BRITISH CHEMICAL ABSTRACTS

A., III.—Biochemistry

NOVEMBER, 1937.

Determination of *iso*propyl alcohol in respiratory air. E. HAHN (Biochem. Z., 1937, **292**, 148—151).—$Pr^{\beta}OH$ is determined (after, *e.g.*, adsorption on SiO_2) by a modification of the method of Knipping and Ponndorf (A., 1927, 70). An intake of 0·72 g. of $Pr^{\beta}OH$ by man during 1 hr. results in the presence of 8 mg. of $COMe_2$ in the respired air. F. O. H.

Arterialisation of blood. VI. Comparison of calculated and experimentally determined decrease in oxygen content of arterial blood during respiratory pause. H. SARRE and H. WACHTER (Z. Biol., 1937, **98**, 221—231; cf. A., 1936, 1399).—A differential equation is deduced to express the temporary fall in $[O_2]$ of arterial blood during respiratory pause. The difference between curves obtained with this equation and experimental curves is discussed. E. M. W.

Blood picture of the normal dog. H. D. BRUNER and G. E. WAKERLIN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 667—670).—The following mean vals. were obtained, no difference being observed between the sexes: erythrocytes $6{\cdot}45\pm0{\cdot}03\times10^6$ per cu. mm., hæmoglobin $13{\cdot}56\pm0{\cdot}07$ g. per 100 c.c., reticulocytes $0{\cdot}44\pm0{\cdot}014\%$, leucocytes $14{\cdot}18\pm0{\cdot}22\times10^3$ per cu. mm. H. G. R.

Effect of adrenaline on blood count and on hæmatocrit value. S. P. LUCIA, P. M. AGGELER, G. D. HUSSER, and M. E. LEONARD (Proc. Soc. Exp. Biol. Med., 1937, **36**, 582—584).—Injection of adrenaline (I) caused an increase in the erythrocyte and leucocyte counts and in the hæmatocrit val. No significant change was observed on adding (I) to whole blood *in vitro*. H. G. R.

"Unmodified porphyrin-*C*." H. THEORELL (Enzymologia, 1937, **4**, Part II, 192—197).—The "unmodified porphyrin-*C*" of Hill and Keilin (A., 1931, 125) consists of a porphyrin–polypeptide complex of high mol. wt. Removal of the polypeptide by acid hydrolysis leaves a porphyrin of mol. wt. 1020 which contains S, but only traces of NH_2-N. The absorption spectrum and hydrophily are not affected by the hydrolysis. J. N. A.

Water-soluble *c*-hæmin from blood. II. Chromotographic enrichment of *c*-hæmin and its behaviour when deprived of iron. O. SCHALES (Ber, 1937, **70**, [*B*], 1874—1880; cf. this vol., 163).—Dil. solutions of hæmoglobin crystals, after peptic digestion, are freed from hæmin by Et_2O and the aq. phase is evaporated to dryness. The residue is purified by dissolution in H_2O, admixture with a phosphate buffer, C_5H_5N, and $Na_2S_2O_4$, and passage through Al_2O_3 (Brockmann). Hæmin-*c* (I), thus purified, gives a dull brownish-violet colour in conc. H_2SO_4, thus differing from chlorohæmin although the porphyrins thus produced can scarcely be distinguished spectroscopically from one another. Removal of Fe from (I) by HBr–AcOH is accompanied by the appearance of a greenish-brown colour which cannot be driven into Et_2O–AcOH by addition of NaOAc. (I) cannot therefore be identical with the prosthetic group of cytochrome-*c* from yeast. H. W.

Reaction between hæmin and hydrogen peroxide. F. HAUROWITZ (Enzymologia, 1937, **4**, Part II, 139—144).—In solutions containing H_2O_2 and hæmin (I), three reactions occur, viz., the formation of the H_2O_2–(I) complex, the catalytic destruction of H_2O_2, and peroxidase destruction of (I). The velocity of the reactions depends on the solvent used. In H_2O_2–(I), the H_2O_2 is co-ordinately linked with the Fe atom. C_5H_5N–(I) in presence of physiological H_2 donators is converted by H_2O_2 into a green Fe-free pigment with an absorption spectrum resembling that of green chlorophyll derivatives. P. W. C.

Effect of hydrogen peroxide on methæmoglobin. R. D. BARNARD (Proc. Soc. Exp. Biol. Med., 1937, **36**, 762—763).—If methæmoglobin is prepared by oxidation of hæmoglobin with $Fe(CN)_6'''$ a methæmoglobin peroxide is formed with H_2O_2 (cf. Keilin and Hartree, A., 1935, 372), whereas if quinhydrone is used oxyhæmoglobin is produced. H. G. R.

Reactions of nitrite with hæmoglobin derivatives. R. D. BARNARD (J. Biol. Chem., 1937, **120**, 177—191).—NO_2' combines with the nucleus Fe of methæmoglobin (I) and diminishes its oxidising activity. Combination of NO_2' with (I) or with hæmatin (II) yields similar products. In aq. NH_3, (II) yields a dissociable compound with NO_2'. In AcOH–Et_2O, (II) is reduced by NO_2' to a hæmochromogen-like compound. NO_2' reacts with, and denatures, the globin of hæmoglobin derivatives. J. L. C.

Determination of albumin and globulin in serum. I. Errors involved in the filtration procedure. H. W. ROBINSON, J. W. PRICE, and C. G. HOGDEN (J. Biol. Chem., 1937, **120**, 481—498).—Following pptn. of globulin by addition of Na_2SO_4 (Howe, A., 1922, ii, 172), filtration through paper results in a significant adsorption loss of albumin (I) to an extent independent of (I) concn. but dependent on the type and quantity of paper. Refiltration of the filtrate through the same paper finally produces

saturation with (I). The adsorbed (I) is not eluted by 22% aq. Na_2SO_4. A modified procedure to avoid this source of error is described. F. O. H.

Presence of a new serum-protein in the blood of various animals. L. F. Hewitt (Biochem. J., 1937, **31**, 1534—1537).—Glycoprotein fractions resembling seroglycoid from horse's serum (cf. A., 1937, 164) were obtained from fox, rabbit, human, and chicken sera. The fractions contained considerable amounts of carbohydrate, were not coagulated by heat or pptd. by $CCl_3{\cdot}CO_2H$, and had $[\alpha] <$ that of crystalbumin. J. L. C.

Measurement of depolarisation of Tyndall light with solutions of proteins, particularly fibrinogen. E. Wöhlisch and A. Neugschwender (Biochem. Z., 1937, **292**, 196—211).—Measurements of intensity and degree of depolarisation of Tyndall light during the coagulation of aq. fibrinogen (I) by thrombin show that with low (I) concn. (at which a negative phase of depolarisation occurs), total depolarisation decreases with increasing concn., whilst above a certain val. of (I) concn. it is independent of concn. The relationship between the angle of depolarisation and opalescence of the solution and the bearing of the data on coagulation phenomena with reference to both colloidal systems and (I) are discussed. F. O. H.

Adsorption of polypeptides by blood-plasma proteins. J. Loiseleur and R. Colliard (Compt. rend., 1937, **205**, 261—263; cf. this vol., 374).—After eliminating proteins by $CCl_3{\cdot}CO_2H$ (I), the filterable N (II) of dil. plasma increases with increasing dilution but not to the same extent as does the (II) from a peptone solution, probably because of the difference in the nature of the colloidal particles. Plasma treated with $MgSO_4$ (1 vol.) for a given time and at a definite temp. and then with (I) (2 vols.) affords more (II) than in the absence of $MgSO_4$; as the $[MgSO_4]$ increases, (II) increases to a max., which inversely $\propto$ the temp. and the time of contact of $MgSO_4$ with the plasma, and then decreases. J. L. D.

Determination of blood-creatinine by the Lange–Roth photometer. P. von Végh (Biochem. Z., 1937, **292**, 189—190).—The method, based on the photometric determination of extinction coeffs. of the colour produced by alkaline picric acid in blood (3 c.c.) deproteinised by Na_2WO_4–H_2SO_4, is described. F. O. H.

Determination of creatinine in blood. H. Popper, E. Mandel, and H. Mayer (Biochem. Z., 1937, **291**, 354—367).—A modification of the method of Folin (A., 1914, ii, 505) is described. A step-photometer or, better, an abs. colorimeter is used. The creatinine (I) content of healthy human whole blood, plasma, and serum is 0·5—1·0 mg. per 100 c.c. The val. remains const. in the individual and is not affected by bleeding, by consuming large amounts of meat or H_2O, or by giving NH_2-acids or diuretics. The (I) content of cerebrospinal fluid, pleural exudates, or ascites is of the same order as that of blood. W. McC.

Cystine in normal and cystinuric human blood. B. H. Brown and H. B. Lewis (Proc. Soc. Exp. Biol. Med., 1937, **36**, 487—488).—The plasma ultrafiltrate of normal human blood contains approx. 1·0 mg. of cystine (I) per 100 c.c. No increase of (I) occurs even after feeding methionine to a cystinuric patient. P. G. M.

Glucosamine content of the serum in health and in pneumonia. I. Nilsson (Biochem. Z., 1937, **291**, 254—258).—The glucosamine (I) content of the serum-proteins (II) is increased in pneumonia whilst the serum-mucoid is unchanged. Comparative data for the (I) content in the normal (II) of horse, cow, pig, and rabbit are given. W. McC.

Effect of bile with and without cholesteryl esters on esterification of cholesterol in plasma. C. Riegel, I. S. Ravdin, and H. J. Rose (J. Biol. Chem., 1937, **120**, 517—530).—Heating of plasma to 38° with normal hepatic bile (dog, man) causes hydrolysis of cholesteryl esters (I) whilst heating plasma alone produces esterification. The hydrolysis does not occur when the bile contains (I), the content of which is unaffected by heating to 38° with normal bile. F. O. H.

Blood fats during the dietary production of fatty livers in dogs. E. V. Flock and J. L. Bollman (Proc. Soc. Exp. Biol. Med., 1937, **36**, 853—855).—No increase in the neutral fats of the plasma was observed on a high-fat diet with or without EtOH. H. G. R.

Precipitin tests with glycogen from various species of animals. D. H. Campbell (Proc. Soc. Exp. Biol. Med., 1937, **36**, 511—512).—Rabbit antisera do not react with liver-glycogen (I) from guinea-pigs, frogs, and chickens, whilst (I) from clams and helminths is immunologically active and sp. P. G. M.

Glycolysis in blood. III. Glycolysis and glutathione. S. Morgulis [with B. Wagner] (Biochimia, 1937, **2**, 638—656).—The level of reduced glutathione (I) remains const. in rabbit blood during glycolysis, after completion of which oxidation of (I) commences. In dog's blood oxidation of (I) commences shortly before completion of glycolysis. Oxidation of (I) is accelerated by adding substances which inhibit glycolysis (NaF), but is not affected by NaCN, which stimulates glycolysis. R. T.

Sugar content of heparinised and oxalated plasmas. I. Neuwirth (J. Biol. Chem., 1937, **120**, 463—465).—The permeability of blood cells (rabbit, man) for sugar is confirmed. J. N. A.

Quantitative drop analysis. IX. Determination of blood-glucose. K. Heck, W. H. Brown, and P. L. Kirk (Mikrochem., 1937, **22**, 306—314).—A solution containing $1—12 \times 10^{-6}$ g. of glucose is treated with 0·04 ml. of 14% Na_2CO_3 + 0·04 ml. of 1·5% $K_3Fe(CN)_6$ at 100° for 5 min. The liquid is acidified with 10% H_2SO_4, and the $Fe(CN)_6''''$ so formed is titrated with 0·01N-$Ce(SO_4)_2$, using $FeSO_4$–phenanthroline as indicator (A., 1931, 1385). Biological fluids are deproteinised with $CuSO_4$ + Na_2WO_4; the solution is separated centrifugally, and treated as above. J. S. A.

Effect of dosage on the rate of disappearance of alcohol from the blood stream. H. W. New-

MAN, A. J. LEHMAN, and W. C. CUTTING (J. Pharm. Exp. Ther., 1937, **61**, 58—61).—After a single intravenous injection of EtOH into dogs, the fall in concn. of blood-EtOH $\propto$ the time, the rate increasing by approx. 17% each time the dose is doubled between 1 and 6 c.c. per kg. H. G. R.

Empirical regression equation relating total serum-calcium to serum-albumin and -globulins. A. B. GUTMAN and E. B. GUTMAN (Proc. Soc. Exp. Biol. Med., 1937, **36**, 527—531).—Total serum-Ca is composed of $\leqslant 4$ fractions, which are represented by the regression equation, total Ca $= m_1 \times$ albumin $+ m_2 \times$ globulin II $+ m_3 \times$ globulin I $+ b$. The variation of the consts. is discussed in the light of the results obtained. P. G. M.

Calcium : magnesium ratio in serum. M. JACOBY and R. JAKOBOWITZ (Enzymologia, 1937, **3**, Part I, 1—4; cf. A., 1933, 746).—The min. lethal doses of $H_2C_2O_4$, $Ca^{"}$, and $Mg^{"}$ for mice (wt. approx. 15 g.) are 2, 1·6, and 2·4 mg., respectively. The effect of $H_2C_2O_4$ is counteracted by injecting sub-lethal doses of $CaCl_2$ but is reinforced by injecting non-lethal doses of $MgCl_2$ which, however, counteract the effect of lethal doses of $CaCl_2$. In rabbits, injection of $MgCl_2$ produces an increase in blood-Mg and a parallel but less pronounced decrease in -$Ca^{"}$, the Ca : Mg ratio being reduced. Injections of $CaCl_2$ increase serum-$Ca^{"}$ and decrease -$Mg^{"}$, the Ca : Mg ratio being increased, usually greatly. W. McC.

Determination of serum-inorganic phosphate and serum-phosphatase activity. A. BODANSKY (J. Biol. Chem., 1937, **120**, 167—175).—Modifications of previously-described methods are given (A., 1933, 316, 863). J. L. C.

Photometric determination of blood-potassium. A. HEIDUSCHKA and H. OBER (Biochem. Z., 1937, **292**, 191—195).—Blood (7—8 c.c.) is deproteinised by $CCl_3{\cdot}CO_2H$ and ashed in presence of $HClO_4$. The ash is dissolved in aq. $HClO_4$ and treated with H_2PtCl_6. The pptd. K_2PtCl_6 is separated, treated with KI–H_2SO_4, and extinction coeffs. of the red-coloured aq. K_2PtI_6 are measured photometrically. F. O. H.

Distribution of iron in the blood. C. E. JENKINS and M. L. THOMSON (Brit. J. Exp. Path., 1937, **18**, 175—190).—A colorimetric method of determining Fe by the thiolglycollic acid method is described. The necessity for exactness in minutiæ of technique is emphasised. $Fe(NH_4)_2(SO_4)_2$ is used for the standard. The red corpuscle contains approx. 7% more Fe than can be accounted for as hæmoglobin (I). Vals. are given for normal and various anæmic conditions and support the suggestion that this non-hæmoglobin-Fe results from breakdown of (I) during ageing of the cell. Confirmatory indications are given by its variation during the menstrual cycle. Plasma-Fe shows a wide range of variation which is partly related to special conditions. R. M. M. O.

Convenient method of securing blood for [micro-]analysis. E. M. ABRAHAMSON (Science, 1937, **86**, 202). L. S. T.

Clot prevention in blood studies in animals. S. NITTIS (Science, 1937, **86**, 201—202).—A simple technique using Na citrate is described. L. S. T.

Mechanism of the activation by chloroform of thrombin in plasma and serum. I. Action of chloroform on oxalated plasma. II. Action of chloroform on serum. H. SCHEURING (Biochem. Z., 1937, **291**, 385—398; **292**, 1—15; cf., A., 1935, 1263).—I. $CHCl_3$ ppts. fibrinogen (I), at the same time dehydrating it, neutralising its electric charge, damaging its micellar structure, and so first diminishing and then destroying its power to coagulate. The coagulating effect of added thrombin (II) is counteracted by $CHCl_3$ before that of added $Ca^{"}$. Hence (I) when pptd. carries down (II), which exerts its coagulating power only after combining with (I). $CHCl_3$ slowly removes (II) from (I) and prevents recombination of (I) and (II). Accordingly the (II) content of plasma is increased by addition of $CHCl_3$.

II. Serum contains a protein which absorbs and hence inactivates the (II) present in lower concn. than in plasma where (II) is bound to (I). (I) and antithrombin (III) have similar physico-chemical structure and hence are affected in the same way by (II) and by $CHCl_3$ and differ only in their power to produce fibrin. The difference in the rate at which (II) of serum and plasma are activated by $CHCl_3$ is due to the presence or absence of (I). In serum thrombogen (IV) is adsorbed on (III) on the surface of which (II) production occurs when thrombokinase (V) is added. $CHCl_3$ removes adsorbed (IV) from (III) and retards (II) production after addition of (V). $CHCl_3$ damages the lipoid envelope of erythrocytes, thus diminishing their power to adsorb (V) and to regulate coagulation. W. McC.

Effect of trypsin on the clotting of blood in hæmophilia. T. L. TYSON and R. WEST (Proc. Soc. Exp. Biol. Med., 1937, **36**, 494—496).—Like thrombin, trypsin (I) accelerates the *in vitro* coagulation of hæmophilic blood. Daily oral administration of 30 g. of (I) with $CaCO_3$, on an empty stomach, to two cases of hæmophilia did not affect the clotting time of the blood. P. G. M.

Use of dialysis in the preparation and purification of immunologically active bacterial products. S. MORELL and G. SHWARTZMAN (Science, 1936, **86**, 130). L. S. T.

Relationship between antibody reaction and enzyme action. H. SACHS (Enzymologia, 1937, **3**, Part I, 44—51).—A review. W. McC.

Is antibody-globulin "denatured" by its combination with antigen? S. B. HOOKER and E. M. FOLLENSBY (Proc. Soc. Exp. Biol. Med., 1937, **36**, 834—835).—The cohesive property of specifically combined antibody-globulin is not developed by heat-denatured normal globulin. H. G. R.

Action of formaldehyde on antibodies. K. IVANOV (Z. Hyg., 1936, **118**, 197—203).—Addition of CH_2O to immune sera is injurious to antibodies to an extent which is related to the $[CH_2O]$ and the time of action. Precipitins, *e.g.*, of anthrax and the antibodies of sera for fowl cholera and swine fever are

very sensitive. Agglutinins and hæmolysins are less easily affected and antigens suffer no injury. A. G. P.

β-Specific receptors (homogeneous coagglutinins) in bacteria of the hog-cholera group. F. Ohashi (Z. Immunitäts., 1937, **90**, 118—124).—The three existing forms of the hog-cholera group can be distinguished by means of their β-sp. receptors. C. R. S.

Analysis of protective substances in specific sera which control experimental infection with *Cl. œdematis maligni* (*Vibrion septique*). D. W. Henderson (Brit. J. Exp. Path., 1937, **18**, 224—238).—The H antibody produced in response to this organism has a protective val. although its action is purely to immobilise the organism and no sensitisation can be demonstrated *in vitro*. An explanation of the protective val. of immobilisation in the case of invasion of tissues by an anaërobe is given. An antibacterial serum forms the most potent protection against this organism. R. M. M. O.

Decrease of toxicity of diphtheria toxin by lanoline and sterols; influence of cholesterol on its immunising power. M. Eisler and F. Gottdenker (Z. Immunitäts., 1937, **90**, 427—451).—The toxicity of diphtheria toxin is reduced (in a degree which increases with the time of incubation) by mixing with lanoline, olive oil, cholesterol (I), its esters, phytosterol, or oxycholesterol. (I) is less effective in aq. suspension than as aq. sol or in solution in oil. An aq. extract of a light petroleum solution of the toxin with lanoline or (I) after sufficient incubation is no longer toxic. The toxin is not destroyed within the animal. The quantity of antitoxin formed increases when (I) is injected with the toxin. C. R. S.

Diphtheria toxin production. III. A simple gelatin hydrolysate medium and some properties of the toxin produced thereon. A. M. Pappenheimer, jun., and S. J. Johnson (Brit. J. Exp. Path., 1937, **18**, 239—244).—A protein-free medium is described on which toxin is produced in large amounts and from which it can subsequently be separated by pptn. with $(NH_4)_2SO_4$. The toxin behaves as a protein and is very sensitive to denaturation on the acid side of p_H 6. Though Fe inhibits its production, continued culture on an Fe-containing medium does not affect the toxin production when the organisms are then transferred to Fe-free medium. A non-toxic protein is formed which ppts. at 1/3 saturation with $(NH_4)_2SO_4$ both in the presence and absence of Fe. The toxin is pptd. almost completely at 2/3 saturation. R. M. M. O.

Effect of a heat-resistant enzyme on the antigenicity of pneumococci. R. J. Dubos and C. M. MacLeod (Proc. Soc. Exp. Biol. Med., 1937, **36**, 696—697).—A heat-resistant enzyme, which renders heat-killed pneumococci Gram-negative without dissolution and inactivates the capsular antigen, has been obtained from various tissues. H. G. R.

Antigen content of filtrates of cultures of *Staphylococcus aureus*. (Analysis by the Schultz-Dale method.) F. Schaaf and P. Robert (Z. Immunitäts., 1937, **90**, 192—206).—Repeated injections of the untreated filtrates or those modified by heat or treatment with CH_2O caused anaphylaxis and contraction of the uterus of sensitised guinea-pigs. All three filtrates contained a common antigen and one or more of four characteristic antigenic groups. C. R. S.

Evaluation and mode of action of tetanus toxin. K. Halter (Z. Hyg., 1936, **118**, 245—262).—The higher titre obtained when the toxin is diluted with aq. peptone (I) than when H_2O or aq. NaCl is used is attributed to the relatively greater lability of the toxin in NaCl rather than to activation by (I). Inactivation by NaCl is largely though not entirely dependent on the amount of O_2 dissolved in the solution. Peptone forms compounds with the O_2, thus protecting the toxin. A. G. P.

Effect of cysteine on tetanus toxin. P. B. Cowles (Yale J. Biol. Med., 1936, **8**, 265—268).—In O_2, cysteine (I) can detoxicate tetanus toxin yielding a toxoid which stimulates the production of and unites with antitoxin. The reaction differs from that of (I) with Cu. Ch. Abs. (*p*)

Immunising power of varieties of tubercle bacilli. J. Weissfeiler, E. N. Morosova, and E. J. Pesina (Ann. Inst. Pasteur, 1937, **59**, 259—281).—Of various avirulent strains, the immunising power is greatest with BCG strains and slight in chromogenic and saprophytic types. Injection of the dried bacilli (0·1 mg.) significantly immunises guinea-pigs for 4—6 months. The degree of immunisation afforded does not depend on the presence of living bacilli in the organism. F. O. H.

Differences in thermostability of various groups of antibodies. K. Meyer and A. Pic (Ann. Inst. Pasteur, 1937, **59**, 282—292; cf. this vol., 55).—The anti-lipin and -polysaccharide antibodies of tubercular serum are inactivated at different temp., the former being more thermostable for rabbit, horse, and man and the latter for guinea-pig. The stability (which is independent of the medium) differs with antibodies of the same type from different sera of the same animal species. F. O. H.

Antigenic nature of the polysaccharides of tubercle bacillus. F. Klopstock and A. Vercellone (Z. Immunitäts., 1937, **90**, 507—512).—Polysaccharides isolated from the bacilli and carefully freed from any traces of lipins showed no sp. biological reaction. C. R. S.

Sensitivity of different strains of typhoid bacilli to the bactericidal action of natural and immune sera. Y. B. Abdoosh (Z. Immunitäts., 1937, **90**, 125—138).—The natural bactericidal antibodies of different mammals behave differently towards the three groups of *Bact. typhosum*. Some show marked differences, others no distinction, between virulent and avirulent strains. Rough strains show bactericidal action more than smooth strains with or without vi-antigen. The *O*-antibody is markedly, the *H*-antibody weakly, bactericidal to various strains of *Bact. typhosum*. The vi-antibody is also active towards strains with the corresponding antigen. C. R. S.

Chemical nature of *O*-antigens of *Bact. typhosum*. Y. Aoki, K. Obi, and H. Tanaka (Z. Immunitäts., 1937, **90**, 162—173).—The nucleoprotein fraction of typhoid bacilli contains the sp. and the non-sp. heterologous *O*-agglutinins; the polysaccharide fraction contains the homologous non-sp. *O*-agglutinin. The fat fraction has no agglutinin-forming power. C. R. S.

Resistance of different receptors to disinfectants. K. Aoki (Z. Immunitäts., 1937, **90**, 452—458).—Typhoid bacilli of mice were subjected to heat and to treatment with antiformin, PhOH, CH_2O, EtOH, $HgCl_2$, Lugol's solution, KOH, peppermint oil, H_3BO_3, alum, and supersaturated solutions of NaCl. The β-sp. receptors being the most sensitive are destroyed at the same time as the living bacteria; the β-non-sp. receptors are the least sensitive. C. R. S.

Demonstration of vaccinia virus in the organs of vaccinated rabbits. O. Andersen (Z. Immunitäts., 1937, **90**, 105—117). C. R. S.

Electric impedance of marine eggs. K. S. Cole and R. H. Cole (Physical Rev., 1936, [ii], **49**, 645).—Calculations based on measurements of the a.c. resistance and capacity of sea-H_2O suspensions of the eggs of sea-urchins and the common starfish show that (i) the capacity of the unfertilised egg interior varies from 0·75 to 1·1 μF. per cm.^{2}, (ii) the egg interior is not electrically homogeneous, approx. 5% of the vol. being membrane-covered material, whilst the balance has a sp. resistance 6—8 times that of sea-H_2O, and (iii) on fertilisation, a membrane with a capacity 2—3 μF. per cm.^{2} is laid down over the egg surface, and separated from it by a space, a few μ. thick, which has approx. the sp. resistance of sea-H_2O. L. S. T.

Changes of hydrogen-ion concentration of the cerebral cortex. J. G. D. de Barenne, W. S. McCulloch, and L. F. Nims (Proc. Soc. Exp. Biol. Med., 1937, **36**, 462—464).—The p_H of the cerebral cortex ∝ its spontaneous electrical activity. Heat-coagulation (5 sec. at 80°) of an area renders this area acid (p_H 6·6) relative to the adjacent normal cortex (p_H 7·3). P. G. M.

Chemical activity of nerve-trunks. Q. Calabro (Riv. Biol., 1937, **22**, 127—131).—Mainly polemical against Bergami (cf. this vol., 258). F. O. H.

Distribution of potassium in nature.—See A., I, 585.

Cattle bones. General composition and protein-nitrogen distribution of pig's bones. M. Saito (Rep. Inst. Sci. Res. Manchoukuo, 1937, **1**, 19—22).—Various bones of a pig were analysed in respect of H_2O, fat, ash, Ca, P, and total protein (I). The yield of crude gelatin (II) extractable by hot H_2O is 25—53% of (I). The N distribution of the NH_2-acids from (I) resembles that of (II), but (I) contains small amounts of tyrosine, tryptophan, and cystine. W. O. K.

Sodium content of bone and other calcified material. H. E. Harrison (J. Biol. Chem., 1937, **120**, 457—462).—The Na content of bone is ≫ that accounted for by extracellular fluid (A., 1936, 682). With bones of rats with various disorders of calcification, the "excess Na," except in those cases where large doses of irradiated ergosterol are given, ∝ Ca content (Ca : Na = 30 : 1). The excess Na cannot be extracted by digestion with KOH–EtOH. Tooth enamel and two samples of pathologically calcified tissue contained approx. the same Na : Ca ratio as in bone. Probably the Na in such material is part of an apatite complex, similar to the Na in fluorapatite. J. N. A.

Component acids of ox depôt fat. Minor constituents. T. P. Hilditch and H. E. Longenecker (Biochem. J., 1937, **31**, 1805—1819).—Acids hitherto unreported from depôts of the type studied include Δ^9-tetradecenoic and -hexadecenoic acid, both present only in small quantity although known as normal components of the depôt fats of lower forms. The C_{18} fraction showed a higher I val. than could be accounted for by oleic acid and contained Δ^9-octadecenoic and $\Delta^{9\lambda}$-octadecadienoic acids. The identification of the dienoic acid was complicated by the low yields (in comparison with the unsaturation to be accounted for) in which tetrahydroxystearic acids were obtained, in contrast to that from the linoleic acid of seed fats. The octadecadienoic acid of ox depôt fat resembles rather that of cow milk fat. Traces of saturated and unsaturated C_{20} acids were regularly observed, but arachidic acid could be isolated only after hydrogenation. Of major components, palmitic acid (26—31 mol.-%) and total C_{18} acids (61—65%) have about the normal vals. for ox and sheep depôt fats. Allowing for the small quantities of hitherto undetected acids now revealed, earlier analyses (Banks and Hilditch, A., 1931, 1178) agree closely with the present figures, implying that total C_{18} val. is approx. const., occasional variations in stearic and oleic acids being mutually balanced. The previously established relation between molar % of fully saturated glycerides and molar % of saturated acids in whole fat is confirmed. R. M. M. O.

Fatty acids of egg oil. F. Trost and B. Doro (Annali Chim. Appl., 1937, **27**, 233—242; cf. B., 1933, 476; A., 1934, 920).—Fatty acids in the oil consist of oleic 35, palmitic 29, palmitoleic 12, linoleic 10, stearic 9, myristic 2, and arachidic acid 0·07%. E. W. W.

Analysis of "angel"-fish eggs. J. de D. Guevara (Bol. Soc. Quím. Peru, 1937, **3**, 78—89).—A prep. of the roe of *Squalus angelus* (H_2O 16·91, ash 2·4, org. N 10·93, total N 11·41, P 1·92, cholesterol 5·44, lecithin 2·05%) yielded 11·33% of $CHCl_3$-sol. fats, *n* 1·4825—1·4880, I val. 105—130, and contained vitamin-*A* and -*D*. F. R. G.

Radial inclusions of giant cells. E. F. Hirsch (Arch. Path., 1935, **20**, 665—682).—The inclusions are cryst. fats (palmitin, stearin) which separate from an oil system containing cholesterol or similar substances and appear when the liquid portion is removed more quickly than the combustion of the dissolved fat occurs. Chemical changes may occur in the composition of the crystals in the tissues rendering them insol. in fat solvents. Ch. Abs. (*p*)

Absorption of fats and dialysis of fatty acids.—See A., I, 562.

Non-labile deuterium of amino-acids treated in dilute deuterium oxide media.—See A., II, 448.

Nitrogenous constituents of the muscle of the shark, *Acanthias vulgaris*. M. Mohr (Z. Biol., 1937, **98**, 276—280; cf. this vol., 167).—Arginine, creatine, and creatinine were isolated. The significance of this is discussed. E. M. W.

Newer biological aspects of protein chemistry. M. Bergmann and C. Niemann (Science, 1937, **86**, 187—190).—A review. L. S. T.

Neuroproteins. II. Effect of age on amino-acid composition of human and mammalian brain proteins. R. J. Block (J. Biol. Chem., 1937, **120**, 467—470; cf. this vol., 374).—Proteins prepared from the brains of five normal human males, aged 4 to 82 years, were analysed for N, histidine (I), lysine (II), arginine (III), tyrosine, and tryptophan. The mol. ratio of (II) : (III) was approx. const. Neuroproteins from rat, guinea-pig, monkey, sheep, and ox yielded approx. the same amounts of the five NH_2-acids. The amount of (I) in the proteins from young mammals is < that from adults. J. N. A.

Constitution of myosin and myogen. J. G. Sharp (Rep. Food Invest. Bd., 1936, 20—21).—The Hausmann nos. of myosin and myogen from rabbit's muscle are recorded. The proteins contain, respectively, arginine 12·80, 11·45%, histidine 2·74, 4·68%, and lysine 10·90, 8·88%. E. C. S.

Proteins of fish. G. A. Reay and C. C. Kuchel (Rep. Food Invest. Bd., 1936, 93—94).—The intracellular proteins (I) (96%) are separated from the stroma-proteins (4%) by exhaustive extraction with 0·05—0·005N-HCl or 0·1—0·005N-NaOH. 7% aq. LiCl removes approx. 85% of the total protein, the remaining (I) becoming sol. after autoclaving and therefore not separable from collagen. The aq. LiCl extract is fractionated by dilution with H_2O into "myosin" and "myogen," the contents of which in freshly-caught and frozen haddock's muscle are recorded. As a result of freezing and storage at −3° for 8 months the sol. (I) are reduced from 85 to 27% of the total protein. E. C. S.

Separation and characterisation of the proteins of egg-white. E. G. Young (J. Biol. Chem., 1937, **120**, 1—9).—Protein fractions were separated from hen's egg-white by $(NH_4)_2SO_4$ pptn. and by dilution with H_2O. In addition to ovalbumin and ovomucoid [cystine (I) 3·95%], ovomucin [N 12·5, S 1·73, (I) 4·57, glucosamine (II) 11·0%] was isolated by both procedures but no globulin was found. These fractions are probably degradation products of a single complex existing in the natural material. The chalaza protein is a mucoprotein [N 13·3, S 1·08, (I) 4·10, (II) 11·4%]. R. M. M. O.

Degradation of ovalbumin by heating with β-naphthol. Chemistry and enzymic behaviour of the degradation products. A. Fodor and N. Lichtenstein (Enzymologia, 1937, **4**, Part II, 36—39; cf. this vol., 141).—Denatured ovalbumin (I) with β-$C_{10}H_7$·OH (135—150°; 6 hr.) yields four fractions, the chief of which, constituting 50% of the amount of (I) taken, is a substance, possibly $C_{116}H_{174}O_{36}N_{25}$, containing arginine residues but no free NH_2. (I) is readily hydrolysed by pancreatin. W. McC.

Osmotic pressure, mol. wt., and stability of amandin, excelsin, and certain other proteins. N. F. Burk (J. Biol. Chem., 1937, **120**, 63—83).—In 6·66M-urea, amandin and excelsin have a mol. wt. approx. one sixth of that in dil. aq. buffer. Both are also denatured and acquire a reactivity with SH reagents. Reduction of mol. wt. and liberation of SH groups also occur in edestin, hæmoglobin, and myogen but not in serum-albumin (I) and -globulin, gliadin, and pepsin. Ovalbumin (II) forms SH groups but its mol. wt. is unaltered, indicating that the cystine residue is near the end of a chain. The cystine of (I) and similarly behaving proteins is in a cyclic form. The physical properties of reduced (I) resemble those of myosin. Alterations in η not accompanied by change in the mol. wt. can thus be related to reduction. R. M. M. O.

Influence of Röntgen rays on van der Waals forces. J. Löbering (Ber., 1937, **70**, [*B*], 1963—1966).—Great differences in the ability to swell are observed in many animal tissues before and after exposure to Röntgen rays. Since a similar behaviour is shown by purified technical gelatin the phenomenon is controlled not by the cell but by the physico-chemical structure of the substances involved. The problem is treated mathematically and swelling graphs are given for irradiated and non-irradiated cartilage and its relationship to the p_H of the solution. H. W.

Chemical nature of the Reynals spreading factor from mammalian testis. F. X. Aylward (Proc. Soc. Exp. Biol. Med., 1937, **36**, 477—481).—The active factor (I) is extracted from minced testis by 0·1N-AcOH and pptd. by $COMe_2$, and can be further purified by dissolution in H_2O and re-pptn. by $COMe_2$. The yield is approx. 2·6 g. per kg. of testis, and the material (20% ash) is stable when heated at 100° for 5 min. (I) in solution gives the protein reactions; it does not dialyse through collodion sacs but can be further purified by electrodialysis, the product containing only a small % of ash. P. G. M.

Spreading and expansion phenomena of unimolecular layers [of proteins].—See A., I, 563.

Dispersion temperature of an intracellular protein, ascaridin.—See A., I, 565.

Base exchange in casein.—See A., I, 564.

Purple colour in shell-membrane of eggs. J. Brooks (Rep. Food Invest. Bd., 1936, 49).—The pigment is not due to the shell porphyrin. A similar coloration is formed by the action of the products of atm. oxidation of, *e.g.*, *o*- or *p*-$C_6H_4(OH)_2$ on the membrane. E. C. S.

Spectroscopic observations of reactions between lactoflavin, the Coulter compound, "cytochrome *b*," and cytochrome *c*. F. Urban and M. D. Eaton (Nature, 1937, **140**, 466).—Several

reactions indicate that the porphyrin ring of cytochrome *c* (I) can oxidise the compounds in Coulter's complex responsible for the 574 and 536 mμ. bands only when the Fe of (I) is in the bi- and not in the tervalent state. L. S. T.

Different types of phosphorus compounds in milk. B. N. Acharya and S. C. Devadatta (Proc. Soc. Biol. Chem. India, 1937, **2**, 8).—P compounds are grouped into (1) orthophosphate, (2) pyrophosphate, (3) esters sol. in $Ba(OH)_2$, (4) esters insol. in $Ba(OH)_2$, (5) "non-esters," including creatinephosphoric acid, hexose mono- and di-phosphates, adenosinephosphoric acid, etc. L. D. G.

Acidosis and off-flavoured milk. H. Barkworth and L. W. L. Cole (Nature, 1937, **140**, 324).—Rothera's test for $COMe_2$ in the milk of cows suffering from acidosis provides a rapid and trustworthy means of diagnosis. Van Slyke's method of determination (A., 1918, ii, 86) can be used. L. S. T.

Action of human saliva on diphtheria bacilli. I. Inhibition of development and spore-killing action. II. Transition of form of the bacilli by the action of human saliva. F. Weigmann and A. Koehn (Z. Hyg., 1936, **118**, 507—515, 516—532).—I. The anti-bacterial action of saliva is diminished by brief heating or by passage through a Seitz filter in an indifferent atm. (N_2). A. G. P.

Properties, extent, and nature of the action of the antibacterial inhibitory substance (inhibin) of human saliva. H. Dold, W. Lächele, and D. D. Hsing (Z. Hyg., 1936, **118**, 369—395).—Inhibin (I) which inhibits the growth of diphtheria bacilli is also active, to varying extents, towards other species. Saliva from different persons shows varied activity. (I) is rendered inactive by heating at 100° for 1 min. or at 52—54° for 30 min. and its activity is not restored by addition of small amounts of fresh material. On storage saliva separates into an upper aq. layer substantially free from (I) and a lower layer containing the corpuscular elements in which (I) accumulates. At ordinary temp. saliva becomes inactive in 10—15 days. (I) does not pass a Seitz filter, is non-diffusible, insol. in H_2O, non-precipitable by EtOH, $CHCl_3$, or $COMe_2$, and is sensitive to light and to drying. It differs from Fleming's lysozyme. A. G. P.

Anti-bacterial inhibitory agent (inhibin) in nasal mucus. A. Ignatius (Z. Hyg., 1936, **118**, 445—454).—Inhibin from nasal secretion has the same properties as that from saliva. A. G. P.

Spectrophotometry of aqueous solutions of bile. A. Boutaric and M. Roy (Compt. rend., 1937, **205**, 258—260).—The product of the optical density of a solution of ox bile and its vol. increases slightly as the vol. increases, when $\lambda = >500$ mμ. With $\lambda = 500$ mμ. the val. is max. for undiluted bile, declining at first and subsequently rising as the vol. is increased. Dil. bile increases in optical density on keeping (probable hydrolysis of the constituents), particularly during the first 24 hr., even at 0° and in the absence of air. J. L. D.

Lithocholic acid gallstones from pig's bile. R. Schoenheimer and C. G. Johnston (J. Biol. Chem., 1937, **120**, 499—501).—The gallstones (which rarely occur in pigs) contain lithocholic acid, probably as Ca salt. F. O. H.

Correlation of *in vitro* activity of normal human gastric juice on casein at p_H 7·4 with gastric intrinsic factor. F. H. L. Taylor, W. B. Castle, R. W. Heinle, and M. A. Adams (Proc. Soc. Exp. Biol. Med., 1937, **36**, 566—568).—The inactivation of gastric juice towards casein (I) at p_H 7·4 suggests that the action on (I) is due to the intrinsic factor. P. G. M.

Determination of phenol-red in gastric contents. F. Hollander, A. Penner, and M. Saltzman (Proc. Soc. Exp. Biol. Med., 1937, **36**, 568—570).—The method used depends on removal of bile pigments and protein with freshly pptd. $Zn(OH)_2$ and colorimetric comparison of the supernatant liquid with a standard solution of phenol-red. P. G. M.

Structure of cystine calculi. E. Szold (Orvosi Het., 1935, **79**, 1196—1197).—The calculi show a central portion of small phosphatic crystals, surrounded by a semi-amorphous phosphate layer, and in turn by an outer cystine layer. Ch. Abs. (*p*)

Pathological creatinuria. L. G. Djen (Trans. 9th Cong. Far East Assoc. Trop. Med., 1934, **1**, 605—612).—The occurrence of creatinuria in certain diseases affords evidence of co-ordination between the activity of endocrine glands and creatine metabolism. Ch. Abs. (*p*)

***p*-Cresol from the urine of pregnant mares.** P. G. Marshall (Nature, 1937, **140**, 362).—Approx. 110 g. of *p*-cresol, free from *o*- or *m*-isomeride, have been obtained after hydrolysis from 400 gallons of the urine of pregnant mares. (Cf. this vol., 321.) L. S. T.

Isolation of ascorbic acid from urine. C. P. Stewart, H. Scarborough, and P. J. Drumm (Nature, 1937, **140**, 282).—A small amount of a cryst. dinitrophenylhydrazine derivative which appears to be that of ascorbic acid has been isolated from urine. L. S. T.

Organic phosphates of urine. J. J. Rae (Biochem. J., 1937, **31**, 1622—1626).—Inorg. P is removed with $Mg(OH)_2$ mixture (p_H 8·8—9·0), an aliquot of the filtrate is digested with 60% $HClO_4$ + 1 or 2 drops of 30% H_2O_2, and the PO_4''' produced determined colorimetrically. A diet rich in org. P raises the urinary excretion of org. P. P. G. M.

Errors in analysis of chloride in albuminous urine. J. Sendroy, jun. (J. Biol. Chem., 1937, **120**, 441—445).—Determinations by the Volhard and indicator adsorption methods give inaccurate results unless the urine (especially in nephritis) is deproteinised. The IO_3' method of Sendroy (cf. this vol., 448) can be used without removal of proteins, and is also applicable to the urine of men taking aspirin. J. N. A.

Increased œstrogenic potency of human urine after hydrogenation. G. van S. Smith and O. W. Smith (Proc. Soc. Exp. Biol. Med., 1937, **36**, 460—462).—A marked rise in œstrogenic potency as determined by the author's method (A., 1936, 229)

of the urine of both pregnant and non-pregnant women occurs when Zn is added prior to acid hydrolysis. P. G. M.

Colorimetric assay of male hormones in urine. R. B. Oesting (Proc. Soc. Exp. Biol. Med., 1937, **36**, 524—526).—The method used is an adaptation of Zimmermann's *m*-$C_6H_4(NO_2)_2$ reaction. The results are correlated with those obtained by the capon comb-growth assay. P. G. M.

Porphyrin excretion in fæces in normal and pathological conditions. K. Dobriner (J. Biol. Chem., 1937, **120**, 115—127).—Methods are described for separation and identification of porphyrin in fæces. Coproporphyrin-I is excreted in normal and most pathological states. In Pb poisoning, -I and -III were simultaneously excreted, and in pigment cirrhosis of the liver -III alone was isolated. In normal and in certain diseased states, excretion of -I ∝ production of type III compounds (*e.g.*, hæmoglobin). J. L. C.

Excretion of porphyrin by dogs. K. Dobriner (Proc. Soc. Exp. Biol. Med., 1937, **36**, 757—760).—Coproporphyrin-I is excreted at a const. rate in normal dogs and ∝ the hæmatopoietic activity. H. G. R.

(A) **Determination of coproporphyrin and total coproporphyrin I excretion.** K. Dobriner, W. H. Strain, and S. A. Localio. (B) **Coproporphyrin-I metabolism and hæmatopoietic activity.** K. Dobriner, W. H. Strain, S. A. Lacolio, H. Keutmann, and D. I. Stephens (Proc. Soc. Exp. Biol. Med., 1937, **36**, 752—754, 755—756).—(A) A photoelectric colorimetric method for determining fæcal and urinary coproporphyrin is described.

(B) In hæmolytic jaundice and anæmia excretion of coproporphyrin-I ∝ the hæmatopoietic activity. H. G. R.

Total coproporphyrin-I excretion in pernicious anæmia. K. Dobriner and W. H. Barker (Proc. Soc. Exp. Biol. Med., 1937, **36**, 864—867).—Increased excretion of coproporphyrin-I and urobilin was observed in the relapse with a return to normal during remission. H. G. R.

A constituent of liver preparations highly active against pernicious anæmia. P. Karrer, P. Frei, and H. Fritzsche (Helv. Chim. Acta, 1937, **20**, 622).—The P, pentose, and adenine contents of liver preps. can be correlated with their anti-anæmic activity; it is suggested that the activity is due to an adenine nucleotide. P. G. C.

Amino-acids (natural and synthetic) as influencing hæmoglobin production in anæmia. G. H. Whipple and F. S. Robscheit-Robbins (Proc. Soc. Exp. Biol. Med., 1937, **36**, 629—632).—In anæmia the dog can use all forms of histidine and phenylalanine for hæmoglobin regeneration. H. G. R.

Cobalt, and sheep diseases. J. B. E. Patterson (Nature, 1937, **140**, 363).—Dartmoor soil on which sheep suffer from a type of anæmia has a mean Co content of 3·9 p.p.m.; lowland soils on which they recover have 16·7 p.p.m. The corresponding vals. for the pastures are 0·20 and 0·45 p.p.m., respectively. L. S. T.

Reactions to the alcohol-insoluble fraction of ragweed pollen. J. Y. Feinstein and R. E. Hoyt (Proc. Soc. Exp. Biol. Med., 1937, **36**, 816—818).—91% of the reactions from the EtOH-insol. fraction are positive with subjects who do not react to whole ragweed pollen extract, but whose family history is positive to allergic disease. H. G. R.

Relation of nicotinic acid and nicotinamide to canine black tongue. C. A. Elvehjem, R. J. Madden, F. M. Strong, and D. W. Woolley (J. Amer. Chem. Soc., 1937, **59**, 1767—1768).—Nicotinic acid and its amide cure canine black tongue. The amide is isolated from liver concentrates and may cure pellagra. R. S. C.

Microbiological test for carcinogenic hydrocarbons. S. Goldstein (Science, 1937, **86**, 176—177).—Carcinogenic hydrocarbons, *e.g.*, methylcholanthrene and 1 : 2 : 5 : 6-dibenzanthracene, accelerate the rate of reproduction of *Escherichia communior*. Phenanthrene has no such effect. L. S. T.

Spectrographic isolation of carcinogenic substances. F. Almasy (Biochem. Z., 1937, **291**, 421—428; cf. A., 1936, 1499).—Isolation of carcinogenic substances from complex mixtures (*e.g.*, tars) is facilitated by fractionally distilling the mixtures in a high vac. and examining the vapours spectrographically in an electrically heated quartz tube, those fractions which exhibit spectra similar to those of carcinogenic compounds being subsequently purified by an improved method of chromatographic analysis. In a 60-cm. tube, ≮ approx. 0·01 mg. of 1 : 2-benzpyrene vapour can thus be detected. W. McC.

Oxygen poisoning and tumour growth. J. A. Campbell (Brit. J. Exp. Path., 1937, **18**, 191—197).—Exposure of rats and mice inoculated with various tumours to 5 atm. pressure of O_2 in no way retarded growth of the tumours. Inoculations from tumours exposed to high O_2 pressures *in vitro* also grew as vigorously as controls. De Almeida's observation that O_2 pressure tolerance in animals is increased by starvation was confirmed. Lowering of temp. is also protective. R. M. M. O.

Alleged tumour-producing properties of lipin material extracted from Rous sarcoma desiccates. A. Pollard and C. R. Amies (Brit. J. Exp. Path., 1937, **18**, 198—204).—The extracted material freed from particulate matter has no carcinogenic properties. R. M. M. O.

Relationship between autolysis and carcinolysis. R. Königstein and R. Willheim (Biochem. Z., 1937, **292**, 276—286).—Autolysis of cancerous cells and carcinolysis by normal serum are totally unrelated processes which, *e.g.*, are respectively inhibited and unaffected by presence of peptone or urea. The former is a proteolytic process whilst the latter probably depends on lipin degradation. Neither normal nor cancerous liver-cells show a characteristic autolysis curve. F. O. H.

Active fraction of Rous chicken sarcoma. M. Levine and E. J. Baumann (Proc. Soc. Exp. Biol. Med., 1937, **36**, 820—823).—The active material is

H_2O-sol. and is probably present in the protein fraction. H. G. R.

Influence of protein or cystine intake on the cataract-producing action of galactose. H. S. Mitchell and G. M. Cook (Proc. Soc. Exp. Biol. Med., 1937, **36**, 806—808).—Development of the cataract is increased by protein deficiency but it is doubtful whether cystine is the important factor concerned. H. G. R.

Serum-carotene in diabetic patients. G. H. Stueck, G. Flaum, and E. P. Ralli (J. Amer. Med. Assoc., 1937, **109**, 343—344).—Serum-carotene is in all cases > normal and is consistent with the manifestation of clinical symptoms of carotenæmia. R. M. M. O.

Anti-diuretic substance in eclampsia and other hypertensive diseases: observations on spinal fluid. G. Levitt (J. Clin. Invest., 1936, **15**, 135—141).—No increase in diuretic substance (posterior pituitary hormone) in the blood was observed in eclampsia and related diseases. Ch. Abs. (*p*)

Ultracentrifugal concentration of a homogeneous heavy component from tissues diseased with equine encephalomyelitis. R. W. G. Wyckoff (Proc. Soc. Exp. Biol. Med., 1936, **36**, 771—773).—A heavy protein (mol. wt. approx. 25×10^6) similar to that obtained from tobacco mosaic virus (A., 1935, 1181) has been isolated from the diseased tissues. H. G. R.

Analysis of the spleen in Gaucher's disease. C. A. Grau and V. Oliva (Bull. Sci. Pharmacol., 1937, **44**, 276—285).—Gaucher's disease is characterised by the presence of kerasin in the spleen, no definite variations in the amount being observed. H. G. R.

Intravenous injection of amino-acids in regeneration of serum-protein following severe experimental hæmorrhage. R. Elman (Proc. Soc. Exp. Biol. Med., 1937, **36**, 867—870).—Regeneration of serum-protein is more rapid following injection of glucose (I) + a complete mixture of NH_2-acids than after (I) alone. H. G. R.

Serum-sodium in relation to liver damage and hyperthyroidism. S. Pedersen, W. G. Maddock, and F. A. Coller (Proc. Soc. Exp. Biol. Med., 1937, **36**, 491—494).—Serum-Na determinations are useless in assessing the advisability of operative treatment of hyperthyroidism. P. G. M.

Increased urinary excretion of iodine in hyperthyroidism. G. M. Curtis and I. D. Puppel (Arch. Int. Med., 1937, **60**, 498—508).—The average excretion of I in hyperthyroidism is four times normal; in toxic nodular goitre the val. is > that in exophthalmic goitre. The daily variation in hyperthyroidism is ⩾ in health. H. G. R.

Effect of acute infection on the iodine value of the phospholipin fatty acids. A. V. Stoesser (Proc. Soc. Exp. Biol. Med., 1937, **36**, 723—726).—In infections of the upper respiratory tract a decrease in serum-phospholipins was accompanied by an I val. > normal, whereas in convalescence a marked fall in I val. was observed. H. G. R.

Mechanism of acute inflammation. V. H. Moon (Arch. Path., 1935, **20**, 561—570).—Local vascular and cellular phenomena are due to liberation from injured cells of certain substances, one of which is combined with histamine (I). (I) may also be a factor in the systemic reactions. Ch. Abs. (*p*)

Atebrin–plasmoquin in treatment of malaria in Uganda. A. F. Brown (J. Trop. Med. Hyg., 1935, **38**, 301—304). Ch. Abs. (*p*)

(A) Plasma-lipins in chronic hæmorrhagic nephritis. (B) Plasma-lipins in essential hypertension. I. H. Page, E. Kirk, and D. D. Van Slyke (J. Clin. Invest., 1936, **15**, 101—107, 109—113).—(A) Total lipins in nephritic or in normal plasma may be calc. as 1·3 × total C with an error of <1%. In the chronic active stage of nephritis plasma-lipins approach the upper normal limits (1·0—2·6 g. per 100 c.c.); in the terminal stages vals. decrease and may finally reach < normal. Relative proportions of cholesterol (I), (I) esters, phosphatides (II), and neutral fats remain substantially unchanged during these changes. The high N/P ratio (3—18) of the terminal lipin indicates that it is present in fractions other than (II). The severity of lipæmia is not paralleled by the plasma-protein deficit.

(B) Hypertension cannot be associated with plasma-lipin or with any lipin fraction. Ch. Abs. (*p*)

Serum-protein changes occurring in degenerative stages of Bright's disease. E. Jameson (Proc. Soc. Exp. Med., 1937, **36**, 808—812).—A decrease in euglobulin and albumin together with the presence of another fraction absent from normal serum was demonstrated by salting-out curves. H. G. R.

Chemical diagnosis of pregnancy. J. Patterson (Brit. Med. J., 1937, 522—525).—The method is based on the bacterial (*B. coli*) fission of the œstriol glycuronide in urine, followed by detection of œstriol by means of the colour test with $C_6H_3(OH)(SO_3H)_2$. A. G. P.

Intravenous manganese in treatment of psoriasis. J. Barr (J. Med. Soc. New Jersey, 1935, **32**, 376—379).—Favourable effects of $MnCl_2$–$CaCl_2$ injections are recorded. Ch. Abs. (*p*)

Review of literature on effects of breathing dusts with special reference to silicosis. D. Harrington and S. J. Davenport (U.S. Bur. Mines, 1937, Bull. 400, 305 pp.).—527 publications are cited.

Effect of arsenobenzene preparations on mice infected with *Trypanosoma cruzi*. T. Minaguchi and Z. Rin (Japan. Z. Mikrobiol. Path., 1935, **29**, 1495—1502).—Arsenobenzene-Na and neoarsenobenzene have neither preventive nor curative properties. Ch. Abs. (*p*)

Comparative effectiveness of chemical sprays in protecting monkeys against nasally instilled poliomyelitis virus. P. K. Olitsky and A. B. Sabin (Proc. Soc. Exp. Biol. Med., 1937, **36**, 532—535).—$ZnSO_4$ was the most effective of the protective agents examined, being more potent than tannic acid, $FeSO_4$, or K alum. P. G. M.

Change in rate of respiratory metabolism in a teleost fish induced by acclimatisation to high and low temperature. N. A. Wells (Biol. Bull., 1935, 69, 361—367).—*Gillichthys mirabilis* acclimatised at a high temp. has a lower rate of O_2 metabolism at intermediate temp. than that acclimatised at a low temp. Ch. Abs. (*p*)

Relations between respiratory metabolism in fishes and susceptibility to certain anæsthetics and lethal agents. F. B. Sumner and N. A. Wells (Biol. Bull., 1935, 69, 368—378).—Respiratory rates and susceptibility to urethane (I) of *Fundulus parvipinnis* and *Gillichthys mirabilis* were greater at high than at low temp. Fishes acclimatised at high temp. and transferred to a medium temp. exhibited lower respiratory rates and susceptibility to (I), chloretone, Et_2O, KCN, and to asphyxiation than did those acclimatised at a low temp. Ch. Abs. (*p*)

Tissue respiration of normal and scorbutic guinea-pig's liver and kidney. E. Stotz, C. J. Harrer, M. O. Schultze, and C. G. King (J. Biol. Chem., 1937, 120, 129—140).—O_2 consumption and CO_2 production of liver are increased in scurvy whilst O_2 consumption of kidney, aërobic and anaërobic glycolysis in liver, and aërobic glycolysis in kidney are unchanged. Addition of vitamin-*C* to normal and scorbutic liver and kidney increases the O_2 consumption, the increase being equiv. to the amount of -*C* oxidised. J. L. C.

Effect of phloridzin [on tissue respiration]. W. Fleischmann (Biochem. Z., 1937, 291, 415—420).—The O_2 uptake of surviving rat's liver and kidney, with and without addition of glucose (I), is not affected by addition of phloridzin (II), whilst that of cerebral cortex is affected only in presence of (I). The increased O_2 uptake caused by added (I) in cortex and in yeast is counteracted by addition of (II) (which is adsorbed by yeast). In the body, (II) probably prevents the absorption of (I) by the kidneys and other organs. W. McC.

Renal oxygen utilisation of dogs with experimental hypertension. M. F. Mason, R. Evers, and A. Blalock (Proc. Soc. Exp. Biol. Med., 1937, 36, 819—820).—No variation in the renal arteriovenous O_2 difference in fasting dogs is caused by partial constriction of the renal artery with or without hypertension. H. G. R.

Metabolic effects of the white bean. A. Illényi and L. Zselyonka (Biochem. Z., 1937, 291, 266—270).—In rats, a diet containing 25% of white bean meal diminishes the basal metabolic rate but does not affect the blood-sugar level. The metabolism apparatus of Belák and Illényi (A., 1936, 91) is more suitable for use with small animals than is that of Benedict. W. McC.

Nutritional value of some Indian diets. D. N. Mullick and J. T. Irving (Nature, 1937, 140, 319—320).—The vals. of N. Indian and two Hindu diets are compared for rats. L. S. T.

Nutritive values of "Glaxo" and "light white" caseinogens. A. F. Morgan and E. O. Greaves (Biochem. J., 1937, 31, 1553—1555).—The superiority of "light white" over "Glaxo" caseinogen when fed to rats in vitamin tests (cf. A., 1929, 1203) cannot be ascribed to superior val. as protein. Both caseinogens have similar growth and maintenance vals., which are < those of crude acid-pptd. preps. J. L. C.

Influence of cod-liver oil in the diet on susceptibility to oxidation of fat of pig. C. H. Lea (Rep. Food Invest. Bd., 1936, 73—75).—The fat laid down has a slightly fishy flavour and is abnormally susceptible to oxidation. E. C. S.

Beneficial effect of non-saponifiable fraction of soya-bean oil on chicks fed a simplified diet. S. H. Babcock, jun., and T. H. Jukes (Proc. Soc. Exp. Biol. Med., 1937, 36, 720—721).—The results of Goettsch and Pappenheimer (A., 1936, 1141) have been confirmed, although the chicks on the supplemented diet were < normal wt. H. G. R.

Relative value of the proteins of certain foodstuffs in nutrition.—See B., 1937, 1127.

Growth-stimulating effect of egg-white : its importance for embryonic development. G. Schmidt (Enzymologia, 1937, 4, Part II, 40—48).—Development does not begin in chick embryos if the org. constituents of the white are absent and hence (restricted) development proceeds in solutions of inorg. salts (*e.g.*, Ringer's solution) only if started in presence of these constituents. Some such solutions irreversibly prevent development. The constituents which stimulate development retain their activity in white diluted 20-fold. Mixtures of the proteins and dialysable substances (but not either separately) stimulate development. Glucose in concns. ≮ those in which it occurs in the white has a growth-promoting effect which differs qualitatively from that of the white. W. McC.

Relative participation of proteins and fats in the production of energy during inanition. E. F. Terroine and S. Synephias (Compt. rend., 1937, 205, 390—392).—Throughout the period of inanition after reserve carbohydrates have been metabolised and before the pre-mortal rise in urinary N, the proportion of the energy output supplied by fats or proteins is const. but the % of the total energy supplied by either varies in different species. J. L. D.

Is lysine the fundamental factor which limits the production of milk in cases of deficient nitrogen feeding ? A. Leroy (Compt. rend. Acad. Agric. France, 1937, 23, 67—76).—The lysine content of the ration is a fundamental factor in N metabolism and utilisation. The distribution of NH_2-acids in common feeding stuffs is recorded. A ration of grain, bran, and ground-nut (1·5 : 1·5 : 1) ensures an adequate supply of lysine for milk production. Such a diet contains tryptophan, cystine, arginine, and histidine in excess of requirements. A. W. M.

Adenosinetriphosphoric acid and its decomposition products in muscles, the functional capacity of which is lowered. O. I. Fainschmidt [with A. I. Tscherniak] (Biochimia, 1937, 2, 621—629).—The adenosinetriphosphoric acid (I)-P content (mg. per 100 g. dry tissue) of the muscles of river turtles rises from 72·0 in winter to 120·2 in summer,

and the $H_4P_2O_7$-P falls from 18·4 to 2·9, the H_3PO_4-P from 216·8 to 197·6, and the adenylic acid-N from 7·6 to 0·9. Phosphocreatine-P rises from 72·3 to 136·3 over the same period. The results suggest that the decomp. products of (I) tend to accumulate in the muscles of hibernating animals. R. T.

Influence of training on the adenosine triphosphate content of rabbit, pigeon, and chicken muscle. V. I. ROZENGART (Biochimia, 1937, **2**, 657—665).—The adenosine triphosphate content of rabbit, pigeon, and chicken skeletal muscle falls as a result of training, to about 90% of the untrained val. R. T.

Production by animal tissues of tryptamine from tryptophan and of tyramine from tyrosine. E. WERLE and G. MENNICKEN (Biochem. Z., 1937, **291**, 325—327; cf. this vol., 304).—Aq. extracts of the kidney of rabbits and guinea-pigs (but not of the kidney of dogs, goats, pigs, monkeys, or oxen, or of liver, spleen, lung, or pancreas) decarboxylate tyrosine (I) and tryptophan (II). The decarboxylation is not caused by bacteria. The enzymes responsible for decarboxylation of (I), (II), and histidine are inhibited by 0·001M-HCN and are possibly identical. Tyramine and tryptamine are not attacked by histaminase. W. McC.

Amino-acid catabolism. IV. Fate of certain α-amino-acids subcutaneously injected into normal dogs. J. A. LEIGHTY and R. C. CORLEY (J. Biol. Chem., 1937, **120**, 331—334).—With *dl*-alanine and *dl*-valine, straight-chain NH_2-acids yielded their N as urea, whilst those with Me and NH_2 on the same C lost N only with difficulty. Me on C adjacent to those carrying NH_2 interfered with deamination. J. N. A.

Degradation of amino-acids by animal tissues. F. LIEBEN and R. KRETSCHMAYER (Enzymologia, 1937, **3**, Part I, 21—25).—Pulp from the liver and kidneys of guinea-pigs, rats, and rabbits enzymically deaminates *dl*-phenylalanine (I) and *dl*-histidine (II), kidney-pulp acting more rapidly on (I) and liver-pulp more rapidly on (II). Neither pulp has any appreciable effect on *l*- or *dl*-tyrosine, *l*-tryptophan, or *l*-adrenaline. W. McC.

Formation and breakdown of amino-acids.—See A., II, 448.

Urea, creatinine, and ammonia excretion in dogs in acidosis. A. S. ALVING and W. GORDON (J. Biol. Chem., 1937, **120**, 103—113).—Acidosis was produced by feeding $CaCl_2$ to dogs with kidneys explanted and the results are compared with those obtained from the same animals on a low-protein diet. Acidosis caused no change in the ratio of the clearances of urea (I) and creatinine (II). The renal blood flow was the same calc. from the extraction and excretion rates of (I) or (II). If (I) + NH_3 were substituted for (I), the above ratio was increased in acidosis and the renal blood flow was > that calc. from (II). (I) is probably not the source of NH_3 formed in the dog's kidney. J. L. C.

Production of urea in the mammary gland. W. R. GRAHAM, jun., O. B. HOUCHIN, and C. W. TURNER (J. Biol. Chem., 1937, **120**, 29—33).—

The urea content of blood obtained under appropriate conditions from the mammary vein in lactating goats is consistently > that of the arterial blood. It is suggested that urea is formed in the gland as a by-product of the synthesis of lactose from proteins, which may thus form the basis of the milk-stimulating effect of high-protein diets. R. M. M. O.

Hepatic excretion in the dog following oral administration of various bile pigments. H. DOUBILET (Proc. Soc. Exp. Biol. Med., 1937, **36**, 687—690).—The largest excretion of bile acids (I) follows administration of the natural (I) of the dog, whilst ox bile salts and glycocholic acid are more efficient than the unconjugated cholic and deoxycholic acids. H. G. R.

Lecithinæmia following the administration of fat. G. HEVESY and E. LUNDSGAARD (Nature, 1937, **140**, 275—276).—Determinations of the proportion of radioactive to ordinary P in the lecithin (I) of the blood and of the intestine of a dog fed with olive oil and radioactive Na phosphate show that the additional lecithin found in the blood contains only a small amount of active P. This supports the view that during the absorption of neutral fats (I) is formed outside the intestinal tract. L. S. T.

Photo-electric spectrophotometry applied to studies in fat metabolism. E. S. MILLER and G. O. BURR (Proc. Soc. Exp. Biol. Med., 1937, **36**, 726—729).—Elæostearic acid is rapidly changed after ingestion into another acid with high absorption at 2350 A. H. G. R.

Fatty acids and glucose in the blood of depancreatised dogs. A. L. LICHTMAN (J. Biol. Chem., 1937, **120**, 35—40).—The rise in blood-fatty acid level does not occur until the blood-sugar has reached 0·24—0·30%. The blood-fats increase as carbohydrate oxidation decreases. Ingestion of glucose in the normal, but not in the depancreatised, dog effects a lowering of the blood-fat. R. M. M. O.

Free sugar concentration of livers of rats absorbing glucose and fructose, in relation to glycogen synthesis. J. P. FLETCHER and E. T. WATERS (Biochem. J., 1937, **31**, 1830—1836).—There is no appreciable difference in free sugar in livers of rats absorbing either fructose (I) or glucose (II). The liver and venous blood of rats absorbing (I) contain only traces of (I) so that its utilisation [either by conversion into (II) or glycogen (III) or by oxidation] keeps pace with its absorption. The absorption coeffs. are: (I) 160, (II) 250—360 mg. per 100 g. per hr. Various possibilities for the greater (III)-producing power of (I) are discussed. Insulin inhibits (III) production from (I) in quantities ≪ those necessary for inhibition in the case of (II). Either (II) is not an intermediary in (III) production from (I) or insulin inhibits formation of (II) from (I). R. M. M. O.

Selective glucose absorption. F. VERZÁR and H. WIRZ (Biochem. Z., 1937, **202**, 174—181).—With rats at 38°, approx. 30% more glucose (I), but not xylose (II), is absorbed from the upper half of the small intestine than from the lower half. At 24°, the absorptions of (I) are proportionately smaller,

but that of (II) is not affected; the rate of absorption of (I) also becomes dependent on (I) concn. The toxic action of $CH_2I{\cdot}CO_2H$ on the upper half is > that on the lower, both at 24° and at 38°. F. O. H.

Fate of mono- and di-*iso*propylideneglucose in the animal organism. E. Dingemanse and E. Laqueur (Enzymologia, 1937, **4**, Part II, 57—64).—Mono*iso*propylideneglucose (I) is harmless but the di-compound (II) is toxic to rats and rabbits. $COMe_2$ in doses of 0·5 g. per kg. subcutaneously injected into rabbits is recovered to the extent of 98·5% in the expired air within 46 hr., no toxic effects being produced. After oral or subcutaneous administration to rabbits of (I) 85% of the combined $COMe_2$ is found unchanged in the urine and 9% in the expired air. The corresponding vals. for (II) are: urine 30—60%, expired air 25%, the $COMe_2$ in the urine being present as (I) mixed with small amounts of (II). Free $COMe_2$ is not found in the urine and free or combined $COMe_2$ is found in the fæces in traces only after administration of (II). W. McC.

Glycolysis of the retina. L. Califano (Atti R. Accad. Lincei, 1937, [vi], **25**, 93—100).—Glycolysis of the retina (ox), as indicated by the anaërobic glycolytic coeff. and lactic acid formation, with glucose (I) or mannose as substrate is ≫ that with fructose, galactose, arabinose, xylose, or hexose mono- or di-phosphate. Thus the glycolysis, which is inhibited by 0·001N-$CH_2I{\cdot}CO_2H$, is essentially one of (I). F. O. H.

Resynthesis of muscle-glycogen from hexose monophosphate. C. F. Cori, G. T. Cori, and A. H. Hegnauer (J. Biol. Chem., 1937, **120**, 193—202).—In frog's muscle aërobically recovering from tetanic stimulation, disappearance of hexose monophosphate (I) and lactic acid (II) is related to glycogen resynthesis. Poisoning with $CH_2I{\cdot}CO_2H$ does not affect the rate of disappearance of (I), and when more (I) than (II) is present, the disappearance of (I) is > that due to the glycogen resynthesised from sources other than (II). (I) appears to be reconverted into glycogen without being first converted into (II). J. L. C.

Phosphagen formation and oxidation of triose phosphate in muscle extract. J. M. Innes (Biochem. J., 1937, **31**, 1586—1594).—Aërobic formation of creatine phosphate is demonstrated in absence of free inorg. PO_4''' but presence of hexose diphosphate (I) and $CH_2I{\cdot}CO_2H$ (II), or in presence of inorg. PO_4''', (I), and (II) or NaF. The formation in presence of F', but not of (II), is at the expense of inorg. PO_4'''. The energy necessary for phosphorylation in the presence of (II) is not obtained by oxidation of triose phosphate (III) but by breakdown of phosphopyruvate formed by such oxidation. The energy for phosphorylation in F'-poisoned extracts is obtained from coupled dismutation alone or possibly together with oxidation. (III) dehydrogenase is probably not concerned in the oxidation-reduction reaction of (III) with $AcCO_2H$. P. W. C.

Interchangeability of pyruvic and oxaloacetic acids as hydrogen acceptors in muscle glycolysis. J. K. Parnas and W. Szankowski (Enzymologia, 1937, **3**, 220—227).—NH_3 production in muscle poisoned with NaF and in the presence of hexose diphosphate is suppressed by oxaloacetic acid (I) as with $AcCO_2H$ (II) (A., 1936, 511). In anaërobic glycolysis (I) probably serves as H carrier from phosphoglyceraldehyde to (II). In aërobic glycolysis the same H would eventually unite with O. A. L.

Pyruvate oxidation in brain. II. Oxygen : pyruvate ratio and respiratory quotient. G. K. McGowan (Biochem. J., 1937, **31**, 1627—1636; cf. this vol., 76, 386).—Not all the pyruvate which is metabolised by pigeon's brain is completely oxidised. The formation of lactic acid affords only a partial explanation of the low O_2 : pyruvate ratio, the bearing of which on the mode of action of vitamin-B_1 is discussed in relation to avitaminous brain. P. G. M.

Rôle of citric acid in intermediate metabolism in animal tissues. H. A. Krebs and W. A. Johnson (Enzymologia, 1937, **4**, Part II, 148—156).—Citric acid (I) catalytically promotes oxidation in muscle, especially in the presence of carbohydrate. In determinations of the rate of oxidative removal of (I) from muscle, the max. val. for $Q_{citrate}$ was −16·9. α-Ketoglutaric acid (II) and succinic acid (III) were found as products of oxidation of (I). Oxaloacetic acid (IV), if added to muscle, condenses with an unknown substance, probably a triose, derived from carbohydrate, to form (I), which on further oxidation regenerates (IV). The net effect of the cycle is the complete oxidation of triose. The intermediate steps in the cycle are: (I) → *iso*citric acid → oxalosuccinic acid → (II) → (III) ⇌ fumaric acid ⇌ *l*-malic acid ⇌ (IV), which with triose regenerates (I). Quant. data suggest that the (I) cycle is the preferential pathway by which carbohydrate is oxidised in animal tissues. P. W. C.

Site of formation of citric acid in the animal body. J. M. Orten and A. H. Smith (Proc. Soc. Exp. Biol. Med., 1937, **36**, 555—556).—Citric acid formed following injection of Na malate into rats is produced mainly in the kidney. P. G. M.

Deuterium as indicator in the study of intermediary metabolism. IX. Conversion of stearic acid into palmitic acid in the organism. R. Schoenheimer and D. Rittenberg (J. Biol. Chem., 1937, **120**, 155—165; cf. this vol., 130).—The D content of palmitic acid (I) isolated from mice fed with D-containing stearic acid (II) for 5 days indicated (II) as the source of (I). Removal of traces of contaminating D-containing substances from D-containing fatty acids and separation of the acids are effected by vac. distillation of the Me esters. J. L. C.

Deuterium as indicator in the study of intermediary metabolism. X. Metabolism of butyric and hexoic acids. D. Rittenberg, R. Schoenheimer, and E. A. Evans, jun. (J. Biol. Chem., 1937, **120**, 503—510; cf. preceding abstract).—Following administration to mice of D-containing Na butyrate and hexoate (D in the α and β and α, β, γ, and δ positions, respectively; prepared from D_2–PtO_2 with Et crotonate and sorbate, respectively), the acids are not detectable in the body whilst the

body-fluids contain D_2O. No D-containing higher fatty acids are present. Hence butyric and hexoic acids are not fat-formers but are rapidly and completely degraded by the animal. F. O. H.

Nitrogen isotope (^{15}N) as a tool in the study of the intermediary metabolism of nitrogenous compounds. R. SCHOENHEIMER, D. RITTENBERG, M. FOX, A. S. KESTON, and S. RATNER (J. Amer. Chem. Soc., 1937, **59**, 1768).—Administration of hippuric acid (I) or glycine and BzOH containing much ^{15}N to dogs leads to excretion of (I) containing much ^{15}N. (I) is thus absorbed from the intestinal tract without hydrolysis, and glycine can be directly used for its formation. R. S. C.

Absorption of radio-sodium in normal human subjects. J. G. HAMILTON (Proc. Nat. Acad. Sci., 1937, **23**, 521—527; cf. this vol., 175).—The absorption of orally administered ^{24}Na by normal human subjects begins within a few min. and in some cases appears complete in 3—10 hr. E. M. W.

Deposition of radio-phosphorus in tissues of growing chicks. S. F. COOK, K. G. SCOTT, and P. ABELSON (Proc. Nat. Acad. Sci., 1937, **23**, 528—533; cf. this vol., 308).—$^{32}_{15}P$ is deposited in all the tissues of growing chicks examined but principally in the bones and muscle. E. M. W.

Absorption of iron compounds from the upper part of the small intestine. J. GROEN and F. H. L. TAYLOR (Proc. Soc. Exp. Biol. Med., 1937, **36**, 694—695).—The apparent absorption is due to combination with, or absorption of the highly ionisable Fe salts by, the mucus. H. G. R.

Calcium–phosphorus ratio in different tissues, particularly in the femur of the rabbit during growth. J. ALQUIER and A. MICHAUX (Compt. rend., 1937, **205**, 177—178).—The % of Ca and the total Ca content of the femur increase with age, the vals. being nearly the same for different litters. The total P content increases similarly, but the % of P varies considerably. Thus the Ca/P ratio varies (1·01—2·22) from litter to litter, especially in young rabbits. In older animals (68 days) the ratio is 1·69—1·73. For the stomach and brain the Ca/P ratio is const. after 1 month, but only after 2 months for the muscles and liver. J. L. D.

Electrolytes in nutritional muscular dystrophy in rabbits. W. O. FENN and M. GOETTSCH (J. Biol. Chem., 1937, **120**, 41—50).—The dystrophy is associated with a gain in Cl' and a loss in $Mg^{\cdot\cdot}$, $K^{\cdot}$, and creatine in the total muscle, which are respectively associated with proportionate increases in the interstitial fluid and decreases in the no. of intact cells. Increased Ca and P occur when there is calcification. R. M. M. O.

Effect of fatigue on post-mortem changes in muscle. E. C. B. SMITH (Rep. Food Invest. Bd., 1936, 21—25).—The buffer index and % H_2O, PO_4''', and Cl' of rats' muscles are little changed as a result of several hr. exercise. In the range of p_H 6·0—8·0 the proteins effect only 40% of the total buffering of *rigor* muscle. E. C. S.

Biological effects of the rays produced by a cyclotron. M. NAKAIDZUMI, K. MURATI, and Y. YAMAMURA (Nature, 1937, **140**, 359).—Photomicrographs showing the effect of irradiation from a Be target bombarded with 2·8-m.v. deuterons from a cyclotron on the spleen and testicles of mice are reproduced. L. S. T.

Response of the skin to radiation. J. D. HARDY (Physical Rev., 1936, [ii], **49**, 868).—Data relating to the response of white, human skin to the heating effects of visible light (0·4—0·8 μ.), near (0·8—2·5 μ.) and far (3 μ.) infra-red radiation are recorded. L. S. T.

Proposed chemical mechanisms for the production of skin erythema and pigmentation by radiant energy. L. E. ARNOW (Science, 1937, **86**, 176).—Mainly a discussion. In presence of O_2, tyrosine is converted into 3 : 4-dihydroxyphenylalanine (I) by ultra-violet light. Skin pigmentation produced by radiant energy may be the direct result of this change, (I) being converted into melanin by the (I)-oxidase. L. S. T.

Artificial mutations under the combined influence of *X*-rays and salts of heavy metals in *Drosophila melanogaster*. N. N. MEDVEDEV (Bull. Inst. Genetics U.S.S.R., 1935, No. 10, 211—222).—*X*-Irradiation of *Drosophila* cultured on media containing 1% of $Pb(OAc)_2$ caused a higher frequency of mutation than did the action of *X*-rays alone. CH. ABS. (*p*)

(A) Acid formation in frozen and thawed *Arbacia punctulata* eggs: its bearing on the problem of activation. (B) Influence of iodoacetate on activation and development of the eggs. J. RUNNSTROM (Biol. Bull., 1935, **69**, 345—350).—(A) Acid is formed in eggs during thawing after freezing at −80°. 0·03M-$CH_2I{\cdot}CO_2Na$ (I), 0·06M-NaF, 0·0004% aq. $CuCl_2$, and pyocyanine did not inhibit acid production; hexose monophosphate did not increase it. The acidity is unrelated to lactic acid.

(B) Enzymic or other activities in which SH groups are concerned have no essential part in fertilisation of the eggs since the latter is unaffected by (I). (I) is harmful to the development of fertilised eggs, and its effect is not prevented by lactic acid or $AcCO_2'$. Carbohydrate breakdown is probably an essential factor in the morphological differentiation of the anterior part of the larva. CH. ABS. (*p*)

Glycylglycine as a sea-water buffer.—See A., I, 585.

Action on metabolism of Carlsbad mineral waters. II. A. KERN and E. STRANSKY (Arch. exp. Path. Pharm., 1937, **185**, 403—410).—The activities of rabbit liver-sulphatase, blood-amylase, and serum-lipase are increased by administration of the waters for 4 weeks whilst administration for a long time increases glycogen formation in rabbit, guinea-pig, and rat liver, the effect with rat being detectable only under special conditions. A diet rich in protein inhibits liver-glycogen deposition in rat. P. W. C.

Influence of copper and a liver fraction on retention of iron. A. P. BARER and W. M. FOWLER

(Arch. Int. Med., 1937, **60**, 474—481).—Addition of Cu caused a decreased retention and increased utilisation of Fe when the latter was given in moderate doses, but had no effect when the dose of Fe was considerably increased. Liver extract caused a slightly reduced retention of Fe, but no increase in hæmoglobin was observed with the additions. H. G. R.

Diffusion of gold injected into the body of the guinea-pig. S. Piña de Rubíes (Anal. Fís. Quím., 1937, **35**, 72—75).—The distribution of Au in the organs of the guinea-pig after death by Au poisoning is determined spectrographically by the author's method (A., I, 336) and the qual. distribution of other elements investigated. F. R. G.

Cardiac activity in the fœtal rat. E. L. Cory (J. Exp. Zool., 1935, **72**, 127—145).—Aq. lactic acid (0·1%), applied direct to fœtuses or injected into the maternal circulation, produced irregular heart-beats similar to those in asphyxia. Alkaline solutions (aq. NH_3, $NaHCO_3$ in Locke solution) had no action. The fœtal heart does not react to adrenaline or to adrenine secretion. Ch. Abs. (*p*)

Electrolytes of blood and urine of dogs with acute hepatic injury produced by arsphenamine. L. J. Soffer, D. A. Dantes, and H. Sobotka (Arch. Int. Med., 1937, **60**, 509—521).—After administration of arsphenamine an increase in the vol. of urine and excretion of lactic acid (I) and protein together with a decrease in excretion of Cl′ and inorg. PO_4''' were observed; in the blood a decrease in serum-Cl′ and CO_3'' and an increase in -inorg. PO_4''' and -(I) were accompanied by a pronounced hæmo-concn. H. G. R.

Respiratory effects of substituted phenols at varying carbon dioxide tensions. M. E. Krahl, A. K. Keltch, and G. H. A. Clowes (Proc. Soc. Exp. Biol. Med., 1937, **36**, 700—702).—Stimulation of oxidation is favoured by high intracellular concns. of the dissociated form, and inhibition of oxidation and reversible block to cell division by high intracellular concns. of the undissociated form, of substituted phenols. H. G. R.

Sensitivity of the organism to drugs in acid and alkaline conditions. E. S. Rosovska and A. I. Tscherkes (Méd. exp. Ukraine, 1934, No. 1, 50—61).—During ingestion of a mixed diet, subcutaneous injection of Na salicylate is followed by an increase in blood-salicylic acid (I) reaching max. in 1—2 hr. and declining to zero in 24 hr. Elimination of salicylates in urine reaches 12—30% of the amount injected and is completed in 24 hr. in many cases. During use of acid foods the max. (I) is reached much later, and with alkaline foods much earlier. Urinary elimination is similarly affected, and in the case of alkaline food amounts to 35—70% of the quantity given. Ch. Abs. (*p*)

Action of *p*-aminophenol on tissue oxidations. F. Bernheim and M. L. C. Bernheim (Science, 1937, **86**, 197).—At p_H 6·4—6·7, 0·0002M-*p*-$NH_2 \cdot C_6H_4 \cdot OH$ inhibits the O_2 uptake of rat liver suspensions by 50%. In higher concns. the inhibition is masked by oxidation to the quinone. PhOH and NH_2Ph in 2—4 times the concn. produce inhibitions of only 5—20%. Salicylic acid and NHPhAc are relatively ineffective. L. S. T.

Effect of drugs in the production of agranulocytosis with particular reference to amidopyrine hypersensitivity. W. Dameshek and A. Colmes (J. Clin. Invest., 1936, **15**, 85—97). Ch. Abs. (*p*)

Bile stimulants. V. V. Zverev (Chim. Farm. Prom., 1935, No. 2, 126—128).—$(CH_2)_6N_4$ and Decholin produce marked bile stimulation in rabbits. Ch. Abs. (*p*)

Biological action of an *o*-aminoazo-derivative of the pyrazole group. G. B. Crippa and R. Ferrari (Riv. Biol., 1937, **22**, 504—507).—Oral administration of 5-amino-4-benzeneazo-1-phenyl-3-methylpyrazole (I) (method of synthesis indicated) to man causes albuminuria whilst parenteral injection is attended by unpleasant symptoms. (I) appears to have a urinary antiseptic activity. The min. lethal dose in rabbits is 0·20 g. per kg. body-wt. F. O. H.

Pharmacological action of cystamine, a blood-pressure lowering substance. H. Robbers (Arch. exp. Path. Pharm., 1937, **185**, 461—491).—Cystamine (I) decreases the blood pressure powerfully, the action being initially on the peripheral circulation. In cats, subcutaneous injection of 45 mg. per kg. reduces the blood pressure by 60 mm. Hg over a period of 4—8 hr. (I) is inactive when given by mouth, and in concns. of 1 : 100 does not affect the isolated frog's heart. Rat uterus is unaffected by (I) up to a concn. of 1 : 8000 and is then inhibited. P. W. C.

Uterus-stimulating, depressor, and bladder-contracting activities in extracts of rat's submaxillary gland. G. F. Koepf and J. F. Mezen (J. Pharm. Exp. Ther., 1937, **60**, 407—419).—The gland contains an uterus-stimulating principle, and also a substance which lowers the blood pressure of the etherised cat and contracts an isolated ring of cat's bladder and the isolated intestine of the guinea-pig. Very probably all these activities are produced by a single substance which is not histamine, acetylcholine, pitocin, the "histamine-like" substance of other tissue extracts, or adenosine. J. N. A.

Action of histamine in comparison with other amines and ammonia on the frog and on frog's heart. Chemical constitution and pharmacological action. K. Sigg (Arch. exp. Path. Pharm., 1937, **185**, 644—654).—The action of histamine (I) on the frog and frog's heart is compared with that of 18 other amines, NH_2-acids, amides, and NH_3. With the frog doses of (I) over 3000 times > those for warm-blooded animals are required before any effect is registered. The activity of these high concns. is not sp. for the various mols. but is due to the NH_3 action of the NH_2 group and with amines is the greater the more NH_2 groups in the mol. P. W. C.

Biological action of carnitine and acetylcarnitine. E. Strack and K. Försterling (Arch. exp. Path. Pharm., 1937, **185**, 612—621).—With mouse intestine, up to 0·05% of carnitine (I) or acetylcarnitine (II) has no effect whilst 0·25—1% causes relaxation. With frog's rectus and leech

muscle, 100 mg. of (I) acting for 45 min. has only the same effect as 3 μg. of acetylcholine acting for 3 min. (II) is only 2/3 as active as (I) with these two types of muscle. With frog's heart (I) and (II) have the same activity but are 50 and 5×10^5 times less active than choline (III) and acetylcholine respectively. Atropine does not inhibit the action of (I). (I) is frequently accompanied by (III) and difficult to separate from it, and such impure (I) may show, especially after acetylation, considerable activity. (I) and (II) affect the heart beat of warm-blooded animals in the same way as of frog's heart. P. W. C.

Influence of ovary lysate on egg production in hens. V. Unik and S. Volkovuisskaja (Probl. of Animal Husbandry U.S.S.R., 1935, No. 3, 86—98).—Injection of the lysate increased egg production. It has not a sp. organotropic influence on the organ from which it is prepared, but exerts a "common protein effect" in stimulating all functions, notably gastric activity, and production of hæmoglobin and erythrocytes in blood. The action of the injections is somewhat influenced by the N content. Ch. Abs. (*p*)

Diffusion of ions through collodion membranes treated with urethanes. E. Ponder and J. C. Abels (Proc. Soc. Exp. Biol. Med., 1937, **36**, 551—553).—The retarding effect of urethanes on the passage of SCN′ through collodion membranes is sp. and does not extend to Cl′, SO_4'', etc. When the membranes contain 0·01—0·1% of lecithin and cholesterol, the narcotics accelerate the diffusion of SCN′, but do not affect that of the other ions. P. G. M.

Barbituric acids containing the 2-methylallyl group.—See A., II, 468.

Effect of the purification of piperidine on the activity of derived local anæsthetics.—See A., II, 467.

Tribromomethyl borate.—See A., II, 396.

Influence of the anion on the action of salts of novocaine and morphine on motor nerves; different qualitative effects depending on the concentration. J. Régnier and A. Quevauviller (Compt. rend., 1937, **205**, 251—254; cf. A., 1936, 893, 634; this vol., 309).—Effects of the salts on the motor nerves of *Rana esculenta* are compared. Novocaine phenylpropionate and citrate usually diminish chronaxie, electrical resistance, and excitability, but increase rheobase, the former salt being 5—7 and the latter 0·1—0·125 times as active as the hydrochloride. Morphine citrate (I) and hydrochloride (II) decrease rheobase whereas the phenylpropionate (III), in concns. of 0·02—0·001N, increases it. (I) and (III) scarcely change the chronaxie whereas (II) increases it. Electrical resistance is decreased in each case as the concn. is increased from 0·001 to 0·02N, (III) being the most active. Excitability in increased and then decreased by (I) and (II) as the concn. increases from 0·001 to 0·02N, but is markedly decreased by (III). Under comparable conditions, (III) is 20—30 times and (I) 0·2—0·1 times as active as (II). J. L. D.

Action of morphine sulphate on intestinal motility and its modification by atropine sulphate. M. A. Kanan (Proc. Soc. Exp. Biol. Med., 1937, **36**, 506—508).—Results of earlier workers are confirmed. P. G. M.

Effects of morphine on blood-sugar and reflex activity in the chronic spinal cat. R. C. Bodo and C. M. Brooks (J. Pharm. Exp. Ther., 1937, **61**, 82—88).—A slight transient fall in blood-sugar followed by a rise above the initial val. occurs. H. G. R.

Effect of morphine injection on blood cells in normal individuals and in opium addicts. C. L. Cheng and W. C. Ma (Trans. 9th Congr. Far East Assoc. Trop. Med., 1934, **1**, 659—673). Ch. Abs. (*p*)

Action of tobacco smoke on the heart, blood pressure, and blood vessels. T. Gotsev (Arch. exp. Path. Pharm., 1937, **185**, 553—565).—Tobacco smoke was breathed by dog, cat, and a lamb and changes of blood pressure and of the blood vessels of intestine, kidney, and spleen were simultaneously measured. The various changes of pressure obtained could also be observed when nicotine was injected intravenously. P. W. C.

Peripheral vaso-constrictor action of cytisine, a nicotine-like substance. Raymond-Hamet (Compt. rend., 1937, **205**, 393—395).—About 0·11 mg. per kg. of cytisine hydrochloride (I) injected into the renal artery (anastomosed with the femoral) of a dog under chloralose anæsthesia diminishes the venous outflow from the kidney. 5·6 mg. per kg. of (I) causes vasodilatation. J. L. D.

Pharmacology of convolvine. J. K. Nolle (Chim. Farm. Prom., 1934, No. 6, 35—37).—Convolvine, a powerful stimulant of the central nervous system, has a local anæsthetic action as persistent as that of cocaine. Ch. Abs. (*p*)

Mechanism of the action of digitalis glucosides on muscle. M. Cattell and H. Goodell (Science, 1937, **86**, 106—107).—Data for the change in K content of the frog's sartorius muscle occurring as a result of immersion for several hr. in a Ringer's solution of ouabain ($1 : 5 \times 10^5$) are recorded. The average loss of K is 29%. L. S. T.

Action of therapeutic doses of digitalis and strophanthin on cat's heart injured by diphtheria toxin. J. Dieckhoff and E. Schulze (Arch. exp. Path. Pharm., 1937, **185**, 418—427).—The conductivity of cat's heart in the heart–lung prep. injured by diphtheria toxin is increased by small doses of strophanthin. Digitalis improves the performance of such hearts but causes various secondary disturbances which react unfavourably on the heart conductivity. P. W. C.

Comparative investigation of the pharmacological activity of natural and synthetic derivatives of *k*-strophanthidin. W. Neumann (Arch. exp. Path. Pharm., 1937, **185**, 329—352).—The pharmacological action on frog's heart both isolated and *in vivo* of the glucosides *k*-strophanthin and cymarin and of 27 synthetic strophanthidin esters with unsubstituted, substituted, and hydroxylated fatty, aromatic, and fatty-aromatic acids is investigated. With some of these esters, the heart

action is as great as with the natural glucosides, especially so with esters of *iso*-fatty acids having 4—7-C chains. In esters with aromatic nuclei, the activity is increased on nitration. Introduction of alkyl and acetylation of OH-acids increased the activity. The time curves for the course of the reaction with the synthetic esters are very similar to those with glucosides. With rabbits, all these esters and also the glucosides showed greater activity than did the corresponding aglucones. In cats, however, this was true only of acetyl-*k*-strophanthidin. P. W. C.

Influence of extract of squill and scillaren on the bundle of His and the refractory phase of frog heart. A. Halbsgut (Klin. Woch., 1936, **15**, 420—421; Chem. Zentr., 1936, i, 3716).—The heart-poison action is similar to that of digitalis glucosides, strophanthin, and antiarin. H. N. R.

Influence of acridine derivatives on the blood picture: relation to sterilising action. Y. Hiraoka (J. Med. Coll. Keijo, 1935, **5**, 338—349).—Administration of rivanol, trypaflavin (I), panseptin, or trypasol increased the no. of white cells. (I) showed the greatest sterilising action *in vitro*. Ch. Abs. (*p*)

(A) Absorption and excretion of atebrin. (B) Influence of food in the stomach. N. D. Kehar (Rec. Malaria Survey India, 1935, **5**, 393—404, 405—411).—(A) Orally administered atebrin (I) is eliminated, to the extent of 50—70%, relatively slowly in urine. Its protective action against malaria depends on prolonged retention in the tissues. (B) Food delays the absorption of (I) and lowers the rate of elimination for 3 days following administration; in this period the muconate was excreted more readily than was the chloride. High-protein diets retard elimination of (I). Ch. Abs. (*p*)

Toxicity of certain codeine compounds for male and female rats of different ages. C. F. Poe, J. G. Strong, and N. F. Witt (J. Pharm. Exp. Ther., 1937, **61**, 62—65).—The toxicity does not vary with the age or sex of the animal or with the type of salt used. H. G. R.

Toxicity of broomweed (*Gutierrezia microcephala*) for cattle, sheep, and goats. F. P. Mathews (J. Amer. Vet. Med. Assoc., 1936, **41**, 55—61). Ch. Abs. (*p*)

Problem of possible systemic effects from certain chlorinated hydrocarbons. C. K. Drinker, M. F. Warren, and G. A. Bennett (J. Ind. Hyg., 1937, **19**, 283—299).—Three fatal cases of industrial poisoning by the fumes of the higher chlorinated products of $C_{10}H_8$ and Ph_2 are described. Rats exposed to mixtures of $C_{10}H_3Cl_5$ and $C_{10}H_2Cl_6$ and to chlorinated Ph_2 (Cl 64%), in concns. comparable with those met with in the air of industrial premises, develop no toxic symptoms during life, but when examined *post-mortem* show a certain degree of damage to the liver but to no other organs. Administration to these poisoned animals of doses of CCl_4, non-toxic to normal animals, produces yellow atrophy of the liver. $C_{10}H_5Cl_3$ is much less toxic than the above higher chlorinated products. The upper safe limit of concn. for the higher chlorinated products in air is 0·5 mg. per cu. m. whilst simultaneous presence of, *e.g.*, CCl_4 should be avoided. W. O. K.

Comparative intravenous toxicity of some monohydric saturated alcohols. A. J. Lehman and H. W. Newman (J. Pharm. Exp. Ther., 1937, **61**, 103—106).—The intravenous toxicities in rabbits (EtOH = 1) of MeOH, PrOH, Bu$^{\beta}$OH, and *iso*amyl alcohol are 0·59, 2·33, 3·56, and 5·99, respectively. H. G. R.

Distribution of methyl alcohol in dogs after inhalation and administration by stomach tube and subcutaneously. W. P. Yant and H. H. Schrenk (J. Ind. Hyg., 1937, **19**, 337—345).—The aq. fluids contain the highest, the tissues a lower, and the bone-marrow and adipose tissues the lowest [MeOH]. The ratio of MeOH to the H_2O content of the fluid or organ is approx. const. and independent of whether the animal is absorbing or losing MeOH or is in a steady state. W. O. K.

Carbon monoxide intoxication: relation to fatigue. U. Bassi and C. Soresina (Rass. med. appl. lav. ind., 1935, **6**, 280—308).—Fatigued guinea-pigs had less resistance than rested animals to the action of illuminating gas (15% CO). When the toxic action of CO is prevalent there is an increase, and when fatigue is prevalent there is a decrease, in hæmoglobin and globular val. Ch. Abs. (*p*)

Influence of petrol vapours on the saturation of the blood by carbon monoxide. H. W. Brondum and G. B. Ray (J. Ind. Hyg., 1937, **19**, 320—322).—In cats under dial-urethane anæsthesia, the rate of saturation of the blood with CO following the respiration of air containing CO is not altered by the presence of petrol vapour. In cases of poisoning by motor exhaust fumes, the toxic effect of CO is probably not enhanced by the petrol vapour. W. O. K.

Calcium content of blood during experimental poisoning with sodium fluoride. T. A. Schtessel (J. Physiol. U.S.S.R., 1935, **19**, 1239—1244).—Prolonged daily administration to dogs of 0·02 g. of NaF per kg. body-wt. did not change blood-Ca. Ch. Abs. (*p*)

Resorption, distribution, and elimination of fluorides during the poisoning of an animal with sodium fluoride. I. D. Gadaskina and T. A. Schtessel (J. Physiol. U.S.S.R., 1935, **19**, 1245—1257).—About 90% of the F′ fed to dogs was retained. When NaF was injected intravenously, elimination occurred via kidneys and intestine. Oral administration of NaF resulted in increased blood-F only after 4—5 months; the F content of tissues was doubled and that of bones increased 5-fold in 3·5 months. Ch. Abs. (*p*)

Health hazard of a group of workers exposed to alumina dust. C. L. Sutherland, A. Meiklejohn, and F. N. R. Price (J. Ind. Hyg., 1937, **19**, 312—319).—In 49 workers at an Al factory exposed to relatively high concns. of Al_2O_3 dust, chemical and radiological examination failed to reveal any trace of pneumoconiosis or other pulmonary disease arising from the inhalation of the dust. No symptoms

attributable to the presence of traces of F in the atm. could be detected. The substitution of Al_2O_3 for the flint used in the prep. of certain varieties of English bone china would seem likely to remove the serious risks involved in the use of the latter.

W. O. K.

Sodium formaldehydesulphoxylate in experimental poisoning by mercuric chloride. W. Modell, H. Gold, G. J. Winthrop, and E. B. Foot (J. Pharm. Exp. Ther., 1937, **61**, 66—81).—Cats given the sulphoxylate (I) survive lethal oral or intravenous doses of $HgCl_2$, the degree of protection being greater in the former case but decreasing as the dose of $HgCl_2$ or the interval between administration of the two drugs is increased. The end product of reduction of $HgCl_2$ by (I) is toxic, especially by the intravenous route. H. G. R.

Effects of minute amounts of lead in the diet of the dog. M. K. Horwitt and G. R. Cowgill (Proc. Soc. Exp. Biol. Med., 1937, **36**, 744—746).—No pathological changes due to Pb poisoning in the tissues and no deposition of Pb in the bones were observed (*X*-ray) over a period of 7 months, with diets containing 27 and 102 mg. of Pb per kg. The Pb contents of blood and bone increased. H. G. R.

Toxicity and pathology of selenium. M. I. Smith, E. F. Stohlman, and R. D. Lillie (J. Pharm. Exp. Ther., 1937, **60**, 449—471).—The toxicity of Se in rats on intravenous injection is the same whether given as SeO_3'' or SeO_4'', 3 mg. per kg. being fatal in about 50% of the cases. The oral min. lethal dose for the rabbit is the same, but SeO_3'' is more toxic on injection. There is a cumulative effect on continual administration of SeO_3'' and SeO_4'' in small doses, and although there is no acquired tolerance, much of it seems to be capable of detoxification. Rats are the most resistant, and cats the most susceptible, to Se poisoning. J. N. A.

Selenium poisoning in fish. M. M. Ellis, H. L. Motley, M. D. Ellis, and R. O. Jones (Proc. Soc. Exp. Biol. Med., 1937, **36**, 519—522).—A single injection of 3 mg. per kg. of Se (as Na_2SeO_3) is fatal in catfish within 48 hr. at 10°. The toxicity increases with rise in temp. Five daily injections of 0·05 mg. of Se produce exophthalmos. Blood-hæmoglobin of poisoned fish (6·9) is < that of normal fish (9·8 g. per 100 c.c.); *d* is also lower. Œdema of the stomach is > that of other organs. P. G. M.

Toxicity of orally ingested arsenic, selenium, tellurium, vanadium, and molybdenum. K. W. Franke and A. L. Moxon (J. Pharm. Exp. Ther., 1937, **61**, 89—102).—When fed (as salts, *e.g.*, Na_2HAsO_3) to rats the order of toxicity is As < Mo < Te < V < Se. Only Se causes a disturbance of the hæmatopoietic function. H. G. R.

Asphyxiation and death in oxygen-deficient air. E. J. Powers (Amer. J. Publ. Health, 1937, **27**, 880—882).—The lethal effect on men of air (O_2 1·6, CO_2 10·8%) in an oil tank due to fermentation of linsced-oil foots is reported. No toxic gases were present, death being due to asphyxiation. The ventilation of such tanks is advisable. W. L. D.

Chemical analysis and diagnosis of poisoning in the laboratory. D. G. Steyn (J.S. African Vet. Med. Assoc., 1935, **6**, 219—223).—Methods of taking and preparing samples are described. Ch. Abs. (*e*)

Use of different measures of reaction velocity in the study of the kinetics of biochemical reactions. O. Bodansky (J. Biol. Chem., 1937, **120**, 555—574).—The kinetics of biochemical reactions are considered with reference to the representation of the rate of reaction by means of reaction consts., to the general relationships between the reaction const. and other criteria of reaction velocity, and to the conditions of applicability consequent to these relationships. The considerations are exemplified by data on reactions, *e.g.*, hydrolysis of Na β-glycerophosphate by phosphatase, and by examination of generalisations of, *e.g.*, the Schütz–Borissov law.

F. O. H.

Rôle of nitrates in biological oxidations. E. Aubel (Enzymologia, 1937, **4**, Part II, 51—52).—In dehydrogenations for which the only H acceptors are O_2 and NO_3', NO_3' is converted into NO_2' which oxidises leucomethylene-blue (I) or reduced flavin. Hence (I) is anaërobically oxidised by NO_3' in presence of *B. coli* and H donator (*e.g.*, lactate, glucose).

W. McC.

Constitution of potato-oxidase. F. Kubowitz (Biochem. Z., 1937, **292**, 221—229).—The activity of the oxidase (I) ∝ its Cu content but is not affected by added Cu. Manometric determinations are effected by successive oxidation of a system of (I), pyrocatechol, dihydropyridine (or triphosphopyridine nucleotide), and hexosemonophosphoric acid. Fractionation of (I) preps. with $COMe_2$, $(NH_4)_2SO_4$, AgOAc, etc. yields a Cu–protein complex (Cu 0·165, N approx. 15%; isoelectric point p_H 5·4).

F. O. H.

Effect of heavy water on enzymic dehydrogenation. T. Thunberg (Enzymologia, 1937, **3**, 56—61).—The rate of decolorisation of methylene-blue in H_2O by meal from *Pisum sativum* dried with $COMe_2$ is decreased by adding D_2O, the effect increasing with increasing $[D_2O]$. With pure D_2O, the rate is decreased 30%. In presence of K_2HPO_4, the decrease produced by D_2O is very slight. Glutamic acid increases the rate more in presence than in absence of D_2O, but *l*-malic acid in presence of K_2HPO_4 produces equal rates in H_2O and D_2O.

W. McC.

Mannitol dehydrogenase. D. Müller (Enzymologia, 1937, **3**, 26—28).—Yeast extracts contain a sp. mannitol (I) dehydrogenase (MeOH, EtOH, glycerol, erythritol, sorbitol, and dulcitol not attacked). Extracts of beans and of cucumber seeds contain EtOH dehydrogenase but not (I) dehydrogenase. (I) dehydrogenase is frequently or always accompanied by EtOH dehydrogenase. W. McC.

Dehydrogenation of pyruvic acid. F. Lipmann (Enzymologia, 1937, **4**, Part II, 65—72).—$AcCO_2H$ is converted into AcOH and CO_2 by the dehydrogenase (I) of dried material from *Bacterium Delbrückii*. There is no relation between the dehydrogenation and the dismutation of $AcCO_2H$. Dehydrogenation occurs only if free PO_4''' or AsO_4''' is present. The prosthetic

group of (I) is cocarboxylase, which occurs in animal tissues in amounts approx. equal to their vitamin-B_1 contents. W. McC.

Components of dehydrogenase systems. XV. Dehydrogenation of α-glycerophosphoric acid in the animal body. H. von Euler, E. Adler, and G. Günther. **XVI. Formic acid- and alcohol-dehydrogenase from seeds.** E. Adler and M. Sreenivasaya (Z. physiol. Chem., 1937, **249**, 1—15, 24—39; cf., this vol., 392).—XV. Animal organs (rat's muscle, kidney, liver, brain; rabbit's muscle) contain an α-glycerophosphoric acid apodehydrogenase (I) the co-enzyme for which is cozymase (II). The muscles contain also Green's glycerophosphate-dehydrogenase (III) (A., 1936, 636) which probably requires no co-enzyme. The dihydrocozymase (IV) produced during the action of the (I) system is oxidised by the yellow enzyme (V). The (III) system does not reduce $AcCO_2H$ but 2H is transferred to the system $AcCO_2H$–lactic acid-dehydrogenase (VI) from (I), (II) and (IV) interacting alternately with (I) and (VI).

XVI. The sp. co-enzyme of HCO_2H-apodehydrogenase (VII) (from peas) is (II) which in the (VII) system is converted, probably irreversibly, into (IV); low concns. of KCN inhibit the action of (VII). The uptake of O_2 by the (VII) system (optimum p_H 5·5—6·0) is increased by (V) and still more by methylene-blue. (II) is also the sp. co-enzyme for the EtOH-dehydrogenase of peas, which closely resembles that of yeast. W. McC.

Oxidation by fumarate of reduced yellow enzyme. K. Laki (Z. physiol. Chem., 1937, **249**, 61—62).—Yellow enzyme reduced with $Na_2S_2O_4$ is re-oxidised by fumaric acid in presence of succinic oxidase. W. McC.

Amino-acids of the yellow enzyme.—See A., II, 448.

Rôle of the second carboxyl group in the enzymic hydrogenation of oxaloacetic acid. K. Laki (Z. physiol. Chem., 1937, **249**, 57—60).—In suspensions of pigeon's breast muscle, oxaloacetic acid (I) takes up 2H from hexose more rapidly than does $AcCO_2H$ because the additional CO_2H of (I) facilitates adsorption of enzymes and possibly also favourably alters the mol. structure. W. McC.

Fermentation producing mannitol. M. Schoen and E. Eras (Enzymologia, 1937, **4**, Part II, 198—204).—The enzyme of Gayon and Dubourg (A., 1901, i, 784) attacks fructose (I) much more quickly than glucose (II) when the two sugars are present in solution. In neutral medium, (I) is converted into mannitol (III) and lactic acid (IV) with small amounts of AcOH. In acid medium (II) gives rise to (IV) and small amounts of AcOH, whilst in neutral medium the proportions of the two acids are reversed. (III) is formed only from (I), and solutions of (II) which have been brought to a potential comparable with that of (I) do not give mannitol. In a solution containing (II) and sorbose, the r_H of which has been lowered by cysteine, the enzyme produces, not sorbitol, but only (III). J. N. A.

Spectrography of the reaction of catalase with ethyl hydrogen peroxide. K. G. Stern (Enzymologia, 1937, **4**, Part II, 145—147; cf. this vol., 220).—On adding EtO_2H to a catalase solution, the absorption band of the free enzyme at 622 mμ. disappears and a new absorption band at 570 mμ. appears. At a rate corresponding with that of the cleavage of the substrate by the enzyme, the new band fades and the original band of the free enzyme reappears. The unstable intermediate compound responsible for the new band has the properties postulated for an enzyme–substrate compound. A certain fraction of the enzyme may be destroyed in a secondary reaction. P. W. C.

Mechanism of enzymic oxidative production of melanin from tyrosine. O. Fürth and H. Thallmayer (Enzymologia, 1937, **3**, 96—100).—Tyrosine with $(NH_4)_2S_2O_8$ or $K_2S_2O_8$ in acid solution or with $K_2S_2O_8$ in alkaline solution gives products richer in C and poorer in H. W. McC.

Enzymic degradation of histamine. I. S. Edlbacher and A. Zeller (Helv. Chim. Acta, 1937, **20**, 717—726).—The enzymic fission of histamine (I) is an oxidative process in which one equiv. of N is liberated as NH_3. Analogous model experiments with ascorbic acid and Fe catalysis suggest that this N atom is derived from the nucleus but this is not yet established. A pigment is formed during fission of (I) and a ketone giving a well-characterised dinitrophenylhydrazone is produced; its constitution has not been established. H. W.

Decarboxylation of *d*-lysine and *l*-aspartic acid. A. I. Virtanen and T. Laine (Enzymologia, 1937, **3**, 266—270).—Living bacteria of certain strains of *B. coli* isolated from sewage and from rat and guinea-pig fæces decarboxylate *d*-lysine at optimum p_H 7 forming cadaverine. Living legume bacteria decarboxylate *l*-aspartic acid also at p_H optimum 7 giving β-alanine. Both reactions are quant. A. L.

Enzymic synthesis of cocarboxylase. H. Tauber (Science, 1937, **86**, 180).—Details of the synthesis (yield approx. 100%) from vitamin-B_1 and orthophosphate (i) by an enzymic system of dried yeast freed from natural cocarboxylase, and (ii) by an enzyme of the duodenal mucosa of the pig, are given. L. S. T.

Influence of nutritive conditions on the urea-forming enzymic complex of rat liver. P. J. van der Lee and A. Gorter (Enzymologia, 1937, **4**, Part II, 129—136).—Variations in the ability of rat liver to form urea, observed over a period of 20 weeks, could not be ascribed either to experimental error or to seasonal variation. A close relationship exists between the activity of the urea-forming enzymic complex and the protein content of the diet. Ornithine was not present in the diet. P. W. C.

Influence of carcinogenic substances on enzymic processes. P. Rondoni and W. Beltrami (Enzymologia, 1937, **3**, 252—257).—Treatment of the skin of rabbits with benzpyrene causes an increase in the lipase content and in the rate of autolysis as determined by the content of N not coagulated by $CCl_3{\cdot}CO_2H$. A. L.

Action of pancreas lipase on αα-dioctoyl-β-monopalmitin and αα-dipalmito-β-mono-octoin. C. Artom and C. Zummo (Enzymologia, 1937, **3**, 231—234).—Pancreas lipase hydrolyses the glycerides at the α and β positions with almost the same velocity. A. L.

Action of sodium salts of organic acids on pancreatic lipase. E. Tria (Enzymologia, 1937, **3**, 12—15; cf. this vol., 311; Woodhouse, A., 1932, 1278).—Pancreatic lipase is not appreciably activated by NaOAc, $Pr^{\alpha}CO_2Na$, $Bu^{\alpha}CO_2Na$, NaOBz, $Na_2C_2O_4$, Na tartrate, citrate, malonate, glutarate, suberate, azelate, or sebacate but is slightly activated by Na myristate, palmitate, and stearate, and greatly activated by Na oleate. W. McC.

The acetylcholine–choline-esterase system. G. E. Hall and C. C. Lucas (J. Pharm. Exp. Ther., 1937, **61**, 10—20).—The esterase from sera of various species is probably sp. Wide variations in the activity of the sera towards different esters were observed within the species. H. G. R.

Choline-esterase in the central nervous system. D. Nachmansohn (Nature, 1937, **140**, 427).—A comparison of the rate of hydrolysis of acetylcholine (I) in the grey and white matter of the spinal cord of the dog shows that the concn. of choline-esterase (II) is 10—20 times greater in the grey matter. In the central nervous system, as in muscle, (II) is found in a high concn. in tissue that contains nerve endings, which suggests that it has for its function the rapid removal of (I), and that the grey matter acts as transmitter of nervous impulses in the central nervous system. In crustaceans (lobster), the concn. of (II) in the ganglion cells is > in the nerve fibre. L. S. T.

Choline-esterase activity of superior cervical ganglia. D. Glick (Nature, 1937, **140**, 426—427).—Direct measurement by a micro-method shows that the max. choline-esterase activity of the superior cervical ganglion of the cat is, on the average, equiv. to the splitting of 0·10 mg. of acetylcholine chloride per sec. per mg. It is calc. that the time required to destroy the acetylcholine liberated by a nerve impulse is within the refractory period provided that enzyme and substrate are localised, at the nerve endings, within the ganglion cell. L. S. T.

Inhibitors of choline-esterase. H. Sobotka and W. Antopol (Enzymologia, 1937, **4**, Part II, 189—191).—Various bile acids (I) inhibit to different extents. The effect is more sp. than their lytic power for blood cells or micro-organisms and cannot be duplicated by other surface-active substances. Bufotenine causes considerable inhibition > that produced by (I). Berberine produces complete inhibition, whilst snake-venom preps. from American *Crotalidæ* have only a slight action. J. N. A.

Choline-phosphatase and choline-esterase. M. Francioli (Enzymologia, 1937, **3**, 200—203).—Choline-phosphatase and choline-esterase, though both inactivated by eserine, are not identical. A. L.

Lecithinase *A* and *B*. M. Francioli (Enzymologia, 1937, **3**, 204—209).—The activity of lecithinase *A*, but not that of lecithinase *B*, is inhibited by eserine. By the action of *B* from wasp venom on lecithin both acid groups are directly split off. A. L.

Effect of storage on the activity of papain. R. R. Thompson (Ind. Eng. Chem., 1937, **29**, 1047).—Storage of papain preps. results in a slow reversible inactivation (loss of SH groups) followed by a more gradual irreversible loss of proteolytic activity F. O. H.

Bacterial proteases. VI. Protease system of Gorini's acidoproteolyte. G. Gorbach (Enzymologia, 1937, **3**, 65—74; cf. A., 1936, 524; this vol., 68).—Cultures of *Caseicoccus* and *Gastrococcus* yield a proteinase (I) of the papain type which exhibits optimal activity at p_H 4·7 and is separated from the common bacterial proteinase (II) (optimal activity at p_H 7) by dialysis, adsorption on kaolin–$Fe(OH)_3$, and elution with aq. $(NH_4)_2HPO_4$. Some preps. of (I) and (II) specifically attack gelatin or caseinogen. The p_H–activity curve of *Caseicoccus* peptidases exhibits max. at p_H 4·8 and 7·0, that of *Gastrococcus* peptidases at p_H 4·8 and 8·4, and that of *Enterococcus* peptidases at p_H 4·8. W. McC.

Multiple nature of crystalline pepsin. G. Ågren and E. Hammarsten (Enzymologia, 1937, **4**, Part II, 49—50).—The behaviour of cryst. pepsin (prepared by Northrop's method) in Theorell's cataphoresis apparatus indicates that it consists of at least two proteins. W. McC.

Fission of glycylglutamic anhydride by crystalline trypsin. Y. Tazawa (Proc. Imp. Acad. Tokyo, 1937, **13**, 272—276).—Purified trypsin (this vol., 141) (trypsin-*A*), on dialysis and cooling in H_2O–EtOH (2 : 1), gives cryst. trypsin-*B*, sol. in H_2O after swelling, dyed with partial decomp. by eosin, picric acid, or I, and giving Millon's and xanthoproteic reactions only feebly. Neither trypsin is autodigested at the optimal p_H in 24—48 hr. -*B* is stable to papain but not to pepsin, and is thus of protein nature; it hydrolyses glycyl-*d*-glutamic anhydride exactly as does -*A*, the reaction being unaffected by NH_2-acids, peptides, or neutral diketopiperazine, but hindered by proteins which possess more affinity for trypsin. R. S. C.

Influence of carbohydrates on proteolytic digestion *in vitro*. P. C. Hsu and W. H. Adolph (J. Chinese Chem. Soc., 1937, **5**, 186—192).—Sol. carbohydrates, including mono- and di-saccharides and dextrin, do not influence the digestion of protein by pepsin or trypsin *in vitro*. Digestibility is measured in terms of the amount of N rendered sol. and in terms of tyrosine liberated. Boiled starch appears to adsorb the protein substrate; there is no evidence that it inhibits the enzymic process. H. W.

Proteoclastic enzyme of wheat and barley. N. P. Kozmina and M. S. Reznitschenko (Biochimia, 1937, **2**, 630—637).—Wheat or barley grain extracts cause initial liquefaction of gelatin, without increase in the no. of free NH_2-groups, and this is followed by proteolytic action, with liberation of NH_2-acids, after the η has reached a min. val. R. T.

Selective absorption in the ultra-violet of solutions of the enzymes of the digestive tract. L. Karczag and M. Hanak (Enzymologia, 1937, 4, Part II, 122—124).—The enzyme solutions can be divided into groups, one containing pepsin which gives an absorption spectrum similar to that of human gastric and duodenal juice (max. at 274 and min. at 248 mμ.), the other containing trypsin (max. at 260 and min. at 238 mμ.). The optical consts. are independent of the type of animal. P. W. C.

Cellulase and other enzymes of the larvæ of *Stromatium fulvum*, Villers. K. Mansour and J. J. Mansour-Bek (Enzymologia, 1937, 4, Part II, 1—6).—The gastric juice of the larvæ contains a cellulase which hydrolyses cellulose, lichenin, and lignocellulose equally rapidly, and exhibits optimal activity at p_H 5·5—5·6. The juice also contains proteolytic enzymes. W. McC.

Pectolase. F. Ehrlich (Enzymologia, 1937, 3, 185—199).—Pectolase from *Penicillium Ehrlichii* hydrolyses pectolic acid in solution or gel to pectolactonic acid in neutral, and to *d*-galacturonic acid in acid, solution. For the latter reaction the optimum temp. is 55°. Hydrolysis is accompanied by a marked reduction in η, thus indicating a close relationship between the η of the substrates and their closed-chain structure. Pectolysis in plants is effected by the combined action of pectase and pectolase. The assumption of a protopectolase is unnecessary. A. L.

[Action of] amylases and glucosidases [on glucosides]. J. Blom and B. Braae (Enzymologia, 1937, 4, Part II, 53—56; cf. A., 1936, 1096).—Maltose (I), α-methylglucoside (II), sucrose (III), salicin (IV), and cellobiose (V) are not attacked by α-amylase (VI) from bacteria. β-Amylase (VII) from ungerminated barley hydrolyses (IV) and (V) but not (I), (II), and (III). (VII) and β-glucosidase (VIII) but not (VI) and α-glucosidase are stable at p_H 3·5. The (VII) and (VIII) contents of ungerminated barley do not vary in parallel and (VII) and (VIII) differ in their resistance to destruction by heat. (V) is more rapidly hydrolysed by glucosidase from barley than is (IV). W. McC.

Starch. II. Hydrolysis of starch paste by β-amylase. A. Tychowski. **III. Hydrolysis of starch paste by heating under pressure.** A. Tychowski and S. Masior (Biochem. Z., 1937, 291, 247—253, 399—405; cf. this vol., 312; Ling and Nanji, J.C.S., 1923, 123, 2666).—II. The amylose (I) of starch paste is rapidly and quantitatively converted into maltose (II) by β-amylase (III) from non-germinated barley although η of the paste decreases very slowly. When the action is very prolonged, amylopectin (IV) is converted into (II) by the slow action of (III) or by α-amylase present in small amount in (III). Separation of (I) and (IV) and the isolation of an active (II) prep. are effected by the action, at 20°, of (III) on the paste in which the ratio (I) : (IV) is 58 : 42.

III. Starch, heated with H_2O for 10 hr., is hydrolysed by the H_3PO_4 which is liberated, the extent of hydrolysis increasing with increase of temp. and acidity (p_H 7·1—3·0). At <130°, sol. starch is produced, at 130—150°, amounts of (II) which increase as temp. increases, and at >150°, glucose and amounts of (II) which decrease as temp. further increases. At >145°, decomp. products of carbohydrates are also produced. The amount of H_3PO_4 liberated increases with increase of temp., being complete at approx. 160°. Small amounts of org. acids of high mol. wt. are also produced. W. McC.

Enzymic phosphorylation of starch. P. Ostern, J. A. Guthke, and B. Umschweif (Enzymologia, 1937, 3, 5—9; cf. A., 1936, 1546).—Dialysed extract of autolysed rabbit's muscle produces hexose-monophosphoric acid (I) (1 g. of Ba salt) from starch (II) (1 g.) and inorg. PO_4''' but not from mono- (glucose, fructose, galactose) or di-saccharides (maltose, sucrose, lactose, trehalose) and inorg. PO_4'''. At 37°, the yield of (I) is optimal in 4 hr., 83% of (II) being converted into (I). (II) is as rapidly phosphorylated as is glycogen. When the period of incubation is prolonged, hydrolysis of (I) occurs, hexose and H_3PO_4 being produced. W. McC.

Difference in structure of starch determined by the diastatic method. N. N. Ivanov, M. M. Kurgatnikov, and V. A. Kirsanova (Enzymologia, 1937, 4, Part II, 163—168).—There is no perceptible difference in the rates of hydrolysis of various starch (I) preps. from the same type of barley by diastase under various conditions. (I) of the round pea is hydrolysed half as fast as (I) from the marrow pea. (I) obtained from peas grown under dry and hot conditions is hydrolysed much more slowly than (I) prepared from peas grown under moist conditions. J. N. A.

Rate of penetration of sugars introduced by infiltration to the sites of enzymic transformation in cells. A. Kursanov and N. Kriukova (Biochimia, 1937, 2, 674—686).—Aq. sucrose (I) is infiltrated into cyclamen leaves, followed after varying times by yeast invertase, which hydrolyses (I) remaining in the pericellular fluid. The rate of penetration of (I) into the cells is thrice that of inversion by intracellular invertase. Infiltration with 0·1M-KCl before introduction of (I) slightly lowers the rate of hydrolysis, and increases the rate of synthesis of starch; 0·1M-$CaCl_2$ has no effect on the latter, but strongly inhibits the former, process. The rate of synthesis of starch from maltose in hortensia leaves is lowered by $CaCl_2$, to an extent > that from glucose. R. T.

Direction of enzyme action as an index of the drought-resisting properties of cultivated plants. I. Action of invertase in drought-resistant and non-resistant varieties of wheat. N. M. Sisakjan (Biochimia, 1937, 2, 687—699).—With lowering of environmental humidity the invertase action of leaves of different wheat varieties becomes predominatingly hydrolytic, to a greater extent in non-resistant than in drought-resistant varieties. R. T.

Synthetic and hydrolytic actions of invertase in living plants. A. I. Oparin (Enzymologia, 1937, 4, Part II, 13—23).—Invertase (I) occurs free

and combined in plants, the free form having hydrolytic, the combined form synthetic, properties. Since the ratio free (I) : combined (I) varies greatly according to the species of plant concerned and since the ratio is altered by various factors (*e.g.*, H_2O content, stage of development, temp., action of narcotics) the ratio hexose : sucrose likewise varies greatly. Sugar beet contains considerable amounts of (I), most of which is combined. W. McC.

Inhibition by glyceraldehyde of glycolytic degradation of carbohydrates. E. Adler, F. Calvet, and G. Günther (Z. physiol. Chem., 1937, **249**, 40—56; cf. this vol., 270).—Glyceraldehyde (I) inhibits lactic acid (II) production from glycogen (III) in dialysed extract of rat's muscle and from glucose (IV) or (III) in cell-free brain extract and sliced Jensen sarcoma and prevents fermentation of (IV) by apozymase + cozymase, but does not affect (II) production from hexose monophosphate (V) in muscle extract or from (V) or hexose diphosphate (VI) in brain extract or sliced sarcoma. (I) does not affect the transfer by hexose phosphorylase (from yeast) of PO_4''' from adenosine triphosphate to (IV) or the reversible transformation of (VI) into $AcCO_2H$ in brain extract or sliced sarcoma in presence of NaF. W. McC.

Magnesium activation of tissue phosphatases. K. V. Giri (Proc. Soc. Biol. Chem. India, 1937, **2**, 10).—Mg activation of kidney, liver, and brain phosphatases is influenced by the duration of extraction and age of the prep. It is increased on purification of the extracts by ultrafiltration. L. D. G.

Non-osseous origins of serum phosphatase : the liver. A. Bodansky (Enzymologia, 1937, **3**, 258—260).—Disturbances of liver function in dogs due to various substances caused increases in serum-phosphatase. This increase was, in certain cases only, associated with a rise in serum-bilirubin. Serum-cholesterol increased in some cases but decreased in others. A. L.

Hydrolysis of glucosides by sweet almond emulsin.—See A., II, 445.

Rôle of proteoflavin in the electrochemical equilibrium of cells. R. Wurmser and S. Filitti-Wurmser (Enzymologia, 1937, **4**, Part II, 137—138).—The potential of an oxidised Lebedev's extract varies in function of time and the resulting curve is characterised by a plateau situated at −0·07 v. at p_H 7 and temp. 25°. The length of the plateau is very greatly increased by adding proteoflavin to the extract, suggesting that alloxazine compounds may play a rôle in the oxidation-reduction equilibria of the living cells. P. W. C.

Enzymic hydrogenation of dehydrodeoxycholic acid by yeast. C. H. Kim (Enzymologia, 1937, **4**, Part II, 119—121).—Dehydrodeoxycholic acid, added to a bottom-yeast fermentation of glucose–$NaHSO_3$, acts as a H acceptor in the same way as does MeCHO and is reduced to α-3-hydroxy-12-ketocholanic acid. P. W. C.

Significance of phosphoglyceric acid production in living yeast. S. Rapoport (Enzymologia, 1937, **3**, 52—55).—Living yeast (brewers' and bakers') in H_2O or aq. PO_4''' produces phosphoglyceric acid (I) from sugar. (I) reaches its max. concn. rapidly and disappears rapidly when fermentation ceases. When brewers' yeast poisoned with PhMe is used, the (I) concn. attained is much greater. Possibly the production of (I) is a self-regulating process involving an unknown H activator. W. McC.

Carboligase and the optical properties of the reaction product. Y. Tomiyasu (Biochem. Z., 1937, **292**, 234—240; cf. this vol., 97).—*l*-Acetoin produced from MeCHO by various yeasts has $[\alpha]_D$ −40° and by bacteria −66° to −98°. With *Bacillus lactis aërogenes*, racemisation occurs to an extent dependent on p_H and condition of the bacilli. With yeasts, [α] is independent of the presence of yeast-cells or sugar. F. O. H.

Fermentation of maltosecarboxylic acid and melibionic acid. I. Neuberg-Rabinowitsch (Enzymologia, 1937, **3**, 41—43).—The acids are fermented by maceration-juice from bottom yeast but not by the fresh yeast itself. Maltose and melibiose are hydrolysed to hexoses by fresh yeast in presence of PhMe. W. McC.

Trehalose and yeast. III. K. Myrbäck and B. Örtenblad (Biochem. Z., 1937, **292**, 230—233; cf. this vol., 314).—During the fermentation of trehalose by yeast, the principal phosphoric ester produced is hexosediphosphoric acid. F. O. H.

Fermentation of dextrins, starch, and disaccharides. K. Myrbäck, B. Örtenblad, and K. Ahlborg (Enzymologia, 1937, **3**, 210—219).—Dried yeasts are able to ferment ordinary starch, sol. starch, and other substances, *e.g.*, dextrins, which are not attacked by amylases. Inhibition of the fermentation by NaF does not affect the hydrolysis of the polysaccharides. By suitable treatment of the yeast the ability to attack polysaccharides is lost, although such preps. can still ferment glucose. Probably the fermentation of the polysaccharides can take place only after hydrolysis. A. L.

Effect of various dyes on fermentation and phosphate synthesis by yeast extract. L. Michaelis, V. Moragues-Gonzalez, and C. V. Smythe (Enzymologia, 1937, **3**, 242—251).—The effect of 21 dyes on fermentation by yeast extract is given. Certain dyes prevented the fermentation of glucose, but did not inhibit that of hexose diphosphate, which was accompanied by a synthesis of org. PO_4'''. No relation between chemical structure and this effect is observed. A. L.

Metabolism of pathogenic yeasts. T. E. Friedemann and E. E. Stenhouse (Proc. Soc. Exp. Biol. Med., 1937, **36**, 750—752).—In buffered peptone–meat extract medium with 5% of glucose the principal products were EtOH and CO_2, the yield being identical with that of non-pathogenic yeasts. H. G. R.

Mechanism of cellular death at high pressure. Compression of yeast in sodium chloride solutions. B. J. Luyet and E. L. Hodapp (Proc. Soc. Exp. Biol. Med., 1937, **36**, 615—617).—The injurious

effect of pressure is increased in aq. NaCl, there being a min. val. at approx. 1·17% NaCl. H. G. R.

Glycocholase in yeast. K. Takahasi (Enzymologia, 1937, **3**, 261—262).—Bottom yeast is capable of hydrolysing glycocholic acid. A. L.

Action of the components of aneurin on yeasts (*Rhodotorula rubra* and *R. flava*). W. H. Schopfer (Compt. rend., 1937, **205**, 445—447).—The growth of these species in culture media is unaffected by bios I or II, whereas that of *Saccharomyces cerevisiæ* is greatly accelerated by bios I + II. Vitamin-B_1 and its pyrimidine moiety greatly accelerate the growth of *R. rubra* and *R. flava*; the thiazole moiety has no action on the former, but slightly accelerates the growth of the latter. J. L. D.

Use of yeast as human food. I. Essential amino-acids of yeast. H. Kraut and F. Schlottmann (Biochem. Z., 1937, **291**, 406—414).—Of the N of yeast, the following % most probably occur as arginine, histidine, lysine, cystine, tryptophan, and tyrosine, respectively: 11·0, 3·0, 11·4, 1·6, 0·9, 2·5. W. McC.

Preparation of fat by means of micro-organisms, with special reference to the work of the Institute of Industrial Fermentation. III. Preparation of fat using *Endomyces vernalis*. IV. Experiments with other organisms. H. Fink, H. Haehn, and W. Hoerburger (Chem.-Ztg., 1937, **61**, 723—726, 744—747; cf. this vol., 181).—With *E. vernalis* under suitable conditions, 30% of the sugar utilised reappears as fat, the possible production of some fat from nutrient protein being undecided. Using dil. molasses the yield is approx. 1/3 of that obtained with optimal nutrients. *P. javanicum* gave only 5·7% of fat with considerable amounts of citric acid. *Oidium lactis* on a whey medium to which are added 100 g. of sugar and $(NH_4)_2SO_4$, KCl, and $MgSO_4$ gave in 5 days 12·5—14·34 g. of fat. P. W. C.

Extent of proteolysis by enzymes of moulds and bacteria. J. Berger, M. J. Johnson, and W. H. Peterson (Enzymologia, 1937, **4**, Part II, 31—35).—At 37° and p_H 5·5 or 7·0 the enzymes of *Aspergillus parasiticus* and *A. alliaceus* hydrolyse gelatin (I), caseinogen (II), edestin, lactalbumin, and ovalbumin to the extent of 82—100%. The rate and extent of hydrolysis of (I) by *A. alliaceus* decrease as (I) concn. increases from 0·5 to 14·3%. No increase in rate or extent is brought about by diminishing greatly (I) and enzyme concn. or by treating (I) successively with the enzymes of the two moulds. (I) and (II) are hydrolysed to the extent of 72 and 97% respectively by the enzymes of *B. megatherium*. W. McC.

Physiological degeneration and regeneration of moulds producing citric acid. T. Chrzaszcz and M. Zakomorny (Biochem. Z., 1937, **291**, 312—324).—Moulds propagated for long periods frequently undergo spontaneous degeneration, those strains of *Aspergillus niger* which produce citric acid (I) losing much of their power to do so and producing instead increased amounts of $H_2C_2O_4$. Degenerated strains temporarily recover part of their (I)-producing power when grown on soil containing sucrose or glucose. In strains producing much (I) before degeneration the power is restored to or above its original level by long-continued (approx. 1 year) growth, with frequent transfer to fresh portions of medium, on malt wort containing peptone or guanidine (II) or on other liquid media containing material favourable (urea is unfavourable) to regeneration. Accumulation of $H_2C_2O_4$ occurs when the medium contains (II) or urea. W. McC.

Effect of ascorbic acid (vitamin-*C*) on the pigmentation of the mycelium of *Aspergillus niger* deficient in magnesium, and on the development of this fungus. J. Lavollay and F. Laborey (Compt. rend., 1937, **205**, 179—180).—When the [$Mg^{··}$] in the culture medium is 0·42 mg. per 100 c.c., pigmentation of the mycelium is greatest. It is nearly abolished by 4 mg. of ascorbic acid (I) per 100 c.c., less pigment being formed. (I) increases the yield of mycelium for a given [Mg] (cf. this vol., 396) but not to the same extent for different [Mg]. Germination and sporulation are accelerated by (I), which may act as an auxiliary H carrier to vitamin-B_2 which is normally present. J. L. D.

Production of *d*-mannitol from glycerol by moulds of the *Aspergillus glaucus* group. I. I. Yamasaki and M. Simomura (Biochem. Z., 1937, **291**, 240—348).—*A. glaucus* cultivated at 16—30° converts 20—30% of the glycerol (I), present as sole C source, into *d*-mannitol, max. yield being obtained with (I) concn. of 5—10 vol.-% and p_H 7·0. W. McC.

Action of organic acids on growth of moulds. R. G. Tomkins (Rep. Food Invest. Bd., 1936, 147—149).—The inhibition of growth of *Botrytis cinerea* by citric acid is due (*a*) to increase in [$H^·$] and (*b*) to a sp. effect of the citrate ion. The undissociated acid appears to favour rather than to retard growth. The malate, maleate, lactate, oxalate, and tartrate ions do not inhibit growth. E. C. S.

Growth of *Penicillium carmino-violaceum*, Biourge, in media containing ethyl and other alcohols: production of pigment. L. Krause and M. Ellis (Ann. Bot., 1937, **1**, 499—513).—The inhibitory action of various concns. of EtOH on the growth, sporulation, and germination of spores is examined. At concns. < the inhibitory level, EtOH is utilised by the mould in the absence of adequate supplies of more favourable C sources. The inhibitory action of EtOH is > that of MeOH. The toxicity of other alcohols of the series increases with their mol. wt. The mould produces at least two pigments. A. G. P.

Intermediates of vitamin-B_1 and growth of *Phycomyces*. W. J. Robbins and F. Kavanagh (Proc. Nat. Acad. Sci., 1937, **23**, 499—502; cf. this vol., 242).—*P. Blakesleeanus* requires vitamin-B_1 for its growth but a mixture of 6-amino-2-methyl-5-bromomethylpyrimidine (I) and 4-methyl-5-hydroxyethylthiazole (II) is equally effective. Substitutes for (I) and (II) gave negative results. E. M. W.

Growth factors for *Phycomyces*. H. M. Sinclair (Nature, 1937, **140**, 361).—With *Phycomyces* in a medium of glucose, asparagine, and inorg. salts

no growth is obtained when synthetic 6-amino-2-methyl-5-aminomethylpyrimidine hydrochloride (I), 4-methyl-5-β-hydroxyethylthiazole (II), or the corresponding 5-thioformylamino- (III) or 6-hydroxy-5-thioformylamino-compounds (IV) are added singly. (I) and (II) together give a large growth, (II) and (III) a fair growth, and (II) and (IV) none. A neutral solution of vitamin-B_1, after destruction by autoclaving for 2 hr. at 125°, still acts as a growth factor. The activity of (I) and (III) is not destroyed by this treatment, even in presence of 0·1N-NaOH; H_2O_2 destroys the activity. This supports Schopfer's view that his alternative factor "*MP*" consists of the degradation products of -B_1. -B_1 diphosphate is approx. as active as -B_1. L. S. T.

Chemotherapy of infectious diseases. M. Oesterlin (Z. Hyg., 1936, **118**, 263—306).—The chemotherapeutic action of substances is related to their optical activity, optical isomerides behaving differently toward trypanosomes. The toxicity of acridine (I) and quinoline (II) derivatives is related to their fluorescence, the character of which is modified by fixation in the affected cell which is a necessary factor in their toxic action. Broad emission bands are associated with high toxicity. Substances exhibiting fluorescence but having no combining capacity with the trypanosome cell have no therapeutic action. In (I) and (II) trypanocides the N^V acts as the haptophore. Conversion of Rivanol (inactive) into the methosulphate causes acquisition of trypanocidal activity. Chemotherapeutic interference of isomeric styrylquinolines depends on the combination of the inactive substance with the receptor substance of the trypanosome with consequent inhibition of the sp. combination of the active trypanocide. Interference phenomena with arsinic acid, (I), and (II) compounds suggests that these substances are all fixed by the same cell constituent. Trypaflavin–parafuchsin (III) interference depends on (III), with which fluorescence is associated. (III) interferes with the action of all similar fluorescent substances. No interference between (III) and arsinic acid occurs since different haptophores are concerned. A. G. P.

Nutrition of flagellate *Tetramitidæ*. Sterols as growth-factors for trichomonads. II. R. Cailleau (Ann. Inst. Pasteur, 1937, **59**, 293—328; cf. this vol., 224).—The growth-promoting activities of 67 sterols for *Trichomonas columbæ* are determined and the relationship with structure is discussed. Nutritive sugars etc. for some *Tetramitidæ* are tabulated. F. O. H.

Electrophoresis and conductivity of bacterial suspensions. R. Seigneurin (Rev. Microbiol. Appl., 1937, **3**, 1—13).—Curves relating to conductivity, p_H, and rate of electrophoresis are given. The charge on individual bacteria depends on the nature of the organism and on the concn. of the suspension. Possible application of electrical measurements to the differentiation of species or strains is discussed. L. D. G.

Strains of *Bacillus radicicola* from root nodules of soya bean. C. H. Wu (Rept. Inst. Sci. Res. Manchoukuo, 1937, **1**, 139—153).—Manchurian strains are examined. Crystal-violet (1/50,000—1/100,000) aids in isolation. Optimum p_H for media is 6·55; mannitol is the most suitable C source. L. D. G.

Mechanism of symbiotic nitrogen fixation. II. The pO_2 function. P. W. Wilson and E. B. Fred (Proc. Nat. Acad. Sci., 1937, **23**, 503—508; cf. A., 1936, 1164).—O_2 is not directly concerned in the symbiotic N fixation process of red clover, since the pO_2 function is essentially the same for the assimilation of both free- and combined N. The process is inhibited by H_2. E. M. W.

[Bacterial] formation of esters of ethyl alcohol. L. Espil, L. Genevois, E. Peynaud, and J. Ribereau-Gayon (Enzymologia, 1937, **4**, Part II, 88—93).—A method is described for determining neutral esters by cold extraction with light petroleum. The rate of esterification under various conditions is examined. Acetic acid bacteria and yeasts esterify AcOH but not malic or tartaric acids. The latter acids are esterified only by a slow chemical reaction, the equilibrium of which is not attained even in 30 years. Bacterial esterification is reversible. P. W. C.

Sugar alcohols. VIII. Oxidative specificity of *Acetobacter suboxydans*. K. P. Dozois, C. J. Carr, and J. C. Krantz, jun., (Proc. Soc. Exp. Biol. Med., 1937, **36**, 564—566).—*A. suboxydans* shows an oxidative specificity for glycerol. P. G. M.

Dissimilation of phosphoric esters by propionic acid bacteria. C. H. Werkman, R. W. Stone, and H. G. Wood (Enzymologia, 1937, **4**, Part II, 24—30).—Proliferating *Propionibacterium pentosaceum* degrades phosphoglyceric acid (I), hexose diphosphate (II), and α-glycerophosphate (III) and, more readily, glucose (IV). 0·02M-NaF prevents or greatly restricts the degradation of (I), (II), and (III) but not the growth of the bacteria in presence of yeast extract or their power normally to ferment (IV). Possibly (I) is not invariably an intermediate in bacterial glycolysis. W. McC.

Respiration and fermentation of *Propionibacterium pentosaceum*. C. Fromageot and P. Chaix (Enzymologia, 1937, **3**, 288—300).—The enzymic mechanism responsible for glucose fermentation in living propionic bacteria is inactivated by oxidation, although small amounts of S compounds have a protecting effect (A., 1935, 248). The lactic acid-fermenting system in the bacteria is less sensitive to oxidation, and that of $AcCO_2H$ is unaffected. A. L.

Acetone–butyl alcohol fermentation. E. Simon and C. Weizmann (Enzymologia, 1937, **4**, Part II, 169—188).—*Clostridium acetobutylicum* contains an enzyme system which reduces $EtCO_2H$ and $PrCO_2H$ to PrOH and BuOH, respectively. Succinic and malonic acids are not attacked, whilst the Et_1 esters of succinic and adipic acids are only hydrolysed. The aldol condensate of $AcCO_2H$ (de Jong, A., 1901, i, 446) is toxic and inhibits the fermentation. Enzymic preps. free from living cells could not be prepared. $CH_2I{\cdot}CO_2H$, salicylic acid, PhMe, $CHCl_3$, trimethyl-β-ethylhexylammonium iodide, NaF, and KCN are

inhibitors, whilst urethane and CO have no action. Addition of $CaCO_3$ to the fermentation decreases the yield of neutral products, but this effect could be counteracted by addition of aq. yeast extract. The data indicate that $PrCO_2H$ is not an intermediary in the fermentation. J. N. A.

Acetoin formation in the acetone-butyl alcohol fermentation. I. YAMASAKI and T. KARASIMA (Enzymologia, 1937, **3**, 271—280).—During the fermentation of starch by *Bac. granulobacter pectinovorum* acetoin (I) is formed, and at the optimum temp. (25°) its formation runs parallel to that of $COMe_2$ and BuOH. (I) is only an intermediate product in the metabolism and probably arises by the condensation of two mols. of MeCHO. A. L.

Fermentation of rhamnose. A. J. KLUYVER and C. SCHNELLEN (Enzymologia, 1937, **4**, Part II, 7—12, cf. Castellani, A., 1931, 1334).—*Bacterium rhamnosifermentans* decomposes rhamnose (I) with production of propylene glycol [1 mol. per mol. of (I)], HCO_2H, AcOH, and succinic acid. Equimol. amounts of CO_2 and H_2 are also produced. A possible mechanism for the degradation is suggested. W. McC.

Factors limiting bacterial growth. I. A. D. HERSHEY and J. BRONFENBRENNER (Proc. Soc. Exp. Biol. Med., 1937, **36**, 556—561).—Under normal conditions the rates of growth and respiration of *B. coli* are limited by the rate at which O_2 can reach the cells, but if excess of O_2 is available growth soon ceases owing to oxidative removal of foodstuffs. P. G. M.

Detection of factors which influence the multiplication of aërobic micro-organisms. J. HIRSCH (Enzymologia, 1937, **4**, Part II, 94—106).—Proliferation of *B. coli* is followed by manometric determination of respiration rates in a Barcroft–Warburg apparatus and the effect of temp., nutritive substances, and sowing on the growth curves is investigated in all phases of growth. P. W. C.

***Bacterium pyocyaneum* and drinking waters.** A. ROCHAIX and G. VIEUX (Rev. Microbiol. Appl., 1937, **3**, 14—17).—A virulent strain was detected in water free from *B. coli* and H_2S-producing bacteria. Antagonism towards other species occurs under certain conditions. *B. pyocyaneum* should be regarded as an index of contamination, and may possibly lead to human infection. L. D. G.

Production of proteinase by gelatin-liquefying bacteria. A. I. VIRTANEN and O. SUOLANTI (Enzymologia, 1937, **3**, 62—64).—A reply to Gorbach and Pirch (this vol., 312). W. McC.

Bacteriology of the hen's egg. R. B. HAINES (Rep. Food Invest. Bd., 1936, 59—65).—*Pseudomonas* species were present in almost all the rots encountered, and form the majority of the organisms present in green rot. Red rot was also, in some instances, due to a *Pseudomonas*. Organisms similar to *Proteus melanovogenes* produced a rapid and complete black rot at 20°. E. C. S.

Luminescence of bacteria. III. Further data regarding spectra connected with bioluminescence. J. G. EYMERS and K. L. VAN SCHOUWENBURG (Enzymologia, 1937, **3**, 235—241; cf. A., 1936, 1301).—The spectral composition of the light emitted by *N*-*d*-glucosido-2 : 3-dihydronicotinamide and its Ac_4 derivative is the same. Data are also given for the spectra of the luminescence of *Cypridina* powder, lactoflavin, the oxidation product of aneurin with $K_3Fe(CN)_6$, and *Pseudomonas putida*. A. L.

Media containing ascorbic acid for anaërobic bacilli. O. EHRISMANN (Z. Hyg., 1936, **118**, 544—554).—Ascorbic acid favours the growth of obligate anaërobes and, like cystine, makes possible the growth of these organisms in the presence of O_2. A. G. P.

Substitution of β-alanine, nicotinic acid, and pimelic acid for meat extract in growth of diphtheria bacillus. J. H. MUELLER (Proc. Soc. Exp. Biol. Med., 1937, **36**, 706—708).—Small quantities of β-alanine, nicotinic and pimelic (I) acids allow $\frac{2}{3}$ of the max. growth of the bacillus from whole tissue extracts when added to a suitable control medium. (I) appears to be the least essential (cf. this vol., 319). H. G. R.

Diphtheria toxin. I. Isolation and characterisation of a toxic protein from filtrates of *Corynebacterium diphtheriæ*. A. M. PAPPENHEIMER, jun. (J. Biol. Chem., 1937, **120**, 543—553).—Treatment of normal toxin preps. with $(NH_4)_2SO_4$, Al_2O_3, dialysis, etc. affords a heat-coagulable protein (N 16, S 0·75, tyrosine 9, tryptophan 1·4%; $[\alpha]_D$ approx. −40° in H_2O; isoelectric point p_H 4·1; mol. wt. probably about 17,000) which is readily denatured at $p_H < 6$ and moderate temp. and is lethal in 5 days to guinea-pigs (body-wt. 250 g.) in doses of approx. 1×10^{-4} mg. F. O. H.

Bactericidal and virulence-diminishing action of saliva on *Pneumococcus*. K. L. PESCH and R. DAMM (Z. Hyg., 1936, **118**, 1—16).—Saliva contains a substance inhibitory to pneumococci. Its activity is diminished by passage through a Seitz filter and to a smaller extent by heating to 56°, and at body temp. is > at room temp. A. G. P.

Significance of ammonia-containing nutrients for type-classification of the *Salmonella* group. F. KAUFFMANN (Z. Hyg., 1936, **118**, 425—428).—The NH_3 method for differentiating between types of this group of bacteria is impracticable. A. G. P.

Influence of contaminating bacteria on results of the microscopic test for streptococcic mastitis. C. S. BRYAN and E. A. NELSON (Amer. J. Publ. Health, 1937, **27**, 914—917).—*Escherichia coli*, *Bacillus subtilis*, and *Staphylococcus aureus* decrease the accuracy of the direct microscopic test in that order. *Brucella abortus* and other types not interfering with the reproduction of streptococci have no effect. The addition of 0·002% of brilliant-green inhibits these organisms. W. L. D.

Antistreptococcal substances. Activity and toxicity of substances derived from benzenesulphonamide. R. L. MAYER and C. OECHSLIN (Compt. rend., 1937, **205**, 181—182).—Oxidised forms of substances known to have antistreptococcal activity *in vivo* are tested. *p*-$NO_2 \cdot C_6H_4 \cdot SO_2 \cdot NH_2$ (I) has >5 times the activity of the *p*-NH_2-compound. *p*-$NO \cdot C_6H_4 \cdot SO_2 \cdot NH_2$ is the most active of the inter-

mediate reduction products of (I). The hydrazo- and hydrazino-derivatives are nearly inactive; the azoxy- and hydroxylamino- (II) -compounds are as active as the ·NH·CH_2Ph-compound. *In vitro*, (II) has the greatest activity; the NH_2-compound has slight activity, whilst the others are almost inactive.
J. L. D.

Preparation of infusion fluids. C. Tui, K. L. McCloskey, M. Schrift, and A. L. Yates (J. Amer. Med. Assoc., 1937, **109**, 250—252).—The "pyrogen" (I) responsible for febrile reactions occasionally following infusions is a bacterial product which appears in distilled H_2O kept in an unsterile vessel. (I) is particulate and appears to have a diameter between 50 mμ. and 1 μ. For its removal in practice an absorptive filtration through compressed asbestos fibre is recommended to precede sterilisation.
R. M. M. O.

Determination of ultra-violet light absorption by certain bacteriophages. L. A. Sandholzer, M. M. Mann, and G. P. Berry (Science, 1937, **86**, 104—105).—Absorption by three bacteriophages, C13, C16, and C36, prepared with a strain of *Escherichia communior* has been determined. Each prep. gave a characteristic λ-photographic density curve.
L. S. T.

Inactivation of bacteriophage by ethyl alcohol. C. A. Colwell (Proc. Soc. Exp. Biol. Med., 1937, **36**, 760—761).—Purified phage is more resistant than crude broth phage to inactivation by EtOH.
H. G. R.

p_H stability of Shope papilloma virus and purified papilloma virus protein. R. W. G. Wyckoff and J. W. Beard (Proc. Soc. Exp. Biol. Med., 1937, **36**, 562—563).—The virus activity remains high on the acid side of p_H 7 but is suddenly lost at p_H 2·9—3·3. Above p_H 10·1 virus solutions immediately become non-infectious, whilst in the range 7·0—10·1 the titre of the solutions gradually diminishes.
P. G. M.

Latent virus of lily. F. P. McWhorter (Science, 1937, **86**, 179).—Latent viruses are present in various species of *Lilium*. The parallelism to potato latent viruses is discussed.
L. S. T.

Ascorbic acid as an inactivating agent of tobacco mosaic virus. M. Lojkin (Contr. Boyce Thompson Inst., 1937, **8**, 445—465).—Autoxidation of ascorbic acid under the influence of $Cu^{\cdot\cdot}$, but not that occurring in the presence of hexoxidase in alkaline solution, is accompanied by the capacity to inactivate highly purified tobacco mosaic virus. The inactivation in the presence of $Cu^{\cdot\cdot}$ depends on the formation of an intermediate product (not dehydroascorbic acid), and is inhibited by catalase. The active agent is possibly a peroxide.
A. G. P.

Change of form of bacteria under the influence of lithium chloride. L. O. Koblmüller (Z. Hyg., 1936, **118**, 17—28).—Change of form of bacteria by LiCl results from a "disease" caused by this salt.
A. G. P.

Action of salts on bacteria. M. Ingram (Rep. Food Invest. Bd., 1936, 89—92; cf. *ibid.*, 1935, 53).—The effect of NaCl and of heating to 50° in presence and in absence of NaCl on uptake of O_2 by halophilic and halophobic bacteria is investigated.
E. C. S.

Toxicity of thiocyanates to bacteria. III. Effect of acid and alkaline solutions of thiocyanates on tubercle bacilli and on tuberculous sputum. G. Lockemann and W. Ulrich (Z. Hyg., 1936, **118**, 117—132).—HCNS and acidified solutions of NaCNS are strongly toxic to the bacilli in aq. suspension. In solutions up to 8N neither NaOH nor NaCNS destroys the organisms, but mixed solutions have considerable toxicity which, however, is < that of acid NaCNS. The activity of acid is > that of alkaline solutions of NaCNS on sputum, disinfection of which is preferably carried out in two stages: (i) using alkaline NaCNS to free the organisms from the viscous mucus, (ii) using acid NaCNS to destroy the bacteria.
A. G. P.

Action of phenols on bacteria. Effect of chemical constitution with special reference to salicylic acid, salicyl aldehyde and alcohol, and of their mono- and di-halogeno-derivatives. III. P. Delauney (J. Pharm. Chim., 1937, [viii], **26**, 177—216; cf. this vol., 183, 359).—Many phenols which have antigenetic action do not exhibit antibiotic activity in aq. suspensions of *Staphylococcus pyogenes aureus* because of their low solubility. *o*-OH·C_6H_4·CHO (I), *o*-OH·C_6H_4·CO_2H (II), and *o*-OH·C_6H_4·CH_2·OH decrease in antigenetic activity in the order named; the order is reversed as regards antibiotic activity. The action of solutions of different phenols in 5% peptone, urine, horse serum, Raulin's fluid, phthalate buffer at p_H 5, 15% tartar emetic solution, and 5% glucose in inhibiting the growth of micro-organisms and in preventing the fermentation of 10% glucose by yeast is studied. 5-Chlorosalicylic acid (III), (I), and its Cl- and Br-derivatives, and 5-chlorosaligenol (all <0·15%) have antigenetic properties in 5% peptone. 0·1% of (III) or (I) sterilises urine. Horse serum is not easily protected against bacterial infection but 5-chloro- (IV) (0·6%) and 5-bromo-salicylaldehyde (V) (0·75%) are moderately effective. Raulin's fluid is sterilised by small concns. of many phenols, notably by 0·01% of (IV) or (V). A phthalate buffer at p_H 5 is sterilised by 0·2% of PhOH and many other phenols. Tartar emetic solution is preserved by 0·005% of (IV) or (V) and less readily by other phenols. 5% glucose is protected by 0·2% of PhOH, 0·25% of (II), (IV), and (V) and by other phenols. 0·1% of (II) completely inhibits the fermentation of 10% glucose by yeast. (III) and its Br-analogue are nearly as efficient. Many other phenols have this inhibitory action to a greater or less extent. *o*-OH·C_6H_4·CO_2Me and its halogen derivatives have little antigenetic effect. Most of these substances are toxic to rats.
J. L. D.

Bactericidal action of pectin. E. Haynes, C. A. Tompkins, G. Washburn, and M. Winters (Proc. Soc. Exp. Biol. Med., 1937, **36**, 839—840).—Addition of 2% of pectin to heart-infusion broth lowers the p_H from 7·6 to 5·0—5·4. Such broth in 48 hr. has a bactericidal action which is ≫ if the p_H is adjusted to >6·0.
H. G. R.

Antimicrobial action of some aromatic compounds. A. Girard, A. Ray, and G. Richard (Nature, 1937, **140**, 283).—When administered orally to mice, 4 : 4′-diacetamidodiphenylsulphoxide, m.p. 292° (uncorr.), and other *s*- or *as*.-sulphoxides containing *p*-OH, -NH_2, or -NO_2 show a high curative activity against *Streptococcus*, and against experimental gonococcal infection. L. S. T.

Action of atropine and eserine on adrenaline secretion caused by potassium and calcium chlorides. G. Katz and G. Katz (Proc. Soc. Exp. Biol. Med., 1937, **36**, 848—851).—Secretion of adrenaline induced by KCl or $CaCl_2$ is diminished by intravenous injection of atropine. Results with eserine were variable. H. G. R.

Determination of adrenaline in blood. J. M. Rogoff (Proc. Soc. Exp. Biol. Med., 1937, **36**, 441—444).—The method depends on the increased sensitivity of the denervated eye to adrenaline (I) caused by repeated small injections. The reaction can be used to detect small amounts (1 in 100—500 million) of (I). The reaction occurs in 2—4 sec. with intra-arterial and in 6—15 sec. with intravenous injections. All the (I) is contained in the serum or plasma. P. G. M.

Effect of various hormones on blood-glutathione. I. Adrenaline and cortin. E. Zunz and O. Vesselovsky (Enzymologia, 1937, **3**, 281—287; cf. A., 1935, 1153).—In the dog intravenous injection of adrenaline or cortin increases the reduced glutathione (I) content of erythrocytes, the total (I) increasing in proportion. A. L.

Effect of repeated cortin injections on renal excretion in the normal organism. F. A. Hartman, L. Lewis, and G. Toby (Science, 1937, **86**, 128—129; cf. this vol., 121).—In dogs, initial injections produced a marked reduction in the $Na^{\cdot}$ and $Cl^{\prime}$ excreted, and usually an increase in the $K^{\cdot}$. After repeated injections the response diminished and eventually disappeared. L. S. T.

Effect of cortin on high blood-non-protein-nitrogen of partially nephrectomised rabbits. M. H. Kuizenga (Proc. Soc. Exp. Biol. Med., 1937, **36**, 665—667).—Injection of cortin causes a decrease in blood-non-protein-N. H. G. R.

Adrenal cortex. III. Structures of compounds *A*, *B*, and *H*.—See A., II, 459.

Similarity of action of purified cortical adrenal extracts to crystalline androsterone and testosterone. I. S. Kleiner, A. I. Weisman, and D. I. Mishkind (Science, 1937, **86**, 159—160).—Like cryst. androsterone and testosterone, purified extracts of adrenal cortex, prepared for administration to man and obtained from three different sources, can initiate the lengthening of the ovipositor of the female bitterling (cf. this vol., 38, 151; Kleiner *et al.*, A., 1936, 1428). L. S. T.

Mechanism of morphine hyperglycæmia. Rôle of the adrenal glands. R. C. Bodo, F. W. Cotui, and A. E. Benaglia (J. Pharm. Exp. Ther., 1937, **61**, 48—57).—No hyperglyeæmia occurs after subcutaneous administration of morphine to cats or dogs if the adrenals are inactivated. H. G. R.

Effect of sterols on the thymus in adrenalectomised rats. J. Schacher, J. S. L. Browne, and H. Selye (Proc. Soc. Exp. Biol. Med., 1937, **36**, 488—491).—Thymus involution occurs in adrenalectomised rats after administration of œstrone (I), œstradiol, or testosterone. Pregnanediol is ineffective but enhances the effect of subsequent treatment with (I). The toxicity of sterols parallels their physiological activity. P. G. M.

Lactoflavin combined with phosphoric acid after adrenalectomy. F. Verzár, H. Hübner, and L. Laszt (Biochem. Z., 1937, **292**, 152—158).—The liver of normal rats contains approx. 0·001% of total flavin (I), approx. 5% of which is free and the rest combined as yellow enzyme. The total (I) is reduced by approx. 50% during the first 4 days following adrenalectomy in rats, cats, and dogs, the amounts of free and combined (I) becoming approx. equal. F. O. H.

Disturbance of carbohydrate metabolism by removal of the adrenal cortex and its relationship to sodium metabolism. L. Laszt and F. Verzár (Biochem. Z., 1937, **292**, 159—173).—Adrenalectomy in rats prevents the selective intestinal absorption of glucose (I), the resulting rate equalling that of xylose (II), the absorption of which is unchanged. After adrenalectomy, ingested or subcutaneously injected (I), (II), fructose, galactose, or arabinose has a marked toxic action, 2—2·5 g. being a fatal dose. Aq. urea or NaCl of tenfold hypertoxicity is tolerated. Ingestion of (I) or a mixed diet causes a loss of $Na^{\cdot}$ (equal to 40—50% of the blood-$Na^{\cdot}$) and H_2O. The disturbance is one of carbohydrate metabolism and is corr. by administration of preps. of adrenal cortex. F. O. H.

Absorption of various sugars after adrenalectomy. N. Judovits and F. Verzár (Biochem. Z., 1937, **292**, 182—188).—Following adrenalectomy in rats, absorption from the small intestine of glucose (I) and galactose (II) is reduced by 50%; that of mannose, sorbose, xylose, and arabinose is unchanged, whilst the relatively greater rate of absorption of (I) and (II) from the upper half of the small intestine is less apparent. F. O. H.

Adrenal insufficiency. J. Stahl, D. W. Atchley, and R. F. Loeb (J. Clin. Invest., 1936, **15**, 41—46).—The decrease in blood-Na and the increase in -urea in adrenal insufficiency may be simultaneous but are not interdependent. Withdrawal of NaCl from the diet of an adrenalectomised dog (maintained on cortical extract) caused an increase in -urea and a decrease in -Na. Withdrawal of the extract produced similar effects. Very potent extracts caused no change in -Na or -urea on a low-salt diet. Withdrawal of NaCl or extract diminished renal function. Lowered dosage of extract decreased NH_3 excretion. Large dosage of extract improved the general condition prior to consistent changes in -Na, -K, or -urea. Standardisation of extracts based on -urea changes in adrenalectomised dogs is unreliable unless the salt intake is controlled. Ch. Abs. (*p*)

Effect of hypophysectomy on blood-lactic acid of *Rhesus* monkeys. A. H. Scott (Proc. Soc. Exp. Biol. Med., 1937, **36**, 540—542).—The blood-lactic acid of *Rhesus* monkeys falls from 104 to 50 mg. per 100 c.c. following hypophysectomy. P. G. M.

Effect of diet on glucose tolerance of normal and hypophysectomised dogs. T. E. Weichselbaum, P. Heinbecker, and M. Somogyi (Proc. Soc. Exp. Biol. Med., 1937, **36**, 802—803).—Hypophysectomised animals showed a decreased glucose tolerance on a high-fat–low-carbohydrate diet. H. G. R.

Composition of milk from rabbits stimulated by the lactogenic hormone. A. J. Bergmann and C. W. Turner (J. Biol. Chem., 1937, **120**, 21—27).—The lactose (I) content of the milk from the experimentally stimulated gland is approx. related to the activity of the gland. Experimental milk from the most active glands resembles colostrum in its (I) and total solid content but has higher fat and lower ash contents. R. M. M. O.

Influence of hormones on the secretory activity of the regressing mammary gland. G. A. Grant (Biochem. J., 1937, **31**, 1538—1543; cf. A., 1936, 1546).—Daily subcutaneous injections of 200—800 Riddle units of prolactin induced the secretion of small amounts of milk of low (0·4—0·8%) lactose content in regressing mammary glands of guinea-pigs. Administration of œstradiol (I) + progesterone reconditioned the acinar tissue of the glands so that prolactin (80 units daily) initiated considerable flow of milk of lactose content 1·7—2·8%. (I) alone gave a much less marked response to prolactin. J. L. C.

Prolactin-like reactions produced by pituitaries of vertebrates. C. P. Lebond and G. K. Noble (Proc. Soc. Exp. Biol. Med., 1937, **36**, 517—518).—A prolactin-like reaction is produced by implantation of the pituitary of various vertebrates and liver of all submammalian classes. P. G. M.

Response of the pigeon crop gland to prolactin: inhibition of œstradiol monobenzoate. S. J. Folley and P. White (Nature, 1937, **140**, 505).—Injections of œstradiol monobenzoate inhibit the crop gland response to prolactin. L. S. T.

Relation of urinary excretion of œstrone to the menstrual cycle of normal women. L. D. Yerby (Proc. Soc. Exp. Biol. Med., 1937, **36**, 496—498).—Two peaks of œstrone excretion occur, at the 15th and 27—28th days respectively. The first is probably due to an increased production by the ripe follicle at the time of ovulation. P. G. M.

Progestin and œstrin of nineteen placentas from normal and toxæmic cases. G. V. S. Smith and J. H. Kennard (Proc. Soc. Exp. Biol. Med., 1937, **36**, 508—510).—The placentas of late pregnancy toxæmia have normal progestin but lowered œstrin contents. P. G. M.

Œstrogenic potency of orally administered œstriolglycuronide. A. D. Odell, D. I. Skill, and G. F. Marrian (J. Pharm. Exp. Ther., 1937, **60**, 420—424; cf. this vol., 74).—Oestriolglycuronide (I) is only slightly more potent when administered orally than when injected subcutaneously in the same medium. The œstriol (II) combined in (I) has approx. the same oral unit as free (II). The intestinal tracts of mice contain a glycuronidase which liberates (II) from (I). J. N. A.

Effect of the white bean on œstrus in the mouse. I. S. Belák and J. Szathmáry. II. L. Zselyonka and A. Illényi (Biochem. Z., 1937, **291**, 259—262, 263—265).—I. In mice on a diet containing $\lessapprox$12% of the bean (*Phaseolus vulgaris*), œstrus does not occur, consumption of food is reduced, and wt. is lost. The effect, which is not produced by the skin of the bean, is destroyed by boiling with H_2O for 15 min.

II. The constituent of the bean which inhibits œstrus is the (globulin) phaseolin (I) or an accompanying product. <5% of (I) in the diet does not inhibit œstrus. W. McC.

Effect of the œstrous cycle on the metabolism of isolated rat uterus. M. Kerly (Biochem. J., 1937, **31**, 1544—1552).—Raising the glucose (I) content of the Ringer's solution increases the rate of anaërobic glycolysis. (I) is converted quantitatively into lactic acid. Uteri from rats in pro-œstrus show high vals. for anaërobic glycolysis and O_2 consumption, whilst aërobic glycolysis is low. In œstrus, anaërobic glycolysis and O_2 consumption are low, rising again in diœstrus. Aërobic glycolysis increases during œstrus. More (I) is used anaërobically than aërobically, showing that the Pasteur effect is operative throughout the cycle. Aërobic sugar usage is approx. const. throughout the cycle. J. L. C.

Folliculin and dihydrofolliculin in the urine of pregnant mares. D. van Stolk and R. L. de Lenchère (Compt. rend., 1937, **205**, 395—396).—Folliculin (10 g. from 1000 litres of urine) and dihydrofolliculin were isolated (no details given). An unidentified oil with marked œstrogenic properties was also obtained. J. L. D.

Successive hormone effects: active substance in urine → ovary → oviduct in *Rhodeus amarus*. L. H. Bretschneider and J. J. D. de Wit (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 624—630).—Urine contains an active gonadotropic substance ("lutidin") causing luteinisation in ovaries of carp. Luteinisation is accompanied by production of a hormone "oviductin" causing enlargement of the oviduct. J. L. C.

Effect of emmenin on gonadotropic hormone excretion in castrates and spontaneous menopause. U. J. Salmon and R. T. Frank (Endocrinol., 1937, **21**, 476—480).—In large doses emmenin prevents the over-excretion of gonadotropic hormone in the urine at the menopause. H. G. R.

Excretion of gonadotropin by normal males after ingestion and injection of extracts of pregnancy urine. M. H. Friedman and G. L. Weinstein (Endocrinol., 1937, **21**, 489—494).—Oral ingestion of 8000—40,000 units or intramuscular injection of 480 units of Antuitrin-*S* caused no augmented excretion of gonadotropic substance

(I), though repeated injection of larger doses led to excretion of variable fractions, $>20\%$ of the injected material. (I) of male urine resembles the active material of castrate rather than that of pregnancy urine. H. G. R.

Augmentation of the gonadotropic hormone from the pregnant mare. A. Lein (Proc. Soc. Exp. Biol. Med., 1937, **36**, 609—611).—The action of the gonadotropic hormone is augmented by pituitary extracts containing primarily the luteinising hormone. H. G. R.

Gonadotropic hormones of the turkey pituitary. E. Witschi, A. J. Stanley, and G. M. Riley (Proc. Soc. Exp. Biol. Med., 1937, **36**, 647—651).—The turkey pituitary is similar in quality to that of cattle, sheep, or rats. The potency of the desiccated material is > that of the ox but < that of sheep or rats. H. G. R.

Antigonadotropic factor. (A) **Origin and preparation.** (B) **Species specificity and organ specificity.** B. Zondek and F. Sulman (Proc. Soc. Exp. Biol. Med., 1937, **36**, 708—712, 712—717).—(A) The antigonadotropic factor (I) has its origin in the blood and is found especially in the serum. It may be conc. by pptn. of the serum with 4 vols. of $COMe_2$ and salting out from the insol. fraction with 48% saturated $(NH_4)_2SO_4$. (I) is not present in the liver, spleen muscles, or urine.

(B) An antigonadotropic serum has $<0{\cdot}5\%$ of its effectiveness if used against a heterologous gonadotropic factor and there is a loss of 93% of the effectiveness of (I) against human pregnancy-urine prolan if used against human pregnancy-blood prolan or against prolan of human pituitary origin. H. G. R.

Augmentation of the gonad-stimulating pituitary hormone by copper. F. E. Emery (Proc. Soc. Exp. Biol. Med., 1937, **36**, 731—733).—Intraperitoneal injection of $CuSO_4$ does not augment the action of pituitary implants on rat's ovaries. H. G. R.

The comb of the baby chick as a test for the male sex hormones. R. T. Frank and E. Klempner (Proc. Soc. Exp. Biol. Med., 1937, **36**, 763—765).—The comb wt. is determined after external application of the hormone in sesamé oil to the crest region. The reaction is very delicate when a small dosage is employed. H. G. R.

Experimental production of intersexuality in the female rat with testosterone. R. R. Greene and A. C. Ivy (Science, 1937, **86**, 200—201).—In rats, injection of œstradiol into a mother antepartum or into a new-born female produces hypospadias. Administration of testosterone and its propionate at varying periods of pregnancy produces an arrest of vaginal development and varying degrees of intersexuality in the female. L. S. T.

Preparation of *epiallo*pregnanolone from *allo*pregnanediol.—See A., II, 459.

Spermine, zinc, and insulin. A. M. Fisher and D. A. Scott (J. Pharm. Exp. Ther., 1937, **61**, 21—29).—The activity of an insulin (I)–Zn prep. towards rabbits is not increased by the addition of spermine (II) but a prolonged hypoglycæmic action occurs after incubation of (I)–(II)–Zn at 52° for 1—2 weeks. H. G. R.

Effect of diet on insulin response in normal and hypophysectomised dogs. P. Heinbecker, M. Somogyi, and T. E. Weichselbaum (Proc. Soc. Exp. Biol. Med., 1937, **36**, 804—805).—In normal dogs change from a high-fat–low-carbohydrate to a low-fat–high-carbohydrate diet has little effect on the insulin response, whereas in hypophysectomised dogs there is an improvement. H. G. R.

Alum-precipitated insulin. L. Rosenthal and J. Kamlet (Proc. Soc. Exp. Biol. Med., 1937, **36**, 474—476).—Alum-pptd. insulin produces a max. blood-sugar depression 7½—12½ hr. after injection into human diabetics with recovery to initial levels in 15—30 hr. A similar prolonged effect is produced in rabbits. P. G. M.

Attenuation of insulin by interfacial adsorption. J. M. Johlin (Proc. Soc. Exp. Biol. Med., 1937, **36**, 523—524).—Aq. insulin (p_H 2·5) was emulsified with $CHCl_3$, which was then evaporated at 45°. The cloudy solution deposited a ppt. on centrifuging which showed a considerable decrease in activity accompanied by prolongation. P. G. M.

Inactivation of insulin by irradiated protein. E. Kather (Arch. exp. Path. Pharm., 1937, **185**, 323—328).—Ovalbumin irradiated with ultra-violet light in N_2 inactivates added insulin (I) due probably to the reduction of the active ·S·S· form of (I) to the inactive ·SH form by SH groups liberated in the photochemical reaction. P. W. C.

Mutual action of thyroxine and cocaine in the animal body. D. E. Hykešová and J. Reřábek (Arch. exp. Path. Pharm., 1937, **185**, 599—611).—Thyroxine increases the rise in body-temp. brought about by cocaine (I) but acts antagonistically to (I) in respect of its effect on the central nervous system. P. W. C.

Influence of thyroxine on rabbit's serum-phosphatase with reference to hyperthyroid diseases. K. Pelczar and S. Murza-Murzicz (Biochem. Z., 1937, **292**, 212—217).—Administration of thyroxine to rabbits and to men with thyroid hyperfunction increases the activity of the blood-phosphatases with glycerophosphoric, adenylic, and guanylic acids as substrates, the increases showing marked individual variations. F. O. H.

Effect of vitamin-*C* on heart muscle metabolism in hyperthyroidism. H. Berg (Arch. exp. Path. Pharm., 1937, **185**, 359—367).—The adenylpyrophosphoric acid content of guinea-pig heart muscle decreases by 25—50% after thyroxine and also after administration of the thyrotropic hormone of the anterior lobe of the pituitary, the effect being in the former case inhibited and in the latter not inhibited by ascorbic acid. P. W. C.

Rôle of thyroid in increased protein metabolism of phloridzin diabetes. I. A. Mirsky, J. D. Heiman, and S. Swadesh (Proc. Soc. Exp. Biol. Med., 1937, **36**, 512—515).—Phloridzin probably exerts some sp. effect on the kidney which in turn

stimulates the thyroid, thus increasing protein metabolism. P. G. M.

Effects on blood-amylase of variations in thyroid activity. W. Bartlett, jun. (Proc. Soc. Exp. Biol. Med., 1937, **36**, 843—848).—Blood-amylase (I) varies inversely with thyroid activity. There is a decrease in (I) following thyroidectomy in thyrotoxic states and the return to normal lags behind the improvement in clinical state. H. G. R.

Synergism and antagonism of vitamins. R. Tislowitz (Sci. Progr., 1937, **32**, 290—294).—A review.

Relation of vitamins to diphtheria toxin and antitoxin. M. Mino (Japan Z. Mikrobiol. Path., 1935, **29**, 1538—1552).—Resistance of guinea-pigs to diphtheria toxin was higher when vitamin-*C* than when -*A*, -*B*, or -*D* was added to the diet. Ch. Abs. (*p*)

New source of vitamin-*A*. J. A. Lovern, J. R. Edisbury, and R. A. Morton (Nature, 1937, **140**, 276).—The viscera of halibut, other than the liver, are a rich and hitherto neglected source of vitamin-*A*. The vitamin may, in part at least, be associated with protein. L. S. T.

Biological conversion of carotene into vitamin-*A*. H. Willstaedt (Enzymologia, 1937, **3**, 228—230).—The growth of fibroblasts in fowl blood-plasma containing vitamin-*A* was > in the -*A*-free plasma. Addition of carotene improved growth only when liver tissue was also present. A. L.

Relation of bile acids to absorption of β-carotene in the rat. J. D. Greaves and C. L. A. Schmidt (Proc. Soc. Exp. Biol. Med., 1937, **36**, 434—437).—There is no evidence that taurocholic and glycocholic acids and decholin form compounds with β-carotene (I). Intravenous is less effective than oral administration of (I). P. G. M.

Inhibition by phenol derivatives of the autoxidation of vitamin-*A*. Thyroxine–vitamin-*A* antagonism. W. Fleischmann and S. Kann (Biochem. Z., 1937, **292**, 296—300).—Thyroxine, di-iodotyrosine, tyrosine, and adrenaline, but not, *e.g.*, phenylalanine, inhibit the autoxidation of vitamin-*A*. F. O. H.

Vitamin-B_1 and the synthesis of fat from carbohydrate. E. W. McHenry (Science, 1937, **86**, 200).—A discussion. L. S. T.

Effect of choline on the vitamin-B_1-sparing action of fats. E. W. McHenry (Biochem. J., 1937, **31**, 1616—1621).—When choline (I) is added to a vitamin-B_1-deficient diet, the optimum amount of fat required to prevent loss of wt. is about 40%. When -B_1 is given, but (I) is deficient, the optimum amount of fat is 10—26%. P. G. M.

Beriberi vitamin. R. R. Williams (Ind. Eng. Chem., 1937, **29**, 980—984).—A review of the isolation and synthesis of vitamin-B_1. F. O. H.

Analogues of aneurin.—See A., II, 472.

Action of synthetic vitamin-B_1. C. R. Eckler and K. K. Chen (Proc. Soc. Exp. Biol. Med., 1937, **36**, 458—460).—Natural cryst. vitamin-B_1 and the synthetic product are pharmacologically identical. P. G. M.

Use of synthetic zeolites in the isolation of vitamin-B_1. I. Experiments with rice polishings. L. R. Cerecedo and D. J. Hennessy. **II. Experiments with brewers' yeast.** L. R. Cerecedo and F. J. Kaszuba. **III. Experiments with wheat germ.** L. R. Cerecedo and J. J. Thornton (J. Amer. Chem. Soc., 1937, **59**, 1617—1619, 1619—1621, 1621—1622).—Isolation of pure vitamin-B_1 from these materials is readily accomplished by base exchange with synthetic zeolites (best "Decalso"). The methods vary somewhat with each material, particularly with respect to the purification needed prior to treatment with the zeolite. The vitamin recovered is purified by way of the Ag salt and silicotungstate. R. S. C.

Utilisation of vitamin-B_1 from fullers' earth adsorbates. J. C. Keresztesy and W. L. Sampson (Proc. Soc. Exp. Biol. Med., 1937, **36**, 686—687).—Vitamin-B_1-depleted rats cannot utilise fully the vitamin present in fullers' earth adsorbates. H. G. R.

Synthesis of cocarboxylase from vitamin-B_1. K. G. Stern and J. W. Hofer (Enzymologia, 1937, **3**, 82—95; cf. this vol., 354).—The compound obtained by the action of $POCl_3$ on synthetic vitamin-B_1 is probably a diphosphoric ester of -B_1 and identical with cocarboxylase (I). Whole blood or extracts of brain, liver, or intestine do not produce (I) from -B_1 + PO_4''' or P_2O_7''''. W. McC.

Vitamin content of wheat and rye.—See B., 1937, 1118.

Determination of aneurin (vitamin-B_1) in urine by the thiochrome reaction. H. G. K. Westenbrink and J. Goudsmit (Rec. trav. chim., 1937, **56**, 803—810).—Aneurin (I) can be determined in urine by the thiochrome (II) reaction if adsorption of less readily adsorbed substances is prevented by dilution and if oxidation is avoided. (I) is adsorbed from the dil. urine by C, oxidised to (II) by alkaline $K_3Fe(CN)_6$ in N_2, and (II) determined by extraction with $Bu^{\beta}OH$ and measurement of the blue fluorescence (Cohen, A., 1935, 466). A blank experiment and standardisation by pure (I) are essential. The method is checked by addition of (I) to urine and supported by determinations on human urine excreted before and after ingestion of (I). R. S. C.

Vitamin-B_2 and the hormone of the adrenal cortex. F. Verzár and L. Laszt (Enzymologia, 1937, **3**, 16—20).—Young adrenalectomised rats receiving no hormone (I) of the adrenal cortex survive if given lactoflavinphosphoric acid (II) but not if given lactoflavin (III) itself. (I) converts (III) into (II) and hence (I) preserves life in the rats only if the diet contains (III). There is no relationship between the amounts of (I) and (III) required for survival. The optimal amount of (III) for survival is 0·02 mg. per rat (wt. 20—50 g.) daily. W. McC.

Factors which cure dermatitis and promote growth in rats. H. von Euler and M. Malmberg (Biochem. Z., 1937, **291**, 368—384).—Yeast extract

and herring's muscle contain a factor B_v stable to heat, alkali, and irradiation with visible light and possibly identical with vitamin-B_6 and with Chick and Copping's factor *Y* (A., 1935, 544). In rats suffering from loss of wt. and dermatitis resulting from a diet containing cod-liver oil, aneurin, and lactoflavin but lacking growth-promoting and anti-dermatitis factors, B_v cures the disease and promotes growth. B_v is pptd. by $AgNO_3$ and by $Hg(OAc)_2$ and, like -B_6 and *Y*, is probably a mixture. W. McC.

Stabilisation of vitamin-*C* by pyrophosphate. K. V. Giri (Proc. Soc. Biol. Chem. India, 1937, **2**, 17—18).—P_2O_7'''' protects vitamin-*C* from oxidation both in alkaline (p_H 7·2) and acid (p_H 5·0) solutions, and inhibits the Cu-catalysed oxidation of -*C* dissolved in H_2O or 5% $CCl_3{\cdot}CO_2H$. L. D. G.

Absorption of vitamin-*C*. Modification of Tillmans' method for determining ascorbic acid in colourless body-fluids. N. Berend and M. Fischer (Biochem. Z., 1937, **291**, 221—228).—Vitamin-*C* cannot be determined in whole blood and losses of 25—35% occur on deproteinisation. No loss occurs when the determination is made, without deproteinisation, in non-hæmolytic, non-lipæmic serum, plasma, lymph, or cerebrospinal fluid acidified with HCl (p_H 1·5—3·5). In cats during -*C* absorption, the -*C* content of the lymph increases, that of the portal blood is doubled during the first hr., that of the blood of the inferior vena cava increases greatly, and that of the liver increases by 67%, 10% of the -*C* given being stored in the liver. Reversibly oxidised -*C* is not found in blood. Unexplained loss of -*C* occurs in the intestine, where some -*C* is destroyed by bacteria. In rats $CH_2I{\cdot}CO_2H$ decreases the rate of absorption of -*C*. W. McC.

Antiscorbutic properties of a salt of iron and ascorbic acid. M. Pijoan (Science, 1937, **86**, 80—81).—A salt (20% Fe and p_H 6·9 in M-solution) of reduced Fe and *l*-ascorbic acid (I) has a high antiscorbutic activity when injected intravenously into scorbutic guinea-pigs and into man. Single daily doses increased plasma-(I) vals. The double linking of the (I) mol. appears to be still present in the salt. L. S. T.

Biologically active 4-ketohexuronic acids (ascorbic and *iso*ascorbic acids). M. Bachstez and G. Cavallini (Chim. e l'Ind., 1937, **19**, 433—435).—*iso*Ascorbic acid (I) (A., 1934, 870) (improved prep. through Na di*iso*propylidene-β-ketogluconate) has a dissociation const. index p_{K_1} 4·18, in close agreement with the val. (4·26) for ascorbic acid (II). The behaviour of (I) is almost identical with that of (II) towards the sp. oxidase of (II). It is suggested that (I) is partly converted into (II) in the tissues. E. W. W.

Oxidation of ascorbic acid by peroxidase systems. Action of hæmoglobin derivatives. M. Fischer (Biochem. Z., 1937, **292**, 271—275).—Ascorbic acid (I) is oxidised by peroxidase systems and by $FeSO_4$–H_2O_2 at acid reactions. Hæmin considerably diminishes autoxidation of (I) at neutral reactions but not in presence of H_2O_2; HCN inhibits oxidation in the latter system. Carboxy- and oxy-hæmoglobin in presence of H_2O_2 effect oxidation but hæmatoporphyrin, either alone or with H_2O_2, is ineffective. F. O. H.

Ascorbic acid content of citrus fruits.—See B., 1937, 1126.

Oxygen consumption and enzyme content of the liver and phosphatase content of blood and bone in avitaminosis-*C*. G. Scoz, C. Cattaneo, and M. C. Gabbrielli (Enzymologia, 1937, **3**, 29—40).—In guinea-pigs, vitamin-*C* deficiency manifests itself in retarded growth, loss of wt., and decreased O_2 consumption, in diminution of the O_2 consumption of the liver, of its power to protect -*C* from oxidation, and of its contents of cathepsin (I), esterase (II), phosphatase (III) (exhibiting optimal activity at acid reactions), amylase, and phosphatase (exhibiting optimal activity at alkaline reactions) [the (I), (II), and (III) contents afterwards attain levels > the initial], in increase followed by decrease of the phosphatase (IV) content of the blood, in initial and final increases in the (IV) content of the bones, in retarded bone growth, and in progressive but limited increase in the ratio dry wt. : ash of the bones. W. McC.

Influence of vitamin-*C* deficiency on the resistance of guinea-pigs to diphtheria toxin. Glucose tolerance. A. Sigal and C. G. King (J. Pharm. Exp. Ther., 1937, **61**, 1—9).—The vitamin-*C* intake for *in-vivo* detoxication of diphtheria toxin is > that necessary to protect from scurvy or show a favourable growth rate. H. G. R.

Importance of the liver for the antirachitic efficiency of vitamin-*D*. W. Heymann (Proc. Soc. Exp. Biol. Med., 1937, **36**, 812—814).—The antirachitic potency of vitamin-*D* is decreased in rats with liver injury. H. G. R.

Comparison of hypervitaminoses induced by irradiated ergosterol and fish-liver oil concentrates. A. F. Morgan, L. Kimmel, and N. C. Hawkins (J. Biol. Chem., 1937, **120**, 85—102).—The toxic effect of pure calciferol in rats is exerted at a lower level than that of the vitamin-*D* of fish-liver oil. -*A* is not responsible for the change since very large excesses can only decrease but not eliminate the toxicity. The susceptibility of rats does not depend on sex; the females maintain a higher femur ash val. but show more advanced calcification of the viscera. R. M. M. O.

Constituents of vitamin-*E* concentrates from rice- and wheat-germ oils. A. R. Todd, F. Bergel, H. Waldmann, and T. S. Work (Nature, 1937, **140**, 361—362).—Acylation with *p*-$NO_2{\cdot}C_6H_4{\cdot}COCl$ or β-$C_{10}H_7{\cdot}COCl$ of purified concentrates from the unsaponifiable portion of rice-germ oil gives a complex mixture of oily and cryst. esters. Hydrolysis of the latter yields three cryst. isomeric alcohols, $C_{30}H_{50}O$, of m.p. 121—122°, 113—114°, and 119—120°. The last forms a β-naphthoate corresponding in properties with that of Kimm's active material (A., 1935, 1546), but like the other two has no vitamin-*E* activity. The last two have properties similar to the tritisterols obtained (A., II, 242) from wheat-germ oil concentrates. Parallel

experiments with wheat-germ oil gave β-amyrin and two isomeric alcohols, $C_{30}H_{50}O$, m.p. 113—114° and 175°, of the tritisterol type; neither possessed -*E* activity. In both cases, the purified oils remaining after removal of these cryst. alcohols have a high biological activity, and give on thermal decomp., considerable amounts of duroquinol. Treatment of the oil from the wheat concentrate with HCNO in C_6H_6 yields a mixture of allophanates from which the products described by Evans *et al.* (A., 1936, 531) could be isolated, in addition to a cryst. allophanate, m.p. 70°. The purified oil from the rice concentrate gave, on keeping, a cryst. substance, m.p. 73°, apparently an aliphatic, mono-unsaturated alcohol (approx. C_{20}). Saturation of the oil with HCNO in C_6H_6 then gave a complex mixture from which an allophanate, m.p. 135—138°, having the properties of β-tocopheryl allophanate was isolated, together with a large amount of an allophanate, m.p. 195—200°. L. S. T.

Vitamin-*E* deficiency in the suckling rat. M. M. O. Barrie (Nature, 1937, **140**, 426; cf. this vol., 283, 406).—The young of vitamin-*E*-deficient rats are born normal, but thyroid and anterior pituitary deficiency develop as a result of the lack of an essential constituent, probably -*E*, of the mother's milk. When fed by a normal rat, they show no sign of abnormality. L. S. T.

Effect of vitamin-*E*-deficient and muscular dystrophy-producing diet on the metabolism of guinea-pigs. E. L. Wood and H. M. Hines (Proc. Soc. Exp. Biol. Med., 1936, **36**, 746—747).—The metabolic rate is normal. H. G. R.

Vitamin-*K*, the fat-soluble antihæmorrhagic vitamin. H. Dam (Angew. Chem., 1937, **50**, 807—811).—A lecture.

Vitamin-*P*. A. Bentsáth and A. Szent-Györgyi (Nature, 1937, **140**, 426).—Vitamin-*P* requires the presence of traces of ascorbic acid for its activity. Such traces, which in themselves have no effect on the development of scurvy, are frequently present in a scurvy diet and enable -*P* to act. L. S. T.

Spectrography of vitamin-*P* (citrin) and of other flavone-like substances. S. Lajos and M. Gerendás (Biochem. Z., 1937, **291**, 229—236; cf. Bruckner and Szent-Györgyi, this vol., 82).—Hesperidin (I) exhibits absorption max. at 278 and 324 mμ. and min. at 255 and 315 mμ. The corresponding vals. for eriodictyol (II) are 290 and 326 mμ., and 251 and 325 mμ. whilst those for homoeriodictyol are 290 and 328 mμ., and 260 and 303 mμ. Quercetin exhibits max. at 258 and 375 mμ. and min. at 240 and 300 mμ. The absorption spectrum of citrin (III) is a combination of those of (I) and (II). The spectra of (I), (II), and (III) change as a result of decomp. on treatment with NaOH. W. McC.

Protoplasmic movement in the *Avena* coleoptile as related to oxygen pressure and age. J. G. Eymers and H. P. Bottelier (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 589—595).—The difference between the temp.–velocity curves of protoplasmic movement in epidermal cells in young and in old *Avena* coleoptiles is due to O_2 deficiency in the young cells. This can be explained on the assumption that the O_2 concn. of the medium decreases with rising temp., and that the area of cell surface available for O_2 diffusion increases with age. J. L. C.

Chemical processes in *Sauromatum* bulbs. A. W. H. van Herk (Proc. K. Akad. Wetensch. Amsterdam, 1937, **40**, 607—614).—The normal rise in temp. of the appendix of *S. guttatum* was not affected by removal of the tubers, female flowers, or sterile portion. Factors governing the rise in temp. are associated with the male flowers, and appear to take effect about 20 hr. before the temp. rise. J. L. C.

Oxidation–reduction potential of aqueous extracts of germinating barley. J. Janicki (Enzymologia, 1937, **4**, 107—110).—The oxidation–reduction potential of aq. extracts of barley decreases strongly during germination, particularly from the 4th to the 10th day, the amylolytic power showing a considerable increase over the same period. Amylase activation in ungerminated barley by H_2S or papain is due to mobilisation of amylase activators probably brought about by displacement of the oxidation–reduction potential. The disappearance of α-amylase (dextrinifying enzyme) during ripening of barley is not due to oxidation of ascorbic acid. P. W. C.

Oxidation–reduction potential of vine sap. E. Beltran, P. Aldebert, and A. Grasset (Compt. rend. Acad. Agric. France, 1937, **23**, 533—538).—The r_H of saps of various vine stocks is determined and discussed in relation to suitability for growth in different soils. A. G. P.

Hydrogen-ion concentration in apples. F. Kidd and C. S. Hanes (Rep. Food Invest. Bd., 1936, 133—135).—The p_H of the sap of Bramley's Seedling apples rose continuously during storage from 2·8 to 3·7 in 100 days at 20°, to 3·4 in 200 days at 15°, to 3·3 in 270 days at 10°, and to 3·1 in >300 days at 3° and 1°. The rise in p_H closely corresponded with the fall in titratable acidity. E. C. S.

Concentration of mesothorium-I by duckweed (*Lemna*). W. I. Vernadsky, B. K. Brunowsky, and C. G. Kunasheva (Nature, 1937, **140**, 317—318).—Duckweed from Orangery Pond, near Leningrad, contains approx. 100 times more mesothorium-I (10^{-14}%) than the H_2O in which it grows. Isotopes of Th are present in the H_2O, but they are not assimilated by the duckweed. L. S. T.

Manganese and cobalt in plant and animal economy. E. Browning (Sci. Progr., 1937, **32**, 276—289).—A survey.

Determination of magnesium in plants. N. D. Costeanu (Bodenk. Pflanzenernähr., 1937, **4**, 358—360).—Mg in plant ash is determined by the drop-reaction method using KI–NaOBr (cf. A., 1936, 1222). A. G. P.

Concentration of solutes in vacuolar and cytoplasmic saps. E. Phillis and T. G. Mason (Nature, 1937, **140**, 370—372).—When sap is expressed from cotton leaves by means of a hydraulic press, the concns. of solutes (Ca, Mg, and K) in successive fractions are < those obtained by expression in a vice, and remain practically const. with a rise in

pressure. In both cases, there is a large increase in concn. when the residue is frozen and pressure is again applied. This does not support the view that H_2O is filtered under pressure through the cytoplasm. Shearing forces, present in the vice but not in the hydraulic press, probably decompose the "vitaid" or continuous phase of the cytoplasm into proteins, lipins, and H_2O, whilst the solutes in the H_2O escape with the vacuolar sap. An approx. max. estimate of concns. of the solutes in the vacuole is thus given by the lowest concn. obtainable by direct pressing. Methods previously used for extraction of sap, *e.g.*, boiling, freezing, grinding, and treatment with anæsthetics, all give mixtures of vacuolar sap with that produced by decomp. of the vitaid. L. S. T.

Distribution of phosphatase activity and analysis of growth in Canada wonder bean. V. Ignatieff (Biochem. J., 1937, **31**, 1611—1615; cf. A., 1936, 1152).—The unit leaf rate and relative growth rate are closely correlated with the phosphatase (I) activity of the leaf and the increase of dry matter in the plant. (I) probably plays a part in carbohydrate metabolism. P. G. M.

Assimilation of formaldehyde by green plants. K. Noack and G. Paechnatz (Naturwiss., 1937, **25**, 569—570).—The poisonous effect of CH_2O on plants has been considerably underrated. 0·006% aq. CH_2O reduces respiration of *Elodea* by 50% and inhibits photosynthesis almost completely. A 0·004% solution reduces respiration of *Chlorella* by 50% and photosynthesis by 74%. The carbohydrate enrichment of marine plants after addition of CH_2O in the dark is illusory. The consumption of CH_2O by the plant is dependent on the partial pressure of O_2 and may result from enzymic oxidation. A. J. M.

Metabolism of nitrogen in apple-fruits. A. C. Hulme (Rep. Food Invest. Bd., 1936, 126—131).—The change-over from hydrolysis to synthesis of protein (cf. *ibid.*, 1935, 111) occurs immediately before the climacteric rise of respiration. The gain in protein-N is, in the first instance, at the expense of asparagine, but later the NH_2-acid-N also contributes. The respiration of fruit from trees injected with urea is >, and that from trees injected with urea + Na_2HPO_4 <, that of normal fruit or that from trees injected with Na_2HPO_4 alone. E. C. S.

Physiology of plant nutrition. VI. Relation of respiration rate to carbohydrate and nitrogen metabolism of the barley leaf as determined by nitrogen and potassium deficiency. F. G. Gregory and P. K. Sen (Ann. Bot., 1937, **1**, 521—561; cf. A., 1936, 1164).—In sand-cultured barley receiving varied levels of N and K supply the H_2O content and respiration rate of leaves diminished with deficiency of N and increased with that of K. With very low levels of K respiration diminishes. Respiration rates are max. in early leaves, but diminish in intermediate and increase again in the last leaves, the relative differences being influenced by manurial treatment. Respiration drift in the dark is also influenced by manurial application and leaf succession. High respiration rates are associated with low sugar and high NH_2-N contents in K-deficient plants; low respiration is accompanied by high sugar and low N fractions in N-deficient plants. Interrelationships between respiration and N metabolism are discussed. A. G. P.

Drought-resistance of sunflower and potato. H. F. Clements (Res. Stud. State Coll. Washington, 1937, **5**, 81—98).—Drought conditions induced high N metabolism in the plants. In sunflower sol. carbohydrates increased in both stems and leaves, and the total leaf area was reduced. The drought-resistance of soya bean, sunflower, and potato decreased in the order named, the hemicellulose contents of the leaves showing a similar gradation. A. G. P.

Synthesis of nitrogenous substances in the living organism. G. Calcagni (Riv. Biol., 1937, **22**, 92—108).—Existing knowledge of the synthesis of N compounds (mainly in plants) is briefly reviewed. Exposure of $CO_2 + H_2O$ or $CO_2 + C$ to sunlight in presence of various catalysts did not yield any org. compound. Similar experiments with starch or glucose + $NaNO_3$ or $(NH_4)_2SO_4$ also gave negative results. CH_2O + aq. NH_3 gave NH_2Me and $(CH_2)_6N_4$ but no arginine. With KCN + NH_3 + NH_4 salt, HCO_2H was formed whilst KCN + NH_3 + CH_2O (MeCHO) yielded glycine (alanine); in presence of $COMe_2$, α-amino*iso*butyric acid was probably formed. The bearing of the data on plant synthetic processes is discussed. F. O. H.

Evolution of hordenine in barley and the final relationship of this alkaloid to tyrosine. Y. Raoul (Compt. rend., 1937, **205**, 450—452).—The hordenine (I) content of germinating barley (*H. murinum*, L.) increases from 0 to 280 mg. per kg. in 11 days and subsequently decreases to 0 in 30 days. The tyrosine (II) content first decreases and then increases but not to its original val., the increase corresponding with the complete utilisation of reserve protein-N. Assumption of the transformation of (II) into (I) accounts for about 23% of the total (II) lost, between the 11th and 17th days. J. L. D.

Excretion of nitrogen by leguminous plants. —See B., 1937, 1103.

Influence of the protein content on the amount of amylase in barley and barley malt. T. Chrzaszcz and J. Sawicki (Enzymologia, 1937, **4**, Part II, 79—87).—The amylase content of different samples of barley varied from 36·8 to 434 (amylolytic power in terms of c.c. of 0·05N-I). The amount of combined amylase also varied, the amylolytic power increasing on treatment with H_2S and papain by 18·6 to 734%. No uniform relationship could be detected between species of barley or protein content and amylase content. P. W. C.

Hydrolysis of sucrose by malic acid–malate mixtures. C. S. Hanes and F. Kidd (Rep. Food Invest. Bd., 1936, 131—133).—The rates of hydrolysis in the living apple are ≫ those predicted from observations made at similar [H·] and temp. *in vitro*. E. C. S.

Influence of temperature on sucrose : hexose and fructose : glucose relations in potatoes. J. Barker (Rep. Food Invest. Bd., 1936, 174—177).—The increase in the sucrose : hexose ratio induced by

transfer to low temp. is transitory, and, except where accumulation of sugar is unduly high, the ultimate effect is to lower the ratio. Temp. has little effect on the equilibrium between fructose and glucose. E. C. S.

Changes in the sugars of the artichoke during storage [non-harvesting] and their conversion into alcohol. G. DE VITO (Annali Chim. Appl., 1937, **27**, 196—206).—During winter, inulin etc. in the tubers of the artichoke (*Helianthus tuberosus*) are converted into sucrose (I) so that finally 75% of the total sugar content is (I). For rapid transformation of all types of sugar present into EtOH, *Saccharomyces fragilis* is recommended. F. O. H.

Decomposition of ethylene chlorohydrin in potato tubers. L. P. MILLER (Contr. Boyce Thompson Inst., 1937, **8**, 479—492).—$CH_2Cl{\cdot}CH_2{\cdot}OH$ absorbed by potato tubers is rapidly decomposed in the tissues, although relatively stable in the expressed juice or in buffers of the same p_H. Cl′ appearing during the decomp. is localised more particularly near the cut surfaces of the tubers. A. G. P.

Seasonal changes in the organic acids of rhubarb (*Rheum hybridum*). A. ALLSOPP (Biochem. J., 1937, **31**, 1820—1829).—The total plant content of citric (I) and malic (II) acids increases during the summer but not during the preceding period of sprouting, during which, however, there is a translocation of both acids from the rhizome to the newly formed shoots. The summer increase is related to photosynthesis. In terms of concn. (I) is min. in rhizome and roots in May and max. in October, and falls continuously in leaves until July. (II) increases to a max. in May, and is approx. const. till September, falling steeply in October. Both (I) and (II) are much more conc. in leaves than in rhizome during the sprouting period, although there is apparently no new formation at this time. The oxalic acid of the rhizome falls in April due to sprouting and then steadily increases until September, falling again steeply in October. The amount in leaves increases gradually throughout the season, falling in October. The total acid of rhizomes is min. in May and max. in September. Translocation of acids to the rhizome evidently begins as soon as they are formed in the leaves and continues throughout the season. The acids are probably not end-products, but are in equilibrium with other substances, probably carbohydrates. R. M. M. O.

Pigment glands of the tomato. A. J. EWART (Ann. Bot., 1937, **1**, 563—564).—Glandular hairs of tomato leaves contain a pigment resembling or identical with citrinin. Alkaline pigment extracts of tomato, unlike those of *Penicillium citrinum*, are rapidly oxidised in air yielding an insol. brown compound. A. G. P.

Fundamentals of photosynthesis. J. FRANCK (J. Washington Acad. Sci., 1937, **27**, 317—329).—A lecture. The chemical mechanism of photosynthesis is considered. A. G. P.

Physiology of *Coffea arabica*. I. Photosynthesis of coffee leaves under natural conditions. F. J. NUTMAN (Ann. Bot., 1937, **1**, 353—367).—Assimilation rates of coffee leaves in relatively low light intensity $\propto$ the intensity. High intensities diminish assimilation. Under all conditions the time lag between change of light intensity and resulting change in assimilation rate is <2 min. The mid-day decline in assimilation during periods of sunshine is not dependent on the H_2O status of the leaf or on the accumulation of assimilates. A. G. P.

Metabolic action between sensitiser and oxygen in light. H. KAUTSKY (Biochem. Z., 1937, **291**, 271—284).—The metabolic action between O_2 and chlorophyll and its bearing on the accompanying changes in phosphorescence and fluorescence are discussed with reference to the conclusions of Gaffron (A., 1936, 1570). F. O. H.

Oxygen uptake of isolated plant tissue. I. Effect of phosphate and of added carbohydrate. II. Effect of inhibitors. J. CALDWELL and J. MEIKLEJOHN (Ann. Bot., 1937, **1**, 477—486, 487—498).—I. The O_2 uptake of thin slices of tomato stem tissue was highest in the presence of 0·033M-KH_2PO_4, and somewhat lower in H_2O. Higher [KH_2PO_4] markedly lowered the intake. Vals. for tissue from plants in the 12-leaf stage were > for those in the 5-leaf stage. The O_2 intake in plants beyond the flowering stage was very low. Addition of glucose or fructose increased the intake by tissue from young but not by that from old plants. O_2 intake in old plants is limited by the activity of the respiratory enzyme system, and in very young plants by the amount of available respiratory substrate.

II. General inhibitors of enzymic activity depressed the O_2 intake of stem slices to extents $\propto$ the concn. 0·033M-KCN caused a reversible inhibition which was not exceeded by that of a 0·33M solution. NaF and $CH_2I{\cdot}CO_2H$ had an irreversible action. The effect of NaN_3 was reversible and was greater in acid than in alkaline solution. Malachite-green had a considerable and urethane a small inhibitory action. Aq. $C_5H_{11}{\cdot}OH$ (1 in 30) caused complete inhibition but at concn. 1 in 3000 had substantially no effect. A. G. P.

Effect of hydrocyanic acid and hydrogen peroxide on the Blackman reaction in *Scenedesmus*. H. GAFFRON (Biochem. Z., 1937, **292**, 241—270).—The respiration of the green alga *S. basiliensis* is readily, and the assimilation only slightly, inhibited by HCN. The inhibitory effects, especially on the Blackman reaction, are dependent on light intensity (*I*). Metabolic relationships between assimilation and respiration and the apparent and true assimilation at high *I* are discussed. The parallel inhibitory action of HCN or H_2O_2 decomp. and the Blackman reaction in most plants is purely accidental and is not related to the assimilation process. Differences in the action of HCN on H_2O_2 decomp. and assimilation in *Chlorella* and *Scenedesmus* are indicated. 0·0001M-HCN inhibits the catalase action by 90%, at which state 0·0002M-H_2O_2 lowers the rate of assimilation by 62%; with H_2O_2-treated algæ, the rate is retarded by 41% when *I* is high but not at all when *I* is low. The bearing of the results on theories of assimilation is discussed, the main problems being the fission of the

sensitiser, photochemical activation of the org. mol., and the nature of the reducing enzyme. F. O. H.

Chlorophyll fluorescence and assimilation of carbonic acid. VII. Dependence of the fluorescence curve of green leaves on oxygen pressure. H. KAUTSKY and R. HORMUTH (Biochem. Z., 1937, **291**, 285—311; cf. this vol., 240).—The rate of O_2 consumption by chlorophyll grains from chloroplasts of *Clematis paniculata* and the accompanying fluorescence depend on p_H. The oxidation process thus decreases owing to formation of acid. Photo-oxidation in living chloroplasts and the course of fluorescence in varying $[O_2]$ are described and discussed. F. O. H.

Hormonal nature of plant development processes. M. C. TSCHAJLACHJAN (Compt. rend. Acad. Sci. U.R.S.S., 1937, **16**, 227—230; cf. A., 1936, 1570).—With the appearance of the first green leaf the plant becomes susceptible to the influence of a photoperiodic factor which causes or accelerates the development of sexual organs. The influence of the factor is localised in various parts of the plant but may be translocated by material carriers from leaves, *via* stems, to growing points. Processes of sexual development are initiated in leaves independently of the rate of growth. Flowering and seed formation are caused by a sp. flowering hormone and are not controlled entirely by the accumulation of particular substances within the plant or by the presence of auxin. Translocation of the hormone in the plant system is equally rapid in all directions and is unrelated to the polarity of the plant system. Basal movement occurs *via* the bark. The hormone is not species-sp. A. G. P.

Influence of partial removal of the embryonic reserves on plant development and the probable presence of a growth factor. O. VERONA and G. BONAVENTURA (Att R. Accad. Lincei, 1937, [vi], **25**, 53—55).—Removal of the embryonic food-reserves from cereal caryopses significantly diminishes subsequent growth; the diminution is not corr. by provision of sugars, starch, or extracts of pituitary, thyroid, or testicular glands. The presence of a growth factor is discussed. F. O. H.

Salt accumulation and polar transport of plant hormones. F. W. WENT (Science, 1937, **86**, 127—128).—The polar transport of auxin (I) in the living plant behaves in a manner similar to that of ion accumulation; it consists of the concn. of (I) from apex towards the base of each cell. Curves of the amount of 3-indolylacetic acid transported through *Avena* coleoptile sections show that the amount transported from apex to base (normal transport) increases approx. linearly with the logarithm of the applied acid concn. up to 1 mg. per c.c. The curve for transport from base to apex (inverse transport) is similar except that the applied concn. must be 100 times as great to give numerically the same transport. The polar (I) transport mechanism thus handles a const. amount of indolylacetic acid independent of the existing gradient. L. S. T.

Tumour production by hormones from *Phytomonas tumefaciens*. G. K. K. LINK and H. W. WILCOX (Science, 1937, **86**, 126—127).—The tumours produced by the application of bacterial extracts of *P. tumefaciens* to hypocotyls of *Phaseolus vulgaris* are described. L. S. T.

Rôle of heteroauxones in legume nodule formation, beneficial host effects of nodules, and soil fertility. G. K. K. LINK (Nature, 1937, **140**, 507).—The activator of nodulation produced in susceptible hosts by *Rhizobium phaseoli* and other nodule-forming organisms is probably 3-indolylacetic acid. This may account for the beneficial effects of green manuring with nodule-bearing plants, of fertilising with manures rich in dung and urine, or with compost, of humus soils, and of mycorrhizal fungi. L. S. T.

Root production on application of indolylbutyric acid to *Cissus* aërial roots. N. E. PFEIFFER (Contr. Boyce Thompson Inst., 1937, **8**, 493—506).—Anatomical changes in the cellular structure of the roots following treatment at or near the tips with indolylbutyric acid (I) are recorded. The effects of naphthylacetic acid, indolyl-acetic and -propionic acids are similar to those of (I). A. G. P.

Growth factors. F. KÖGL, P. FILDES, A. LWOFF, B. C. J. G. KNIGHT, G. M. RICHARDSON, H. M. SINCLAIR, and M. A. H. TINCKER (Proc. Roy. Soc., 1937, **B**, **124**, 1—13).—A report of a discussion. P. W. C.

Preparation of plant growth-promoting substances. I. Ethyl α-naphthylglyoxylate, α-naphthylglycollic acid, and α-naphthylacetic acid.—See A., II, 456.

Effect of dwarf disease on the lucerne plant. J. L. WELMER (J. Agric. Res., 1937, **55**, 87—104).—Affected plants show yellowing of roots due to accumulation of a gum (resembling wound gum) largely in the vessels of the outer xylem. Gum appears, if at all in stems, only in the first few in. With the development of disease in the plants, transpiration diminishes and the permeability of the root system to H_2O decreases; the tops have higher $[H^{\cdot}]$ and titratable acidity, higher ash content, and less starch than healthy plants. A. G. P.

Bromothymol-blue in aqueous sodium hydroxide as a clearing and staining agent for fungus-infected roots. S. D. GARRETT (Ann. Bot., 1937, **1**, 563).—Fresh or EtOH-pickled root tissue is soaked in N-NaOH containing 0·04% of bromothymol-blue. Meristematic tissue of root apices and young fungus hyphæ, spores, and sporangia take up the stain. A. G. P.

Rubidium and strontium toxicity to plants inhibited by potassium and calcium respectively. A. M. HURD-KARRER (J. Washington Acad. Sci., 1937, **27**, 351—353).—The toxicity of $Rb^{\cdot}$ was partly counteracted by $K^{\cdot}$ and that of $Sr^{\cdot\cdot}$ by $Ca^{\cdot\cdot}$. In proportion to their concn. nutrient cations diminish the absorption and hence the injurious action of toxic cations which are sufficiently similar, chemically, to preclude selective absorption by the plants. A. G. P.

Selenium in plants in relation to its occurrence in soils. J. T. MILLER and H. G. BYERS (J.

Agric. Res., 1937, **55**, 59—68).—Three groups of plants are distinguished: (*a*) those able to absorb Se readily without injury and in which Se may be a definite physiological requirement, (*b*) those able to take up moderate amounts of Se without severe injury, (*c*) those showing very limited tolerance to Se, of which they absorb only small amounts. A. G. P.

Effect of certain nitrogenous compounds on the rate of decay of wood. H. Schmitz and F. Kaufert (Amer. J. Bot., 1936, **23**, 635—638).—Asparagine increased the rate of decay of Norway pine (*Pinus resinosa*) heartwood and sapwood by *Lenzites trabea* and of paper birch (*Betula papyrifera*) sapwood by *Polystictus versicolor*, but did not affect that of birch heartwood by the latter organism. NH_4NO_3 had no effect except in one instance. A. G. P.

Biological origin of pentoses. F. J. Paton (Chem. and Ind., 1937, 908).—Oxidation of a disaccharide by alkaline $KMnO_4$ produces a conjugated compound yielding a hexose and a uronic acid on hydrolysis. If pentoses originate biologically by decarboxylation of uronic acids this would indicate the manner of origin of the hexose–pentose–uronic acid linkings found in nature. Since the disaccharide is usually the first product of photosynthesis that can be isolated the pentose unit may thus arise directly without intermediate formation of the hexose unit. R. M. M. O.

Analysis of carbohydrates of the cell wall of plants. IV. Determination of methylpentoses as methylfurfuraldehyde: methods of distillation and precipitation. C. R. Marshall and F. W. Norris (Biochem. J., 1937, **31**, 1289—1298).—The most suitable distillation method is a modification of that of Kullgren and Tyden (A., 1929, 1278) using HCl stabilised with an excess of NaCl. For the determination of methylfurfuraldehyde in aq. HCl phloroglucinol and thiobarbituric acid were suitable precipitants. A predetermined graph is necessary for use with titrimetric methods. High results obtained by titrimetric methods or by pptn. with 2 : 4-dinitrophenylhydrazine were caused by $COMe_2$ derived mainly from rhamnose. J. L. C.

[**Constituents of**] ***Struthiopteris spicant.*** F. J. Goodrich and E. Koozin (Amer. J. Pharm., 1937, **109**, 412—415).—The rhizomes contain 7·73% of starch, 6·5% of total and 3·89% of reducing sugars, 3·02% of pentosans, but no alkaloids, glucosides, or filicin. J. L. D.

Chemical similarity and classification of the Hordaceæ. H. Colin and H. Belval (Compt. rend., 1937, **205**, 191—193).—The base of the stem of *Elymus arenarius* contains reducing sugars, sucrose, and a fructoside (I), $[\alpha]_D$ −43° (the rhizomes and seeds contain less of these constituents), which is non-reducing and when partly hydrolysed has $[\alpha]_D$ −82°. (I) with dil. acids affords 5—6% of glucose and with emulsin, β-methylglucoside. These properties are compared with those of glucosides from other members of the same family. J. L. D.

Hydrolysis of starch by hydrochloric acid at 20°. Phosphoric acid content of potato starch. —See A., II, 446.

Polyuronide from tobacco stalks. E. Bennett (Ind. Eng. Chem., 1937, **29**, 933).—The isolation and partial analysis of a polyuronide from the cured stripped stalk of Havana seed tobacco is described. The chief sugar obtained on hydrolysis is xylose. F. R. S.

Hemicelluloses. III. Extraction and preparation. A. G. Norman (Biochem. J., 1937, **31**, 1579—1585; cf. A., 1935, 673, 1435).—When hot EtOH–NaOH is used as a pretreatment before hemicellulose (I) extraction, it must be shown analytically that the furfuraldehyde-yielding constituents have not been attacked. Extensive removal of (I) material is effected by extraction with cold 4% NaOH alternated with brief chlorination. Such extracts may contain a high proportion of polysaccharides derived from cellulose (II). Brief extraction with hot, more dil. alkali has less drastic effect on the (II) and such extracts may consist largely of polyuronide (I). The lignin content of the (I) preps. should always be determined; it may be reduced by brief treatment with Cl_2 and thorough washing with EtOH of moderate concn. P. W. C.

Orientation of cellulose and "primary" substance in the growing *Avena* coleoptile. K. Wuhrmann and M. Meyer (Naturwiss., 1937, **25**, 539—540).—Cells of the apical portion of the coleoptile show negative and those of the base positive double refraction. Basal cells show thread-like instead of tubular structure. After extraction for 48 hr. with EtOH–C_6H_6–C_5H_5N, the degree of double refraction was decreased but showed the same variation. The phenomenon therefore depends on the presence of a doubly-refracting cellulose skeleton in which a doubly-refracting substance, which can be extracted by a suitable solvent, is embedded. A. J. M.

Asparagose.—See A., II, 446.

Bletillamannan, a mannan from the tubers of *Bletilla striata*.—See A., II, 446.

Cremastramannan, the mannan of Japanese saleps.—See A., II, 446.

Constitution of new disaccharide "xyloglucuronic acid" from *Kadsura japonica*, Don. —See A., II, 442.

Presence of octadecatrienoic acids in seed-oils of pomegranate, karasu-uri (*Trichosanthes cucumeroides*), and balsam pear. Y. Toyama and K. Uozaki (J. Soc. Chem. Ind. Japan, 1937, **40**, 249—250B).—The presence of punicic acid in pomegranate seed-oil (A., 1935, 960) was confirmed. Trichosanic acid was not found in the other two oils (cf. *ibid.*; A., 1936, 1307). Karasu-uri seed-oil contained a stereoisomeride of β-elæostearic acid whilst α-elæostearic acid was isolated from balsam pear seed-oil. T. G. G.

Constitution of the seeds of *Blepharis edulis*, Pers. II. Composition of the oil. G. P. Pendse and J. B. Lal (J. Indian Chem. Soc., 1937, **14**, 362—366; cf. A., 1936, 911).—Oil extracted from the seeds with C_6H_6 contains oleic 67, linoleic 13, stearic 6, palmitic, 4·6, and arachidic acid 0·03%, and unsaponifiable matter (3%) containing a

phytosterol, m.p. 115—117°. The oil on keeping deposits arnisterol (cf. Klobb, A., 1904, i, 410; 1905, i, 594). A. Li.

Fruits of *Solanum nigrum*, Linn. I. Composition of the oil from the seeds. G. P. Pendse (J. Indian Chem. Soc., 1937, **14**, 367—370).—Oil extracted with light petroleum contains oleic 64, linoleic 24, stearic 3·1, and palmitic acid 2·1%, and unsaponifiable matter (1·5%) containing a phytosterol, m.p. 127—129° (Ac derivative, m.p. 119—120°). A. Li.

Negatively doubly-refracting constituent of cuticular layers of the plant epidermis. M. Meyer (Naturwiss., 1937, **25**, 539).—After extraction with fat solvents the negative double refraction of cuticular layers of various xerophytes disappeared. The wax mols. to which the refraction is probably due must be arranged perpendicularly to the surface of the cells, and hence to the sub-microscopic cellulose lamellæ. A. J. M.

[Constituents of] *Rhus glabra*. G. H. McFadden and R. L. McMurray (Amer. J. Pharm., 1937, **109**, 397—406; cf. this vol., 161).—A 95% EtOH extract of the fruit contained a resin and an oil, hydrolysed by EtOH–KOH to glycerol, linoleic, oleic, palmitic, arachidic, and lignoceric acid, Bu$^{\alpha}$OH, and unsaponifiable material which contained a sterol, m.p. 137·2° (Ac derivative, m.p. 117—118°), and hentriacontane. J. L. D.

Croton resin. IV. Acids insoluble in light petroleum. J. R. Spies (J. Org. Chem., 1937, **2**, 62—67; cf. A., 1935, 527).—Saponification of croton resin gives fatty acids 30, acids (I) insol. in light petroleum 40, and H_2O-sol. phenols 30%. Methylation of (I) with MeI–Ag_2O gives esters (OMe 12·5%), from which the heptoate, hexoate, and laurate, and Me_2 azelate (possibly derived by oxidation) are obtained; by hydrolysis these give an acid containing 7·3% of OMe. This indicates the presence of OH-acids in the resin. An active fraction was obtained, which was inactivated by methylation; the analogy with urushiol (Hill *et al.*, A., 1935, 246) is indicated. R. S. C.

Artostenone, a ketonic sterol from *Artocarpus integrifolia*.—See A., II, 459.

Intravacuolar inclusions in the fruit of the ivy (*Hedera helix*, L.). R. Échevin and R. Ulrich (Compt. rend., 1937, **205**, 247—249).—The pericarp of the immature fruit is rich in intravacuolar lecithin (I) (1·7% of the dry wt.), the amount of which increases as the fruit matures. When mature fruit are dried, the (I) content of the pericarp decreases. The remaining portions of mature seed are (I)-free. J. L. D.

Chemical constituents of lichens found in Ireland. *Parmelia conspersa*, Ach. M. Mohan, J. Keane, and T. J. Nolan (Sci. Proc. Roy. Dublin Soc., 1937, **21**, 593—594).—Et_2O extracts of the lichen yield usnic acid. Boiling $COMe_2$ extracts stictic acid from the residue. P. G. M.

Constituents of *Pertusaria concreta*, Nyl, form *Westringii*, Nyl.—See A., III, 462.

Constitution of xanthyletin.—See A., II, 465.

Allantoic acid in the leaves of *Corylus avellana*. L. Leroux (Compt. rend., 1937, **205**, 172—173; cf. A., 1927, 284; 1926, 548).—The press-juice of the leaves, after treatment with uranium acetate, affords with xanthhydrol dixanthylallantoic acid (I), which after hydrolysis with HCl is converted into *Ag allantoate*. The dried leaves contain 0·43 g. of (I) per kg. Hydrolysis of the press-juice with HCl at 60° affords urea. The reactions previously obtained (cf. A., 1927, 1116) for $CHO{\cdot}CO_2H$ are due to (I). J. L. D.

Purines in the plant kingdom. New purine in tea. T. B. Johnson (J. Amer. Chem. Soc., 1937, **59**, 1261—1264).—1 : 3 : 7 : 9-Tetramethyluric acid (cf. Fischer, A., 1884, 446) was isolated from the residues after the removal of caffeine from tea. A. Li.

Differences in amino-acid content of the leaf proteins of male and female hemp plants. A. Kiezel and V. Paschevitsch (Biochimia, 1937, **2**, 666—673).—The proteins of male plants contain slightly less histidine and $(CO_2H)_2$-acids, and slightly more arginine and lysine, than do those of female plants. R. T.

Biochemical investigation of different varieties of Bengal rice. III. Enzymic digestibility of rice starch and protein. Action of salivary and pancreatic amylase, pepsin, and trypsin. K. P. Basu and S. Mukherjee. **IV. Biological value of proteins of Aman and Aus rice and of their polishings by the balance-sheet and growth methods. V. Extraction and analysis of proteins of Aman and Aus rice.** K. P. Basu and M. N. Basak (Indian J. Med. Res., 1936, **23**, 777—787; 1937, **24**, 1043—1066, 1067—1076).—III. Data for the enzymic degradation of varieties of rice, polished and non-polished, are tabulated. The rate of hydrolysis is generally increased after polishing or parboiling.

IV. The biological val. of the proteins of Aus and Aman rice is 80, whilst that of the polishings is 68. Data indicating the nutritive val. of the proteins are given.

V. Data for the extractability, NH_2-acid distribution, and nutritive val. of the proteins are given. W. O. K.

Partial fission of proteins. II. Gliadin. T. Kunishige (J. Biochem. Japan, 1937, **25**, 307—327; cf. Uchino, A., 1934, 1375).—The products yielded by fractional hydrolysis of gliadin with dil. H_2SO_4 or NaOH under pressure at 170° were examined for N distribution and the data are compared with those for fibroin. F. O. H.

Extraction and analysis of the proteins of green gram (*Phaseolus mungo*), lentil (*Lens esculenta*), and *Lathyrus sativa* (Khesari). K. P. Basu, M. C. Nath, M. O. Ghani, and R. Mukherjee (Indian J. Med. Res., 1937, **24**, 1027—1042).—Lentil, green gram, and *Lathyrus sativa* contain 22·6, 23·26, and 32·2% of protein, respectively, of which >90% is extractible by solvents. The low cystine content of the lentil proteins accounts for their low biological val. The globulin of lentil is deficient in tryptophan (I) and the glutelin in histidine. The

proteins of *L. sativa* are deficient in (I). Addition of (I) to rats on a diet of *L. sativa* improves the condition of the fur but does not increase growth. The poor growth on *L. sativa* diet is to be ascribed to the small intake of food due to the presence of some toxic substance in *L. sativa*. W. O. K.

Flower pigments. H. Körperth (Österr. Chem.-Ztg., 1937, **40**, 432—434).—A brief review.

Pigment of red autumn leaves of species of *Acer*.—See A., II, 464.

Colouring matters of *Drosera Whittakeri*. V. Constitution of droserone.—See A., II, 460.

Effect of light on pigments and dyes. S. Nakamura and H. Kanazawa (Proc. Imp. Acad. Tokyo, 1937, **13**, 204—207).—The stability to sunlight of mineral pigments and natural indigo used in old Japanese arts is found by the Pulfrich cascade photometer to be very great. That of the dyes from *Lithospermum erythrorhinon* roots and *Carthamus tinctoria* flowers is somewhat less. R. S. C.

Citraurin, polyene pigment of the orange.—See A., II, 443.

Occurrence and distribution of saponins in herb drugs. (A) A. Kuhn and G. Schäfer. (B) M. Roberg (Arch. Pharm., 1937, **275**, 477, 478—479).—Polemical (cf. B., 1935, 573; this vol., 191). R. S. C.

Origin and function of hordenine. Y. Raoul (Ann. Ferm., 1937, **3**, 129—148; 193—218; cf. this vol., 305).—I. The physical and chemical properties, constitution, and synthesis of hordenine (I) are fully described.

II. The principal theories of the origin and function of alkaloids in plants are considered. Tyrosine is decarboxylated to tyramine (II) when heated at 250° under diminished pressure; (II) with CH_2O and HCO_2H gives (I). (I) with 30% H_2O_2 yields the *amine-oxide*, m.p. 214°, converted by Ac_2O followed by hydrolysis with 15% H_2SO_4 into methyltyramine. A microchemical technique for the localisation of (I) is described. The alkaloid is not present in the ungerminated grain but appears during the first days of germination (15—16°) and again disappears after about a month. H. W.

Rôle and origin of alkaloids. Y. Raoul (Bull. Sci. pharmacol., 1937, **44**, 114—120).—A general account, with special reference to the formation of hordenine. L. D. G.

Pot-curare.—See A., II, 474.

Calcium iodate as a temporary preservative. H. F. Steedman (Nature, 1937, **139**, 1072).—0·1% aq. $Ca(IO_3)_2$ preserves certain classes of biological material. L. S. T.

Use of *n*-butyl alcohol in the paraffin method. A. G. Lang (Stain Tech., 1937, **12**, 113—117).—Modifications in the use of BuOH in dehydrating are based on equilibria in the ternary system H_2O–EtOH–BuOH. E. M. W.

Chromatograms of biological stains on acid and basic adsorbents. C. H. Lou (Stain Tech., 1937, **12**, 119—124).—Three types of adsorption are recognised in the separation of stains by chromatographic analysis using different adsorbents. An artificial cell for demonstration purposes is described. E. M. W.

Pyridine–formalin in Zenker–formol fixatives. V. Warbritton (Stain Tech., 1937, **12**, 125).—C_5H_5N–CH_2O is unsuitable for use with Zenker's fluid owing to the formation of a ppt. E. M. W.

Tress modification of cresyl-violet technique for staining nerve cells. R. W. Barris and W. H. Waller (Stain Tech., 1937, **12**, 125—126).—Differentiation with $CHCl_3$–Et_2O–EtOH (cf. A., 1935, 1146) solution is dependent on the presence of small amounts of Cl_2 in the $CHCl_3$. AcOH is preferred to HCl for acidifying the EtOH used in completing differentiation. E. M. W.

Improvements in the compressed-air ultracentrifuge for biological work. A. Gratia (Compt. rend. Soc. Biol., 1937, **125**, 1057—1058).—Sedimentation is fixed by freezing the material prior to stopping the apparatus. H. G. R.

Micro-respiration vessel for moving organisms. J. Heller (Biochem. Z., 1937, **291**, 245—246).—The vessel consists of a filter tube (with sintered glass filter plate) to which are attached by means of ground joints a glass cap above and a glass extension below. The capacity is 10—15 or 80 c.c. The vessel is suitable for use with, *e.g.*, insect larvæ. W. McC.

Anaërobic ultrafiltration. P. H. Lavietes (J. Biol. Chem., 1937, **120**, 267—275).—An apparatus for anaërobic ultrafiltration of serum through Cellophane is described. There is no significant loss of CO_2, glucose, or protein, and the concn. of electrolytes in the ultrafiltrate is independent of the relative vol. of substrate and filtrate. J. N. A.

Technique for investigation and determination of trephones. L. Grimard (Compt. rend. Soc. Biol., 1937, **125**, 853—855). H. G. R.

Rapid method for protein dialysis. F. W. Bernhart, L. E. Arnow, and A. C. Bratton (Ind. Eng. Chem. [Anal.], 1937, **9**, 387—388).—350 c.c. of a solution of 35 g. of ovalbumin and 9 g. of $(NH_4)_2SO_4$ were treated for 14 hr. in a simple distillation dialyser and then for 48 hr. in an electric dialyser. It then had the conductivity of distilled H_2O and measured 600 c.c. E. H. S.

Utilisation of the fluorescence produced by sulphuric acid in the determination of bile acids in blood, fæces, and urine. M. Jenke and F. Bandow (Z. physiol. Chem., 1937, **249**, 16—23).—Blood, fæces, and urine contain substances in addition to bile acids (I) which yield fluorescent solutions in H_2SO_4 and hence intensity of fluorescence is not a measure of (I) content. The substances cannot be removed chemically. Cholic and glyco- and taurocholic acid exhibit a selective absorption band at 385·0 mμ. spectrographic examination of which enables the (I) content to be determined. Cholesterol, dihydrocholesterol, and indican interfere. W. McC.

Mercuric salts and nitrous acid in the colorimetric determination of tyrosine and tryptophan

present in solution. J. W. H. Lugg (Biochem. J., 1937, **31**, 1422—1433).—In the determination of tyrosine (I) and tryptophan (II) contents of hydrolysates of plant-leaf proteins by the method of Folin and Ciocalteu a turbidity often develops. A modified procedure for the determination of (I) is described in which (I) is first treated with Hg^{II} salts, the resulting product with HNO_2 giving a red colour. The ppt. of (II) Hg^{II} sulphate, which separates while (I) is being mercurated, is re-dissolved and treated with HNO_2 under defined conditions. The colour thus produced is suitable for the determination of (II). The course of the reactions between (I) and (II) and Hg^{II} salts and HNO_2 has been investigated and the effect of interfering substances determined. W. O. K.

Determination of cystine in finger-nail clippings with hydrolysis for one hour. M. X. Sullivan, H. W. Howard, and W. C. Hess (J. Biol. Chem., 1937, **119**, 721—724).—Hydrolysis with 15N-H_2SO_4 at 150° for 1 hr. followed by dilution and decolorisation with C gave solutions suitable for colorimetric or iodometric determination of cystine. An average val. of 9·9% was obtained in 9 pathological cases by this method as compared with 10·1% by hydrolysis for 7 hr. with 20% HCl (cf. A., II, 89). J. L. C.

Photo-electric determination of glucose in blood and urine. W. S. Hoffman (J. Biol. Chem., 1937, **120**, 51—55).—The method depends on the diminution of colour due to reduction of $Fe(CN)_6'''$. R. M. M. O.

Use of the step-photometer in the determination of phosphoglyceric acid. S. Rapoport (Biochem. Z., 1937, **291**, 429—432; cf. this vol., 133).—The method previously described is applied to the determination (error 3%) of $<0·03$ mg. of phosphoglyceric acid in organs and in yeast, a step-photometer being used. W. McC.

Comparison of methods for the determination of furfuraldehyde yield of soils and plant materials. C. N. Acharya (Proc. Soc. Biol. Chem. India, 1937, **2**, 19—20, and Biochem. J., 1937, **31**, 1800—1804).—In the presence of soil, the phloroglucinol method may be employed if $SnCl_2$ is added to reduce oxidising agents in the soil. Hydroxymethylfurfuraldehyde may be removed from the ppt. with boiling EtOH. L. D. G.

Determination of thiocyanate in tissues. B. B. Brodie and M. M. Friedman (J. Biol. Chem., 1937, **120**, 511—516).—The tissue is digested with EtOH–KOH and the digest is freed from EtOH and deproteinised by HNO_3–H_2WO_4. The filtrate is made alkaline and pigments are removed by C, CNS′ being determined colorimetrically as Fe^{III} salt in the resulting solution. With 75×10^{-6} g. of CNS′, the error is approx. 8%. F. O. H.

Determination of ethereal sulphur in serum and urine. S. Lorant and A. Herzog (Biochem. Z., 1937, **292**, 98—100; cf. this vol., 166).—The difference between the SO_4''-S vals. before and after hydrolysis (HCl) for 15 min. at 100° is the ethereal S. W. McC.

Micro-determination of chloride in biological fluids by means of solid silver iodate. I. Gasometric analysis. II. Titrimetric analysis. III. Colorimetric analysis. J. Sendroy, jun. (J. Biol. Chem., 1937, **120**, 335—403, 405—417, 419—439).—I. Solutions containing Cl′ are shaken with solid $AgIO_3$, and the sol. IO_3' so formed is determined in the solution by its oxidative reaction with alkaline N_2H_4, the evolved N_2 being measured manometrically. With 0·02 c.c. of serum, the error is 1%. No removal of proteins, either by pptn. or digestion, from urine, plasma, or serum is required, although protein-free filtrates of serum or whole blood can be used. The reactions involved in the method are discussed from the theoretical viewpoint.

II. The IO_3' formed in solution is determined volumetrically, using acidified KI and $Na_2S_2O_3$, with starch as indicator. As in the gasometric procedure, proteins need not be removed, and the accuracy and rapidity of the two methods are about the same.

III. The I liberated as above is determined colorimetrically, either as free I or as the blue complex with starch. The method is applicable to salt solutions and protein-free filtrates only. It is not as accurate nor as rapid as the above methods, but it can be used for the determination of extremely small amounts of Cl′, *e.g.*, that contained in 0·0006 mg. of NaCl. J. N. A.

Determination of iodine in biological material. C. D. Stevens (J. Lab. Clin. Med., 1937, **22**, 1074—1079).—The Fashena and Trevorrow method (A., 1936, 914) has been modified for use with 10 c.c. of blood. H. G. R.

Quantitative spectrographic analysis of biological material. II. J. S. Foster and C. A. Horton (Proc. Roy. Soc., 1937, **B**, **123**, 422—430; cf. A., 1936, 536).—A spectrographic estimation of traces of B in plants, based on the Merton wedge photometer, is described. E. M. W.

Photometric determination of iron in blood and tissues by sulphosalicylic acid. A. de Niederhäusern and E. Ferrarini (Boll. Soc. ital. Biol. sperim., 1937, **12**, 229—230).—The tissue (0·05—0·3 g.) is digested with H_2SO_4–HNO_3 (1 : 3), the digest neutralised with NaOH and then acidified with HCl, NH_4Cl, aq. NH_3, and sulphosalicylic acid are added, and the resulting colour is examined photometrically. F. O. H.

Factors affecting the determination of inorganic iron in animal tissues D. R. Borgen and C. A. Elvehjem (J. Biol. Chem., 1937, **119**, 725—734).—Vals. for ionisable Fe by the 2 : 2′-dipyridyl reagent were more uniform on homogenised than on macerated liver. Interference by flavins was avoided by the use of $Na_2S_2O_3$ or thioglycollic acid as reducing agents. Low results obtained when $Na_4P_2O_7$ is added to liver or blood are due to partial pptn. of Fe as pyrophosphate. Evidence that only about 70% of Fe in liver is in inorg. form is presented. J. L. C.