limits the proportion of solutes and colloids within the spore which become utilisable for growth. Inhibited spores regain normal activity on transference to H_2O media. Transference to 100% D_2O at any stage of development causes cessation of growth. A. G. P.

Growth of *Erysiphe* germ tubes in deuterium oxide after exposure to water. R. PRATT (Amer. J. Bot., 1937, 24, 76—82).—Injury to germ tubes of *E. graminis tritici* placed in D_2O - H_2O after pre-exposure to H_2O increased with the $[D_2O]$ of the mixture, with the period of initial exposure to H_2O , and with the length of the germ tube at the time of transfer. A. G. P.

Hydrogen-ion concentration and sexual expression in *Lychnis dioica*, L. J. F. STANFIELD (Plant Physiol., 1937, 12, 151—162).—In both sexes xylem, epidermis, and sclerenchyma were consistently more acid (by range indicator methods) than other stem tissues. In general whole stems of staminate plants had a higher p_H than those of pistillate plants. Ovules and vascular strands connected with them were more alkaline than other tissues of the ovary. The ovary wall of the pistillate flower, the base of the stamen filament, and the base of petals in staminate flowers have a similar p_H range. The pseudo-receptacle of the staminate flower is more acid than the placenta of the pistillate. Differentiation of the sexes was shown by reference to individual tissues but not by a difference in general p_H range. Potentiometric measurements of saps show greater acidity in staminate flowers. At the blooming stage acidity increases in both sexes. No direct relation exists between p_H range and sex. A. G. P.

Acidity of the juice of *Desmarestia*. H. E. WIRTH and G. B. RIGG (Amer. J. Bot., 1937, 24, 68—70).—The acidity of the juice is not due to the presence of org. acids but probably results from differential absorption of ions from neutral salts. A. G. P.

Time factor in utilisation of mineral nutrients by hemp. M. E. TIBEAU (Plant Physiol., 1936, 11, 731—747).—Tallest and most vigorous plants with largest and thickest leaves were obtained by use of Knop's solution with 8 times normal concn. of K. K deficiency caused stunting and Cu mottling. Plants recovered quickly from various temporary periods of K starvation, but in no case attained growth equal to that of plants receiving a continuous K supply. Mg deficiency caused chlorosis but growth was not otherwise affected by the level of Mg supply. Recovery from Mg starvation was slower as the period of starvation was prolonged. Excess of Ca retarded growth and a deficiency induced necrosis and loss of meristematic activity. Recovery from Ca deficiency was more rapid after long periods of starvation. Short periods of N shortage were followed by rapid recovery but early death. Recovery was slow after long periods of deprivation. High levels of N supply at the time of fruit bud differentiation led to formation

of female flowers, and low levels of N favour male inflorescence. A. G. P.

Mineral nutrient requirements of plants. P. MACY (Plant Physiol., 1936, 11, 749—764).—A crit. (optimum) % of each nutrient present in each kind of plant is postulated. Higher contents show "luxury consumption" and lower contents are associated with a "poverty adjustment" which \propto the deficiency, until a min. level is reached. The crit. % composition of a plant is an inherent characteristic. This and the min. val. vary only under extreme conditions. Mitscherlich's law of min. holds only during poverty adjustment, whereas Liebig's law of min. is applicable to the whole of the remainder of the growth curve. The application of these considerations to the assessment of fertiliser requirements for individual crops on particular soils is discussed. A. G. P.

Mineral nutrition and seasonal growth of *Ageratum* in sand cultures with auto-irrigation. W. L. NOREM (Amer. J. Bot., 1936, 23, 545—555).—In sand cultures the optimum concns. of the principal nutrients for growth are determined. A. G. P.

Relation of nutrient salt concentration to growth of the tomato and to the incidence of blossom-end rot of fruit. W. R. ROBBINS (Plant Physiol., 1937, 12, 21—50).—With sand-cultured plants, nutrient solutions having osmotic pressure 0.08 atm. restricted growth through deficiency of nutrients if supplied at 1 litre per day but good vegetative growth was produced at the rate of 4 litres per day. With nutrients having 0.44—1.7 atm. osmotic pressure excellent growth was obtained. With 3.1 atm. growth was slightly restricted by factors other than nutrient supply, notably by low availability of H_2O for tissue development. The importance of light, temp., R.H., rate of air movement, and the p_H and O_2 tension of the nutrient in the appearance of blossom-end rot is shown. A. G. P.

Entrance of lime and magnesia into plants. K. P. TULAIKOVA (Chim. Sotz. Zemled., 1935, No. 3, 22—34).—Optimum [Mg] in nutrients for flax and barley are determined. A ratio of Ca : Mg = 1 : 4 was not injurious. The intake of Ca by barley is twice that of Mg, max. utilisation occurring in the final stage of vegetative growth. Max. utilisation of Mg takes place at the flowering stage. Ca facilitates the intake of Mg by young barley plants. CH. ABS. (p)

Effect of potassium supply on the water relations of foliage leaves. L. G. G. WARNE (New Phytol., 1936, 35, 403—417).—Application of K increases the H_2O content of leaves of seakale beet when expressed on an area basis. The simultaneous increase in K content is greater when K_2SO_4 than when KCl is given. Dried leaf material from K-treated plants imbibes increased amounts of H_2O . This is ascribed to the presence of larger amounts of sol. hygroscopic substances rather than to any change in colloidal constituents. K increases cell and leaf size and decreases stomatal frequency. Its effect on transpiration is due only to the action on stomatal activity. Diurnal changes in stomatal aperture are unaffected by the K supply. A. G. P.

Physiological effects of potassium on plants. A. JACOB (Chem.-Ztg., 1937, 61, 278—279).—A review. A. G. P.

Influence of the chloride ion on the carbohydrate content of potato leaves. S. S. BASLAVSKAJA (Plant Physiol., 1936, 11, 863—871).—Heavy applications of Cl' lower the carbohydrate content of the leaves as a result of decreased chlorophyll content in leaves and diminished photosynthetic activity. Leaves of Cl'-treated plants contain relatively higher proportions of starch. A. G. P.

Influence of chlorides and sulphates on the intake of ammonia- and nitrate-nitrogen by plants. A. V. VLADIMIROV (Chim. Sotz. Zemled., 1935, No. 3, 14—21).—The rate of penetration of Cl' into plants is $>$ that of $\text{SO}_4^{''}$. Cl' favours greater absorption of K^+ and NH_4^+ and smaller absorption of NO_3^- . Univalent cations effect a greater absorption of NO_3^- , Cl', and $\text{SO}_4^{''}$ and a smaller absorption of NH_4^+ than do bivalent ions. Intake of NH_4^+ is controlled by the ratio of complementary anions and cations entering the plant. High absorption of NO_3^- from NH_4NO_3 (I) is favoured by cations of high entrance capacity, e.g., K, or by anions of low capacity, e.g., $\text{SO}_4^{''}$. The reverse is true for the entry of NH_4^+ . The physiological reaction of (I) depends on the anions and cations accompanying it. CH. ABS. (p)

Varietal differences in the phosphorus-feeding capacity of plants. A. S. LYNNESS (Plant Physiol., 1936, 11, 665—688).—Varietal differences are established in the ability of maize plants to absorb P from nutrient solutions in sand culture. The rate of intake of P was not directly \propto the $[\text{PO}_4^{''}]$ of the medium. With high levels of P supply, growth was rapid at first but subsequently declined and plants showed signs of injury. Growth (dry wt.) and P contents of maize were closely related. Sugar and starch contents were inversely related. High correlation is demonstrated between the P-absorbing capacity of plants and the p_H of the nutrient. Heavy applications of N cause excessive transpiration and early death. Growth response following temporary deficiency was much more marked in the case of P and K than in that of Ca or N. Plants well supplied with P contained much starch, well-developed xylem, and light-to-medium cell walls. These conditions were reversed with low $[\text{PO}_4^{''}]$. In crossing P-deficient with P-responsive strains the gene for P deficiency behaved as a recessive on the F_2 generation. A. G. P.

Availability of adsorbed phosphoric acid to plants. V. I. SOKHATNOV and S. V. ODINTZOVA (Chim. Sotz. Zemled., 1935, No. 5, 37—45).— $\text{Fe}(\text{OH})_3$ gels were treated with H_3PO_4 or NaH_2PO_4 and after removal of all dissolved $\text{PO}_4^{''}$ the gels were used in plant cultures. Plant yields were greatest with gels of highest absorptive capacity. CH. ABS. (p)

Anion respiration. H. LUNDEGÅRDH (Biochem. Z., 1937, 290, 104—124).—The earlier work on the respiration of roots (wheat seedlings) is continued with roots of different ages and glucose contents (cf. A., 1935, 794), and it is confirmed that a special respiratory process is concerned in the absorption

of anions by the roots which is independent physiologically and chemically of the basal respiration of the roots. The amount of anions absorbed divided by the CO_2 eliminated is const. for a particular ion but varies with the ion, being 2 for NO_3^- and 3 for Cl' . The effect of cations is only appreciable with more intense absorption in progress. With nitrates, the cation effect increases in the series Na, K, Mg, Ca, NH_4 , Sr, Ba, H. P. W. C.

Effect of boron deficiency on structure of Zea mais. E. T. ELTINGE (Plant Physiol., 1936, 11, 765—778).—The effect of B deficiency on the development of the plants is examined. Deficient plants had higher dry-matter contents. A. G. P.

Boron content of apples at different stages of development. J. C. JOHNSON and W. A. DELONG (Plant Physiol., 1937, 12, 219—220).—In healthy fruit the total B content increases progressively through the season, very rapidly during the period of active cell division and rapid growth. The B content (on dry wt. basis) decreases rapidly during June—July (Nova Scotia) and subsequently remains practically const. The B content of parings differed but little from that of the flesh. A. G. P.

Cryptotrophic malnutrition of sorghum in solution culture. K. A. GROSSENBACHER and B. E. LIVINGSTON (Amer. J. Bot., 1936, 23, 588—591).—Mn, B, Zn, and Cu are necessary for the growth of sorghum. Effects of deficiencies of these elements are discussed. A. G. P.

Relation between chemical nature of substrate and degree of chlorosis in maize.—See B., 1937, 479.

Effect of plant nutrients, soil reaction, and light on gardenias.—See B., 1937, 480.

Nitrogen metabolism of plants. M. LEMOIGNE (Chim. et Ind., 1937, 37, 636—645).—Current theories are reviewed. A. G. P.

Methods for studying nitrogen metabolism in plants. F. S. ORCUTT and P. W. WILSON (Plant Physiol., 1936, 11, 713—729).—Sap is pressed from macerated material and is heated at 70° to ppt. protein. Amide-N in the clarified sap may be hydrolysed by 20% aq. NaHSO_3 without humin formation. Hydrolysis of N compounds intermediate between proteins and NH_2 -acids is effected (also without humin production) by an enzyme solution containing proteinase, carboxy- and amino-polypeptidase, and dipeptidase. The hydrolysis process eliminates error in phosphotungstic acid pptn. and in "other N" determinations due to the presence of peptides. The latter are more accurately determined from α - NH_2 -acid vals. observed before and after hydrolysis. A method of N fractionation is shown and vals. for top and root saps of soya bean are recorded. A. G. P.

Nitrogen in relation to the growth of citrus cuttings in solution cultures. A. R. C. HAAS (Plant Physiol., 1937, 12, 163—172).—Depletion of the N supply to rooted cuttings of Lisbon lemon was followed by collapse of the root system and loss of leaves. N-deficient leaves differ from those affected by chlorosis due to p_H changes. Tops of

cuttings grown with NH_4^+ as sole source of N increased in size with the $[\text{NH}_4^+]$ given but had the appearance of N-deficient leaves. Rapidly growing cuttings may not obtain sufficient supplies of N from frequently renewed nutrients of very low N concn. In media containing 785 p.p.m. of NO_3^- , >5 p.p.m. of NO_2^- was injurious. A. G. P.

Nutritional studies of loblolly pine. R. M. ADDOMS (Plant Physiol., 1937, 12, 199—205).—In sand cultures the pine utilised NO_3^- more effectively in acid and NH_4^+ more effectively in nearly neutral media. A. G. P.

Nitrite and formaldehyde formation in certain algæ. A. L. SOMMER (Plant Physiol., 1936, 11, 853—861).—Light is an important factor in the reduction of NO_3^- to NO_2^- in algal cells. PO_4^{3-} accelerates the reduction process and also the formation of CH_2O . Combination of NO_2^- and CH_2O is probably an early stage in protein synthesis, which may take place simultaneously with the condensation of CH_2O to form sugars. A. G. P.

(A) Availability of proteins and inorganic salts of the green leaf. (B) Availability of carbohydrates and fats of the green leaf: crude fibre. M. K. HORWITT, G. R. COWGILL, and L. B. MENDEL (J. Nutrition, 1936, 12, 237—254, 255—273).—(A) Among *in vitro* digestion methods none was suitable for evaluating the utilisable N of green leaves. In determining available N better results can be obtained by removal of fat-sol. N ($\text{EtOH-Et}_2\text{O}$), NO_3^- , NH_3 , and amide-N (reduction and distillation with MgO) prior to Kjeldahl determination of protein and NH_2 -acid. Digestion of entire leaves of spinach by successive treatment with pepsin, trypsin, and erepsin gave results similar to those obtained with pure proteins. *In vitro* tests indicate that only a part of the Ca and Fe of spinach is utilisable. All Cl^- and PO_4^{3-} is H_2O -sol.

(B) Taka-diastase contains a maltase capable of converting maltose (I) into glucose, provided the concn. of (I) in the substrate is >0.25 g. per 100 c.c. Enzymic methods for determining crude fibre yield vals. for spinach which are $>$ thrice those obtained by A.O.A.C. methods. The proportion of true fats in foodstuffs is determined by hydrolysis of the $\text{EtOH-Et}_2\text{O}$ extract and subsequent fractionation with light petroleum to eliminate chlorophyll etc. A. G. P.

Sequence and climatic distribution of some plant acids. J. B. MCNAIR (Amer. J. Bot., 1936, 23, 629—634).—The distribution of oxalic, succinic (I), malic, tartaric (II), and citric (III) acids in plants from different climatic zones is examined. The production in plants of other acids from (I) by successive oxidation processes is indicated. Tropical plants tend to produce (II) and temperate plants to produce (III). A. G. P.

Distribution and formation of acid amides in higher plants. G. SCHWAB (Planta, 1936, 25, 579—606).—Methods for determining asparagine (I) and glutamic acid (II) in plants are described. Both occurred simultaneously in all plants examined but their relative proportions varied considerably in

different species. Three classes of plants are distinguished, viz., those characterised by high (I), by high (II), or by similar (I) and (II) contents. Under certain physiological conditions plants in which one amide is dominant may produce very considerable amounts of the other. The formation of the typical plant amide \propto the accumulation of NH_3 . The proportion of the "opposite" amide is \propto the rate of amide decomp., the typical amide being the more rapidly formed and the more readily decomposed. Both amides act as NH_3 detoxicants. The nature of the amide formed depends on constitutional factors and is probably related to the activity of sp. amidases. The extent of amide formation is controlled by the NH_3/sugar ratio in the plant. A. G. P.

Storage of sugar in the roots of beet. Significance of invertase. A. I. OPARIN (Biochimia, 1937, 2, 135—145).—In sugar beet and fodder beet from various parts of the U.S.S.R. the sugar content is inversely \propto the invertase (I) content and the ratio sucrose : hexoses decreases as the (I) content increases. Beet from dry areas has a lower (I) content than beet from well-watered areas. In beet (I) has synthetic as well as hydrolytic action. W. McC.

Dynamics of formation of cell wall constituents of rye straw (*S. cereale*). A. M. PALEEV (Biochimia, 1937, 2, 3—18).—The content of H_2O -sol. carbohydrates (I) falls, and those of xylan (II) and cellulose (III) rise, until blossoming. Seed formation is associated with a slight rise in (I), and a fall in (II) and (III). At maturity the (II) and (III) contents are at a max., and the (I) content at a min. The lignin content rises continually during growth. R. T.

Synthesis of hyoscyamine in *Atropa belladonna*. B. T. CROMWELL (Biochem. J., 1937, 31, 551—559).—The effect of withdrawal of essential elements and of presenting N in different forms on the synthesis, in particular of total alkaloids in terms of hyoscyamine (I), in culture plants of *A. belladonna* is determined. (I) formation is not affected by withdrawal of K and still continues on withdrawal of N. Administration of N as asparagine, hexamine, or $(\text{NH}_4)_2\text{SO}_4$ increases (I) formation but N as $\text{Ca}(\text{NO}_3)_2$, KNO_3 , or urea produces no change. Plants grown in the dark and fed $\text{KNO}_3 + \text{glucose}$ show increased (I) formation. Detached leaves with their petioles placed in the dark in aq. glucose or KNO_3 or in H_2O show increased (I) formation provided carbohydrate reserve is present. Starvation experiments on leaves attached to the plant show an increase in (I). P. W. C.

Inheritance of carotene in carrots. S. L. EMSWELLER, P. C. BURRELL, and H. A. BORTHWICK (Proc. Amer. Soc. Hort. Sci., 1935, 33, 508—511).—Carotene (I) contents were higher in phloem than in xylem, and greater in the top than in the bottom of roots. Colour and (I) contents were closely related. Inbreeding of carrots increases the uniformity in (I) content. A. G. P.

Persistence of chlorophyll [in leaves] following bacterial action. G. NICOLAS and B. AGGÉRY (Compt. rend., 1937, 204, 611—613).—Localised semi-transparent areas of leaves are associated

with the presence of certain bacteria on the surface of the chloroplasts. The no. of chloroplasts in affected tissue is small. During yellowing of leaves with age the infected tissue remains unchanged, the transformation of chloroplasts into yellow chromoplasts being retarded by the bacteria. The apparent "fixation" of the chlorophyll is discussed.

A. G. P.

Physiology of symbiosis in Leguminosæ. K. MOTHES and J. PRIETZ (Naturwiss., 1937, 25, 201—202).—With young nodules of *Vicia faba*, the bacterial tissue is red in colour, due to the presence of a very labile oxidation product (I) of dihydroxyphenylalanine, which can be stabilised only at an oxidation potential of $r_H > 15$. Active nodule tissues in N_2 develop an $r_H > 7$. Bacterial cultures normally use O_2 . Cultures growing in N_2 develop $r_H 4$, which on aeration rises to 22—24, the culture developing well with $r_H 15$ —24. This r_H , which is decisive for bacterial growth, is attained without O_2 in presence of (I).

P. W. C.

Rôle of ascorbic acid in reduction of nitrates in plant tissues. D. M. MICHLIN (Biochimia, 1936, 1, 617—627).—Potato tubers contain 0.015—0.020% of ascorbic acid (I). Part of (I) added to potato juice undergoes reversible oxidation. In presence of (I) NO_2^- added to the juice undergoes rapid reduction, chiefly to unidentified products, not including NH_3 , and partly to NO . The process of reduction of HNO_2 to NH_3 by *Chlorella* is not affected by (I).

R. T.

Biological rôle of vitamin-C in plants. II. K. I. STRATSCHITSKI and B. A. RUBIN (Biochimia, 1936, 1, 642—653).—Cabbage and salad leaves, and tomato and cucumber fruit, and their juices, cause reversible oxidation of ascorbic acid (I). The oxidation becomes irreversible after the lapse of a period, the length of which varies inversely with the p_H . Dehydroascorbic acid injected into living cabbage leaves undergoes reduction, and greatly increases the respiratory rate of the leaves.

R. T.

Enzymic activity of living plant cells in relation to "vernalisation" of seeds. I. Effect of vernalisation on the direction of invertase action. N. M. SISAKJAN (Biochimia, 1937, 2, 263—273).—In winter wheat and cotton vernalisation of the seeds greatly increases the hydrolytic and correspondingly decreases the synthetic activity of the invertase (I). In cotton, onions, and cabbage the ratio is highest in the slow-ripening varieties. Vernalisation causes decrease in the sucrose and increase in the hexose contents. Vernalisation affects (I) by altering the structural state of the cell colloids.

W. McC.

Enzymic reduction of nitrate in green vegetable cells. D. M. MICHLIN and P. A. KOLESNIKOV (Biochimia, 1937, 2, 402—412).—The enzyme of vegetable cells which reduces NO_3^- is a sp. aldehydease. Addition of aldehydes ($MeCHO$, glyceraldehyde) affects the rate of reduction only after the reducing substances of the cells have been consumed. Reduction of NO_3^- then occurs only in presence of aldehydes. $AcCO_2Na$ reduces NO_3^- because it is decarboxylated by the carboxylase of the cells with production of $MeCHO$.

W. McC.

Q (A., III.)

Biological rôle of enzymes in plants. I. Action of invertase as a factor in sugar storage. B. A. RUBIN and O. T. LUTIKOVA (Biochimia, 1937, 2, 423—436).—In leaves and roots of various species of beet the sugar (I) content increases with increasing invertase (II) content but in the autolysed, pulped roots the (II) content is inversely \propto the (I) content. The hydrolytic action of (II) (and in some species the synthetic action also) in the leaves increases with duration of growth. In roots the synthetic action predominates. In leaves the synthetic action increases in the middle of the day. Where the total sugar content of beet is high the abs. content and % of hexoses are low.

W. McC.

Quantitative catalase index in barley. S. S. ELIZAROVA (Biochimia, 1937, 2, 442—453).—The index is a genotypic character and is not affected by the latitude of the place of reproduction but is high in northern types, intermediate in mountain types, and low in southern types. The index decreases in summer and increases in autumn and winter.

W. McC.

Change in activity of enzymes, soluble carbohydrates, and intensity of respiration of rice seeds germinating under water. P. S. ERYGIN (Plant Physiol., 1936, 11, 821—832).—Compared with germination on moist filter-paper, germination under H_2O involves greater losses of dry matter, suppression of enzyme activity (notably of invertase, catalase), decreased respiratory rates, and modifications of relative respiration rates among different strains. Sol. carbohydrates (mainly monosaccharides and sucrose) occur in larger amounts in seeds of lowland than in those of upland varieties. Small amounts of maltose occur in seeds germinated under H_2O .

A. G. P.

Membrane effect of the absorbing tissues and the intake of dyes by living (plant) cells. A. T. CZAJA (Planta, 1936, 26, 90—119).—Cell walls of lower and higher plants show an alkaline membrane effect towards basic dyes. In *Spirogyra* cells the cation of basic dyes is first absorbed by the cell wall and thence as a dye salt passes into the cytoplasm. With dil. solutions of basic dyes nearly the whole of the anion remains in the external solution. Addition of appropriate salts to the basic dye solution retards the adsorption of the cation and its passage into the cell.

A. G. P.

Adsorption-absorption and translocation of derris constituents in bean plants. R. A. FULTON and H. C. MASON (Science, 1937, 85, 264).—Derris constituents are adsorbed-absorbed and translocated to new growth of bean plants treated with a suspension of derris powder in H_2O .

L. S. T.

Effect of ethylene chlorohydrin and thiourea on *Elodea* and *Nitella*. B. MARCY (Plant Physiol., 1937, 12, 207—212).— $CH_2Cl \cdot CH_2 \cdot OH$ (<1%) and $CS(NH_2)_2$ (<5%) increased the rate of protoplasmic streaming in *Elodea* and *Nitella* after 24—48 hr. Larger concns. were toxic in both cases. The max. increase in streaming averaged 70—100%.

A. G. P.

Effects of colchicine and of *Viscum album* preparations on germination of seeds and growth

of seedlings. L. HAVAS (Nature, 1937, 139, 371—372).—When applied to wheat seedlings colchicine (I) at first stimulates the rate of development of roots and root hair and then depresses and finally arrests root growth. A dialysate of *Viscum*, containing no alkaloid, added to (I) had a growth-inhibiting action > either dialysed *Viscum* or (I) applied separately. Simultaneous administration of (I) and the pressed sap of *Viscum* (containing viscalbin) had no such effect, but increased the total wt. of the shoots compared with that of seedlings treated with *Viscum* sap or (I) alone. L. S. T.

Physiology of pollen germination in *Corylus avellana*: pollen and stigma suction force; swelling phenomena of the pollen colloids. H. SCHOCH-BODMER (Protoplasma, 1936, 25, 337—371).—The colloids of pollen grains can take up H₂O when kept over aq. sucrose $\times 1.6$ — $1.8M$, i.e., corresponding with 70—90 atm. osmotic pressure, but the optimum for germination is $0.4M$, which corresponds with the suction force of the stigma (8—13 atm.). The amount of swelling of pollen grains on the stigma is about the same as when placed over $0.4M$ -sucrose. Over 0.1 — $0.2M$ -sucrose H₂O uptake and swelling are too rapid and germination is abnormal. When immersed in dil. solutions or H₂O the pollen grains soon die due to O₂ shortage, the sol. matter of the cell sap is discharged through the wall, and the protoplast coagulates. M. A. B.

Retarded germination in seed of *Hypericum perforatum* caused by calcium. H. A. BORTHWICK (Bot. Gaz., 1936, 98, 270—282).—Small amounts of Ca, e.g., that in tap-H₂O, retarded germination. The effect is not related to the p_H of the H₂O.

A. G. P.

Formation of purine-nitrogen during germination. P. DE GRAEVE (Compt. rend., 1937, 204, 798—800).—Purine-N, mainly as allantoic acid, increases in seeds of *Trifolium sativum* during germination, reaching a max. after 20 days and then decreasing. With N-poor seeds (wheat, maize) the accumulation of purine-N is mainly as allantoin, indicating a very low allantoinase activity.

F. O. H.

Determining germination of seeds by detecting embryo respiration with dinitrobenzene. A. A. GUREVITSCH (Chim. Sotz. Zemled., 1935, No. 4, 96—105).—Respiratory activity in living cells leads to reduction of C₆H₄(NO₂)₂; the reduction products are distributed in active tissue and give a characteristic colour reaction with aq. NH₃. CH. ABS. (p)

Determination of germinative ability by the dinitrobenzene method without direct germination tests. I, II. A. GUREVITSCH (Ber. deut. bot. Ges., 1935, 53, 303—318; 1937, 55, 54—58).—I. Seeds are treated with C₆H₄(NO₂)₂ (I) in aq. suspension for 5 hr. at room temp. or for 1 hr. at 40—45°. (I) is reduced to NO₂·C₆H₄·NH·OH by respiratory activity of viable seeds. Treatment with aq. NH₃ produces a purple colour in areas in which reduction has occurred.

II. The test is given by *o*- and *p*- but not by *m*-(I). Commercial *m*-(I) contains small amounts of the *o*- and *p*-isomerides and gives good results. Con-

versely small amounts of the isomerides in *m*-(I) may be detected by tests with seeds. A. G. P.

Spectrographic method for determining carbon dioxide exchange between an organism and its surroundings. E. D. MCALISTER (Plant Physiol., 1937, 12, 213—215).—Apparatus is described (cf. A., 1936, 812). A. G. P.

Effect of atmospheric humidity on rate of carbon fixation by plants. J. W. MITCHELL (Bot. Gaz., 1936, 98, 87—104).—Assimilation of C by a no. of plants was unaffected by the R.H. of the atm. but was retarded at 30° in *Pelargonium*. Intake of CO₂ continued even after leaf stomata were closed.

A. G. P.

Influence of oxygen and carbon dioxide concentrations on respiration of tomato fruits. F. G. GUSTAFSON (Amer. J. Bot., 1936, 23, 441—445).—By stepwise decrease in [O₂] and increase in [CO₂] a crit. ratio is reached at which respiratory activity of tomatoes diminishes. This stage is associated with the stage of development of the fruits. Short exposure to low [O₂]-high [CO₂] conditions does not affect growth of fruit but retards ripening. O₂ consumption decreases at a higher O₂ tension than does CO₂ production. O₂ consumption, normally >, becomes <, CO₂ production at certain O₂:CO₂ ratios. Anaerobic respiration is induced under these conditions.

A. G. P.

Respiration of green and chlorophyll-deficient types in maize. M. G. GRONER (Amer. J. Bot., 1936, 23, 381—385).—Respiratory rates of green and albino maize seedlings were the same. Exposure to long periods of light or darkness did not affect the rate in albinos except in the case of sudden exposure to light after prolonged darkness when CO₂ production increased. Re-introduction of air after anaerobiosis had a similar effect. When supplied in nutrient media to seedlings from which the endosperm had been removed, maltose, glucose, and sucrose increased respiratory rates to extents which decreased in the order named.

A. G. P.

Chlorophyll fluorescence and assimilation of carbonic acid. VI. Photographic registration and evaluation of time-intensity of fluorescence curves of green leaves. H. KAUSKY and A. MARX (Biochem. Z., 1937, 290, 248—260; cf. A., 1936, 767).—A description is given of an electrical apparatus with which the relation between the intensity of fluorescence and the time of irradiation of green leaves with ultra-violet light and the effect of temp. on this relation are recorded and measured by means of an automatically produced photographic curve.

W. McC.

Does the combined action of all the spectral colours in white light increase the photosynthetic activity of the individual colours? C. MONTFORT (Ber. deut. bot. Ges., 1937, 55, 142—156).—The effects of white light on the assimilation rates of carotene-rich chloroplasts are > the added effects of the constituent colours.

A. G. P.

Influence of deuterium oxide on photochemical and dark reactions of photosynthesis. R. PRATT, F. N. CRAIG, and S. F. TRELEASE (Science, 1937,

85, 271—273; cf. A., 1935, 1177).—With *Chlorella*, the principal effect of D_2O on photosynthesis is to retard the dark reaction. D_2O has little, if any, effect on the photochemical stage. H_2O as well as D_2O enters into the dark rather than into the photochemical stage of photosynthesis. L. S. T.

Theory of photosynthesis.—See A., I, 319.

Effect of natural growth-substance and of β -indolylacetic acid on plant metabolism. G. FRIEDRICH (Planta, 1936, 25, 607—647).—In older *Helianthus* shoots and in young wilted seedlings geotropic response is associated with differences in reducing sugar content (high on underside). These differences result from starch hydrolysis or sugar translocation. The response in young turgescient seedlings does not involve differences in sugar concn., possibly because sugar is used in membrane formation. Sugar differences are related to differential distribution of growth-substance. Mechanical bending of stems induces changes in carbohydrate content on the two sides of the stem. At 0° geotropic response in older plants does not set up a sugar gradient. Growth-substance affects the tension of cell walls and only indirectly affects carbohydrate changes. Asymmetric application of β -indolylacetic acid (I) to old *Helianthus* stems causes changes in sugar concn., only after bending is apparent. Similar treatment of seedlings does not affect sugar distribution. Curvature produced in stems by (I) is operated by a mechanism different from that of geotropic response.

A. G. P.

Dependence of the growth of *Avena* coleoptiles and their so-called growth-substance production on the auxin content of the endosperm. R. POHL (Planta, 1936, 25, 720—750).—The increased growth of the coleoptile following treatment with β -indolylacetic acid is due solely to cell extension; no division occurs. The endosperm growth-substance (I) is identical with that of the coleoptile; the difference between blastanin and the coleoptile substance is one of concn. only. Geotropic response is decreased by cutting through the seed coat and aleurone grains, and further soaking in H_2O diminishes the size of the seedling. The effect is intensified by extracting the cut seed with a sugar solution. Removal of (I) from cut seed by means of an electric current leads to development of a very small seedling which, however, contains the normal no. of cells in the coleoptile. Coleoptiles from uncut seed are not affected by this treatment. (I) from urine increases the length of the coleoptile from extracted seed. Application of pure auxin has the greatest effect. Hetero-auxin and phenylacetic acid have no action.

A. G. P.

Specificity of action of auxins for the *Avena* and pea tests. E. M. SHACKELL (Austral. J. Exp. Biol., 1937, 15, 33—42).—Using substances related to the auxins, plant enzymes, physiologically active substances of animal origin, and chemicals with particular physiological activity, negative results were obtained in most cases in the *Avena* and pea tests. The latter are not sp. for auxins (cf. Went, A., 1935, 131); positive reactions were obtained with thionaphthen-3-acetic and *cis*-cinnamic acids. Plants probably respond to a restricted and definite at.

structure for promotion of growth. The β - CH_2 - CO_2H in the indole ring is essential for activity, but replacement of indole-N by C, O, or S does not inactivate the mol. J. N. A.

Reciprocal differences in *Epilobium* varieties. IV. Internodal growth and cell extension in *E. hirsutum* as influenced by synthetic β -indolylacetic acid. G. SCHLENKER and G. MITTMANN (Jahrb. wiss. Bot., 1936, 83, 315—323).—Stimulation of internodal growth and cell elongation by hetero-auxin is examined.

A. G. P.

Effect of [hetero-]auxin on *Chlorella vulgaris*. H. C. YIN (Proc. Nat. Acad. Sci., 1937, 23, 174—176).— β -Indolylacetic acid (I) increased the size of *Chlorella* cells. High concns. of (I) were injurious. When added to the culture medium (I) disappeared fairly rapidly (50% in 2 weeks, 80—90% in 3 weeks). *Chlorella* has little or no ability to synthesise auxin.

A. G. P.

Histological reactions of bean plants to indolylacetic acid. E. J. KRAUS, N. A. BROWN, and K. C. HAMNER (Bot. Gaz., 1936, 98, 370—420).—Indolylacetic acid causes proliferation in cells of the various structural elements of decapitated bean seedlings, the changes resembling those associated with crown-gall produced by *B. tumefaciens*.

A. G. P.

Effect of 3-indolylacetic acid on cell walls of stem and root. W. J. ROBBINS and J. R. JACKSON (Amer. J. Bot., 1937, 24, 83—88).—Stem wall materials (cotton thread, hemp cord) stretch more under tension after treatment with 0.2% indolylacetic acid in lanoline (I). The bending of wall material (paper strip, dried strips of potato tuber, elm twigs) is increased and that of roots (maize, willow, etc.) lessened by similar treatment in comparison with that resulting from application of (I) alone.

A. G. P.

Transport of growth-substance in plants. I, II. F. LAIBACH and O. FISCHNICH (Planta, 1936, 25, 648—659; 26, 81—89).—I. Hetero-auxin applied epidermally to leaves is translocated apically if the flow to the midrib is prevented.

II. Rates of translocation of growth-substance vary considerably in different plant species.

A. G. P.

Transport of root-forming hormone in woody cuttings. W. C. COOPER (Plant Physiol., 1936, 11, 779—793).—Hetero-auxin (I) or a substance activated by (I) is transported in the phloem and in a line parallel to phloem elements. When the basal ends of lemon or rose cuttings are placed in aq. (I) there is some upward movement of the solution depending on the rate of transpiration. Application of conc. aq. (I) to the base of cuttings causes a rapid downward movement of a substance (rhizocalin) which is present in leaves and stems and which is necessary for root formation.

A. G. P.

Auxins and the growth of roots. K. V. THIMANN (Amer. J. Bot., 1936, 23, 561—569).—The action of β -indolylacetic acid (I) on the elongation of the main root of *Avena* and of *Pisum* is the same whether the root-tip is present or not, but is greater when (I) is applied externally than when the cut stump is

treated. Czaja's theory of the inhibitory action of (I) necessitates the occurrence of two streams of (I) in the root and is considered improbable. (I) entering roots from seeds also inhibits root elongation and cannot be classed as a germination hormone. (I) controls lateral branching in *Pisum* roots, and inhibits the elongation of isolated root tips. Differences in response of various plant species to (I) are attributable to differences in their normal (I) contents.

A. G. P.

Growth-substance and growth of aerial roots of *Vitis gongyloides*. C. H. ANDREAS (Proc. K. Akad. Wetensch. Amsterdam, 1937, 40, 174—180).—Effects of environmental conditions on the growth of the roots are examined. Asymmetric application of growth-substance (lanoline paste preps.) restricts growth and causes a positive curvature. Extraction of the roots with acidified (HCl) CHCl_3 removes a substance which causes negative curvature in *Avena* tests.

A. G. P.

Growth-substance and seedling roots. E. R. FABER (Jahrb. wiss. Bot., 1936, 83, 439—469).—Growth-substance (I) applied in paste form symmetrically to root-tips of beans and lupins restricts elongation but not the thickening of the roots. Asymmetrical application causes positive curvature, max. effects being attained with intermediate concs. of (I) in the paste. Conc. pastes cause a negative curvature in decapitated roots, the effect being influenced by the length of root tip removed and by the length of the cotyledons. Entire roots of *Avena sativa* and *Agrostemma githago* show negative curvature and strong growth inhibition with conc. pastes and positive curvature and weak inhibition of growth with less conc. pastes. Removal of cotyledons of lupin and bean seedlings restricts the curvature caused by asymmetric application of (I). In maize, beans, and lupins (I) is translocated in both basal and apical directions. (I) is present in root-tips of these plants, to a smaller extent in those of *Avena*, but not in those of *A. githago* or *Lepidium sativum*.

A. G. P.

Inhibition of [plant] roots by growth hormone. R. H. LANE (Amer. J. Bot., 1936, 23, 532—535).— β -Indolylacetic acid (I) is a sp. inhibitor of *Avena* roots. Coleoptiles were not affected by application of (I) to roots. Indolylpropionic acid was less effective than (I).

A. G. P.

Upward effects of auxin in coleoptiles and stems. R. SNOW (New Phytol., 1936, 35, 292—304).—Evidence is given indicating transportation of hetero-auxin (I) morphologically upward in oat coleoptiles, largely but not entirely by way of the conducting strands. (I) accelerates growth of coleoptiles, in whichever direction it is transported. Retardation of growth of very young internodes of peas by (I) drawn up in the transpiration stream is effected by a process differing from that operating in the retardation produced by external application of (I) paste.

A. G. P.

Intumescences on poplar leaves. III. Rôle of plant growth hormones in their production. C. D. LA RUE (Amer. J. Bot., 1936, 23, 520—524).—Intumescences were induced on leaves of *Populus*

grandidentata by application of pieces of leaves on which intumescences already existed, or by injection of Et_2O extracts of such leaves, extracts of *Rhizopus suinus*, or β -indolylacetic acid, the effect being very marked when treated leaves were submerged. Plant hormones cause intumescences on leaves confined in unventilated damp chambers.

A. G. P.

Cell-dividing and -stretching growth-substance. A. RIPPEL (Planta, 1936, 26, 164—166).—Distinction is drawn between the cell-elongating action of the auxin group and the cell-dividing effect of the yeast growth-substance.

A. G. P.

Influence of light on the response of plants to growth-substance. F. LAIBACH (Jahrb. wiss. Bot., 1936, 83, 324—339).—Darkening of plant organs stimulates growth of other organs situated on the basal side, the effect being regarded as a response to growth-substance. This is conditioned by a substance which is formed in darkened organs, but not in those exposed to light.

A. G. P.

Inactivation of plant growth-substance by light. P. R. BURKHOLDER and E. S. JOHNSTON (Smithsonian Misc. Coll., 1937, 95, No. 20, 14 pp.).—Growth-substance (I) in oat coleoptiles or absorbed in agar blocks loses activity on exposure to light of high intensity from a Hg arc or to ultra-violet light. With lateral illumination the concn. of (I) in intact coleoptiles was higher on the illuminated side and in excised tips on the darkened side.

A. G. P.

Vitamin- B_1 a growth factor for higher plants. J. BONNER (Science, 1937, 85, 183—184).—Vitamin- B_1 is an important growth factor for isolated pea roots *in vitro*.

L. S. T.

Vitamin- B_1 and the growth of excised tomato roots. W. J. ROBBINS and M. A. BARTLEY (Science, 1937, 85, 246—247).—White's demonstration (A., 1934, 1418) of potentially unlimited growth for excised root tips of tomato in a solution containing mineral salts, sucrose, and yeast is confirmed. The effective materials in the dried yeast are sol. in 80% EtOH, and are not destroyed by autoclaving for 12 hr. at 120° at p_H 9.0. Yeast ash obtained at a low red heat cannot replace the yeast. Excised tomato roots grow in White's solution, however, when the yeast is replaced by minute amounts of Merck's natural cryst. vitamin- B_1 or synthetic $-B_1$. The beneficial effects of yeast are not completely accounted for by its $-B_1$ content. Pantothenic acid cannot be substituted for $-B_1$. Growth factors (probably $-B_1$) are present in samples of purified maltose and glucose.

L. S. T.

Effect of follicular hormone on growth of culture plants. K. SCHARER and W. SCHROPP (Biochem. Z., 1937, 290, 1—23; cf. A., 1936, 256).—The effect of increasing amounts (500—1500 mouse units) of the cryst. hormone on the growth of various plants is investigated. The effect was negligible with lupins and maize, slight with lucerne and clover, but with soya bean considerably increased yields of both bean and straw resulted. The abs. amount of crude protein was decreased with lupins and maize, increased with soya bean, slightly increased with

clover, and was unaffected with lucerne. Changes in ash, K, P, Ca, and Mg contents are also recorded.

P. W. C.

Parthenocarpy induced by pollen extracts. F. G. GUSTAFSON (Amer. J. Bot., 1937, 24, 102—107).

—CHCl₃-extracts of pollen contain a substance which initiates growth of the ovary and in some cases causes seedless fruits to be formed.

A. G. P.

Influence of heavy-metal salts on the geotropic response of plants. II. Effect of copper salts on the plagiogeotropism of *Tradescantia* shoots and the positive orthogeotropism of seedling roots. H. VON WITSCH (Jahrb. wiss. Bot., 1936, 83, 340—358; cf. A., 1934, 1272).—Cu salts disturb the geotropic response of *Tradescantia* shoots and cause a negative curvature. By delaying the geotropic stimulus of Cu-treated shoots a positive curvature is obtained. Removal of the growing tip restricts the positive curvature. These effects are ascribed to the influence of Cu in the formation or translocation of growth-substance.

A. G. P.

Effect of toxic salts on the degradation of the nucleus through inanition in the lupin. G. DELOFFRE (Compt. rend. Soc. Biol., 1937, 124, 1234—1236).—The toxic action of CuSO₄, HgCl₂, and CdCl₂ occurs between two limits and is of the same order as that on the regeneration of the nucleus (cf. this vol., 189).

H. G. R.

Effects of pruning the roots of gas-injured trees. C. G. DEUBER (Amer. J. Bot., 1936, 23, 432—433).—Exposure of roots to H₂O through which coal gas had been passed caused extensive injury especially to distal parts. Pruning and transference to good soil caused development of new roots and trees became normal in 2 years.

A. G. P.

Sensitivity of aseptic seedlings to some carcinogenic substances. A. BERTHELOT and G. AMOUREUX (Compt. rend., 1937, 204, 517—519).—Various growth-stimulating agents [1:2:5:6-dibenzanthracene, 1:2-benzpyrene (I), 3-indolylacetic acid, etc.] have a toxic effect on sunflower seedlings. In one case treatment with (I) caused an efflorescent appearance of cellular origin.

W. O. K.

Detection of heavy metals in plants and the chromosporodogram method. S. PRAT (Mikrochem., Molisch Festschr., 1936, 342—349).—The distribution of injected Pb, Cu, and Ni in the cell tissues and cell contents of plants is studied by means of the colour reactions with Na₂S, rubianic acid, and dimethylglyoxime, respectively. The material after treatment with the reagent is sectioned and examined microscopically. "Spodograms" are obtained by careful incineration of dried tissue on a white glazed tile. The ash skeleton is treated locally with the reagents, preferably in EtOH, giving suitable colour reactions with the metals under investigation, thereby revealing transport or local concn. of the metal.

J. S. A.

Micro-colorimetric determination of potassium in plant ash. J. TISCHER (Mikrochem., Molisch Festschr., 1936, 418—435).—1 g. of material is ashed, and the ash is treated with HCl and conc. An aliquot portion of the aq. extract of the residue

is pptd. with Na₃Co(NO₂)₆ (I), and K determined as described previously (A., 1931, 1259). In presence of amounts of Fe >50% of the K content, pptn. is effected from 0.76N-AcOH solution. Large amounts of PO₄^{'''} necessitate increasing the concn. of (I) in the pptn.

J. S. A.

Iron storage by blue algæ. V. VOUK (Mikrochem., Molisch Festschr., 1936, 439—446).—Microchemical evidence as to the localisation and manner of storage of Fe in *Cyanophyceæ* is discussed with reference to its ecological and physiological aspects.

J. S. A.

Accumulation of calcium oxalate in cells of *Tradescantia fluminensis* rich in starch. O. WERNER (Mikrochem., Molisch Festschr., 1936, 452—454).—The associated accumulation of cryst. CaC₂O₄ and starch in the same cell is described.

J. S. A.

Hydrocyanic acid in grasses. A. C. LÉEMANN (Onderstepoort J. Vet. Sci., 1935, 5, 97—136).—Tests for cyanogenetic glucosides in 88 grass species are recorded. In *Eustachys paspaloides* and *Sorghum verticilliflorum*, HCl or high alkalinity inhibits HCN production. No HCN is eliminated during the making of hay but transformation into other compounds may occur. Heating grass to 59° and 70° liberates as much HCN as does the CHCl₃ test. HCN is removed by 42.5% but not by 95% EtOH. Al and Mn but not Fe, Mg, or Ca inhibit HCN liberation. Pb acetate ppts. the enzyme with denaturation and partly ppts. the glucoside.

CH. ABS. (p)

Composition of flowers of citrus varieties. A. R. C. HAAS (Proc. Amer. Soc. Hort. Sci., 1935, 33, 61—66).—Ash constituents (Ca, Mg, K, Na), N, P, sugar, and pectin contents of flowers and small fruits are examined. The no. of flowers produced is ≥ the no. of fruits which mature. The abscission of non-effective flowers may involve loss of org. and inorg. constituents in amounts sufficient appreciably to reduce the vigour of the tree.

A. G. P.

Composition of *Pinus radiata* needles. H. O. ASKEW (New Zealand J. Sci. Tech., 1937, 18, 651—655).—In 1—2-year plants the mineral and N contents of needles, stems, and roots decreased in the order named. Subsequent changes in composition with advancing age are recorded.

A. G. P.

Chemical composition, digestibility, and nutritive value of juniper berry cakes (*Juniperus communis*, L.). B. MAYMONE, R. MARRACINO, and A. CARUSI (Ann. Ist. sper. zootec. Roma, 1935, 2, 401—419).—The cakes are made from the residue from steam-distillation by boiling with H₂O and compressing. They contain traces of oil (a mixture of terpenes, chiefly α-pinene) but are free from alkaloids, HCN, and cyanogenetic glucosides. The material contained H₂O 23.72, crude protein 6.23 (including 5.68 of pure protein), Et₂O extract 10.75, crude fibre 27.16, N-free extractives 38.00, and ash 4.14% but wide variations were found. The Et₂O extract yielded 56.55% of acid (calc. as oleic) and 3.86% of unsaponifiable matter. The dried N-free extractives contained reducing sugars 12.7, starch 4.2, and pentosans 9.23%, the remainder probably consisting of org.

acids. The ash was very rich in K and Ca and contained a large excess of fixed bases over fixed acids. The constituents of the cakes had the following digestibilities for sheep: N-free extractives 66, proteins 39, Et₂O extract 37, crude fibre 20%. The calorie val. of the cakes was about 880 per kg. Sheep receiving $\frac{1}{2}$ approx. 50% of the calorie val. of their ration as cakes did not suffer in any way but milch cows consumed the cakes with reluctance and could be given only small amounts. NUTR. ABS. (m)

Glucidic constituents of the interior tissue of the stem of papyrus (*Cyperus papyrus*). E. VOTOČEK (Coll. Czech. Chem. Comm., 1937, 9, 126—133).—The parenchymatic tissue of the papyrus stem contains glucose, *d*-fructose, xylosan, glucosan, and cellulose. E. W. W.

Diastatic decomposition of native potato starch. G. WEICHSEL (Planta, 1936, 26, 28—47).—The relative resistance of starch to diastatic decomp. is examined in relation to the structure of the granule, especially in the outer layers. A. G. P.

Water-soluble polysaccharide from barley leaves.—See A., II, 231.

Composition of fatty oils in different parts of plants. V. GERLOFF (Planta, 1936, 25, 667—688).—Fatty oils from roots of *Paeonia officinalis* and of *Lappa major* contained more saturated acids than the corresponding seed oils. Differences are not due to the proportions of linoleic (I) and linolenic (II) acids present. Root oils contain larger proportions of unsaponifiable matter (III) and oleic acid. Oils in the wood and bark of *Tilia cordata* differ in respect of I val., CNS val., and (III). Lime oil contains oleic acid, (I), and small amounts of (II). Lime bark oil contains tiliadin, C₃₀H₄₉·OH. A. G. P.

Constituents of *Hydrocotyle asiatica*. I. M. A. WALI and M. C. T. KATTI (Proc. Indian Acad. Sci., 1937, 5, A, 109—114).—Steam distillation of the products (8.2%) extracted by 95% EtOH from *H. asiatica* affords a small amount of an essential oil. The light petroleum extract of the dried residue (after saponification) contains oleic, linoleic, linolenic, lignoceric, palmitic, and stearic acids and sitosterol (I). Subsequent extraction with Et₂O and CHCl₃ gives more (I), and the final EtOH extract contains tannin and glucose. No alkaloids are present. J. W. B.

Wax-like constituents from expressed oil from the peel of Florida grapefruit, *Citrus grandis*. K. S. MARKLEY, E. K. NELSON, and M. S. SHERMAN (J. Biol. Chem., 1937, 118, 433—441).—The non-volatile waxy residue remaining after distillation of the peel oil contains the following: solid fatty acids of mean mol. wt. corresponding with C₃₂H₆₄O₂; linolenic, linoleic, and oleic acids; a sapogenic ketone, C₃₁H₅₂O, m.p. 253—254°, [α]_D²⁰ -20.1° (oxime, m.p. 281—282°); a hydrocarbon fraction which from m.p., setting points, and crystal spacing appeared to consist chiefly of C₂₉H₅₀ and C₃₁H₆₄; a phytosterol C₂₈H₄₇·OH, m.p. 132—133° (acetate, m.p. 112.5—113.5°; acetate dibromide, m.p. 115°); and umbelliferone. These constituents have their origin in the cuticle wax of the

fruit and are dissolved by the oil during the pressing process. P. W. C.

Naturally occurring linoleic acid in cottonseed and soya-bean oils and the regenerated linoleic acid from α -linoleic acid tetrabromide of these oils.—See A., II, 227.

New compounds from the unsaponifiable matter of wheat-germ oil.—See A., II, 242.

Isolation of the toxic principle from a species of *Dimorphotheca* (probably *fruticosa*). C. RIMINGTON and D. G. STEYN (Onderstepoort J. Vet. Sci., 1935, 5, 79—80).—The plant contains the cyanogenic glucoside linamarin (cf. A., 1918, i, 526). CH. ABS. (p)

Anisoxide.—See A., II, 257.

Reducing substances in the malt of soya beans produced in Manchuria. M. SUGIURA (J. Orient. Med., 1936, 25, 54).—Germination of the beans is accompanied by increase in the ascorbic acid (I) and decrease in the glutathione (II) content. (I) and (II) appear to be essential for germination. There is twice as much (I) in the green parts of the sprout as in the white parts. NUTR. ABS. (m)

Detection of alantolactone in *Enula* root. R. FISCHER and H. EHRLICH (Mikrochem., Molisch Festschr., 1936, 103—105).—Microsublimation at 50—55°/12 mm. yields alantolactone, micro-m.p. 70—72°. J. S. A.

Natural occurrence of acetylornithine. R. H. F. MANSKE (Canad. J. Res., 1937, 15, B, 84—87).—Air-dried taproots of *Corydalis ochotensis*, Turcz., contain 10% of acetyl-*d*-ornithine, NHAc·[CH₂]₃·CH(NH₂)·CO₂H, m.p. 266° (corr.; decomp.), [α]_D²⁵ +13.1° in H₂O (Cu salt, +H₂O), hydrolysed to AcOH and *d*-ornithine (picrate, new m.p. 207°). E. W. W.

Contents of essential amino-acids in proteins of different varieties of soya beans. M. A. GUBERNIEV and V. I. TOVARNICKII (Trudy Vsesojuz. Inst. Zernobobov. Kul'tur, 1935, 4, 75—85).—The feeding val. of various proteins is recorded. Analyses of NH₂-acids of glycinin are tabulated. NUTR. ABS. (m)

Cystine, tryptophan, and tyrosine content of the soya bean. F. A. CSONKA and D. B. JONES (Brit. Food J., 1936, 38, 62—64).—Defatted dried meal from beans grown under ordinary and optimal conditions contains: N 8.66—10.51, cystine (I) 0.287—0.491, tryptophan 0.91—1.17, and tyrosine 2.29—3.01%. The (I) content is usually \propto the N content. In feeding experiments a diet of beans of low (I) content may lead to (I) deficiency. NUTR. ABS. (m)

Protein content of the bark of black locust, *Robinia pseudacacia*. D. B. JONES and S. PHILLIPS (J. Amer. Chem. Soc., 1937, 59, 595—596).—The inner portion of the bark contains 12.94—27.98% (average 21.5) of protein. The immunity of trees to attack by the locust borer and the protein content are not related. H. B.

Proteins and thymonucleic acid of horse-chestnut (*Aesculus hippocastanum*) seeds. A. N.

BELOZERSKI and I. I. DUBROVSKAJA (Biochimia, 1936, 1, 665—675).—The cotyledons contain a globulin, termed hippocastanin (I), and a nucleoprotein, which, on hydrolysis, yields a protein of a similar NH_2 -acid composition to that of (I), and a nucleic acid, from which guanine, adenine, cytosine, thymine, and lævulic acid, but not uracil, are obtained.

R. T.

Proteins of *Festuca pratensis*. I. S. JAIT-SCHNIKOV (J. Gen. Chem. Russ., 1937, 7, 388—390).—The seeds contain 14.5% of proteins, for which analytical data are given.

R. T.

Structure of proteins. IV. Benzoylated protein. A. KIZEL and K. PSCHENOVA (Biochimia, 1937, 2, 111—126).—Gliadin (I) from wheat and cucurbitin (II) from pumpkin seeds are attacked by NaOH with liberation of reactive groups, but (I) is more resistant than (II) and the groups liberated in (I) are easily eliminated after benzoylation, whereas those liberated in (II) are not. In benzoylated (I) and (II) Bz is bound in 2 (possibly 3) different ways. The benzoylated arginine, histidine, and tyrosine residues are eliminated by cold 0.1N-NaOH.

W. McC.

Amino-acid composition of proteins from two edible mushrooms; methods of study [of proteins]. A. KIZEL and S. KONOVALOV (Biochimia, 1937, 9, 47—59).—The NH_2 -acid composition of proteins from *Psalliota campestris* and *Armillaria mellea* has been determined. Certain sources of error in the usual methods are pointed out.

R. T.

Chemistry of tobacco. V. Do fermented leaves contain protein? N. I. GAVRILOV and V. M. ROMANOV (Planta, 1936, 26, 6—18).—Barnstein's method gives unduly high vals. for protein in tobacco leaves. The principal protein constituent of the leaves is closely associated with the cell walls, shows no biuret reaction, but gives a positive picric acid test. An alkali-sol. protein is also present. EtOH- and H_2O -extracts of fermented leaves are free from protein, but the crude cell residue contains a very resistant protein. All proteins examined were hydrolysed by conc. acids only with difficulty and approx. 25% of the total N was humified in the process (cf. A., 1929, 1499).

A. G. P.

Changes in plant nucleic compounds during extraction in presence of trichloroacetic acid. É. MICHEL-DURAND (Compt. rend., 1937, 204, 613—615).—Discrepancies in examinations of nucleic compounds are ascribed to decomp. effected by 10% aq. $\text{CCl}_3\cdot\text{CO}_2\text{H}$ at room temp. Use of neutral salt solutions for extraction of nucleoproteins is recommended.

A. G. P.

Chemical changes in protein during thermal denaturation. A. KIZEL and K. OPALJAR (Biochimia, 1937, 2, 82—89).—The % content of dicarboxylic NH_2 -acids in pumpkin seed globulin falls from about 20 to 6.8—8.7% after heating (95°; 30 min.) with 10% NaCl; the effect is not observed in H_2O and aq. CO_2 . Other NH_2 -acids remain unchanged.

R. T.

Carotenoids of the peach. G. MACKINNEY (Plant, Physiol., 1937, 12, 216—218).—The caro-

tenoid fraction contains β -carotene, cryptoxanthin, lutein, and zeaxanthin. Only a trace of α -carotene was detected. Peach differs from apricot in having no γ -carotene or lycopene in the carotenoid complex.

A. G. P.

***Bixa orellana* and carotene.** D. DA F. RIBEIRO (Rev. Biol. Hyg., 1935, 6, 98—101).—The nuts of *B. orellana* yield a reddish-brown substance containing red bixin and an orange-yellow material, the former giving a more marked colour with SbCl_3 than does the latter.

NUTR. ABS. (m)

Cytological studies on flowers of *Ranunculaceae*. W. SCHARINGER (Protoplasma, 1936, 25, 404—426).—The anthocyanin bodies in epidermis cells of *Delphinium* petals show a cryst. structure. They may be anthocyanin crystals or cryst. anthocyanophores. The cells also contain doubly-refracting bodies probably of a lipin nature, which can be stained with neutral-red, chrysoidine, and Janus-green and are sol. in acids and alkalis, EtOH, Et_2O , COMe_2 , and CH_2O . Osmic acid gives a faint brown and I-KI an intense brown. The cell vacuoles often contain cytoplasmic globules not stainable by neutral-red and containing drops of a fatty oil stainable by Sudan and sol. in EtOH. In certain petals of *D. triste* the cell sap is coloured dark brown by anthophæin and is a solid gel. Plasmolysis or vital staining with neutral-red converts it into a sol.

M. A. B.

Pigment of the cloudberry, *Rubus chamaemorus*. L. H. WILLSTAEDT (Skand. Arch. Physiol., 1936, 75, 155—165).—Cloudberryes are red until just before they are ripe, when they turn yellow. The red colour appears to be due to anthocyanin. A cloudberry preserve ("mylta") contained 0.455 mg. of total carotene (0.073 mg. of β -carotene) per 100 g., together with δ - and γ -carotene, phytoanthin, and zeaxanthin.

NUTR. ABS. (m)

Red pigment occurring in sugar cane with Sereh disease. J. C. TINBERGEN and VAN DER VLOODT (Chem. Weekblad, 1937, 34, 254—256).—The red pigment isolated chromatographically on Al_2O_3 is sparingly sol. in org. solvents, gives an absorption spectrum totally different from that of purpurin, and yields no anthracene on distillation with Zn. It is not derived from anthraquinone or carotene and is not an anthocyanin pigment.

S. C.

Chlorophyll. H. FISCHER (Mikrochem., Molisch Festschr., 1936, 67—98).—A review of the author's work.

J. S. A.

Physical properties of chlorophyll films.—See A., I, 301.

Double refraction and grains of chloroplasts. F. WEBER (Mikrochem., Molisch Festschr., 1936, 447—451).—The nature of the chloroplasts is discussed.

J. S. A.

Chemical examination of *Sarcostemma australe*, R.Br., the "caustic vine." J. C. EARL and J. B. DOHERTY (J. Coun. Sci. Ind. Res. Australia, 1937, 10, 26—28).—This latex-bearing plant is reported as toxic to cattle. EtOH-extracts of the dried plant yield a wax containing α - and β -amyrin,

30% of unsaponifiable matter, and a saponin $C_{22}H_{34}O_{10}$, giving α -methylglucoside on acid hydrolysis.

A. G. P.

Chemical properties of the hormone of *Mimosa pudica*. H. FITTING (Jahrb. wiss. Bot., 1936, 83, 270—314).—The hormone is isolated from the EtOH extract of leaves by pptn. with $Pb(OAc)_2$. It is heat-resistant, decomposed by 1% HCl but not by 10% AcOH, readily decomposed by alkalis, is adsorbed by C, is dialysable, and is destroyed by H_2O_2 .

A. G. P.

American mistletoe. F. J. DESANTIS and E. V. LYNN (J. Amer. Pharm. Assoc., 1937, 26, 219—220).—Analysis of *Phoradendron flavescens* indicates presence of tannin, pentosans, saponins, probably traces of choline derivatives, but no alkaloids or glucosides.

F. O. H.

Tea leaves. III. Constitution of tannin in leaves. Y. OSHIMA. **IV. Enzyme chemistry of manufacture of black tea.** Y. OSHIMA and K. HAYASHI (J. Agric. Chem. Soc. Japan, 1935, 11, 750—756, 757—759; cf. A., 1934, 571).—III. The cryst. tannin isolated from leaves in 5'-hydroxycatechin.

IV. d-Catechin and galocatechin are oxidised to reddish-brown products by enzymes extracted from tea buds.

CH. ABS. (p)

Detection of baptisin in *Baptisia* root. R. FISCHER and H. EHRLICH (Mikrochem., Molisch Festschr., 1936, 99—102).—Baptigenin (micro-m.p. 278—284°) is obtained by microsublimation from the root and from pure baptisin at 180—200°/12 mm. The glucoside itself is not volatile.

J. S. A.

Histochemical notes on betulin. M. STEINER (Mikrochem., Molisch Festschr., 1936, 405—417).—Betulin (I) may be detected in plant tissues by micro-sublimation and micro-m.p. determination (247—252°). (I) is found in the outer periderm of the cork in all birch barks, and may be detected similarly in fossil deposits and in peats.

J. S. A.

Chemistry and pharmacology of *Tylophora asthmatica*. R. N. CHOPRA, N. N. GHOSH, J. B. BOSE, and S. GHOSH (Arch. Pharm., 1937, 275, 236—242).—The plant yields 0.44% of alkaloids, including 0.1% of tylophorine, $C_{23}H_{27}O_4N$, amorphous, m.p. 125—130° (decomp.), $[\alpha]_D^{25}$ —15.8° in $CHCl_3$ [hydrochloride, m.p. 261—265° (decomp.); hydrobromide, m.p. 252—255° (decomp.); hydriodide, m.p. 243—245° (decomp.); sulphate: aurichloride] (cf. Ratnagiriswaran *et al.*, A., 1935, 1433). Its pharmacological action is described.

R. S. C.

Pharmacognosy of *Matricaria discoidea*, D.C. P. N. SCHÜRHOFF and K. HARTWICH (Arch. Pharm., 1937, 275, 256—268).—With the exception of the essential oil the constituents of *M. discoidea* (description and tests recorded) are substantially the same as those of *M. chamomilla*.

R. S. C.

Kousso. I. Protokosin.—See A., II, 250.

Karanjin.—See A., II, 258.

Fraxinol, a component of ash bark.—See A., II, 254.

Ayapin.—See A., II, 254.

Aristolochine from roots of *Aristolochia indica*, Linn.—See A., II, 265.

Narcotoline, a new alkaloid of the poppy.—See A., II, 265.

Constitution of l-asarinin.—See A., II, 259.

Tobacco alkaloids.—See A., II, 265.

Alkaloids of *Corydalis scouleri*, Hk., and *C. sibirica*, Pers.—See A., II, 265.

Alkaloids of *Senecio*. Jacobine, jacobine, and jaconine.—See A., II, 265.

New alkaloid, rubradinine, from the Rubiaceae.—See A., II, 266.

New alkaloid, formosanine, from *Ourouparia formosana*, Matsumura and Hayata.—See A., II, 266.

Mitraversine.—See A., II, 266.

Micro-analysis of seeds without loss of germinating power. N. N. IVANOV (Mikrochem., Molisch Festschr., 1936, 243—258).—Micro-analyses are carried out on representative sections of tissue cut from the seed without impairing its viability. Alkaloids are detected and roughly estimated by Burchard's KI + I reagent. Oils are extracted by means of Et_2O from tissue dried at 100°, and oxidised with acid $K_2Cr_2O_7$, the excess of which is titrated iodometrically. Protein, in grist from seed dried at 30—35°, is determined by the micro-Kjeldahl-NaOBr method, with iodometric determination of the excess of NaOBr.

J. S. A.

Rapid staining with buffered Wright stain. DECOSTELLO (Folia Hematol., 1935, 53, 390—395).—A PO_4''' buffer at p_H 6.2 is the best diluting fluid.

CH. ABS. (p)

Observation of ultracentrifugal sedimentation by the Toepler "Schlieren" method.—See A., I, 332.

Limitations of colorimetric analyses.—See A., I, 331.

Determination of small amounts of ammonia and other bases by the use of boric acid. A. E. SOBEL, H. YUSKA, and J. COREN (J. Biol. Chem., 1937, 118, 443—446).—A method is described for determination of NH_3 , produced by urease action, micro-Kjeldahl distillation, or in the electrometric determination of total base, in which the NH_3 is trapped in 2% H_3BO_3 and titrated back to the original colour, using methyl-red or methyl-red + methylene-blue as indicator.

P. W. C.

Determination of small quantities of arsenic in medico-legal cases. D. N. CHATTERJI, K. R. GANGULY, and M. Z. FARUQI (J. Indian Chem. Soc., 1936, 13, 751—754).—The material is digested with $H_2SO_4 + HNO_3$, and excess of HNO_3 removed by heating with $(NH_4)_2C_2O_4$ or urea. As is determined by the electrolytic Marsh method, after boiling the solution with pyrogallol + H_2SO_3 to ensure complete reduction to As^{III} .

J. S. A.

Determination of iron in simple and biological media.—See A., I, 329.