

Biblioteka Główna i OINT
Politechniki Wrocławskiej



100100161471

A 610 II
mm



NATURE, JANUARY 16, 1937

NATURE

A WEEKLY JOURNAL OF SCIENCE

*"To the solid ground
Of nature trusts the Mind that builds for aye."*—WORDSWORTH.

Volume 138

JULY 4, 1936, to DECEMBER 29, 1936



1936.479
LONDON

MACMILLAN AND CO., LTD.
NEW YORK: THE MACMILLAN COMPANY



Supplements should be collated and bound
with the numbers with which they were issued.

INDEX

NAME INDEX

- Abderhalden (Prof. E.), nominated an honorary member of the Society of Biological Chemists at Bangalore, 160; nominated an honorary member of the Sociedad Cubana de Biología, 1008
- Abell (R. H.), [C. F. Bolton and], Transmission and Distribution of Electricity, 109
- Abramowitz (A. A.), Action of Intermedin on Crustacean Melanophores and of the Crustacean Hormone on Elasmobranch Melanophores, 775
- Acharya (Dr. C. N.), Scientists and War, 469
- Adams (Dr. C. E.), Seismology in New Zealand, 397
- Adams (G. A.), Ultra-violet Absorption Spectrum of Haemoglobin, 368
- Adamson (A. M.), Environment of Marquesan Insects, 766
- Adler (E.), Prof. H. v. Euler and H. Hellström, Action of Co-enzyme as the specific Co-enzyme of Lactic Dehydrogenase from Heart Muscle, 968
- Aebersold (P. C.), [J. H. Lawrence, E. O. Lawrence and], Comparative Effects of X-Rays and Neutrons on Normal and Tumour Tissue, 943
- Ahier (G.), Christiansen Filters, 48
- Ahrens (F. B.), Herausgegeben von Prof. R. Pummerer-Erlangen, Sammlung chemischer und chemisch-technischer Vorträge (*Review*), 864
- Aikawa (Dr. H.), Japanese Diatoms, 1104
- Aiyappan (A.), South Indian Blood Groups, 888
- Akhieser (A.), L. Landau and I. Pomeranchuk, Scattering of Light by Light, 206
- Alam (Z.), Self-Sterility in *Fruca sativa* Mill, 372
- Albert (M.), [V. Lombard, C. Eichner and], Permeability of Palladium to Hydrogen, 48
- Alexejevski (N. E.), [L. W. Shubnikov and], Transition Curve for the Destruction of Supraconductivity by an Electric Current, 804
- Alfvén (Prof. H.), A Cosmic Cyclotron as a Cosmic Ray Generator?, 761
- Algar (Prof. J.), Synthesis of Diflavonols, 300
- Allan (J. M.), [Dr. H. R. Angell, A. V. Hill and], Control of Downy Mildew of Tobacco, 334
- Allan (P. B. M.), Trout Heresy (*Review*), 308
- Allen (A. H. B.), The Self in Psychology: a Study in the Foundations of Personality (*Review*), 424
- Allen (Dr. E. J.), retirement of, 235; awarded the Darwin medal of the Royal Society, 833; presented with the Darwin medal of the Royal Society; work of, 980
- Allen (M. W.), Lunar Periodicity of Earthquakes, 209
- Allen of Hurtwood (Lady), How Allotments could be made an Amenity Asset to the Community, 927
- Allfrey (M. A. A.), Air and Vapour Locks in Fuel Systems, 937
- Allibone (Dr. T. E.), D. B. McKenzie and F. R. Perry, Impulse Voltages for Transformer Testing, 937
- Alverdes (Prof. F.), Grundzüge der Vererbungslehre (*Review*), 823
- "Amator", The Way to Happiness for Humanity: a Modern Philosophy for Everyone (*Review*), 636
- Ananthakrishnan (R.), Raman Spectrum of Cyclopropane, 123; Constitution of Phosphorous Acid and the Phosphites, 803
- Andersen (Prof. E. B.), A Radioactive Isotope of Iron, 76
- Anderson (Dr. A.), [death], 430; [obituary article], 609
- Anderson (B. W.), and C. J. Payne, Liquids of High Refractive Index, 168
- Anderson (Dr. C. D.), awarded half of the Nobel prize for physics; work of, 873; and S. H. Neddermeyer, Cloud Chamber Observations of Cosmic Rays, 555
- Anderson (E. M.), Dynamics of the Formation of Conesheets, Ring-dykes, and Caldron-subsidences, 48
- Anderson (W. H.), Morphology of Coleoptera, 1019
- Andersson-Kottö (Miss I.), and Miss A. E. Gairdner, New Type of Apospory in Ferns, 471
- Andrade (Prof. E. N. da C.), The Atom. New edition (*Review*), 348; "A Treatment of Modern Physics", 465
- Andrews (P. E.), [H. G. Lambert and], Light and Sound (*Review*), 183
- Angell (Dr. H. R.), J. M. Allan and A. V. Hill, Control of Downy Mildew of Tobacco, 334
- Ankel (Dr. W. E.), Prosobranchs of the North Sea and Baltic, 1104
- Ansbacher (S.), awarded a silver medal by the American Medical Association, 160
- Antoun (H.), and F. Minaw, Simultaneous Transmission and Reception of Radio Waves, 761
- Aoki (H.), [S. Kikuchi, K. Husimi and], Experiments with Neutrons, 252; Emission of Beta-Rays from Substances Bombarded with Neutrons, 841
- Applebey (M. P.), Relations between Industry and the Profession of Chemistry, 557
- Archer (C. T.), Thermal Conductivity of Deuterium, 286
- von Ardenne (Baron M.), translated by O. S. Puckle, Television Reception (*Review*), 421
- Arend (S.), and G. C. Flammarion, Photographing Meteor Trails, 690
- Armstrong (Dr. E. F.), re-elected president of the Association of British Chemical Manufacturers, 681
- Armstrong (Prof. H. E.), [SO₂]₂, 26; Insect Coloration, 242
- Armstrong (L.), Excavation of Derbyshire Caves, 962
- Armstrong (T. F.), [Dr. J. Grainger and], Electric Heating of Garden Frames, 251
- Arndt (Dr. W.), Sponges of the North Sea and Baltic, 333
- Arnot (Dr. F. L.), A New Process of Negative Ion Formation, 162
- Arsenjew-Heil (Dr. A.), Dr. O. Heil and C. H. Westcott, Influence of Temperature on the 'Group' of Slow Neutrons, 462
- Aschaffenburg (R.), Surface Properties of Non-aqueous Solutions, 644
- Ashby (Dr. E.), Prof. F. A. E. Crew, Dr. C. D. Darlington, E. B. Ford, Prof. J. B. S. Haldane, Prof. E. J. Salisbury, Dr. W. B. Turrill and C. H. Waddington, Genetics in the Universities, 972
- Astaurov (B.), Artificial Parthenogenesis in the Silkworm (*Bombyx mori* L.), 656
- Astbury (W. T.), and others, Fibre Studies, 824
- Aston (Dr. F. W.), elected president of the Cambridge Philosophical Society, 838; Isotopic Weights by the Doublet Method, 1094
- Atkins (Dr. W. R. G.), [Dr. H. H. Poole and], Standardization of Photo-electric Cells for the Measurement of Energy, 338
- Aubert (M.), Relations between the Baeyer Tension τ and the Characteristic Raman Frequency in the case of the Cyclic Hydrocarbons, 812

- Auerbach (Dr. Charlotte), Imaginal Buds of the Appendages in *Drosophila*, 689
- Avenol (J. L. A.), conferment upon, of an honorary doctorate by Oxford University, 941
- Avsec (D.) and M. Luntz, Electro-convective Vortices, 1112
- Ayer (A. J.), Language, Truth and Logic (*Review*), 823
- Aymar (G. C.), Bird Flight (*Review*), 1037
- Babbage (Dr. D. W.), elected an official fellow of Magdalene College, Cambridge, 89
- Bacharach (A. L.), Review of Biochemistry (*Review*), 309; Chemistry of Calciferol and Vitamin D₃, 387; Dairy Science (*Review*), 625
- Bachmakoff (Dr. A.), Origins of the Russian Population, 1061
- Back (S.), [Dr. W. Clayton, R. I. Johnson, J. F. Morse and], Inhibited Deposition of Stearin from Chilled Olive Oil, 801
- Baekeland (Prof. L. H.), elected an honorary foreign fellow of the Royal Society of Edinburgh, 67
- Bagnold (R. A.), Movement of Desert Sand, 855
- Bahl (Prof. K. N.), Pheretima (the Indian Earthworm). Second edition (*Review*), 147; 1092
- Bailey (Prof. E. B.), and W. J. McCallien, Perthshire Tectonics; Schiehallion to Glen Lyon, 896
- Bailly (Jean-Sylvain), bicentenary of the birth of, 431
- Bainbridge (C. G.), History of the Commercial Production of Oxygen, 191
- Bajpai (R. R.), [G. R. Toshniwal, B. D. Pant and], Collisional Friction Frequency in the Ionosphere at Allahabad, 37
- Baker (E.), [F. M. Brewer and], Indium, 890
- Baker (F. C.), *Helisoma corpulentum* and its Relatives in Canada, 889
- Baldwin (E.), and Dr. Dorothy Moyle Needham, Phosphagen in Echinoid Muscle and in Electrical Tissue, 506
- Balfour of Burleigh (Lord), appointed a member of the Medical Research Council, 717
- Balfour (Miss Alice), [obituary article], 234
- Balfour (Dr. M. C.), awarded the silver medal of the Greek Academy of Sciences, Arts and Letters, 24
- de Balsac (H. H.), Biogéographie des Mammifères et des Oiseaux de l'Afrique du Nord, 273
- Balzam (Dr. N.), Bacterial Flora of Blow-fly Larvæ, 889
- Bamford (C. H.), [Dr. R. G. W. Norrish and], Photodecomposition of Aldehydes and Ketones, 1016
- Banerjee (S. S.), and B. N. Singh, High-Frequency Modulation of Ultra-Short Waves, 890
- Bangham (Prof. D. H.), [Dr. A. R. Tourky and], Colloidal Silica in Natural Waters and the 'Silicomolybdate' Colour Test, 587
- Banner (E. H. W.), [H. C. Turner and], Electrical Measurements in Principle and Practice (*Review*), 635
- Barach (Dr. A. L.), awarded a bronze medal by the American Medical Association, 160
- Barbot (A.), Method of extracting Aldehydes and Ketones from their Bisulphite Compounds, 855
- Barchewitz (P.), Absorption Spectra of Benzene and its Derivatives in the Near Infra-Red (6000-9500 Å.), 985; and A. Naherniac, Automatic Recording Spectrograph for the Near Infra-Red (6000-9500 Å.), 855
- Bardach (M.), [A. Besredka and], Intra-Cutaneous Immunization of Rabbits against Epithelioma inoculated in the Eye, 258
- Barker (Prof. F. D.), [death], 235
- Barker (H. A.), Fermentation of Some Diabasic C₄ Acids by *Aerobacter aerogenes*, 217
- Barker (Dr. S. G.), Research and the Jute Industry, 322; 581
- Barnard (J. E.), and F. V. Welch, Practical Photomicrography. Third edition (*Review*), 636
- Barnóthy (Dr. J.), and Dr. M. Forró, Measurements of Cosmic Ray Intensity in a Deep Mine, 325; Absence of Cosmic Rays from Nova Lacertæ, 544
- Baroni (A.), Sulphide, Selenide and Thioselenide of Thiocyanogen, 340
- Barrett (Sir James), The Hammond Organ, 297; Research and Teaching in Universities, 303; The Native School of Medicine at Suva, 320
- Barrow (Dr. E.), and others, Scientific Workers and War, 80
- Bartholomew (J.), The Oxford Advanced Atlas. Fifth edition (*Review*), 307
- Bartky (Prof. W.), Highlights of Astronomy (*Review*), 821
- Bartlett (M. S.), Intrinsic Uncertainty of Reference Frames, 401
- Barton (C. H.), Diesel Fuel Specifications, 174
- Bartram (E. B.), Mosses of Fiji, 554
- Bartsch, Molluscs and Blood Flukes, 371
- Bashford (L. A.), Prof. H. V. A. Briscoe and Dr. W. Jevons, Ultra-violet Band Systems of the Emitters GeCl and GeBr, 883
- Basset (J.), and M. Dodé, Solubility of Nitrogen in Water at Ultra-Pressures up to 4,500 kgm./cm.², 896
- Bašta (Dr. J.), Unity of Force and Matter, 83; [obituary], 832
- Bastein (Dr. P.), [Prof. Portevin and], Forgeability of Various Light and Ultra-Light Alloys, 692
- Bates (M.), [Dr. L. W. Hackett and], Swarming of the Males of Certain European Anophelines in Captivity, 506
- Bath (Dr. F.), appointed lecturer in mathematics in Edinburgh University, 1110
- Bauer (Prof. E.), and A. Raskin, Increase of Diamagnetic Susceptibility on the Death of Living Cells, 801
- Bausch (Dr. E.), awarded the American Society of Mechanical Engineers medal; work of, 963
- Bawden (F. C.), N. W. Pirie, J. D. Bernal and I. Fankuchen, Liquid Crystalline Substances from Virus-Infected Plants, 1051
- Baxter (Evelyn V.), [Leonora Jeffrey Rintoul and], A Vertebrate Fauna of Forth (*Review*), 703
- Baxter (J. S.), appointed University demonstrator in anatomy in Cambridge University, 853
- Bazzoni (Prof. C. B.), Emergy and Matter (*Review*), 862
- Beams (Prof. J. W.), [Dr. L. B. Snoddy, W. T. Ham, jun., H. Trotter, jun. and], Transmission of High-Voltage Impulses of Controllable Speed, 167
- Bean (Prof. R. B.), The Races of Man (*Review*), 862
- Bean (W. J.), Trees and Shrubs Hardy in the British Isles. Vol. 3 (*Review*), 346
- Bebeshin (K.), [I. Smorodincev and], Glycogen Content of Ascarids, 561
- Beck (H. C.), [Prof. C. G. Seligman, Dr. P. D. Ritchie and], Early Chinese Glass from Pre-Han to T'ang Times, 721
- Bedel (C.), Minimum Temperature of Oxidation of Silicon, 519
- de Beer (Dr. G. R.), Molecules and Morphogenesis (*Review*), 863
- Běhouněk (O.), [Dr. F. Schacherl and], Dissociation Pressure of Copper Sulphate Pentadeuterate, 406
- Bell (D. J.), Length of Saccharide Chains in Glycogens from Different Sources, 289
- Bell (Dr. Julia), and Prof. J. B. S. Haldane, Linkage in Man, 759
- Bellamy (A. W.), Inter-Specific Hybrids in *Platyptæcilus*: One Species ZZ-WZ; the other XY-XX, 943
- Bellamy (Miss Ethel F.), Catalogue of Earthquake Epicentres, 766
- Belorizky (D.), Peculiarities of Nova Lacertæ, 1936, 560
- Benedict (F. G.), and J. M. Bruhn, Chimpanzee Metabolism, 415; and R. C. Lee, Body Temperatures of Elephants, 415
- Bennet-Clark (Dr. T. A.), resignation from Manchester University, 772
- Benson (Prof. Margaret), [obituary article], 17
- Bentsáth (A.), St. Ruzsnyák and Prof. A. Szent-Györgyi, Vitamin Nature of Flavones, 798
- Bergel (F.), and A. R. Todd, The Structure of Aneurin and Thiochrome, 76; 119; 406
- von Bergmann (Ernst), centenary of the birth of; work of, 1003
- Bernal (J. D.), [F. C. Bawden, N. W. Pirie, I. Fankuchen and], Liquid Crystalline Substances from Virus-Infected Plants, 1051

- Berry (Dr. G.), Apparent Transformation of One Virus into Another, 208
- Berry (H.), Modern Perfumes and Essences (*Review*), 949
- Bertrand (G.), and L. de Saint-Rat, A New Colour Reaction of Copper with Urobilin, 414
- Besredka (A.), and M. Bardach, Intra-Cutaneous Immunization of Rabbits against Epithelioma inoculated in the Eye, 258
- Bewley (Dr. W. F.), Science and the Glasshouse Industry, 556
- Beynon (J. H.), Prof. I. M. Heilbron and Dr. F. S. Spring, A Novel Interrelationship in the Triterpene Group, 1017
- Bhabha (H. J.), and Dr. W. Heitler, Passage of Fast Electrons through Matter, 401
- Bhagavantam (S.), Vibrations of the Ethylene Molecule, 1096
- Bhar (J. N.), [Dr. H. Rakshit and], Some Observations on the *C* Regions of the Ionosphere, 283
- Bhattacharya (D. K.), [Prof. K. Prosad and], Excitation of Raman Spectra of Substances with the Aid of 'Optical Catalysts', 510
- Biasotti (A.), V. Deulofeu and J. R. Mendive, Hypoglycaemic Action of Histone Insulinate, 1101
- Bijl (A.), Thermal Properties of Helium, Hydrogen and Deuterium, 723; [Prof. A. Michels, C. Michels-Veraart and], Indication of a Decrease in the Polarizability of a Non-Polar Molecule by Pressure, 509
- Billham (E. G.), British Thunderstorms, 851
- Billimoria (M. C.), [Dr. W. H. Pearsall and], Nitrogen Losses in Green Plants, 801
- Bingham (A. E.), Microscope in Engineering and Industry, 715
- Bingham (R. W.), conferment upon, of an honorary doctorate by Oxford University, 941
- Birch (Dr. T. W.), and Dr. L. W. Mapson, Role of Adenylic Acid in Vitamin B₁ Deficiency, 27
- Birkhoff (Prof. G. D.), conferment upon, of an honorary doctorate by Paris University, 941
- Bjerge (Dr. T.), Radio-Helium, 400; and Dr. K. J. Broström, β -Ray Spectrum of Radio-Helium, 400
- Bjerknes (Prof. V.), World Weather (*Review*), 781
- Bjerrum (Prof. N.), translated by R. P. Bell, Inorganic Chemistry (*Review*), 626
- Blackett (Prof. P. M. S.), La radiation cosmique. 4 parts (*Review*), 100
- Blackwelder (R. E.), Morphology of Coleoptera, 1019
- Blain (Sir Herbert), Improvement of Roads, 198
- Blair (Dr. G. W. Scott), and D. Morland, Practical Tests for Ling Honey, 770
- Blakeway (A.), [death], 678; [obituary article], 751
- Bland-Sutton, Bt. (Sir John), [death], 1088
- Bleksley (A. E. H.), The Cepheid Variables and Black-Body Radiation, 286
- Blenheim (W. J.), [death], 791
- Bleriot (L.), [death], 235
- Blockson (Dr. B. H.), awarded a gold medal by the American Medical Association, 160
- Bloom (J. H.), and R. R. James, Medical Practitioners in the Diocese of London licensed under the Act of 3 Henry VIII, C. II; an Annotated List, 1529-1725 (*Review*), 142
- Boas (G.), [A. O. Lovejoy and], with supplementary essays by W. F. Albright and P. E. Dumont, A Documentary History of Primitivism and Related Ideas. Vol. I (*Review*), 187
- Bode (Frances D.), [C. D. Stock and], Early Man in New Mexico, 208
- Bodenstein (Prof. M.), awarded the Bunsen medal of the German Bunsen Society, 282
- Boerlage (G. D.), J. J. Broeze, L. J. Le Mesurier and R. Stansfield, Correlation of Tests on the Ignition Quality of Diesel Fuels, 174
- Bohane (Dr. E.), impending retirement from the directorship of the Royal Dublin Society, 838
- Böhm (Dr. A.), Pacific Dinoflagellates, 935
- Bohr (Prof. N.), Conservation Laws in Quantum Theory, 25; Properties and Constitution of Atomic Nuclei, 695
- Boivin (A.), [G. Ramon, R. Richou and], Flocculating and Immunizing Properties of Anatoxins purified by Precipitation with Trichloroacetic Acid, 774
- Bolliger (A.), Reaction of Creatinine with 1,3,5-Trinitrobenzol, 2,4,6-Trinitrotoluol, and 2,4,6-Trinitrobenzoic Acid, 813
- Bollman (V. L.), [J. W. M. Du Mond and], X-Ray Method for Determining Electronic Charge, 767
- Bolton (C. F.), and R. H. Abell, Transmission and Distribution of Electricity, 109
- Bömer (Prof. A.), [death], 791
- Bompiani (Prof. E.), Manifolds of Plenary Space (*Review*), 343
- Bond (C. J.), Fasciation in Plants, 554
- Bond (J.), Birds of Bay Islands, Spanish Honduras, 725
- Bond (T. E. T.), Fungi and Graft Unions, 40
- Bondy (H.), and V. Vanicek, Relative Abundance of Potassium and Lithium Isotopes and the Emission of Alkali Ions from Glass Melts, 49
- Bone (Prof. W. A.), retirement of; work of, 18; awarded the Davy medal of the Royal Society, 833; presented with the Davy medal of the Royal Society; work of, 980; title of emeritus professor conferred upon, by London University, 1110; and L. E. Outridge, Some Influences of Dilution on the Explosive Combustion of Hydrocarbons, 942; and Dr. G. W. Himus, Coal: its Constituents and Uses; with a supplementary chapter upon Fuel Economy and Heat Transmission in Industrial Furnaces by Dr. R. J. Sarjant (*Review*), 991
- Bonner (J.), Plant Tissue Cultures from a Hormone Point of View, 415
- Booker (Dr. H. G.), appointed assistant lecturer in mathematics in Cambridge University, 518
- Boone (L.), Crustacea: Anomura, Macrura, Euphausiacea, Isopoda, Amphipoda and Echinodermata: Asteroidea and Echinoidea (*Review*), 385
- Booth (E. T.), and C. Hurst, Nuclear Reactions due to Neutrons of 2 m.e.v. Energy, 367; Scattering of Neutrons by Protons, 1011
- Boring (E. G.), and S. S. Stevens, Nature of Tonal Brightness, 775
- Borissiak (A.), Prof. A. P. Karpinsky, 495
- Born (Dr. M.), resignation of lectureship in mathematics in Cambridge University, 518
- Bosanquet (Dr. L. S.), title of reader conferred upon, by London University, 940
- Bose (Utsab Kumar), A new kind of Ring Phenomenon in Sputtered Metallic Films, 684
- Bossuet (R.), Search for the Alkaline Metals in Natural Waters, 339
- Bottazzi (M.), elected an associate of the Royal Academy of Belgium, 502
- Bouillenne (R.), awarded the Laurent prize of the Royal Academy of Belgium, 240
- Boule (M.), forthcoming retirement and presentation by friends and pupils, 196
- Boulton (N. S.), appointed lecturer in civil engineering in Sheffield University, 136
- Bouma (P. J.), Visual Acuity and Speed of Vision in Road Lighting, 1103
- Bowen (N. L.), and J. F. Schairer, System Albite-Fayalite, 378
- Bower (Prof. F. O.), gift to Glasgow University, 731
- Bower (S. Morris), and others, Survey of Thunderstorms in the British Islands. Fourth Annual Report, 1934. Vol. 2, Part I, 851
- Bowers (C. G.), Rhododendrons and Azaleas: their Origins, Cultivation and Development (*Review*), 632
- Bowley (Prof. A. L.), proposed tribute to, 107; conferment upon, of the title of emeritus professor by London University, 772
- Bowman (Prof. A. A.), [obituary article], 16
- Boyd (A. W.), Swallows in Britain, 553
- Boyd (J. D.), Wilhelm von Waldeyer, 761
- Boyd (J. P.), Civilization since James Watt, 916
- Boylston (Prof. H. M.), An Introduction to the Metallurgy of Iron and Steel. Second edition (*Review*), 1032

- Boys (Sir Charles), elected an honorary fellow of the Royal Society of Edinburgh, 67
- Brachet (J.), awarded the Van Beneden prize of the Royal Academy of Belgium, 240
- Bragg (Sir William), re-elected president of the Royal Society, 833; Progress in the Technique of Crystal Analysis, 953
- Bragg (Prof. W. L.), Structure-Factor Graphs for Crystal Analysis, 362
- von Braunmühl (Dr. H. J.), und W. Weber, Einführung in die angewandte Akustik (*Review*), 310
- Brazier (C. E.), Comparison of Pyrheliometers, 1027
- Brebner (J. H.), Progress of the Post Office, 731
- Breder, jun. (C. M.), Fishes from the *Pawnee* Second Oceanographic Expedition, 170; Reproductive Habits of the North American Sunfishes, 470
- Breguet (L.), Possibilities of Speed and Radius of Action of Gyroplanes, 48
- Brein (Prof. F.), [death], 356
- Brend (Dr. W. A.), Sacrifice to Attis: a Study of Sex and Civilization (*Review*), 952
- Brett (R. G.), [Prof. A. L. McAulay, F. D. Cruickshank and], Chromosome Number of *Eucalyptus Globulus* and *Eucalyptus Johnstoni*, 550
- Brewer (F. M.), and E. Baker, Indium, 890
- Brigden (W. W.), elected Marmaduke Sheild scholar in anatomy in Cambridge University, 89
- Briggs (Prof. E. A.), The Red Blood Corpuscles of Primitive Mammals, 762
- Briggs (G. E.), recommended for appointment as reader in plant physiology in Cambridge University, 1067
- Brightman (R.), General Smuts (*Review*), 569
- Brindley (Dr. G. W.), Asymmetry in Metallic Zinc and Cadmium, 290
- Briscoe (Prof. H. V. A.), [L. A. Bashford, Dr. W. Jevons and], Ultra-Violet Band Systems of the Emitters GeCl and GeBr, 883
- Briton-Jones (Prof. H. R.), [death], 832; [obituary article], 913
- Brittain (F. H.), Appraisal of Loudspeakers, 1021
- Britton (S. E.), Rural Electrification in Great Britain, 500
- Brock (J. F.), appointed assistant director of research in medicine in Cambridge University, 853
- Brock (Dr. W.), An Introduction to Contemporary German Philosophy (*Review*), 269
- Brongersma (Dr. L. D.), Systematists and Text-Books, 280
- Bronson (Prof. H. L.), and colleagues, Specific Heats of Metals, 1105
- Brønsted (J. N.), Relation between Heat and Work, 774
- Brooks (late C. C.), and J. M. B. Brown, Pine Shoot Moth, 888
- Brooks (G.), Fluorescence of the Skin of the Frog, *Rana esculenta*, 179
- Brooks (Prof. F. T.), Plant Pathology in the Tropics (*Review*), 661
- Brooks (R. L.), Forests and Forestry in Trinidad and Tobago, 926
- Broom (Dr. R.), New Fossil Anthropoid Skull from South Africa, 356; 486; 498; The Dentition of *Australopithecus*, 719
- Brose (Dr. H. L.), and E. B. Jones, Colorimetric Estimation of Phosphorus, 644; An Effect of X-Radiation on the Blood, 687
- Broström (Dr. K. J.), [Dr. T. Bjerger and], β -Ray Spectrum of Radio-Helium, 400
- Brown (A.), appointed full-time assistant in physiology in Edinburgh University, 1110
- Brown (C. A. Cameron), Refrigeration for the Farm and Dairy, 649
- Brown (F. G. W.), Mathematics for Technical Students. 2 parts (*Review*), 864
- Brown (Dr. J. Coggin), India's Mineral Wealth (*Review*), 621
- Brown (J. M. B.), [late C. C. Brooks and], Pine Shoot Moth, 888
- Brown (late Dr. N. E.), New Genus of *Mesembryanthemum*, 726
- Brown (Dr. P.), American Martyrs to Science through the Roentgen Rays (*Review*), 634
- Brown (R. H. J.), [W. C. Fahie and], The Beams Ultracentrifuge, 207; Effect of Large Centrifugal Forces on *Paramecium*, 843
- Brown (Dr. W.), appointed director of the Institute of Experimental Psychology, Oxford, 14
- Bruckner (V.), and Prof. A. Szent-Györgyi, Chemical Nature of Citrin, 1057
- Bruhats (G.), and P. Guénard, Circular Dichroism of Solutions of Camphor in Organic Solvents, 896
- Brühl, Count of, John Maurice, bicentenary of the birth of; work of, 1045
- Bruhn (J. M.), [F. G. Benedict and], Chimpanzee Metabolism, 415
- Bruins (E. M.), [J. Clay, J. T. Wiersma and], A Temporary Excess of Ten Per Cent in Cosmic Radiation, 812
- Brun (E.), Friction of a Solid Moving in Water, 1111
- Brunet (P.), et A. Mieli, Histoire des Sciences: Antiquité (*Review*), 630
- Brunowsky (B.), [K. Kunasheva and], Radioactive Elements in Plants, 726
- Bryant (D. M.), [A. D. Buchanan Smith, O. J. Robison and], Genetics of the Pig, 878
- Bryson (H. C.), The Gramophone Record (*Review*), 637
- Buchanan (Sir George), [death], 678; [obituary article], 832
- Buchner (Prof. P.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Buck (Prof. P. H.), (Te Rangi Hiroa), awarded the Rivers memorial medal of the Royal Anthropological Institute, 72; Physical Characters of the Cook Islanders, 725
- Buckingham (R. A.), [Dr. H. S. W. Massey and], Determination of Van der Waals Forces, 77
- Buddington (A. F.), and E. Callaghan, Diorites of the Cascade Range, Oregon, 513
- Buller (Prof. A. H. R.), Researches on Fungi. Vol. 6 (*Review*), 1033
- Burchell (J. P. T.), An Early Magdalenian 'Raclette' Industry in the Lower Thames Valley, 79
- Burhop (E. H. S.), R. D. Hill and A. A. Townsend, Selective Absorption of Neutrons in Silver, 1094
- Burkenroad (M. D.), Morphology and Distribution of Penæids, 371
- Burks (B. D.), Nearctic Dirhinini and Epitranini (Hymenoptera, Chalcididae), 91
- Burnet (Dr. E.), nominated director of the Pasteur Institute at Tunis, 615
- Burrows (C. R.), Existence of a Surface Wave in Radio Propagation, 284
- Burrows (E.), Ethnology of Futuna, 647
- Burrows (G. J.), and A. Lench, Derivatives of Zinc Halides with Tertiary Arsines; Co-ordination Compounds of Cadmium with Tertiary Arsines, 813
- Burrows (H.), A Protective Action of Progesterone on the Genital Organs of Male Mice, 164
- Burstall (Prof. A. F.), elected professor of engineering and dean of the faculty of engineering in Melbourne University; work of, 1003
- Burt (E. T.), awarded a Frank Smart zoology prize of Cambridge University, 89
- Butenandt (Prof. A.), appointed director of the Kaiser Wilhelm Institute of Biochemistry at Berlin-Dahlem; awarded the Rinecker gold medal of Würzburg University, 838
- Butler (Dr. N. Murray), Decline and Fall of Morals, 559
- Butler (W. J. E.), awarded the Sir George Jessel studentship in mathematics of London University, 177
- Butler (Sir William Waters), gift to Birmingham University, 156
- Buxton (C. R.), The Alternative to War: a Programme for Statesmen (*Review*), 1072
- Buxton (Prof. J. B.), appointed acting principal and acting dean of the Royal Veterinary College, and successor to Sir Frederick Hobday, 282
- de Buy (H. G.), Change in the Response of Oat Coleoptiles to Growth Regulators produced by Aging, 91
- Byerly (P.), and J. T. Wilson, Recent Earthquakes in California, 936
- Byng (E. S.), Administration as a Definite Profession, 653
- Bywaters (E. G. L.), Metabolism of Cartilage, 30; 288

- Calder (W. A. S.), The Chemist as World Citizen, 173
 Caldwell (Dr. J.), Formation of Local Lesions by Tobacco Mosaic Virus, 83; The Agent of Virus Disease in Plants, 1065
 Calkins (Prof. G. N.), The Smallest Living Things (*Review*) 862
 Callaghan (E.), [A. F. Buddington and], Diorites of the Cascade Range, Oregon, 513
 Callendar (Dr. L. H.), Oxide Layer on a Polished Surface, 291
 Callenfels (Dr. P. V. van Stein), Melanesian Civilization of Eastern Asia, 876
 Calman (Dr. W. T.), Centenary of Darwin's Visit to the Galapagos Islands: Issue of Commemorative Stamps by Ecuador, 15; Memoirs on Systematic Zoology (*Review*), 98; Dr. H. J. Hansen, 193; impending retirement of; work of, 792; Marine Boring Animals Injurious to Submerged Structures. Second edition, revised by G. I. Crawford, 1050
 Camichel (H.), Spectrum of Nova Lacertæ observed with the Large Telescope at Meudon, 1112
 Campbell (Prof. C. M.), Destiny and Disease in Mental Disorders: with Special Reference to the Schizophrenic Psychoses (*Review*), 386
 Campbell (H. L.), [H. C. Sherman and], Regularity of Nutritional Response to Chemical Intake, 775
 Campbell (Dr. N. R.), Nature and Purpose of Science (*Review*), 381; and R. S. Rivlin, Effect of Hydrogen on Photo-electric Cells, 1063
 Campbell (R. T.), awarded the Theodore Williams scholarship in physiology in Oxford University, 853
 Campbell (W. P.), awarded the Squibb fellowship at Harvard University, 1093
 Campbell-Renton (M. L.), [G. Dreyer and], Bactericidal Action of Radiation, 648
 Canals (E.), and P. Peyrot, Fluorescence of Some Pure Substances, 1026
 Cannon (Prof. H. G.), A Method of Illustration for Zoological Papers (*Review*), 485
 Capatos (L.), and N. Perakis, Magnetic Study of the Mixed Crystals of Divalent Copper and Silver, 48
 Carey (A. D.), [death], 17
 Carlgren (Prof. O.), New Work on Cœlenterates, 371
 Carpéni (G.), Dissociation Constants of Reductinic Acid and its Product of Oxidation by Iodine, 1112
 Carpenter (Prof. G. D. Hale), Charles Darwin and Entomology, 88; Insect Coloration, 243; Natural Selection, 686, 1017
 Carrison (G.), [F. Chodat and], Effect of Sodium Monoiodoacetate on the Respiration of the Yellow *Staphylococcus*, 985
 Carroll (Prof. J. A.), The Total Solar Eclipse of June 19, 1936: Observations at Omsk, 349
 Carr-Saunders (Prof. A. M.), Need for Centralization of Information on Economic and Social Surveys, 597; World Population: Past Growth and Present Trends (*Review*), 817
 Cartwright and Findlay, Principal Rots of English Oak, 409
 Cash (Prof. J. T.), [death], 960; [obituary article], 1087
 Castle (E. S.), Model Imitating the Origin of Spiral Wall Structure in Certain Plant Cells, 378
 Catcheside (Dr. D. G.), Trisomic Mutations of *Oenothera lamarckiana*, 690
 Cattell (Prof. McKeen), Physiological Effects of Pressure, 1019
 Cauchois (Mlle. Yvette), Observation and Measurement of the *L_α* Satellites for the Elements 72, 73, 75, 83, 90 and 92, 216
 Caullery (Prof. M.), Les conceptions modernes de l'hérédité (*Review*), 633
 Cavenagh (Prof. F. A.), appointed professor of education at King's College, London, 941
 Cawston (F. G.), *Opuntia* used as a Larvicide, 179
 Cayeux (L.), Coproliths of the North African Phosphates, 476
 Cazamian (Prof. L.), A Function of the University, 303
 Centnerszwer (M.), and J. Szper, Electrolysis of Some Salts in Anhydrous Glycerol, 733
 Cernuschi (F.), Conservation of Energy and Shankland's Experiment, 896
 Chablay (A.), [H. Gault and], Action of Organic Acids on Esters, 855
 Chabrolin (C.), Germination of the Seeds of the Orobanche Bean (*Orobanche speciosa*), 414
 Chalonge (D.), Remarkable Variation in the Spectrum of γ-Cassiopeia, 560
 Chamberlain (Sir Austen), Work of the London School of Hygiene and Tropical Medicine, 877
 Chambers (E. G.), [E. Farmer and], Proficiency and Psychological Tests, 725
 Chambers (Dr. L. A.), Effects produced by Ultra-sonic Vibrations, 1091
 Champenowne (D. G.), awarded the Adam Smith prize of Cambridge University, 1110
 Champneys (Sir Weldon Dalrymple), Modern Views on Infection and Disinfection (Chadwick lecture), 1046
 Chandler (Charles Frederick), centenary of the birth of, 961
 Chaplin (C. J.), and E. H. Nevard, Strength Tests of Structural Timbers, 129
 Chapman (F.), The Species Nightmare: an Absorbing Scientific Problem, 539; and W. J. Parr, Suggested Classification of the Foraminifera, 520
 Chapman (Lucie, Wendell and), The Little Wolf: a Story of the Coyote of the Rocky Mountains (*Review*), 1079
 Chapman (Prof. S.), elected a member of the Kaiserlich Deutsche Akademie der Naturforscher, Halle, 756; The Earth's Magnetism (*Review*), 1079
 Chapman (Wendell and Lucie), The Little Wolf: a Story of the Coyote of the Rocky Mountains (*Review*), 1079
 Chapman (Dr. V. J.), appointed assistant lecturer in botany in Manchester University, 772; elected an unofficial Drosier fellow of Gonville and Caius College, Cambridge, 853
 Chapple (H. J. B.), Popular Television (*Review*), 421
 Charcot (Dr. J. B. E. A.), [death], 537; [obituary article], 608
 Charlesworth (Prof. J. Kaye), Geomorphology of the Irish Sea Basin, 1040
 Chatley (Dr. H.), Measurement of River Bores, 207
 Chattopadhyay (K. P.), Social Origins in India, 408
 Chaytor (A. H.), Letters to a Salmon Fisher's Sons. Fourth edition (*Review*), 308
 Chedin (J.), and Mme. Jeanne Cieutat Pradier, Raman Effect and Molecular Structure of Nitric Anhydride, 855
 Cheftel (H.), and Marie-Louise Pigeaud, Estimation of Ascorbic Acid (Vitamin C) by Titration, 799
 Chen (Tze-Tuan), Mitosis in Opalinids (Protozoa, Ciliata), 1 and 2, 1070
 Chesterman (D. R.), and C. L. Foster, Creeping Movements of *Spirogyra*, 403
 Cheymol (J.), Structure of Verbenalloside, 897
 Cheynier (Dr. A.), Jouannet: Grand-père de la Préhistoire (*Review*), 823
 Chia (L. P.), Peking Man: Further Discoveries, 1004
 Childe (Prof. V. G.), Man and Forest in Prehistoric Europe (*Review*), 95; Man Makes Himself (*Review*), 699
 Childs (Dr. W. H. J.), and Dr. H. A. Jahn, Absorption Spectrum of Heavy Methane (CH₃D) in the Photographic Infra-Red, 285
 Chodat (F.), and G. Carrisson, Effect of Sodium Monoiodoacetate on the Respiration of the Yellow *Staphylococcus*, 985
 Cholodny (Prof. N. G.), Growth Hormones and Development of Plants, 586
 Chrétien (A.) and G. Varga, Manganese Trichloride, 334
 Churcher (B. G.) and A. J. King, Measurements of Noise, 329
 Clarendon (Earl of), Science in South Africa, 713
 Clark (Prof. A. J.), and others, Chemical and Physical Basis of Pharmacological Action, 938
 Clark (Anna-Betty), [C. P. Winsor and], Dark Adaptation after varying degrees of Light Adaptation, 415
 Clark (Dr. C. H. Douglas), Optical Polarization Ellipsoids of the Halogen Halide Gases, 126; and Dr. E. C. Humphries, Kerr Constants of the Hydrogen Halide Gases, 248

- Clark (C. H. W.), Overhead Line Insulators, 1048
 Clark (F. H.), Linkage Relations of Hydrocephalus (*hy*₁) in the House Mouse, *Mus musculus*, 775
 Clark (G.), appointed junior assistant bacteriologist in Sheffield University, 1067
 Clark (H.), Brittle Stars from Puerto Rica, 371
 Clark (Dr. J. G. D.), The Mesolithic Settlement of Northern Europe: a Study of the Food-gathering Peoples of Northern Europe during the Early Post-Glacial Period (*Review*), 95; Arminghall Timber Monument, 470
 Claude (G.), Presence of Gold in Sea-water, 138
 Clay (J.), E. M. Bruins and J. T. Wiersma, A Temporary Excess of Ten per cent in Cosmic Radiation, 812
 Clayton (Dr. W.), The Theory of Emulsions and their Technical Treatment. Third edition (*Review*), 702; S. Back, R. I. Johnson and J. F. Morse, Inhibited Deposition of Stearin from Chilled Olive Oil, 801
 Cleaves (H. E.), and J. G. Thompson, The Metal—Iron (*Review*), 96
 Cleghorn (Prof. R. A.), and G. A. McVicar, High Potassium Diet and the Survival of Adrenalectomized Rats, 124
 Clements (Prof. R. G. H.), The Science of Highway Engineering (*Review*), 951
 Clow (Dr. A.), and J. M. C. Thompson, Resonance Structures of Carbon Dioxide, Carbonyl Sulphide and Carbon Disulphide, 802
 Coblentz (W. W.), and R. Stair, Solar Temperature, 690
 Cochran (Dr. W.), Kikuchi Lines from Etched Copper Crystal, 202
 Cockcroft (Dr. J. D.), High Velocity Positive Ions (Mackenzie Davidson memorial lecture), 1025
 Cockerell (Prof. T. D. A.), The 'Road Runner' of North America, 166; African Honey Bees, 249
 Cockett (A. H.), [Prof. Allan Ferguson and], Specific Heat of a Liquid at Different Temperatures, 842
 Cohn (Dr. W. M.), Continuous Spectra of certain types of Stars and Nebulae, 127
 Coker (Prof. E. G.), awarded the Rumford medal of the Royal Society, 833; presented with the Rumford medal of the Royal Society; work of, 979
 Colbrie (E. F.), Nuclear Disintegration by a Radium B + C Source (2), 49
 Collet (Prof. L. W.), The Structure of the Alps. Second edition (*Review*), 8
 Collie (C. H.), and J. H. E. Griffiths, Experiments with Neutrons, 252
 Colwell (Prof. R. C.), A. W. Friend, N. I. Hall and L. R. Hill, The Lower Regions of the Ionosphere, 245; Velocity of Radio Waves, 978
 Compton (Prof. A. H.), The Freedom of Man (Terry lectures), (*Review*), 6
 Conant (President J. B.), conferment upon, of an honorary doctorate by Oxford University, 772
 Condon (Prof. E. U.), and Dr. G. H. Shortley, The Theory of Atomic Spectra (*Review*), 525
 Conigrave (C. P.), North Australia (*Review*), 1074
 Coningham (Capt. H. J.), [death], 914
 Conn (G. K. T.), [Dr. G. B. B. M. Sutherland and], Infra-red Absorption Spectrum of Heavy Phosphine (PD₃), 641
 Connell (Dr. H. C.), Clinical Results of 'Ensol' Therapy, 888
 Connolly (Prof. C. J.), Origins of Speech and the Orang-utan, 977
 Connor (R.), and J. H. Van Campen, A Reagent for Structure Determination, 372
 Constable (J. E. R.), Sound Insulation by Double Partitions, 890
 Conway of Allington (Lord), A Pilgrim's Quest for the Divine (*Review*), 310
 Cook (E. M.), [F. Watson, jun. and], Accuracy of Observations by Inexperienced Meteor Observers, 514
 Cook (Prof. G.), appointed regius professor of civil engineering in Glasgow University, 46
 Cook (Prof. J. W.), awarded a prize by the International Union against Cancer for cancer research, 579
 Cook (R. P.), [Dr. J. Needham, W. W. Nowinski, K. C. Dixon and], Mechanism of Carbohydrate Breakdown in Early Embryonic Development, 462
 Coolidge, jun. (H. J.), Distribution of Coast Gorilla, 1019
 Cooper (Joyce M.), [H. Finnemore and], Cyanogenetic Glucosides in Australian Plants (4), 260
 Cooper (K. W.), A Hatching Secretion in *Rana pipiens* Schreber, 415
 Copisarow (Dr. M.), Colloid Substrate in Photosynthesis, 509
 Coppock (R.), appointed a member of the Industrial Health Research Board of the Medical Research Council, 199
 Cork (J. M.), and E. O. Lawrence, Transmutation of Platinum by Deuterons, 130
 Corlett (Prof. W. T.), The Medicine-Man of the American Indian and his Cultural Background (*Review*), 268
 Cormack (Prof. B. G.), [death], 356
 Cornish (Dr. Vaughan), Preservation of English Scenery, 538
 Costantin (J.), Production of Wheat in Peru in 1932 and 1934, 812
 Cosyns (M. G. E.), Specific Ionization of Cosmic Radiation, 284
 Cott (Dr. H. B.), appointed lecturer in zoology in Glasgow University, 46
 Couder (A.), [A. Danjon et], Lunettes et télescopes: théorie, conditions d'emploi, description, réglage (*Review*), 738
 Coulborn (Dr. R.), Research in Universities, 304
 Coulson (Dr. A. L.), Patwar Meteoric Shower of 29th July, 1935, 513
 la Cour (Dr. D.), elected president of the International Union for Geodesy and Geophysics, 650
 Coursey (P. R.), Lightning and Atmospherics, 509
 Cowdrey (W. A.), Dr. E. D. Hughes and Prof. C. K. Ingold, Reaction Kinetics and the Walden Inversion, 759
 Cowper-Coles (Sherard O.), [obituary article], 712
 Cramp (Prof. W.), The Engineer and the Nation, 453; 574; High Court Procedure and the Cost of Patent Actions, 737
 Crampton (Prof. H. E.), The Coming and Evolution of Life (*Review*), 862
 Crane (M. B.), Immunity of Apples to Woolly Aphis, 513
 Crawford-Jones (Lt.-Col. C.), Mycoses of Man and other Mammals (*Review*), 185
 Creel (Dr. H. G.), The Birth of China: a Survey of the Formative Period of Chinese Civilization (*Review*), 565
 Creighton (Prof. H. J.), Principles and Applications of Electrochemistry. In 2 vols. Vol. 1: Principles. Third edition (*Review*), 144
 Crerar (Hon. T. A.), Hydro-electric Progress in Canada in 1935: Water Power Resources of Canada and Hydro-electric Progress in 1935, 12
 Crew (Prof. F. A. E.), White Rats and Lamarckism, 689; and P. C. Koller, Genetical and Cytological Studies of the Intergeneric Hybrid of *Cairina moschata* and *Anas platyrhynchos platyrhynchos*, 178; [Dr. E. Ashby, Dr. C. D. Darlington, E. B. Ford, Prof. J. B. S. Haldane, Prof. E. J. Salisbury, Dr. W. B. Turrill, C. H. Waddington and], Genetics in the Universities, 972
 Crommelin (Dr. A. C. D.), Identity of Comets 1818 I, 1873 VII, 1928 III, 1105
 Croneis (C.), and W. C. Krumbein, Down to Earth: an Introduction to Geology (*Review*), 527
 Cronshaw (C. J. T.), Benign Gifts of Organic Chemistry, 557
 Crookall (R.), [F. B. A. Welch and], Bristol and Gloucester District (*Review*), 389
 Crosthwaite (Col. H. L.), Revision of Ordnance Plans from Air Photographs, 101
 Crozier (Prof. W. J.), Déterminisme et variabilité dans le comportement des organismes (*Review*), 99; Sensory Discrimination of Intensities, 415; [M. Upton and], Auditory Intensity Discrimination, 415
 Cruickshank (F. D.), [Prof. A. L. McAulay, R. G. Brett and], Chromosome Number of *Eucalyptus globulus* and *Eucalyptus Johnstoni*, 550
 Cuénot (Prof. L.), L'Espèce (*Review*), 742
 Cunningham (Dr. B.), Canadian Water Power Developments during 1935, 10; Deterioration of Structures in Sea Water, 148

- Cunnington (A.), Public Lighting, 715
 Curie (M.), Phosphorescent Glass, 1026
 Curtis (Prof. W. E.), Dr. F. Dickens and S. F. Evans, The 'Specific Action' of Ultra-short Wireless Waves, 63; 1100
 Cuthill (Dr. R.), Sorptive Properties of the Silk Fibre, 175
 Cutler (Prof. I. E.), [death], 17
 Cuykendall (T. R.), and M. T. Jones, Absorption of Short X-Rays, 513
- Dakin (A. N.), elected Lady Wallis Budge fellow in Egyptology at University College, Oxford, 693
 Dalby (Prof. W. E.), [death], 17; [obituary article], 65
 Dale (Sir Henry), elected an honorary fellow of the Royal Society of Edinburgh, 67; Training of Chemists for work in Biochemistry and Medicine, 557; awarded half of the Nobel prize for medicine for 1936; work of, 792
 Dampier (Sir William Cecil), presented with the gold medal and made an honorary member of the Royal Agricultural Society, 1050
 Dangeard (L.), Study of the Oolitic Limestones by Staining and Decalcification, 49
 Danjon (A.), et A. Couder, Lunettes et télescopes : théorie conditions d'emploi, description, réglage (*Review*), 738
 Dänzer (Dr. H.), Grundlagen der Quantenmechanik (*Review*), 269
 Dark (S. T. E.), Feeding Habits of Stick Insects, 1058
 Darlington (Dr. C. D.), The External Forces acting on Chromosomes, 366; and H. C. Osterstock, Projection Method for Demonstration of Chromosomes *in situ*, 79; [Dr. E. Ashby, Prof. F. A. E. Crew, E. B. Ford, Prof. J. B. S. Haldane, Prof. E. J. Salisbury, Dr. W. B. Turrill, C. H. Waddington and], Genetics in the Universities, 972
 D'Arrigo (A.), Ricerche sul Regime dei Litorali nel Mediterraneo, 558
 Darwin (Prof. C. G.), Terminology in Physics, 908
 Das (M. M.), Experimental Electricity (*Review*), 183
 Dasannacharya (Prof. B.), and G. S. Rao, Steady Performance of Geiger-Müller Counters, 289
 David (late Sir T. W. Edgeworth), and Dr. R. J. Tillyard, Memoir on Fossils of the Late Pre-Cambrian (Newer Proterozoic) from the Adelaide Series, South Australia (*Review*), 994
 David (Prof. W. T.), Gaseous Combustion, 930
 Davidson (C. F.), [F. Walker and], Geology of the Faeroes, 178
 Davidson (G. F.), Molecular Structure of Cellulose, 175
 Davidson (Rev. M.), The Heavens and Faith (*Review*), 227; Computation of the Real Paths of Meteors, 514
 Davies (Cadet John Burton), awarded the Howard prize of the Royal Meteorological Society, 24
 Davies (Lord), Anarchy or Peace, 321; Nearing the Abyss: The Lesson of Ethiopia (*Review*), 1072
 Davies (Dr. W. G.), School Certificate Examples in Physics (*Review*), 183
 Davies (Dr. W. L.), The Chemistry of Milk (*Review*), 625
 Davies (Dr. S. J.), appointed professor of mechanical engineering at King's College, London, 772
 Davis (Dr. J. G.), and Dr. H. L. A. Tarr, Relation of so-called *Streptococcus apis* to certain Lactic Acid Streptococci, 763
 Dawkins (Prof. R. M.), The Monks of Athos (*Review*), 228
 Dawson (Sir Philip), Road, Rail and Fuel, 752; Land Transport, 892
 Deacon (E. R.), [death], 430; [obituary article], 578
 Debye (Prof. P.), awarded the Nobel prize for chemistry; work of, 873
 Delaplace (R.), Atomic Hydrogen and the Disappearance of Hydrogen in Discharge Tubes, 179
 Delatizky (B.), [Dr. B. F. J. Schonland, J. P. Gaskell and], Variation of Cosmic Ray Intensity with Sidereal Time, 325
 Deller (Sir Edwin), [death], 960; [obituary article], 1043
 Delorme (J.), [P. Riou and], Lead Values in Maple and Cane Sugars, 138
- Deming (Prof. H. G.), General Chemistry: an Elementary Survey; emphasizing Industrial applications of Fundamental Principles. Fourth edition (*Review*), 424
 Dempster (Prof. A. J.), Atomic Masses of Uranium and Thorium, 120; Mass Equivalent of the Energy in Radioactive Transformations, 201
 Denbigh (K. G.), Osborne Reynolds Ridge, 612
 Denham (Prof. H. G.), Benefits from Scientific Research to Agriculture in New Zealand, 746
 Dennell (R.), Feeding Mechanism of *Apseudes talpa* and the Evolution of the Peracaridan Feeding Mechanisms, 896
 Denoël (Prof. L.), elected an honorary member of the Société de l'Industrie Minérale, 18
 Derjaguin (Dr. B.), Range of Action of Surface Forces, 330
 Derry (L. W.), resignation from Manchester University, 772
 Desai (Dr. R. D.), and Prof. R. F. Hunter, Non-Existence of Multiplanar Cyclohexane Rings, 548
 Desreux (V.), [G. Dupont and], Study of β -Myrcene, 855
 Destriau (G.), Scintillations of Zinc Sulphide, 807
 Détré (G.), New World Altitude Record, 324
 Deulofeu (V.), [A. Biasotti, J. R. Mendive and], Hypoglycaemic Action of Histone Insulinate, 1101
 Devoto (Prof. L.), [death], 318
 Dewey (H.), South-West England (*Review*), 390
 Dewey (Prof. J.), Authority and Resistance to Social Change, 915
 Dhar (Prof. N. R.), and S. K. Mukerji, Promotion of Nitrogen Fixation in Tropical Soils, 648; Nitrogen Fixation with Cow-Dung, 1060
 Diamond (A. S.), Primitive Law (*Review*), 59
 Dickens (Dr. F.), Mechanism of Carbohydrate Oxidation, 1057; [Prof. W. E. Curtis, S. F. Evans and], The 'Specific Action' of Ultra-short Wireless Waves, 63; 1100; and Dr. H. Weil-Malherbe, Metabolism of Cartilage, 125
 Dight (Eng.-Capt. S. R.), Naval Water-tube Boilers, 213
 Dischendorfer (O.), and A. Verdino, Condensation of Benzoin and Thymol (2), 49
 Dixey (Dr. F.), Alkaline Rocks of Chilwa, Southern Nyasaland, 1020
 Dixon (Prof. H. H.), Convection of Heat and Materials in the Stem of a Tree, 1111
 Dixon (K. C.), [Dr. J. Needham, W. W. Nowiński, R. P. Cook and], Mechanism of Carbohydrate Breakdown in Early Embryonic Development, 462
 Doan (Prof. G. E.), The Principles of Physical Metallurgy (*Review*), 1032
 Dobbie (Dr. J. C.), appointed second senior observer at the Cambridge Solar Physics Observatory, 693; [Dr. T. W. Wormell and], Nova Lacertæ, 1936, 38
 Dobell (C.), A Text-Book of Unapplied Biology (*Review*), 523
 Dobinski (Dr. S.), Oxide Layer on a Polished Copper Surface, 31; and J. Wesolowski, Density of Liquid Selenium, 301; and Dr. C. F. Elam, Surface of Copper formed by Solidification *in vacuo*, 685
 Dobzhansky (T.), [A. H. Sturtevant and], Inversions in the Third Chromosome of Wild Races of *Drosophila pseudo-obscura*, etc., 600
 Dodd (A. P.), Control of the Prickly-pear in Australia, 911
 Dodé (M.), [J. Basset and], Solubility of Nitrogen in Water at Ultra-Pressures up to 4,500 kgm./cm.², 896; [H. Moureu and], Formation of the Monochlorhydrins of Glycols, 897
 Dodge (Prof. C. W.), Medical Mycology: Fungous Diseases of Men and other Mammals (*Review*), 185
 Dodson (Helen), Changes in the Spectrum of the Star 25 Orionis, 1021
 Dole (Prof. M.), Principles of Experimental and Theoretical Electrochemistry (*Review*), 144
 Dolejšek (Prof. V.), and V. Kunzl, The M_{IV}, γ -Absorption Edges of Protactinium (At. No. 91), 590
 Doll (H. G.), [A. A. Perebinosoff, M. Schlumberger and], Temperature Measurements in Oil Wells, 1020
 Dollman (Capt. G.), The Rabbit Menace, 501; Marius Maxwell, 871

- Donald (H. P.), Suppression of Tangled in *Drosophila pseudo-obscura*, 48; Genetical Constitution of *Drosophila pseudo-obscura*, 725
- Donnan (Prof. F. G.), elected an honorary fellow of the Royal Society of Edinburgh, 67; Tercentenary of the University of Utrecht, 131; elected an honorary fellow of the National Institute of Sciences of India, 879
- Dorsett (P. H.), presented with the Meyer medal of the American Genetic Association; work of, 18
- Dougall (Dr. J.), appointed Gibson lecturer in the history of mathematics in Glasgow University, 895
- Douglas (Dr. J. A.), appointed deputy for the professor of geology in Oxford University, 810
- Douglass (Dr. A. E.), Dating Pueblo Bonito and other Ruins of the South-West, 315
- Dover (C.), Science at the International Peace Congress, 516; Half-Castes and World Peace, 432
- Downes (F. A.), Automatic Control of Road Traffic, 472
- Drew (E. A.), presented with the Chadwick gold medal and prize, 756
- Dreyer (G.), and M. L. Campbell-Renton, Bactericidal Action of Radiation, 648
- Drinkwater (J. W.), appointed lecturer in mechanical engineering in Birmingham University, 215
- Drummond (Dr. D. G.), The 2.73 μ Absorption Band in Fused Silica, 248
- Drummond (Prof. J. C.), Chemical Aspects of some Modern Nutritional Problems (Bedson lecture), 1022
- Dubar (L.), Influence of the Gases of the Atmosphere on the Electrical Conductivity of Cuprous Oxide, 339
- Dubois (P.), [E. Rencker and], Hydrates of Manganous Sulphate, 414
- Dubrisay (R.), and J. Lefol, Saline Hydrates, 476
- Dudley (Earl of), elected chairman of the Parliamentary Science Committee, 965
- Dufay (J.), and H. Grouiller, Proportion of Polarized Light in the Solar Corona, 599
- Dufraisse (C.), and M. Gérard, Dissociable Organic Oxides and Anthracene Structure, 90
- Dufton (A. F.), New Heating Laboratory at the Building Research Station, 335
- Dugas (R.), La méthode dans la mécanique des quanta, 358
- Du Mond (J. W. M.), and V. L. Bollman, X-Ray method for Determining Electronic Charge, 767
- Dunlop (W. R.), Business Mental Activity and Management, 23
- Dunn (Prof. J. Shaw), elected professor of pathology in Glasgow University, 46
- Dunn (Prof. L. C.), Heredity and Variation (Review), 862
- Dunning (J. R.), G. B. Pegram, G. A. Mitchell, G. Fink and E. Segrè, Velocity of Slow Neutrons, 734
- Dupont (Prof. G.), Cours de chimie industrielle. Tome 1 et 2 (Review), 568; and V. Desreux, Study of β -Myrcene, 855
- Durack (Elizabeth, Mary and), All-About: the Story of a Black Community on Argyle Station, Kimberley (Review), 1074
- Durack (Mary and Elizabeth), All-About: the Story of a Black Community on Argyle Station, Kimberley (Review), 1074
- Durst (C. S.), awarded the Buchan prize of the Royal Meteorological Society, 966
- Durward (Dr. A.), elected professor of anatomy in Leeds University, 46
- Dyal (S.), Spiders of Lahore, 1104
- Eakin (H. M.), Silting of Reservoirs, 806
- Easson (L. H.), and E. Stedman, Absolute Activity of Choline Esterase, 767
- Eastwood (T.), Northern England (Review), 390
- Ebstein (Prof. Wilhelm), centenary of the birth of; work of, 914
- Edgeworth (Prof. F. H.), The Cranial Muscles of Vertebrates (Review), 221
- Edser (late E.), revised edition by N. M. Bligh, Heat for Advanced Students (Review), 952
- Edwards (A. B.), Almandine Garnets in some Devonian Igneous Rocks of Victoria, 91
- Eeg-Olofsson (Dr. T.), [Dr. G. Ising and], Gravity Measurements in Sweden, 889
- Eggleton (Dr. P.), Catalysis of Chemical Reactions, 608
- Ehrenbaum (Prof. E.), Naturgeschichte und wirtschaftliche Bedeutung der Seefische Nordeuropas (Review), 57
- Ehrenstein (Dr. M.), awarded a Van't Hoff prize of the Royal Academy of Sciences of Amsterdam, 324
- Eichner (C.), [V. Lombard, M. Albert and], Permeability of Palladium to Hydrogen, 48
- Ekholm (W. C.), [H. B. Weiser, W. O. Milligan and], Plaster of Paris, 294
- Elam (Dr. C. F.), [S. Dobinski and], Surface of Copper formed by Solidification in vacuo, 685
- Elder (J. H.), [R. M. Yerkes and], Sexual and Reproductive Cycles of Chimpanzee, 91; Reproduction in the Chimpanzee, 725
- Elford (W. J.), [Sir Patrick Laidlaw and], New Group of Filterable Organisms, 648
- Elizarova (S. S.), Influence of Hydrogen Ion Activity and of Salinity on the Eggs of *Engraulis encrasicolus* L. (Anchovy), 561
- Ellenberger (V.), History of the Ba-ga-Malete of Ramoutsa, 180
- Ellinger (F.), Colloids and the Biological Effect of Radiation, 1014
- Elliot (Lt.-Col. R. H.), Indian Conjuring (Review), 425; [obituary article], 913
- Elliot (J. S.), Bedfordshire Vermin Payments, 614
- Elliot (Walter), presented with a certificate and badge of honorary life governorship of the Royal Agricultural Society, 1050
- Ellsworth (L.), My Flight Across Antarctica, 238
- Eloff (Dr. G.), A Case of 50 per cent Crossing-over in the Male *Drosophila*, 34; Behaviour of Local *Drosophila melanogaster* during late Larval Stage, 402
- Elphinstone (Lady), Botany for Children (Review), 784
- Emerson (R. A.), and J. K. Kempton, The Maize Survey, 1090
- Emmanuel-Zavizziano (Mme. H.), and M. Haïssinsky, Electrolysis of Solutions of Titanium Salts, 414
- Emmerie (A.), Determination and Excretion of Flavins in normal Human Urine, 164
- Enthoven (R. E.), Mysore Tribes and Castes (Review), 225
- Entrican (A. R.), Properties and Uses of Kauri, 158
- Enzmann (Dr. E. V.), and C. P. Haskins, Two unusual Modifications of Eye Colour in *Drosophila melanogaster*, 165
- Epprecht (A.), [Prof. H. Erlenmeyer and], Some Properties of Pentadeuterobenzoic Acid, C₆D₅COOH, 367; [H. Schenkel and], Use of Deuterium as an Indicator in Stereochemical Investigations, 547
- Erikson (Miss D.), Pathogenic Aerobic Organisms of the Actinomyces Group, 170
- Eriksson-Quensel (I. B.), and The Svedberg, Molecular Weight of a Virus Protein, 937
- Erk (Dr. S.), and Dr. A. Schmidt, Viscometry, 593
- Erlenmeyer (Prof. H.), and A. Epprecht, Some Properties of Pentadeuterobenzoic Acid, C₆D₅COOH, 367; H. Schenkel and A. Epprecht, Use of Deuterium as an Indicator in Stereochemical Investigations, 547; H. Lobeck and Prof. K. Fromherz, Acetylcholine containing Heavy Hydrogen, 1063
- Errera, Prof. J., and Dr. P. Mollet, Intermolecular Forces and O—H Absorption Bands in Alcohols at 3 μ , 882
- Escande (L.), and G. Sabathe, Errors produced by the Inclination of the Trajectories in Calibrations carried out by means of Hydrometric Screws with Counting Gear, 984
- Esclanton (E.), Eclipse of the Sun of June 19, 1936, 216
- Esnault-Pelterie (R.), elected a member of the Paris Academy of Sciences, 240
- Espil (L.), and G. Mandillon, Action of Bromacetates on various Alkaloids, 258
- 'Espinasse (P. G.), Bilateral Gynandromorphism in Feathers, 645
- Euler (Prof. H. v.), [E. Adler, H. Hellström and], Action of Co-enzyme as the Specific Co-enzyme of Lactic Dehydrogenase from Heart Muscle, 968

- von Euler-Chelpin (Prof. H.), elected an honorary member of the Association of German Chemists, 543
- Evans (Sir Arthur), Minoan Influences in Ancient Syria, 357; awarded the Copley medal of the Royal Society, 833; presented with the Copley medal of the Royal Society; work of, 979
- Evans (G. C.), appointed Frank Smart student in botany in Cambridge University, 46
- Evans (S. F.), [Prof. W. E. Curtis, Dr. F. Dickens and], The 'Specific Action' of Ultra-short Wireless Waves, 63; 1100
- Evans (Dr. U. R.), recommended for a further appointment as assistant director of research in metallurgy in Cambridge University, 1067
- Eve (Prof. A. S.), [Prof. C. E. Mendenhall, Prof. D. A. Keys and], College Physics (*Review*), 183
- Extermann (C. R.), Diffraction of Light by Ultra-Sonic Waves, 843
- Eymers (Johanna G.), [K. L. van Schouwenburg and], Quantum Relationship of the Light-Emitting Process of Luminous Bacteria, 245
- Eysank (E.), Coloration of Fluorite and Rock Salt, 415
- Faber (Prof. K.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Fahie (W. C.), and R. H. J. Brown, The Beams Ultra-centrifuge, 207
- Fahrenheit (Daniel Gabriel) (1686-1736), 428
- Fairey (C. R.), and F. Handley Page, gift to the Royal Aeronautical Society, 927
- Fairlie (A. M.), Sulfuric Acid Manufacture (*Review*), 568
- Fairthorne (R. A.), and B. G. D. Salt, A Fairthorne-Salt Mathematical Film, 726
- Faivre (R.), [H. Lefebvre and], Oxidation of Coal, 943
- Falmouth (Viscount), appointed a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research, 927
- Fankuchen (I.), [F. C. Bawden, N. W. Pirie, J. D. Bernal and], Liquid Crystalline Substances from Virus-infected Plants, 1051
- Farmer (E.), and E. G. Chambers, Proficiency and Psychological Tests, 725
- Farran (G. P.), Copepods from the Great Barrier Reef, 1062
- Fath (Prof. E. A.), Through the Telescope: a Story of the Stars (*Review*), 821
- Faucounau (L.), New Method for the Preparation of Catalysts, 561
- Faulkner (Dr. I. J.), Solid Carbon Dioxide, 191
- Fauver (Dr. Edgar), and Dr. Edwin Fauver, awarded the American Physical Education honorary award for achievement, 361
- Fauver (Dr. Edwin), [Dr. Edgar Fauver and], awarded the American Physical Education honorary award for achievement, 361
- Fay (Dr. C. R.), Problems of Plantation Economy, 452; 957
- Feather (Dr. N.), elected a fellow of Trinity College, Cambridge, 731
- Feinberg (R. G.), [Dr. S. G. Levit, S. G. Ginsburg, V. S. Kalinin and], Immunological Detection of the Y-Chromosome in *Drosophila melanogaster*, 78
- Fell (Dr. E. W.), Distortion of Iron and Molybdenum, 760
- Fell (W. A.), resignation of demonstratorship in anatomy in Cambridge University, 518
- Ferguson (Prof. Allan), Trends in Modern Physics, 449; Splashes and what they teach, 499; Trends in Modern Physics, 785; appointed representative of the British Association to the Parliamentary Science Committee, 1005; and A. H. Cockett, Specific Heat of a Liquid at Different Temperatures, 842
- Ferris (Dr. G. F.), Sucking Lice, 82
- Fersman (A. E.), edited by C. P. Dutt, The Scientific Study of Soviet Mineral Resources (*Review*), 97
- Fielding (Miss U. L.), conferment upon, of the title of reader in neurological anatomy by London University, 46
- Fieser (Prof. L. F.), The Chemistry of Natural Products related to Phenanthrene (*Review*), 224
- Filippi (Angiolo), centenary of the birth of, 538
- Finch (Prof. G. I.), conferment upon, of the title of professor by London University, 772; The Beilby Layer on Non-Metals, 1010
- Finch (Prof. V. C.), and Prof. G. T. Trewartha, Elements of Geography (*Review*), 1075
- Findlay [Cartwright and], Principal Rots of English Oak, 409
- Finlayson (H. H.), The Red Centre: Man and Beast in the Heart of Australia (*Review*), 1074
- Finnemore (H.), and Joyce M. Cooper, Cyanogenetic Glucosides in Australian Plants (4), 260
- Fischer (Glaswerk G.), 'Lumophor' Glass for Tubes containing Luminous Gases, 978
- Fisher (H. A. L.), A History of Europe (*Review*), 903
- Fisher (Prof. R. A.), Curve Fitting, 934; The Half-Drill Strip System Agricultural Experiments, 1101
- Flammarrion (G. C.), [S. Arend and], Photographing Meteor Trails, 690
- Flenley (R.), and W. N. Weech, World History: the Growth of Western Civilization (*Review*), 263
- Fletcher (late Sir Walter), memorial to, 875
- Fleure (Prof. H. J.), Racial Theory and Genetic Ideas, 1042; [H. Peake and], The Law and the Prophets (*Review*), 632
- de Fleury (Marquis), and Dr. H. Portier, Complex Interdependence of the Properties of Alloys, etc., 691
- Flexner (Dr. S.), appointed George Eastman visiting professor at Oxford University for 1937-38, 895
- Flint (Dr. H. T.), Geometrical Optics (*Review*), 528
- Florence (R. T.), R. J. Myers and Prof. W. D. Harkins, Contact Potentials of Reversible Soluble Films of Lauric Acid, 405
- Fock (V.), Inconsistency of the Neutrino Theory of Light, 1011
- Foex (E.), and M. Lansade, Pathogenic Action of a Bacterium isolated from Potato Tubers, 138
- Foex (M. A.), Action of Hydrogen on Alkaline Glasses at a High Temperature, 943
- Folley (S. J.), and H. D. Kay, Phosphatase of Cow's Milk, 767
- Folsom (Dr. J. W.), [death], 751
- Fomin (V.), F. G. Houtermans, I. W. Kurtshatov, A. I. Leipunski, L. Shubnikov and G. Shtshepkin, Absorption of Thermal Neutrons in Silver at Low Temperatures, 326; F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and L. W. Schubnikow, Neutron Absorption of Boron and Cadmium at Low Temperatures, 505
- Fonteyne (R.), Raman Effect in Absolute Perchloric Acid, 886
- Forbes (Prof. G.), [death], 751; [obituary article], 830
- Forbes (R. J.), Bitumen and Petroleum in Antiquity (*Review*), 632
- Ford (E. B.), Natural Selection, 1053; [Dr. E. Ashby, Prof. F. A. E. Crew, Dr. C. D. Darlington, Prof. J. B. S. Haldane, Prof. E. J. Salisbury, Dr. W. B. Turrill, C. H. Waddington and], Genetics in the Universities, 972
- Ford (H.), awarded the Holley medal of the American Society of Mechanical Engineers, 963
- Forestier (H.), and Mlle. Myriam Graff, Reduction of Boric Anhydride by Manganese, 1026; and F. Redslob, Decomposition of Cadmium Ferrite, 1112
- Forró (Dr. M.), [Dr. J. Barnóthy and], Measurements of Cosmic Ray Intensity in a Deep Mine, 325; Absence of Cosmic Rays from Nova Lacertae, 544
- Forsell (Prof. C. G. A.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Forsyth (Prof. A. R.), Intrinsic Geometry of Ideal Space. 2 Vols (*Review*), 343
- Foster (C. L.), [D. R. Chesterman and], Creeping Movements of *Spirogyra*, 403
- Fotheringham (Dr. J. K.), [death], 1044
- Fourmarier (Prof. P.), elected an honorary member of the Société de l'Industrie Minérale, 18
- Fournier (H.), Application of the methods of Microchemical Analysis to the Study of the Corrosion of Light Aluminium Alloys, 49

- Fowler (Prof. A.), title of emeritus professor conferred upon, by London University, 1110
- Fowler (Prof. R. H.), awarded a Royal medal of the Royal Society, 833; presented with a Royal medal of the Royal Society; work of, 979
- Fox (Dr. C. S.), Original Laterite of Buchanan, 649
- Fox (Prof. H. Munro), Rates of Cleavage of Sea Urchin Eggs in Different Latitudes, 839; C. A. Wingfield and B. G. Simmonds, Oxygen Consumption of Mayfly Nymphs in relation to Available Oxygen, 1015
- Fraipont (Dr. C.), Fossil Men of Engis, 553
- Franchet (L.), Rural Custom in Civilized Communities, 253
- Francis (P. A.), Science and the Poultry Industry, 789
- Frank (F. C.), Energy of Formation of 'Cyclol' Molecules, 242
- Franke (Dr. K. W.), [death], 832
- Frankfort (Dr. H.), Archaeological Finds in Iraq, 279
- Franks (O. S.), elected professor of moral philosophy in Glasgow University, 895
- Fraser (Mabel S.), Vascular Supply to the Follicle-bearing Ranunculaceæ, 896
- Fraser (Sir William), J. C. Loudon and the Waterloo Beeches, 277
- Fraser-Harris (Prof. D. F.), Joy in Scientific Discovery, 498
- Fredericq (Prof. H.), elected a *correspondant* of the Royal Academy of Belgium, 502
- Frei (Dr. H.), [Dr. G. Groetzinger and], Disengagement of Energy in Melting Electrets, 130
- Freissler (H.), [W. J. Müller, E. Plettinger and], Anodic Behaviour of Gold-Copper Alloys in 5*N* Hydrochloric Acid and *N* Sulphuric Acid, 218
- Freymann (Mme. Marie), and René Freymann, Infra-red Absorption and Raman Spectra of Amides and Anilides and the Structure of these Compounds, 90
- Freymann (René), [Mme. Marie Freymann and], Infra-red Absorption and Raman Spectra of Amides and Anilides and the Structure of these Compounds, 90 [R. Zouckermann and], High-Frequency Absorption of various Alcohols, 217
- Fried (S.), [B. Susz and], Raman Spectrum of Gallic Acid, of some of its Derivatives, and of Tannin, 259
- Friend (A. W.), [Prof. R. C. Colwell, N. I. Hall, L. R. Hall and], The Lower Regions of the Ionosphere, 245
- Friend (Dr. J. Newton), Latent Heat of Evaporation of Liquid Helium, 1102
- Friwald (O. E.), Prof. O. Hassel and S. Rustad, Refractive Indexes of Ordinary and Heavy Ammonia, 330
- Frolova (Dr. S. L.), Several Spontaneous Chromosome Aberrations in *Drosophila*, 204
- Fromherz (Prof. K.), [Prof. H. Erlenmeyer, H. Lobeck and], Acetylcholine containing Heavy Hydrogen, 1063
- Frost (W. E.), [C. F. Humphries and], Chironomid Fauna of the Mosses of the River Liffey, 300
- Fryer (J. C. F.), and others, Insect Pests of Crops in England and Wales, 1932-1934, 212
- Fuson (Prof. R. C.), [Prof. R. L. Shriner and], A Systematic Identification of Organic Compounds: a Laboratory Manual (*Review*), 704
- Fyfe (J. L.), The External Forces Acting on Chromosomes, 366
- Fyson (P. F.), Lightning and Atmospherics, 278
- Gadd (C. J.), and R. Campbell Thomson, A Middle-Babylonian Chemical Text, 555
- Gaddum (Prof. J. H.), Eingeleitet von H. H. Dale, Gefässerweiternde Stoffe der Gewebe (*Review*), 267
- Gager (Dr. C. S.), The Plant World (*Review*), 862
- Gardner (A. E.), [I. Andersson-Kottö and], New Type of Apospory in Ferns, 471
- Gál (Dr. I.), Estimation of Ascorbic Acid (Vitamin C) by Titration, 799; [L. Havas and], Divergent Physiological Effects of Synthetic and 'Natural' Ascorbic Acids, 586
- Galloway (W. R.), [Dr. F. Ll. Jones and], Sparking Potential of Mercury Vapour, 973
- Galpin (Dr. Nancy), Relationship between Post-Natal Coat Characters and Prenatal Follicle Density as affected by Increase in Fetal Size, 585
- Gaposchkin (Cecilia Payne), Physical Condition of the Super-Novæ, 378
- Gardiner (Sir Frederick Crombie), gift to Glasgow University, 895
- Gardiner (trustees of late William G.), gift to Glasgow University, 895
- Gardner (N. L.), New Red Alga from New Zealand, 378
- Gardner (R. E.), [D. I. Macht and], Phytopharmacological Reactions of Normal, Toxic and Atoxic Sera, 414
- Garner (C. S.), [Prof. A. A. Noyes and], Oxidation-Reduction Potential, 252
- Garrod (Miss D. A. E.), Cultures of the Upper Palæolithic, 454; The Upper Palæolithic in the Light of Recent Discovery, 826
- Garstang (Prof. W.), Seasonal Changes in the Underwaters of Bermuda, 60; appointed to take charge temporarily of the Natural History Department of Aberdeen University, 772
- Gaselee (Sir Stephen), Natural Science in England at the end of the Twelfth Century, 1003
- Gaskell (J. P.), [Dr. B. F. J. Schonland, B. Delatizky and], Variation of Cosmic Ray Intensity with Sidereal Time, 325
- Gates (Prof. R. R.), Tibetan Blood Groups, 293; Blood Group Investigation, 470; Genetical and Taxonomic Investigations in *Oenothera*, 1020
- Gault (H.), and A. Chablay, Action of Organic Acids on Esters, 855
- Gause (Dr. G. F.), Stereoisomeric Nature of Oxidation and Fermentation, 245; Nicotine Inhibition of Oxidation and Fermentation, 976
- Gauthier (G.), Conductivity of Super-purity Aluminium, etc., 691
- Gay (P. F.), and Prof. M. W. Travers, Influence of Nitric Oxide on the Thermal Decomposition of Dimethyl Ether. Gaseous Catalysis, 546
- Gazan (M. H.), Flavours and Essences: a Handbook of Formulæ (*Review*), 949
- Gazin (C. L.), Fossil Horse Remains from Idaho, 512
- Geiss (W.), Development of the Coiled-Coil Lamp, 130
- Gemant (A.), Experiments with Electrets, 130
- George (T. N.), [B. Smith and], North Wales (*Review*), 390
- George (Dr. W. H.), The Scientist in Action: a Scientific Study of his Methods (*Review*), 381; Surface Markings on a Diamond, 616
- Gérard (M.), [C. Dufraisse and], Dissociable Organic Oxides and Anthracene Structure, 90
- Gericke (Prof. W. F.), Crop-growing without Soil, 581
- Gerth (Prof. H.), Geologie Südamerikas. Teil 2 (*Review*), 147
- Gex (Mlle. Madeleine), Variations in the Ultra-violet Spectrum of Phenol as a Function of the pH, 258
- Gheury de Bray (M. E. J.), Velocity of Light, 681
- Ghosh (B.), [Prof. B. C. Guha and], Biosynthesis of Ascorbic Acid, 844
- Ghosh (C. C.), Beekeeping. Third edition, 1061
- Giaque (W. F.), and J. W. Stout, Heat Capacity of Ice, 334
- Gibb (Sir Alexander), Development of Transport, 794; Engineering and Empire Development, 1038
- Gibbs (Dr. R. E.), given the title of reader by London University, 1110
- Giffen (Dr. E.), appointed reader in mechanical engineering at King's College, London, 1110
- Gifford (E. W.), Yavapai Indians, 765
- Gill (Dr. L.), False Killer Whales in South Africa, 541
- Gilmore (J. A.), Young's Modulus for Steel Surveying Bands, 812
- Ginsburg (S. G.), [Dr. S. G. Levit, V. S. Kalinin, R. G. Feinberg and], Immunological Detection of the Y-Chromosome in *Drosophila melanogaster*, 78
- Giri (K. V.), and A. Sreenivasan, The Amylase System of Rice Grain during Ripening and Germination, 406
- Giroud (A.), and C. P. Leblond, Value of the Acid Silver Nitrate Reaction as a Test of Ascorbic Acid, 247
- Glasgow (Prof. R. S.), Principles of Radio Engineering (*Review*), 822

- Glasstone (Dr. S.), and Dr. A. Hickling, Electrolytic Oxidation and Reduction: Inorganic and Organic (*Review*), 144
- Glob (P. V.), Eskimo Cultural Origins in East Greenland, 647
- Glückauf (E.), [F. A. Paneth, H. Loleit and], Helium produced in Artificial Transmutation, 1105
- Goddard (Dr. A. E.), A Text-Book of Inorganic Chemistry. Edited by Dr. J. Newton Friend. Vol. II: Organometallic Compounds. Part 3: Derivatives of Phosphorus, Antimony and Bismuth (*Review*) 268
- Gold (Col. E.), Dr. W. Schmidt, 1086
- Goldfinger (P.), W. Jeunehomme and B. Rosen, Dissociation Energy of Diatomic Sulphur, Selenium and Tellurium Vapours, 205
- Goldie (Dr. A. H. R.), Ascent of Air in Cyclones, 166
- Goldschmidt (late Prof. V.), Herausgegeben von Dr. H. Himmel und Dr. K. Müller, Kursus der Kristallometrie (*Review*), 269
- Golla (F. L.), title of professor conferred upon, by London University, 940
- Good (N. E.), Flour Beetles of the genus *Tribolium*, 129
- Goodman (Dr. N. G.), Benjamin Rush, Physician and Citizen, 1746-1813 (*Review*), 663
- Goodrich (Prof. E. S.), awarded a Royal medal of the Royal Society, 833; presented with a Royal medal of the Royal Society; work of, 980
- Goodspeed (T. H.), [F. M. Uber and], Micro-incineration Studies (3), 775
- Goodwin (A. J. H.), The Mpondo Regimental System, 813
- Gordon (J. W.), [death], 537; [obituary article], 677
- Gordon (R. R.), awarded a Ramsay memorial Glasgow fellowship, 584
- Gough (Dr. H. J.), and others, Fractures in Metals and Brittle Materials, 132
- Graff (Mlle. Myriam), [H. Forestier and], Reduction of Boric Anhydride by Manganese, 1026
- Graham-Smith (W.), grant made to, from the Balfour Fund of Cambridge University, 772
- Grainger (Dr. J.), and T. F. Armstrong, Electric Heating of Garden Frames, 251
- Granier (J.), Important Cause of Error in the Measurement of Capacities by the Ballistic Method, 138
- Gravelly (Dr. F. H.), Indian Temple Architecture, 935
- Gray (J. T.), [late A. M. Lea and], Food of Australian Birds, 592
- Graziadei (H. T.), Cosmic Rays and Solar Activity, 562
- Greening (C. B.), Direct Oxidation of Soil Humus, 848
- Greenshields (F.), Tetraploidy and Hymenoptera, 330
- Greenwood (Prof. M.), and May Smith, Labour Wastage in Industry, 408; and others, Experimental Epidemiology, 474
- Greenwood (Dr. T.), The Growth of Ancient Science (*Review*), 630
- Gregory (Dr. F. G.), and O. N. Purvis, Vernalization, 249; Vernalization of Winter Rye during Ripening, 973; Devernalization of Winter Rye by High Temperature, 1013
- Gregory (J. C.), appointed honorary lecturer in the history of science in Leeds University, 215
- Gregory, Bt. (Sir Richard), Cultural and Social Values of Science, 594
- Gresley (Sir H. Nigel), Recent Developments in Steam Locomotives, 793
- Grewe, Vitamin B, 432
- Grieve (Dr. B. J.), Spotted Wilt virus and the Hormone Heteroauxin, 129
- Griffin (J.), Alternative to Rearmament (*Review*), 1071
- Griffith (C. L. T.), The Mysterious Number 137, 332
- Griffiths (Dr. E.), Seventh International Congress of Refrigeration, 229
- Griffiths (Prof. J. H.), The Psychology of Human Behaviour (*Review*), 823
- Griffiths (J. H. E.), [C. H. Collie and], Experiments with Neutrons, 252
- Griffiths (J. S.), Women's Initiation among the Mpondo, 813
- Grignard (Prof. V.), [obituary article], 791
- Grimes (F. W.), Map of South Wales showing the Distribution of Long Barrows and Megaliths, 613
- Groetzinger (Dr. G.), and Dr. H. Frei, Disengagement of Energy in Melting Electrets, 130; and J. Lichtschein, The Crystal Photo-effect and Rectifying Action in the Bulk of the Crystal, 163
- Gromier (Dr. É.), La vie des animaux sauvages de l'Afrique (*Review*), 780
- Grossfeld (Prof. H.), Electrolytes and a General Phenomenon in Tissue Cells, 31
- Grouiller (H.), [J. Dufay and], Proportion of Polarized Light in the Solar Corona, 599
- Grout (J. L. A.), appointed honorary lecturer in radiological anatomy in Sheffield University, 1067
- Grove (W. B.), British Stem- and Leaf-Fungi (Coelomycetes). Vol. 1 (*Review*), 384
- Groves (K.), and J. Marshall, Spray covering on Apples, 294
- Grubb (Prof. A. C.), [death], 318
- Grüneberg (Dr. H.), A case of Complete Reversion of a Chromosomal Rearrangement in *Drosophila melanogaster*, 508
- Guéhen (Prof. G.), Activation of Silver by Neutrons, 1095
- Guénard (P.), [G. Bruhat and], Circular Dichroism of Solutions of Camphor in Organic Solvents, 896
- Guest (E.), [Dr. W. B. Haines and], Rejuvenating Old Rubber Trees, 936
- Guha (Prof. B. C.), and B. Ghosh, Biosynthesis of Ascorbic Acid, 844
- Guillaume (Dr. C. E.), elected an honorary member of the Société de l'Industrie Minérale, 18; retirement of, from the Bureau international des Poids et Mesures, 755
- Guillet, jun. (L.), [A. Portevin and], Elastic Modulus of certain definite Intermetallic Compounds, 476
- Gulliksen, (F. H.), and E. H. Vedder, Industrial Electronics (*Review*), 704
- Gumbel (E. J.), Extreme Periods between Radioactive Emissions, 560
- Guminski (K.), Luminescence of Barrier Anodes of Aluminium, 180; 897
- Gunn (Dr. R.), Continental Motions, 848
- Gutman (Mlle. J.), [M. Tiffeneau and], Molecular Transformation in the Cyclopic Series, 897
- Haberlandt (Dr. G.), elected an honorary member of the Academy of Sciences of Vienna, 240
- Hackett (Dr. C.), awarded a senior fellowship by the Medical Research Council, 879
- Hackett (Dr. L. W.), and M. Bates, Swarming of the Males of certain European Anophelines in Captivity, 506
- Haddow (A.), re-appointed Laura de Saliceto student in London University, 177
- Hadfield, Bt. (Sir Robert), elected an honorary member of the Société de l'Industrie Minérale, 18; gift to the Advisory Council of the Imperial Institute on Mineral Resources, 718; gift to Harvard University, 1005
- Hafstad (L. R.), N. P. Heydenburg and M. A. Tuve, Excitation of Nuclei by Proton Bombardment, 767
- Hagihara (Y.), Speed of Corpuscles ejected from Stellar Atmospheres, 301
- Hagiwara (T.), [N. Nasu and], Japanese Earthquake of February 21, 1936, 171
- Haglund (Prof. S. E. P.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Hailsham (Viscount), acceptance of the chairmanship of the British Empire Cancer Campaign, 24
- Haines (R. T. M.), [J. F. Ward and], Estimation of Vitamin A, 128
- Haines (Dr. W. B.), and E. Guest, Rejuvenating Old Rubber Trees, 936
- Haissinsky (M.), [Mme. H. Emmanuel-Zavizziano and], Electrolysis of Solutions of Titanium Salts, 414
- von Halban, jun. (Dr. H.), [Dr. P. Preiswerk and], The Form of Nuclear Levels, 163

- Haldane (Prof. J. B. S.), Natural Selection, 1053; [Dr. Julia Bell and], Linkage in Man, 759; [Dr. E. Ashby, Prof. F. A. E. Crew, Dr. C. D. Darlington, E. B. Ford, Prof. E. J. Salisbury, Dr. W. B. Turrill, C. H. Waddington and], Genetics in the Universities, 972
- Hale-White (Sir William), Great Doctors of the Nineteenth Century (*Review*), 663
- Hall (Sir Daniel), Objects of the National Institute of Agricultural Botany, 158; The Improvement of Native Agriculture in Relation to Population and Public Health (*Review*); 305; Cultural and Social Values of Science, 596; A Social Analysis (*Review*), 779
- Hall (E. S.), [G. S. Lucas and], Radio Relay Services, 541
- Hall (H. W.), resignation of demonstratorship in anatomy in Cambridge University, 518; Stability of Rotating Threads, 932
- Hall (N. F.), and T. O. Jones, Protium-Deuterium Ratio in Water, 1021
- Hall (N. I.), [Prof. R. C. Colwell, A. W. Friend, L. R. Hill and], The Lower Regions of the Ionosphere, 245; [R. C. Colwell, L. R. Hill and], Velocity of Radio Waves, 978
- Hall (Dr. R. O.), 'Lines' on the Surface of Moving Water, 466
- Hall (W. J.), appointed technical editor of the *Journal of the Textile Institute*, 543
- Hall (Prof. W. T.), Textbook of Quantitative Analysis. Second edition (*Review*), 570
- Hall, Urethral Sinus in Rodents and Insectivores, 512
- Halligan (G. H.), Causes of Ice Ages, 813
- Hallpike (C. S.), Prof. H. Hartridge, and Dr. A. F. Rawdon-Smith, Physical Nature of certain of the Vibrating Elements of the Internal Ear, 839
- Ham, jun. (W. T.), [Dr. L. B. Snoddy, Prof. J. W. Beams, H. Trotter, jun. and], Transmission of High-Voltage Impulses of Controllable Speed, 167
- Hamblin (F. T.), [Dr. C. H. Johnson and], Radioactive Isotopes of Bromine, 504
- Hamer (Sir William), [obituary article], 192
- Hamilton (R. A.), Directions of Homogeneous Auroral Arcs, 1059
- Hamilton (S. B.), Coulomb as a Pioneer in the Science of Construction, 1089
- Hamilton (Dr. W. J.), appointed professor of anatomy in St. Bartholomew's Hospital Medical College, 176
- Hampson, Bt. (Sir George), [death], 712; [obituary article], 831
- Handley (R. S.), resignation of demonstratorship in anatomy in Cambridge University, 518
- Hansen (Dr. H. J.), [death], 66; [obituary article], 193
- Happold (Dr. F. C.), appointed lecturer in biochemistry in Leeds University, 215
- Hardenberg (Dr. J. D. F.), Fishes from West Borneo, 806
- Harkins (Prof. W. D.), [R. T. Florence, R. J. Myers and], Contact Potentials of Reversible Soluble Films of Lauric Acid, 405
- Harland (Dr. S. C.), Haploids in Cotton, 334
- Harris (F. R.), appointed a research fellow in glass technology in Sheffield University, 895
- Harris (Prof. H. A.), Atrophy, Burial, Suppression or Total Loss in Evolution, 928
- Harris (Dr. Leslie), and others, Chemistry and Food Science, 744
- Harris (L. H.), E. H. Jolley and F. D. Morrell, Developments in British Telegraph Services, 893
- Harris (N.), Petrological Study of the Portrush Sill and its Veins, 984
- Harrison (Dr. H. S.), Concerning Human Progress, 20; 188; elected president of the Royal Anthropological Institute, 72
- Harrison (J.), [E. R. Hiscox and], Estimation of Fatty Acids in Organic Mixtures, 32
- Harrison (J. D. B.), Forest and Forest Industries of the Prairie Provinces, 1091
- Harrison (J. J.), New British Bird, 251
- Harrison (K. P.), appointed Benn W. Levy student in biochemistry in Cambridge University, 940
- Harrison (Dr. W. H.), [death], 496; [obituary article], 749
- Hartelius (V.), [N. Nielsen and], Chemistry of Growth Substance B, 203
- Hartley (Sir Harold), re-elected chairman of the International Executive Council of the World Power Conference, 583
- Hartog (Sir Philip), and Dr. E. C. Rhodes. With a Memorandum by Prof. C. Burt, The Marks of Examiners (*Review*), 820
- Hartree (Prof. D. R.), Dr. B. Swirles and Dr. H. S. W. Massey, Theory of Complex Atoms, 1080
- Hartridge (Prof. H.), [C. S. Hallpike, Dr. A. F. Rawdon-Smith and], Physical Nature of certain of the Vibrating Elements of the Internal Ear, 839
- Haselfoot (C. E.), [death], 832
- Haskins (C. P.), [Dr. E. V. Enzmann and], Two Unusual Modifications of Eye Colour in *Drosophila melanogaster*, 165
- Hassel (Prof. O.), [O. E. Frivold, A. Rustad and], Refractive Indexes of Ordinary and Heavy Ammonia, 330
- Hathaway (Miss Esse V.), Partners in Progress (*Review*), 740
- Hauser (Dr. E. A.), and C. E. Reed, Centrifuging in Rotating Hollow Cylinders, 975
- Hautot (A.), The K-radiation of Crystallized Boron, 258
- Havas (L.), and I. Gál, Divergent Physiological Effects of Synthetic and 'Natural' Ascorbic Acids, 586
- Hawkes (C.), Early Iron in Egypt, 592
- Hawkes (Prof. C. J.), Training of the Engineer, 753
- Hawkins (Prof. H. L.), Palaeontology and Humanity, 450; 521, 534
- Hayes (Sister Carmela), The Common Stick Insect, 886
- Hayes (Rev. J. Gordon), [obituary article], 1044
- Hayes (R. C.), Focal Depth of the Hawke's Bay Earthquake of February 2-3, 1931, 126; Reliability of Seismograph Stations, 463
- Hearman (Miss J.), Northern Spy Apple Stock, 936
- Hearne (E. Marie), Induced Chiasma Formation in Somatic Cells by a Carcinogenic Hydrocarbon, 291
- Hebbs (L.), Wood Pulp for the Rayon Industries, 175
- Hegner (Prof. R.), assisted by Jane Z. Hegner, Parade of the Animal Kingdom (*Review*), 780
- Heidelberger (Prof. M.), K. O. Pedersen and A. Tiselius, Ultracentrifugal and Electrophoretic Studies on Antibodies, 165
- Heil (Dr. O.), [Dr. A. Arsenjewa-Heil, C. H. Westcott and], Influence of Temperature on the 'Groups' of Slow Neutrons, 462
- Heilbron (Prof. I. M.), [J. H. Beynon, C. H. Bamford and], A Novel Interrelationship in the Triterpene Group, 1017
- Heisenberg (W.), Quantum-mechanical Theory of Cosmic Ray Showers, 42
- Heitler (Dr. W.), The Quantum Theory of Radiation (*Review*), 483; [H. J. Bhabha and], Passage of Fast Electrons through Matter, 401
- Hele (Dr. T. S.), resignation of lectureship in biochemistry in Cambridge University, 518
- Hellmund (R. E.), Training of the Engineer in the U.S.A., 174
- Hellström (H.), [E. Adler, Prof. H. v. Euler and], Action of Co-enzyme as the Specific Co-enzyme of Lactic Dehydrogenase from Heart Muscle, 968
- de Hemptinne (Prof. Marc), and J. Wouters, Geometrical Constitution of Silichloroform, 884
- Henderson (Brig.-Gen. Sir Brodie Haldane), [death], 609
- Henderson (Prof. D. K.), Alcoholism and Psychiatry (Norman Kerr memorial lecture), 715
- Henderson (Prof. J.), Mollusca of Colorado, Utah, Montana, Idaho and Wyoming—Supplement, 170
- Henderson and Wilson, Actions of Acetylcholine on the Brain, 129
- Hendrick (Prof. F.), [death], 751
- Hendrick (Prof. J.), Soil Science, 457; Development of Soil Studies, 729; Soil Science in the Twentieth Century, 995
- Henri (V.), Electronic State of the Radicals in Polyatomic Molecules, 377
- Henrion (J.), Dielectric Losses in an Alternating Field of High Frequency and Molecular Dimensions, 339

- Herbert (T.), Food Transport, 745
- Hering (Prof. M.), Die Blatt-Minen Mittel- und Nord-Europas. Lief 2: Brunella—Filipendula (*Review*), 704
- Hérissey (H.), and G. Poirot, Extraction of Viburnitol from the Leaves of *Viburnum Tinus*, 599
- Herman (L.), and Mme. Renée Herman-Montagne, Absorption Coefficients of the Bands 4774, 5770 and 6290A. of Oxygen, 216
- Herman-Montagne (Mme. Renée), [L. Herman and], Absorption Coefficients of the Bands 4774, 5770 and 6290A. of Oxygen, 216
- Heron-Allen (E.), The genus *Keramosphaera* Brady, 689
- Herrick (Prof. G. W.), Insect Enemies of Shade-Trees (*Review*), 386
- Herrmann (Prof. K.), Asymmetry in Metallic Zinc and Cadmium, 290
- Herzog (G.), with the assistance of C. G. Blooah, Jabo Proverbs from Liberia: Maxims in the Life of a Native Tribe (*Review*), 905
- Hess (Prof. V. F.), awarded half of the Nobel prize for physics; work of, 873
- Hetherington (Sir Hector), Prof. A. A. Bowman, 16
- Heubner (Prof. W.), elected an honorary member of the Biological Society of Vienna and of the Imperial Leopold Caroline German Academy of Natural Philosophers at Halle, 797
- Hevesy (G.), Splitting of Atomic Nuclei under the influence of Neutrons on Rare Earths, 774
- Heydenburg (N. P.), [L. R. Hafstad, M. A. Tuve and], Excitation of Nuclei by Proton Bombardment, 767
- Heyn (F. A.), Evidence for the Expulsion of Two Neutrons from Copper and Zinc by One Fast Neutron, 723
- Hickinbottom (Dr. W. J.), Reactions of Organic Compounds (*Review*), 224
- Hickling (Dr. A.), Electrolytic Oxidation, 937; [Dr. S. Glasstone and], Electrolytic Oxidation and Reduction: Inorganic and Organic (*Review*), 144
- Hickman (Dr. K.), Identification of Vitamins by Molecular Distillation, 881
- Hicks (Prof. G. Dawes), The Phases of Berkeley's Idealism (*Review*), 818
- Hickson (W. S. E.), Rate of Absorption of Oxygen by Sodium Sulphite Solution, 645
- Hildebrand (Prof. J. H.), Solubility of Non-Electrolytes. Second edition (*Review*), 742
- Hill (Sir Arthur), awarded a Veitch memorial gold medal of the Royal Horticultural Society, 1093
- Hill (A. V.), Cercospora Leaf-spot of Tobacco, 209; [Dr. H. R. Angell, J. M. Allan and], Control of Downy Mildew of Tobacco, 334
- Hill (D. W.), and Dr. F. O. Howitt, Insulin: its Production, Purification and Physiological Action (*Review*), 56
- Hill (Prof. E. L.), The Compton Effect, 209
- Hill (Sir Leonard), awarded the T. K. Sidey summer-time memorial medal and prize of the Royal Society of New Zealand, 682; and H. J. Taylor, The 'Specific Action' of Ultra Short Wireless Waves, 591
- Hill (L. R.), [Prof. R. C. Colwell, A. W. Friend, N. I. Hall and], The Lower Regions of the Ionosphere, 245; [Prof. R. C. Colwell, N. I. Hall and], Velocity of Radio Waves, 978
- Hill (R.), and D. Richter, Glycosides of Madder, 38
- Hill (R. D.), [E. H. S. Burhop, A. A. Townsend and], Selective Absorption of Neutrons in Silver, 1094
- Himus (Dr. G. W.), [Prof. W. A. Bone and], Coal: its Constituents and Uses; with a Supplementary Chapter upon Fuel Economy and Heat Transmission in Industrial Furnaces by Dr. R. J. Sarjant (*Review*), 991
- Hinton (H. E.), grant made to, from the Balfour Fund of Cambridge University, 772
- Hinton (M. A. C.), appointed keeper of zoology in the British Museum (Natural History), 793; elected zoological secretary of the Linnean Society, 838
- Hiscox (E. R.), and J. Harrison, Estimation of Fatty Acids in Organic Mixtures, 32
- Hittig (Prof. G.), awarded the Justus Liebig medal of the Association of German Chemists, 543
- Hoare, Porcine Trypanosomiasis, 294
- Hobson (H.), Advantages from the Electricity Grid, 611
- Hobson (W.), appointed part-time lecturer in physiology and hygiene in Leeds University, 215
- Hocart (A. M.), Anthropology as it is (*Review*), 904
- Hodge (A. E.), [death], 832
- Hodge (Prof. W. V. D.), elected a non-stipendiary fellow of Pembroke College, Cambridge, 895
- Hodgkin (A. L.), elected Michael Foster student in Cambridge University, 215; elected a fellow of Trinity College, Cambridge, 731
- Hodgson (E. A.), Bibliography of Seismology, 836
- Hodgson (J. L.), [obituary article], 430
- Hodsmen (H. J.), National Smoke Abatement Exhibition, 728
- Hogben (Prof. L. T.), The Retreat from Reason (Conway memorial lecture), 139; Cultural and Social Values of Science, 595
- Hogg (A. R.), Bursts of Cosmic Radiation, 77
- Hollings (H.), Gum in Coal Gas, 876
- Hollmann (Dr. H. E.), Physik und Technik der ultrakurzen Wellen. Band I (*Review*), 822
- Holman (W. M.), Phosphate Solubility in certain New South Wales Soils, 897
- Holmes (Prof. A.), New Analyses of Tertiary Igneous Rocks (Antrim and Staffa), 300
- Holmes (P.), [P. Ulyott and], Thermal Stratification in Lakes, 971
- Holmgren (Prof. I.), conferment upon, of an honorary doctorate by Paris University, 941
- Homerberg (Prof. V. O.), [Prof. R. S. Williams and], Principles of Metallography. Third edition (*Review*), 1032
- Hönl (Prof. I.), [death], 17
- Hooker (late Dr. S. C.), Lapachol and Related Compounds, 1047
- Hooper (C. H.), Pollination of Plums, 648
- Hope-Jones (F.), Clocks Showing Mean and Sidereal Time Simultaneously, 931
- Hopkins (G. H. E.), Mosquitoes of the Ethiopian Region, 592
- Hopkinson (R. G.), awarded the Gaster memorial premium of the Illuminating Engineering Society, 615
- Hopwood (Prof. F. L.), Some New Phenomena produced by Sound Vibrations, 1059
- Horder (Lord), The Strain of Modern Civilization, 529
- Hornell (J.), Boat Construction in Ancient Scandinavia and Oceania, 765
- Hotine (Major M.), Signals for Triangulation, 254
- Houtermans (F. G.), [V. Fomin, A. I. Leipunsky, L. B. Rusinow, L. W. Schubnikow and], Neutron Absorption of Boron and Cadmium at Low Temperatures, 505
- Hovgaard (W.), Torsion of Rectangular Tubes, 378
- Howard (A. L.), Forests and Flora of British Honduras (*Review*), 145
- Howell (Dr. H. G.), Ground State Vibrational Frequencies, 36; Vibrational Frequencies of Molecules, 290
- Howitt (Dr. F. O.), [D. W. Hill and], Insulin: its Production, Purification and Physiological Action (*Review*), 56
- Howland (Prof. R. C. J.), [obituary article], 790
- Hrdlička (Dr. A.), Puberty in Eskimo Girls, 378; Aleutian Islands' Skull of Abnormal Size, 613
- Hsu (Prof. Yin-Chi), [Prof. J. G. Needham, Dr. J. R. Traver and others], The Biology of Mayflies: with a Systematic Account of North American Species (*Review*), 223
- Hubbard (Prof. J. C.), A Piezo-electric Ultra-Micrometer, 171
- Hubbe (Dr. E.), work of, 679; The Realm of the Nebulae (Mrs. Hepsa Ely Silliman memorial lectures) (*Review*), 859; Observational Approach to Cosmology (Rhodes memorial lectures), 1001
- Hueppe (Prof. F.), awarded the Goethe medal by the Chancellor of the Reich, 797
- Huggins (Dr. C. B.), awarded a gold medal by the American Medical Association, 160

- Hughes (Dr. E. D.), awarded a Ramsay memorial British fellowship, 584; Prof. C. K. Ingold and A. D. Scott, Unimolecular Elimination and the Significance of the Electrical Conduction, Racemization and Halogen Replacement of Organic Halides in Solution, 120; [W. A. Cowdrey, Prof. C. K. Ingold and], Reaction Kinetics and the Walden Inversion, 759
- Hulbert (E. O.), [L. C. Young and], Radio and the Sun-spot Cycle, 472
- Hull (A. W.), Changing Direct Current to Alternating Current by means of Thyratrons, 415
- Hull (Prof. G. F.), An Elementary Survey of Modern Physics (*Review*), 952
- Hulme (Dr. H. R.), appointed lecturer in applied mathematics in Liverpool University, 46
- Hume-Rothery (Dr. W.), The Structure of Metals and Alloys (*Review*), 7
- Humphries (C. F.), and W. E. Frost, Chironomid Fauna of the Mosses of the River Liffey, 300
- Humphries (Dr. E. C.), [Dr. C. H. Douglas Clark and], Kerr Constants of the Hydrogen Halide Gases, 248
- Hund (A.), Phenomena in High-Frequency Systems (*Review*), 9
- Hunter (A.), and Dr. R. W. B. Pearse, Sensitivity of Photographic Plates in the region $\lambda\lambda$ 2500-2100Å., 37
- Hunter (Dr. D.), Saints and Martyrs, 1048
- Hunter (H.), appointed director of the Plant Breeding Institute of Cambridge University, 693
- Hunter (Dr. Monica), Reaction to Conquest: Effects of Contact with Europeans on the Pondo of South Africa (*Review*), 947
- Hunter (Dr. R. F.), appointed assistant lecturer in chemistry in Manchester University, 772; and Prof. R. Samuel, Valency and Molecular Structure, 411; [Dr. R. D. Desai and], Non-Existence of Multiplanar Cyclohexane Rings, 548
- Hupkes (W.), Diesel-Electric Traction on the Netherlands Railways, 174
- Hurgonje (Prof. S.), [obituary article], 317
- Hurst (Dr. C. C.), Heredity and the Ascent of Man (*Review*), 743
- Hurst (C.), [E. T. Booth and], Nuclear Reactions due to Neutrons of 2 m.e.v. Energy, 367; Scattering of Neutrons by Protons, 1011
- Hurst (D. G.), [Prof. W. H. Watson and], Transparency of Sodium and Potassium Films in the Schumann Region, 124
- Hurt (Dr. P.), Teaching the use of Libraries, 597
- Husband (Prof. J.), granted the title of emeritus professor by Sheffield University, 895
- Husimi (K.), [S. Kikuchi, H. Aoki and], Experiments with Neutrons, 252; Emission of Beta-Rays from Substances Bombarded with Neutrons, 841
- Hutchinson (Dr. J. B.), Inheritance in Cotton, 471
- Hutchison (Dr. R.), and Prof. V. H. Motttram, Food and the Principles of Dietetics. Eighth edition (*Review*), 994
- Hutt (Prof. W. H.), Economists and the Public: a Study of Competition and Opinion (*Review*), 1037
- Hutton (C. O.), awarded an external studentship at Emmanuel College, Cambridge, 299
- Hutton (F. W.), centenary of the birth of, 833
- Hutton (Dr. J. H.), appointed a lecturer in the faculty of archaeology and anthropology in Cambridge University; work of, 394
- Hutton (Prof. R. S.), elected a professorial fellow of Clare College, Cambridge, 299
- Huxley (Dr. J. S.), Natural Selection and Evolutionary Progress, 451; 571; 603; and others, Genetics and Ecology in relation to Selection, 748
- Hyde, Bt. (Sir Charles), gift to Birmingham University, 156
- Ide (J. M.), Elastic Properties of Rocks, 775
- Ikeda (Prof. K.), [obituary article], 318
- Imms (Dr. A. D.), Control of the Prickly-pear in Australia, 911
- Ingold (Prof. C. K.), [Dr. E. D. Hughes, A. D. Scott and], Unimolecular Elimination and the Significance of the Electrical Conduction, Racemization and Halogen Replacement of Organic Halides in Solution, 120; Structure of Benzene, 472; [W. A. Cowdrey, Dr. E. D. Hughes and], Reaction Kinetics and the Walden Inversion, 759
- Ionescu (T. V.), Luminous Discharges observed in the Magnetic Field at Pressures below 10^{-4} mm. of Mercury, 90
- Iredale (Dr. T.), Isotopes and Molecular Asymmetry, 292
- Irmann (Dr. R.), [Prof. A. von Zeerleder and], Strength of Pure Aluminium and various Aluminium Alloys after Heating, 691
- Irvine (Sir James), The Use of Knowledge, 67
- Irving (Dr. H. M. N. H.), appointed tutor in natural science at St. Edmund Hall, Oxford, 693
- Ishii (C.), [Dr. Y. Nishina and], A Cosmic Ray Burst at a Depth Equivalent to 800 m. of Water, 721
- Ising (Dr. G.), and Dr. T. Eeg-Olofsson, Gravity Measurements in Sweden, 889
- de l'Isle (Jean-Baptiste-Louis Romé), bicentenary of the birth of, 319
- Israel (H. R.), Californian Shrimps of Commerce, 208
- van Itersen, jun. (Prof. G.), Structure of the Wall of *Valonia*, 364
- Iwanenko (Dr. D.), and A. Sokolow, Interaction of Heavy Nuclear Particles, 246; Self-Interaction of Neutrons and Protons, 684
- Iyer (L. K. Ananthakrishna), The Mysore Tribes and Castes. Vol. I (*Review*), 225
- Iyer (V. D.), Typhoons and Indian Weather, 936
- Jackson (C.), Discovery of a Nova in Sagittarius, 681
- Jackson (Sir Herbert), [death], 1044
- Jacob (H. E.), translated by Eden and Cedar Paul, The Saga of Coffee: the Biography of an Economic Product (*Review*), 702
- Jacobsen (Dr. J. C.), Correlation between Scattering and Recoil in the Compton Effect, 25
- Jacqué (L.), Mechanical Properties of Steels treated with Hot Hydrogen under Pressure, 985
- Jaeger (Prof. F. M.), Specific Heats of Metals and Alloys at High Temperatures, 211
- Jaffe (B.), Outposts of Science: a Journey to the Workshops of our Leading Men of Science (*Review*), 740
- Jahn (Dr. H. A.), [Dr. W. H. J. Childs and], Absorption Spectrum of Heavy Methane (CH_3D) in the Photographic Infra-Red, 285
- James (R. R.), [J. H. Bloom and], Medical Practitioners in the Diocese of London licensed under the Act of 3 Henry VIII, C. II; an Annotated List 1529-1725 (*Review*), 142
- Jeans (Sir James), Some Problems of Present-day Astronomy, 538
- Jeffreys (Dr. H.), Reliability of Seismograph Stations, 464
- Jelley (Dr. E. E.), Spectral Absorption and Fluorescence of Dyes in the Molecular State, 1009
- Jenkin (Penelope M.), Ecology of Alkaline Lakes of the Rift Valley, 554
- Jenkins (Rhys), Heat Engine Idea in the Seventeenth Century, 794
- Jensen (H. L.), Microbiology of Australian Soils, 208
- Jespersen (Dr. P.), Oceanic Macroplankton of the *Dana* Expeditions, 45
- Jessen (K.), New Archaeological Datings in Danish Pollen Diagrams, 695
- Jeunehomme (W.), [P. Goldfinger, B. Rosen and], Dissociation Energy of Diatomic Sulphur, Selenium and Tellurium Vapours, 205
- Jevons (Dr. W.), [L. A. Bashford, Prof. H. V. A. Briscoe and], Ultra-Violet Band Systems of the Emitters GeCl and GeBr , 883
- Jewkes (J.), elected professor of social economics in Manchester University, 68
- Joad (C. E. M.), Guide to Philosophy (*Review*), 100
- Joerg (W. L. G.), Topographical Results of Ellsworth's Trans-Antarctic Flight, 238

- Johnson (Dr. C. E.), [death], 154
 Johnson (Dr. C. H.), and F. T. Hamblin, Radioactive Isotopes of Bromine, 504
 Johnson (Prof. D.), Carolina 'Bays', 471
 Johnson (Dr. N. G.), Effects of Chemical Combination with Oxygen and Fluorine on the $K\alpha_{1,2}$ -Doublet of some of the Lighter Elements, 1056
 Johnson (R. I.), [Dr. W. Clayton, S. Back, J. F. Morse and], Inhibited Deposition of Stearin from Chilled Olive Oil, 801
 Joliot-Curie (Mme.), resignation of under-secretaryship for scientific investigation in the French Cabinet to occupy a chair in the Faculty of Natural Science at the Sorbonne, 797
 Jolley (E. H.), [L. H. Harris, F. D. Morrell and], Developments in British Telegraph Services, 893
 Jolliffe (Prof. A. E.), title of emeritus professor conferred upon, by London University, 1110
 Jones (C. L.), [Prof. E. L. Quinn and], Carbon Dioxide (*Review*), 993
 Jones (D.A.), [obituary article], 871
 Jones (E. B.), [Dr. H. L. Brose and], Colorimetric Estimation of Phosphorus, 644; An Effect of X-Radiation on the Blood, 687
 Jones (Dr. F. Ll.), and W. R. Galloway, Sparking Potential of Mercury Vapour, 973
 Jones (Prof. F. Wood), The McCoy Society's Expedition to Lady Julia Percy Island, 906
 Jones (F. W.), [C. Sykes and], Order—Disorder Transition in Alloys, 936
 Jones (Dr. H. Spencer), The Royal Research Ship *Research* 230; Astronomical Telescopes (*Review*), 738
 Jones (Miss I.), Nursery Education in Lancashire, 731
 Jones (M. T.), [T. R. Cuykendall and], Absorption of Short X-Rays, 513
 Jones (T. O.), [N. F. Hall and], Protium-Deuterium Ratio in Water, 1021
 Jones (W. J.), Domestic Lighting, 795
 Jones (Prof. W. Neilson), Genetics in the Universities, 1058
 Joplin (G. A.), Ben Bullen Plutonic Complex, N.S.W., 259
 Jordan (Prof. E. O.), [death], 914
 Jordan (Prof. P.), Aushauliche Quantentheorie: eine Einführung in die moderne Auffassung der Quantenerscheinungen (*Review*), 1076
 Jowett (Dr. H. A. D.), [death], 318; [obituary article], 355
 Joy (Dr. N. H.), How to Know British Birds (*Review*), 424
 Joyet-Lavergne (P.), Valuation of the Power of Oxidation Catalysis in the Living Cell, 1027
 Judge (A. W.), High Speed Diesel Engines: with Special Reference to Automobile and Aircraft Types. Second edition (*Review*), 527; Maintenance of High-Speed Diesel Engines (*Review*), 527; Stereoscopic Photography: its Application to Science, Industry and Education. Second edition (*Review*), 637
 Junge (Dr. G. C. A.), Bones of a Whale from the Wieringermeer, Zuider Zee, 78
 Just (Prof. G.), Praktische Übungen zur Vererbungslehre: für Studierende, Ärzte und Lehrer. Zweite Auflage. Teil 1 (*Review*), 784
 Kagwa (Sir Apolo), translated by E. B. Kalibala, edited by May Mandelbaum (Edel), Baganda History and Institutions, 540
 Kahane (E.), and Mlle. Jeanne Lévy, Origin of the Choline of Sperm, 258
 Kahovec (L.), and K. W. F. Kohlrausch, Raman Spectrum of Hydrazine and its Hydrate, 562
 Kalchar (Dr. H.), Inhibitory Effect of Phloridzin and Phloretin on Kidney Phosphatase, 289
 Kalinin (V. S.), [Dr. S. G. Levit, S. G. Ginsburg, R. G. Feinberg and], Immunological Detection of the Y-Chromosome in *Drosophila melanogaster*, 78
 Kaplan (Prof. J.), Effect of Oxygen on the Auroral Afterglow, 35
 Kaptereff (P. N.), Viability of Plant Structures, 540; Plant Organisms in Permanently Frozen Subsoil, 714
 Kármán (Prof. T. Von), appointed Rouse Ball lecturer in Cambridge University for 1936-37, 810
 Karpinsky (Prof. A. P.), [death], 154; [obituary article], 495
 Katunskij (V.), Movement of Growth-promoting Substance and the Growth of Plants in an Electric Field, 656
 Katz (M. L.), (Prof. M. Schein and), Ultra-violet Luminescence of Sodium Chloride, 883
 Kay (H. D.), [S. J. Folley and], Phosphatase of Cow's Milk, 767
 Kaye (Dr. G. W. C.), Measurement of γ -Radiations, 606; and Prof. T. H. Laby, Tables of Physical and Chemical Constants and some Mathematical Functions. Eighth edition (*Review*), 635
 Keeble (Sir F. W.), Polly and Freddie (*Review*), 1035
 Keeling (Dr. S. V.), given the title of reader by London University, 1110
 Keesom (Prof.), and Dr. W. Tuyn, Temperature Scale, 977
 Keith (Sir Arthur), Origins of Modern Races of Mankind, 194; Chronology of Early Man and Cultural Associations, 277
 Kelley (Prof. T. L.), Essential Traits of Mental Life (*Review*), 952
 Kemp (J. D.), [E. A. Long and], Entropy of Deuterium Oxide, 890
 Kemp (Dr. Stanley), appointed secretary of the Marine Biological Association of the United Kingdom and director of the Marine Biological Laboratory at Plymouth; work of, 235
 Kempton (J. K.), [R. A. Emerson and], The Maize Survey, 1090
 Kendall (Prof. J.), Prof. A. A. Noyes, 17; Theory and Practice of Electrochemistry (*Review*), 144
 Kennaway (Prof. E. L.), awarded a prize by the International Union against Cancer for cancer research, 579
 Kennedy (Dr. F.), Effects of Noise, 935
 Kennet (Lord), Consumption of Statistics, 876
 Kenyon (Miss Kathleen), Excavations of Roman Leicester, 69
 Keogh (Lt.-Gen. Sir Alfred), [death], 235; [obituary article], 392
 Kerr (Prof. J. Graham), gift to Glasgow University, 731
 Kessenich (Prof. W.), Russian Eclipse Measurements on the Ionosphere, 195
 Kettle (Prof. E. H.), [death], 960; [obituary article], 1044
 Keys (Prof. D. A.), [Prof. A. S. Eve, Prof. C. E. Mendenhall and], College Physics (*Review*), 183
 Khambata (B. S.), and A. Wassermann, Kinetics of an Inverse Diene Synthesis in the Pure Liquid state, 368
 Khan (M. A. R.), Luminosity of Meteoric Trails, 933
 Kidd (Dr. F.), Food Preservation, 745; and West, Gas Storage of Apples, 1062
 Kidder (Dr. A. V.), Central American Studies: The Copan Project, 1089; The Maize Survey, 1090
 Kikoin (A. K.), [L. W. Shubnikov and], Optical Experiments on Liquid Helium II, 641
 Kikuchi (S.), H. Aoki and K. Husimi, Experiments with Neutrons, 252; Emission of Beta-Rays from Substances Bombarded with Neutrons, 841
 Kimble (G. T. H.), appointed lecturer in geography in Reading University, 136
 King (A. J.), [B. G. Churcher and], Measurements of Noise, 329
 King (Sohtsu G.), gift of conchological literature to the Science Society of China Library, Shanghai, 110
 Kingdon-Ward (Capt. F.), Plant Hunting and Exploration in Tibet, 516
 Kinnersley (H. W.), Potassium in the Brain in Vitamin B₁ Deficiency, 368
 Kinoshita, Sex Change in a Fish, 40
 Kintner (Dr. S. M.), [death], 751
 Kipping (Prof. F. S.), Organic Derivatives of Silicon (Bakerian lecture), 41
 Kirby (J.), [Dr. G. C. M. McGonigle and], Poverty and Public Health (*Review*), 482
 Kirkby (Dr. W. A.), appointed lecturer in fuel technology in Sheffield University, 693
 Kitching (G. C.), The Manatee of St. Helena, 33

- Kitching (Dr. J. A.), Effects of Hypertonic Media on the Contractile Vacuoles of Protozoa, 287; appointed lecturer in experimental zoology in Edinburgh University, 1110
- Kiu (Tien), Photographic Plates Sensitized with Sodium Salicylate, 1112
- Kiyohara (K.), The Plant Chloroplast, 848
- Kleinholz (L. H.), Reptilian Colour Changes (1), 600
- Klieneberger (E.), Baron Axel von Klinckowström, 154
- Kliger (I. J.), Inhibitive Effect of Vitamin C on Toxin Production by *C. Diphtheria*, 291
- Klinckowström (Baron Axel von), [obituary article], 154
- Klotz (Prof. O.), [death], 914
- Knappen (Phoebe), Food of Passenger Pigeon, 1061
- Knight (Dr. B. H.), Road Aggregates: their Uses and Testing (*Review*), 951
- Knight (B. C. J. G.), Bacterial Nutrition, 474
- Knopf, (Prof. O.), Eightieth birthday of, 718
- Knowles (Lt.-Col. R.), [death], 609; [obituary article], 872
- Knowlton (Prof. A. A.), and Prof. M. O'Day, Laboratory Manual in Physics. Second edition (*Review*), 183
- Knox (T. M.), appointed professor of moral philosophy in St. Andrews University, 89
- Koba (K.), Revision of the Specific Name of a Crab as a Second Intermediate Host of *Paragonimus westermani* in Formosa, 1062
- Koehler (Prof. W. A.), Principles and Applications of Electrochemistry. In 2 Vols. Vol. 2: Applications (*Review*), 144
- Kohl-Larsen (Dr. L.), awarded the silver Leibniz medal of the Prussian Academy of Sciences, 460
- Kohlrausch (F.), Praktische Physik. Siebzehnte Auflage. Herausgegeben von F. Henning (*Review*), 183
- Kohlrausch (K. W. F.), [L. Kahovec and], Raman Spectrum of Hydrazine and its Hydrate, 562
- Kolkwitz (Prof. R.), elected an honorary member of the Botanical Society of Japan, 1093
- Koller (P. C.), Chromosomes of the Male Grey Squirrel, 178; [Prof. F. A. E. Crew and], Genetical and Cytological Studies of the Intergenic Hybrid of *Cairina moschata* and *Anas platyrhynchos platyrhynchos*, 178
- Kolodziejski, Larval Transplantation in Axolotl, 371
- Köppen (Prof. W.), Ninetieth birthday of, 718
- Körber (Prof. F.), elected a corresponding member of the Royal Swedish Academy of Engineering Science, 502
- Kovacs (Dr.), nominated an honorary member of the German Statistical Society, 361
- Kramp (Dr. P. L.), The Medusæ *Eirene* and *Helgicirrho*, 333
- Krausz (S.), [P. Túry and], Effect of Molecular Nitrogen on Molybdenum at High Temperatures, 331
- Krauz (Prof. C.), and Dr. J. M. Štěpánek, Constitution of Tetranitromethane, 807
- Krebs (Dr. H. A.), Intermediate Metabolism of Carbohydrates, 288
- Krentz (S.), Luminescence of Some Minerals, 733
- Krook (M.), elected an Isaac Newton student in Cambridge University, 895
- de Kruif (Dr. P.), in collaboration with Rhea de Kruif, Why Keep them Alive? (*Review*), 523
- Krumbein (W. C.), [C. Croneis and], Down to Earth: an Introduction to Geology (*Review*), 527
- Kun (H.), [E. Steinach, O. Peozenik and], Action of Sex Hormones (1, 2, 3), 49
- Kunashera (K.), and B. Brunowsky, Radioactive Elements in Plants, 726
- Kunzl (V.), [Prof. V. Dolejšek and], The M_{IV,V}-Absorption Edges of Protactinium (At. No. 91), 590
- Küster (Prof. E.), Die Pflanzenzelle Vorlesungen über normale und pathologische Zytomorphologie und Zytogenese (*Review*), 623
- Laby (Prof. T. H.), [Dr. G. W. C. Kaye and], Tables of Physical and Chemical Constants and Some Mathematical Functions. Eighth edition (*Review*), 635
- Lacroix (A.), Meteorites (Æroliths) Found in the Tanezrouft (Western Sahara), 984
- Ladner (A. W.), and C. R. Stoner, Short Wave Wireless Communication. Third edition (*Review*), 822
- Lagrange (Prof. E.), [obituary article], 750
- Lagrula (J.), Method of Simultaneous Pupillary Regions, 179
- Laidlaw (Sir Patrick), and W. J. Elford, New Group of Filterable Organisms, 648
- Lambert (H. G.), and P. E. Andrews, Light and Sound (*Review*), 183
- Lämmel (Dr. R.), Die menschlichen Rassen (*Review*), 666
- Lamont (Dr. A.), appointed assistant lecturer in geology in Birmingham University, 215; Palæozoic Seismicity, 243
- Lampitt (Dr. L. H.), Preparation of Food, 745
- Lanchester (Dr. F. W.), Part Played by Skin-Friction in Aeronautics, 1022
- Landau (Dr. L.), The Theory of Phase Transitions, 840; [A. Akhieser, I. Pomeranchuk and], Scattering of Light by Light, 206
- Landes (Prof. H.), [death], 832
- Landis (P. H.), Control of the Romantic Impulse through Education, 558
- Lang (Miss Edith Mary Valentine Scott), bequest to St. Andrews University, 853
- Lang (K.), Northern Harpacticids, 647
- Langdon-Brown (Sir Walter), The Background to Harvey (Harveian Oration), 833
- de Lange, The Chordate Head, 471
- Langlands (I.), Testing Green Karri Timber, 170
- Lansade (M.), [E. Foex and], Pathogenic Action of a Bacterium Isolated from Potato Tubers, 138
- de Lapparent (J.), Generating Media of Montmorillonite and of Sepiolite, 695
- Larmor (Prof. A.), [death], 712; [obituary article], 791
- Larmor (Sir Joseph), The Nature of Viscid Fluid Threads, 74; Physiological Potency of Dilute Traces, 929
- La Rue (C. D.), Effect of Auxin on the Abscission of Petioles, 91
- Lasnitzki (Dr. A.), and Dr. M. Lasnitzki, Comparison of Mineral and Biological Potassium in Diet Experiments, 799
- Lasnitzki (Dr. M.), [Dr. A. Lasnitzki and], Comparison of Mineral and Biological Potassium in Diet Experiments, 799
- Laszt (L.), [Prof. F. Verzář and], Sodium and Water Metabolism in Relation to Disturbances of Carbohydrate Metabolism after Adrenalectomy, 844
- Laurie (A. H.), The Stock of Antarctic Blue Whales, 33
- Laurie (Prof. A. P.), Formulæ of Medieval Painters (*Review*), 266
- Lauwerys (J. A.), The Teaching of Science in Schools, 205
- Law (R. K.), appointed a member of the Industrial Health Research Board of the Medical Research Council, 199
- Lawrence (E. O.), [J. M. Cork and], Transmutation of Platinum by Deuterons, 130; [J. H. Lawrence, P. C. Aebersold and], Comparative Effects of X-Rays and Neutrons on Normal and Tumour Tissue, 943
- Lawrence (J. H.), P. C. Aebersold and E. O. Lawrence, Comparative Effects of X-Rays and Neutrons on Normal and Tumour Tissue, 943
- Lawrow (Prof. B. A.), Prof. W. M. Rodionow, E. M. Bomdas and N. S. Jarussowa, Antiscorbic Activity of a Derivative of Gluconic Acid, 40
- Laws (Prof. F. A.), [death], 1088
- Lea (late A. M.), [J. T. Gray and], Food of Australian Birds, 592
- Lea (Dr. D. E.), and others, Measurement of Ionization Current, 1024
- Lea (Prof. F. C.), granted the title of emeritus professor by Sheffield University, 895
- Lea (Dr. F. M.), International Commission on Large Dams: Congress at Washington, 768
- Leakey (Dr. L. S. B.), Fossil Human Remains from Kanam, and Kanjera, Kenya Colony, 643; A New Fossil Skull from Eyassi, East Africa: Discovery by a German Expedition, 1082
- Le Blanc (Prof. M.), elected an honorary member of the German Bunsen Society, 282
- Leblond (C. P.), [A. Giroud and], Value of the Acid Silver Nitrate Reaction as a Test of Ascorbic Acid, 247

- Le Chatelier (Prof. H.), [death], 609; [obituary article], 711
- Leclainche (Dr. E.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Lecoin (M.), Form of the Continuous β -Spectrum of Radium E, 414
- Lecomte (J.), Infra-Red Absorption Spectra and the Modes of Vibration of Organic Compounds, 138
- Ledermann (W.), Singular Pencils of Zehfuss, Compound and Schläflian Matrices, 48
- Lee (C. A.), Some Problems of a Small Manufacturing Business, 653
- Lee (R. C.), [F. G. Benedict and], Body Temperatures of Elephants, 415
- Léemann (Dr. A. C.), Translocation of Solutes in Plants, 1099
- Leeper (G. W.), Ann Nicholls and S. M. Wadham, Soil and Pasture Studies in the Mount Gellibrand Area, Western District of Victoria, 520
- Lefebvre (H.), and R. Faivre, Oxidation of Coal, 943
- Lefol (J.), [R. Dubrisay and], Saline Hydrates, 476
- Leighton (Dr. G.), Supervision of the Nation's Food Supply (Benjamin Ward Richardson lecture), 1006
- Leiper (Margaret), [May Smith and], Sickness Absence Wastage in Industry, 408
- Leipunsky (A. I.), [V. Fomin, F. G. Houtermans, L. B. Rusinow, L. W. Schubnikow and], Neutron Absorption of Boron and Cadmium at Low Temperatures, 505
- Leith (Prof. R. F. C.), [death], 1088
- Leitner (I.), Quantum Yield in the Coloration of Rock Salt by X-, γ -, and β -rays, 415
- Leivesley (H. G.), Electrically Driven Steering Gear, 555; Steamship Communication between Europe and America, 925
- Lejeune (Mlle. Maria), Means of Isolating the Micro-Fossils included in Flints, 561
- Leloup (Dr. E.), Hydroids from the West Indies, 409
- Lench (A.), [G. J. Burrows and], Derivatives of Zinc Halides with Tertiary Arsines; Co-ordination Compounds of Cadmium with Tertiary Arsines, 813
- Lesheim (Prof. H.), Diamagnetism and Particle Size, 848
- Lester (P.), et Prof. J. Millot, Les races humaines (*Review*), 570
- Le Sueur (A. D. C.), Care of Old Trees, 109
- Leuchs (Prof. K.), Geologie von Asien. Band 1, Teil 1 (*Review*), 228
- Levan (A.), Different Results in Reciprocal Crosses between Diploid and Triploid *Allium Schænoprasum* L., 508
- Levi-Civita (Prof. T.), Relativistic Problem of Two Bodies, 171
- Levit (Dr. S. G.), S. G. Ginsburg, V. S. Kalinin and R. G. Feinberg, Immunological Detection of the Y-Chromosome in *Drosophila melanogaster*, 78
- Levitt (J.), and G. W. Searth, Studies of Frost Hardening, 806
- Levy (Prof. H.), Determinism and Man (*Review*), 6
- Lévy (Mlle. Jeanne), [E. Kahane and], Origin of the Choline of Sperm, 258
- Levy (Dr. L. F.), State of Ascorbic Acid in Plant Tissues, 933
- Levyns (Mrs. M. R.), The Genus *Stoebe*, 217
- Lewin (L.), Ranges of Particles Emitted by Samarium, 326
- Lewis (E. I.), Preparation for Business Careers, 732
- Lewis (F.), The Lyre-bird in Victoria, 926
- Lewis (F. C.), [obituary article], 276
- Lewis (Sir Thomas), Vascular Disorders of the Limbs: described for Practitioners and Students (*Review*), 619
- Lichtenfeld (A.), and K. Schwarz, Theory of Kikuchi Lines Studied by Means of Models, 218
- Lichtschein (J.), [Dr. G. Groetzinger and], The Crystal Photo-Effect and Rectifying Action in the Bulk of the Crystal, 163
- Limaye (V. D.), [L. N. Seaman and], Rules for the Grading of Teak Squares, 1007
- Lindemann (Prof. F. A.), Theoretical Aspects of Low Temperature Research, 190
- Lindsay (Prof. R. B.), and Prof. H. Margenau, Foundations of Physics (*Review*), 187
- Linsdale (Dr. Jean M.), Coloration of Nest Linings and Nestlings, 470
- Linstead (H. N.), Poisons Law: with a Chapter upon the International Background of Dangerous Drugs Legislation, by Sir Malcolm Delevinge (*Review*), 666
- Lipmann (F.), Fermentation of Phosphogluconic Acid, 588; Hydrogenation of Vitamin B₁, 1097
- Lips (Dr. E. M. H.), and J. Sack, A Hardness Tester for Microscopical Objects, 328
- Littlejohn (L. H.), awarded a Colonial agricultural research scholarship, 731
- Littlejohns (R. T.), The Lyre-bird in Victoria, 926
- Liu (Prof. C. H.), Tattooing in China, 370
- Livingood (J. J. and J. J.), and G. Seaborg, Production of Artificial Radioactivity by Deuterons, 1021
- Livingstone (Sir Richard), The Future in Education, 456; 601
- Lizowski (Prof. Z.), Present Position of Science in Poznań, 501
- Ljungdahl (Dr. G. S.), Gravity Measurements in Sweden, 890
- Lloyd (Dr. D. Jordan), [Dr. D. M. Wrinch and], The Hydrogen Bond and the Structure of Proteins, 758
- Lloyd (Prof. T. C.), [A. F. Puchstein and], Alternating-Current Machines (*Review*), 666
- Lobeck (H.), [Prof. H. Erlenmeyer, Prof. K. Fromherz and], Acetylcholine Containing Heavy Hydrogen, 1063
- Lochhead (J. H.), Body Orientation of the Lower Crustacea (Branchiopoda), 232
- Lock (G.), and G. Nottes, Derivatives of 3, 5-Dimethoxybenzaldehyde (5), 49
- Locket (G. H.), Regeneration in Arachnida, 885
- Lockley (R. M.), Birds of the Green Belt and the Country Around London (*Review*), 424
- Lockyer (Dr. W. J. S.), [obituary article], 153
- Loescheke (Prof. H.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Loewi (Prof. O.), awarded half of the Nobel prize for medicine for 1936; work of, 792
- Loleit (H.), [F. A. Paneth, E. Gluckauf and], Helium Produced in Artificial Transmutation, 1105
- Lombard (V.), C. Eichner and M. Albert, Permeability of Palladium to Hydrogen, 48
- Long (E. A.), and J. D. Kemp, Entropy of Deuterium Oxide, 890
- Longchambon (H.), and G. Migeon, The Sepiolites, 561
- Longobardi (C.), translated by Olivia Rossetti Agresti, Land-Reclamation in Italy: Rural Revival in the Building of a Nation (*Review*), 4
- Lonsdale (Dr. Kathleen), Simplified Structure Factor and Electron Density Formulae for the 230 Space Groups of Mathematical Crystallography (*Review*), 627
- Lotmar (W.), [K. H. Meyer and], Elementary Lattice of Crystallized Caoutchouc, 259
- Lotz (Prof. H.), awarded the gold Leibniz medal of the Prussian Academy of Sciences, 460
- Loudon (J. C.), and the Waterloo Beeches, 277
- Love (Dr. R. M.), Occurrence of Haploid Pollen Mother Cells in a *Vulgaris* Wheat, 589
- Lovejoy (A. V.), and G. Boas, with Supplementary Essays by W. F. Albright and P. E. Dumont, A Documentary History of Primitivism and Related Ideas. Vol. 1 (*Review*), 187
- Lovell (A. C.), appointed assistant lecturer in physics in Manchester University, 772
- Lovell (A. C. B.), Thin Metallic Films, 1063
- Lowe (Prof. C. Van Riet), Rock Engravings in the Vaal River Basin, 599; Archaeological Investigations in the Northern Transvaal, 580
- Lowe (W. P.), New British Bird, 251
- Lowndes (A. G.), Flagella Movement, 210
- Lowry (Prof. T. M.), [death], 791; [obituary article], 912
- Lucas (A. H. S.), [obituary article], 234
- Lucas (G. S.), and E. S. Hall, Radio Relay Services, 541
- Lucas (R.), Specific Heats of Liquids and Gases, 896

- Lüdi (W.), Das Grosse Moos im westschweizerischen Seelande und die Geschichte seiner Entstehung (*Review*), 187
- Ludlam (G. B.), awarded a junior fellowship by the Medical Research Council, 879
- Lugeon (Prof. M.), elected an honorary foreign fellow of the Royal Society of Edinburgh, 67
- Lugt (G. J.), Design of Fuel Injectors for Diesel Engines, 174
- Luke (Sir Harry), The Making of Modern Turkey, from Byzantium to Angora (*Review*), 743
- Luke (K. D.), Dr. W. M. Madgin and Dr. H. L. Riley, Formation of Carbon Dendrites, 161
- Lull (Prof. R. S.), Fossils (*Review*), 862
- Lundgren (Dr. H. P.), Association and Dissociation Reactions of Thyroglobulin, 122
- Luntz (M.), [D. Avsec and], Electro-convective Vortices, 1112
- Lynch (Dr. G. R.), The Analytical Chemist and Food Science, 746
- Lyons (J.), Influence of Chemical Composition on the Firmness of Butter, 338
- Macadam (J. L.), centenary of the death of, 869; 874
- Macalpine (Commr. T. W.), Improvement of Scientific and Technical Literature, 398
- McAulay (Prof. A. L.), F. D. Cruickshank and R. G. Brett, Chromosome Number of *Eucalyptus globulus* and *Eucalyptus Johnstoni*, 550
- Macaulay (Dr. J. M.), Range of Action of Surface Forces, 587
- Macaulay (W. H.), [death], 960
- MacBride (Prof. E. W.), Insect Coloration and Natural Selection, 365; Natural Selection, 884; title of emeritus professor conferred upon, by London University, 1110
- McCallien (W. J.), [E. B. Bailey and], Perthshire Tectonics; Schiehallion to Glen Lyon, 896
- McClellan (Capt. W. N.), Work of River Flow Records, 582
- McCrae (R.), Application of Influence Lines to the Stress Analysis of Beams and Lattice Girders. Part 2, 852
- McCrea (Dr. W. H.), appointed professor of mathematics in Queen's University, Belfast, 136
- McCulloch (Rev. G.), A Parson in Revolt (*Review*), 634
- MacCurdy (Dr. G. G.), The Coming of Man (*Review*), 862
- Macdonald (Sir George), elected an honorary fellow of Balliol College, Oxford, 46
- MacDougall (G. D. A.), appointed assistant lecturer in economics in Leeds University, 215
- MacDowall (A. B.), ninety-third birthday of, work of, 1045
- MacDowall (Prof. R. J. S.), Circulation of the Blood, 454; 488
- McGee (Dr. J. D.), Campbell Swinton and Television, 674
- M'Gonigle (Dr. G. C. M.), and J. Kirby, Poverty and Public Health (*Review*), 482
- McGowan (G. K.), and Prof. R. A. Peters, Carbohydrate Metabolism, 552
- MacGregor (A. G.), Geology of Montserrat, 1069
- Machotin (A.), Reduction Phenomena in the Morphology of the Adult Moth *Operophtera brumata* L., 657
- McIntosh (Dr. T. P.), Varietal Difference in the Potato, 294
- Mack (G. L.), The State of Ascorbic Acid in Plant Tissues, 505
- Mackail (J. W.), Human History and Geographical Discovery, 613
- Mackay (Prof. C. O.), Graphical Solutions (*Review*), 864
- McKay (R.), Loose Smut of Oats, 513
- McKenzie (A. E. E.), Light (*Review*), 636
- Mackenzie (Dr. A. H.), [death], 609; 681
- McKenzie (D. B.), [Dr. T. E. Allibone, F. R. Perry and], Impulse Voltages for Transformer Testing, 937
- Mackintosh (Dr. N. A.), South Sandwich Trench, 726
- Macklin (Dr. Madge T.), Two-factor Inheritance in Man, 847
- MacLagan (Sir Eric), Museums and the Public, 172
- Maclean (Prof. J.), Mathematics in Bombay, 21
- MacLeod (Brig.), Co-ordination of African Surveys, 255
- MacLeod (Dr. J.), A New Blowfly Attacking Sheep in Western Scotland, 467
- McMahon (Sir Henry), One Hundred and Eighty Years of Pioneer Work by the Royal Society of Arts, 834
- McMichael (Dr. J.), awarded the E. Alan Johnston and Lawrence research fellowship in medicine, 134
- MacMillan (Prof. W. D.), Theoretical Mechanics: Dynamics of Rigid Bodies (*Review*), 264
- McMinn (Prof. H. E.), and Evelyn Maino, An Illustrated Manual of Pacific Coast Trees, with List of Trees Recommended for Various Uses on the Pacific Coast, by Prof. H. W. Shepherd (*Review*), 570
- Macnaughton (D. J.), and others, Developments in Electroplating, 707
- McNee (Dr. J. W.), appointed regius professor of the practice of medicine in Glasgow University, 731
- McPhee (E. T.), Official Year Book of the Commonwealth of Australia. No. 28, 1935 (*Review*), 9
- MacRobert (Prof. T. M.), Some Formulæ for the Associated Legendre Functions of the Second Kind, with Corresponding Formulæ for the Bessel Functions, 896
- McSwiney (Prof. B. A.), appointed a member of the Industrial Health Research Board of the Medical Research Council, 199
- McVicar (G. A.), [Prof. R. A. Cleghorn and], High Potassium Diet and the Survival of Adrenalectomized Rats, 124
- McWilliam (J. M.), The Birds of the Firth of Clyde (*Review*), 424
- Macht (D. I.), and R. E. Gardner, Phytopharmacological Reactions of Normal, Toxic and Atoxic Sera, 414
- Madgin (Dr. W. M.), [K. D. Luke, Dr. H. L. Riley and], Formation of Carbon Dendrites, 161
- Madsen (Dr. C. B.), Radioactive Isotopes of Nickel and Copper, 722
- Madsen (H.), Shore Fauna of the Arctic, 806
- Maegraith (B. G.), [J. A. Moy-Thomas and], awarded the Rolleston memorial prize of Oxford University, 853
- Magat (Dr. M.), Tables annuelles de constantes et données numériques de chimie, physique, biologie et technologie. Années: 1931 à 1934 (*Review*), 743; [H. Moureu, G. Wettröff and], Two Forms of Phosphorus Pentachloride, 476
- Mahajani (Dr. G. S.), Lessons in Elementary Analysis. Second edition (*Review*), 784
- Maige (Prof. A.), elected a *correspondant* of the Paris Academy of Sciences, 199
- Maillard (A.), Proportion of Deuterium in the Light Hydrocarbons from Petrols of Various Sources of Origin, 897
- Maino (Evelyn), [Prof. H. E. McMinn and], An Illustrated Manual of Pacific Coast Trees, with List of Trees Recommended for Various Uses on the Pacific Coast, by Prof. H. W. Shepherd (*Review*), 570
- Mair (Dr. Lucy Philip), awarded the Wellcome gold medal of the Royal Anthropological Institute, 72; Native Policies in Africa (*Review*), 947
- Maitre (V.), Colour of Stars of the Spectral Types A0, A2, 90
- Makins (F. K.), The Identification of Trees and Shrubs (*Review*), 348
- Malamud (Prof. W.), Outlines of General Psychopathology (*Review*), 386
- Maloeuf (N. S. R.), The Nitroprusside Reaction as a Test for Reduced Glutathione, 75
- Malpas (A. H.), Marine Work in Ceylon, 877
- Mandillon (G.), [L. Espil and], Action of Bromoacetates on Various Alkaloids, 258
- Mankin (Winifred), Quantitative Analysis of Silver-Gold Alloys, 260
- Mann (F. G.), D. Purdie and A. F. Wells, A Co-ordinated Cuprous Complex, 978
- Mann (L.), Bronze Age Burials in Scotland, 236; Antiquities in Shetland, 512
- Manneback (Prof. C.), and A. Verleysen, Provisional Computation of the Plane Vibration Frequencies of Symmetrical Deuteroethylenes, 367

- Mansfield (Lord), Bird-Ringing and Bird Migration, 89
- Manton (Dr. Irene), Spiral Structure of Chromosomes in *Osmunda*, 1058
- Manton (Dr. S. M.), Ecological Surveys of Coral Reefs, 173
- Mapother (Dr. E.), title of professor conferred upon, by London University, 940
- Mapson (Dr. L. W.), [Dr. T. W. Birch and], Role of Adenylic Acid in Vitamin B₁ Deficiency, 27
- Marchand (J. M.), South African Marine Fishes of Commercial and Angling Importance, 796
- Marmont (G.), [C. A. G. Wiersma and], Mechanism of Inhibition of Crayfish (*Cambarus clarkii*) Muscle, 775
- Marr (J. W. S.), awarded the Dr. W. S. Bruce memorial prize, 67
- Marsh (A.), and others, Domestic Cokes, 964
- Marshall (C. W.), The Science of Invention, 539
- Marshall (J.), [K. Groves and], Spray Covering on Apples, 294
- Marston (A. T.), Preliminary Note on a New Fossil Human Skull from Swanscombe, Kent, 200
- Martin (Sir Charles), Control of Rabbit Infestation by the Use of a Virus, 396
- Marvin (F. S.), A Sketch of World History (*Review*), 263 ; Mr. Fisher's History of Europe (*Review*), 903
- Marzenau (Prof. H.), [Prof. R. B. Lindsay and], Foundation of Physics (*Review*), 187
- Maskell [Mason, Phillis and], Problems of Translocation in the Plant, 336
- Mason (E. W.), Some British Coelomycetes (*Review*), 384
- Mason, Maskell and Phillis, Problems of Translocation in the Plant, 336
- Mason (M. H.), The Paradise of Fools : being an Account, by a Member of the Party, of the Expedition which covered 6,300 miles of the Libyan Desert by Motor-Car in 1935 (*Review*), 634
- Massey (Dr. H. S. W.), and R. A. Buckingham, Determination of van der Waals Forces, 77 ; [Prof. D. R. Hartree, Dr. B. Swirles and], Theory of Complex Atoms, 1080
- Mather (K.), Prof. H. J. Muller's 'Out of the Night' (*Review*), 228
- Matheson (A.), Danger Spots, 198
- Mathews (Helen M.), [C. E. Zo Bell and], Qualitative Study of the Bacterial Flow of Sea and Land Breezes, 1070
- Mathis (M.), Diagnosis of Yellow Fever by Intracerebral Inoculation of the Blood of the Patient into White Mice, 656
- Mathur (Prof. K. K.), [death], 496
- Matiegka (Prof. J.), Archæological Discoveries at Předmost, 104
- Mavor (J. A.), Small Craft Types, 1092
- Maxwell (Sir John Stirling), Turf Nurseries, 298
- Maxwell (Marius), [obituary article], 871
- Megaw (Miss H. D.), and Prof. F. Simon, Density and Compressibility of Solid Hydrogen and Deuterium at 4.2° K., 244
- Meillet (Prof. A.), [obituary article], 609
- Mellanby (Prof. E.), awarded the Moxon gold medal of the Royal College of Physicians, 240
- Mellanby (Mrs. H.), appointed honorary research assistant in zoology in Sheffield University, 895
- Mellanby (Prof. J.), appointed a member of the Medical Research Council, 717
- Mellanby (Dr. K.), Humidity and Insect Metabolism, 124 ; appointed honorary lecturer in zoology in Sheffield University, 895
- Mellor (D. P.), and F. M. Quodling, Optical Properties and Crystal Structure of Some Compounds of the Type R_2MX_4 , 477
- Mellor (Dr. J. W.), A Comprehensive Treatise on Inorganic and Theoretical Chemistry. Vol. 15 (*Review*), 310
- Menchoff (Prof. D.), Les conditions de monogénéité, 41
- Mendelssohn (K.), and R. B. Pontius, Time Effects in Supra-Conductors, 29
- Mendenhall (Prof. C. E.), Prof. A. S. Eve and Prof. D. A. Keys, College Physics (*Review*), 183
- Mendive (J. R.), [A. Biasotti, V. Deulofeu and], Hypoglycæmic Action of Histone Insulinate, 1101
- Menzel (Prof. D. H.), Stars and Planets (*Review*), 862
- Menzies (Prof. A. W. C.), [J. T. Miles, R. W. Shearman and], Equilibria in Salt Systems with Deuterium Water, 121 ; [F. T. Miles and], Vapour Pressure of Deuterium Water, 294
- Menzies (W. J. M.), Sea Trout and Trout (*Review*), 308
- Merriam (Prof. H. G.), The Liberal Arts College in State-supported Universities, 983
- Merricks (F.), [death], 17
- Metcalfe (G.), awarded a Frank Smart botany prize of Cambridge University, 89
- Meunier (P.), Aluminium in Animal Tissues, 943
- Meyer (K. H.), and W. Lotmar, Elementary Lattice of Crystallized Caoutchouc, 259
- Meyer (Dr. P.), Colloid Osmotic Pressure of the Body Fluids of Freshwater Animals, 287
- Meyrick (E.), eighty-second birthday of ; work of, 874
- Michels (Prof. A.), C. Michels-Veraart and A. Bijl, Indication of a Decrease in the Polarizability of a Non-Polar Molecule by Pressure, 509
- Michels-Veraart (C.), [Prof. A. Michels, A. Bijl and], Indication of a Decrease in the Polarizability of a Non-Polar Molecule by Pressure, 509
- Mieli (A.), [P. Brunet et], Histoire des sciences : Antiquité (*Review*), 630
- Miesowicz (M.), Influence of the Magnetic Field on the Viscosity of Liquids in the Nematic Phase, 300
- Migeon (G.), [H. Longchambon and], The Sepiolites, 561
- Miles (F. T.), R. W. Shearman and Prof. A. W. C. Menzies, Equilibria in Salt Systems with Deuterium Water, 121 ; and Prof. A. W. C. Menzies, Vapour Pressure of Deuterium Water, 294
- Miles (Dr. H. W.), and Mary Miles. Edited by H. C. Long, Insect Pests of Glasshouse Crops (*Review*), 348
- Miles (Mary), [Dr. H. W. Miles and], Edited by H. C. Long, Insect Pests of Glasshouse Crops (*Review*), 348
- Mill (Dr. H. R.), elected a member of the German Academy of Naturalists at Halle, 460 ; Dr. J. B. Charcot, 608
- Millard (E. B.), Physical Chemistry for Colleges. Fourth edition (*Review*), 528
- Milligan (W. O.), [H. B. Weiser, W. C. Ekholm and], Plaster of Paris, 294
- Millikan (G. A.), [F. J. W. Roughton and], Velocity of Rapid Reactions, 130
- Millin (Mrs. Sarah Gertrude), General Smuts. 2 Vols. (*Review*), 569
- Millot (Prof. J.), [P. Lester et], Les races humaines (*Review*), 570
- Mills (W. H.), [P. M. Raitland and], Resolution of an Allene Compound, 514
- Milne (Prof. E. A.), The Background of the Galaxies, 38
- Milne (G.), Normal Erosion as a Factor in Soil Profile Development, 548
- Milner (W. S.), appointed lecturer in electrical engineering in Sheffield University, 136
- Minaw (F.), [H. Antoun and], Simultaneous Transmission and Reception of Radio Waves, 761
- Miner (J. R.), Prices of Biological Books in 1935, 196
- Mirsky (A. E.), and L. Pauling, Structure of Native, Denatured and Coagulated Proteins, 600
- Mitchell (J. S.), Chemical Changes in Proteins, 608
- Mitchell (Prof. S. A.), Eclipses of the Sun. Fourth edition (*Review*), 823
- Mitra (Dr. Panchanan), [obituary article], 750
- Mitra (Prof. S. K.), Some Observations on the *C* Regions of the Ionosphere, 283
- Mitton (Dr. R. G.), Mechanics and Hydrostatics (*Review*), 59
- Miyabe (Prof. N.), Japanese Earthquake of February 21, 1936, 171 ; and others, The Formosa Earthquake of April 21, 1935, 353
- Moir (J. Reid), Pre-Crag Flint Implements, 170
- Mole (G.), Ignition of Explosive Gases, 1063
- Mollet (Dr. P.), [Prof. J. Errera and], Intermolecular Forces and O-H Absorption Bands in Alcohols at 3 μ , 882
- Molliard (M.), Yield of Green Plants as a Function of the Proportion of Oxygen in the Atmosphere, 338

- Mond (Sir Robert), Works as I have seen Them Grow (Messel memorial lecture), 172; elected an associate foreign member of the Académie des Inscriptions et Belles Lettres, Paris; work of, 1002, 1050
- Monteil, Geometrical Laws of Egg Cleavage, 648
- Montgomery (H. B. S.), Heat-Treatment for Wood-Decaying Fungi, 1104
- Moore (J. T.), Multi-Cylinder Steam Turbines, 849
- Moos (Dr. N. A. F.), [obituary article], 430
- Morette (A.), Melting Point of Vanadium Oxychloride and Vanadium Tetrachloride, 90
- Morgan (T. L.), appointed assistant lecturer in civil engineering in Sheffield University, 693
- Moriwaki (D.), A Case of 50 per cent Crossing-Over in the Male *Drosophila*, 34
- Morland (D.), [Dr. G. W. Scott Blair and], Practical Tests for Ling Honey, 770
- Morrell (F. D.), [L. H. Harris, E. H. Jolley and], Developments in British Services, 893
- Morrison (F.), [A. R. Penfold and], Differentiation of Varieties of Eucalypts by their Essential Oils, 1099
- Morse (J. F.), [Dr. W. Clayton, S. Back, R. I. Johnson and], Inhibited Deposition of Stearin from Chilled Olive Oil, 801
- Mortensen (Prof. T.), A Monograph of the Echinoidea, 2: Bothriocidaroida, Melonechinoida, Lepidocentroida and Stirodonta. Text and Atlas (*Review*), 344
- Morton (F.), resignation from Manchester University, 772
- Mosely (M. E.), A Study of the Ephemeroptera (*Review*), 223
- Moss (R.), Water under the Western Ice Cap in North-East Land, 803
- Moss (W.), appointed first senior observer at the Cambridge Solar Physics Observatory, 693
- Mottram (Prof. V. H.), [Dr. R. Hutchison and], Food and the Principles of Dietetics. Eighth edition (*Review*), 994
- Moureu (H.), M. Magat and G. Wetoff, Two Forms of Phosphorus Pentachloride, 476; and M. Dodé, Formation of the Monochlorhydrins of Glycols, 897
- Moycho (W.), Independence of the Production of Proteases and the Development of the Cell in *Bacterium prodigiosum*, 179
- Moynihan (Lord), [death], 430; [obituary article], 577
- Moy-Thomas (J. A.), and B. G. Maegraith, awarded the Rolleston memorial prize of Oxford University, 853
- Mozley (A.), Freshwater and Terrestrial Mollusca of Northern Asia, 517
- Mukerji (S. K.), [Prof. N. R. Dhar and], Promotion of Nitrogen Fixation in Tropical Soils, 648; Nitrogen Fixation with Cow-Dung, 1060
- Muller (Prof. H. J.), Out of the Night: a Biologist's View of the Future (*Review*), 228
- Müller (Prof. J. H.), [death], 154
- Müller (W. J.), H. Freissler and E. Plettinger, Anodic Behaviour of Gold-Copper Alloys in 5N Hydrochloric Acid and N Sulphuric Acid, 218
- Müntzing (Dr. A.), Autopolyploidy, 252
- Murakawa (Dr. K.), Anomalies in the Fine Structure of the First Spark Spectrum of Iodine, 324
- Murgatroyd (Dr. F.), awarded a senior fellowship by the Medical Research Council, 879
- Murphy (Prof. P. A.), Nature and Control of Potato Virus Diseases, 955
- Myers (R. J.), [R. T. Florence, Prof. W. D. Harkins and], Contact Potentials of Reversible Soluble Films of Lauric Acid, 405
- Myers (Prof. J. L.), Effect of Changing Outlook and Development in Method of Research (im Thurn memorial lecture), 395
- Nagata (T.), Distribution of Earthquakes in the Kwanto (Japan) District, 1063
- Naherniac (A.), [P. Barchewitz and], Automatic Recording Spectrograph for the Near Infra-Red (6000-9500 Å.), 855
- Nakata (K.), Atmospheric Vorticity, 41
- Nandi (Dr. H. K.), Origin of Rice, 1104
- Nanson (Prof. E. J.), [death], 235
- Naora (N.), [S. Tokunaga and], Palaeolithic Site in Manchukuo, 1019
- Narkiewicz-Jodko (K.), [A. Ziemecki and], Continuity of the Variation of the Cosmic Radiation in the Upper Layers of the Troposphere, 301
- Nasu (N.), and T. Hagiwara, Japanese Earthquake of February 21, 1936, 171; T. Hagiwara and S. Omoti, Distribution of Earthquakes in the Kwanto (Japan) District, 1063
- Nath (N. S. Nagendra), [Sir C. V. Raman and], Diffraction of Light by Ultra-Sonic Waves, 616
- Nathan (Sir Charles), [death], 17
- de Navarro (J. M.), Celtic Studies (John Rhys memorial lecture), 1089
- Navashin (Prof. M.), The Corona During the Total Solar Eclipse of June 19, 73
- Neave (Dr. S. H. M.), [death], 791
- Neckham (Alexander), work of, 1003
- Neddermeyer (S. H.), [C. D. Anderson and], Cloud Chamber Observations of Cosmic Rays, 555
- Needham (Dr. Dorothy Moyle), Phosphagen in Echinoid Muscle and in Electrical Tissue, 506; Phosphorylation of Cozymase, 774
- Needham (Dr. J.), Order and Life (Terry lectures), (*Review*), 863; W. W. Nowiński, R. P. Cook and K. C. Dixon, Mechanism of Carbohydrate Breakdown in Early Embryonic Development, 462
- Needham (Prof. J. G.), The Animal World (*Review*), 862; Dr. J. R. Traver, Prof. Yin-Chi Hsu and others, The Biology of Mayflies: with a Systematic Account of North American Species (*Review*), 223
- Neuberg (Prof. C.), elected a foreign member of the Swedish Academy of Sciences, 502
- Neuburger (M. C.), Die Allotropie der chemischen Elemente und die Ergebnisse der Röntgenographie (*Review*), 9
- Neugebauer (Prof. O.), Numerical Methods in Late Babylonian Astronomy, 849
- Neuninger (Elisabeth), [Elisabeth Rona and], Artificial Radioactivity of Thorium; Artificial Radioactivity of Thulium, 657
- Nevard (E. H.), [C. J. Chaplin and], Strength Tests of Structural Timbers, 129
- Newbigin (late Dr. Marion I.), Plant and Animal Geography (*Review*), 782
- Newbold (W.), [obituary article], 192
- Newitt (Dr. D. M.), given the title of reader by London University, 1110
- Newman (Dr. I. V.), The Angiospermic Carpel, 209
- Newton (H. W.), Radio Fadings and Bright Solar Eruptions, 1017
- Nicholas (T. C.), resignation of lectureship in geology in Cambridge University, 518
- Nicholls (Ann), Mineralogy of the Sand Fractions of Some Victorian Soils, 91; [G. W. Leeper, S. M. Wadham and], Soil and Pasture Studies in the Mount Gellibrand Area, Western District of Victoria, 520
- Nicodemus (Dr. O.), Development of the Chemistry of Acetylene, 475
- Nicol (Edith A. T.), Fauna of the Brackish Water lochs of North-Uist, 178
- Nicol (Dr. H.), The Two Ends of Straw, 398
- Nicolet (M.), Dissociation Energy of Carbon Monoxide and the Abundance of Elements in Stellar Atmospheres, 1097
- Nielsen (Dr. E. S.), Northern Phytoplankton and its Production, 82
- Nielsen (N.), and V. Hartelius, Chemistry of Growth Substance *B₁*, 203
- Nieuwland (Prof. J. A.), [death], 66
- Nippold (Dr. A.), [death], 914
- Nishina (Dr. Y.), and C. Ishii, A Cosmic Ray Burst at a Depth Equivalent to 800 m. of Water, 721
- Nobrega (P.), [J. Reis, A. S. Reis and], Diseases of Birds, 847
- Nocht (Prof.), awarded the gold medal of Hamburg University, 927

- Nockolds (Dr. S. R.), appointed demonstrator in mineralogy and petrology in Cambridge University, 1025
- Noltie (H. R.), appointed lecturer in physiology in Leeds University, 215
- Noonan (Dr. S. W. J.), awarded a gold medal by the American Medical Association, 160
- Nørlund (Dr. P.), Viking Settlers in Greenland: and their Descendants during Five Hundred Years (*Review*), 948
- Norrish (Dr. R. G. W.), and C. H. Bamford, Photodecomposition of Aldehydes and Ketones, 1016
- Norwood (Dr. C.), School Libraries, 597
- Nottes (G.), [G. Lock and], Derivatives of 3, 5-Dimethoxybenzaldehyde (5), 49
- Novy (Dr. F. G.), presented by the American Association with the 250,000th microscope produced by Bausch and Lomb; work of, 67
- Nowinski (W. W.), [Dr. J. Needham, R. P. Cook, K. C. Dixon and], Mechanism of Carbohydrate Breakdown in Early Embryonic Development, 462
- Noyes (Prof. A. A.), [obituary article], 17; and C. S. Garner, Oxidation-Reduction Potential, 252
- Nuffield (Lord), gifts to Oxford University, 713; elected an honorary fellow of Pembroke College, Oxford, 895; further gift to Oxford University, 941
- Ockenden (R. E.), The British Earthquake of April 6, 1580, 472
- O'Connor (Dr. P.), Irish Fungi, 338; 1020
- O'Day (Prof. M.), [Prof. A. A. Knowlton and], Laboratory Manual in Physics. Second edition (*Review*), 183
- Oddie (G. T.) (Sister Mary Cecilia), [Prof. J. F. Spencer and], Preparation of Lithium Alum, 169
- Odell (N. E.), Mock Suns Observed at Nanda Devi in Garhwal, 764
- Offermann (Dr. C. A.), X-Chromosome of *Drosophila*, 129
- Ogawa (E.), Exchange Reactions with Isotopes, 294
- Okabe (Prof. K.), A New Electron Oscillator, 685
- Okada (Yaichiro), Geckos of Japan, 765
- Oketani (S.), [J. J. Trillat and], Transformations Produced in Certain Metals by Heating in a Vacuum or in Air, 1069
- Okuda (T.), Narrow Continuous Band of Potassium in the Extreme Red, 168
- Oldham (R. D.), [obituary article], 316
- Omer, jun. (G. C.), Constancy of Wave-Length of Light, 587
- Öpik (E.), Meteor Heights from the Arizona Expedition, 943
- Oppenheimer (Prof. C.), Die Fermente und ihre Wirkungen. Suppt., Lief 4. (Bd. 1, Spec. Teil: Haupt-Teil 9-12) (*Review*), 269
- Orbelli (Prof. L. A.), appointed a member of the Permanent International Committee of the Physiological Congresses, 838
- Orchard (F. C.), Mercury Arc Rectifier Practice (*Review*), 784
- Ormsby (Prof. M. T. M.), title of emeritus professor conferred upon, by London University, 1110
- Ormsby-Gore (W. G. A.), Colonial Policy and Scientific Research, 3; Native Policy in Africa, 107; African Problems, 680; elected an honorary fellow of New College, Oxford, 693; Taxation, Administration and Research in East Africa, 735; Illustrated Regional Guides to Ancient Monuments. Vol. 3: East Anglia and Midlands, 875
- Orr (Sir John Boyd), Native Agriculture in Africa and its Relationship to Population (*Review*), 305
- Orton (Prof. J. H.), Habit and Shell-Shape in the Portuguese Oyster, *Ostrea angulata*, 466
- Osborn (late Prof. H. F.), edited by Mabel Rice Percy, Proboscidea: a Monograph of the Discovery, Evolution, Migration and Extinction of the Mastodonts and Elephants of the World. Vol. 1 (*Review*), 860
- Osborne (Prof. W. A.), Adjustable Resonators and Orchestration, 1059
- Ōshima (Y.), Tannin Substance of Formosan Tea Leaves, 695
- Osterstock (H. C.), [Dr. C. D. Darlington and], Projection Method for Demonstration of Chromosomes *in situ*, 79
- Outridge (L. E.), [Prof. W. A. Bone and], Some Influences of Dilution on the Explosive Combustion of Hydrocarbons, 942
- Page (F. Handley), [C. R. Fairey and], gift to the Royal Aeronautical Society, 927
- Page (T. L.), Chemical Composition of the Planetary Nebulae, 503
- Paisley (Dr. J. C.), resignation from Sheffield University, 895
- Palmer (Dr. A.), bequest to Reading University, 136
- Palmer (G. E. H.), elected a member of the council of Reading University, 136
- Paneth (Prof. F. A.), Chemical Exploration of the Stratosphere, 834; E. Glückauf and H. Loleit, Helium Produced in Artificial Transmutation, 1105
- Pant (B. D.), [G. R. Toshnival, R. R. Bajpai and], Collisional Friction Frequency in the Ionosphere at Allahabad, 37
- Parisi (E.), and G. de Vito, Ripening of Cheeses, 340
- Park (Prof. W. H.), retirement from New York University, 718
- Parkes [Rowlands and], Antithyrotropic Activity, 82
- Parkinson (F.), gifts to Leeds University, 46; 1067
- Parks (Prof. W. A.), [death], 751; [obituary article], 870
- Parr (W. J.), [F. Chapman and], Suggested Classification of the Foraminifera, 520
- Parsons (C. G.), awarded a Walter Myers travelling studentship of Birmingham University, 215
- Parsons (Sir John), awarded the Lucien Howe medal of the American Ophthalmological Society, 927
- Parsons (R. H.), The Development of the Parsons Steam Turbine. 2 Parts (*Review*), 567
- Partington (Prof. J. R.), Origin of the Word 'Solute', 646; and H. I. Stonehill, Oxidation-Reduction Potential, 252
- Pascoe (Sir Edwin H.), India and Mineral Development (*Review*), 621
- Paterson, Administrative Classification of Australian Aborigines, 715
- Paterson (C. C.), Science and Electric Lighting, 515
- Paterson (T. T.), elected a fellow of Trinity College, Cambridge, 731
- Paterson-Hart (G.), Composts for Mushroom Growing, 409
- Patrick (D.), Steam Locomotive Design, 1092
- Patton (R. T.), A Fossil *Casuarina* from near Bacchus Marsh, Victoria, 91
- Pauc (C.), Introduction of Directions in a Metrical Space, 813
- Paulais (R.), Localization of Nickel in the Organs of Lamellibranch Molluscs, 812
- Pauling (L.), [A. E. Mirsky and], Structure of Native, Denatured and Coagulated Proteins, 600
- Pausert (T.), Wooden Pipe Lines, 198
- Pavlov (late Prof.), projected memorial to, 72
- Payman (Dr. W.), and W. C. F. Shepherd, Explosive Waves and Shock Waves (4), 942
- Payne (C. J.), [B. W. Anderson and], Liquids of High Refractive Index, 168
- Payne (E.), [death], 537
- Peabody, Jr. (Prof. D.), The Design of Reinforced Concrete Structures (*Review*), 634
- Peake (H.), and Prof. H. J. Fleure, The Law and the Prophets (*Review*), 632
- Pearl (Prof. R.), Fertility and Contraception in the United States, 40; Tuberculosis and Inheritance, 333
- Pearsall (Dr. W. H.), and M. C. Billimoria, Nitrogen Losses in Green Plants, 801
- Pearse (Dr. H. L.), Effect of Phenylacetic Acid on the Growth of Tobacco Plants, 363
- Pearse (Dr. R. W. B.), [A. Hunter and], Sensitivity of Photographic Plates in the Region $\lambda\lambda$ 2500-2100 Å., 37
- Peczenik (O.), [E. Steinach, H. Kunand], Action of Sex Hormones (1, 2, 3), 49

- Pedersen (Dr. K. O.), Molecular State of Proteins in Mixtures and Concentrated Solutions, 363; [Prof. M. Heidelberger, A. Tiselius and], Ultracentrifugal and Electrophoretic Studies on Antibodies, 165
- Pei (W. C.), Peking Man, 1056
- Peissachovitch (S. S.), [A. J. Rabinovitch and], Theory of Photographic Development, 849
- Pekeris (C. L.), Atmospheric Oscillations, 642
- Penfold (A. R.), and F. Morrison, Differentiation of Varieties of Eucalypts by their Essential Oils, 1099
- Penndorf (R.), Ozone as a Heating Factor in the Atmosphere, 247
- Penney (Dr. W. G.), appointed reader in mathematics in the Imperial College—Royal College of Science, 772
- Pentinali (Prof. F.), awarded the Riberi prize, 615
- Perakis (N.), [L. Capatos and], Magnetic Study of the Mixed Crystals of Divalent Copper and Silver, 48
- Pérard (A.), nominated director of the Bureau international des Poids et Mesures, 755
- Percival (Prof. J.), Cereals of Ancient Egypt and Mesopotamia, 270
- Perebinosoff (A. A.), [M. Schlumberger, H. G. Doll and], Temperature Measurements in Oil Wells, 1020
- Perrin (Prof. M. J.), appointed under-secretary for scientific investigation in the French Cabinet, 797
- Perry (F. R.), [Dr. T. E. Allibone, D. B. McKenzie and], Impulse Voltages for Transformer Testing, 937
- Pesta (Dr. O.), German Copepods, 293
- Peters (Prof. R. A.), Effect of Dichlor-Diethyl-Sulphane on Brain Respiration, 327; Research and Teaching in Universities, 590; [G. K. McGowan and], Carbohydrate Metabolism, 552
- Pethybridge (Dr. G. H.), presentation to, 160
- Petrie (Sir Flinders), The Mysterious Number 137, 81
- Petrovič (Dr. A.), Marriage Among Serbian Gypsies, 370; 847
- Petrow (Dr. V. A.), Enolization of Oxycholesterilene, 645
- Pettit (E.), A Second Law of the Motions of Eruptive Prominences, 91
- Pettit (Dr. E.), The Blue Water of Crater Lake, 198
- Peyrot (P.), [E. Canals and], Fluorescence of Some Pure Substances, 1026
- Pfeiffer (Dr. H. H.), Evidence of Linear Units within Protoplasm, 1054
- Philip (Prof. J. C.), Training the Chemist for Service to the Community, 449; Chemistry and the Modern State, 492
- Phillips (Dr. H.), Washing Raw Wool with Solutions of Soap and Soda, 44; Cross-Linkage Formation in Keratins, 121
- Phillips (Prof. J.), New Conceptions of a Rock Garden, 459
- Phillis (Mason, Maskell and], Problems of Translocation in the Plant, 336
- Pickard (G. L.), Electronic Specific Heat in Palladium, 123
- Picken (Dr. L. E. R.), appointed Balfour student in Cambridge University, 46
- Pickup (E.), [Dr. E. J. Williams and], Conservation of Energy in Radiation Processes, 461
- Piekara (A.), and B. Piekara, Electrical Saturation in Pure Liquids and their Mixtures, 943
- Piekara (B.), [A. Piekara and], Electrical Saturation in Pure Liquids and their Mixtures, 943
- Pierret (E.), Properties of Triodes with Large Diameter Plate in Very High Frequencies, 339
- Pigeaud (Marie-Louise), [H. Cheftel and], Estimation of Ascorbic Acid (Vitamin C) by Titration, 799
- Pim (Sir Alan), Financial Position in Kenya, 736
- Pincus (Dr. P.), Enamel Protein, 970
- Pirie (N. W.), [F. C. Bawden, J. D. Bernal, I. Fankuchen and], Liquid Crystalline Substances from Virus-infected Plants, 1051
- Pirotta (Prof. P. R.), [death], 712
- Pitman (Capt. C. R. S.), Organized Control of Elephants in Uganda, 434
- Pitt (Miss Frances), Polecat and Pine-Marten in Great Britain, 434
- Planck (Prof. Max), nominated honorary doctor by Graz University, 361
- Platz (H.), [P. W. Schenk and], A New Oxide of Phosphorus, 849
- Plenderleith (Dr. H. J.), appointed professor of chemistry at the Royal Academy, 24
- Plettinger (E.), [W. J. Müller, H. Freissler and], Anodic Behaviour of Gold-Copper Alloys in 5N Hydrochloric Acid and N Sulphuric Acid, 218
- Plummer (Dr. W. G.), [death], 356
- Pocock (R. W.), and T. H. Whitehead, The Welsh Borderland (*Review*), 390
- Poirot (G.), [H. Hérissé and], Extraction of Viburnitol from the Leaves of *Viburnum Tinus*, 599
- Polaroid Products, Ltd., Technical Uses of 'Polaroid', 726
- Pollard (Prof. A. F. C.), Polarization of Light and Some Technical Applications, 311
- Polunin (N.), Flora of the Canadian Eastern Arctic, 331
- Pomeranchuk (I.), [A. Akhieser, L. Landau and], Scattering of Light by Light, 206
- Pomerat (C. M.), and M. X. Zarrow, Effect of Temperature on the Respiration of the Earthworm, 91
- Pontius (R. B.), [K. Mendelssohn and], Time Effects in Supra-Conductors, 29
- Poole (E. G. C.), Introduction to the Theory of Linear Differential Equations (*Review*), 629
- Poole (Dr. H. H.), and Dr. W. A. G. Atkins, Standardization of Photo-Electric Cells for the Measurement of Energy, 338
- Poole (Dr. J. H. J.), New Method of Measuring the Radioactivity of Rocks, 1111
- Pope (Sir W. J.), Prof. H. L. Le Chatelier, 711; Prof. T. M. Lowry, 912
- Porret (Dr. D.), awarded a Ramsay memorial Swiss fellowship, 584
- Porsild (E.), Reindeer Grazing, 293
- Portevin (A.), and L. Guillet, jun., Elastic Modulus of Certain Definite Intermetallic Compounds, 476
- Portevin (Prof.) and Dr. P. Bastien, Forgeability of Various Light and Ultra-Light Alloys, 692
- Portier (Dr. H.), [Marquis des Fleury and], Complex Interdependence of the Properties of Alloys, etc., 691
- Portier (P.), elected a member of the Paris Academy of Sciences, 24
- Poucher (W. A.), Perfumes, Cosmetics and Soaps: with Especial Reference to Synthetics, Vols. 2 and 3. Fifth edition (*Review*), 949
- Poulton (Sir Edward B.), elected president of the British Association for 1937; work of, 497
- Pound (Dr. R.), Place of Higher Learning in American Life, 518
- Powell (C. F.), Seismic Observations in Montserrat, 1069
- Pradier (Mme. Jeanne Cieutat), [J. Chedin and], Raman Effect and Molecular Structure of Nitric Anhydride, 855
- Praeger (Prof. W. E.), [death], 678
- Pratt (C. C.), Interaction Across Modalities: Simultaneous Stimulation, 943
- Prawnsnitz (Prof. C.), Respiratory Dust Disease in the Cotton Industry, 370
- Preiswerk (Dr. P.), and Dr. H. von Halban, jun., The Form of Nuclear Levels, 163
- Prentice (J. P. M.), Orionid Meteors, 978
- Prettre (M.), Influence of a Chemically Inert Gas on the Velocity of the Chain Reaction of Mixtures of Normal Pentane and Oxygen, 695; Inhibition by Hydrogen of the Chain Reaction of Mixtures of Normal Pentane and Oxygen, 774
- Price (Harriet), edited by W. P. Wright, The Junior Gardener (*Review*), 784
- Prince (Dr. E. E.), [death], 751
- Pringle (Dr. J.), The South of Scotland (*Review*), 391
- Pringle (J. W. S.), elected a Martin Thackeray student at King's College, Cambridge, 215
- Prinzing (Dr. F.), nominated a member of the German Statistical Society, 361
- Pritchard (Capt. J. L.), The Book of the Aeroplane. Third edition (*Review*), 1037

- Prosad (Prof. K.), and D. K. Bhattacharya, Excitation of Raman Spectra of Substances with the Aid of 'Optical Catalysts', 510
- Pryce (M. H. L.), elected a fellow of Trinity College, Cambridge, 731
- Pryce-Jones (J.), Physical Properties of Heather Honey, 770
- Puchstein (A. F.), and Prof. T. C. Lloyd, Alternating-Current Machines (*Review*), 666
- Pullen (N. D.), A Dual Anodic Process for the Treatment of Aluminium Surfaces, 692
- Purdie (D.), [F. G. Mann, A. F. Wells and], A Co-ordinated Cuprous Complex, 978
- Purewal (S. S.), and P. K. Rao, Standard Errors of Mendelian Ratios, 977
- Purvis (O. N.), [Dr. F. G. Gregory and], Vernalization, 249; Vernalization of Winter Rye during Ripening, 973; Devernalization of Winter Rye by High Temperature, 1013
- Pyman (Dr. F.), presented with the Hanbury gold medal of the Pharmaceutical Society; Contributions of Chemistry to Pharmacy and Medicine, 693
- Pyne (G. T.), and Prof. J. J. Ryan, A Molecular Constant for Soured Milks, 1111
- Quarendon (Dr. R.), J. L. Macadam: Father of Modern Road-Making, 869
- Quastel (Dr. J. H.), Catalysis of Chemical Reactions, 607; and E. D. Yates, Invertase and Dyestuffs, 690
- Quinn (Prof. E. L.), and C. L. Jones, Carbon Dioxide (*Review*), 993
- Quodling (F. M.), [D. P. Mellor and], Optical Properties and Crystal Structure of Some Compounds of the Type R_2MX_4 , 477
- Rabinovitch (A. J.), and S. S. Peissachovitch, Theory of Photographic Development, 849
- Rabinowitch (Dr. E.), and Dr. J. Weiss, Reversible Oxidation and Reduction of Chlorophyll, 1098
- Radcliffe-Brown (Prof. R. A.), appointed professor of social anthropology in Oxford University, 751, 772; work of, 751
- Radford (C. A. R.), appointed director of the British School of Archaeology at Rome; work of, 614
- Rado (Dr. R.), appointed assistant lecturer in mathematics in Sheffield University, 693
- Raggatt (H. G.), Geology of the North-West Basin of Western Australia, with Particular Reference to the Stratigraphy of the Permo-Carboniferous, 260
- Rahn (Prof. O.), Invisible Radiations of Organisms; with an Introduction to the Physics of Radiation, by S. W. Barnes (*Review*), 96
- Rainey (F. G.), Eskimo Chronology, 378
- Raitland (P. M.), and W. H. Mills, Resolution of an Allene Compound, 514
- Rajam (C. V.), Wave Forms of Atmospherics at Madras, 1064
- Rakshit (Dr. H.), and J. N. Bhar, Some Observations on the C Regions of the Ionosphere, 283
- Ramage (H.), Analysis of Tissues for Metallic Content, 762
- Raman (Sir C. V.), and N. S. Nagendra Nath, Diffraction of Light by Ultra-Sonic Waves, 616
- Ramdohr (Prof. P.), elected a member of the Geologiska Föreningen of Stockholm, 1093
- Ramon (G.), A. Boivin and R. Richou, Flocculating and Immunizing Properties of Anatoxins purified by Precipitation with Trichloroacetic Acid, 774
- Ramsay (Lady), [death], 960
- Ramsbottom (J.), Uses of Fungi, 455; Positive Economics of the Fungi, 746; Mycological Researches (*Review*), 1033
- Ramsey (A. S.), Hydrostatics: a Text-Book for the Use of First Year Students at the Universities and for the Higher Division in Schools (*Review*), 386
- Randall (J. T.), Argon, Neon and Helium, 191; An X-Ray Study of Sulphuric and Orthophosphoric Acids, 842
- Randhawa (M. S.), Periodicity in Algae, 251
- Rao (G. S.), [Prof. B. Dasannacharya and], Steady Performance of Geiger-Müller Counters, 289
- Rao (Dr. K. R.), Structure of Bromine III, 168
- Rao (P. K.), [S. S. Purewal and], Standard Errors of Mendelian Ratios, 977
- Rappard (Prof. W. E.), The Common Menace of Economic and Military Armaments (Richard Cobden lecture), 394
- Rasetti (F.), Il nucleo atomico (*Review*), 1037
- Raskin (A.), [Prof. E. Bauer and], Increase of Diamagnetic Susceptibility on the Death of Living Cells, 801
- Ratcliffe (F. N.), Wind Erosion in South Australia, 358; Soil Drift in the Arid Pastoral Areas of South Australia, 1039
- Rawdon-Smith (Dr. A. F.), [C. S. Hallpike, Prof. H. Hartridge and], Physical Nature of Certain of the Vibrating Elements of the Internal Ear, 839
- Rây (Sir P. C.), Synthesis of Two Isomeric bis-Thio-camphors, 548
- Read (Dr. B. E.), Chinese Medicinal Plants from the Pen Ts'ao Kang Mu, A.D. 1596. Third edition (*Review*), 484
- Read (H. H.), The Grampian Highlands (*Review*), 391
- Read (J. H.), Early Photographs, 239
- Reboul (J.), Action Exerted by Ordinary Metals on the Photographic Plate and on the Electrometer, 138
- Record (Prof. S. J.), [P. C. Standley and], The Forests and Flora of British Honduras (*Review*), 145
- Redfield (Dr. A. C.), An Ecological Aspect of the Gulf Stream, 1013
- Redmayne (Sir R. A. S.), King Coal (*Review*), 991
- Redslob (F.), [H. Forestier and], Decomposition of Cadmium Ferrite, 1112
- Reed (C. E.), [Dr. E. A. Houser and], Centrifuging in Rotating Hollow Cylinders, 975
- Reeds (Dr. C. A.), The Earth (*Review*), 862
- Rees (W. S.), appointed demonstrator in anatomy in Sheffield University, 136
- Reeves (Prof. F. W.), Adult Education in the U.S.A., 811
- Regener (Prof. E.), Oxygen Content of the Stratosphere, 544
- Reid (Dr. C.), appointed reader in physiology at the London Hospital Medical College, 772
- Reilly (Prof. J.), Distillation (*Review*), 570
- Reinecke (O. S. H.), Oil Treatment of Uneven Blossoming, 593
- Reis (A. S.), [J. Reis, P. Nobrega and], Diseases of Birds, 847
- Reis (J.), P. Nobrega and A. S. Reis, Diseases of Birds, 847
- Reismann (Dr. O.), German Road Progress, 280
- Renaud (Prof. E. B.), Rock-Drawings and Paintings of the High Plains, U.S.A., 1061
- Rencker (S.), and P. Dubois, Hydrates of Manganous Sulphate, 414
- Rendle (Dr. A. B.), Preservation of Native Floras, 457
- Renn (C. E.), Persistence of the Eel-Grass Disease and Parasite on the American Atlantic Coast, 507
- Renner (Dr. G. T.), [Prof. C. Langdon White and], Geography: an Introduction to Human Ecology (*Review*), 1075
- Rensch (Dr. B.), Die Geschichte des Sundabogens: eine tiergeographische Untersuchung (*Review*), 622
- Rentschler (Violet), [C. Stern and], Effect of Temperature on the Frequency of Somatic Crossing-Over in *Drosophila melanogaster*, 600
- Rhodes (Dr. E. C.), [Sir Philip Hartog and, with a Memorandum by Prof. C. Burt], The Marks of Examiners (*Review*), 820
- Ribaud (Prof. G.), Mesure des températures (*Review*), 905
- Rich (Florence), Some Diatoms from the Victoria Falls, 180
- Richardson (Hugh), [obituary article], 1088
- Richey (J. E.), Scotland: the Tertiary Volcanic Districts (*Review*), 391
- Richou (R.), [G. Ramon, A. Boivin and], Flocculating and Immunizing Properties of Anatoxins purified by Precipitation with Trichloroacetic Acid, 774

- Richter (D.), [R. Hill and], Glycosides of Madder, 38
 Riecke (Prof. R.), nominated an honorary member of the American Ceramic Society, 460
 Riesman (Prof. D.), The Story of Medicine in the Middle Ages (*Review*), 142
 Riley (Dr. H. L.), [K. D. Luke, Dr. W. M. Madgin and], Formation of Carbon Dendrites, 161
 Rinagl (F.), Importance of the Upper Elastic Limit, 218
 Rintoul (Leonora Jeffrey), and Evelyn V. Baxter, A Vertebrate Fauna of Forth (*Review*), 703
 Rintoul (W.), [death], 356; [obituary article], 429
 Riou (P.), and J. Delorme, Lead Values in Maple and Cane Sugars, 138
 Risler (J.), Antiseptic Power of Essential Oils, 656
 Ritchie (A. D.), Architecture of Life, 607; The Natural History of Mind (Turner lectures), 618
 Ritchie (Prof. J.), appointed professor of natural history in Edinburgh University, 176
 Ritchie (Dr. P. D.), [Prof. C. G. Seligman, H. C. Beck and], Early Chinese Glass from Pre-Han to T'ang Times, 721
 Rivlin (R. S.), [Dr. N. R. Campbell and], Effect of Hydrogen on Photo-electric Cells, 1063
 Robb (Dr. A. A.), [death], 1044
 Roberts (A. M.), Mechanical Tests for Engineering Materials, 852
 Roberts (N. H.), 50 Cycle Wave-Forms in Insulation Testing; Device for the Superposition and Simultaneous Delineation of two Wave-Forms on a Single Cathode Ray Oscillograph Screen, 813
 Roberts (W.), Centenary of Loudon's 'Arboretum', 237
 Robertson (Sir John), [death], 1088
 Robertson (J. D.), grant made to, from the Balfour fund of Cambridge University, 46
 Robertson (Dr. J. M.), Structure Factor and Electron Density Formulae (*Review*), 627; Calculation of Structure Factors and Summation of Fourier Series in Crystal Analysis: Non-Centrosymmetrical Projections, 683
 Robertson (Sir Robert), William Rintoul, 429
 Robinson (Dr. D. M.), Dielectric Phenomena in High Voltage Cables (*Review*), 633
 Robinson (Prof. G. W.), Soils: Their Origin, Constitution and Classification. Second edition. (*Review*), 9; Soil Classification, 729
 Robinson (Mrs. J. V.), appointed assistant lecturer in economics and politics in Cambridge University, 518
 Robinson (O. J.), [A. D. Buchanan Smith, D. M. Bryant and], Genetics of the Pig, 878
 Robinson (Prof. R.), Constitution of Tetranitromethane, 975
 Roche (Prof. J.), Essai sur la biochimie générale et comparée des pigments respiratoires (*Review*), 662
 Rogers (Sir Leonard), Anti-Vivisection Finance, 71
 Roig (J.), and J. Thouvenin, Variation of the Optical Density of Photographic Plates with the Dryness Conditions, 179
 Rona (Elisabeth), and Elisabeth Neuninger, Artificial Radioactivity of Thorium; Artificial Radioactivity of Thulium, 657
 Roosevelt (President), Science and Social Values, 498
 del Rosario (F.), American Flies of the Genus *Psychoda*, 847
 Rosen (B.), [P. Goldfinger, W. Jeunehomme and], Dissociation Energy of Diatomic Sulphur, Selenium and Tellurium Vapours, 205
 Rosenthal (E.), Old Time Survivals in South Africa, 254
 Ross (I. Clunies), Sheep and Wool Production in North-Eastern Asia, 1103
 Ross (Dr. T. A.), An Enquiry into Prognosis in the Neuroses (*Review*), 743
 Rosseland (Prof. S.), Theoretical Astrophysics: Atomic Theory and the Analysis of Stellar Atmospheres and Envelopes (*Review*), 628
 Rossi (Prof. B.), Rayons Cosmiques (*Review*), 100
 Rossier (P.), Approximate Expression of the Colour Index as a Linear Function of the Inverse of the Effective Temperature of Stars; Observations of the 1936 Comet, 985; Spectrographic Observations of Novæ Herculis, 1934 and Aquilæ, 1936, 985
 Rotblat (J.), Ranges of Particles Emitted in the Disintegration of Boron and Lithium by Slow Neutrons, 202; Resonance Levels for Absorption of Neutrons, 545
 Roughton (F. J. W.), and G. A. Millikan, Velocity of Rapid Reactions, 130
 Roux (Dr. E.), unveiling of a bronze bust of, 757
 Rowan (Prof. W.), Bird Migration (*Review*), 1078
 Rowland (E. N.), elected an additional Isaac Newton student in Cambridge University, 895
 Rowlands and Parkes, Antithyrotropic Activity, 82
 Rudy (Dr. H.), Vitamine and Mangelkrankheiten: ein Kapitel aus der menschlichen Ernährungslehre (*Review*), 994
 Ruse (Dr. H. S.), appointed professor of mathematics in University College, Southampton, 1067
 Rusinow (L. B.), [V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. W. Schubnikow and], Neutron Absorption of Boron and Cadmium at Low Temperatures, 505
 Russell (Dr. A. S.), Order of Affinity of Metals for Copper, Iron, Cobalt and Nickel, 161
 Russell (F. S.), and others, Plankton Research, 410
 Russell (Sir John), Land-Reclamation in Italy (*Review*), 4; and others, Education for Rural Life, 891
 Rustad (S.), [O. E. Frivold, Prof. O. Hassel and], Refractive Indexes of Ordinary and Heavy Ammonia, 330
 Ruzsnyák (S.), and Prof. A. Szent-Györgyi, Vitamin P: Flavonols as Vitamins, 27; [A. Benráth, Prof. A. Szent-Györgyi and], Vitamin Nature of Flavones, 798
 Rutherford (Lord), Science in Development (Norman Lockyer lecture), 865; Electric Illumination, 1046
 Ruys (A. Charlotte), Isolation of Typhoid Bacilli from Water, 259
 Ruzicka (M.), elected an associate of the Royal Academy of Belgium, 502
 Ryan (Prof. J. J.), [G. T. Pyne and], A Molecular Constant for Soured Milks, 1111
 Rylov (Prof. W. M.), Das Zooplankton der Binnengewässer (*Review*), 424
 Sabathe (G.), [L. Escande and], Errors Produced by the Inclination of the Trajectories in Calibrations carried out by Means of Hydrometric Screws with Counting Gear, 984
 Sabetay (S.), Method for the Rapid Diagnosis and Approximate Estimation of the Primary Alcohols, etc., 1112
 Sabin (Florence Rena), Franklin Paine Mall: the Story of a Mind (*Review*), 663
 Sabrazès (Prof. J.), elected correspondent of the Paris Academy of Sciences, 72
 Sack (J.), [Dr. E. M. H. Lips and], A Hardness Tester for Microscopical Objects, 328
 Sadler (Sir Michael), A. Abbott, Dr. P. B. Ballard, Prof. C. L. Burt, Dr. C. Delisle Burns, Sir Philip Hartog, Prof. C. Spearman and Dr. S. D. Stirr, Essays on Examinations (*Review*), 820
 Saha (Prof. M. N.), 'A Treatment of Modern Physics', 464
 Sahni (Prof. B.), Antiquities of the Jumna Valley, 82; Gondwana Affinities of the Angara Flora in the Light of Geological Evidence, The, 720; Himalayan Uplift Since the Advent of Man, 847
 de Saint-Périer (Dr. René), Le Magdalénien de La Grande Salle, 1023
 Saint-Rat (L. de), [G. Bertrand and], A New Colour Reaction of Copper with Urobilin, 414
 Saita (T.), Japanese Earthquake of February 21, 1936, 171
 Sakai (T.), Brachyura Collected by Mr. F. Hiro at Palao Islands, 1062
 Salisbury (Prof. E. J.), [Dr. E. Ashby, Prof. F. A. E. Crew, Dr. C. D. Darlington, E. B. Ford, Prof. J. B. S. Haldane, Dr. W. B. Turrill, C. H. Waddington and], Genetics in the Universities, 972
 Salomon (Prof. H.), Schlacke and Vitamine (*Review*), 905
 Salt (B. G. D.), [R. A. Fairthorne and], A Fairthorne-Salt Mathematical Film, 726
 Sampson (Prof. R. A.), The Spectroscope in the Observatory, 1006

- Samuel (Prof. R.), [Prof. R. F. Hunter and], Valency and Molecular Structure, 411
- Sanders (F. H.), Diffraction of Light by Ultra-Sonic Waves, 285
- Sanders (T. R. B.), appointed lecturer in engineering in Cambridge University, 89
- Sarton (Dr. G.), elected an honorary foreign fellow of the Royal Society of Edinburgh, 67; The Study of the History of Science; The Study of the History of Mathematics (*Review*), 700; Unity and Diversity of the Mediterranean World, 926
- Saunders (O. A.), Effect of Pressure upon Natural Convection in Air, 855
- Sauvageau (Prof. C.), [death], 678
- Savorgnan (Dr.), nominated an honorary member of the German Statistical Society, 361
- Savory (T. H.), Regeneration in Arachnida, 550
- Sawyer (W. W.), Second Order Focusing for Mass Spectrographs, 513
- Sayce (R. U.), Rural Custom in Civilized Communities, 253
- Searth (G. W.), [J. Levitt and], Studies of Frost Hardening, 806
- Schacherl (Dr. F.), and O. Běhounek, Dissociation Pressure of Copper Sulphate Pentahydrate, 406
- Schack-Sommer (Dr. G.), [death], 751; [obituary article], 1087
- Schairer (J. F.), [N. L. Bowen and], System Albite-Fayalite, 378
- Schebesta (Father P.), translated by G. Griffin, My Pygmy and Negro Hosts (*Review*), 345
- Schedl (Dr. K. E.), Der Schwammspinner (*Porthetria dispar* L.) in Euroasien, Afrika und Neuengland (*Review*), 704
- Schein (Prof. M.), and M. L. Katz, Ultra-violet Luminescence of Sodium Chloride, 883
- Schenk (P. W.), and H. Platz, A New Oxide of Phosphorus, 849
- Schenkel (H.), [Prof. H. Erlenmeyer, A. Epprecht and], Use of Deuterium as an Indicator in Stereochemical Investigations, 547
- Schintlmeister (J.), Origin of α -Rays of 2 cm. Range, 477
- Schleich (late C. L.), translated by B. Miall, Those Were Good Days! Reminiscences (*Review*), 663
- Schlesinger (Dr. M.), The Feulgen Reaction of the Bacteriophage Substance, 508; Centrifuging in Rotating Hollow Cylinders, 549
- Schlumberger (C. and M.), Electrical Prospecting and its Uses, 807
- Schlumberger (M.), H. G. Doll and A. A. Perebinosoff, Temperature Measurements in Oil Wells, 1020
- Schmidt (Dr. A.), [Dr. S. Erk and], Viscometry, 593
- Schmidt (late Dr. J.), A Text-Book of Organic Chemistry. English edition by Dr. H. G. Rule. New edition (*Review*), 633
- Schmidt (P. J.), Resistance of Fish to Supercooling, 977
- Schmidt (Dr. T.), The Electric Quadrupole Moment of the Nucleus $^{127}_{53}\text{I}$, 404
- Schmidt (W.), Vertical Motion in Clouds studied by Cinematograph Pictures, 218
- Schmidt (Prof. W.), [death], 960; [obituary article], 1086
- Schofield (Dr. R. K.), Behaviour of Soil Moisture in the Field, 729
- Schokalsky (Prof. J.), Soviet Arctic Stations, 593
- Scholz (Prof. W.), appointed director of the department of cerebral pathology of the German Research Institute of Psychiatry, 361
- Schonland (Dr. B. F. J.), B. Delatizky and J. P. Gaskell, Variation of Cosmic Ray Intensity with Sidereal Time, 325
- Schorr (Dr. R.), Catalogue of Stellar Proper Motions, 767
- Schott (Prof. G.), mit einem beitrage von Prof. E. Hentschel und Dr. W. Schott, Geographie des Indischen und Stillen Ozeans (*Review*), 419
- Schott (Prof. S.), nominated a member of the German Statistical Society, 361
- Schottky (Dr. W.), awarded the Hughes medal of the Royal Society, 833; presented with the Hughes medal of the Royal Society; work of, 980
- van Schouwenburg (K. L.), and Johanna G. Eymers, Quantum Relationship of the Light-Emitting Process of Luminous Bacteria, 245
- Schrire (V.), and H. Zwarenstein, Pancreas and Blood Inorganic Phosphorus, 180
- Schrödinger (Prof. E.), Indeterminism and Free Will, 13
- Schubnikow (L. W.), [V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and], Neutron Absorption of Boron and Cadmium at Low Temperatures, 505
- Schüle (Dr. J.), Die Bierhefe als Heil-, Nähr- und Futtermittel (*Review*), 665
- Schwarz (Dr. E.), The Sterckfontein Ape, 969
- Schwarz (K.), [A. Lichtenfeld and], Theory of Kikuchi Lines studied by means of Models, 218
- Scott (A. D.), [Dr. E. D. Hughes, Prof. C. K. Ingold and], Unimolecular Elimination and the Significance of the Electrical Conduction, Racemization and Halogen Replacement of Organic Halides in Solution, 120
- Scott (T. H.), and W. J. Stokie, Wild Flowers of the Wayside and Woodland (*Review*), 227
- Scourfield (D. J.), A Fungal Parasite of Algae, 1105
- Scroggie (M. G.), Television (*Review*), 421
- Seaborg (G.), [J. J. and J. J. Livingood and], Production of Artificial Radioactivity by Deuterons, 1021
- Seaman (L. N.), and V. D. Limaye, Rules for the Grading of Teak Squares, 1007
- Seares (F. H.), Selective Absorption of Starlight by Interstellar Clouds, 378
- Seifriz (Prof. W.), Protoplasm (*Review*), 1077
- Seligman (Prof. C. G.), Dr. P. D. Ritchie and H. C. Beck, Early Chinese Glass from Pre-Han to T'ang Times, 721
- Seligman (G.), Snow Structure and Ski Fields; with an Appendix on Alpine Weather, by C. K. M. Douglas (*Review*), 481
- Selye (Prof. H.), A Syndrome produced by Diverse Nocuous Agents, 32
- Sergi (Prof. G.), [death], 751
- Serpe (J.), The K-Radiation of Boron, 179
- Servant (R.), Measurements of Double Refraction in the Extreme Ultra-violet, 48
- Servigne (M.), Luminescence of Solid Substances produced by Direct Excitation in a Geissler Tube, 733
- Sewall (Prof. H.), [death], 393
- Seward (Sir Albert), elected an honorary fellow of Downing College, Cambridge, 772; elected an honorary fellow of the National Institute of Sciences of India, 879
- Sewell (Lt.-Col. R. B. Seymour), Geophysics of the Indo-Pacific Region (*Review*), 419
- Shang-Yi (Ch'en), [Ny Tsi-Zé and], Displacement of the Higher Members of the Principal Series of Rubidium by the Rare Gases, 476; Continuous Absorption Band of Rubidium in the Presence of Foreign Gases, 1055
- Shanklin (Dr. W. M.), Physical Characters of the Bedouin, 251
- Shapiro (B. G.), and H. Zwarenstein, Relation of the Pituitary Gland to Muscle Creatine, 178
- Shapiro (Dr. H. L.), The Heritage of the *Bounty*: the Story of Pitcairn through Six Generations (*Review*), 382; and Dr. P. H. Buck (Te Rangi Hiroa), Physical Characters of the Cook Islanders, 725
- Sharples (A.), Diseases and Pests of the Rubber Tree (*Review*), 661
- Shaw (Prof. C. G.), Logic in Theory and Practice (*Review*), 187
- Shaw (Dr. F. J. F.), [death], 235; [obituary article], 317
- Shaw (Sir Napier), with the assistance of Elaine Austin, Manual of Meteorology. Vol. 2. Second edition (*Review*), 781
- Shearman (R. W.), [F. T. Miles, Prof. A. W. C. Menzies and], Equilibria in Salt Systems with Deuterium Water, 121
- Sheffield (Dr. F. M. L.), Virus Diseases and Cytology, 1020; Development of the Cotton Hair, 1062
- Sheldon (Prof. H. H.), Space, Time, and Relativity (*Review*), 862
- Shelton (H. S.), The Teaching of Science in Schools, 127

- Shen (Dr. Chia-Jui), Family Hapalocarcinidae (Coral-infesting Crabs), 935
- Shepard (F. P.), Underlying Causes of Submarine Canyons, 775
- Shepherd (W. C. F.), [Dr. W. Payman and], Explosive Waves and Shock Waves (4), 942
- Sheppard (Dr. W. F.), [obituary article], 872
- Sherborn (Dr. C. D.), elected president of the Society for the Bibliography of Natural History, 395
- Sherlock (R. L.), London and the Thames Valley (*Review*), 389
- Sherman (H. C.), and H. L. Campbell, Regularity of Nutritional Response to Chemical Intake, 775
- Sherrington (Sir Charles), elected an associate of the Royal Academy of Belgium, 502
- Shiras (G.), Hunting Wild Life with Camera and Flashlight: a Record of Sixty-five Years' Visits to the Woods and Waters of North America. 2 Vols. (*Review*), 780
- Shortley (Dr. G. H.), [Prof. E. U. Condon and], The Theory of Atomic Spectra (*Review*), 525
- Shriner (Prof. R. L.), and Prof. R. C. Fuson, The Systematic Identification of Organic Compounds: a Laboratory Manual (*Review*), 704
- Shrubsole (G.), Spawning of the Common Toad, 835
- Shubnikov (L. W.), Destruction of Supraconductivity by Electric Current and Magnetic Field, 545; and A. K. Kikoin, Optical Experiments on Liquid Helium II, 641; and N. E. Alexejevski, Transition Curve for the Destruction of Supraconductivity by an Electric Current, 804
- Sigerist (Dr. H. E.), translated by Miss H. Nagel, American Medicine (*Review*), 142
- Silberstein (Dr. L.), Discrete Space-Time, 807; Minimal Lines and Geodesics within Matter: a Fundamental Difficulty of Einstein's Theory, 1012
- Sillcox (L. K.), Streamlined Trains, 238
- Simmonds (B. G.), [Prof. H. Munro Fox, C. A. Wingfield and], Oxygen Consumption of Mayfly Nymphs in Relation to Available Oxygen, 1015
- Simon (Dr. F.), Attainment of Temperatures below 1° K., 190; appointed reader in thermodynamics in Oxford University; work of, 874, 895; [Miss H. D. Megaw and], Density and Compressibility of Solid Hydrogen and Deuterium at 4·2° K., 244
- Simonds (W. A.), Edison, his Life, his Work, his Genius (*Review*), 740
- Simpson (Dr. J. B.), Fossil Pollen in Scottish Tertiary Coals, 48
- Singh (B. N.), [S. S. Banerjee and], High-Frequency Modulation of Ultra-Short Waves, 890
- Sinton (Lt.-Col. J. A.), appointed to conduct malaria research in England and India, 380
- Sjoerdsma (W.), Monomolecular Layers of Chlorophyll, 405
- Slon (Marion), [T. Urbanski and], Nitration of some Normal Paraffin Hydrocarbons, 774
- van Slyke (Dr. D. V.), awarded the Charles Mickle fellowship of Toronto University, 282
- Smart (Dr. W. M.), appointed regius professor of astronomy in Glasgow University, 895
- Smiles (J.), and H. Wrighton, Micrography of Metals in Ultra-violet Light, 855
- Smith (A. D. Buchanan), O. J. Robison and D. M. Bryant, Genetics of the Pig, 878
- Smith (A. E. Clarence), [obituary article], 678
- Smith (Dr. Bernard), [obituary article], 354
- Smith (B.), and T. N. George, North Wales (*Review*), 390
- Smith (E. L.), Photosynthesis in relation to Light and Carbon Dioxide, 775
- Smith (Dr. E. R.), [Dr. M. Wojciechowski and], Determination of Physico-Chemical Constants, 30
- Smith (Sir Frank), Sir Charles Parsons Memorial Lecture, 852
- Smith (F.), appointed assistant lecturer in chemistry in Birmingham University, 215
- Smith (Sir Grafton Elliot), Peking Man: Further Discoveries, 1004; title of emeritus professor conferred upon, by London University, 1110
- Smith (H. Fairfield), Influence of Temperature on Crossing-over in *Drosophila*, 329
- Smith (May), [Prof. M. Greenwood and], Labour Wastage in Industry, 408; and Margaret Leiper, Sickness Absence Wastage in Industry, 408
- Smith (M. R.), The Argentine Ant in the United States, 647
- Smith (Sylvanus J.), A Text-Book of Physical Chemistry (*Review*), 864
- Smith (S. W.), Place and Function of the Administrative and Technical Worker in the New Forms of Economic Structure, 653
- Smollett (Tobias), edited, with an Introduction and Notes, by C. E. Jones, An Essay on the External Use of Water (*Review*), 142
- Smorodincev (I.), and K. Bebeschin, Glycogen Content of Ascarids, 561
- Smuts (Gen.), elected Chancellor of Cape Town University, 584
- Smythe (W. R.), [D. E. Wooldridge and], Separation of Gaseous Isotopes by Diffusion, 555
- Snoddy (Dr. L. B.), Prof. J. W. Beams, W. T. Ham, jun., and H. Trotter, jun., Transmission of High-Voltage Impulses of Controllable Speed, 167
- Snowman (Dr. J.), A Short History of Talmudic Medicine (*Review*), 142
- Soddy (Prof. F.), impending retirement of, 772; The Hexlet, 958
- Sokolow (A.), [D. Iwanenko and], Interaction of Heavy Nuclear Particles, 246; Self-Interaction of Neutrons and Protons, 684
- Sollas (Prof. W. J.), [death], 751; [obituary article], 959
- van Someren (V. D.), [T. Warwick and], Roding of the Woodcock, 977
- Somogyi (Dr. J. C.), A New Microcolorimetric Apparatus and a method for Determination of Total Blood Volume, 763
- Southwell (Prof. R. V.), An Introduction to the Theory of Elasticity: for Engineers and Physicists (*Review*), 54; elected a member of the Hebdomadal Council of Oxford University, 895
- Speakman (Dr. J. B.), Reactivity of the Sulphur Linkage in Animal Fibres, 43; Cross Linkage Formation in Keratins, 327
- Speicher (B. R.), Are Hymenoptera Tetraploid?, 78
- Spence (Dr. R.), and Dr. W. Wild, Mechanism of the Photo-decomposition of Acetone, 206
- Spencer (Prof. J. F.), and G. T. Oddie (Sister Mary Cecilia), Preparation of Lithium Alum, 169; and Dr. V. C. G. Trew, Diamagnetism of Mixtures of Organic Liquids, 974
- Sponer (Prof. H.), Molekülspektren und ihre Anwendung auf chemische Probleme. 1: Tabellen; Teil 2: Text (*Review*), 386
- Sprague (G. F.), [L. J. Stadler and], Genetic Effects of Ultra-Violet Radiation in Maize, 1, 2, 3, 1070
- Spratt (H. P.), Libraries for Scientific Research in Europe and America (*Review*), 59
- Spring (Dr. F. S.), [J. H. Beynon, Prof. I. M. Heilbron and], A Novel Interrelationship in the Triterpene Group, 1017
- Squire (Alderman C.), elected president of the Museums Association, 172
- Squire (F. A.), Insect Life of Temporary Rain Swamps in British Guiana, 151
- Sreenivasan (A.), Role of Silicon in the Plant, 889; [K. V. Giri and], The Amylase System of Rice Grain during Ripening and Germination, 406
- Stacey (F. S.), [obituary article], 318
- Stacey (Dr. M.), appointed lecturer in chemistry in Birmingham University, 215
- Stach (L. W.), An Upper Oligocene Bryozoan Faunule, 520
- Stadler (L. J.), and G. F. Sprague, Genetic Effects of Ultra-violet Radiation in Maize, 1, 2, 3, 1070
- Stair (R.), [W. W. Coblenz and], Solar Temperature, 690
- Stamp (Sir Josiah), The Impact of Science upon Society, 435; Plea for the Scientific Definition of Terms used, 746
- Stamp (Dr. L. Dudley), Problems of Plantation Economy, 957; The North Sea Basin, 1105
- Standley (P. C.), and Prof. S. J. Record, The Forests and Flora of British Honduras (*Review*), 145

- Stansfield (Prof. H.), The Osborne Reynolds Ridge, 20
 Stanworth (J. E.), appointed a research fellow in glass technology in Sheffield University, 895
 Stapledon (Prof. R. G.), Grassland of Great Britain, 875, 927
 Start (Miss Laura E.), and Miss Mabel C. Wright, Garments from Yunnan, 805
 Stebbins and Whitford, Colours of Globular Clusters, 890
 Stedman (E.), [L. H. Easson and], Absolute Activity of Choline Esterase, 767
 Stein (Sir Aurel), Projected survey of the Eastern Frontiers of the Roman Empire, 68
 van Stein Callenfels (Dr. P.), Cultural Associations of Solo Man, 293
 Steinach (E.), H. Kun and O. Peczenik, Action of Sex Hormones (1, 2, 3), 49
 Steinhardt (Dr. J.), Inactivation of Crystalline Pepsin, 74; Total Dissociation of Horse Hæmoglobin, 800
 Stenz (Dr. E.), Ziema: Fizyka Globu, mórz i atmosfery (Review), 994
 Štěpánek (Dr. J. M.), [Prof. C. Krauz and], Constitution of Tetranitromethane, 807
 Stephensen (Dr. K.), Crustacea from the *Godthaab* Expedition, 848
 Stephenson (J.), with an Historical Section by W. G. East, Berkshire (Land of Britain, part 78) (Review), 227
 Stephenson (Dr. W.), appointed assistant director of the Institute of Experimental Psychology, Oxford, 14, 46
 Stern (C.), and Violet Rentschler, Effect of Temperature on the Frequency of Somatic Crossing-over in *Drosophila melanogaster*, 600
 Sternon (M.), awarded the Lefebvre prize of the Royal Academy of Belgium, 240
 Steven (G. A.), Seals in Cornwall, 370
 Stevens (H. P.), and W. H. Stevens, Rubber Latex. Revised edition, 110;
 Stevens (S. S.), [E. G. Boring and], Nature of Tonal Brightness, 775
 Stevens (W. H.), [H. P. Stevens and], Rubber Latex. Revised edition, 110
 Stevens (W. R.), awarded Silver Jubilee Commemoration Award of the Illuminating Engineering Society, 615
 Stewart (Dr. A. B.), Problems in Applied Pedology, 730
 Stewart (Prof. A. W.), Recent Advances in Organic Chemistry. Vol. 2. With the addition of part 2, by Dr. H. Graham (Review), 633
 Stiles (Dr. C. W.), Suggested Cases for Suspension of Rules of Nomenclature, 34; Proposed Suspension of Rules of Nomenclature in the Case of Bohadsch 1761, 206
 Stock (C. D.), and Frances D. Bode, Early Man in New Mexico, 208
 van Stockum (W. J.), Gravitational Field of a Distribution of Particles Rotating about an Axis of Symmetry, 896
 Stokes (F. M. C.), Aptitudes of the Bantu, 1059
 Stokley (J.), Stars and Telescopes (Review), 821
 Stokoe (W. J.), [T. H. Scott and], Wild Flowers of the Wayside and Woodland (Review), 227
 Stonehill (H. I.), [Prof. J. R. Partington and], Oxidation-Reduction Potential, 252
 Stoner (C. R.), [A. W. Ladner and], Short Wave Wireless Communication. Third edition (Review), 822
 Störmer (Prof. C.), Northern Lights, 159
 Stout (J. W.), [W. F. Giaque and], Heat Capacity of Ice, 334
 Stoyko (N.), Irregularity of the Earth's Rotation, 339
 Strauss (J. N.), awarded a junior fellowship by the Medical Research Council, 879
 Streeter (Dr. G. L.), elected an honorary foreign fellow of the Royal Society of Edinburgh, 67
 Strohe (Dr.), Industrial Use of Electric Batteries, 297
 Strömren (E.), Ole Römer's Meridian Observations and the so-called Mayer Formula for the Correction of the Observed Time of Transit for Instrumental Errors, 695
 Strong (Dr. W. D.), Cultural Origins in Central America, 1045
 Stroobant (Prof. P. H.), [obituary article], 496
 "Student", The Half-Drill Strip System Agricultural Experiments, 971
 Stueckelberg (E. C. G.), Continuous γ -Radioactivity and Unitary Field Theory, 259
 Sturtevant (A. H.), and T. Dobzhansky, Inversions in the Third Chromosome of Wild Races of *Drosophila pseudo-obscura*, etc., 600
 Suess (F. E.), Interpretation of the Occurrence of Pumice Stone at Köfels in Ötztale, 49
 Sun (Cheng E.), and Ta-you Wu, Nitrous Oxide Molecule, 409
 Supple (G. C.), awarded a silver medal by the American Medical Association, 160
 Sussmilch (C. A.), Change of Sea-level at Botany Bay, 897
 Susz (B.), and S. Fried, Raman Spectrum of Gallic Acid, of some of its Derivatives and of Tannin, 259
 Sutherland (Dr. G. B. B. M.), and G. K. T. Conn, Infra-red Absorption Spectrum of Heavy Phosphine (PD₃), 641
 Svedberg (Prof. The), [I. B. Eriksson-Quensel and], Molecular Weight of a Virus Protein, 937
 Swain (Squadron Leader F. R. D.), New Aeroplane Height Record, 580
 Swann (Dr. W. F. G.), Cosmic Rays, 209
 Swings (P.), La spectroscopie appliquée (Review), 269
 Swirles (Dr. B.), [Prof. D. R. Hartree, Dr. H. S. W. Massey and], Theory of Complex Atoms, 1080
 Sykes (C.), and F. W. Jones, Order-Disorder Transition in Alloys, 936
 Sykes (Brig.-Gen. Sir Percy), The Quest for Cathay (Review), 1036
 Synge (Prof. J. L.), Equivalent Particle-Observers, 28
 Szent-Györgyi (Prof. A.), [S. Rusznák and], Vitamin P: Flavonols as Vitamins, 27; [A. Benráth, S. Rusznák and], Vitamin Nature of Flavones, 798; [V. Bruckner and], Chemical Nature of Citrin, 1057
 Szper (J.), [M. Centnerszwer and], Electrolysis of some Salts in Anhydrous Glycerol, 733
 Talbot (Prof. A. N.), awarded the John Fritz gold medal; work of, 1002
 Talman (C. F.), [death], 393; [obituary article], 537
 Tamm (N.), Discovery of a Nova in Aquila, 756
 Tarr (Dr. H. L. A.), [Dr. J. G. Davis and], Relation of so-called *Streptococcus apis* to certain Lactic Acid Streptococci, 763
 Tattersall (A. E.), Railway Signals for Fogs, 766
 Tawde (Dr. N. R.), Constants of Diatomic Molecules, 649
 Taylor (C. N.), Odyssey of the Islands (Review), 348
 Taylor (H. J.), [Sir Leonard Hill and], The 'Specific Action' of Ultra Short Wireless Waves, 591
 Taylor (Prof. L. W.), Newton's Prism in the British Museum, 585
 Teegan (J. A. C.), Comparison of γ -Ray Intensities from Radium Preparations, 338
 Telling (Miss H. G.), The Rational Quartic Curve in Space of Three and Four Dimensions (Review), 905
 Testut (R.), Formation of Chromium Carbides, 1026
 Tetley (J. H.), Route of Migrating Parasites in Ruminants, 802
 Thatte (Prof. V. N.), Raman Spectrum of Thiophosphoryl Chloride, 468
 Theiler (Sir Arnold), [death], 193; [obituary article], 354
 Thellier (E.), Determination of the Direction of Permanent Magnetization of Rocks, 856
 Théodoresco (Mlle. Marie), Raman Effect of a Tungstotartaric Complex Compound in Water, 812
 Theorell (H.), Keilin's Cytochrome *c* and the Respiratory Mechanism of Warburg and Christian, 687
 Thiele (Dr. H.), Formation of Carbon Dendrites, 688
 Thimann (K. V.), Physiology of the Formation of Nodules on Legume Roots, 775
 Thomas (Dr. Dighton), Geology and the Community, 89
 Thomas (F. C.), Ability and Knowledge: the Standpoint of the London School (Review), 423
 Thomas (I. M.), Diastase in Rabbit Saliva, 1015
 Thomas (Dr. J.), Josiah Wedgwood as a Pioneer of Steam Power in the Pottery Industry, 925
 Thomas (P. T.), Genotypic Control of Chromosome Size, 402
 Thompson (Prof. D'Arcy W.), elected president of the Royal Society of Edinburgh, 756

- Thompson (D. V.), The Materials of Medieval Painting (*Review*), 266
- Thompson (Lieut. E. H.), An Automatic Plotting Machine for Air Photographs, 254
- Thompson (E. J.), Archaeology of South America, 716
- Thompson (J. G.), [H. E. Cleaves and], The Metal-Iron (*Review*), 96
- Thompson (Dr. J. H. C.), elected a fellow of Wadham College and lecturer in mathematics in Oxford University, 89
- Thompson (J. M. C.), [Dr. A. Clow and], Resonance Structures of Carbon Dioxide, Carbonyl Sulphide and Carbon Disulphide, 802
- Thompson (Dr. R. Campbell), [C. J. Gadd and], A Middle-Babylonian Chemical Text, 555; A Dictionary of Assyrian Chemistry and Geology (*Review*), 1035
- Thomson (Dr. A. L.), Migrations of Birds, 554; Bird Migration: A Short Account (*Review*), 1078
- Thomson (Dr. H. Campbell), The Story of the Middlesex Hospital Medical School (*Review*), 142
- Thomson (Sir J. J.), Recollections and Reflections (*Review*), 989
- Thomson (Sir St. Clair), awarded the Weber-Parkes medal and prize of the Royal College of Physicians, 240
- Thorson (Dr. G.), Egg-Capsules and Development of Arctic Marine Prosobranchs, 213
- Thouvenin (J.), [J. Roig and], Variation of the Optical Density of Photographic Plates with the Dryness Conditions, 179
- Ticehurst (N. F.), and others, Fauna of Sussex, 592
- Tifeneau (M.), and Mlle. J. Gutman, Molecular Transformation in the Cyclanic Series, 897
- Tilho (J.), Present Condition of the Zone of Capture of the Logone by the Bénoué, 258
- Tillyard (Dr. R. J.), A New Upper Triassic Fossil Insect Bed in Queensland, 719; [late Sir T. W. Edgeworth David and], Memoir on Fossils of the Late Pre-Cambrian (Newer Proterozoic) from the Adelaide Series, South Australia (*Review*), 994
- Timmermann (Prof. J.), Les solutions concentrées (*Review*), 306
- Timoshenko (Prof. S.), Theory of Elasticity (*Review*), 45
- Timperley (W. A.), appointed research fellow in physiology in Sheffield University, 1067
- Tincker (Dr. M. A. H.), Hormones and Horticulture, 766
- Tiselius (A.), [Prof. M. Heidelberger, K. O. Pedersen and], Ultracentrifugal and Electrophoretic Studies on Antibodies, 165
- Todd (A. R.), [F. Bergel and], The Structure of Aneurin and Thiochrome, 76; 119; Synthesis of Thiochrome, 406
- Tokunaga (M.), Anatomy of a Nyphomyiid Fly, 806
- Tokunaga (S.), and N. Naora, Palaeolithic Site in Manchukuo, 1019
- Tolansky (Dr. S.), The Electric Quadrupole Moment of the Nucleus $^{127}_{55}\text{I}$, 404
- Tombs (D. M.), Parallel-plane Diode Magnetron, 36
- Toshniwal (G. R.), B. D. Pant and R. R. Bajpai, Collisional Friction Frequency in the Ionosphere at Allahabad, 37
- Tourky (Dr. A. R.), and Prof. D. H. Bangham, Colloidal Silica in Natural Waters and the 'Silicomolybdate' Colour Test, 587
- Tournaire (Mlle. Arlette), and E. Vassy, Influence of the Wave-length of the Light on the Evolution of the Latent Image, 179
- Tournay (R.), Existence of Zinc Metaborate, 695
- Townend (Dr. S.), Frosted Wool Process, 44
- Townsend (A. A.), [E. H. S. Burhop, R. D. Hill and], Selective Absorption of Neutrons in Silver, 1094
- Trapp (Dr. G.), A Bacillus Isolated from Diseased Plants of *Aucuba japonica* (Thunb.), 40
- Travancore (Maharajah of), Temples and Caste in Travancore, 875
- Traver (Dr. J. R.), [Prof. J. G. Needham, Prof. Yin-Chi Hsu, and others], The Biology of Mayflies: with a Systematic Account of North American Species (*Review*), 223
- Travers (Prof. M. W.), Kinetics of Gas Reactions: an Attempt to connect Thermal Decomposition and Oxidation Processes, 26; Mechanism of Thermal Change in Gaseous Organic Compounds, 967; [P. F. Gay and], Influence of Nitric Oxide on the Thermal Decomposition of Dimethyl Ether. Gaseous Catalysis, 546
- Tréhim (R.), Application of certain Physical Methods to the Search for Complex Compounds in Solution, 943
- Trevor (J. C.), awarded a Leonard Darwin scholarship of the Eugenics Society; work of, 756
- Trew (Dr. V. C. G.), [Prof. J. F. Spencer and], Diamagnetism of Mixtures of Organic Liquids, 974
- Trewartha (Prof. G. T.), [Prof. V. C. Finch and], Elements of Geography (*Review*), 1075
- Trillat (J. J.), and S. Oketani, Transformations produced in Certain Metals by Heating in a Vacuum or in Air, 1069
- Troll (Prof. W.), Vergleichende Morphologie der höheren Pflanzen. Band I, Lief 1 (*Review*), 950
- Trotter, jun. (H.), [Dr. L. B. Snoddy, Prof. J. W. Beams, W. T. Ham, jun., and], Transmission of High-Voltage Impulses of Controllable Speed, 167
- Trowell (O. A.), appointed lecturer in physiology in Edinburgh University, 1110
- Truchet (R.), Heavy Chloroform CDCl_3 , 179
- Trueman (Prof. A. E.), Correlation of the Coal Measures, 705
- Truscott (Prof. S. J.), title of emeritus professor conferred upon, by London University, 1110
- Tschesche (Dr. R.), awarded the Carl Duisberg memorial prize of the Association of German Chemists, 543
- Tseretelli (Prof. M.), Asianic Deities in the Paganism of Ancient Georgia, 512
- Tsi-Zé (Ny), and Ch'en Shang-Yi, Displacements of the Higher Members of the Principal Series of Rubidium by the Rare Gases, 476; Continuous Absorption Band of Rubidium in the Presence of Foreign Gases, 1055; and Weng Wen-Po, Absorption Spectrum of Potassium, 561
- Tucker (Dr. W. S.), Direction Finding by Sound, 111
- Tuckwell (Rev. W.), A Pioneer of School Science, 914
- Turnbull (Prof. H. W.), Revised Prepared System of the Quadratic Complex, 48
- Turner (H. C.), and E. H. W. Banner, Electrical Measurements in Principle and Practice (*Review*), 635
- Turrill (Dr. W. B.), [Dr. E. Ashby, Prof. F. A. E. Crew, Dr. C. D. Darlington, E. B. Ford, Prof. J. B. S. Haldane, Prof. E. J. Salisbury, C. H. Waddington and], Genetics in the Universities, 972
- Túry (P.), and S. Krausz, Effect of Molecular Nitrogen on Molybdenum at High Temperatures, 331
- Tuve (M. A.), [L. R. Hafstad, N. P. Heydenburg and], Excitation of Nuclei by Proton Bombardment, 767
- Tuyn (Dr. W.), [Prof. Keesom and], Temperature Scale, 977
- Tyler (W. F.), Electrification of a Roof during a Thunderstorm, 724
- Ubbelohde (A. R.), Expansion Pressures of Metallic Hydrogen and Deuterium, 845
- Uber (F. M.), and T. H. Goodspeed, Micro-incineration Studies (3), 775
- Ugolini (Prof. L. M.), [obituary article], 791
- Uhlenhuth (Prof. P.), nominated a foreign member of the Royal Academy of Sciences of Stockholm, 199
- Ulyott (P.), and P. Holmes, Thermal Stratification in Lakes, 971
- Ulrich (R.), Correlation between the Elongation of the Fruit and the Development of the Seeds in the Wallflower, *Cheiranthus Cheiri*, 1027
- Unwin (Dr. J. D.), [obituary article], 234
- Upton (M.), Differential Sensitivity in Sound Localization, 415; and W. J. Crozier, Auditory Intensity Discrimination, 415
- Urbanski (T.), and Marion Slon, Nitration of some Normal Paraffin Hydrocarbons, 774
- Uvarov (Dr. B. P.), Biography and Ecology of North African Birds and Mammals, 273

- Valentine (D. H.), appointed curator of the Cambridge University Botanical Museum and Herbarium, 731
- Vallery-Radot (Dr. P.), elected a member of the Paris Academy of Medicine, 615
- Van den Branden (Prof. F.), elected a *correspondant* of the Royal Academy of Belgium, 502
- Van Campen (J. H.), [R. Connor and], A Reagent for Structure Determination, 372
- Van Name (W. G.), American Land and Fresh-Water Isopod Crustacea, 554
- Van Rooy (Prof. A. H. M. J.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Van Uven (Prof. M. J.), Mathematical Treatment of the Results of Agricultural and other Experiments (*Review*), 347
- Van Wert (Dr. L. R.), An Introduction to Physical Metallurgy (*Review*), 1032
- Van der Wyk (Dr. A. J. A.), Viscosity of Binary Mixtures, 845
- Vaníček (V.), [H. Bondy and], Relative Abundance of Potassium and Lithium Isotopes and the Emission of Alkali Ions from Glass Melts, 49
- Varga (G.), [A. Chrétien and], Manganese Trichloride, 334
- Vassy (E.), [Mlle. Arlette Tournaire and], Influence of the Wave-length of the Light on the Evolution of the Latent Image, 179
- Vavilov (N. I.), elected an honorary foreign fellow of the Royal Society of Edinburgh, 67
- Vegard (Prof. L.), Red and Sunlit Auroras and the State of the Upper Atmosphere, 930; Auroral Phenomena and the Behaviour of the Ionosphere during a Total Solar Eclipse, 974
- Veley (Dr. Lilian), [death], 960
- Verdino (A.), [O. Dischendofer and], Condensation of Benzoin and Thymol (2), 49
- Verleysen (A.), [Prof. C. Manneback and], Provisional Computation of the Plane Vibration Frequencies of Symmetrical Deuteroethylenes, 367
- Verma (S. C.), A New Strigoid Parasite of the Rare Genus *Cyathocotyle*, 589, 757
- Verzár (Prof. F.), and L. Laszt, Sodium and Water Metabolism in relation to Disturbances of Carbohydrate Metabolism after Adrenalectomy, 844
- Vialard-Goudou (A.), Oxidation of some Organic Substances by Perchloric Acid, 695
- Vigoureux (P.), Electricity (Principles of Electric and Magnetic Measurements. Pt. 1) (*Review*), 485
- Viljoen (Dr. S.), The Economics of Primitive Peoples (*Review*), 904
- Virtanen (Prof. A. I.), Nature of the Excretion of Nitrogen Compounds from Legume Nodules, 880
- de Vito (G.), [E. Parisi and], Ripening of Cheeses, 340
- Vnukova (Mrs. A.), Dependence of the Herschel Effect upon the surrounding Gas Medium, 246
- Voisey (A. H.), Upper Palaeozoic Rocks around Yessabah near Kempsey, N.S.W., 259
- Vollette (F.), Hydrogenation of Coal: a French Process, 473
- Vorbrodt (W.), Use of Concentrated Hydrogen Peroxide for the Determination of the Mineral Content of Plant and Animal Materials, 733
- Waddington (C. H.), Organizers in Mammalian Development, 125; Morphogenesis and the Field Concept, 809; [Dr. E. Ashby, Prof. F. A. E. Crew, Dr. C. D. Darlington, E. B. Ford, Prof. J. B. S. Haldane, Prof. E. J. Salisbury, Dr. W. B. Turrill and], Genetics in the Universities, 972
- Wadham (S. M.), [G. W. Leeper, Ann Nicholls and], Soil and Pasture Studies in the Mount Gellibrand Area, Western District of Victoria, 520
- Wahl (H.), Chlorination of *p*-Chlortoluene, 258
- Waksman (Prof. S. W.), Humus: Origin, Chemical Composition, and Importance in Nature (*Review*), 624
- von Waldeyer (Wilhelm), centenary of the birth of, 579
- Waldschmidt-Leitz (Prof. E.), Recent Advances in Enzyme Chemistry, 409
- Wales (Dr. H. G. Q.), Archaeology in Indo-China, 795
- Walker (Dr. A. G.), appointed lecturer in pure mathematics in Liverpool University, 46
- Walker (F.), and C. F. Davidson, Geology of the Faeroes, 178
- Walker (Dr. O. J.), Specific Heats of Metals and Alloys at High Temperatures, 211
- Walker (W. M.), Mound Builders in Louisiana, U.S.A., 805
- Wallerant (Prof. F.), [death], 393
- Wallin (Dr. J. E. W.), Personality Maladjustments and Mental Hygiene (*Review*), 636
- Walton (H. F.), and J. H. Wolfenden, Temperature Coefficient of the Electrolytic Separation of the Hydrogen Isotopes, 468
- Wanklyn (Miss H. G.), appointed lecturer in geography in Cambridge University, 1025
- Ward (J. F.), and R. T. M. Haines, Estimation of Vitamin A, 128
- Ware (W. M.), New Disease of Stocks, 766
- Waring (H.), Colour in the Dogfish, *Scyllium canicula*, 1100
- Warmoltz (N.), A Second Sheath near the Cathode of an Arc Discharge, 36
- Warren (H.), Demonstration of Phosphorescence, 974
- Warwick (T.), and V. D. van Someren, Roding of the Woodcock, 977
- Wassén (Dr. H.), Archaeology in Western Colombia, 333
- Wassermann (A.), [B. S. Khambata and], Kinetics of an Inverse Diene Synthesis in the Pure Liquid State, 368
- Waters (Dr. W. A.), Physical Aspects of Organic Chemistry (*Review*), 224
- Waterston (Prof. D.), Morphology of Muscles (*Review*), 221
- Watson, jun. (F.), and E. M. Cook, Accuracy of Observations by Inexperienced Meteor Observers, 514
- Watson (Sir Malcolm), Experimental Research and Disease (Stephen Paget memorial lecture, 197
- Watson (Prof. W. H.), and D. G. Hurst, Transparency of Sodium and Potassium Films in the Schumann Region, 124
- Watt (R. A. Watson), appointed superintendent of the Air Ministry Research Station, Bawdsey Manor, 460
- Wattiez (M.), awarded the Lefebvre prize of the Royal Academy of Belgium, 240
- Watts (Prof. W. W.), Prof. W. J. Sollas, 959; title of emeritus professor conferred upon, by London University, 1110
- Weatherhead (Rev. Leslie D.), Spiritual Healing, 277
- Webb (C. E.), Magnetism (Principles of Electric and Magnetic Measurements. Pt. 2) (*Review*), 485
- Webb (R. R.), [obituary article], 392
- Weber (W.), [Dr. H. J. von Braunmühl und], Einführung in die angewandte Akustik (*Review*), 310
- Wedel (W. R.), Pawnee Archaeology, 888
- Weech (W. N.), [R. Flenley and], World History: the Growth of Western Civilization (*Review*), 263
- Weevers (T.), Some Phytochemical Problems, 259
- Wegelin (Prof. K.), elected a member of the Imperial Leopold Caroline German Academy of Science, 160
- Weidenreich (Dr. F.), Brain Size in Man and the Great Apes, 689; Peking Man: Further Discoveries, 1004
- Weil-Malherbe (Dr. H.), Carbohydrate Metabolism, 551; [Dr. F. Dickens and], Metabolism of Cartilage, 125
- Weinstein (A.), Equations of Vibration of a Plate, 259
- Weiser (H. B.), W. O. Milligan and W. C. Ekholm, Plaster of Paris, 294
- Weiss (Prof. F. E.), elected president of the South-Eastern Union of Scientific Societies, 89
- Weiss (Dr. J.), Photo-Reduction of Fluorescent Substances by Ferrous Ions, 80; [Dr. E. Rabinowitch and], Reversible Oxidation and Reduction of Chlorophyll, 1098
- Welch (F. B. A.), and R. Crookall, Bristol and Gloucester District (*Review*), 389
- Welch (F. V.), [J. E. Barnard and], Practical Photomicrography. Third edition (*Review*), 636
- Weling (A. N.), The Kātkāris: a Sociological Study of an Aboriginal Tribe of the Bombay Presidency (*Review*), 100
- Wellcome (Sir Henry), [death], 193; [obituary article], 275

- Wells (A. F.), [F. G. Mann, D. Purdie and], A Co-ordinated Cuprous Complex, 978
- Wells (H. G.), The Anatomy of Frustration: a Modern Synthesis (*Review*), 779; The Idea of a World Encyclopædia, 917
- Wells (H. M.), London Telephone Trunk Exchange, 1006
- Wen-Po (Weng), [Ny Tsi-Zé and], Absorption Spectrum of Potassium, 561
- Wernick (Dr. S.), Sherard O. Cowper-Coles, 712
- Wesolowski (J.), [S. Dobinski and], Density of Liquid Selenium, 301
- West [Dr. F. Kidd and], Gas Storage of Apples, 1062
- Westcott (C. H.), [Dr. A. Arsenjewa-Heil, Dr. O. Heil and], Influence of Temperature on the 'Groups' of Slow Neutrons, 462
- Westenbrink (Dr. H. G. K.), Relative Velocities of the Absorption of Different Sugars from the Intestine of Rat and Pigeon, 203
- Westergaard (Prof. H.), [death], 1088
- Westermarck (Dr. E.), The Future of Marriage in Western Civilization (*Review*), 186; Methods in Social Anthropology (Huxley memorial lecture), 808
- Weston (Dr. E.), [obituary article], 496
- Westroff (G.), [H. Moureu, M. Magat and], Two Forms of Phosphorus Pentachloride, 476
- Whayman (Eng. Rear-Adml. W. M.), Present Position of Marine Steam Boilers, 213
- Wheeler (Prof. W. M.), elected an honorary foreign fellow of the Royal Society of Edinburgh, 67
- White (Prof. C. Langdon), and Dr. G. T. Renner, Geography: an Introduction to Human Ecology (*Review*), 1075
- White (Prof. H. E.), Introduction to Atomic Spectra (*Review*), 525
- White (Dr. H. L.), Anther Smut of Carnations, 848
- White (Dr. W. A.), Twentieth Century Psychiatry: its Contribution to Man's Knowledge of Himself (Thomas W. Salmon memorial lectures) (*Review*), 636
- White (W. H.), A Complete Physics written for London Medical Students and General Use (*Review*), 183
- Whitehead (T. H.), [R. W. Pocock and], The Welsh Borderland (*Review*), 390
- Whitford [Stebbins and], Colours of Globular Clusters, 890
- Whitney (B. S.), Computing Meteor Heights, 514
- Wiemann (J.), Raman Effect and Organic Chemistry: the Structure of the 'Oses' and the Raman Effect, 896
- Wiersma (C. A. G.), and G. Marmont, Mechanism of Inhibition of Crayfish (*Cambarus clarkii*) Muscle, 775
- Wiersma (J. T.), [J. Clay, E. M. Bruins and], A Temporary Excess of Ten per cent in Cosmic Radiation, 812
- Wild (Prof. J.), George Berkeley: a Study of his Life and Philosophy (*Review*), 818
- Wild (Dr. W.), [Dr. R. Spence and], Mechanism of the Photo-decomposition of Acetone, 206
- Wildman (Dr. A. B.), Estimations in the Fleece of Important Wool Characteristics, 43
- Wilkensky (Dr. B.), Life in the Dead Sea, 467
- Willcox (Dr. O. W.), Nations Can Live at Home (*Review*), 58
- Willey (Dr. E. J. B.), Mechanism of Chemical Reaction in the Electric Discharge, 1054
- Williams (Prof.), Synthesis of Vitamin B (Antineurin), 356, 372
- Williams (Dr. C. J.), appointed Leverhulme foundation lecturer in physics in Liverpool University, 46
- Williams (E. G.), Spectra of β -type Stars, 334; appointed first junior observer at the Cambridge Solar Physics Observatory, 693
- Williams (Dr. E. J.), and E. Pickup, Conservation of Energy in Radiation Processes, 461
- Williams (P. H.), A New Disease of Mushroom Beds, 690
- Williams (Lady Rhys), Maternal Mortality and Malnutrition, 1103
- Williams (Prof. R. S.), and Prof. V. O. Homerberg, Principles of Metallography (*Review*), 1032
- Willmer (E. N.), elected an official fellow of Clare College, Cambridge, 810
- Wilmott (A. J.), Endemic Flora of Britain, 89
- Wilson (Dr.), appointed to conduct a nutritional survey in India, 381
- Wilson (J. T.), [P. Byerly and], Recent Earthquakes in California, 936
- Wilson [Henderson and], Actions of Acetylcholine on the Brain, 129
- Windred (G.), Electrical Contacts, 41
- Winge, (Ø.), Linkage in *Pisum*, 695
- Wingfield (C. A.), [Prof. H. Munro Fox, B. G. Simmonds and], Oxygen Consumption of Mayfly Nymphs in Relation to Available Oxygen, 1015
- Winsor (C. P.), and Anna-Betty Clark, Dark Adaptation after Varying Degrees of Light Adaptation, 415
- Winterbotham (Brig. H. S. L.), Mapping of our African Colonies, 452
- Wintringham (Mrs. M.), Emergency Open-Air Nurseries in the Distressed Areas, 731
- Wishart (Dr. J.), Mathematics and Agriculture (*Review*), 347
- Wissler (Dr. C.), Population of the Northern Plains Indians, 553
- Wojciechowski (Dr. M.), A Simplified Procedure for Determining Normal Boiling Points by the Comparative Method, 1096; and Dr. E. R. Smith, Determination of Physico-Chemical Constants, 30
- Wolfenden (J. H.), [H. F. Walton and], Temperature Coefficient of the Electrolytic Separation of the Hydrogen Isotopes, 468
- Wolters (A. W.), Patterns of Experience, 455; 670
- Wood (H. E.), The Radcliffe Observatory in South Africa, 320
- Woodward (Sir Arthur Smith), elected associate of the Royal Academy of Belgium, 502
- Wooldridge (D. E.), and W. R. Smythe, Separation of Gaseous Isotopes by Diffusion, 555
- Woolley (Sir Leonard), Syria and Crete: Further Discoveries, 20; The Racial Elements in Sumerian Art History, 69; Archaeological Investigations in Syria, 235
- Wooster (Dr. W. A.), Professional Associations of Scientific Workers, 1017
- Wormell (Dr. T. W.), and Dr. J. C. Dobbie, *Nova Lacertæ*, 1936, 38
- Worsdell (W. C.), Comparative Morphology of Plants (*Review*), 950
- Wouters (J.), [Prof. Marc de Hemptinne and], Geometrical Constitution of Silicichloroform, 884
- Wray (D. A.), The Pennines and Adjacent Areas (*Review*), 390
- Wright (J. N.), appointed professor of logic and mathematics in St. Andrews University, 89
- Wright (Miss Mabel C.), [Miss Laura E. Start and], Garments from Yunnan, 805
- Wright (S.), *Pseudodiptomus* from South America, 592
- Wrighton (H.), [J. Smiles and], Micrography of Metals in Ultra-Violet Light, 855
- Wrinch (Dr. D. M.), Energy of Formation of 'Cyclol' Molecules, 241; Structure of Proteins, 607; Structure of Proteins and of certain Physiologically Active Compounds, 651; and Dr. D. Jordan Lloyd, The Hydrogen Bond and the Structure of Proteins, 758
- Wu (Ta-You), [Cheng E. Sun and], Nitrous Oxide Molecule, 409
- Yates (E. D.), [J. H. Quastel and], Invertase and Dye-stuffs, 690
- Yerkes (R. M.), and J. H. Elder, Sexual and Reproductive Cycles of Chimpanzee, 91; Reproduction in the Chimpanzee, 725
- Yonge (Prof. C. M.), Mode of Life, Feeding, Digestion and Symbiosis with *Zooxanthellæ* in the *Tridacnidae*, 473
- Yoshida (T.), Reaction between Ammonia and Carbon Dioxide, 695
- Young (H. T.), Electric Services in Buildings, 752
- Young (L. C.), and E. O. Hulburt, Radio and the Sunspot Cycle, 472
- Young (Prof. P. T.), Motivation of Behaviour: the Fundamental Determinants of Human and Animal Activity (*Review*), 666
- Yule (G. Udny), Dr. W. F. Sheppard, 872

- Zacwilichowski (J.), New Method of obtaining Aberrant Forms of Lepidoptera under the Influence of Chemical Reagents, 897
- Zahn (Prof. F.), nominated president of the International Statistical Institute, 1008
- Zander (Prof. E.), Beiträge zur Herkunftsbestimmung bei Honig. Band 1 (*Review*), 147
- Zangwill (O. L.), elected a Martin Thackeray student at King's College, Cambridge, 215
- Zannick (Prof. R.), awarded the Sudhoff medal of the German Society of the History of Medicine, Natural Science and Technique, 718
- Zarrow (M. X.), [C. M. Pomerat and], Effect of Temperature on the Respiration of the Earthworm, 91
- von Zeerleder (Prof. A.), and Dr. R. Irmann, Strength of Pure Aluminium and various Aluminium Alloys after Heating, 691
- Ziemecki (A.), and K. Narkiewicz-Jodko, Continuity of the Variation of the Cosmic Radiation in the Upper Layers of the Troposphere, 301
- ZoBell (C. E.), and Helen M. Mathews, Qualitative Study of the Bacterial Flow of Sea and Land Breezes, 1070
- Zouckermann (R.), and R. Freymann, High-Frequency Absorption of various Alcohols, 217
- Zuckerman (Dr. S.), Hormones and Evolution, 408
- Zwarenstein (H.), [B. J. Shapiro and], Relation of the Pituitary Gland to Muscle Creatine, 178; [V. Schrire and], Pancreas and Blood Inorganic Phosphorus, 180
- Zwicky (F.), Extra-Terrestrial Effects of Cosmic Rays, 91

TITLE INDEX

- α -Rays of 2 cm. Range, Origin of, J. Schintlmeister, 477
 Aberdeen University, Prof. W. Garstang appointed to take charge temporarily of the Natural History Department, 772
 Ability and Knowledge: the Standpoint of the London School, F. C. Thomas (*Review*), 423
 Absorption Coefficients of the Bands 4774, 5770 and 6290 Å. of Oxygen, L. Herman and Mme. Renée Herman-Montagne, 216
 Abyss: Nearing the, the Lesson of Ethiopia, Lord Davies (*Review*), 1072
 Académie des Inscriptions et Belles Lettres, Paris, Sir Robert Mond elected an associate foreign member of the, 1002
 Acetone, Photo-decomposition of, Mechanism of the, Dr. R. Spence and Dr. W. Wild, 206
 Acetylcholine: Actions of, on the Brain, Henderson and Wilson, 129; Containing Heavy Hydrogen, Prof. H. Erlenmeyer, H. Lobeck and Prof. K. Fromherz, 1063
 Acetylene, Development of the Chemistry of, Dr. O. Nicodemus, 475
 Acid Silver Nitrate Reaction, Value of the, as a Test of Ascorbic Acid, A. Giroud and C. P. Leblond, 247
 Actinomyces Group, Pathogenic Aerobic Organisms of the, Miss D. Erikson, 170
 Adenylc Acid in Vitamin B₁ Deficiency, Role of, Dr. T. W. Birch and Dr. L. W. Mapson, 27
 Administration: A Definite Profession, E. S. Byng, 653; and Technology in Industry, 653
 Administrative and Technical Worker, Place and Function of the, in the New Forms of Economic Structure, S. W. Smith, 653
 Adrenalectomized Rats, High Potassium Diet and the Survival of, Dr. R. A. Cleghorn and G. A. McVicar, 124
Aerobacter aerogenes, Fermentation of some Diabasic C₄ Acids by, H. A. Barker, 217
 Aeronautics, Skin-Friction in, The Part Played by, Dr. F. W. Lancaster, 1022
 Aeroplane: Height Record: G. Détré, 324; New, Squadron Leader F. R. D. Swain, 580; Materials, Research in, New Laboratory for, 610; The Book of the, Capt. J. L. Pritchard. Third edition (*Review*), 1037
 Africa: Native Policy in, W. G. A. Ormsby-Gore, 107; Dr. L. P. Mair (*Review*), 947; Artificial Lakes in, Proposal for, 717
 African: Honey Bees, Prof. T. D. A. Cockerell, 249; Surveys, Co-ordination of, Brig. MacLeod, 255; Colonies, Mapping of our, Brig. H. S. L. Winterbotham, 452; Problems, W. G. A. Ormsby-Gore, 680
 Africans, Ten, Edited by Margery Perham (*Review*), 947
 Agricultural: Botany, National Institute of, Annual Meeting, 158; Research: Farmer's Guide to, 199; Institutes in Great Britain, Report for 1933-34, 239; and other Experiments, Mathematical Treatment of the Results of, Prof. M. J. Van Uven (*Review*), 347; and Horticultural Pests, Leaflet on, 755; Research: Empire Co-operation in, 777; Experiments, The Half-Drill Strip System, "Student", 971; Prof. R. A. Fisher, 1101; Situation, World, in, 1934-35, 1091
 Agriculture: The New, and World Peace (*Review*), 58; Mathematics and, Dr. J. Wishart (*Review*), 347; and Fisheries, Ministry of, Leaflets of the, 583
 Air: Conditioning in Living Rooms, 409; Ministry Research Station, Bawdsey Manor, R. A. Watson Watt appointed superintendent of the, 460; Natural Convection in, Effect of Pressure upon, O. A. Saunders, 855; -Conditioned Flats, 877; and Vapour Locks in Fuel Systems, M. A. A. Allfrey, 937; Raid Precautions in Factories and Business Premises, 1089
 Airmen's Reactions, Study of, 1961
 Akustik, Einführung in die angewandte, Dr. H. J. von Braunmühl und W. Weber (*Review*), 310
 Albite-Fayalite, System, N. L. Bowen and J. F. Schairer, 378
 Alcoholism and Psychiatry, Prof. D. K. Henderson (Norman Kerr memorial lecture), 715
 Alcohols: various, High-frequency Absorption of, R. Zouckermann and R. Freymann, 217; at 3 μ , Inter-molecular Forces and O—H Absorption Bands in, Prof. J. Errera and Dr. P. Mollet, 882; Primary, Method for the Rapid Diagnosis and Approximate Estimation of the, S. Sabetay, 1112
 Aldehydes and Ketones, Photodecomposition of, Dr. R. G. W. Norrish and C. H. Bamford, 1016
 Aleutian Islands' Skull of Abnormal Size, Dr. A. Hrdlička, 613
 Algæ: Periodicity in, M. S. Randhawa, 251; a Fungal Parasite of, D. J. Scourfield, 1105
 Alkaline: Metals in Natural Waters, Search for the, R. Bossuet, 339; Glasses, Action of Hydrogen on, at a High Temperature, M. A. Foex, 943; Rocks of Chilwa, Southern Nyasaland, Dr. F. Dixey, 1020
 All-About: The Story of a Black Community on Argyle Station, Kimberley, Mary and Elizabeth Durack (*Review*), 1074
 Allene Compound, Resolution of an, P. M. Raitland and W. H. Mills, 514
Allium Schanoprasum L., Different Results in Reciprocal Crosses between Diploid and Triploid, A. Levan, 508
 Allotments could be made an Amenity Asset to the Community, How, Lady Allen of Hurtwood, 927
 Alloys: Metals and, Structure of, Dr. W. Hume-Rothery (*Review*), 7; Order-Disorder Transition in, C. Sykes and F. W. Jones, 936; Nickel-Iron, Magnetic Properties of the, 940
 Almandine Garnets in some Devonian Igneous Rocks of Victoria, A. B. Edwards, 91
 Alpine Studies (*Review*), 8
 Alps, The Structure of the, Prof. L. W. Collet. Second edition (*Review*), 8
 Alternating-Current Machines, A. F. Puchstein and Prof. T. C. Lloyd (*Review*), 666
 Altitude Record, New World, G. Détré, 324; Squadron Leader F. R. D. Swain, 580
 Aluminium: Luminescence of Barrier Anodes of, K. Guminski, 180; and its Alloys, Some Properties of, G. Gauthier; Marquis de Fleury and Dr. H. Portier; Prof. A. von Zeerleder and Dr. R. Irrmann, 691; N. D. Pullen; Prof. Portevin and Dr. P. Bastien, 692; Luminescence of Barrier Anodes of, K. Guminski, 897 in Animal Tissues, P. Meunier, 943
 America, Central, Cultural Origins in, Dr. W. D. Strong, 1045
 American: Association, Dr. F. G. Novy presented with the 250,000th microscope produced by Bausch & Lomb, 67; Mercantile Marine, Records of the, 110; University, Problems of an, President of California University, 136; Medical Association, award of medals to Dr. C. B. Huggins, Dr. S. W. J. Noonan, Dr. B. H. Blockson, G. C. Supple, S. Ansbacher and Dr. A. L. Barach, 160; Amaryllis Year Book. Vol. 2, 239; Steam-boats, Use of Coal in [1836], 299; Physical Education honorary award made to Dr. Edgar and Dr. Edwin Fauver, 361; Early Tertiary Mammals, 427; Ceramic Society, Prof. R. Riecke nominated an honorary member of the, 460; Life, Place of Higher Learning in, Dr. R. Pound, 518; Research Grants, 542; Ophthalmological Society, Lucien Howe medal of the, award of the, to Sir John Parsons, 927; Society of Mechanical Engineers, award of the A.S.M.E. medal to Dr. E. Bausch and the Holley medal to H. Ford, 963; Inventions, Twelve Notable, 1088
 Amides and Anilides, Infra-red Absorption and Raman Spectra of, and the Structure of these Compounds, Mme. Marie Freymann and René Freymann, 90

- Ammonia: Ordinary and Heavy, Refractive Indexes of, O. E. Frivold, Prof. O. Hassel and S. Rustad, 330; and Carbon Dioxide, Reaction between, T. Yoshida, 695
- Ammonium Mandelate in Urinary Infections, 649
- Analysis, Elementary, Lessons in, Dr. G. S. Mahajani. Second edition (*Review*), 784
- Anarchy or Peace, Lord Davies, 321
- Anatoxins purified by Precipitation with Trichloroacetic Acid, Flocculating and Immunizing Properties of, G. Ramon, A. Boivin and R. Richou, 774
- Ancient: Monuments, Illustrated Regional Guides to, W. G. A. Ormsby-Gore. Vol. 3: East Anglia and Midlands, 875; Buildings in Scotland and England, 1073
- Aneurin and Thiochrome, The Structure of, F. Bergel and A. R. Todd, 76; 119
- Angiospermic Carpel, Dr. I. V. Newman, 209
- Animal: Fibres, Reactivity of the Sulphur Linkage in, Dr. J. B. Speakman, 43; Products, 170; Life in the Forth Area (*Review*), 703; Kingdom, Parade of the, Prof. R. Hegner, assisted by Jane Z. Hegner (*Review*), 780
- Animals, Wild, at Large (*Review*), 780
- Animaux sauvages de l'Afrique, La vie des, Dr. É. Gromier (*Review*), 780
- Anophelines in Captivity, Swarming of the Males of certain European, Dr. L. W. Hackett and M. Bates, 506
- Antarctica: My Flight Across, L. Ellsworth, 238; Discoveries in, 1047
- Anthropology: Social, Methods in, Prof. E. Westermarck (Huxley memorial lecture), 808; As It Is, A. M. Hocart (*Review*), 904
- Antibodies, Ultracentrifugal and Electrophoretic Studies on, Prof. M. Heidelberger, K. O. Pedersen and A. Tiselius, 165
- Anti-Noise Regulations of Philadelphia, 398
- Antiscorbutic Activity of a Derivative of Gluconic Acid, Prof. B. A. Lawrow, Prof. W. M. Rodionow, E. M. Bomdas and N. S. Jarussowa, 40
- Antithyrotropic Activity, Rowlands and Parkes, 82
- Anti-Vivisection Finance, Sir Leonard Rogers, 71
- Apothecaries, Society of, The Herbarizing Dinner of the [1836], 137
- Apple Stock, Northern Spy, Miss J. Hearman, 936
- Apples: Spray Covering on, K. Groves and J. Marshall, 294; Immunity of, to Woolly Aphis, 513; Gas Storage of, Kidd and West, 1062
- Apsuedes talpa*, Feeding Mechanism of, and the Evolution of the Peracaridan Feeding Mechanisms, R. Dennell, 896
- Aquarist and Pond-Keeper*, March-April, 360
- Arachnida, Regeneration in, T. H. Savory, 550; G. H. Lockett, 885
- Arc Discharge, Cathode of an, A Second Sheath near the, N. Warmoltz, 36
- Archaeological: Discoveries at Přebmost, Dr. J. Matiegka 104; Excavations in Britain, 320, 321
- Archaeology in Western Colombia, Dr. H. Wassén, 333
- Arctic: Marine Prosobranchs, Breeding of, 213; Shore Fauna of the, H. Madsen, 806
- Argentine Ant in the United States, M. R. Smith, 647
- Argon, Neon and Helium, J. T. Randall, 191
- Armaments: Science and, 261; Economic and Military, The Common Menace of, Prof. W. E. Rappard (Richard Cobden lecture), 394; and the Scientific Worker, 987
- Arminghall Timber Monument, Dr. J. G. D. Clark, 470
- Arms, Private Manufacture and Trading in, Royal Commission on the, Report, 987
- Armstrong College, Report of Standing Committee for Research, 375
- Ascarids, Glycogen Content of, I. Smorodincev and K. Bebeshin, 561
- Ascension, Island of, Geology of the [1836], 137
- Ascorbic Acid: Value of the Acid Silver Nitrate Reaction as a Test of, A. Giroud and C. P. Leblond, 247; in Plant Tissues, The State of, G. L. Mack, 505; (Vitamin C), Estimation of, by Titration, Dr. I. Gál; H. Cheftel and Marie-Louise Pigeaud, 799; Biosynthesis of, Prof. B. C. Guha and B. Ghosh, 844; in Plant Tissues, State of, Dr. L. F. Levy, 933; Acids, Synthetic and 'Natural', Divergent Physiological Effects of, L. Havas and I. Gál, 586
- Asia: Northern, Molluscs of, A. Mozley, 517; Minor, Geology of [1836], 773
- Asianic Deities in the Paganism of Ancient Georgia, Prof. M. Tseretelli, 512
- Asien, Geologie von, Prof. K. Leuchs. Band 1, Teil 1 (*Review*), 228
- Assyrian Chemistry and Geology, A Dictionary of, Dr. R. Campbell Thompson (*Review*), 1035
- Astronomy: Present-day, Some Problems of, Sir James Jeans, 538; For All (*Review*), 821; Highlights of, Prof. W. Bartky (*Review*), 821; International Co-operation in (*Review*), 902
- Astrophysics: A Programme for (*Review*), 628; Theoretical, Atomic Theory and the Analysis of Stellar Atmospheres and Envelopes, Prof. S. Rosseland (*Review*), 628
- Astrophysik, Handbuch der, Herausgegeben von G. Eberhard, A. Kohlschütter, H. Ludendorff. Band 7 (*Review*), 1079
- Athens, The British School of Archaeology at, 659
- Athos, the Monks of, Prof. R. M. Dawkins (*Review*), 228
- Atlas, A New 'Oxford' (*Review*), 307
- Atmospheric: Vorticity, K. Nakata, 41; Oscillations, C. L. Pekeris, 642; Pollution, Research on, 963
- Atmospherics: Lightning and, P. F. Fyson, 278; P. R. Coursey, 509; at Madras, Wave Forms of, C. V. Rajam, 1064
- Atom, The, Prof. E. N. da C. Andrade. New edition (*Review*), 348
- Atomic: Physics: Progress in, Conference at Copenhagen, 42; Hydrogen and the Disappearance of Hydrogen in Discharge Tubes, R. Delaplace, 179; Spectra: Introduction to, Prof. H. E. White (*Review*), 525; The Theory of, Prof. E. U. Condon and Dr. G. H. Shortley (*Review*), 525; Nuclei: Properties and Constitution of, Prof. N. Bohr, 695; Splitting of, under the Influence of Neutrons on Rare Earths, G. Hevesy, 774
- Atoms, Complex, Theory of, Prof. D. R. Hartree, Dr. B. Swirles and Dr. H. S. W. Massey, 1080
- Attis: Sacrifice to, A Study of Sex and Civilization, Dr. W. A. Brend (*Review*), 952
- Aucuba japonica* (Thunb.), A Bacillus Isolated from Diseased Plants of, Dr. G. Trapp, 40
- Aurora Borealis of October 11, 1836, 655
- Auroral: Afterglow, Effect of Oxygen on the, Prof. J. Kaplan, 35; Ares, Directions of Homogeneous, R. A. Hamilton, 1059; Phenomena and the Behaviour of the Ionosphere during a Total Solar Eclipse, Prof. L. Vegard, 974
- Auroras, Red and Sunlit, and the State of the Upper Atmosphere, Prof. L. Vegard, 930
- Australia: Official Year Book of the Commonwealth of, No. 28, 1935, E. T. McPhee (*Review*), 9; Geological Survey of, 21; Scientific and Industrial Research, Council for, Ninth Annual Report, 21; Radio Research in, 214; Scientific and Industrial Research in, 278; Weed Problems in, 434; Control of the Prickly-Pear in, A. P. Dodd; Dr. A. D. Imms, 911; South, Soil Drift in the Arid Pastoral Areas of, F. N. Ratcliffe, 1039; North, C. P. Conigrave (*Review*), 1074; The Impact of Civilization in (*Review*), 1074
- Australian: Soils, Microbiology of, H. L. Jensen, 208; Plants, Cyanogenetic Glucosides in, H. Finnemore and Joyce M. Cooper (4), 260; Aborigines, Administrative Classification of, Paterson, 715
- Australopithecus*, The Dentition of, Dr. R. Broom, 719
- Autopolyploidy, Dr. A. Müntzing, 252
- Avon Biological Research, Third Annual Report on, 614
- Axolotl, Larval Transplantation in, Kolodziejski, 371

- β -Myrcene, Study of, G. Dupont and V. Desreux, 855
 Babylonian Astronomy, Late, Numerical methods in, Prof. O. Neugebauer, 849
 Bacterial: Epidemiology and Nutrition, 474; Nutrition, B. C. J. G. Knight, 474; Flora of Sea and Land Breezes, Qualitative Study of the, C. E. ZoBell and Helen M. Mathews, 1070
 Bacteriophage Substance, The Feulgen Reaction of the, Dr. M. Schlesinger, 508
Bacterium prodigiosum, Independence of the Production of Proteases and the Development of the Cell in, W. Moycho, 179
 Ba-ga-Malete of Ramoutsa, History of the, V. Ellenbeyer, 180
 Baganda Institutions, Sir Apolo Kagwa, translated by E. B. Kalibala. Edited by May Mandelbaum (Edel), 540
 Bakelized Bearings, 171
 Ballooning, Progress of [1836], 299
 Bantu, Aptitudes of the, F. M. C. Stokes, 1059
 Bay Islands, Spanish Honduras, Birds of, J. Bond, 725
 Beams and Lattice Girders, Application of Influence Lines to the Stress Analysis of, R. McCrae. Part 2, 852
 Beams Ultracentrifuge, The, W. C. Fahie and R. H. J. Brown, 207
 Beauty, In Search of (*Review*), 1035
 Bedfordshire Vermin Payments, J. S. Elliot, 614
 Bedouin, Physical Characters of the, Dr. W. M. Shanklin, 251
 Bee-Keeping in India, C. C. Ghosh. Third edition, 1061
 Behavior: Motivation of, the Fundamental Determinants of Human and Animal Activity, Prof. P. T. Young (*Review*), 666
 Beilby Layer on Non-Metals, The, Prof. G. I. Finch, 1010
 Beit fellowships for scientific research, award of, 177
 Belfast, Queen's University, Dr. W. H. McCrea appointed professor of mathematics, 136
 Belgium, Formation of a Ministry of Health in, 282
 Bell, Sir Charles, leaves London [1836], 257
 Ben Bullen Plutonic Complex, N.S.W., G. A. Joplin, 259
 Bennett, Edward Turner, death of [1836], 299
 Benzene: Structure of, Prof. C. K. Ingold and others, 472; and its Derivatives, Absorption Spectra of, in the Near Infra-Red (6000-9500 Å.), P. Barchewitz, 985
 Benzoin and Thymol, Condensation of, O. Dischendorfer and A. Verdino (2), 49
 Berkeley: George, a Study of his Life and Philosophy, Prof. J. Wild (*Review*), 818
 Berkeley's Idealism, The Phases of, Prof. G. Dawes Hicks (*Review*), 818
 Bermuda, Underwaters of, Seasonal Changes in the, Prof. W. Garstang, 60
 Berzelius awarded the Copley medal [1836], 941
 Bessel Functions, Some Formulæ for the Associated Legendre Functions of the Second kind, with corresponding Formulæ for the, Prof. T. M. McRobert, 896
 Beta-Rays, Emission of, from substances Bombarded with Neutrons, S. Kikuchi, H. Aoki and K. Husimi, 841
 Bibliography, Co-operation in, 716
 Bierhefe als Heil-, Nähr- und Futtermittel, Die, Dr. J. Schüle (*Review*), 665
 Binary Mixtures, Viscosity of, Dr. A. J. A. Van der Wyk, 845
 Biochemical Progress (*Review*), 741
 Biochemie des Menschen und der Tiere, Handbuch der, Herausgegeben von Prof. C. Oppenheimer. Zweite Auflage. Ergänzungswerk. Band 3 (*Review*), 309
 Biochemistry: Review of, A. L. Bacharach (*Review*), 309; and Medicine, Training of Chemists for work in, Sir Henry Dale, 557; Annual Review of. Edited by J. M. Luck. Vol. 5 (*Review*), 741
 Biography, The Technique of (*Review*), 740
 Biological: Chemists, Society of, at Bangalore, Prof. E. Abderhalden nominated an honorary member of the, 160; Books in 1935, Prices of, J. R. Miner, 196; Society of Vienna, Prof. W. Heubner elected an honorary member of the, 797
 Biology: Unapplied, A Text-Book of, C. Dobell (*Review*), 523; of Water-Supply, Exhibit of, at the British Museum (Natural History), 964
 Biot at the Collège de France [1836], 90
 Bird: -Ringing and Bird Migration, Lord Mansfield, 89; -Song, Records of, 610; Flight, G. C. Aymar (*Review*), 1037; Migration: a Short Account, Dr. A. L. Thomson; Prof. W. Rowan (*Review*), 1078
 Birds: British, How to Know, Dr. N. H. Joy (*Review*), 424; of the Firth of Clyde, The, J. M. McWilliam (*Review*), 424; of the Green Belt and the Country Around London, R. M. Lockley (*Review*), 424; Migrations of, Dr. A. L. Thomson, 554; Australian, Food of, late A. M. Lea and J. T. Gray, 592; Useful, Advisory Leaflets on, 614; Diseases of, J. Reis, P. Nobrega and A. S. Reis, 847; of Agricultural Importance, Advisory Leaflets on, 1092
 Birmingham University: gifts by Sir William Waters Butler and Sir Charles Hyde, Bt., 156; C. G. Parsons awarded a Walter Myers travelling studentship; Dr. M. Stacey appointed lecturer and F. Smith assistant lecturer in chemistry; Dr. A. Lamont assistant lecturer in geology; and J. W. Drinkwater lecturer in mechanical engineering, 215; and City, Annual Report for 1935-36 of the Joint Board for Mental Disease, 541
 Bisulphite Compounds, Method of extracting Aldehydes and Ketones from their, A. Barrot, 855
 Bitumen and Petroleum in Antiquity, R. J. Forbes (*Review*), 632
 Black-Body Radiation, The Cepheid Variables and, A. E. H. Beksley, 286
 Blatt-Minen Mittel und Nord-Europas, Die, Prof. M. Hering. Lief 2: Brunella-Filipendula (*Review*), 704
 Blood: Circulation of the, Prof. R. J. S. McDowall, 454; Group Investigation, Prof. R. R. Gates, 470; Circulation of the, The Control of the, Prof. R. J. S. McDowall, 488; Pigments (*Review*), 662; An Effect of X-Radiation on the, Dr. H. L. Brose and E. B. Jones, 687; Volume, Total, A New Microcolorimetric Apparatus and a Method for Determination of, Dr. J. C. Somogyi, 763
 Blow-fly: Larvæ, Bacterial Flora of, Dr. N. Balzam, 889; A New, Attacking Sheep in Western Scotland, Dr. J. MacLeod, 467
 Boat Construction in Ancient Scandinavia and Oceania, J. Hornell, 765
 Bohadsch 1761, Proposed Suspension of Rules of Nomenclature in the Case of, C. W. Stiles, 206
 Boiling Points, Normal, A Simplified Procedure for Determining, by the Comparative Method, Dr. M. Wojciechowski, 1096
 Boric Anhydride, Reduction of, by Manganese, H. Forestier and Mlle. Myriam Graff, 1026
 Borneo, West, Fishes from, Dr. J. D. F. Hardenberg, 806
 Boron: the K-Radiation of, J. Serpe, 179; and Lithium, Ranges of Particles Emitted in the Disintegration of, by Slow Neutrons, J. Rotblat, 202; Crystallized, the K-Radiation of, A. Hautot, 258; and Cadmium, Neutron Absorption of, at Low Temperatures, V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and L. W. Schubnikow, 505
 Botanical: Progress, Twenty-five Years of, 373; Society of London [1836], 376; Society of Japan, Prof. R. Kolkwitz elected an honorary member of the, 1093
 Botany: for Children, Lady Elphinstone (*Review*), 784
 Botany Bay, Change of Sea-level at, C. A. Sussmilch, 897
 Bounty: The Heritage of the, The Story of Pitcairn through Six Generations, Dr. H. L. Shapiro (*Review*), 382
 Bracken as a Weed, 706
 Brain: Respiration, Effect of Dichlor-Diethyl-Sulphone on, Prof. R. A. Peters, 327; Trust' in American Politics, 559; Size in Man and the Great Apes, Dr. F. Weidenreich, 689
 Braithwaite's Steam Floating Fire Engine [1836], 655

- (Branchiopoda), Body Orientation of the Lower Crustacea, J. H. Lochhead, 232
- Bristol and Gloucester District, F. B. A. Welch and R. Crookall, 389
- Britain: The Land of, Part 78: Berkshire, J. Stephenson, with an Historical Section by W. G. East (*Review*), 227
- British: Museum (Natural History), Recent Acquisitions, 21; Empire: Economic Products of the, 21; Cancer Campaign, Acceptance by Viscount Hailsham of the Chairmanship, 24; Medical Association, Annual Meeting of the, 71; Honduras, Forests and Flora of, P. C. Standley and Prof. S. J. Record; A. L. Howard (*Review*), 145; Guiana, Insect Life of Temporary Rain Swamps in, F. A. Squire, 151; School of Archaeology at Athens, 159; Museum (Natural History), Recent Acquisitions at the, 196; Bird, New, J. J. Harrison; W. P. Lowe, 251; Association: Blackpool Meeting of the, 274; at Bristol [1836], 300; School of Archaeology at Athens, 323; Association at Bristol [1836], 337; 376; Stem- and Leaf-Fungi (Coelomycetes), W. B. Grove. Vol. 1 (*Review*), 384; Association and Social Science, Incorporation of the British Science Guild, 431; Science Guild, Incorporation in the British Association, 431; Association: A Scientific Survey of Blackpool and District, Edited by A. Grime (*Review*), 485; Meetings; Sir Edward B. Poulton elected president for 1937, 497; Commonwealth Scientific Conference, 539; School of Archaeology: at Rome, C. A. R. Radford appointed director, 614; at Athens, The, 659; Chemical Manufacturers, Association of, Activities of the, 680; Dr. E. F. Armstrong re-elected president, 681; Museum (Natural History): Recent Acquisitions, 754; impending retirement of Dr. W. T. Calman, 792; M. A. C. Hinton appointed keeper of zoology, 793; Surveying in South American Seas [1836], 854; Telegraph Services, Developments in, L. H. Harris, E. H. Jolley and F. D. Morrell, 893; Museum (Natural History), Acquisitions at the, 964; Association, appointment of officers for 1937, 1004; Film Institute, Third Annual Report, 1067; Honduras, Forestry in, 1049; Institute of Radiology: Annual Congress and Exhibition, 1024; Launderers' Research Association, 1004; Mosquito Control Institute, Work of the, 1046
- Brittle Stars from Puerto Rico, H. Clark, 371
- Broadcasting: Electrical Interference with, 181; 255; International Relations Promoted by, 678
- Bromacetates, Action of, on Various Alkaloids, L. Espil and G. Mandillon, 258
- Bromine: III, Structure of, Dr. K. R. Rao, 168; Radio-active Isotopes of, Dr. C. H. Johnson and F. T. Hamblin, 504
- Bronze Age Burials in Scotland, L. Mann, 236
- Brooklyn Botanic Garden, Twenty-fifth anniversary, 373
- Bruce, Dr. W. S., memorial prize, award of the, to J. W. S. Marr, 67
- Brussels and Antwerp Railway [1836], 732
- Buchanan, Original Laterite of, Dr. C. S. Fox, 649
- Buckland's "Bridgewater Treatise" on Geology [1836], 598
- Building: Research Station, New Heating Laboratory at the, 156; A. F. Dufton, 335; Research Board, Work of the, 878
- Burns, Modern Treatment of, 555
- Business: Mental Activity and Management, W. R. Dunlop, 23; Careers, Preparation for, E. I. Lewis, 732
- Butter, Firmness of, Influence of Chemical Composition on the, J. Lyons, 338
- Cadmium: Metallic Zinc and, Asymmetry in, Prof. K. Herrmann; Dr. G. W. Brindley, 290; Boron and, Neutron Absorption of, at Low Temperatures, V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and L. W. Schubnikow, 505; with Tertiary Arsines, Co-ordination Compounds of, G. J. Burrows and A. Lench, 813; Ferrite, Decomposition of, H. Forrester and F. Redslob, 1112
- Cairina moschata* and *Anas platyrhynchos platyrhynchos*, Genetical and Cytological Studies of the Intergeneric Hybrid of, Prof. F. A. E. Crew and P. C. Koller, 178
- Calciferol and Vitamin D₃, Chemistry of, A. L. Bacharach, 387
- Californian Shrimps of Commerce, H. R. Israel, 208
- Cambridge: Oxford and, Co-operation between, 678; Philosophical Society, election of officers, 838; University: G. C. Evans appointed Frank Smart student in botany and Dr. L. E. R. Picken Balfour student; grant from the Balfour Fund made to J. D. Robertson, 46; T. R. B. Sanders appointed lecturer in engineering; W. W. Bridgen elected Marmaduke Shield scholar in anatomy; award of Frank Smart prizes to G. Metcalfe and E. T. Burt; Dr. D. W. Babbage elected an official fellow of Magdalene College, 89; A. L. Hodgkin elected Michael Foster student; O. L. Zangwill and J. W. S. Pringle elected Martin Thackeray students at King's College, 215; Prof. R. S. Hutton elected a professorial fellow of Clare College; C. O. Hutton awarded an external studentship at Emmanuel College, 299; Dr. J. H. Hutton appointed lecturer in the faculty of archaeology and anthropology, 394; award of Frank Edward Elmore studentships to A. C. E. Cole, G. D. Hadley, L. C. Martin and B. McArdale; Dr. H. G. Booker appointed assistant lecturer in mathematics and Mrs. J. V. Robinson assistant lecturer in economics and politics; resignation of Dr. T. S. Hele, H. W. Hall, W. A. Fell, R. S. Handley, Dr. M. Born and T. C. Nicholas, 518; H. Hunter appointed director of the Plant Breeding Institute; appointments to the Solar Physics Observatory of W. Moss, J. C. Dobbie and E. G. Williams, 693; D. H. Valentine appointed curator of the Botanical Museum and Herbarium; Dr. N. Feather, M. H. L. Pryce, A. L. Hodgkin and T. T. Paterson elected fellows of Trinity College, 731; grants from the Balfour Fund made to W. Graham-Smith and H. E. Hinton; Sir Albert Seward elected an honorary fellow of Downing College, 772; Prof. T. Von Kármán appointed Rouse Ball lecturer for 1936-37; E. N. Willmer elected an official fellow of Clare College; J. F. Brock appointed assistant director of research in medicine; J. S. Baxter appointed demonstrator in anatomy; Dr. V. J. Chapman elected an unofficial Drosier fellow of Gonville and Caius College, 853; M. Krook elected an Isaac Newton student and E. N. Rowland an additional Isaac Newton student; Prof. W. V. D. Hodge elected a non-stipendiary fellow of Pembroke College, 895; The I.C.I., Ltd. and Work on Molecular Rays; K. P. Harrison appointed Benn W. Levy student, 940; Miss H. G. Wanklyn appointed lecturer in geography, and Dr. S. R. Nockolds demonstrator in mineralogy and petrology, 1025; recommended that Dr. U. R. Evans continue assistant director of research in metallurgy and that G. E. Briggs be appointed reader in plant physiology, 1067; award of the Adam Smith prize to D. G. Champenowne, 1110
- Camphor, Solutions of, in Organic Solvents, Circular Dichroism of, G. Bruhat and P. Guénard, 896
- Canada: National Research Council, Eighteenth Annual Report, 236; Petroleum Fuels in, 336; Mining in, 359; Forestry Research in, 396; Mineral Wealth of, 878
- Canadian: Water Power Developments during 1935, Dr. B. Cunningham, 10; Work on Dermatophyte Fungi, 176; Eastern Arctic, Flora of the, N. Polunin, 331; Reindeer Herd, 542
- Cancer: Research: Grants for, 119; awards for, made to Prof. E. L. Kennaway and Prof. J. W. Cook, 579; Congress, International, Second, 727; Treatment of, with an Enzyme Solution ('Ensol'), Dr. H. C. Connell, 888; Research in Great Britain, 999; Research Fund, Imperial, Thirty-fourth Annual Report, 1935-36, 1085

- Canyons, Submarine, Underlying Causes of, F. P. Shepard, 775
- Caoutchouc, Crystallized, Elementary Lattice of, K. H. Meyer and W. Lotmar, 259
- Cape Town University, Gen. Smuts elected Chancellor, 584
- Carbohydrate : Breakdown in Early Embryonic Development, Mechanism of, Dr. J. Needham, W. W. Nowinski, R. P. Cook and K. C. Dixon, 462 ; Metabolism : Dr. H. Weil-Malherbe, 551 ; G. K. McGowan and Prof. R. A. Peters, 552 ; Sodium and Water Metabolism in Relation to Disturbances of, after Adrenalectomy, Prof. F. Verzár and L. Laszt, 844 ; Oxidation, Mechanism of, Dr. F. Dickens, 1057
- Carbohydrates, Intermediate Metabolism of, Dr. H. A. Krebs, 288
- Carbon : Dendrites, Formation of, K. D. Luke, Dr. W. M. Madgin and Dr. H. L. Riley, 161 ; Dioxide, Solid, Dr. I. J. Faulkner, 191 ; Dendrites, Formation of, Dr. H. Thiele, 688 ; Dioxide, Carbonyl Sulphide and Carbon Disulphide, Resonance Structures of, Dr. A. Clow and J. M. C. Thompson, 802 ; Disulphide, Carbon Dioxide, Carbonyl Sulphide and, Resonance Structures of, Dr. A. Clow and J. M. C. Thompson, 802 ; Dioxide, Prof. E. L. Quinn and C. L. Jones (*Review*), 993
- Carbonyl Sulphide, Carbon Dioxide and Carbon Disulphide, Resonance Structures of, Dr. A. Clow and J. M. C. Thompson, 802
- Caries in Children's Teeth, Influence of Diet on, 956
- Carnations, Anther Smut of, Dr. H. L. White, 848
- Carnegie Institution of Washington, Report for Year ending October 31, 1935, 542
- Carolina 'Bays', Prof. D. Johnson, 471
- Cartilage : Metabolism of : E. G. L. Bywaters, 30 ; Dr. F. Dickens and Dr. H. Weil-Malherbe, 125 ; E. G. L. Bywaters, 288
- Cascade Range, Oregon, Diorites of the, A. F. Buddington and E. Callaghan, 513
- Cass, Sir John, Technical Institute, Opening of the Thirty-fifth Session, 693
- γ -Cassiopeia, Spectrum of, Remarkable Variation in the, D. Chalonge, 560
- Casuarina, A Fossil, from near Bacchus Marsh, Victoria, R. T. Patton, 91
- Catalysts, Preparation of, New Method for the, L. Faucounau, 561
- Cathay, The Quest for, Brig.-Gen. Sir Percy Sykes (*Review*), 1036
- Caucasian Studies, 499
- Cells, Living, Death of, Increase of Diamagnetic Susceptibility on the, Prof. E. Bauer and A. Raskin, 801
- Cellulose, Molecular Structure of, G. F. Davidson, 175
- Celtic Studies, J. M. de Navarro (John Rhys memorial lecture), 1089
- Central American Studies : The Copan Project, Dr. A. V. Kidder, 1089
- Centrifuging in Rotating Hollow Cylinders, Dr. M. Schlesinger, 549 ; Dr. E. A. Hauser and C. E. Reed, 975
- Cepheid Variables, The, and Black-Body Radiation, A. E. H. Blinksley, 286
- Cercospora Leaf-Spot of Tobacco, A. V. Hill, 209
- Cereals of Ancient Egypt and Mesopotamia, Prof. J. Percival, 270
- Ceylon, Marine Work in, A. H. Malpas, 877
- Chadwick gold medal and prize, presentation of the, to E. A. Drew, 756
- Chamberlain memorial at Birmingham University, 156
- Champollion : Monument to [1836], 257 ; and Hieroglyphics, 278
- Charaka Club, The Proceedings of the, Vol. 8 (*Review*), 663
- Cheeses, Ripening of, E. Parisi and G. de Vito, 340
- Chemical : Engineering Congress of the World Power Conference, 44 ; Warfare, The Medical Profession and, 155 ; Industry, Society of, annual meeting at Liverpool, 172 ; Reactions, Catalysis of, in organisms, Dr. J. H. Quastel, 607 ; Dr. P. Eggleton, 608
- Chemischer und chemischtechnischer Vorträge, Sammlung F. B. Ahrens. Herausgegeben von Prof. R. Pummerer-Erlangen. Neue Folge, Heft 33 : Die Azoxyverbindungen, Dr. E. Müller (*Review*), 864
- Chemist : The, as World Citizen, W. A. S. Calder, 173 ; Training the, for Service to the Community, Prof. J. C. Philip, 449
- Chemistry : Organic : Developments in (*Review*), 224 ; Physical Aspects of, Dr. W. A. Waters (*Review*), 224 ; Inorganic : A Text-Book of, edited by Dr. J. Newton Friend. Vol. II, Part 3 (*Review*), 268 ; and Theoretical, A Comprehensive Treatise on, Dr. J. W. Mellor. Vol. 15 (*Review*), 310 ; General, an Elementary Survey ; Emphasizing Industrial Applications of Fundamental Principles, Prof. H. G. Deming. Fourth edition (*Review*), 424 ; and the Modern State, Prof. J. C. Philip, 492 ; Physical, for Colleges, Prof. E. B. Millard. Fourth edition (*Review*), 528 ; and the Community, 557 ; Organic, Benign Gifts of, C. J. T. Cronshaw, 557 ; Industrial, Developments in (*Review*), 568 ; Inorganic : Prof. N. Bjerrum. Translated by R. P. Bell (*Review*), 626 ; The Field of (*Review*), 626 ; Organic : A Text-Book of, late Dr. J. Schmidt. English edition by Dr. H. G. Rule. Third edition (*Review*), 633 ; Recent Advances in, Prof. A. W. Stewart. Vol. 2, with the addition of Part 2, by Dr. H. G. Graham (*Review*), 633 ; and Food Science, Dr. L. Harris, and others, 744 ; Physical, A Text-Book of, Sylvanus J. Smith (*Review*), 864 ; and Geology, Early (*Review*), 1035 ; American, Annual Survey of, Vol. 10, 1935. Edited by C. J. West (*Review*), 1079
- Chemotherapy, An Institute of, 961
- Chiasma Formation, Induced, in Somatic Cells by a Carcinogenic Hydrocarbon, E. Marie Hearne, 291
- Child Neurology Research, 878
- Chimie industrielle, Cours de, Prof. G. Dupont. Tome 1 et 2 (*Review*), 568
- Chimpanzee : Sexual and Reproductive Cycles of, R. M. Yerkes and J. H. Elder, 91 ; Metabolism, F. G. Benedict and J. M. Bruhn, 415 ; Reproduction in the, J. H. Elder and R. M. Yerkes, 725
- China : Seas, Oceanography and Meteorology of, 83 ; Tattooing in, Prof. C. H. Liu, 370 ; The Birth of, A Survey of the Formative Period of Chinese Civilization, Dr. H. G. Creel (*Review*), 565 ; The Early Cultures of (*Review*), 565
- Chinese : Materia Medica (*Review*), 484 ; Medicinal Plants from the Pen Ts'ao Kang Mu, A. D. 1596, Dr. B. E. Read. Third edition (*Review*), 484 ; Glass, Early, from Pre-Han to T'ang Times, Prof. C. G. Seligman, Dr. P. D. Ritchie and H. C. Beck, 721
- Chironomid Fauna of the Mosses of the River Liffey, C. F. Humphries and W. E. Frost, 300
- Chloroform, Heavy, CDCl_3 , R. Truchet, 179
- Chlorophyll : Monomolecular Layers of, W. Sjoerdsma, 405 ; Reversible Oxidation and Reduction of, Dr. E. Rabinowitch and Dr. J. Weiss, 1098
- Chloroplast, The Plant, K. Kiyohara, 848
- p*-Chlortoluene, Chlorination of, H. Wahl, 258
- Choline : of Sperm, Origin of the, E. Kahane and Mlle. Jeanne Lévy, 258 ; Esterase, Absolute Activity of, L. H. Easson and E. Stedman, 767
- Chordate Head, The, de Lange, 471
- Christiansen Filters, G. Ahier, 48
- Chromium Carbides, Formation of, R. Testut, 1026
- Chromosome Size, Genotypic Control of, P. T. Thomas, 402
- Chromosomes : *in situ*, Demonstration of, Projection Method for, Dr. C. D. Darlington and H. C. Oosterstock, 79 ; The External Forces Acting on, J. L. Fyfe ; Dr. C. D. Darlington, 366
- Citrin, Chemical Nature of, V. Bruckner and Prof. A. Szent-Györgyi, 1057
- Civilization, Modern, The Strain of, Lord Horder, 529
- Civil List Pensions, 119
- Clarke's Magneto-Electric Machine [1836], 655
- Clinical Research (*Review*), 619
- Clocks showing Mean and Sidereal Time Simultaneously, F. Hope-Jones, 931

- Cloud Chamber Observations of Cosmic Rays, C. D. Anderson and S. H. Neddermeyer, 555
- Clouds, Vertical Motion in, Studied by Cinematograph Pictures, W. Schmidt, 218
- Clyde Estuary, Geology of the [1836], 854
- Coal: Low Temperature Carbonization of, 130; Hydrogenation of, A French Process, F. Vollette, 473; Measures, Correlation of the, Prof. A. E. Trueman, 705; Gas: Gum in, H. Hollings, 876; Research, 876; Oxidation of, H. Lefebvre and R. Faivre, 943; its Constituents and Uses, Prof. W. A. Bone and Dr. G. W. Himus. With a Supplementary Chapter upon Fuel Economy and Heat Transmission in Industrial Furnaces by Dr. R. J. Sarjant (*Review*), 991; King, Sir R. A. S. Redmayne (*Review*), 991
- Coelenterates, New Work on, Prof. O. Carlgren, 371
- Ceolomycetes, Some British, E. W. Mason (*Review*), 384
- Coffee: Biography of (*Review*), 702; The Saga of, The Biography of an Economic Product, H. E. Jacob. Translated by Eden and Cedar Paul (*Review*), 702
- Coiled-Coil Lamp, Development of the, W. Geiss, 130
- Cokes, Domestic, A. Marsh and others, 964
- Coleoptera, Morphology of, W. H. Anderson; R. E. Blackwelder, 1019
- Coleopterologica, Bibliographia (*Review*), 310
- Colloid: Osmotic Pressure of the Body Fluids of Fresh-water Animals, Dr. P. Meyer, 287; Substrate in Photosynthesis, Dr. M. Copisarow, 509
- Colloids and the Biological Effect of Radiation, F. Ellinger, 1014
- Colonial: Policy and Scientific Research, W. G. A. Ormsby-Gore, 3; Office Appointments: 72; 324; 502; 682; 879; 1008; Territories, The Demand for, and Equality of Economic Opportunity, 754
- Colorado, Early Man in, 459
- Colour Reaction of Copper with Urobilin, A. New, G. Bertrand and L. de Saint-Rat, 414
- Columbia Encyclopedia, The, C. F. Ansley, Editor-in-Chief (*Review*), 901
- Comet, 1936, Observations of the, P. Rossier, 985
- Comets: Observations on, 240; 1818 I, 1873 VII, 1928 III, Identity of, Dr. A. C. D. Crommelin, 1105
- Community, Science and the, 417
- Complex Compounds in Solution, Application of Certain Physical Methods to the Search for, R. Tréhin, 943
- Compounds of the Type R_2MX_4 , Optical Properties and Crystal Structure of Some, D. P. Mellor and F. M. Quodling, 477
- Compression Ignition Engines (*Review*), 527
- Compton Effect: Scattering and Recoil in the, Correlation between, Dr. J. C. Jacobsen, 25; Prof. E. L. Hill, 209
- Conchology, Library of, Presented by Sohtsu G. King to the Science Society of China Library, Shanghai, 110
- Cone-Sheets, Ring-Dykes and Caldron-Subsidence, Dynamics of the Formation of, E. M. Anderson, 48
- Conjuring, Indian, Lt.-Col. R. H. Elliot, 425
- Conquest: Reaction to, Effects of Contact with Europeans on the Rondo of South Africa, Dr. Monica Hunter (*Review*), 947
- Constants and Numerical Data, Annual Tables of, 681
- Construction, Science of, Pioneer in the, S. B. Hamilton, 1089
- Continental Motions, Dr. R. Gunn, 848
- Cook Islanders, Physical Characters of the, Dr. H. L. Shapiro and Dr. P. H. Buck (Te Rangī Hiroa), 725
- Copepods: German, Dr. O. Pesta, 293; from the Great Barrier Reef, G. P. Farran, 1062
- Copper: and Silver, Divalent, Magnetic Study of the Mixed Crystals of, L. Capatos and N. Perakis, 48; Sulphate Pentadeuterate, Dissociation Pressure of, Dr. F. Schacherl and O. Běhounek, 406; Surface of, Formed by Solidification *in vacuo*, S. Dobinski and Dr. C. F. Elam, 685; Nickel and, Radioactive Isotopes of, Dr. C. B. Madsen, 722
- Coral: Reef Ecology at Low Isles, 173; Reefs, Ecological Surveys of, Dr. S. M. Manton, 173; -Infesting Crabs, Family Hapalocarcinidae, Dr. Chia-Jui-Shen, 935
- Corona during the Total Solar Eclipse of June 19, The, Prof. M. Navashin, 73
- Acetone, Photo-Decomposition of, Mechanism of the, Dr. R. Spence and Dr. W. Wild, 206
- Acid Silver Nitrate Reaction as a Test of Ascorbic Acid, Value of the, A. Giroud and C. P. Leblond, 247
- Adenylic Acid in Vitamin B, Deficiency, Role of, Dr. T. W. Birch and Dr. L. W. Mapson, 27
- Adrenalectomized Rats, High Potassium Diet and the Survival of, Dr. R. A. Cleghorn and G. A. McVicar, 124
- African Honey Bees, Prof. T. D. A. Cockerell, 249
- Agricultural Experiments, The Half-Drill Strip System, "Student", 971; Prof. R. A. Fisher, 1101
- Alcohols at 3 μ , Intermolecular Forces and O-H Absorption Bands in, Prof. J. Errera and Dr. P. Mollet, 882
- Aldehydes and Ketones, Photodecomposition of, Dr. R. G. W. Norrish and C. H. Bamford, 1016
- Allium Schönoprasum* L., Different Results in Reciprocal Crosses between Diploid and Triploid, A. Levan, 508
- Ammonia, Ordinary and Heavy, Refractive Indexes of, O. E. Frivold, Prof. O. Hassel and S. Rustad, 330
- Aneurin and Thiochrome, The Structure of, F. Bergel and A. R. Todd, 76, 119
- Anophelines in Captivity, Certain European, Swarming of the Males of, Dr. L. W. Hackett and M. Bates, 506
- Antibodies, Ultracentrifugal and Electrophoretic Studies on, Prof. M. Heidelberger, K. O. Pedersen and A. Tiselius, 165
- Arachnida: Regeneration in: T. H. Savory, 550; G. H. Lockett, 885
- Arc Discharge, A Second Sheath near the Cathode of an, N. Warmoltz, 36
- Ascorbic: Acid: Value of the Acid Silver Nitrate Reaction as a Test of, A. Giroud and C. P. Leblond, 247; in Plant Tissues, The State of, G. L. Mack, 505; Synthetic and 'Natural', Divergent Physiological Effects of, L. Havas and I. Gál, 586; Acid: (Vitamin C), Estimation of, by Titration, Dr. I. Gál; H. Cheftel and Marie-Louise Pigeaud, 799; Biosynthesis of, Prof. B. C. Guha and B. Ghosh, 844; in Plant Tissues, State of, Dr. L. F. Levy, 933
- Atmospheric Oscillations, C. L. Pekeris, 642
- Atmospherics, Lightning and, P. R. Coursey, 509
- Auroral: Afterglow, Effect of Oxygen on the, Prof. J. Kaplan, 35; Phenomena and the Behaviour of the Ionosphere during a Total Solar Eclipse, Prof. L. Vegard, 974; Arcs, Homogeneous, Directions of, R. A. Hamilton, 1059
- Auroras, Red and Sunlit, and the State of the Upper Atmosphere, Prof. L. Vegard, 930
- Australopithecus*, The Dentition of, Dr. R. Broom, 719
- Bacteriophage Substance, The Feulgen Reaction of the, Dr. M. Schlesinger, 508
- Bantu, Aptitudes of the, F. M. C. Stokes, 1059
- Beams Ultracentrifuge, The, W. C. Fahie and R. H. J. Brown, 207
- Beilby Layer on Non-Metals, The, Prof. G. I. Finch, 1010
- Beta-Rays, Emission of, from Substances Bombarded with Neutrons, S. Kikuchi, H. Aoki and K. Husimi, 841
- Binary Mixtures, Viscosity of, Dr. A. J. A. Van der Wyk, 845
- Black-Body Radiation, The Cepheid Variables and, A. E. H. Bleksley, 286
- Blood: An Effect of X-Radiation on the, Dr. H. L. Brose and E. B. Jones, 687; Volume, Total, A New Microcolorimetric Apparatus and a Method for Determination of, Dr. J. C. Somogyi, 763
- Blowfly, A New, Attacking Sheep in Western Scotland, Dr. J. MacLeod, 467
- Bohadsch 1761, Proposed Suspension of Rules of Nomenclature in the Case of, C. W. Stiles, 206
- Boiling Points, Normal, A Simplified Procedure for Determining, by the Comparative Method, Dr. M. Wojciechowski, 1096
- Boron: and Lithium, Ranges of Particles Emitted in the Disintegration of, by Slow Neutrons, J. Rotblat, 202; and Cadmium, Neutron Absorption of, at Low Temperatures, V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and L. W. Schubnikow, 505

- Brain Respiration, Effect of Dichlor-Diethyl-Sulphone on, Prof. R. A. Peters, 327
- Bromine : III, Structure of, Dr. K. R. Rao, 168 ; Radio-active Isotopes of, Dr. C. H. Johnson and F. T. Hamblin, 504
- Cadmium : Metallic Zinc and, Asymmetry in, Prof. K. Herrmann ; Dr. G. W. Brindley, 290 ; Boron and, Neutron Absorption of, at Low Temperatures, V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and L. W. Schubnikow, 505
- Canadian Eastern Arctic, Flora of the, N. Polunin, 331
- Carbohydrate : Breakdown in Early Embryonic Development, Mechanism of, Dr. J. Needham, W. W. Nowinski, R. P. Cook and K. C. Dixon, 462 ; Metabolism, Dr. H. Weil-Malherbe, 551 ; G. K. McGowan and Prof. R. A. Peters, 552 ; Disturbances, after Adrenalectomy, Sodium and Water Metabolism in Relation to, Prof. F. Verzář and L. Laszt, 844 ; Oxidation, Mechanism of, Dr. F. Dickens, 1057
- Carbohydrates, Intermediate Metabolism of, Dr. H. A. Krebs, 28
- Carbon : Dendrites : Formation of, K. D. Luke, Dr. W. M. Madgin and Dr. H. L. Riley, 161 ; Formation of, Dr. H. Thiele, 688 ; Disulphide, Carbon Dioxide, Carbonyl Sulphide and, Resonance Structures of, Dr. A. Clow and J. M. C. Thompson, 802 ; Dioxide, Carbonyl Sulphide and Carbon Disulphide, Resonance Structures of, Dr. A. Clow and J. M. C. Thompson, 802
- Carbonyl Sulphide, Carbon Dioxide, Carbon Disulphide and, Resonance Structures of, Dr. A. Clow and J. M. C. Thompson, 802
- Cartilage : Metabolism of : E. G. L. Bywaters, 30 ; Dr. F. Dickens and Dr. H. Weil-Malherbe, 125 ; E. G. L. Bywaters, 288
- Cells, Living, Increase of Diamagnetic Susceptibility on the Death of, Prof. E. Bauer and A. Raskin, 801
- Centrifuging in Rotating Hollow Cylinders, Dr. M. Schlesinger, 549 ; Dr. E. A. Hauser and C. E. Reed, 975
- Cepheid Variables, The, and Black-Body Radiation, A. E. H. Bleksley, 286
- Chiasma Formation, Induced, in Somatic Cells by a Carcinogenic Hydrocarbon, E. Marie Hearne, 291
- Chinese Glass, Early, from Pre-Han to T'ang Times, Prof. C. G. Seligman, Dr. P. D. Ritchie and H. C. Beck, 721
- Chlorophyll : Monomolecular Layers of, W. Sjoerdsma, 405 ; Reversible Oxidation and Reduction of, Dr. E. Rabinowitch and Dr. J. Weiss, 1098
- Chromosome Size, Genotypic Control of, P. T. Thomas, 402
- Chromosomes : *in situ*, Projection Method for Demonstration of, Dr. C. D. Darlington and H. C. Osterstock, 79 ; The External Forces acting on, J. L. Fyfe ; Dr. C. D. Darlington, 366
- Citric, Chemical Nature of, V. Bruckner and Prof. A. Szent-Györgyi, 1057
- Clocks showing Mean and Sidereal Time Simultaneously, F. Hope-Jones, 931
- Colloid : Osmotic Pressure on the Body Fluids of Fresh-water Animals, Dr. P. Meyer, 287 ; Substrate in Photosynthesis, Dr. M. Copisarow, 509
- Colloids and the Biological Effect of Radiation, F. Ellinger, 1014
- Compton Effect, Scattering and Recoil in the, Correlation between, Dr. J. C. Jacobsen, 25
- Copper : Sulphate Pentahydrate, Dissociation Pressure of, Dr. F. Schacherl and O. Běhounek, 406 ; Surface of, formed by Solidification *in vacuo*, S. Dobinski and Dr. C. F. Elam, 685 ; Nickel and, Radioactive Isotopes of, Dr. C. B. Madsen, 722
- Corona during the Total Solar Eclipse of June 19, The, Prof. M. Navashin, 73
- Cosmic : Radiation : Bursts of, A. R. Hogg, 77 ; Specific Ionization of, M. G. E. Cosyns, 284 ; Ray : Intensity in a Deep Mine, Measurements of, Dr. J. Barnóthy and Dr. M. Forró, 325 ; Intensity, Variation of, with Sidereal Time, Dr. B. F. J. Schonland, B. Delatizky and J. P. Gaskell, 325 ; Rays, Absence of, from Nova Lacertae, Dr. J. Barnóthy and Dr. M. Forró, 544 ; Ray Burst at a Depth Equivalent to 800 m. of Water, A, Dr. Y. Nishina and C. Ishii, 721 ; Cyclotron, A, as a Cosmic Ray Generator ? Prof. H. Alfvén, 761
- Cow-Dung, Nitrogen Fixation with, Prof. N. R. Dhar and S. K. Mukerji, 1060
- Crystal : Bulk of the, The Crystal Photo-Effect and Rectifying Action in the, Dr. G. Grotzinger and J. Lichtschein, 163 ; Analysis : Structure-Factor Graphs for, Prof. W. L. Bragg, 362 ; Calculation of Structure Factors and Summation of Fourier Series in, Non-centrosymmetrical Projections, Dr. J. M. Robertson, 683
- Crystalline Substances, Liquid, from Virus-infected Plants, F. C. Bawden, N. W. Pirie, J. D. Bernal and I. Fankuchen, 1051
- Curve Fitting, Prof. R. A. Fisher, 934
- Cyathocotyle*, A New Strigeid Parasite of the Rare Genus, S. C. Verma, 589
- Cyclohexane Rings, Multiplanar, Non-existence of, Dr. R. D. Desai and Prof. R. F. Hunter, 548
- 'Cyclol' Molecules, Energy of Formation of, Dr. D. M. Wrinch, 241 ; C. F. Frank, 242
- Cyclones, Ascent of Air in, Dr. A. H. R. Goldie, 166
- Cyclopropane, Raman Spectrum of, R. Ananthakrishnan, 123
- Dead Sea, Life in the, Dr. B. Wilkanský, 467
- Deuterium : Water, Equilibria in Salt Systems with, F. T. Miles, R. W. Shearman and Prof. A. W. C. Menzies, 121 ; Solid Hydrogen and, at 4.2° K., Density and Compressibility of, Miss H. D. Megaw and Prof. F. Simon, 244 ; Thermal Conductivity of, C. T. Archer, 286 ; Use of, as an Indicator in Stereochemical Investigations, Prof. H. Erlenmeyer, H. Schenkel and A. Epprecht, 547 ; Helium, Hydrogen and, Thermal Properties of, A. Bijl, 723 ; Metallic Hydrogen and, Expansion Pressures of, A. R. Ubbelohde, 845
- Deuteroethylenes, Symmetrical, Provisional Computation of the Plane Vibration Frequencies of, Prof. C. Manneback and A. Verleysen, 367
- Devernization of Winter Rye by High Temperature, Prof. F. G. Gregory and O. N. Purvis, 1013
- Diamagnetism of Mixtures of Organic Liquids, Prof. J. F. Spencer and Dr. V. C. G. Trew, 974
- Diamond, Surface Markings on a, Dr. W. H. George, 616
- Diastase in Rabbit Saliva, I. M. Thomas, 1015
- Diatomic Sulphur, Selenium and Tellurium Vapours, Dissociation Energy of, P. Goldfinger, W. Jeunehomme and B. Rosen, 205
- Dichlor-diethyl-sulphone, Effect of, on Brain Respiration, Prof. R. A. Peters, 327
- Dilute Traces, Physiological Potency of, Sir Joseph Larmor, 929
- Dimethyl Ether, Influence of Nitric Oxide on the Thermal Decomposition of, Gaseous Catalysis, P. F. Gay and Prof. M. W. Travers, 546
- Drosophila* : Male, A Case of 50 per cent Crossing-over in the, D. Moriawaki ; Dr. G. Eloff, 34 ; *melanogaster* : Immunological Detection of the Y-Chromosome in, Dr. S. G. Levit, S. G. Ginsburg, V. S. Kalinin and R. G. Feinberg, 78 ; Two Unusual Modifications of Eye Colour in, Dr. E. V. Enzmann and C. P. Haskins, 165 ; Several Spontaneous Chromosome Aberrations in, Dr. S. L. Frolova, 204 ; Influence of Temperature on Crossing-over in, H. Fairfield Smith, 329 ; *melanogaster* : During Late Larval Stage, Behaviour of Local, Dr. G. Eloff, 402 ; A Case of Complete Reversion of a Chromosomal Rearrangement in, Dr. H. Grüneberg, 508
- Dyes in the Molecular State, Spectral Absorption and Fluorescence of, Dr. E. E. Jelley, 1009
- Ear, Internal, Physical Nature of Certain of the Vibrating Elements of the, C. S. Hallpike, Prof. H. Hartridge and Dr. A. F. Rawdon-Smith, 839
- Eel-grass Disease and Parasite on the American Atlantic Coast, Persistence of the, C. E. Renn, 507
- Einstein's Theory, a Fundamental Difficulty of, Minimal Lines and Geodesics within Matter, Dr. L. Silberstein, 1012
- Electric Discharge, Chemical Reaction in the, Mechanism of, Dr. E. J. B. Willey, 1054

- Electrification of a Roof during a Thunderstorm, W. F. Tyler, 724
- Electrolytes and a General Phenomenon in Tissue Cells, Prof. H. Grossfeld, 31
- Electron Oscillator, A New, Prof. K. Okabe, 685
- Electrons, Fast, Passage of, through Matter, H. J. Bhabha and Dr. W. Heitler, 401
- Emitters GeCl and GeBr, Ultra-Violet Band Systems of the, L. A. Bashford, Prof. H. V. A. Briscoe and Dr. W. Jevons, 883
- Enamel Protein, Dr. P. Pincus, 970
- Erosion, Normal, as a Factor in Soil Profile Development, G. Milne, 548
- Ethylene Molecule, Vibrations of the, S. Bhagavantam, 1096
- Eucalypts, Differentiation of Varieties of, by their Essential Oils, A. R. Penfold and F. Morrison, 1099
- Eucalyptus*: *Johnstoni*, *Eucalyptus Globulus* and, Chromosome Number of, Prof. A. L. McAulay, F. D. Cruickshank and R. G. Brett, 550
- Evolution, Atrophy, Burial, Suppression or Total Loss in, Prof. H. A. Harris, 928
- Fatty Acids in Organic Mixtures, Estimation of, E. R. Hiscox and J. Harrison, 32
- Feathers, Bilateral Gynandromorphism in, P. G. 'Espinasse, 645
- Fermentation, Oxidation and, Stereoisomeric Nature of, Dr. G. A. Gause, 245
- Feulgen Reaction of the Bacteriophage Substance, The, Dr. M. Schlesinger, 508
- Flavins in Normal Human Urine, Determination and Excretion of, A. Emmerie, 164
- Flavones, Vitamin Nature of, A. Bentsáth, S. Ruzsnyák and Prof. A. Szent-Györgyi, 798
- Flavonols as Vitamins, Vitamin P: S. Ruzsnyák and Prof. A. Szent-Györgyi, 27
- Fluorescent Substances, Photo-reduction of, by Ferrous Ions, Dr. J. Weiss, 80
- Fossil: Human: Skull from Swanscombe, Kent, Preliminary Note on a New, A. T. Marston, 200; Remains from Kanam and Kanjera, Kenya Colony, Dr. L. S. B. Leakey, 643
- Fourier Series in Crystal Analysis: Calculation of Structure Factors and Summation of Noncentrosymmetrical Projections, Dr. J. M. Robertson, 683
- Galaxies, The Background of the, Prof. E. A. Milne, 38
- Gas Reactions: Kinetics of, An Attempt to Connect Thermal Decomposition and Oxidation Processes, Prof. M. W. Travers, 26
- Gaseous: Combustion, Prof. W. T. David, 930; Organic Compounds, Mechanism of Thermal Change in, Prof. M. W. Travers, 967
- Geiger-Müller Counters, Steady Performance of, Prof. B. Dasannacharya and G. S. Rao, 289
- Genetics in the Universities, Dr. E. Ashby, Prof. F. A. E. Crew, Dr. C. D. Darlington, E. B. Ford, Prof. J. B. S. Haldane, Prof. E. J. Salisbury, Dr. W. B. Turrill and C. H. Waddington, 972; Prof. W. Neilson Jones, 1058
- Glutathione, Reduced, The Nitroprusside Reaction as a Test for, N. S. R. Maloeuf, 75
- Gondwana Affinities of the Angora Flora in the Light of Geological Evidence, The, Prof. B. Sahni, 720
- Growth: Substance B, Chemistry of, N. Nielsen and V. Hartelius, 203; Hormones and Development of Plants, Prof. N. G. Cholodny, 586
- Gulf Stream, An Ecological Aspect of the, Dr. A. C. Redfield, 1013
- Hemoglobin, Ultra-violet Absorption Spectrum of, G. A. Adams, 368
- Hardness Tester, A, for Microscopical Objects, Dr. E. M. H. Lips and J. Sack, 328
- Hawke's Bay Earthquake of February 2-3, 1931, Focal Depth of the, R. C. Hayes, 126
- Heavy Nuclear Particles, Interaction of, D. Iwanenko and A. Sokolov, 246
- Helium: Radio-: Dr. T. Bjerger, 400; β -Ray Spectrum of, Dr. T. Bjerger and Dr. K. J. Bröström, 400; II, Liquid, Optical Experiments on, L. W. Shubnikov and A. K. Kikoin, 641; Hydrogen and Deuterium, Thermal Properties of, A. Bijl, 723; Liquid, Latent Heat of Evaporation of, Dr. J. Newton Friend, 1102
- Herschel Effect, Dependence of the, upon the Surrounding Gas Medium, Mrs. A. Vnukova, 246
- High-Voltage Impulses at Controllable Speed, Transmission of, Dr. L. B. Snoddy, Prof. J. W. Beams, W. T. Ham, jun. and H. Trotter, jun., 167
- Histone Insulinate, Hypoglycæmic Action of, A. Biasotti, V. Deulofeu and J. R. Mendive, 1101
- Horse Hemoglobin, Total Dissociation of, Dr. J. Steinhardt, 800
- Hydrogen: Halide Gases, Optical Polarization Ellipsoids of the, Dr. C. H. Douglas Clark, 126; Solid, and Deuterium at 4.2° K., Density and Compressibility of, Miss H. D. Megaw and Prof. F. Simon, 244; Halide Gases, Kerr Constants of the, Dr. C. H. Douglas Clark and Dr. E. C. Humphries, 248; Isotopes, Electrolytic Separation of the, Temperature Coefficient of the, H. F. Walton and J. H. Wolfenden, 468; and Deuterium, Helium, Thermal Properties of, A. Bijl, 723; Bond, The, and the Structure of Proteins, Dr. D. M. Wrinch and Dr. D. Jordan Lloyd, 758; Metallic, and Deuterium, Expansion Pressures of, A. R. Ubbelohde, 845
- Hymenoptera: Tetraploid? Are, B. R. Speicher, 78; Tetraploidy and, F. Greenshields, 330
- Insect: Metabolism, Humidity and, K. Mellanby, 124; Coloration: Prof. H. E. Armstrong, 242; Prof. G. D. Hale Carpenter, 243; and Natural Selection, Prof. E. W. MacBride, 365; Prof. G. D. Hale Carpenter, 686
- Inverse Diene Synthesis in the Pure Liquid State, Kinetics of an, B. S. Khambata and A. Wassermann, 368; A. Wassermann, 369
- Ion Formation, Negative, A New Process of, Dr. F. L. Arnot, 162
- Ionosphere: at Allahabad, Collisional Friction Frequency in the, G. R. Toshnival, B. D. Pant and R. R. Bajpai, 37; The Lower Regions of the, Prof. R. C. Colwell, A. W. Friend, N. I. Hall and L. R. Hill, 245; *C* Regions of the, Some Observations on the, Dr. H. Rakshit and J. N. Bhar; Prof. S. K. Mitra, 283
- Iron: A Radioactive Isotope of, Prof. E. B. Andersen, 76; and Molybdenum, Distortion of, Dr. E. W. Fell, 760
- Isomeric bis-Thiocamphors, Synthesis of Two, Sir P. C. Rây, 548
- Isotopes and Molecular Asymmetry, Dr. T. Iredale, 292
- Isotopic Weights by the Doublet Method, Dr. F. W. Aston, 1094
- $Ka_{1,2}$ -Doublet of Some of the Lighter Elements, Effects of Chemical Combination with Oxygen and Fluorine on the, Dr. N. G. Johnson, 1056
- Keilin's Cytochrome c and the Respiratory Mechanism of Warburg and Christian, H. Theorell, 687
- Keratins, Cross-Linkage Formation in, Dr. H. Phillips, 121; Dr. J. B. Speakman, 327
- Kerr Constants of the Hydrogen Halide Gases, Dr. C. H. Douglas Clark and Dr. E. C. Humphries, 248
- Ketones, Aldehydes, and, Photodecomposition of, Dr. R. G. W. Norrish and C. H. Bamford, 1016
- Kidney Phosphatase, Inhibitory Effect of Phloridzin and Phloretin on, Dr. H. Kalekar, 289
- Kikuchi Lines from Etched Copper Crystal, Dr. W. Cochrane, 202
- Lactic Dehydrogenase from Heart Muscle, Action of Co-enzyme as the Specific Co-enzyme of, E. Adler, Prof. H. v. Euler and H. Hellström, 968
- Lakes, Thermal Stratification in, P. Ulyott and P. Holmes, 971
- Lauric Acid, Contact Potentials of Reversible Soluble Films of, R. T. Florence, R. J. Myers and Prof. W. D. Harkins, 405
- Light: Scattering of, by Light, A. Akhieser, L. Landau and I. Pomeranchuk, 206; Diffraction of, by Ultra-Sonic Waves, F. H. Sanders, 285; Constancy of Wavelength of, G. C. Omer, jun., 587; Diffraction of: by Ultra-Sonic Waves, Sir C. V. Raman and N. S. Nagendra Nath, 616; C. R. Extermann, 843; Neutrino Theory of, Inconsistency of the, V. Fock, 1011
- Lightning and Atmospherics, P. R. Coursey, 509
- Linkage in Man, Dr. Julia Bell and Prof. J. B. S. Haldane, 759

- Liquid, Specific Heat of a, at Different Temperatures, Prof. Allan Ferguson and A. H. Cockett, 842
- Liquids of High Refractive Index, B. W. Anderson and C. J. Payne, 168
- Lithium: Alum, Preparation of, Prof. J. F. Spencer and G. T. Oddie (Sister Mary Cecilia, O.P.), 169; Boron and, Ranges of Particles Emitted in the Disintegration of, by Slow Neutrons, J. Rotblat, 202
- Luminous Bacteria, Light-Emitting Process of, Quantum Relationship of the, K. L. van Schouwenburg and Johanna G. Eymers, 245
- Madder, Glycosides of, R. Hill and D. Richter, 38
- Magdalenian 'Raclette' Industry in the Lower Thames Valley, An Early, J. P. T. Burchell, 79
- Magnetron, Parallel-plane Diode, D. M. Tombs, 36
- Mammalian Development, Organizers in, C. H. Waddington, 125
- Manatee of St. Helena, The, G. C. Kitching, 33
- Matter: Minimal Lines and Geodesics within, A Fundamental Difficulty of Einstein's Theory, Dr. L. Silberstein, 1012
- Mayfly Nymphs, Oxygen Consumption of, in Relation to Available Oxygen, Prof. H. Munro Fox, C. A. Wingfield and B. G. Simmonds, 1015
- Mercury Vapour, Sparking Potential of, Dr. F. Ll. Jones and W. R. Galloway, 973
- Metallic: Zinc and Cadmium, Asymmetry in, Prof. K. Herrmann; Dr. G. W. Brindley, 290; Films, Sputtered, A New Kind of Ring Phenomenon in, U. K. Bose, 684
- Metals, Order of Affinity of, for Copper, Iron, Cobalt and Nickel, Dr. A. S. Russell, 161
- Meteorite Trains, Luminosity of, M. A. R. Khan, 933
- Methane, Heavy (CH_3D), Absorption Spectrum of, in the Photographic Infra-Red, Drs. W. H. J. Childs and H. A. Jahn, 285
- Mice, Genital Organs of Male, A Protective Action of Progesterone on the, H. Burrows, 164
- Microcolorimetric Apparatus, A New, and a Method for Determination of Total Blood Volume, Dr. J. C. Somogyi, 763
- Mock Suns Observed at Nanda Devi in Garhwal, N. E. Odell, 764
- Molecular: Asymmetry, Isotopes and, Dr. T. Iredale, 292; Nitrogen, Effect of, on Molybdenum at High Temperatures, P. Túry and S. Krausz, 331
- Molecules, Vibrational Frequencies of, Dr. H. G. Howell, 290
- Molybdenum: at High Temperatures, Effect of Molecular Nitrogen on, P. Túry and S. Krausz, 331; Iron and, Distortion of, Dr. E. W. Fell, 760
- Natural Selection: Insect Coloration and, Prof. E. W. MacBride, 365; Prof. G. D. Hale Carpenter, 686; Prof. E. W. MacBride, 884; Prof. G. D. Hale-Carpenter, 1017; Prof. J. B. S. Haldane; E. B. Ford, 1053
- Nebulae, Stars and, Continuous Spectra of Certain Types of, Dr. W. M. Cohn, 127
- Neutrino Theory of Light, Inconsistency of the, V. Fock, 1011
- Neutron Absorption of Boron and Cadmium at Low Temperatures, V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and L. W. Schubnikow, 505
- Neutrons: Slow, Influence of Temperature on the 'Groups' of, Dr. A. Arsenjewa-Heil, Dr. O. Heil and C. H. Westcott, 462; Resonance Levels for Absorption, of, J. Rotblat, 545; and Protons, Self-Interaction of, Dr. I. Iwanenko and A. Sokolow, 684; Two, Evidence for the Expulsion of, from Copper and Zinc by one Fast Neutron, F. A. Heyn, 723; Scattering of, by Protons, E. T. Booth and Dr. C. Hurst, 1011; in Silver, Selective Absorption of, E. H. S. Burhop, R. D. Hill and A. A. Townsend, 1094; Activation of Silver by, Prof. G. Guéhen, 1095
- Newton's Prism in the British Museum, Prof. Ll. W. Taylor, 585
- Nickel and Copper, Radioactive Isotopes of, Dr. C. B. Madsen, 722
- Nicotine Inhibition of Oxidation and Fermentation, Dr. G. F. Gause, 976
- Nitrogen: Losses in Green Plants, Dr. W. H. Pearsall and M. C. Billimoria, 801; Compounds from Legume Nodules, Nature of the Excretion of, Prof. A. I. Virtanen, 880; Fixation with Cow-Dung, Prof. N. R. Dhar and S. K. Mukerji, 1060
- Nitroprusside Reaction as a Test for Reduced Glutathione, The, N. S. R. Maloeuf, 75
- Noise, Measurements of, B. G. Churcher and A. J. King, 329
- Nomenclature, Rules of, Suggested Cases for Suspension of, Dr. C. W. Stiles, 34
- Non: -Aqueous Solutions, Surface Properties of, R. Aschaffenburg, 644; -Polar Molecule, Polarizability of a, by Pressure, Indication of a Decrease in the, Prof. A. Michels, C. Michels-Veraart and A. Bijl, 509
- North-East Land, Water under the Western Ice Cap in, R. Moss, 803
- Nova Lacertae: 1936, Dr. T. W. Wormell and Dr. J. C. Dobbie, 38; Absence of Cosmic Rays from, Dr. J. Barnóthy and Dr. M. Forró, 544
- Nuclear: Levels, The Form of, Dr. R. Preiswerk and Dr. H. von Halban, jun., 163; Reactions Due to Neutrons of 2 m.e.v. Energy, E. T. Booth and C. Hurst, 367
- Nucleus $^{127}_{53}\text{I}$, The Electric Quadrupole Moment of the, Dr. T. Schmidt; Dr. S. Tolansky, 404
- Number 137, The Mysterious, Sir Flinders Petrie, 81; C. L. T. Griffith, 332
- Orchestration, Adjustable Resonators and, Prof. W. A., Osborne, 1059
- Organic Halides in Solution, Unimolecular Elimination of the Significance of the Electrical Conduction, Racemization and Halogen Replacement of, Dr. E. D. Hughes, Prof. C. K. Ingold and A. D. Scott, 120
- Organizers in Mammalian Development, C. H. Waddington, 125
- Orthophosphoric Acids, Sulphuric and, An X-Ray Study of, J. T. Randall, 842
- Osmunda*, Spiral Structure of Chromosomes in, Dr. Irene Manton, 1058
- Ostrea angulata*, Habit and Shell-Shape in the Portuguese Oyster, Prof. J. H. Orton, 466
- Oxidation and Fermentation, Stereoisomeric Nature of, Dr. G. A. Gause, 245
- Oxide Layer: on a Polished Copper Surface, Dr. S. Dobinski, 31; on a Polished Surface, Dr. L. H. Callendar, 291
- Oxycholesterilene, Enolization of, Dr. V. A. Petrow, 645
- Oxygen: Content of the Stratosphere, Prof. E. Regener, 544; Rate of Absorption of, by Sodium Sulphite Solution, W. S. E. Stickson, 645; Consumption of Mayfly Nymphs in Relation to Available Oxygen, Prof. H. Munro Fox, C. A. Wingfield and B. G. Simmonds, 1015
- Ozone as a Heating Factor in the Atmosphere, R. Penn-dorf, 247
- Palaeozoic Seismicity, Dr. A. Lamont, 243
- Palladium, Electronic Specific Heat in, G. L. Pickard, 123
- Paramecium*, Effect of Large Centrifugal Forces on, R. H. J. Brown, 843
- Parasites in Ruminants, Migrating, Route of, J. H. Tetley, 802
- Particle-Observers, Equivalent, Prof. J. L. Synge, 28
- Peking Man, W. C. Pei, 1056
- Pentadeuterobenzoic Acid, $\text{C}_6\text{D}_5\text{COOH}$, Some Properties of, Prof. H. Erlenmeyer and A. Epprecht, 367
- Pepsin, Crystalline, Inactivation of, Dr. J. Steinhart, 74
- Perchloric Acid, Absolute, Raman Effect in, R. Fonteyne, 886
- Phase Transitions, The Theory of, Dr. L. Landau, 840
- Phenylacetic Acid, Effect of, on the Growth of Tomato Plants, Dr. H. L. Pearce, 363
- Phloretin, Phloridzin and, Inhibitory Effect of, on Kidney Phosphatase, Dr. H. Kalckar, 289
- Phloridzin and Phloretin, Inhibitory Effect of, on Kidney Phosphatase, Dr. H. Kalckar, 289
- Phosphagen in Echinoid Muscle and in Electrical Tissue, E. Baldwin and Dr. Dorothy Moyle Needham, 506

- Phosphine, Heavy (PD_3), Infra-Red Absorption Spectrum of, Dr. G. B. B. M. Sutherland and G. K. T. Conn, 641
- Phosphites, Phosphorous Acid and the, Constitution of, R. Ananthakrishnan, 803
- Phosphogluconic Acid, Fermentation of, F. Lipmann, 588
- Phosphorescence, Demonstration of, H. Warren, 974
- Phosphorous: Acid and the Phosphites, Constitution of, R. Ananthakrishnan, 803; Phosphorus: Colorimetric Estimation of, Dr. H. L. Brose and E. B. Jones, 644
- Photographic Plates, Sensitivity of, in the Region $\lambda\lambda$ 2500–2100 Å., A. Hunter and Dr. R. W. B. Pearce, 37
- Photo-Reduction of Fluorescent Substances by Ferrous Ions, Dr. J. Weiss, 80
- Photosynthesis, Colloid Substrate in, Dr. M. Copisarow, 509
- Physico-Chemical Constants, Determination of, Dr. M. Wojciechowski and Dr. E. R. Smith, 30
- Physics, Modern, A Treatment of, Prof. M. N. Saha, 464; Prof. E. N. da C. Andrade, 465
- Planetary Nebulae, Chemical Composition of the, T. L. Page, 503
- Plant Tissues, State of Ascorbic Acid in, Dr. L. F. Levy, 933
- Plants: Growth Hormones and Development of, Prof. N. G. Cholodny, 586; Green, Nitrogen Losses in, Dr. W. H. Pearsall and M. C. Billimoria, 801
- Post-Natal Coat Characters and Prenatal Follicle Density, Relationships between, as Affected by Increase in Foetal Size, Dr. Nancy Galpin, 585
- Potassium: Diet, High, and the Survival of Adrenalectomized Rats, Dr. R. A. Cleghorn and G. A. McVicar, 124; Sodium and, Films in the Schumann Region, Transparency of, Prof. W. H. Watson and D. G. Hurst, 124; in the Extreme Red, Narrow Continuous Band of, T. Okuda, 168; in the Brain in Vitamin B_1 Deficiency, H. W. Kinnerley, 368; Mineral and Biological, Comparison of, in Diet Experiments, Dr. A. Lasnitzki and Dr. M. Lasnitzki, 799
- Prenatal Follicle Density, Post-Natal Coat Characters, Relationship between, as Affected by Increase in Foetal Size, Dr. Nancy Galpin, 585
- Progesterone, A Protective Action of, on the Genital Organs of Male Mice, H. Burrows, 164
- Protactinium (At. No. 91), The $\text{M}_{IV,V}$ -Absorption Edges of, Prof. V. Dolejšek and V. Kunzl, 590
- Proteins: in Mixtures and Concentrated Solutions, Molecular State of, Dr. K. O. Pedersen, 363; Structure of, The Hydrogen Bond and the, Dr. D. M. Wrinch and Dr. D. Jordan Lloyd, 758
- Protons, Neutrons and, Self-Interaction of, Dr. D. Iwanenko and A. Sokolow, 684
- Protoplasm, Linear Units within, Evidence for, Dr. H. H. Pfeiffer, 1054
- Protozoa, Contractile Vacuoles of, Effects of Hypertonic Media on the, Dr. J. A. Kitching, 287
- Quantum Theory, Conservation Laws in, Prof. N. Bohr, 25
- Rabbit Saliva, Diastase in, I. M. Thomas, 1015
- Radiation: Processes, Conservation of Energy in, Dr. E. J. Williams and E. J. Pickup, 461; Colloids and the Biological Effect of, F. Ellinger, 1014
- Radioactive Transformations, Mass Equivalent of the Energy in, Prof. A. J. Dempster, 201
- Radio: Propagation, Existence of a Surface Wave in, C. R. Burrows, 284; Helium: Dr. T. Bjerge, 400; β -Ray Spectrum of, Dr. T. Bjerge and Dr. K. J. Broström, 400; Waves, Simultaneous Transmission and Reception of, H. Antoun and F. Minaw, 761; Fadings and Bright Solar Eruptions, H. W. Newton, 1017
- Raman: Spectrum: of Cyclopropane, R. Ananthakrishnan, 123; of Thiophosphoryl Chloride, Prof. V. N. Thatte, 468; Spectra of Substances, Excitation of, with the aid of 'Optical Catalysts', Prof. K. Prosad and D. K. Bhattacharya, 510; Effect in Absolute Perchloric Acid, R. Fonteyne, 886
- Reaction Kinetics and the Walden Inversion, W. A. Cowdrey, Dr. E. D. Hughes and Prof. C. K. Ingold, 759
- Red Blood Corpuscles of Primitive Mammals, The, Prof. E. A. Briggs, 762
- Reference Frames, Intrinsic Uncertainty of, M. S. Bartlett, 401
- Resonators, Adjustable, and Orchestration, Prof. W. A. Osborne, 1059
- Rice Grain, The Amylase System of, during Ripening and Germination, K. V. Giri and A. Sreenivasan, 406
- River Bores, Measurement of, Dr. H. Chatley, 207
- 'Road Runner' of North America, The, Prof. T. D. A. Cockerell, 166
- Rotating Hollow Cylinders, Centrifuging in, Dr. E. A. Hauser and C. E. Reed, 975
- Rubidium, Continuous Absorption Band of, in the Presence of Foreign Gases, Ny Tsi-Zé and Ch'en Shang-Yi, 1055
- Rules of Nomenclature in the Case of Bohadsch 1761, Proposed Suspension of, Dr. C. W. Stiles, 206
- Rye, Winter: Devernization of, by High Temperature, Prof. F. G. Gregory and O. N. Purvis, 1013; Vernalization of, during Ripening, Prof. F. G. Gregory and O. N. Purvis, 973
- Saccharide Chains in Glycogens from Different Sources, Length of, D. J. Bell, 289
- Salt Systems, Equilibria in, with Deuterium Water, F. T. Miles, R. W. Shearman and Prof. A. W. C. Menzies, 121
- Samarium, Ranges of Particles Emitted by, L. Lewin, 326
- Science in Schools, The Teaching of, H. S. Shelton, 127; J. A. Lauwers, 205
- Scientific Workers: and War, Dr. E. Barrow and others, 80; Professional Associations of, Dr. W. A. Wooster, 1017
- Scientists and War, Dr. C. N. Acharya, 469
- Scyllium canicula*, Colour in the Dogfish, H. Waring, 1100
- Sea Urchin Eggs, Rates of Cleavage of, in Different Latitudes, Prof. H. Munro Fox, 839
- Seismicity, Palaeozoic, Dr. A. Lamont, 243
- Seismograph Stations, Reliability of, R. C. Hayes, 463; Dr. H. Jeffreys, 464
- Sideral Time, Variation of Cosmic Ray Intensity with, Dr. B. F. J. Schonland, B. Delatizky and J. B. Gaskell, 325
- Silica: Fused, The 2.73 μ Absorption Band in, Dr. D. G. Drummond, 248; Colloidal, in Natural Waters and the 'Silicomolybdate' Colour Test, Dr. A. R. Tourky and Prof. D. H. Bingham, 587
- Silicichloroform, Geometrical Constitution of, Prof. M. de Hemptinne and J. Wouters, 884
- 'Silicomolybdate' Colour Test, Colloidal Silica in Natural Waters and the, Dr. A. R. Tourky and Prof. D. H. Bingham, 587
- Silver: Neutrons in, Selective Absorption of, E. H. S. Burhop, R. D. Hill and A. A. Townsend, 1094; Activation of, by Neutrons, Prof. G. Guéhen, 1095
- $[\text{SO}_3]_2$, Prof. H. E. Armstrong, 26
- Sodium: and Potassium Films in the Schumann Region, Transparency of, Prof. W. H. Watson and D. G. Hurst, 124; and Water Metabolism in Relation to Disturbances of Carbohydrate Metabolism after Adrenalectomy, Prof. F. Verzár and L. Laszt, 844; Chloride, Ultra-Violet Luminescence of, Prof. M. Schein and M. L. Katz, 883
- Soil Profile Development, Normal Erosion as a Factor in, G. Milne, 548
- Solar: Eclipse, Total, of June 19, The Corona during the, Prof. M. Navashin, 73; Eruptions, Bright, Radio Fadings and, H. W. Newton, 1017
- 'Solute', Origin of the Word, Prof. J. R. Partington, 646
- Solutes in Plants, Translocation of, Dr. A. C. Léemann, 1099
- Sound Vibrations, Some New Phenomena Produced by, Prof. F. L. Hopwood, 1059
- Spirogyra*, Creeping Movements of, D. R. Chesterman and C. L. Foster, 403
- Stars and Nebulae, Continuous Spectra of Certain Types of, Dr. W. M. Cohn, 127
- Stearin from Chilled Olive Oil, Inhibited Deposition of, Dr. W. Clayton, S. Beck, R. I. Johnson and J. F. Morse, 801

- Stellar Atmospheres, Dissociation Energy of Carbon Monoxide and the Abundance of Elements in, M. Nicolet, 1097
- Sterckfontein Ape, The, Dr. E. Schwarz, 969
- Stereochemical Investigations, Use of Deuterium as an Indicator in, Prof. H. Erlenmeyer, H. Schenkel and A. Epprecht, 547
- Stick : Insect, The Common, Sister Carmela Hayes, 886 ; Insects, Feeding Habits of, S. T. E. Dark, 1058
- Stratosphere, Oxygen Content of the, Prof. E. Regener, 544
- Streptococcus apis*, Relation of So-called, to Certain Lactic Acid Streptococci, Dr. J. G. Davis and Dr. H. L. A. Tarr, 763
- Structure-Factor Graphs for Crystal Analysis, Prof. W. L. Bragg, 362
- Sugars, Different, from the Intestine of Rat and Pigeon, Relative Velocities of the Absorption of, Dr. H. G. K. Westenbrink, 203
- Sulphuric and Orthophosphoric Acids, An X-Ray Study of, J. T. Randall, 842
- Supraconductivity : Destruction of, by Electric Current and Magnetic Field, L. Shubnikov, 545 ; Destruction of, by an Electric Current, Transition Curve for the, L. W. Shubnikov and N. E. Alexeevski, 804
- Supra-Conductors, Time Effects in, K. Mendelssohn and R. B. Pontius, 29
- Surface Forces, Range of Action of, Dr. B. Derjaguin, 330 ; Dr. J. M. Macaulay, 587
- Syndrome produced by Diverse Nocuous Agents, A, Prof. H. Selye, 32
- Tetranitromethane, Constitution of, Prof. R. Robinson, 975
- Tetraploidy and Hymenoptera, F. Greenshields, 330
- Thermal Neutrons in Silver at Low Temperatures, Absorption of, V. Fomin, F. G. Houtermans, I. W. Kurtshatov, A. I. Leipunski, L. Shubnikov and G. Shtshepkin, 326
- Thiochrome : Aneurin and, The Structure of, F. Bergel and A. R. Todd, 76, 119 ; Synthesis of, F. Bergel and A. R. Todd, 406
- Thiophosphoryl Chloride, Raman Spectrum of, Prof. V. N. Thatte, 468
- Thorium, Uranium and, Atomic Masses of, Prof. A. J. Dempster, 120
- Threads, Rotating, Stability of, H. W. Hall, 932
- Thyroglobulin, Association and Dissociation Reactions of, Dr. H. P. Lundgren, 122
- Tissue Cells, Electrolytes and a General Phenomenon in, Prof. H. Grossfeld, 31
- Tissues, Analysis of, for Metallic Content, H. Ramage, 762
- Tomato Plants, Growth of, Effect of Phenylacetic Acid on the, Dr. H. L. Pearse, 363
- Total Solar Eclipse, Auroral Phenomena and the Behaviour of the Ionosphere during a, Prof. L. Vegard, 974
- Triterpene Group, A Novel Interrelationship in the, J. H. Beynon, Prof. I. M. Heilbron and Dr. F. S. Spring, 1017
- Ultra-Sonic Waves, Diffraction of Light by, F. H. Sanders, 285
- Unimolecular Elimination and the Significance of the Electrical Conduction, Racemization and Halogen Replacement of Organic Halides in Solution, Dr. E. D. Hughes, Prof. C. K. Ingold and A. D. Scott, 120
- Universities, Research and Teaching in, Prof. R. A. Peters, 590
- Upper : Triassic Fossil Bed in Queensland, A New, Dr. R. J. Tillyard, 719 ; Atmosphere, Red and Sunlit Auroras and the State of the, Prof. L. Vegard, 930
- Uranium and Thorium, Atomic Masses of, Prof. A. J. Dempster, 120
- Valonia*, Structure of the Wall of, Prof. G. van Iterson, jun., 364
- Verbalization : Dr. F. G. Gregory and O. N. Purvis, 249 ; of Winter Rye during Ripening, Prof. F. G. Gregory and O. N. Purvis, 973
- Vibrational Frequencies, Ground State, Dr. H. G. Howell, 36
- Viscid Fluid Threads, The Nature of, Sir Joseph Larmor, 74
- Viscosity of Binary Mixtures, Dr. A. J. A. Van der Wyk, 845
- Vitamin : B₁ Deficiency, Role of Adenylic Acid in, Dr. T. W. Birch and Dr. L. W. Mapson, 27 ; P : Flavanols as Vitamins, S. Rusznayák and Prof. A. Szent-Györgyi, 27 ; A, Estimation of, J. F. Ward and R. T. M. Haines, 128 ; C, Inhibitive Effect of, on Toxin Production by *C. diphtheria*, I. J. Kligler, 291 ; B, Deficiency, Potassium in the Brain in, H. W. Kinnersley, 368 ; Nature of Flavones, A. Bentsáth, S. Rusznayák and Prof. A. Szent-Györgyi, 798 ; (C), Ascorbic Acid, Estimation of, by Titration, Dr. I. Gál, H. Cheftel and Marie-Louise Pigeaud, 799 ; B₁, Hydrogenation of, F. Lipmann, 1097
- Vitamins, Identification of, by Molecular Distillation, Dr. K. Hickman, 881
- van der Waals Forces, Determination of, Dr. H. S. W. Massey and R. A. Buckingham, 77
- Walden Inversion, Reaction Kinetics and the, W. A. Cowdrey, Dr. E. D. Hughes and Prof. C. K. Ingold, 759
- von Waldeyer, Wilhelm, J. D. Boyd, 761
- War : Scientific Workers and, Dr. E. Barrow and others, 80 ; Scientists and, Dr. C. N. Acharya, 469
- Water, Moving, 'Lines' on the surface of, Dr. R. O. Hall, 466
- Whale, Bones of a, from the Wieringermeer, Zuider Zee, Dr. G. C. A. Junge, 78
- Whales, Antarctic Blue, The Stock of, A. H. Laurie, 33
- Wheat, Occurrence of Haploid Pollen Mother Cells in a *vulgaris*, Dr. R. M. Love, 589
- Wireless Waves, Ultra Short, The 'Specific Action' of, Sir Leonard Hill and H. J. Taylor, 591 ; Prof. W. E. Curtis, Dr. F. Dickens and S. F. Evans, 1100
- X-Radiation, An Effect of, on the Blood, Dr. H. L. Brose and E. B. Jones, 687
- Corrosion of Light Aluminium Alloys, Application of the Methods of Micro-chemical Analysis to the Study of the, H. Fournier, 49
- Cosmic : Ray Showers, Quantum-mechanical Theory of, W. Heisenberg, 42 ; Radiation, Bursts of, A. R. Hogg, 77 ; Rays : Extra-terrestrial Effects of, F. Zwicky, 91 ; Dr. W. F. G. Swann, 209 ; Radiation : Specific Ionization of, M. G. E. Cosyns, 284 ; in the Upper Layers of the Troposphere, Continuity of the Variation of the, A. Ziemecki and K. Narkiewicz-Jodko, 301 ; Ray : Intensity : in a Deep Mine, Measurements of, Dr. J. B. Barnóthy and Dr. M. Forró, 325 ; Intensity, Variation of, with Sidereal Time, Dr. B. F. J. Schonland, B. Delatizky and J. P. Gaskell, 325 ; Rays : Absence of, from Nova Lacertae, Dr. J. Barnóthy and Dr. M. Forró, 544 ; Cloud Chamber Observations of, C. D. Anderson and S. H. Neddermeyer, 555 ; and Solar Activity, H. T. Graziadei, 562 ; Ray Burst at a Depth Equivalent to 800 m. of Water, A. Dr. Y. Nishina and C. Ishii, 721 ; Cyclotron, A, as a Cosmic Ray Generator ? Prof. H. Alfvén, 761 ; Radiation, a Temporary Excess of Ten per cent in, J. Clay, E. M. Bruins and J. T. Wiersma, 812
- Cosmology, The Observational Approach to, Dr. E. P. Hubble (Rhodes memorial lectures), 1001
- Cotton : Haploids in, Dr. S. C. Harland, 334 ; Inheritance in, Dr. J. B. Hutchinson, 471 ; Hair, Development of the, Dr. F. M. L. Sheffield, 1062
- County Natural History Societies, [1836], 257
- Cow-Dung, Nitrogen Fixation with, Prof. N. R. Dhar and S. K. Mukerji, 1060
- Cows' Milk, Phosphatase of, S. J. Folley and H. D. Kay, 767
- Cozymase, Phosphorylation of, Mme. Dorothy Moyle Needham, 774
- Cranial Muscles of Vertebrates, The, Prof. F. H. Edgeworth (Review), 221
- Crater Lake, The Blue Water of, Dr. E. Pettit, 198
- Crayfish (*Cambarus clarkii*) Muscle, Mechanism of Inhibition of, C. A. G. Wiersma and G. Marmont, 775
- Creatinine, Reaction of, with 1,3,5-trinitrobenzol, 2,4,6-trinitrotoluol, and 2,4,6-trinitrobenzoic Acid, A. Bolliger, 813

- Crop-Growing Without Soil, Prof. W. F. Gericke, 581
 Crops and Livestock in England and Wales, 281
 Crosse, Andrew, and his Electrical Experiments [1836], 519
 Crustacea, L. Boone (*Review*), 385
 Crystal: the Crystal Photo-effect and Rectifying Action in the Bulk of the, Dr. G. Groetzinger and J. Lichtschein, 163; Analysis: Structure-Factor Graphs for, Prof. W. L. Bragg, 362; Calculation of Structure Factors and Summation of Fourier Series in, Non-centrosymmetrical Projections, Dr. J. M. Robertson, 683; Analysis, Progress in the Technique of, Sir William Bragg, 953
 Crystal Palace, Destruction of the, 961
 Crystalline Substances, Liquid, from Virus-infected Plants, F. C. Bawden, N. W. Pirie, J. D. Bernal and I. Fankuchen, 1051
 Crystals, Optical Phenomena of, [1836], 1026
 Cultural and Social Values of Science, Sir Richard Gregory, Bt., 594; Prof. L. Hogben, 595; Sir A. D. Hall, 596
 Culture, Science and, 479
 Cuprous: Oxide, Electrical Conductivity of, Influence of the Gases of the Atmosphere on the, L. Dubar, 339; Complex, A Co-ordinated, F. G. Mann, D. Purdie and A. F. Wells, 978
Current Science, July, 358
 Curve Fitting, Prof. R. A. Fisher, 934
Cyathocotyle, A new Strigeid Parasite in the Rare Genus, S. C. Verma, 589, 757
 Cyclanic Series, Molecular Transformation in the, M. Tiffeneau and Mlle. J. Gutman, 897
 Cyclohexane Rings, Multiplanar, Non-Existence of, Dr. R. D. Desai and Prof. R. F. Hunter, 548
 'Cyclol' Molecules, Energy of Formation of, Dr. D. M. Wrinch, 241; F. C. Frank 242
 Cyclones, Ascent of Air in, Dr. A. H. R. Goldie, 166
 Cyclopropane, Raman Spectrum of, R. Ananthakrishnan, 123
 Cytology: Experimental, International Congress of, Meeting at Copenhagen, 769
 Czechoslovakia: Education in, 375; Institute of Hygiene of, Vitamins in the Diet of the Poor, 682; Bee Control in, 717
 Dairy Science, A. L. Bacharach (*Review*), 625
 Dams: Large, International Commission on, Congress at Washington, Dr. F. M. Lea, 768
 Dana Report, No. 7: Quantitative Investigations on the Distribution of Macroplankton in Different Oceanic Regions, Dr. P. Jespersen, 45
 Danish Pollen Diagrams, New Archaeological Datings in, K. Jessen, 695
 Dark Adaptation after Varying Degrees of Light Adaptation, C. P. Winsor and Anna-Betty Clark, 415
 Dartford-Purfleet Tunnel, 459
 Darwin: at St. Helena [1836], 47; Charles, and Entomology, Prof. G. D. Hale Carpenter, 88
 Darwin's: Visit to the Galapagos Islands: Centenary of, Issue of Commemorative Stamps by Ecuador, Dr. W. T. Calman, 15; Reflections on Travel [1836], 560
 Days! Those were Good, Reminiscences, late C. L. Schleich. Translated by B. Miall (*Review*), 663
 Dead Sea, Life in the, Dr. B. Wilkanski, 467
 De Bilt, Holland, Earthquake Records at, 109
 'Degassing' by Electricity, 1090
 Demographic Statistics, 1007
 Denmark, Medicine in [1836], 177
 Dental Caries and Diet, 956
 Derbyshire Caves Exhibition, 962
 Dermatophyte Fungi, Canadian Work on, 176
 Desert Sand, Movement of, R. A. Bagnold, 855
 Determinism and Man, Prof. H. Levy (*Review*), 6
 Déterminisme et variabilité dans le comportement des organismes, Prof. W. J. Crozier (*Review*), 99
 Deuterium: Water, Equilibria in Salt Systems with, F. T. Miles, R. W. Shearman and Prof. A. W. C. Menzies, 121; Solid Hydrogen and, Density and Compressibility of, at 4.2° K., Miss H. D. Megaw and Prof. F. Simon, 244; Thermal Conductivity of, C. T. Archer, 286; Water, Vapour Pressure of, F. T. Miles and Prof. A. W. C. Menzies, 294; as an Indicator in Stereochemical Investigations, Use of, Prof. H. Erlenmeyer, H. Schenkel and A. Epprecht, 547; Helium, Hydrogen and, Thermal Properties of, A. Bijl, 723; Metallic Hydrogen and, Expansion Pressures of, A. R. Ubbelohde, 845; Oxide, Entropy of, E. A. Long and J. D. Kemp, 890
 Deuteroethylenes, Plane Vibration Frequencies of Symmetrical, Provisional Computation of the, Prof. C. Manneback and A. Verleysen, 367
 Devernization of Winter Rye by High Temperature, Prof. F. G. Gregory and O. N. Purvis, 1013
 Diamagnetism: and Particle Size, Prof. H. Lessheim, 848; of Mixtures of Organic Liquids, Prof. J. F. Spencer and Dr. V. C. G. Trew, 974
 Diamond, Surface Markings on a, Dr. W. H. George, 616
 Diastase in Rabbit Saliva, I. M. Thomas, 1015
 Diatomic: Sulphur, Selenium and Tellurium Vapours, Dissociation Energy of, P. Goldfinger, W. Jeune-homme and B. Rosen, 205; Molecules, Constants of, Dr. N. R. Tawde, 649
 Diatoms, Japanese, Dr. H. Aikawa, 1104
 Dichlor-Diethyl-Sulphone, Effect of, on Brain Respiration, Prof. R. A. Peters, 327
 Dielectric: Losses in an Alternating Field of High Frequency and Molecular Dimensions, J. Henrion, 339; Phenomena in High Voltage Cables, Dr. D. M. Robinson (*Review*), 633
 Diesel: -Electric Traction on the Netherlands Railways, W. Hupkes, 174; Engines, Design of Fuel Injectors for, G. J. Lugt, 174; Fuel Specifications, C. H. Barton, 174; Fuels: and Engineering, 174; Ignition, Quality of, Correlation of Tests on the, carried out at Delft and Sunbury, G. D. Boerlage, J. J. Broeze, L. J. Le Mesurier and R. Stansfield, 174; Engines, High Speed: Maintenance of, A. W. Judge (*Review*), 527; with Special Reference to Automobile and Aircraft Types, A. W. Judge. Second edition (*Review*), 527
 Dietary Standards, 810
 Differential Equations, The Theory of (*Review*), 629
 Diflavonols, Synthesis of, Prof. J. Algar, 300
 Dilute Traces, Physiological Potency of, Sir Joseph Larmor, 929
 3,5-Dimethoxybenzaldehyde, Derivations of, G. Lock and G. Nottes (5), 49
 Dimethyl Ether, Influence of Nitric Oxide on the Thermal Decomposition of, Gaseous Catalysis, P. F. Gay and Prof. M. W. Travers, 546
 Dinoflagellates of the Coastal Waters of the Western Pacific, Dr. A. Böhm, 935
 Direction Finding by Sound, Dr. W. S. Tucker, 111
 Dirhinini and Epitranini (Hymenoptera, Chalcididae), Nearctic, B. D. Burks, 91
 Disease in the Tropics, Prevention of, 71
 Dissociable Organic Oxides and Anthracene Structure, C. Dufraisse and M. Gérard, 90
 Distillation, Prof. J. Reilly (*Review*), 570
 Doctors of the Nineteenth Century, Great, Sir William Hale-White (*Review*), 663
 Dove Marine Laboratory, Report of the, 434
Drosophila: Male, A case of 50 per cent Crossing-over in the, D. Moriwaki; Dr. G. Eloff, 34; *pseudo-obscura*, Suppression of Tangled in, H. P. Donald, 48; *melanogaster*, Y-Chromosome in, Immunological Detection of the, Dr. S. G. Levit, S. G. Ginsburg, V. S. Kalinin and R. G. Feinberg, 78; X-Chromosome of, Dr. C. A. Offermann, 129; *melanogaster*, Two Unusual Modifications of Eye Colour in, Dr. E. V. Enzmann and C. P. Haskins, 165; Several Spontaneous Chromosome Aberrations in, Dr. S. L. Frolova, 204; Crossing-over in, Influence of Temperature on, H. Fairfield Smith, 329; *melanogaster*: Local, during late Larval Stage, Behaviour of, Dr. G. Eloff, 402; A case of Complete Reversion of a Chromosomal Rearrangement in, Dr. H. Grüneberg, 508; Effect of Temperature on the Frequency of Somatic Crossing-over in, C. Stern

- and Violet Rentschler, 600; *pseudo-obscura*, Inversions in the Third Chromosome of Wild Races of, A. H. Sturtevant and T. Dobzhansky, 600; Imaginal Buds of the Appendages in, Dr. Charlotte Auerbach, 689; *pseudo-obscura*, Genetical Constitution of, H. P. Donald, 725
- Dutrochet's Experiments in Vegetable Physiology [1836], 1111
- Dyes in the Molecular State, Spectral Absorption and Fluorescence of, Dr. E. E. Jelley, 1009
- Dynamics, Classical (*Review*), 264
- Ear, Internal, Physical Nature of certain of the Vibrating Elements of the, C. S. Hallpike, Prof. H. Hartridge and Dr. A. F. Rawdon-Smith, 839
- Early Man, Chronology of, and Cultural Associations, Sir Arthur Keith, 277
- Earth: Down to, an Introduction to Geology, C. Croneis, and W. C. Krumbein (*Review*), 527
- Earthquake: Records at De Bilt, Holland, 109; Japanese, of February 21, 1936, N. Nasu and T. Hagiwara; N. Miyabe; T. Saita, 171; Formosa, of April 21, 1935, Prof. N. Miyabe and others, 353; of April 6, 1580, The British, R. E. Ockenden, 472; Belluno, of October 18, 713; Epicentres, Catalogue of, Miss Ethel F. Bellamy, 766
- Earthquakes: Lunar Periodicity of, M. W. Allen, 209; Tokyo, in 1935, 252; in California, Recent, P. Byerly and J. T. Wilson, 936; in the Kwanto (Japan) District, Distribution of, T. Nagata; N. Nasu, T. Hagiwara and S. Omoti, 1063
- Earth's: Rotation, Irregularity of the, N. Stoyko, 339; Magnetism, The, Prof. S. Chapman (*Review*), 1079
- Earthworm, Respiration of the, Effect of Temperature on the, C. M. Pomerat and M. X. Zarrow, 91
- East Africa, Taxation, Administration and Research in, W. G. A. Ormsby-Gore, 735
- Echinoidea, A Monograph of the. 2: Text and Atlas, Prof. T. Mortensen (*Review*), 344
- Economic and Social Surveys, Need for Centralization of Information on, Prof. A. M. Carr-Saunders, 597
- Economics, International, and Social Reconstruction, 341
- Economists and the Public: A Study of Competition and Opinion, Prof. W. H. Hutt (*Review*), 1037
- Edinburgh University: Prof. J. Ritchie appointed professor of natural history; conferment of doctorates, 176; Dr. J. A. Kitching appointed lecturer in experimental zoology, O. A. Trowell lecturer in physiology, A. Brown full-time assistant in physiology, and Dr. F. Bath lecturer in mathematics, 1110
- Edison, his Life, his Work, his Genius, W. A. Simonds (*Review*), 740
- Education: The Future in, Sir Richard Livingstone, 456; Act, 1936, 558; The Future in, Sir Richard Livingstone, 601; for Rural Life, Sir John Russell; H. Morris; G. W. Pierce, 891
- Educational Platform for 1936, An, 895
- Eel-Grass Disease and Parasite on the American Atlantic Coast, Persistence of the, C. E. Renn, 507
- Egg Cleavage, Geometrical Laws of, Monteil, 648
- Egypt: Early Iron in, C. Hawkes, 592; Ancient, Royal Prowess in, 837
- Egyptian, Ancient, Sculpture, 1005
- Ehrenberg's Microscopical Discoveries [1836], 694
- Einstein's Theory, A Fundamental Difficulty of, Minimal Lines and Geodesics within Matter, Dr. L. Silberstein, 1012
- Eirene and Helgicirra, The Medusae, Dr. P. L. Kramp, 333
- Elastic Modulus of certain Definite Intermetallic Compounds, A. Portevin and L. Guillet, jun., 476
- Elasticity: Theory of: An Introduction to the, for Engineers and Physicists, Prof. R. V. Southwell (*Review*), 54; Prof. S. Timoshenko (*Review*), 54
- Electrets, Experiments with, Dr. G. Grootzinger and H. Frei; A. Gemant, 130
- Electric: Heating of Garden Frames, Dr. J. Grainger and T. F. Armstrong, 251; Batteries, Industrial Use of, Dr. Strohe, 297; Supply in the Irish Free State, 397; and Magnetic Measurements, Principles of. Part 1: Electricity, P. Vigoureux; Part 2: Magnetism, C. E. Webb (*Review*), 485; Lighting, Science and, C. C. Paterson, 515; Field, Movement of Growth-Promoting Substance and the Growth of Plants in an, V. Katunskij, 656; Services in Buildings, H. T. Young, 752; Currents in Metalliferous Veins [1836], 983; Illumination, Lord Rutherford; Exhibition of, 1046; Discharge, Mechanism of Chemical Reaction in the, Dr. E. J. B. Willey, 1054
- Electrical: Contacts, G. Windred, 41; Interference with Broadcasting, 181; 255; Engineering Supply, Day-load Peaks in, 372; Engineers, Institution of, awards of scholarships to W. E. Harper, P. Hargreaves, L. S. Armand, D. H. Thomas, W. H. Penley, E. F. O. Masters and L. G. Leaton, 375; Accidents in 1935, Report on, 459; Power Station, New Fulham, 611; Measurements in Principle and Practice, H. C. Turner and E. H. W. Banner (*Review*), 635; Prospecting and its Uses, M. Schlumberger, 807; Saturation in Pure Liquids and their Mixtures, A. and B. Piekara, 943; Machinery Laboratory, Polytechnic, Regent Street, 1066
- Electricity: Distribution in Great Britain, 69; in Horticulture, 70; Transmission and Distribution of, C. F. Bolton and R. H. Abell, 109; Experimental, M. M. Das (*Review*), 183; Supply, Progress in France of, 359; Grid, Advantages from the, H. Hobson, 611
- Electrification: Rural, in Great Britain, S. E. Britton, 500; of a Roof during a Thunderstorm, W. F. Tyler, 724
- Electrochemistry: Experimental and Theoretical, Principles of, Prof. M. Dole (*Review*), 144; Principles and Applications of: Prof. H. J. Creighton. In 2 Vols. Vol. 1: Principles. Third edition (*Review*), 144; Prof. W. A. Koehler. In 2 Vols. Vol. 2: Applications (*Review*), 144; Theory and Practice of, Prof. J. Kendall (*Review*), 144
- Electrolysis of Some Salts in Anhydrous Glycerol, M. Centnerszwer and J. Szper, 733
- Electrolytes and a General Phenomenon in Tissue Cells, Prof. H. Grossfeld, 31
- Electrolytic Oxidation: and Reduction: Inorganic and Organic, Dr. S. Glasstone and Dr. A. Hickling (*Review*), 144; Dr. A. Hickling, 937
- Electronic Charge, X-Ray method for Determining, J. W. M. Du Mond and V. L. Bollman, 767
- Electronics, Industrial, F. H. Gulliksen and E. H. Vedder (*Review*), 704
- Electron Oscillator, A New, Prof. K. Okabe, 685
- Electrons, Fast, through Matter, Passage of, H. J. Bhabha and Dr. W. Heitler, 401
- Electroplating, Developments in, D. J. Macnaughtan and others, 707
- Elements 72, 73, 75, 83, 90 and 92, Observation and Measurement of the *Lx* Satellites for the, Mlle. Yvette Cauchois, 216
- Elephants: Body Temperatures of, F. G. Benedict and R. C. Lee, 415; Evolution of the (*Review*), 860
- Ellsworth's Trans-Antarctic Flight, Topographical Results of, W. L. G. Joerg, 238
- Elm Trees, Disease in [1836], 215
- Emitters GeCL and GeBr, Ultra-Violet Band Systems of the, L. A. Bashford, Prof. H. V. A. Briscoe and Dr. W. Jevons, 883
- Empire: Survey Officers, Conference of, 1935, 254; Surveys, 254; Fauna at Home and Abroad, 434; Co-operation in Agricultural Research, 777
- Emulsions: Theory and Practice (*Review*), 702; Theory of, and their Technical Treatment, Dr. W. Clayton. Third edition (*Review*), 702
- Enamel Protein, Dr. P. Pincus, 970
- Encyclopædia, World, The Idea of a, H. G. Wells, 917
- Endemic Flora of Britain, A. J. Wilmott, 89
- Energy, Conservation of, and Shankland's Experiment, F. Cernuschi, 896
- Engineer: Training of the, in the U.S.A., R. E. Hellmund, 174; and the Nation, Prof. W. Cramp, 453; 574; Training of the, Prof. C. J. Hawkes, 753

- Engineering: Materials, Mechanical Tests for, A. M. Roberts, 852; and Empire Development, Sir Alexander Gibb, 1038
- England: Northern, T. Eastwood, 390; South-west, H. Dewey, 390; and Wales, Population of [1836], 732
- Engraulis encrasicolus* L. (Anchovy), Influence of Hydrogen Ion Activity and of Salinity on the Eggs of, S. S. Elizarova, 561
- Entomological Society [1836], 47, 598
- Enzyme: Studies (*Review*), 141; Chemistry, Recent Advances in, Prof. E. Waldschmidt-Leitz, 409
- Enzymforschung, Ergebnisse der, Herausgegeben von F. F. Nord und R. Weidenhagen. Band 5 (*Review*), 141
- Enzymologia*, Nos. 1 and 2, 612
- Ephemeroptera, A Study of the, M. E. Mosely (*Review*), 223
- Epidemiology, Experimental, Prof. M. Greenwood, Dr. A. B. Hill, Dr. W. C. Topley and J. Wilson, 474
- Epithelioma Inoculated in the Eye, Intra-cutaneous Immunization of Rabbits against, A. Besredka and M. Bardach, 258
- Ericsson's, John, Screw Propeller [1836], 90
- Erosion, Normal, as a Factor in Soil Profile Development, G. Milne, 549
- Eruca sativa* Mill, Self-Sterility in, Z. Alam, 372
- Eruptive Prominences, A Second Law of the Motions of, E. Pettit, 91
- Eskimo: Chronology, F. G. Rainey, 378; Girls, Puberty in, A. Hrdlička, 378; Cultural Origins in East Greenland, P. V. Glob, 647
- Essential Oils, Antiseptic Power, either Immediate or after Prolonged Action, of, J. Risler, 656
- Esters, Action of Organic Acids on, H. Gault and A. Chablay, 855
- Ethnology of the Far East, 876
- Ethylene Molecule, Vibrations of the, S. Bhagavantam, 1096
- Eucalypts, Differentiation of Varieties of, by their Essential Oils, A. R. Penfold and F. Morrison, 1099
- Eucalyptus: globulus* and *Eucalyptus Johnstonei*, Chromosome Number of, Prof. A. L. McAulay, F. D. Cruickshank and R. G. Brett, 550
- Eugenics Society, J. C. Trevor awarded a Leonard Darwin scholarship, 756
- Euphrates Expedition [1836], 177
- Europe: A History of, H. A. L. Fisher (*Review*), 903; Mr. Fisher's History of, F. S. Marvin (*Review*), 903
- European Civilization and the African (*Review*), 947
- Evolution: Hormones and, Dr. S. Zuckerman, 408; Atrophy, Burial, Suppression or Total Loss in, Prof. H. A. Harris, 928
- Examinations, Essays on, Sir Michael Sadler and others (*Review*), 820
- Examiners, The Marks of, Sir Philip Hartog and Dr. E. C. Rhodes. With a Memorandum by Prof. C. Burt (*Review*), 820
- Experience, Patterns of, A. W. Wolters, 455
- Experimental Psychology at Oxford, The Institute of, Dr. W. Brown appointed director and Dr. W. Stephenson assistant director, 14
- Faeroes, Geology of the, F. Walker and C. F. Davidson, 178
- Fahrenheit, Daniel Gabriel (1686-1736), 428
- Fairthorne-Salt Mathematical Film, R. A. Fairthorne and B. G. D. Salt, 726
- False-Killer Whale: in Scotland, 408; in South Africa, Dr. L. Gill, 541
- Faraday: House Journal*, 755; Letter, A, London University Degrees, 710
- Fatty Acids in Organic Mixtures, Estimation of, E. R. Hiscox and J. Harrison, 32
- Feathers, Bilateral Gynandromorphism in, P. G. 'Espinasse 645
- Fermente, Die, und ihre Wirkungen, Prof. C. Oppenheimer. Suppt., Lief 4 (*Review*), 269
- Ferns, Apospory in, A New Type of, Misses I. Andersson-Kottö and A. E. Gairdner, 471
- Feulgen Reaction of the Bacteriophage Substance, The, Dr. M. Schlesinger, 508
- Fibre Studies, W. T. Astbury and others, 824
- Fibres, Chemistry of, 175
- Field Concept, Morphogenesis and the, C. H. Waddington, 809
- Fiji, Mosses of, E. B. Bartram, 554
- Films: and their Utilization, 239; Educational, 983
- Filterable Organisms, New Group of, Sir Patrick Laidlaw and W. J. Elford, 648
- Finance, Research and, 51
- Fireball: over Yorkshire, 360; Bright, of November 14, 965
- Fire-Fighting in America, History of, 197
- Fish: and Fishing (*Review*), 308; Resistance of, to Supercooling, P. J. Schmidt, 977
- Fishes, A Book of (*Review*), 57
- Flagella Movement, A. G. Lowndes, 210
- Flavanols as Vitamins, Vitamin P: S. Rusznyák and Prof. A. Szent-Györgyi, 27
- Flavins in Normal Human Urine, Determination and Excretion of, A. Emmerie, 164
- Flavones, Vitamin Nature of, A. Bentsáth, S. Rusznyák and Prof. A. Szent-Györgyi, 798
- Flavours and Essences: A Handbook of Formulæ, M. H. Gazan (*Review*), 949
- Floras, Native, Preservation of, Dr. A. B. Rendle, 457
- Flour Beetles of the genus *Tribolium*, N. E. Good, 129
- Fluorescence of Some Pure Substances, E. Canals and P. Peyrot, 1026
- Fluorescent Substances, Photo-Reduction of, by Ferrous Ions, Dr. J. Weiss, 80
- Fluorite and Rock Salt, Coloration of, E. Eysank, 415
- Food: Requirements in the Modern State, 379; Science, Chemistry and, Dr. L. Harris and others, 744; Preparation of, Dr. L. H. Lampitt, 745; Transport, T. Herbert, 745; Science, The Analytical Chemist and, Dr. G. R. Lynch, 746; and the Family Budget, 753; Production, Consumption and Prices, Statistics of, 765; Investigation: a Retrospect and the Future, 825; Board, Report of the, for the Year 1935, 825; and the Principles of Dietetics, Dr. R. Hutchison and Prof. V. H. Mottram. Eighth edition (*Review*), 994
- Foraminifera, A Suggested Classification of the, F. Chapman and W. J. Parr, 520
- Forbes, J. D., and Auguste de la Rive [1836], 559
- Force and Matter, Unity of, Dr. J. Bašta, 83
- Forest and Forest Industries of the Prairie Provinces, J. D. B. Harrison, 1091
- Forestry in Kenya, 253
- Forests and Forestry in Trinidad and Tobago, R. L. Brooks, 926
- Formosa Earthquake of April 21, 1935, Prof. N. Miyabe and others, 353
- Formosan Tea Leaves, Tannin substance of, Y. Ōshima, 695
- Forth, A Vertebrate Fauna of, Leonora Jeffrey Rintoul and Evelyn V. Baxter (*Review*), 703
- Forthcoming Books of Science, 637
- Fossil: Human Skull, A New, from Swanscombe, Kent, Preliminary note on, A. T. Marston, 200; Anthropoid Skull from South Africa, New, Dr. R. Broom, 356; 486, 498; Horse Remains from Idaho, C. L. Gazin, 512; Men of Engis, Dr. C. Fraipont, 553; Human Remains from Kanam and Kanjera, Kenya Colony, Dr. L. S. B. Leakey, 643; Skull, A New, from Eyassi, East Africa, Discovery by a German Expedition, Dr. L. S. B. Leakey, 1082
- Fossils: on the Continent, Discovery of [1836], 413; of the Late Pre-Cambrian (Newer Proterozoic) from the Adelaide Series, South Australia, Memoir on, late Sir T. W. Edgeworth David and Dr. R. J. Tillyard (*Review*), 994
- Fourier Series in Crystal Analysis: Calculation of Structure Factors and Summation of, Non-centrosymmetrical Projections, Dr. J. M. Robertson, 683
- Fowl Paralysis, Leaflet on, 797

- France d'outremer, Les ressources minérales de la. 3 :
Le zinc, le plomb, l'argent, le cuivre, l'or, les minerais
radioactifs, le mica, les pierres précieuses, substances
diverses. 4 : Le phosphate (*Review*), 265
- Franklin Institute, Biochemical Research at the, 23
- Free Will, Indeterminism and, Prof. E. Schrödinger, 13
- Friction of a Solid Moving in Water, E. Brun, 1111
- Fritz, John, gold medal, award of the, to Prof. A. N.
Talbot, 1002
- Frost Hardening, J. Levitt and G. W. Scarth, 806
- Fruit : Juice Factory, A New, 157 ; Supplies in 1935,
296
- Frustration : The Anatomy of, a Modern Synthesis,
H. G. Wells (*Review*), 779
- Fungi : and Graft Unions, T. E. T. Bond, 40 ; Irish,
P. O'Connor, 338, 1020 ; Uses of, J. Ramsbottom, 455 ;
Positive Economics of the, J. Ramsbottom, 746 ;
Researches on, Prof. A. H. R. Buller. Vol. 6
(*Review*), 1033 ; Wood-Decaying, Heat-Treatment
for, H. B. S. Montgomery, 1104
- Futuna, Ethnology of, E. Burrows, 647
- γ -Radiations, Measurement of, Dr. G. W. C. Kaye, 606
- γ -Radioactivity, Continuous, and Unitary Field Theory,
E. C. G. Stueckelberg, 259
- γ -Ray Intensities from Radium Preparations, Comparison
of, J. A. C. Teegan, 338
- Galaxies, The Background of the, Prof. E. A. Milne, 38
- Gallic Acid, Raman Spectrum of, of some of its Deriva-
tives and of Tannin, B. Susz and S. Fried, 259
- Gambart, Jean-Félix-Adolphe, Death of [1836], 137
- Gardener, The Junior, Harriet Price. Edited by Walter
P. Wright (*Review*), 784
- Gas : Reactions : Kinetics of, an Attempt to connect
Thermal Decomposition and Oxidation Processes,
Prof. M. W. Travers, 26 ; Attacks : Is there any
Protection ?, 360
- Gaseous : Isotopes, Separation of, by Diffusion, D. E.
Wooldridge and W. R. Smythe, 555 ; Combustion,
Prof. W. T. David, 930 ; Organic Compounds,
Mechanism of Thermal Change in, Prof. M. W.
Travers, 967
- Gases, Explosive, Ignition of, G. Mole, 1063
- Geckos of Japan, Y. Okada, 765
- Gefässerweiternde Stoffe der Gewebe, Prof. J. H. Gaddum.
Eingeleitet von H. H. Dale (*Review*), 267
- Geiger-Müller Counters, Steady Performance of, Prof.
B. Dasannacharya and G. S. Rao, 289
- Genetic Ideas, Racial Theory and, Prof. H. J. Fleure,
1042
- Genetics : and Ecology in Relation to Selection, Dr. J. S.
Huxley and others, 748 ; and Race, 988 ; in the
Universities, Dr. E. Ashby, Prof. F. A. E. Crew,
Dr. C. D. Darlington, E. B. Ford, Prof. J. B. S.
Haldane, Prof. E. J. Salisbury, Dr. W. B. Turrill
and C. H. Waddington, 972 ; Prof. W. Neilson Jones,
1058
- Geodesy and Geophysics : International Union of,
General Assembly at Edinburgh ; Dr. D. la Cour
elected next president, 650
- Geographical Magazine, December, 1007
- Geographical Review, Index to the, 796
- Geography : and Distribution (*Review*), 782 ; Plant and
Animal, late Dr. Marion I. Newbigin (*Review*), 782 ;
an Introduction to Human Ecology, Prof. C. Langdon
White and Dr. G. T. Renner (*Review*), 1075 ; Elements
of, Prof. V. C. Finch and Prof. G. T. Trewartha
(*Review*), 1075 ; New, Foundations of the (*Review*),
1075
- Geological : Survey of Great Britain, Summary of Progress
of the, 1933, 373 ; Survey and Museum : New
Activities, 433
- Geologiska Föreningen, Stockholm, Prof. P. Ramdohr
elected a member of the, 1093
- Geology : and the Community, Dr. Dighton Thomas, 89 ;
in Great Britain, 373 ; British Regional, 389
- Geometry, Intrinsic, of Ideal Space, Prof. A. R. Forsyth.
2 Vols. (*Review*), 343
- Geomorphology of the Irish Sea Basin, Prof. J. Kaye
Charlesworth, 1040
- Geophysics of the Indo-Pacific Region, Lt.-Col. R. B. S.
Sewell (*Review*), 419
- Geophysik, Handbuch der, Herausgegeben von Prof. B.
Gutenberg. Band 1, Lief 3 : Breitenschwankungen,
von Prof. W. D. Lambert ; Theorie des irdischen
Schwerefeldes, von Prof. E. A. Ansel. Lief 4 (Schluss
des Bandes) : Beobachtung der Schwerkraft ; Die
Lotabweichungen ; Das Problem der Isostasie. Von
Prof. W. Heiskanen (*Review*), 784
- German : Philosophy, Contemporary, An Introduction to,
Dr. W. Brock (*Review*), 269 ; Road Progress, Dr.
O. R. Eismann, 280 ; Bunsen Society, Prof. M.
Bodenstein awarded the Bunsen medal ; Prof. M.
Le Blanc elected an honorary member, 282 ; Research
Institute of Psychiatry, Prof. W. Scholz appointed
director of the department of Cerebral Pathology of
the, 361 ; Statistical Society, Prof. S. Schott, Dr.
F. Prinzing, Dr. Kovacs and Dr. Savorgman nomi-
nated honorary members, 361 ; Academy of Natural-
ists, Halle, Dr. H. R. Mill elected a member of the,
460 ; Chemists at Munich, 475 ; Chemical Engineer-
ing, 500 ; Naturalists, Association of [1836], 518 ;
Chemists, Association of, Prof. H. von Euler-Chelpin
elected an honorary member of the ; award of the
Justus Liebig medal to Prof. G. Hittig and the Carl
Duisberg memorial prize to Dr. R. Tschesche, 543 ;
Society of the History of Medicine, Natural Science
and Technique, award of the Sudhoff medal to Prof.
R. Zaunick, 718
- Giraffes at the Zoological Gardens, London [1836], 216
- Girard, Pierre-Simon, 1765-1836 [1836], 942
- Glasgow University : grant from the Bellahouston Bequest
Fund ; Prof. G. Cook appointed regius professor of civil
engineering ; Prof. J. S. Dunn elected professor of
pathology and Dr. H. B. Cott appointed lecturer in
zoology ; Dr. J. Dougall to deliver the Gibson lecture
for 1936-37, 46 ; Dr. J. W. McNee appointed regius
professor of the practice of medicine ; gifts from
Prof. J. Graham Kerr and Prof. F. O. Bower ; L. H.
Littlejohn awarded a Colonial agricultural research
scholarship, 731 ; Dr. W. M. Smart elected regius
professor of astronomy ; O. S. Franks elected pro-
fessor of moral philosophy ; Dr. J. Dougall appointed
Gibson lecturer in the history of mathematics ; gifts
by Sir Frederick Crombie Gardiner and the trustees
of the late W. G. Gardiner, 895
- Glasshouse Industry, Science and the, Dr. W. F. Bewley,
556
- Glass Melts, Relative Abundance of Potassium and
Lithium Isotopes and the Emission of Alkali Ions
from, H. Bondy and V. Vanicek, 49 ; Phosphorescent,
M. Curie, 1026
- Globular Clusters, Colours of, Stebbins and Whitford, 890
- Glueonic Acid, Antiscorbatic Activity of a Derivative of,
Prof. B. A. Lawrow, Prof. W. M. Rodionow, E. M.
Bomdas and N. S. Jarussowa, 40
- Glutathione, Reduced, The Nitroprusside Reaction as a
Test for, N. S. R. Maloeuf, 75
- Glycols, Monochlorhydrins of, Mechanism of the For-
mation of the, H. Moureu and M. Dodé, 897
- Godthaab Expedition, Crustacea from the, Dr. J. Stephen-
sen, 848
- Goethe medal, award of the, by the Chancellor of the
Reich to Prof. F. Hueppe, 797
- Gold : in Sea-Water, Presence of, G. Claude, 138 ; -Copper
Alloys, Anodic Behaviour of, in 5N Hydrochloric
Acid and N Sulphuric Acid, W. J. Müller, H. Freissler
and E. Plettinger, 218
- Gold Coast Survey, Report of the, for 1935-36, 1092
- Gondwana Affinities of the Angara Flora in the light of
Geological Evidence, The, Prof. B. Sahni, 720
- Gorilla, Coast, Distribution of, H. J. Coolidge, jun., 1019
- Government Laboratory, Work of the, 730
- Graham's Work on the Constitution of Salts [1836], 983
- Gramophone Record, The, H. C. Bryson (*Review*), 637
- Grampian Highlands, The, H. H. Read, 391
- Graphical Solutions, Prof. C. O. Mackey (*Review*), 864

- Grassland of Great Britain, Prof. R. G. Stapledon, 875, 927
 Gravitational Field of a Distribution of Particles Rotating about an Axis of Symmetry, W. J. van Stockum, 896
 Gravity Measurements in Sweden, Dr. G. Ising and Dr. T. Eeg-Olofsson, 889; Dr. G. S. Ljungdahl, 890
 Gray on Museums of Natural History [1836], 773
 Graz University, Prof. Max Planck nominated an honorary doctor by, 361
 Great Britain, Local Botany in [1836], 854
 Greek Academy of Sciences, Arts and Letters, Dr. M. C. Balfour awarded the silver medal of the, 24
 Greenkeeping Research, 398
 Greenland: A Norse Settlement of the Viking Age in (*Review*), 948; Viking Settlers in, and their Descendants during Five Hundred Years, Dr. P. Norlund (*Review*), 948
 Gresham Lecturers, The [1836], 984
 Grosse Moos im westschweizerischen Seelande und die Geschichte seiner Entstehung, Das, W. Lüdi (*Review*), 187
 Growth: Substance *B*, Chemistry of, N. Nielsen and V. Hartelius, 203; Hormones and Development of Plants, Prof. N. G. Chlodny, 586
 Guatemala, Maya Culture in the Highlands of, 892
 Gulf Stream, An Ecological Aspect of the, Dr. A. C. Redfield, 1013
 Günther's Catalogue of Fishes in the British Museum, Re-issue of, 1092
 Gurney, Sir Goldsworthy, and his Steam Carriages [1836], 137
 Gypsies, Serbian, Marriage among, Dr. A. Petrovič, 847
 Gyroplanes, Possibilities of Speed and Radius of Action of, L. Breguet, 48

 Hadrian's Wall, Excavation of, 108
 Hæmoglobin, Ultra-Violet Absorption Spectrum of, G. A. Adams, 368
 Half-Castes and World Peace, C. Dover, 432
 Hamburg University, gold medal of the, award of the, to Prof. Nocht, 927
 Hammond Organ, The, Sir James Barrett, 297
 Hancock's, Walter, Steam Carriages [1836], 519
 Happiness for Humanity: The Way to, a Modern Philosophy for Everyone, "Amator" (*Review*), 636
 Hardness Tester for Microscopical Objects, A, Dr. E. M. H. Lips and J. Sack, 328
 Harpacticids, Northern, K. Lang, 647
 Harvard: University: Tercentenary Celebrations, The, 667, 679; Gift to, by Sir Robert Hadfield, Bt., 1005; award of the Squibb fellowship to W. P. Campbell, 1093
 Harvey, The Background to (Harveian oration), Sir Walter Langdon-Brown, 833
 Hatton Garden, Historical Memorial in, 194
 Hawke's Bay Earthquake of February 2-3, 1931, Focal Depth of the, R. C. Hayes, 126
 Health: Services, London, 110; National, Physique, Nutrition and, 857; Dr. James Johnson on [1836], 1068
 Heat: and Work, Relation between, J. N. Brønsted, 774; Engine Idea in the Seventeenth Century, Rhys Jenkins, 794; for Advanced Students, late E. Edser. Revised edition by N. M. Bligh (*Review*), 952
 Heating: and Lighting Appliances, Ancient, 71; in a Vacuum or in Air, Transformations produced in certain Metals by, J. J. Trillat and S. Oketani, 1069
 Heavens, The, and Faith, Rev. M. Davidson (*Review*), 227
 Heavy Nuclear Particles, Interaction of, D. Iwanenko and A. Sokolow, 246
 Heidelberg and the Universities of America, 853
Helgicirra, *Eirene* and, The Meduse, Dr. P. L. Kramp, 333
Helisoma corpulentum and its Relatives in Canada, F. C. Baker, 889
 Helium: Argon, Neon, J. T. Randall, 191; Radio-, Dr. T. Bjerger, 400; β -Ray Spectrum of, Dr. T. Bjerger and Dr. K. J. Broström, 400; II, Liquid, Optical Experiments on, L. W. Shubnikov and A. K. Kikoin, 641; Hydrogen and Deuterium, Thermal Properties of, A. Bijl, 723; Liquid, Latent Heat of, Evaporation of, Dr. J. Newton Friend, 1102; produced in Artificial Transmutation, Prof. F. A. Paneth, E. Glückauf and H. Loleit, 1105
 Henry, Dr. William, Death of [1836], 376
 l'Hérédité, Les conceptions modernes de, Prof. M. Caullery (*Review*), 633
 Heredity and the Ascent of Man, Dr. C. C. Hurst (*Review*), 743
 Herkunftsbestimmung bei Honig, Beiträge zur. Band 1, Prof. E. Zander (*Review*), 147
Herpetologia, No. 1, 582
 Herschel: Sir John, and Mr. Somerville [1836], 90; Effect, Dependence of the, upon the Surrounding Gas Medium, Mrs. A. Vnukova, 246; Caroline, and Sir John Herschel [1836], 694
 Hexlet, The, Prof. F. Soddy, 958
 High: -Frequency Systems, Phenomena in, A. Hund (*Review*), 9; -Voltage Impulses at Controllable Speed, Transmission of, Dr. L. B. Snoddy, Prof. J. W. Beams, W. T. Ham, jun. and H. Trotter, jun., 167; Voltages, Production and Technical Application of, 605
 Highway Engineering, The Science of, Prof. R. G. H. Clements (*Review*), 951
 Himalayan Uplift since the Advent of Man, Prof. B. Sahni, 847
 Histone Insulinate, Hypoglycæmic Action of, A. Biasotti, V. Deulofeu and J. R. Mendive, 1101
 History, General, The Place of Science in, 575
 Homœopathy, Doctrine of [1836], 773
 Honey, Heather, Physical Properties of, J. Pryce-Jones; Dr. G. W. Scott, Blair and D. Morland, 770
 Horizon, The Receding (*Review*), 859
 Hormones: and Evolution, Dr. S. Zuckerman, 408; and Horticulture, Dr. M. A. H. Tincker, 766
 Horse Hæmoglobin, Total Dissociation of, Dr. J. Steinhart, 800
 Horticultural: Colour Chart, A, 322; Research: Recent Advances in, East Malling Research Station; Long Ashton Research Station; Cheshunt Research Station, 850
 Horticulture, Electricity in, 70
 Hospitals and Sanatoria, Costing Returns of, 398
 Hudson Strait Survey, 806
 Hufeland, Christoph Wilhelm, 1762-1836 [1836], 338
 Human: Progress, Concerning, Dr. H. S. Harrison, 20; Life, The Planning of, 139; Progress, Concerning, Dr. H. S. Harrison, 188; Heredity, Bureau of, 460; Tendencies, 521; History and Geographical Discovery, J. W. Mackail, 613; Behaviour, The Psychology of, Prof. J. H. Griffiths (*Review*), 823
 Humboldt's Plan in 1836 for a World Magnetic Survey, 894
 Humus: Origin, Chemical Composition, and Importance in Nature, Prof. S. W. Waksman (*Review*), 624; Soil, Nature and Functions of (*Review*), 624
 Hydrazine and its Hydrate, Raman Spectrum of, L. Kahovec and K. W. F. Kohlrausch, 562
 Hydrocarbons: Cyclic, Relations between the Baeyer Tension τ and the Characteristic Raman Frequency in the case of the, M. Aubert, 812; Explosive Combustion of, Influences of Dilution on the, Prof. W. A. Bone and L. E. Outridge, 942
 Hydrocephalus (*hy*), in the House Mouse, *Mus musculus*, Linkage Relations of, F. H. Clark, 775
 Hydro-Electric Development, Britain's Largest, 19
 Hydrogen: Halide Gases, Optical Polarization Ellipsoids of the, Dr. C. H. Douglas Clark, 126; Solid, and Deuterium at 4-2° K., Density and Compressibility of, Miss H. D. Megaw and Prof. F. Simon, 244; Halide Gases, Kerr Constants of the, Dr. C. H. Douglas Clark and Dr. E. C. Humphries, 248; Isotopes, Temperature Coefficient of the Electrolytic Separation of the, H. F. Walton and J. H. Wolfenden, 468; Helium and Deuterium, Thermal Properties of, A. Bijl, 723; Peroxide, Use of Concentrated, for the Determination of the Mineral Content of Plant and Animal Materials, W. Vorbrodt, 733; Bond, The, and the Structure of Proteins, Drs. D. M. Wrinch and

- D. Jordan Lloyd, 758; Inhibition by, of the Chain Reaction of Mixtures of Normal Pentane and Oxygen, M. Prettre, 774; Metallic, and Deuterium, Expansion Pressures of, A. R. Ubbelohde, 845
- Hydrogenation of Coal: a French Process, F. Vollette, 473
- Hydroids from the West Indies, Dr. E. Leloup, 409
- Hydrostatics: a Text-book for the use of First Year Students at the University and for the Higher Divisions in Schools, A. S. Ramsey (*Review*), 386
- Hygiene, Proposed Foundation in Japan of a Museum of, 72
- Hymenoptera: Tetraploid?, Are, B. R. Speicher, 78; Tetraploidy and, F. Greenshields, 330
- Ice: Heat Capacity of, W. F. Giauque and J. W. Stout, 334; Ages, Causes of, G. H. Halligan, 813
- Illuminating Engineering Society, award of the Gaster memorial premium to R. G. Hopkinson and of the Silver Jubilee Commemoration award to W. R. Stevens, 615
- Illumination: Recommended Values of, 238; Progress in, 715; Research at the Science Museum, 1107
- Imperial: Leopold Caroline German Academy of Science, election as members of Prof. P. Buchner, Prof. H. Loescheke, Prof. C. G. A. Forsell, Prof. S. E. P. Haglund, Prof. K. Faber, Prof. A. H. M. J. Van Rooy, Dr. E. Leclainche and Prof. K. Wegelin, 160; Institute, Advisory Council of the, on Mineral Resources, gift to, by Sir Robert Hadfield, Bt., 718; Leopold Caroline German Academy of Natural Philosophers, Halle, Prof. W. Heubner elected an honorary member of the, 797; Agricultural Bureaux, Seventh Annual Report, 1048; Cancer Research Fund, Thirty-fourth Annual Report 1935-36, 1085
- Indeterminism: and Free Will, Prof. E. Schrödinger, 13; and Psychology (*Review*), 99
- Index Generalis. Année 16, 1936 (*Review*), 100
- India: Meteorology in, 70; Meteorology for Airmen in, 108; Survey of, General Report for 1935, 237; Cotton Research in, 359; Social Origins in, K. P. Chattapadhyay, 408; and Mineral Development, Sir Edwin Pascoe (*Review*), 621; Zoological Survey of, Report for 1932-35, 836; National Institute of Sciences of, Prof. F. G. Donnan and Sir Albert Seward elected honorary fellows of the, 879
- Indian: Institute of Science, Bangalore, 42; Crop Plants, Physiology of, 70; Vital Statistics for 1933, 159; Conjecture, Lt.-Col. R. H. Elliot, 425; *Science Abstracts*, No. 1, 543, 916; *Wild Life*, 614; Association for the Cultivation of Science, Report for 1935, 717; South, Blood Groups, A. Aiyappan, 888; Temple Architecture, Outline of, Dr. F. H. Gravely, 935; Institute of Science, The, 945; Institute of Science, Report of Quinquennial Reviewing Committee, 981
- India's Mineral Wealth: a Guide to the Occurrences and Economics of the Useful Minerals of the Indian Empire, Dr. J. Coggin Brown (*Review*), 621
- Indischen und Stillen Ozeans, Geographie des, Prof. G. Schott. Mit einem beitrage von Prof. E. Hentschel und Dr. W. Schott (*Review*), 419
- Indium, F. M. Brewer and E. Baker, 890
- Indo-China, Archaeology in, Dr. H. G. Q. Wales, 795
- Inductive Capacity Apparatus, Specific [1836], 1068
- Industrial Development in South Africa and Facilities for the Establishment of Factories. Edited by Dr. V. Bosman, 256
- Industry: Sickness Absence Wastage in, May Smith and Margaret Leiper, 408; Labour Wastage in, Prof. M. Greenwood and May Smith, 408; and the Profession of Chemistry, Relations between, M. P. Appleby, 557; Leadership in, 563; Administration and Technology in, 653
- Infection and Disinfection, Modern views on, Sir Weldon Dalrymple Champneys (Chadwick lecture), 1046
- Infra-red Absorption Spectra and the Modes of Vibration of Organic Compounds, J. Lecomte, 138
- Inheritance in Man, Two-factor, Dr. Madge T. Macklin, 847
- Inoculation against Colds, Post Office Tests of, 916
- Insect: Metabolism, Humidity and, K. Mellanby, 124; Life of Temporary Rain Swamps in British Guiana, F. A. Squire, 151; Pests and Crops in England and Wales, J. C. F. Fryer and others, 212; Coloration, Prof. H. E. Armstrong, 242; Prof. G. D. Hale Carpenter, 243; Pests of Glasshouse Crops, Dr. H. W. Miles and Mary Miles. Edited by H. C. Long (*Review*), 348; Coloration and Natural Selection, Prof. E. W. MacBride, 365; Prof. G. D. Hale Carpenter, 686
- Insecticide by Shot-Gun, Distribution of, 23
- Institute of Metals, Paris meeting of the, 691
- Insulating Material, A New, 593
- Insulation Testing, 50 Cycle Wave-forms in, N. H. Roberts, 813
- Insulators, Overhead Line, C. H. W. Clark, 1048
- Insulin: its Production, Purification and Physiological Action, D. W. Hill and Dr. F. O. Howitt (*Review*), 56
- Integral Calculus, Fox Talbot on the [1836], 854
- Intensities, Sensory Discrimination of, W. J. Crozier, 415
- Intensity Discrimination, Auditory, M. Upton and W. J. Crozier, 415
- Intermedin, Action of, on Crustacean Melanophores and of the Crustacean Hormone on Elasmobranch Melanophores, A. A. Abramowitz, 775
- International: Congress of the History of Science, Forthcoming, 323; Economics and Social Reconstruction, 341; Botanical Congress, Sixth, 396; Peace Congress, Science at the, C. Dover, 516; Union of Geodesy and Geophysics: General Assembly at Edinburgh; Dr. D. la Cour elected next president, 650; Relations promoted by Broadcasting, 678; Quaternary Association, Conference in Vienna, 692; Cancer Congress, Second, 727; Commission on Large Dams: Congress at Washington, Dr. F. M. Lea, 768; Congress of Experimental Cytology: Meeting at Copenhagen, 769; Astronomical Union, Transactions of the. Vol. 5: Fifth General Assembly held at Paris, July 10 to July 17, 1935. Edited by Prof. F. J. M. Stratton (*Review*), 902; Studies Conference, Permanent, 915; Statistical Institute, Prof. F. Zahn nominated president of the, 1008
- Invention, Science of, C. W. Marshall, 539
- Inverse Diene Synthesis, Kinetics of an, in the Pure Liquid State, B. S. Khambata and A. Wassermann, 368; A. Wassermann, 369
- Invertase and Dyestuffs, J. H. Quastel and E. D. Yates, 690
- Iodine, First Spark Spectrum of, Anomalies in the Fine Structure of the, Dr. K. Murakawa, 324
- Ion Formation, Negative, A New Process of, Dr. F. L. Arnot, 162
- Ionization Current, Measurement of, Dr. F. E. Lea, 1024
- Ionosphere: at Allahabad, Collisional Friction Frequency in the, G. R. Toshniwal, B. D. Pant and R. R. Bajpai, 37; Russian Eclipse Measurements on the, Prof. W. Kessenich, 195; The Lower Regions of the, Prof. R. C. Colwell, A. W. Friend, N. I. Hall and L. R. Hill, 245; Some Observations on the C Regions of the, Dr. H. Rakshit and J. N. Bhar; Prof. S. K. Mitra, 283
- Ions, High Velocity Positive, Dr. J. D. Cockcroft (Mackenzie Davidson memorial lecture), 1025
- Ipswich Museum, Special Exhibit at, 357
- Iraq, Archaeological Finds in, Dr. H. Frankfort, 279
- Ireland, Flora of [1836], 376
- Irish: Free State, Electricity Supply Board of the, Annual Report, 397; Sea Basin, Geomorphology of the, Prof. J. Kaye Charlesworth, 1040
- Iron: A Radioactive Isotope of, Prof. E. B. Andersen, 76; Wire and Nerves, 83; Properties of (*Review*), 96; The Metal—, H. E. Cleaves and J. G. Thompson (*Review*), 96; and Molybdenum, Distortion of, Dr. E. W. Fell, 760
- Islands, Odyssey of the, C. N. Taylor (*Review*), 348
- Isomeric bis-Thiocamphors, Synthesis of Two, Sir P. C. Rây, 548
- Isopod Crustacea, American Land and Fresh-Water, W. G. Van Name, 554

- Isotopes : and Molecular Asymmetry, Dr. T. Iredale, 292 ;
Exchange Reactions with, E. Ogawa, 294
Isotopic Weights by the Doublet Method, Dr. F. W. Aston, 1094
Isturitz, The Cave of, A Magdalenian Site of Southern France, 1023
Italy, Land-Reclamation in, C. Longobardi, translated by Olivia Rossetti Agresti, Sir John Russell (*Review*), 4

Jabo Proverbs from Liberia : Maxims in the Life of a Native Tribe, G. Herzog, with the assistance of C. G. Blooah, 905
Japan : National Research Council of, Report, April 1934—March 1935, 502 ; Geckos of, Y. Okada, 765 ; Decline in Birth-rate, 838
Japanese Brachyura, T. Sakai ; K. Koba, 1062
Journet : Grand-père de la Préhistoire, Dr. A. Cheynier (*Review*), 823
Junna Valley, Antiquities of the, Prof. B. Sahni, 82
de Jussieu, Antoine-Laurent, Death of [1836], 476
Jute Industry, Research and the, Dr. G. S. Barker, 322 ; 581

K α _{1,2}-Doublet of some of the Lighter Elements, Effects of Chemical Combination with Oxygen and Fluorine on the, Dr. N. G. Johnson, 1056
Kaiser Wilhelm Institute of Biochemistry, Berlin-Dahlem, Prof. A. Butenandt appointed director of the, 838
Kaiserlich Deutsche Akademie der Naturforscher, Halle, Prof. S. Chapman elected a member of the, 756
Karri Timber, Testing Green, I. Langlands, 170
Kätkäris : The, A Sociological Study of an Aboriginal Tribe of the Bombay Presidency, A. N. Weling (*Review*), 100
Kauri, Properties and Uses of, A. R. Entrican, 158
Keilin's Cytochrome c and the Respiratory Mechanism of Warburg and Christian, H. Theorell, 687
Kelvin, Bust of, for the Smithsonian Institution, 579
Kenya, Annual Forest Report for 1934, 253
Kepler, Collected Works of (*Review*), 422
Kepleriana, Bibliographia, unter mitarbeit von Dr. L. Rothenfelder. Herausgegeben von Prof. M. Caspar (*Review*), 422
Keramophaera Brady, Genus, E. Heron-Allen, 689
Keratins, Cross-Linkage Formation in, Dr. H. Phillips, 121 ; Dr. J. B. Speakman, 327
Kerr Constants of the Hydrogen Halide Gases, Dr. C. H. Douglas Clark and Dr. E. C. Humphries, 248
Ketones, Aldehydes and, Photodecomposition of, Dr. R. G. W. Norrish and C. H. Bamford, 1016
Kew, Royal Botanic Gardens, New Exhibits, 1090
Kidney Phosphatase, Inhibitory Effect of Phloridzin and Phloretin on, Dr. H. Kalekar, 289
Kikuchi Lines : from Etched Copper Crystal, Dr. W. Cochrane, 202 ; Theory of, Studied by means of Models, A. Lichtenfeld and K. Schwarz, 218
Kincardine-on-Forth Bridge, Opening of the, 794
Kinematography, Exhibition of, 963
King's College, London, Medical Museum at [1836], 559
Kingship and Kinship, 1029
Knowledge : Use of, Sir James Irvine, 67 ; Unified, The Service of, 899
Kristallometrie, Kursus der, late Prof. V. Goldschmidt. Herausgegeben von Dr. H. Himmel und Dr. K. Müller (*Review*), 269

Lactic Dehydrogenase from Heart Muscle, Action of Co-enzyme as the Specific Co-enzyme of, E. Adler, Prof. H. v. Euler and H. Hellström, 968
Lady Julia Percy Island, The McCoy Society's Expedition to, Prof. F. Wood Jones, 906
Lakes, Thermal Stratification in, P. Ullyott and P. Holmes, 971
Lamps, New Discharge Bulb, 836
Land-Reclamation in Italy, C. Longobardi, translated by Olivia Rossetti Agresti, Sir John Russell (*Review*), 4
Language, Truth and Logic, A. J. Ayer (*Review*), 823
Lapachol and Related Compounds, late Dr. S. C. Hooker, 1047
Lassell, William, on Casting Specula [1836], 1110
Latent Image, Evolution of the, Influence of the Wave-length of the Light on the, Mlle. Arlette Tournaire and E. Vassy, 179
Lauric Acid, Contact Potentials of Reversible Soluble Films of, R. T. Florence, R. J. Myers and Prof. W. D. Harkins, 405
Law, The, and the Prophets, H. Peake and Prof. H. J. Fleure (*Review*), 632
Lax, F.R.S., William, Death of [1836], 732
Layman's Library, The (*Review*), 862
League of Nations : Reform, 321 ; Rearmament and the, 1071
Leeds University : Dr. A. Durward elected professor of anatomy ; donation from F. Parkinson, 46 ; gift by the Lord Mayor of Leeds ; J. C. Gregory appointed honorary lecturer in the history of science, Dr. F. C. Happold lecturer in biochemistry, H. R. Noltie lecturer in physiology, W. Hobson part-time lecturer in physiology and hygiene and G. D. A. MacDougall assistant lecturer in economics, 215 ; Gift by F. Parkinson, 1067 ; Report of the Dept. of Pathology and Bacteriology, 1092
Leicester, Roman, a National Asset, 356 ; 432
Lepidoptera, Obtaining Aberrant forms of, under the influence of Chemical Reagents, J. Zacwilichowski, 897
L'Espèce, Prof. L. Cuénot (*Review*), 742
Leyden University, gift to, by the Rockefeller Foundation, 941
Liberal Arts College in State-supported Universities, Prof. H. G. Merriam, 983
Libraries : for Scientific Research in Europe and America, H. P. Pratt (*Review*), 59 ; Teaching the Use of, Dr. P. Hurt, 597
Lice, Sucking, Dr. G. F. Ferris, 82
Life, The Architecture of, A. D. Ritchie and others, 607
Light : and Sound, H. G. Lambert and P. E. Andrews (*Review*), 183 ; Scattering of, by Light, A. Akhieser, L. Landau and I. Pomeranchuk, 206 ; Diffraction of, by Ultra-sonic Waves, F. H. Sanders, 285 ; Polarization of, and some Technical Applications, Prof. A. F. C. Pollard, 311 ; Constancy of Wave-length of, G. C. Omer, jun., 587 ; Diffraction of, by Ultra-Sonic Waves, Sir C. V. Raman and N. S. Nagendra Nath, 616 ; A. E. E. McKenzie (*Review*), 636 ; Velocity of, M. E. J. Gheury de Bray, 681 ; Diffraction of, by Ultra-sonic Waves, C. R. Extermann, 843 ; Neutrino Theory of, Inconsistency of the, V. Fock, 1011 ; Melloni's Investigations on [1836], 1068
Lighting : Public, A. Cunningham, 715 ; Domestic, W. J. Jones, 795
Lightning and Atmospherics, P. F. Fyson, 278 ; P. R. Coursey, 509
Lincoln, Potters of, 357
Linear Differential Equations, Introduction to the Theory of, E. G. C. Poole (*Review*), 629
Linkage in Man, Dr. Julia Bell and Prof. J. B. S. Haldane, 759
Linnean Society, M. A. C. Hinton elected zoological secretary, 838
Liquid at Different Temperatures, Specific Heat of a, Prof. Allan Ferguson and A. H. Cockett, 842
Liquids of High Refractive Index, B. W. Andersson and C. J. Payne, 168
Lister Institute : of Preventive Medicine, Forty-second Annual Report, 197 ; New Ultracentrifuge Installation at the, 654
Lithium : Alum, Preparation of, Prof. J. F. Spencer and G. T. Oddie (Sister Mary Cecilia), 169 ; Boron and, Ranges of Particles emitted in the Disintegration of, by Slow Neutrons, J. Rotblat, 202

- Liverpool: Dr. A. G. Walker appointed lecturer in pure mathematics, Dr. H. R. Hulme lecturer in applied mathematics, and Dr. C. J. Williams Leverhulme Foundation lecturer in physics, 46; and Manchester Railway, Progress on the [1836], 177; Learned Societies, 322; Biological Society, Fiftieth anniversary, 716
- Locomotives, Steam, Recent Developments in, Sir H. Nigel Gresley, 793
- Logic in Theory and Practice, Prof. C. G. Shaw (*Review*), 187
- Logone, Zone of Capture of the, by the Bénoué, Present Condition of the, J. Tilho, 258
- London: University: conferment of title of reader in neurological anatomy conferred on Miss U. L. Fielding; award of postgraduate studentships, 46; Centenary Celebrations, 84; conferment of doctorates, 176; A. Haddow re-appointed Laura de Saliceto student; W. J. E. Butler awarded the Sir George Jessel studentship in mathematics, 177; School of Economics, Dept. of Business Administration, 375; and Thames Valley, R. L. Sherlock, 389; Hospital, Research at the, 399; Meteorological Society [1836], 599; University Degrees: a Faraday Letter, 710; University: Dr. W. G. Penney appointed reader in mathematics in the Imperial College—Royal College of Science, and Dr. C. Reid reader in physiology at the London Hospital Medical College; title of professor conferred on G. I. Finch and that of emeritus professor on Prof. A. L. Bowley; Dr. S. J. Davies appointed professor of mechanical engineering at King's College, 772; conferment of doctorates on R. P. Tripathi, E. E. Jelley and R. W. Bailey, 810; School of Hygiene and Tropical Medicine, Work of the, Sir Austen Chamberlain, 877; University: conferment of doctorates on E. E. Jelley and R. W. Bailey, 895; conferment of title of professor on F. L. Golla and Dr. E. Mapother and that of reader on Dr. L. S. Bosanquet; conferment of doctorates on H. Chaudhuri, R. G. Hatton and F. C. Chalklin, 940; Prof. F. A. Cavenagh appointed professor of education at King's College, 941; Telephone Trunk Exchange, H. M. Wells, 1006; and Greenwich Railway, Opening of the [1836], 1026; University, Dr. E. Giffen appointed reader in mechanical engineering at King's College; title of reader conferred on Dr. R. E. Gibbs, Dr. S. V. Keeling and Dr. D. M. Newitt and that of emeritus professor on Sir Grafton Elliot Smith, Prof. M. T. M. Ormsby, Prof. A. E. Jolliffe, Prof. W. A. Bone, Prof. A. Fowler, Prof. E. W. MacBride, Prof. S. J. Truscott and Prof. W. W. Watts, 1110
- Loudon, J. C., and the Waterloo Beeches, Sir William Fraser, 277
- Loudon's 'Arboretum', Centenary of, W. Roberts, 237
- Loudspeakers, Appraisal of, F. H. Brittain, 1021
- Louisiana, U.S.A., Mound Builders in, W. M. Walker, 805
- Low: Temperature Research, Theoretical Aspects of, Prof. F. A. Lindemann, 190; Temperatures and their Industrial Uses, 190
- Luminescence: of some Minerals, S. Kreutz, 733; of Solid Substances produced by Direct Excitation in a Geissler Tube, M. Servigne, 733
- Luminous: Discharges observed in the Magnetic Field at Pressures below 10^{-4} mm. of Mercury, T. V. Ionescu, 90; Bacteria, Quantum Relationship of the Light-emitting Process of, K. L. van Schouwenburg and Johanna G. Eymers, 245; Phenomena on the Sea during a Thunderstorm, 278
- 'Lumophor' Glass for Tubes containing Luminous Gases, Glaswerk Gust. Fischer, 978
- Lunettes et télescopes: théorie, conditions d'emploi, description, réglage, A. Danjon et A. Couder (*Review*), 738
- Lyell: and Mantell [1836], 47; and Darwin [1836], 1110
- Lyre-Bird in Victoria, F. Lewis; R. T. Littlejohns, 926
- Macadam: J. L., Father of Modern Road-Making, Dr. R. Quarendon, 869, 874
- McCoy Society's Expedition to Lady Julia Percy Island, The, Prof. F. Wood Jones, 906
- Madder, Glycosides of, R. Hill and D. Richter, 38
- Magdalenian 'Raclette' Industry, An Early, in the Lower Thames Valley, J. P. T. Burchell, 79
- Magdalénien de la Grande Salle, Le, Dr. René de Saint-Périer, 1023
- Magnet, Earliest Printed Book on the, 795
- Magnetic: Observations in New Zealand and elsewhere, 500; Field, Oscillatory Discharges in a, 1067
- Magnetron, Parallel-plane Diode, D. M. Tombs, 36
- Maiden Castle, Dorchester: Excavations at, 395; Foundation Rites at, 580
- Maize: Ultra-Violet Radiation in, Genetic Effects of, L. J. Stadler and G. F. Sprague, 1, 2 and 3, 1070
- Maize Survey, The, R. A. Emerson and J. K. Kempton, 1090
- Malaria: and Nutrition, 380; Acaquinine as a Preventive of, 1050
- Malariology, Institute of, Rome, Mission to Abyssinia to Study Malaria, 1093
- Malayan Zoogeography (*Review*), 622
- Mall: Franklin Paine, the Story of a Mind, Florence Rena Sabin (*Review*), 663
- Malta, Prehistoric Relics in, 765
- Mammalian: Development, Organizers in, C. H. Waddington, 125; Fauna of the White River Oligocene. Part 1: Insectivora and Carnivora, 427
- Man: The Freedom of, Prof. A. H. Compton (Terry lectures), (*Review*), 6; and Forest in Prehistoric Europe, Prof. V. G. Childe (*Review*), 95; The Progress of, 188; Makes Himself, Prof. V. Gordon Childe (*Review*), 699; The Rise of (*Review*), 699
- Manatee of St. Helena, The, G. C. Kitching, 33
- Manchester University: J. Jewkes elected professor of social economics, 68; resignations of Dr. T. A. Bennet-Clark, F. Morton and L. W. Derry; A. C. Lovell appointed assistant lecturer in physics, Dr. R. F. Hunter assistant lecturer in chemistry, and Dr. V. J. Chapman assistant lecturer in botany; gift of a research grant from the International Tin Research and Development Council, 772
- Manchukuo, Palaeolithic Site in, S. Tokunaga and N. Naora, 1019
- Manganese: Trichloride, A. Chrétien and G. Varga, 334; Steel, Medallions of, 755
- Manganous Sulphate, Hydrates of, E. Rencker and P. Dubois, 414
- Mankind, Origins of Modern Races of, Sir Arthur Keith, 194
- Manufacturing Business, Some Problems of a small, C. A. Lee, 653
- Marconi-E.M.I. Television System, 514
- Marine: Steam Boilers, Present Position of, Eng. Rear-Adml. W. M. Whayman, 213; Biological Association of the United Kingdom, retirement of Dr. E. J. Allen; Dr. S. Kemp appointed secretary and director of the laboratory, 235; Boring Animals injurious to Submerged Structures, Dr. W. T. Calman. Second edition, revised by G. I. Crawford, 1050
- Marquesan Insects, Environment of, A. M. Adamson, 766
- Marriage: in Western Civilization, The Future of, Dr. E. Westermarck (*Review*), 186; Society and the Institution of (*Review*), 186; Hygiene, May, 398
- Martindale and Westcott, The Extra Pharmacopoeia of, Twentieth edition. Vol. 2 (*Review*), 59
- Mass Spectrographs, Second Order Focusing for, W. W. Sawyer, 513
- Maternal Mortality and Malnutrition, Lady (Rhys) Williams, 1103
- Mathematics: at Bombay, Prof. J. Maclean, 21; and Agriculture, Dr. J. Wishart (*Review*), 347; History of, The Study of the, Dr. G. Sarton (*Review*), 700; Science and, History of (*Review*), 700; for Technical Students, F. G. W. Brown. 2 Parts (*Review*), 864
- Matter: Minimal Lines and Geodesics within, a Fundamental difficulty of Einstein's Theory, Dr. L. Silberstein, 1012

- Maya Culture in the Highlands of Guatemala, 892
- Mayflies : The Biology of, with a Systematic Account of North American species, Prof. J. G. Needham, Dr. J. R. Traver, Prof. Yin-Chi Hsu and others (*Review*), 223
- Mayfly Nymphs, Oxygen Consumption of, in relation to Available Oxygen, Prof. H. Munro Fox, C. A. Wingfield and B. G. Simmonds, 1015
- Meare Lake Village, Excavations at, 395
- Measurement of Capacities by the Ballistic Method, Important Cause of Error in the, J. Granier, 138
- Mechanical Science, Applications of, 852
- Mechanics : and Hydrostatics, Dr. R. G. Mitton (*Review*), 59 ; Theoretical, Dynamics of Rigid Bodies, Prof. W. D. MacMillan (*Review*), 264
- Medical : Statistics [1836], 137 ; Practitioners in the Diocese of London licensed under the Act of 3 Henry VIII, C. II ; an annotated list 1529-1725, J. H. Bloom and R. Rutson James (*Review*), 142 ; Curriculum, The, 182 ; Research Council, Industrial Health Research Board of the, R. Coppock, R. K. Law and Prof. B. A. McSwiney appointed members of the, 199 ; Research, Post-Graduate, 360 ; Biography (*Review*), 663 ; Research Council : appointment to the, of Lord Balfour of Burleigh and Prof. J. Mellanby, 717 ; awards of the, to Dr. F. Murgatroyd, Dr. C. Hackett, G. B. Ludlam and J. N. Strauss, 879
- Medicine : American, Dr. H. E. Sigerist. Translated by Miss H. Nagel (*Review*), 142 ; History of (*Review*), 142 ; in the Middle Ages, The Story of, Prof. D. Riesman (*Review*), 142 ; Talmudic, A Short History of, Dr. J. Snowman (*Review*), 142 ; -Man of the American Indian and his Cultural Background, The, Prof. W. T. Corlett (*Review*), 268 ; Forensic, Report on, 433 ; Pharmacy and, Contributions of Chemistry to, Dr. F. Pyman, 693
- Medico-Botanical Society [1836], 854
- Medieval : Painters, Formulæ of, Prof. A. P. Laurie (*Review*), 266 ; Painting, The Materials of, D. V. Thompson (*Review*), 266
- Mediterranean : Littoral, The, A. D'Arrigo, 558 ; World, Unity and Diversity of the, Dr. G. Sarton, 926
- Melanesian Civilization of Eastern Asia, Dr. P. V. van Stein Callenfels, 876
- Melbourne University, Dr. A. F. Burstall elected professor of engineering and dean of the engineering faculty in, 1003
- Mendelian Ratios, Standard Errors of, S. S. Purewal and P. K. Rao, 977
- Menschlichen Rassen, Die, Dr. R. Lämmel (*Review*), 666
- Mental : Disorders : Destiny and Disease in, with Special Reference to the Schizophrenic Psychoses, Prof. C. M. Campbell (*Review*), 386 ; Life, Essential Traits of, Prof. T. L. Kelley (*Review*), 952
- Mercury : Arc Rectifier Practice, F. C. Orchard (*Review*), 784 ; Vapour, Sparking Potential of, Dr. F. Ll. Jones and W. R. Galloway, 973
- Mersey Tunnel, Fire in the, 280
- Mesembryanthemum, New Genus of, late Dr. N. E. Brown, 726
- Mesolithic Settlement of Northern Europe : The, A Study of the Food-Gathering Peoples of Northern Europe during the Early Post-Glacial Period, Dr. J. G. D. Clark (*Review*), 95
- Metabolism at High Altitudes, 935
- Metallic : Zinc and Cadmium, Asymmetry in, Prof. K. Herrmann ; Dr. G. W. Brindley, 290 ; Films, Sputtered, A New Kind of Ring Phenomenon in, Utsab Kumar Bose, 684 ; Films, Thin, A. C. B. Lovell, 1063
- Metallurgical Text-Books (*Review*), 1032
- Metallurgy : of Iron and Steel, An Introduction to the, Prof. H. M. Boylston. Second edition (*Review*), 1032 ; Physical : An Introduction to, Dr. L. R. Van Wert (*Review*), 1032 ; The Principles of, Prof. G. E. Doan (*Review*), 1032
- Metallography, Principles of, Prof. R. S. Williams and Prof. V. O. Homerberg. Third edition (*Review*), 1032
- Metals : and Alloys, Structure of, Dr. W. Hume-Rothery (*Review*), 7 ; and Brittle Materials, Fractures in, Dr. H. J. Gough and others, 132 ; Order of Affinity of, for Copper, Iron, Cobalt and Nickel, Dr. A. S. Russell, 161 ; and Alloys at High Temperatures, Specific Heats of, Prof. F. M. Jaeger ; Dr. O. J. Walker, 211 ; Institute of, Paris Meeting of the, 691 ; Micrography of, in Ultra-Violet Light, J. Smiles and H. Wrighton, 855 ; Specific Heats of, Prof. H. L. Bronson and colleagues, 1105
- Metchnikoff Institute of the Ukraine, Bulletin of, No. 1, 360
- Meteor : Observations, B. S. Whitney ; F. Watson, jun. and E. M. Cook ; Rev. Dr. M. Davidson, 514 ; Trails, Photographing, S. Arend and G. C. Flammarion, 690 ; Heights from the Arizona Expedition, E. Öpik, 943
- Meteoritic Trains, Luminosity of, M. A. R. Khan, 933
- Meteorites (Æroliths) found in the Tanezrouft (Western Sahara), A. Lacroix, 984
- Meteorological Office, Annual Report for year ending March 31, 1936, 1048
- Meteorology : in India, 70 ; for Airmen in India, 108 ; Manual of, Sir Napier Shaw, with the assistance of Elaine Austin. Vol. 2 : Comparative Meteorology. Second edition (*Review*), 781
- Meteors, Orionid, J. P. M. Prentice, 978
- Methane, Heavy (CH₃D) in the Photographic Infra-Red, Absorption Spectrum of, Drs. W. H. J. Childs and H. A. Jahn, 285
- Metrical Space, Introduction of Directions in a, C. Pauc, 813
- Meyer medal of the American Genetic Association, presentation of the, to P. H. Dorsett, 18
- Mice, Male, Genital Organs of, A Protective Action of Progesterone on the, H. Burrows, 164
- Microbiology, Second International Congress for, 295
- Microcolorimetric Apparatus, A New, and a Method for Determination of Total Blood Volume, Dr. J. C. Somogyi, 763
- Micro-fossils Included in Flints, A Means of Isolating the, Mlle. Maria Lejeune, 561
- Micro-incineration Studies (3), F. M. Uber and T. H. Goodspeed, 775
- Micro-organisms, Type Cultures of, 889
- Microscope in Engineering and Industry, A. E. Bingham, 715
- Middle-Babylonian Chemical Text, A, C. J. Gadd and R. Campbell Thompson, 555
- Middlesex Hospital Medical School, The Story of the, Dr. H. Campbell Thomson (*Review*), 142
- Midwives Act, Circular on the, 755
- Milk : The Chemistry of, Dr. W. L. Davies (*Review*), 625 ; Graded, Bacteriological Tests for, 1050
- Milks, Soured, Molecular Constant for, G. T. Pyne and Prof. J. J. Ryan, 1111
- Millport, Research at, 397
- Mind, The Natural History of (Tanner Lectures), A. D. Ritchie (*Review*), 618
- Mineral Resources of the French Colonies (*Review*), 265
- Mississippi, Exploration of the [1836], 1111
- Mock Suns Observed at Nanda Devi in Garhwal, N. E. Odell, 764
- Modalities : Interaction Across, Simultaneous Stimulation, C. C. Pratt, 943
- Molecular : Asymmetry, Isotopes and, Dr. T. Iredale, 292 ; Nitrogen, Effect of, on Molybdenum at High Temperatures, P. Túry and S. Krausz, 331 ; Structure, Valency and, Prof. R. F. Hunter and Prof. R. Samuel, 411
- Molecules : Vibrational Frequencies of, Dr. H. G. Howell, 290 ; and Morphogenesis, Dr. G. R. de Beer (*Review*), 863
- Molekülspektren und ihre Anwendung auf chemische Probleme, Prof. H. Sponer. 1 : Tabellen ; Teil 2 : Text (*Review*), 386
- Molluscs : Land and Freshwater, of Colorado, Prof. J. Henderson, 170 ; and Blood Flukes, Bartsch, 371 ; of Northern Asia, A. Mozley, 517

- Molybdenum : Effect of Molecular Nitrogen on, at High Temperatures, P. Túry and S. Krausz, 331 ; Iron and, Distortion of, Dr. E. W. Fell, 760
- Mond Nickel Co., Ltd., New Laboratories of the, 771
- Monogénéité, Les conditions de, Prof. D. Menchoff, 41
- Montmorillonite, Generating Media of, and of Sepiolite, J. de Lapparent, 695
- Montserrat, Geology of, A. G. MacGregor : Seismic Observations in, C. F. Powell, 1069
- Morals, Decline and Fall of, Dr. N. Murray Butler, 559
- Moravia, Archæological Excavations in, 553
- Morphogenesis and the Field Concept, C. H. Waddington, 809
- Moscow : Foundation in, of an Institute for Experimental Physiology and Therapeutics, 718 ; Medical Centre for, 1091
- Mosquito Control and Local Authorities, 1046
- Mosquitoes of the Ethiopian Region, G. H. E. Hopkins 592
- Mpondo : Regimental System, A. J. H. Goodwin, 813 ; Women's Initiation among the, J. S. Griffiths, 813
- Muscles, Morphology of, Prof. D. Waterston (*Review*), 221
- Museums : and the Public, Sir Eric Maclagan, 172 ; Association, Annual Conference at Leeds ; Alderman C. Squire elected president, 172
- Mushroom : Growing, Composts for, G. Paterson-Hart, 409 ; Beds, New Disease of, P. H. Williams, 690
- Mycological Researches, J. Ramsbottom (*Review*), 1033
- Mycology : Medical, Fungous Diseases of Men and other Mammals, Prof. C. W. Dodge (*Review*), 185
- Mycoses of Man and other Mammals, Lt.-Col. C. Crawford-Jones (*Review*), 185
- Mysore Tribes and Castes, The, L. K. Ananthakrishna Iyer ; R. E. Enthoven (*Review*), 225
- National : Inland Water Survey, First Annual Report, 19 ; Physical Laboratory, Annual Inspection of the, 85 ; Trust, Forty-first Annual Report, 157 ; and International Health and Welfare, 196 ; Central Library, Twelfth Annual Report, 236 ; Smoke Abatement Exhibition, H. J. Hodsman, 728 ; Museum of Wales and Welsh Cultural Studies, 751
- Nation's Food Supply, Supervision of the, Dr. G. Leighton (Benjamin Ward Richardson lecture), 1006
- Nations Can Live at Home, Dr. O. W. Willcox (*Review*), 58
- Native : Policy in Africa, W. G. A. Ormsby-Gore, 107 ; Territories and the Union of South Africa, 155 ; Agriculture : Improvement of, in Relation to Population and Public Health, Sir A. Daniel Hall (*Review*), 305 ; in Africa and its Relationship to Population, Sir John Boyd Orr (*Review*), 305 ; School of Medicine at Suva, The, Sir James Barrett, 320
- Natural : *History Magazine*, Discontinuance of the, 796
- Natural History, Society for the Bibliography of, election of officers, 395 ; Resources Conservation, 680 ; Selection : Insect Coloration and, Prof. E. W. MacBride, 365 ; and Evolutionary Progress, Prof. J. S. Huxley, 451 ; 571 ; 603 ; Insect Coloration and, Prof. G. D. Hale Carpenter, 686 ; Prof. E. W. MacBride, 884 ; Science in England at the end of the Twelfth Century, Sir Stephen Gaselee, 1003 ; Selection, Prof. G. D. Hale Carpenter, 1017 ; Prof. J. B. S. Haldane ; E. B. Ford, 1053
- Naval Water-Tube Boilers, Eng.-Capt. S. R. Dight, 213
- Navier, Louis-Marie-Henri, death of, [1836], 337
- Nebulæ : Stars and, Certain Types of, Continuous Spectra of, Dr. W. M. Cohn, 127 ; The Realm of the, Dr. E. Hubble (Mrs. Hepsa Ely Silliman memorial lectures), (*Review*), 859
- Negroes and Pygmies (*Review*), 345
- Neon, Argon, Helium, J. T. Randall, 191
- Neoplasms, Experimental, 334
- Nerves, Iron Wire and, 83
- Nest Linings and Nestlings, Coloration of, Dr. Jean M. Linsdale, 470
- Neuroses, Prognosis in the, An Enquiry into, Dr. T. A. Ross (*Review*), 743
- Neutrino Theory of Light, Inconsistency of the, V. Fock, 1011
- Neutron Absorption of Boron and Cadmium at Low Temperatures, V. Fomin, F. G. Houtermans, A. I. Leipunsky, L. B. Rusinow and L. W. Schubnikow, 505
- Neutrons : Experiments with, C. H. Collie and J. H. E. Griffiths ; S. Kikuchi, H. Aoki and K. Husimi, 252 ; 'Slow', Influence of Temperature on the 'Groups' of, Dr. A. Arsenjewa-Heil, Dr. O. Heil and C. H. Westcott, 462 ; Resonance Levels for Absorption of, J. Rotblat, 545 ; and Protons, Self-Interaction of, Dr. D. Iwanenko and A. Sokolow, 684 ; Evidence for the Expulsion of Two, from Copper and Zinc by One Fast Neutron, F. A. Heyn, 723 ; Slow, Velocity of, J. R. Dunning, G. B. Pegram, G. A. Mitchell, G. Fink and E. Segre, 734 ; Scattering of, by Protons, E. T. Booth and Dr. C. Hurst, 1011 ; in Silver, Selective Absorption of, E. H. S. Burhop, R. D. Hill and A. A. Townsend, 1094 ; Activation of Silver by, Prof. G. Guében, 1095
- Newcomen Society, Report for 1935-36, 925
- New : Mexico, Early Man in, C. D. Stock and Frances D. Bode, 208 ; South Wales Soils, Phosphate Solubility in Certain, W. M. Holman, 897 ; York : City, Deaths from Motor Accidents, 718 ; York University, retirement of Prof. W. H. Park, 718 ; Zealand : New Red Alga from, N. L. Gardner, 378 ; Seismology in, Dr. C. E. Adams, 397 ; Benefits in, from Scientific Research in Agriculture, Prof. H. G. Denham, 746 ; York Zoological Society, Aquarium of the, 965
- Newton, William Stukeley on (*Review*), 617
- Newtoniana, Sale of, 195
- Newton's : Prism in the British Museum, Prof. L. W. Taylor, 585 ; Life, Sir Isaac, Memoirs of, by William Stukeley, M.D., F.R.S., 1752, edited by A. H. White (*Review*), 617
- Nickel : and Copper, Radioactive Isotopes of, Dr. C. B. Madsen, 722 ; in the Organs of Lamellibranch Molluscs, Localization of, R. Paulais, 812 ; -Iron Alloys, Magnetic Properties of the, 940
- Nicotine Inhibition of Oxidation and Fermentation, Dr. G. F. Gause, 976
- Night Sky : in August, 159 ; in September, 361 ; in October, 583 ; in November, 756 ; in December, 965 ; in January, 1093
- Nitric Anhydride, Molecular Structure of, Raman Effect and, J. Chedin and Mme. Jeanne Cieutat Pradier, 855
- Nitrogen : Fixation in Tropical Soils, Promotion of, Prof. N. R. Dhar and S. K. Mukerji, 648 ; Losses in Green Plants, Dr. W. H. Pearsall and M. C. Billimoria, 801 ; Compounds from Legume Nodules, Nature of the Excretion of, Prof. A. I. Virtanen, 880 ; in Water, Solubility of, at Ultra-Pressures up to 4,500 kgm./cm.², J. Basset and M. Dodé, 896 ; Fixation with Cow-Dung, Prof. N. R. Dhar and S. K. Mukerji, 1060
- Nitroprusside Reaction as a Test for Reduced Glutathione, The, N. S. R. Maloeuf, 75
- Nitrous Oxide Molecule, Cheng E. Sun and Ta-you Wu, 409
- Nobel Prize : for chemistry, award of the, to Prof. P. Debye ; for physics, divided between Prof. V. F. Hess and Dr. C. D. Anderson, 873 ; for medicine divided between Sir Henry Dale and Prof. O. Loewi, 792
- Nodules on Legume Roots, Physiology of the Formation of, K. V. Thimann, 775
- Noise : Measurements of, B. G. Churcher and A. J. King, 329 ; on the Road, Report on, 753 ; Effect of, Dr. F. Kennedy, 935
- Nomenclature, Rules of, Suggested Cases for Suspension of, Dr. C. W. Stiles, 34
- Non : -Polar Molecule, Indication of a Decrease in the Polarizability of a, by Pressure, Prof. A. Michels, C. Michels-Veraart and A. Bijl, 509 ; -Aqueous Solutions, Surface Properties of, R. Aschaffenburg, 644
- North : Uist, Fauna of the Brackish Water Lochs of, Edith A. T. Nicol, 178 ; African Birds and Mammals,

- Biogeography and Ecology of, Dr. B. P. Uvarov, 273 ;
-East Coast Institution of Engineers and Shipbuilders,
awards to Eng.-Comdr. C. J. Hawkes, G. F. Hardy,
R. C. Thompson, W. C. S. Wigley, A. Gilchrist and
Dr. W. Pratt, 282 ; American Sunfishes, Reproductive
Habits of the, C. M. Breder, 470 ; African Phosphates,
Coproliths of the, L. Cayeux, 476 ; -East Land,
Water under the Western Ice Cap in, R. Moss, 803 ;
Sea Basin, Dr. Dudley Stamp, 1105
- Northern : Lights, Prof. C. Störmer, 159 ; Plains Indians,
Population of the, Dr. C. Wissler, 553 ; Transvaal,
Archaeological Investigations in the, Prof. C. van
Riet Lowe, 580
- Nova : Lacertæ : 1936, Dr. T. W. Wormell and Dr. J. C.
Dobbie, 38 ; Absence of Cosmic Rays from, Dr. J.
Barnóthy and Dr. M. Forró, 544 ; 1936, Peculiarities
of, D. Beloritzky, 560 ; in Sagittarius, Discovery of
a, C. Jackson, 681 ; in Aquila, Discovery of a, N.
Tamm, 756 ; Lacertæ, Spectrum of, observed with
the Large Telescope at Meudon, H. Camichel, 1112
- Novæ Herculis, 1934, and Aquilæ, 1936, Spectrographic
Observations of, P. Rossier, 985
- Nuclear : Disintegration by a Radium B + C Source,
E. F. Colbric (2), 49 ; Levels, The Form of, Dr. P.
Preiswerk and Dr. H. von Halban, jun., 163 ; Re-
actions Due to Neutrons of 2 m.e.v. Energy, E. T.
Booth and C. Hurst, 367
- Nucleo Atomico, Il, F. Rasetti (Review), 1037
- Nucleus $^{127}_{53}\text{I}$, The Electric Quadrupole Moment of the,
Dr. T. Schmidt ; Dr. S. Tolansky, 404
- Number 137, The Mysterious, Sir Flinders Petrie, 81 ;
C. L. T. Griffith, 332
- Nursery Education, Miss I. Jones ; Mrs. M. Wintringham, 731
- Nutrition : The Problem of, Vol. 1, 379 ; Malaria and,
380 ; in the Colonial Empire, appointment of a
committee on, 797 ; and National Health, Physique,
857 ; Some Chemical Aspects of, 1022
- Nutritional : Response to Chemical Intake, Regularity
of, H. C. Sherman and H. L. Campbell, 775 ; Prob-
lems, Modern, Chemical Aspects of some, Prof. J. C.
Drummond (Bedson lecture), 1022
- Nyasaland, Native Labour from, 835
- Nymphomyid Fly, Anatomy of a, M. Tokunaga, 806
- Oak : English, Principal Rots of, Cartwright and Findlay,
409 ; Homegrown, Properties of, 471
- Oat Coleoptiles, Change in the Response of, to Growth
Regulators Produced by Aging, H. G. du Buy, 91
- Oats : Loose Smuts of, R. McKay, 513 ; Huskless, 581
- Oceania, Ancient Scandinavia and, Boat Building in, J.
Hornell, 765
- Oceanic Macroplankton of the Dana Expeditions, 45
- Enothera* : *Lamarckiana*, Trisomic Mutations of, Dr. D. G.
Catcheside, 690 ; Genetical and Taxonomic Inves-
tigations in, Prof. R. R. Gates, 1020
- Official Statistics, Guide to Current, 1935, 360
- Oil : Treatment for Uneven Blossoming, O. S. H. Reinecke,
593 ; Wells, Temperature Measurements in, M.
Schlumberger, H. G. Doll and A. A. Perebinosoff, 1020
- Oolitic Limestones, Study of the, by Staining and Decalcifi-
cation, L. Dangeard, 49
- Opalinids (Protozoa, Ciliata), Mitosis in, Tze-Tuan Chen,
1 and 2, 1070
- Operophtera brumata* L., Reduction Phenomena in the
Morphology of the Adult Moth, A. Machotin, 657
- Opium Eating and Health [1836], 942
- Optics, Geometrical, Dr. H. T. Flint (Review), 528
- Opuntia* used as a Larvicide, F. G. Cawston, 179
- Orang-utan, Origins of Speech and the, Prof. C. J.
Connolly, 977
- Orchestration, Adjustable Resonators and, Prof. W. A.
Osborne, 1059
- Order and Life, Dr. J. Needham (Terry lectures) (Review),
863
- Ordnance Plans, Revision of, from Air Photographs,
Col. H. L. Crosthwait, 101
- Organic : Halides in Solution, Unimolecular Elimination
and the Significance of the Electrical Conduction,
Racemization and Halogen Replacement of Organic
Halides in Solution, Dr. E. D. Hughes, Prof. C. K.
Ingold and A. D. Scott, 120 ; Compounds : Reactions
of, Dr. W. J. Hickinbottom (Review), 224 ; The
Systematic Identification of, A Laboratory Manual,
Prof. R. L. Shriner and Prof. R. C. Fuson (Review),
704
- Organizers in Mammalian Development, C. H. Wadding-
ton, 125
- Organometallic Compounds, Part 3, Dr. A. E. Goddard
(A Text-Book of Inorganic Chemistry, edited by
Dr. J. Newton Friend. Vol. 11) (Review), 268
- Organon*, No. 1, 237
- Orient, The Call of the (Review), 1036
- Orionis, Changes in the Spectrum of the Star 25, Helen
Dodson, 1021
- Orobancha speciosa*, Germination of the Seeds of, C.
Chabrolin, 414
- Orthophosphoric, Sulphuric and, Acids, An X-Ray Study
of, J. T. Randall, 842
- Oscillatory Discharges in a Magnetic Field, 1067
- Osmunda*, Spiral Structure of Chromosomes in, Dr. Irene
Manton, 1058
- Ostrea angulata*, Habit and Shell-shape in the Portuguese
Oyster, Prof. J. H. Orton, 466
- Oxford : Advanced Atlas, The, J. Bartholomew. Fifth
edition (Review), 307 ; and Cambridge, Co-operation
between, 678 ; University : Sir George Macdonald
elected an honorary fellow of Balliol College ; Dr. W.
Stephenson appointed assistant director of the
Institute of Experimental Psychology, 46 ; Dr.
J. H. C. Thompson elected a fellow of Wadham
College and lecturer in mathematics, 89 ; Research
in Social Studies in, 679 ; Dr. H. M. N. H. Irving
appointed tutor in natural science at St. Edmund
Hall ; A. N. Dakin elected Lady Wallis Budge fellow
in Egyptology at University College ; W. G. A.
Ormsby-Gore elected an honorary fellow of New
College, 693 ; gifts by Lord Nuffield, 713 ; Prof. A. R.
Radcliffe-Brown appointed professor of social anthro-
pology, 751 ; Prof. A. R. Radcliffe-Brown appointed
professor of social anthropology ; impending retire-
ment of Prof. F. Soddy ; conferment of an honorary
doctorate on President J. B. Conant ; scheme for
the appointment of vice-chancellor ; research degrees
in last academic year, 772 ; W. D. Hambly granted the
degree of D.Sc. ; Dr. J. A. Douglas appointed deputy
for the professor of geology, 810 ; award of the
Rolleston memorial prize to J. A. Moy-Thomas and
B. G. Maegraith ; award of the Theodore Williams
scholarship in physiology to R. T. Campbell, 853 ;
Dr. F. Simon appointed reader in thermodynamics,
874, 895 ; Dr. S. Flexner appointed George Eastman
visiting professor for 1937-38 ; Prof. R. V. Southwell
elected a member of the Hebdomadal Council ; Lord
Nuffield elected an honorary fellow of Pembroke
College ; conferment of honorary doctorates on
R. W. Bingham and J. L. A. Avenol ; further gift
by Lord Nuffield, 941 ; Lord Nuffield's gift to the
Medical School, 1025
- Oxidation : and Fermentation, Stereoisomeric Nature of,
Dr. G. A. Gause, 245 ; -Reduction Potential, Prof.
J. R. Partington and H. I. Stonehill ; Prof. A. A.
Noyes and C. S. Garner, 252 ; Catalysis in the Living
Cell, Power of, P. Joyet-Lavergne, 1027
- Oxide Layer on a Polished Copper Surface, Dr. S. Dobinski,
31 ; Dr. L. H. Callendar, 291
- Oxycholesterilene, Enolization of, Dr. V. A. Petrow, 645
- Oxygen : Commercial Production of, C. G. Bainbridge,
191 ; In the Atmosphere, Yield of Green Plants as a
Function of the Proportion of, M. Molliard, 338 ;
Content of the Stratosphere, Prof. E. Regener, 544 ;
Rate of Absorption of, by Sodium Sulphite Solution,
W. S. E. Hickson, 645 ; Consumption of Mayfly
Nymphs in relation to Available Oxygen, Prof. H.
Munro Fox, C. A. Wingfield and B. G. Simmonds,
1015
- Ozone as a Heating Factor in the Atmosphere, R. Penn-
dorf, 247

- Palaeontology and Humanity, Prof. H. L. Hawkins, 450 ; 521, 534
- Palaeozoic Seismicity, Dr. A. Lamont, 243
- Palladium : to Hydrogen, Permeability of, V. Lombard, C. Eichner and M. Albert, 48 ; Electronic Specific Heat in, G. L. Pickard, 123
- Pancreas, The, and Blood Inorganic Phosphorus, V. Schrire and H. Zwarenstein, 180
- Paradise of Fools : The, being an Account, by a Member of the Party, of the Expedition which Covered 6,300 miles of the Libyan Desert by Motor-Car in 1935, M. H. Mason (*Review*), 634
- Paraffin Hydrocarbons, Normal Nitration of Some, T. Urbanski and Marion Slon, 774
- Paramecium*, Effect of Large Centrifugal Forces on, R. H. J. Brown, 843
- Parasites, Migrating, in Ruminants, Route of, J. H. Tetley, 802
- Paris : Academy of Sciences, Prof. J. Sabrazès elected a *correspondant* of the, 72 ; Prof. A. Maigé elected a *correspondant* of the, 199 ; R. Esnault-Pelterie elected a member of the, 240 ; Academy of Medicine, Dr. P. Vallery-Radot elected a member of the, 615 ; University, conferment of honorary doctorates on Prof. I. Holmgren and Prof. G. D. Birkhoff, 941
- Parliamentary Science Committee : additions to the, 717 ; election of officers, 965 ; The British Association a constituent member of the, with Prof. Allan Ferguson as representative, 1005
- Parson in Revolt, A. Rev. J. McCulloch (*Review*), 634
- Parsons : Steam Turbine, The Development of the, R. H. Parsons. 2 Parts (*Review*), 567 ; Sir Charles, memorial, 852 ; memorial lecture, Sir Frank Smith, 852
- Particle Observers, Equivalent, Prof. J. L. Synge, 28
- Pasteur Institute : of Southern India, Annual Report, 159 ; Tunis, Dr. E. Burnet nominated director of the, 615 ; of India, Kasauli, Annual Report, 717
- Patent Actions, High Court Procedure and the Cost of, Prof. W. Cramp, 737
- Patentees, Institute of, medal awards of the, 323
- Patterns of Experience, The, A. W. Wolters, 670
- Patwar Meteoric Shower of July 29, 1935, Dr. A. L. Coulson, 513
- Paulin Aneroids, 554
- Pavlov : Institute of Aviation Medicine, 681 ; late Prof. I. P., Documents relating to the life and work of the, 966
- Pawnee : Second Oceanographic Expedition, Fishes from the, C. M. Breder, jun., 170
- Pawnee Archaeology, W. R. Wedel, 888
- Pedology : (Soil Science) at the British Association, 729 ; Applied, Problems in, Dr. A. B. Stewart, 730
- Peirce, Charles Sanders, Collected Papers of, edited by C. Hartshorne and P. Weiss. Vol. 6 : Scientific Metaphysics (*Review*), 1037
- Pelseneer, Paul, *Mélanges* (*Review*), 783
- Peking Man : Further Discoveries, L. P. Chia ; Sir Grafton Elliot Smith ; Prof. F. Weidenreich, 1004 ; W. C. Pei, 1056
- Peneids, Morphology and Distribution of, M. D. Burkenroad, 371
- Pencils of Zehfuss, Singular Compound and Schläflian Matrices, W. Ledermann, 48
- Penguins, King, at Edinburgh Zoological Park, Breeding of, 878
- Pennines, The, and Adjacent Areas, D. A. Wray, 390
- Pentadeuterobenzoic Acid, C_6D_5COOH , Some Properties of, Prof. H. Erlenmeyer and A. Epprecht, 367
- Pentane, Normal, and Oxygen, Influence of a Chemically Inert Gas on the Velocity of the Chain Reaction of Mixtures of, M. Prettre, 695
- Peppermint, Cultivation and Distillation of, Leaflet on, 797
- Pepsin, Crystalline, Inactivation of, Dr. J. Steinhardt, 74
- Perchloric Acid : Oxidation of Some Organic Substances by, A. Vialard-Goudou, 695 ; Absolute, Raman Effect in, R. Fonteyne, 886
- Perfumes : and Essences, Modern, H. Berry (*Review*), 949 ; Cosmetics and Soaps : with Especial Reference to Synthetics, W. A. Poucher. Vols. 2 and 3. Fifth edition (*Review*), 949
- Periodicals, Subject Index to, 1935 (*Review*), 147
- Pernambuco, The Reef at [1836], 257
- Personality Maladjustments and Mental Hygiene, Dr. J. E. W. Wallin (*Review*), 636
- Perthshire Tectonics ; Schiehallion to Glen Lyon, Prof. E. B. Bailey and W. J. McCallien, 896
- Petioles, Abscission of, Effect of Auxin on the, C. D. La Rue, 91
- Petroleum Fuels in Canada, 336
- Petrology and Movements of Snow Deposits (*Review*), 481
- Petrols of Various Sources of Origin, Proportion of Deuterium in the Light Hydrocarbons from, A. Maillard, 897
- Pflanzen, höheren, Vergleichende Morphologie der, Prof. W. Troll. Band 1. Lief. 1 (*Review*), 950
- Pflanzenzelle : Die, Vorlesungen über normale und pathologische Zytomorphologie und Zytogenese, Prof. E. Küster (*Review*), 623
- Pharmaceutical Society, presentation of the Hanbury gold medal to Dr. F. Pyman, 693
- Pharmacists, French, Education of [1836], 216
- Pharmacological Action, Chemical and Physical Basis of, Prof. A. J. Clark and others, 938
- Pharmacy and Medicine, Contributions of Chemistry to, Dr. F. Pyman, 693
- Phase Transitions, The Theory of, Dr. L. Landau, 840
- Phenanthrene, Chemistry of Natural Products related to, Prof. L. F. Fieser (*Review*), 224
- Phenol as a Function of the pH, Variations in the Ultra-Violet Spectrum of, Mlle. Madeleine Gex, 258
- Phenylacetic Acid, Effect of, on the Growth of Tomato Plants, Dr. H. L. Pearce, 363
- Pheretima (The Indian Earthworm), Prof. K. N. Bahl. Second edition (*Review*), 147 ; 1092
- Philosophy, Guide to, C. E. M. Joad (*Review*), 100
- Phloretin, Phloridzin and, Inhibitory Effect of, on Kidney Phosphatase, Dr. H. Kalekar, 289
- Phosphagen in Echinoid Muscle and in Electrical Tissue, E. Baldwin and Dr. Dorothy Moyle Needham, 506
- Phosphine, Heavy (PD_3), Infra-Red Absorption Spectrum of, Dr. G. B. B. M. Sutherland and G. K. T. Conn, 641
- Phosphites, Constitution of Phosphorous Acid and the, R. Ananthakrishnan, 803
- Phosphogluconic Acid, Fermentation of, F. Lipmann, 588
- Phosphorescence, Demonstration of, H. Warren, 974
- Phosphorous Acid and the Phosphites, Constitution of, R. Ananthakrishnan, 803
- Phosphorus : Pentachloride, H. Moureu, M. Magat and G. Wetroff, 476 ; Colorimetric Estimation of, Dr. H. L. Brose and E. B. Jones, 644 ; A New Oxide of, P. W. Schenk and H. Platz, 849
- Photo-electric Cells : for the Measurement of Energy, Standardization of, Dr. H. H. Poole and Dr. W. R. G. Atkins, 338 ; Effect of Hydrogen on, Dr. N. R. Campbell and R. S. Rivlin, 1063
- Photographic : Plates : Sensitivity of, in the Region $\lambda\lambda$ 2500–2100 Å., A. Hunter and Dr. R. W. B. Pearce, 37 ; Plate Action exerted by Ordinary Metals on the, and on the Electrometer, J. Reboul, 138 ; Plates, Variation of the Optical Density of, with the Dryness Conditions, J. Roig and J. Thouvenin, 179 ; Development, Theory of, A. J. Rabinovitch and S. S. Peissachovitch, 849 ; Sensitized with Sodium Salicylate, Tien Kiu, 1112
- Photographs, Early, J. H. Read, 239
- Photography, 81st Annual Exhibition of, International, 499
- Photomicrographic Reproduction of Scientific Papers, 358
- Photo : -Micrography, Practical, J. E. Barnard and F. V. Welch. Third edition (*Review*), 636 ; -Reduction of Fluorescent Substances by Ferrous Ions, Dr. J. Weiss, 80

- Photosynthesis: Colloid Substrate in, Dr. M. Copisarow, 509; in Relation to Light and Carbon Dioxide, E. L. Smith, 775
- Physical: and Chemical Constants, Tables of, and Some Mathematical Functions, Dr. G. W. C. Kaye and Prof. T. H. Laby. Eighth edition (*Review*), 635; Science, Sixty Years of (*Review*), 989
- Physico-chemical Constants, Determination of, Dr. M. Wojciechowski and Dr. E. R. Smith, 30
- Physics: A Complete, Written for London Medical Students and General Use, W. H. White (*Review*), 183; College, Prof. C. E. Mendenhall, Prof. A. S. Eve and Prof. D. A. Keys (*Review*), 183; Elementary, Teaching (*Review*), 183; Laboratory Manual in, Prof. A. A. Knowlton and Prof. M. O'Day. Second edition (*Review*), 183; School Certificate Examples in, Dr. W. G. Davies (*Review*), 183; Foundations of, Prof. R. B. Lindsay and Prof. H. Margenau (*Review*), 187; Modern: Trends in, Prof. Allan Ferguson, 449, 785; "A Treatment of", Prof. M. N. Saha, 464; Prof. E. N. da C. Andrade, 465; Institute of, Inauguration of a London and Home Counties Branch, 837; Terminology in, Prof. C. G. Darwin, 908; Modern, An Elementary Survey of, Prof. G. F. Hull (*Review*), 952
- Physik, Praktische, F. Kohlrausch. Siebzehnte Auflage. Herausgegeben von F. Henning (*Review*), 183
- Physiological Congresses, Permanent International Committee of the, Prof. L. A. Orbeli appointed a member of the, 838
- Physiology, Study of [1836], 854
- Physique, Nutrition and National Health, 857
- Phytochemical Problems, Consideration of Some, T. Weevers, 259
- Phytopharmacological Reactions of Normal, Toxic and Atoxic Sera, D. I. Macht and R. E. Gardner, 414
- Phytoplankton, Northern, and its Production, Dr. E. S. Nielsen, 82
- Piezoelectric Ultra-micrometer, A, Prof. J. C. Hubbard, 171
- Pig, Genetics of the, A. D. Buchanan Smith, O. J. Robison and D. M. Bryant, 878
- Pigeon, Passenger, Food of the, Phoebe Knappen, 1061
- Pigments respiratoires, Essai sur la biochimie générale et comparée des, Prof. J. Roche (*Review*), 662
- Pilgrim's Quest for the Divine, A, Lord Conway of Allington (*Review*), 310
- Pine Shoot Moth, late C. C. Brooks and J. M. B. Brown, 888
- Pisum*, Linkage in, Ø. Winge, 695
- Pitcairn Island, The People of (*Review*), 382
- Pituitary Gland, Relation of the, to Muscles Creatine, B. G. Shapiro and H. Zwarenstein, 178
- Planetary Nebulae, Chemical Composition of the, T. L. Page, 503
- Plankton Research, F. S. Russell, A. C. Hardy, and others, 410
- Plant: Translocation in the, Problems of, Mason, Maskell and Phillis, 336; Cells, Origin of the Spiral Wall Structure in Certain, E. S. Castle, 378; Tissue Cultures from a Hormone Point of View, J. Bonner, 415; Breeding, Research in, 501; Hunting and Exploration in Tibet, Capt. F. Kingdon-Ward, 516; Structures, Viability of, P. N. Kapteff, 540; Cytology (*Review*), 623; Pathology in the Tropics, Prof. F. T. Brooks (*Review*), 661; Organisms in Permanently Frozen Subsoil, P. N. Kapteff, 714; Tissues, State of Ascorbic Acid in, Dr. L. F. Levy, 933
- Plantation Economy, Problems of, Dr. C. R. Fay, 452, 957; Dr. L. D. Stamp, 957
- Plants: Fasciation in, C. J. Bond, 554; Development of, Growth Hormones and, Prof. N. G. Cholodny, 586; Green, Nitrogen Losses in, Dr. W. H. Pearsall and M. C. Billimoria, 801; Comparative Morphology of, W. C. Worsdell (*Review*), 950; Virus Disease in, The Agent of, Dr. J. Caldwell, 1065
- Plaster of Paris, H. B. Weiser, W. O. Milligan and W. C. Ekholm, 294
- Platinum, Transmutation of, by Deuterons, J. M. Cork and E. O. Lawrence, 130
- Platypacilus*, Inter-Specific Hybrids in, A. W. Bellamy, 943
- Plenary Space, Manifolds of, Prof. E. Bompiani (*Review*), 343
- Plotting Machine for Air Photographs, an Automatic, Lieut. E. H. Thompson, 254
- Plums, Pollination of, C. H. Hooper, 648
- Poids et Mesures, Bureau international des, retirement of Dr. C. E. Guillaume; A. Pérard nominated director, 755
- Poisons Law, H. N. Linstead. With a chapter upon the International Background of Dangerous Drugs Legislation, by Sir Malcolm Delevigne (*Review*), 666
- Poland, Wild Animals in, 878
- 'Polaroid', Technical Uses of, 726
- Polly and Freddie, Sir F. W. Keeble (*Review*), 1035
- Polyatomic Molecules, Electronic State of the Radicals in, V. Henri, 377
- Polymerisation and Condensation, The Phenomena of (*Review*), 268
- Polytechnic, Regent Street, Electrical Machinery Laboratory, 1066
- Pond, F.R.S., John, death of [1836], 413
- Population: World, Past Growth and Present Trends, Prof. A. M. Carr-Saunders (*Review*), 817; Investigation Committee, appointment of a, 836
- Porcine Trypanosomiasis, Hoare, 294
- Portrush Sill and its Veins, Petrological Study of the, N. Harris, 984
- Post-Natal Coat Characters and Prenatal Follicle Density, Relationship between, as Affected by Increase in Foetal Size, Dr. Nancy Galpin, 585
- Post Office, Progress of the, J. H. Brebner, 731
- Potassium: Diet, High, and the Survival of Adrenalectomized Rats, Dr. R. A. Cleghorn and G. A. McVicar, 124; Films, Sodium and, Transparency of, in the Schumann Region, Prof. W. H. Watson and D. G. Hurst, 124; in the Extreme Red, Narrow Continuous Band of, T. Okuda, 168; in the Brain in Vitamin B₁ Deficiency, H. W. Kinnersley, 368; Absorption Spectrum of, Ny Tsi-Zé and Weng Wen-Po, 561; Mineral and Biological, in Diet Experiments, Comparison of, Dr. A. Lasnitzki and Dr. M. Lasnitzki, 799
- Potato: Tubers, Pathogenic Action of a Bacterium isolated from, E. Fox and M. Lansade, 138; Varietal Difference in the, Dr. T. P. McIntosh, 294; Virus Diseases, Nature and Control of, Prof. P. A. Murphy, 955
- Poultry Industry, Science and the, P. A. Francis, 789
- Poverty: and Public Health, Dr. G. C. M. McGonigle and J. Kirby (*Review*), 482; Malnutrition and Disease (*Review*), 482
- Poznań, Science in, Prof. Z. Lizowski, 501
- Pre-Crag Flint Implements, J. Reid Moir, 170
- Předmost, Archaeological Discoveries at, Dr. J. Matiegka, 104
- Prenatal Follicle Density, Relationship between Post-Natal Coat Characters and, as Affected by Increase in Foetal Size, Dr. Nancy Galpin, 585
- Press, Freedom of the, 795
- Pressure, Physiological Effects of, Prof. McKeen Cattell, 1019
- Prickly-Pear in Australia, Control of the, A. P. Dodd; Dr. A. D. Imms, 911
- Primitivism and Related Ideas, A Documentary History of, A. O. Lovejoy and G. Boas: with supplementary essays by W. F. Albright and P. E. Dumont. Vol. 1 (*Review*), 187
- Primitive: Law, A. S. Diamond (*Review*), 59; Peoples, The Economics of, Dr. S. Viljoen (*Review*), 904
- Proboscidea: A Monograph of the Discovery, Evolution, Migration and Extinction of the Mastodonts and Elephants of the World, late Prof. H. F. Osborn. Edited by Mabel Rice Percy. Vol. 1 (*Review*), 860
- Professional Organizations, Outlook of, 815

- Proficiency and Psychological Tests, E. Farmer and E. G. Chambers, 725
- Progesterone, A Protective Action of, on the Genital Organs of Male Mice, H. Burrows, 164
- Progress, Partners in, Miss Esse V. Hathaway (*Review*), 740
- Prosobranchs, Arctic Marine, Egg-Capsules and Development of, Dr. G. Thorson, 213; of the North Sea and Baltic, Dr. W. E. Ankel, 1104
- Protactinium (At. No. 91), The M_{IV} - ν -Absorption Edges of, Prof. V. Dolejšek and V. Kunzl, 590
- Proteins: Molecular State of, in Mixtures and Concentrated Solutions, Dr. K. O. Pedersen, 363; Native, Denatured and Coagulated, Structure of, A. E. Mirsky and L. Pauling, 600; Structure of, Dr. D. M. Wrinch, 607; Chemical Changes in, J. S. Mitchell, 608; Structure of, and of Certain Physiologically Active Compounds, Dr. D. M. Wrinch, 651; Work on, Dr. F. Kidd, 745; Structure of, The Hydrogen Bond and the, Dr. D. M. Wrinch and Dr. D. Jordan Lloyd, 758
- Protium-Deuterium Ratio in Water, N. F. Hall and T. O. Jones, 1021
- Proton Bombardment, Excitation of Nuclei by, L. R. Hafstad, N. P. Heydenburg and M. A. Tuve, 767
- Protons, Neutrons and, Self-Interaction of, Dr. D. Iwanenko and A. Sokolow, 684
- Protoplasm: Evidence for Linear Units within, Dr. H. H. Pfeiffer, 1054; Prof. W. Seifriz (*Review*), 1077; Structure and Activities of (*Review*), 1077
- Protozoa, Contractile Vacuoles of, Effects of Hypertonic Media on the, Dr. J. A. Kitching, 287
- Prussian Academy of Sciences, award of the Leibniz gold medal to Prof. H. Lotz and the Leibniz silver medal to Dr. L. Kohl-Larsen, 460
- Pseudodiptomus* from South America, S. Wright, 592
- Psychiatry: Twentieth Century, its Contribution to Man's Knowledge of Himself (Thomas W. Salmon memorial lectures), Dr. W. A. White (*Review*), 636
- Psychoda*, American Flies of the Genus, F. del Rosario, 847
- Psychologique, L'Année, Année 35 (1934), Vol. 1 (*Review*), 228
- Psychology: The 'Factor School' in (*Review*), 423; The Self in, A Study in the Foundations of Personality, A. H. B. Allen (*Review*), 424; The Naturalist Outlook in (*Review*), 618
- Psychopathology, General, Outlines of, Prof. W. Malamud (*Review*), 386
- Public Health Act, 1936, 927
- Pueblo Bonito and other Ruins of the South-West, Dating, Dr. A. E. Douglass, 315
- Pumice Stone at Kōfels in Ötztale, Interpretation of the Occurrence of, F. E. Suess, 49
- Pupillary Regions, Method of Simultaneous, J. Lagrula, 179
- Pygmy and Negro Hosts, My, Father P. Schebesta. Translated by G. Griffin (*Review*), 345
- Pyrheliometers, Comparison of, C. E. Brazier, 1027
- Quadratic Complex, Revised Prepared System of the, Prof. H. W. Turnbull, 48
- Quanta, La méthode dans la mécanique des, R. Dugas, 358
- Quantenmechanik, Grundlagen der, Dr. H. Dänzer (*Review*), 269
- Quantentheorie: Anschauliche, eine Einführung in die moderne Auffassung der Quantenerscheinungen, Prof. P. Jordan (*Review*), 1076
- Quantitative Analysis, Textbook of, Prof. W. T. Hall. Second edition (*Review*), 570
- Quantum: Theory, Conservation Laws in, Prof. N. Bohr, 25; Electrodynamics (*Review*), 483; Theory of Radiation, The, Dr. W. Heitler (*Review*), 483; Theory and Physical Problems (*Review*), 1076
- Quaternary Association, International, Conference in Vienna, 692
- Queen Mary*, Record of the, 399
- Rabbit: Infestation, Control of, by the Use of a Virus, Sir Charles Martin, 396; Menace, G. Dollman, 501; Saliva, Diastase in, I. M. Thomas, 1015
- Race, Genetics and, 988
- Races Humaines, Les, P. Lester et Prof. J. Millot (*Review*), 570
- Racial Theory and Genetic Ideas, Prof. H. J. Fleure, 1042
- Radcliffe: Observatory in South Africa, The, 320; Travelling Fellowship in Astronomy, 679
- Radiation: cosmique, La, Prof. P. M. S. Blackett. Parts 1 to 4 (*Review*), 100; Processes, Conservation of Energy in, Dr. E. J. Williams and E. Pickup, 461; Biological Effects of, edited by Dr. B. M. Duggar and others. 2 Vols. (*Review*), 620; Bactericidal Action of, G. Dreyer and M. L. Campbell-Renton, 648; Colloids and the Biological Effect of, F. Ellinger, 1014
- Radiations, Invisible, of Organisms, Prof. O. Rahn. With an Introduction to the Physics of Radiation, by S. W. Barnes (*Review*), 96
- Radio: Research in Australia, 214; Propagation, Existence of a Surface Wave in, C. R. Burrows, 284; Communication, Ultra-Short Wave, 321; Exhibition, National, at Olympia, 410; and the Sunspot Cycle, L. C. Young and E. O. Hulburt, 472; Relay Services, G. S. Lucas and E. S. Hall, 541; Elements in Plants, K. Kunasheva and B. Brunowsky, 726; Waves, Simultaneous Transmission and Reception of, H. Antoun and F. Minaw, 761; Communication and Short Waves (*Review*), 822; Engineering, Principles of, Prof. R. S. Glasgow (*Review*), 822; Waves, Velocity of, Prof. R. C. Colwell, N. L. Hall and L. R. Hill, 978; Fading and Bright Solar Eruptions, H. W. Newton, 1017
- Radioactive: Transformations, Mass Equivalent of the Energy in, Prof. A. J. Dempster, 201; Emissions, Extreme Periods between, E. J. Gumbell, 560
- Radioactivity: Artificial, Production of, by Deuterons, J. J. and J. J. Livingood and G. Seaborg, 1021; of Rocks, New Method of Measuring the, Dr. J. H. J. Poole, 1111
- Radio-Helium, Dr. T. Bjerger, 400; β -Ray Spectrum, Dr. T. Bjerger and Dr. K. J. Broström, 400
- Radiology: British Institute of, Annual Congress and Exhibition, 1024
- Radium: E, Continuous β -Spectrum of, Form of the, M. Lecoq, 414; Therapy Technique, Advances in, 611
- Railway: Electrification, Economics of, 280; Signals for Fogs, A. E. Tattersall, 766
- Raman: Spectrum: of Cyclopropane, R. Ananthakrishnan, 123; of Gallic Acid, of Some of its Derivatives and of Tannin, B. Susz and S. Fried, 259; of Thiophosphoryl Chloride, Prof. V. N. Thatte, 468; Spectra of Substances, Excitation of, with the Aid of 'Optical Catalysts', Prof. K. Prosad and D. K. Bhattacharya, 510; Spectrum of Hydrazine and its Hydrate, L. Kahovec and K. W. F. Kohlrausch, 562; Effect: of a Tungstotartaric Complex Compound in Water, Mlle. Marie Théodoresco, 812; and Molecular Structure of Nitric Anhydride, J. Chedin and Mme. Jeanne Cieutat Pradier, 855; in Absolute Perchloric Acid, R. Fonteyne, 886; and Organic Chemistry: The Structure of the 'Oses' and the Raman Effect, J. Wiemann, 896
- Ramsay memorial fellowships, awards to Dr. E. D. Hughes, R. R. Gordon and Dr. D. Porret, 584
- Rana pipiens* Schreber, Hatching Secretion in, K. W. Cooper, 415
- Ranunculaceæ, Vascular Supply to the Follicle-bearing, Mabel S. Fraser, 896
- Rat, The, Your Enemy—(film), 837
- Rational Quartic Curve in Space of Three and Four Dimensions: The, being an Introduction to Rational Curves, Miss H. G. Telling (*Review*), 905
- Rats, White, and Lamarckism, Prof. F. A. E. Crew, 689
- Rayon Industries, Wood Pulp for the, L. Hebbs, 175
- Rayons cosmiques, Prof. B. Rossi (*Review*), 100
- Reaction Kinetics and the Walden Inversion, W. A. Cowdray, Dr. E. D. Hughes and Prof. C. K. Ingold, 759

- Reactions, Rapid, Velocity of, F. J. W. Roughton and G. A. Millikan, 130
- Reading University, bequest by Dr. A. Palmer; G. E. H. Palmer elected a member of the university council; G. T. H. Kimble appointed lecturer in geography, 136
- Rearmament: Alternative to, J. Griffin (*Review*), 1071; and the League of Nations, 1071
- Reason, The Retreat from, Prof. L. Hogben (Conway memorial lecture), 139
- Recollections and Reflections, Sir J. J. Thomson (*Review*), 989
- Rectangular Tubes, Torsion of, W. Hovgaard, 378
- Red: Blood Corpuscles of Primitive Mammals, The, Prof. E. A. Briggs, 762; Centre: The, Man and Beast in the Heart of Australia, H. H. Finlayson (*Review*), 1074
- Reductinic Acid, Dissociation Constants of, and its Product of Oxidation by Iodine, G. Carpeni, 1112
- Reference Frames, Intrinsic Uncertainty of, M. S. Bartlett, 401
- Refrigeration: Seventh International Congress of, Dr. E. Griffiths, 229; for the Farm and Dairy, C. A. Cameron Brown, 649
- Reindeer Grazing, E. Porsild, 293
- Reinforced Concrete Structures, The Design of, Prof. D. Peabody, jun. (*Review*), 634
- Relativistic Problem of Two Bodies, Prof. T. Levi-Civita, 171
- Religion—A Changing Force? 1
- Research: and Finance, 51, 156, 714; Fellowships and Grants, 134; Experimental, and Disease, Sir Malcolm Watson (Stephen Paget memorial lecture), 197; Method of, on Broader Philosophic Principles, Prof. J. L. Myers (im Thurn memorial lecture), 395; Co-ordination Group, 1005
- Research, The Royal Research Ship, Dr. H. Spencer Jones, 230
- Reservoirs, Silting of, H. M. Eakin, 806
- Resonators, Adjustable, and Orchestration, Prof. W. A. Osborne, 1059
- Respiratory Dust Disease in the Cotton Industry, Prof. C. Prausnitz, 370
- Reynolds, Osborne, Ridge, Prof. H. Stansfield, 20; K. G. Denbigh, 612
- Rhododendrons and Azaleas: Their Origins, Cultivation and Development, C. G. Bowers (*Review*), 632
- Riberi prize, award of the, to Prof. F. Pentinalli, 615
- Rice: Grain, The Amylase System of, during Ripening and Germination, K. Venkata Giri and A. Sreenivasan, 406; Origin of, Dr. H. K. Nandi, 1104
- Rift Valley, Ecology of Alkaline Lakes of the, Penelope M. Jenkin, 554
- River: Bores, Measurement of, Dr. H. Chatley, 207; Flow Records, Work of, Capt. W. N. McClean, 582
- 'Road: Runner' of North America, The, Prof. T. D. A. Cockerell, 166; Transport Vehicles, 322; Traffic, Automatic Control of, F. A. Downes, 472; Rail and Fuel, Sir Philip Dawson, 752; Aggregates: Their Uses and Testing, Dr. B. H. Knight (*Review*), 951; Lighting, Visual Acuity and Speed of Vision in, P. J. Bouma, 1103
- Roads, Safety on the, Sir Herbert Blain; A. Matheson, 198
- Rock: Salt, Quantum Yield in the Coloration of, by X-, γ - and β -Rays, I. Leitner, 415; Garden, New Conceptions of a, Prof. J. Phillips, 459; Drawings and Paintings of the High Plains, U.S.A., Prof. E. B. Renaud, 1061; Gardens and Rock Plants. Edited by F. J. Chittenden, 1049
- Rockefeller Foundation, Report for 1935, 501
- Rocks: Elastic Properties of, J. M. Ide, 775; Permanent Magnetization of, Direction of, E. Thellier, 856
- Roentgen Rays, American Martyrs to Science through the, Dr. P. Brown (*Review*), 634
- Roman: Empire, Eastern Frontiers of the, Projected Survey by Sir Aurel Stein, 68; Leicester, Excavations at, Miss Kathleen Kenyon, 69; Sites and the National Trust, 156
- Romano-British Pottery Kiln from Berkshire, 962
- Romantic Impulse, Control of the, through Education, P. H. Landis, 558
- Römer's, Ole, Meridian Observations and the So-called Mayer Formula for the Correction of the Observed Time of Transit for Instrumental Errors, E. S. Ström-gren, 695
- Röntgenographie, Die, Allotropie der chemischen Elemente und die Ergebnisse der, M. C. Neuburger (*Review*), 9
- Rotating Hollow Cylinders, Centrifuging in, Dr. E. A. Hauser and C. E. Reed, 975
- Royal: Academy, Dr. H. J. Plenderleith appointed professor of chemistry at the, 24; Meteorological Society, award of the Howard prize to Cadet John Burton Davies, 24; Society of Edinburgh, election of honorary fellows, 67; Anthropological Institute, election of officers; award of the Rivers memorial medal to Prof. P. H. Buck (Te Rangī Hiroa) and of the Wellcome gold medal to Dr. Lucy Philip Mair, 72; Academy: of Sciences of Stockholm, Prof. P. Uhlenhuth nominated a foreign member of the, 199; of Belgium, awards of the, to Wattiez, Sternon, R. Bouillenne and J. Brachet, 240; College of Physicians, award of the Weber-Parkes medal to Sir St. Clair Thomson, and the Moxon gold medal to Prof. E. Mellanby, 240; Veterinary College, Prof. J. B. Buxton appointed acting principal and acting dean, and to succeed Sir Frederick Hobday as principal and dean on Sir Frederick's retirement, 282; Academy: of Sciences of Amsterdam, Dr. M. Ehrenstein awarded a Van't Hoff prize of the, 324; of Belgium, Sir Arthur Smith Woodward, Sir Charles Sherrington, M. Ruzicka and M. Bottazzi elected associates, and Prof. F. Van den Branden and Prof. H. Frederieq *correspondants* of the, 502; Swedish Academy of Engineering Science, Prof. F. Körber elected a corresponding member of the, 502; Navy, Steam Department of the [1836], 598; Society: of New Zealand, award of the T. K. Sidey summertime memorial medal and prize to Sir Leonard Hill, 682; of Edinburgh, election of officers, 756; Society, award of Royal medals to Prof. R. H. Fowler and Prof. E. S. Goodrich, the Copley medal to Sir Arthur Evans, the Rumford medal to Prof. E. G. Coker, the Davy medal to Prof. W. A. Bone, the Darwin medal to Dr. E. J. Allen and the Hughes medal to Dr. W. Schottky, 833; election of officers, 833; of Arts, One Hundred and Eighty Years of Pioneer Work by the, Sir Henry McMahon, 834; Dublin Society, retirement of Dr. E. Bohane, 838; Aeronautical Society, gifts to the, by C. R. Fairey and F. Handley Page, 927; Agricultural Society, presentation to Walter Elliot of a certificate and badge of honorary life governorship and to Sir William Cecil Dampier of the Society's gold medal and honorary membership, 1050; Meteorological Society, award of the Buchan prize to C. S. Durst, 966; Society: Research Funds, 961; Anniversary Meeting of the, and presentation of medals, 979; of Arts, institution of the distinction of D.I. (Designer for Industry), 1007; Horticultural Society, award of a Veitch memorial gold medal to Sir Arthur Hill, 1093
- Rubber: Latex, H. P. and W. H. Stevens. Revised edition, 110; Tree, Diseases and Pests of the, A. Sharples (*Review*), 661; Trees, Rejuvenating Old, Dr. W. B. Haines, 936
- Rubidium: Displacements of the Higher Members of the Principal Series of, by the Rare Gases, Ny Tsi-Zé and Ch'en Shang-Yi, 476; in the Presence of Foreign Gases, Continuous Absorption Band of, Ny Tsi-Zé and Ch'en Shang-Yi, 1055
- Rules of Nomenclature in the Case of Bohadoch 1761, Proposed Suspension of, Dr. C. W. Stiles, 206
- Rural: Custom in Civilized Communities, R. U. Sayce; L. Franchet, 253; E. Rosenthal, 254; Life, Education for, Sir John Russell; H. Morris; Prof. N. M. Comber; T. S. Dymond; G. W. Pierce; Sir Arnold Wilson, 891

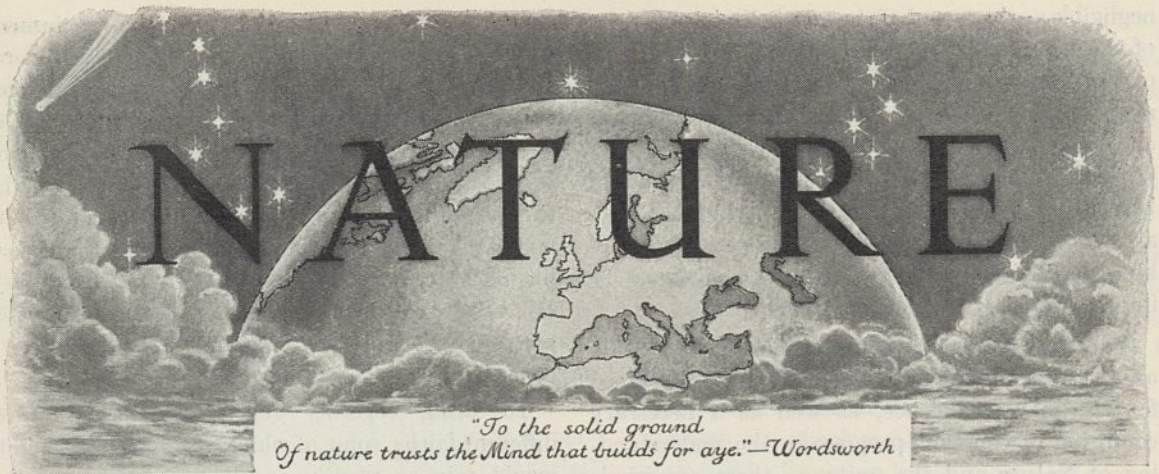
- Rush, Benjamin, Physician and Citizen, 1746-1813, N. G. Goodman (*Review*), 663
- Russell, Lord John, and the University of London [1836], 1025
- Russia, Sudden Deaths and Suicides in [1836], 338
- Russian Population, Origins of the, Dr. A. Bachmakoff, 1061
- Rye, Winter, Vernalization of, during Ripening, Prof. F. G. Gregory and O. N. Purvis, 973; Devernization of, by High Temperature, Prof. F. G. Gregory and O. N. Purvis, 1013
- Saccharide Chains in Glycogens from Different Sources, Length of, D. J. Bell, 289
- Safety in Mines Research Board, Fourteenth Annual Report, 540
- Saints and Martyrs, Dr. D. Hunter, 1048
- St. Albans High School for Girls, Observatory for, 753
- St. Andrews University: J. N. Wright appointed professor of logic and metaphysics; T. M. Knox appointed professor of moral philosophy, 89; Bequest by Miss Edith Mary Valentine Scott Lang, 853
- St. Bartholomew's Hospital Medical College, Dr. W. J. Hamilton appointed professor of anatomy, 176
- St. James's Ornithological Society [1836], 942
- Saline Hydrates, R. Dubrisay and J. Lefol, 476
- Salmon Fisher's Sons, Letters to a, A. H. Chaytor. Fourth edition (*Review*), 308
- Salt Systems, Equilibria in, with Deuterium Water, F. T. Miles, R. W. Shearman and Prof. A. W. C. Menzies, 121
- Samarium, Ranges of Particles emitted by, L. Lewin, 326
- Sands, Clays and Minerals, April, 22
- Scandinavia, Ancient, and Oceania, Boat Construction in, J. Hornell, 765
- Scenery, English, Preservation of, Dr. Vaughan Cornish, 538
- Schlacke und Vitamine, Prof. H. Salomon (*Review*), 905
- Schönbein and Faraday [1836], 475; 941
- School Libraries, Dr. C. Norwood, 597
- School Nature Study, July, 110
- Schwammspinner, Der (*Porthetria dispar* L.) in Euroasien, Afrika und Neugland, Dr. K. E. Schedl (*Review*), 704
- Science: News a Century ago, 47; 90; in the Public Press, 93; in Schools, The Teaching of, H. S. Shelton, 127; News a Century ago, 137; Museum, South Kensington, Report for 1935, 157; News a Century ago, 177; in Schools, The Teaching of, J. A. Lauwerys, 205; News a Century ago, 215; 257; and Armaments, 261; Museum, Recent Acquisitions at the, 279; News a Century ago, 299; 337; Museum Library, Classification for works on Pure and Applied Science in the, 359; News a Century ago, 376; Nature and Purpose of, Dr. N. R. Campbell (*Review*), 381; News a Century ago, 413; and the Community, 417; The Impact of, upon Society, Sir Josiah Stamp, 435; News a Century ago, 475; and Culture, 479; and Social Values, President Roosevelt, 498; Museum, Smoke Abatement Exhibition at the, 499; and Electric Lighting, C. C. Paterson, 515; at the International Peace Congress, C. Dover, 516; News a Century ago, 518; and the Glasshouse Industry, Dr. W. F. Bewley, 556; News a Century ago, 559; in General History, The Place of, 575; Cultural and Social Values of, Sir Richard Gregory, Bt., 594; Prof. L. Hogben, 595; Sir A. D. Hall, 596; News a Century ago, 598; Ancient, The Growth of, Dr. T. Greenwood (*Review*), 630; Forthcoming Books of, 637; News a Century ago, 655; Museum, Early Photographic Instruments at the, 681; News a Century ago, 694; The Social Mission of, 697; and Mathematics, History of (*Review*), 700; History of, The Study of the, Dr. G. Sarton (*Review*), 700; News a Century ago, 732; Outposts of, A Journey to the Workshops of our leading Men of Science, B. Jaffe (*Review*), 740; News a Century ago, 773; and the Poultry Industry, P. A. Francis, 789; Museum, Recent Acquisitions at the, 836; News a Century ago, 854; in Development, Lord Rutherford (Norman Lockyer lecture), 865; News a Century ago, 941; The Indian Institute of, 945; News a Century ago, 983; 1025; General: The Teaching of, 1030; for Secondary Schools, 1030; News a Century ago, 1068; Museum, Illumination Research at the, 1107; News a Century ago, 1110
- Sciences: Histoire des, Antiquité, P. Brunet et A. Mieli (*Review*), 630
- Scientific: and Technical Books, Recent, July 25, v; August 29, v; September 26, v; October 31, iii; December 5, vii; December 26, iii; Research, Colonial Policy and, W. G. A. Ormsby-Gore, 3; *Horticulture*, 22; Workers and War, Dr. E. Barrow and others, 80; and Technical Literature, Improvement of, Commdr. T. W. Macalpine, 398; Discovery, Joy in, Prof. D. F. Fraser-Harris, 498; Investigation, Under-secretary for, in the French Cabinet, resignation of Mme. Joliot-Curie, appointment of Prof. M. J. Perrin, 797; and Industrial Research, Advisory Council to the Committee of the Privy Council for, Viscount Falmouth appointed a member of the, 927; Workers, Professional Associations of, Dr. W. A. Wooster, 1017
- Scientist in Action: The, a Scientific Study of his methods, Dr. W. H. George (*Review*), 381
- Scientists and War, Dr. C. N. Acharya, 469
- Scotland: Roman, Frontier System in, 279; The South of, Dr. J. Pringle, 391; The Tertiary Volcanic Districts, J. E. Richey, 391
- Scottish: Tertiary Coals, Fossil Pollen in, Dr. J. B. Simpson, 48; Highlands, Development of the, 771
- Scyllium canicula*, Colour in the Dogfish, H. Waring, 1100
- Sea: Trout and Trout, W. J. M. Menzies (*Review*), 318; Urchins (*Review*), 344; Urchin Eggs in Different Latitudes, Rates of Cleavage of, Prof. H. Munro Fox, 839
- Seals in Cornwall, G. A. Steven, 370
- Seefische Nordeuropas, Naturgeschichte und wirtschaftliche Bedeutung der, Prof. E. Ehrenbaum (*Review*), 57
- Seismicity, Palaeozoic, Dr. A. Lamont, 243
- Seismograph Stations, Reliability of, R. C. Hayes, 463; Dr. H. Jeffreys, 464
- Seismology: Progress in, 613; Bibliography of, E. A. Hodgson, 836
- Selection, Genetics and Ecology in relation to, Dr. J. S. Huxley and others, 748
- Selenium, Liquid, Density of, S. Dobinski and J. Wesolowski, 301
- Sepiolites, The, H. Longchambon and G. Migeon, 561
- Serbian Gypsies, Marriage among, Dr. A. Petrovič, 370
- Sex: Change in a Fish, Kinoshita, 40; Hormones, Action of, E. Steinach, H. Kun and O. Peczenik (1), 49
- Shade-Trees, Insect Enemies of, Prof. G. W. Herrick (*Review*), 386
- Sheep and Wool Production in North-Eastern Asia, I. Clunies Ross, 1103
- Sheffield University: N. S. Boulton appointed lecturer in civil engineering, W. S. Milner lecturer in electrical engineering and W. S. Rees demonstrator in anatomy, 136; Mining and Fuel Research in, 1934-35, 281; Additions to, 610; Dr. R. Rado appointed assistant lecturer in mathematics, T. L. Morgan assistant lecturer in civil engineering and Dr. W. A. Kirkby lecturer in fuel technology, 693; Prof. F. C. Lea and Prof. J. Husband given the title of emeritus professor; Dr. K. Mellanby appointed honorary lecturer in zoology, Mrs. H. Mellanby honorary research assistant in zoology, and J. E. Stanworth and F. R. Harris research fellows in glass technology; resignation of Dr. J. O. Paisley, 895; J. L. A. Grout appointed lecturer in radiological anatomy, G. Clark, junior assistant bacteriologist and W. A. Timperley research fellow in physiology, 1067
- Shetland, Antiquities in, L. Mann, 512
- Siamese Twins, The [1836], 178
- Sidereal Time, Variation of Cosmic Ray Intensity with, Dr. B. F. J. Schonland, B. Delatizky and J. P. Gaskell, 325
- Signals for Triangulation, Major M. Hotine, 254

- Silica : Fused, The 2-73 μ Absorption Band in, Dr. D. G. Drummond, 248 ; Colloidal, in Natural Waters and the 'Silicomolybdate' Colour Test, Dr. A. R. Tourky and Prof. D. H. Bangham, 587
- Silicichloroform, Geometrical Constitution of, Prof. M. de Hemptinne and J. Wouters, 884
- 'Silicomolybdate' Colour Test, Colloidal Silica in Natural Waters and the, Dr. A. R. Tourky and Prof. D. H. Bangham, 587
- Silicon : Organic Derivatives of, Prof. F. S. Kipping (Bakerian lecture), 41 ; Oxidation of, Minimum Temperature of, C. Bedel, 519 ; in the Plant, Role of, A. Sreenivasan, 889
- Silk Fibre, Sorptive Properties of the, Dr. R. Cuthill, 175
- Silkworm (*Bombyx mori* L.), Artificial Parthenogenesis in the, B. Astaurov, 656
- Silver : -Gold Alloys, Quantitative Analysis of, Winifred Mannin, 260 ; Neutrons in, Selective Absorption of, E. H. S. Burhop, R. D. Hill and A. A. Townsend, 1094 ; Activation of, by Neutrons, Prof. G. Guében, 1095
- Skin-Friction in Aeronautics, The Part Played by, Dr. F. W. Lanchester, 1022
- Small Craft Types, J. A. Mavor, 1092
- Smoke Abatement Exhibition, National, H. J. Hodsman, 728
- Smuts, General, Mrs. Sarah Gertrude Millin. 2 Vols., R. Brightman (*Review*), 569
- Snow Structure and Ski Fields, G. Seligman ; with an Appendix on Alpine Weather, by C. K. M. Douglas (*Review*), 481
- [SO₃]₂, Prof. H. E. Armstrong, 26
- Social : Reconstruction, International Economics and, 341 ; Life in a Rural Community, 581 ; Mission of Science, The, 697 ; Analysis, A, Sir Daniel Hall (*Review*), 779 ; Anthropology, Methods in, Prof. E. Westermarck (Huxley memorial lecture), 808 ; Change, Authority and Resistance to, Prof. J. Dewey, 915
- Sociedad Cubana de Biología, Prof. E. Abderhalden nominated an honorary member of the, 1008
- Société de l'Industrie Minérale, election as honorary members of Sir Robert Hadfield, Bt., Dr. C. E. Guillaume, Prof. L. Denoël and Prof. P. Fourmarier, 18
- Sodium : and Potassium Films, Transparency of, in the Schumann Region, Prof. W. H. Watson and D. G. Hurst, 124 ; and Water Metabolism in relation to Disturbances of Carbohydrate Metabolism after Adrenalectomy, Prof. F. Verzar and L. Laszt, 844 ; Chloride, Ultra-Violet Luminescence of, Prof. M. Schein and M. L. Katz, 883
- Soil : Science : Prof. J. Hendrick, 457 ; Fertilizers and General Agronomy, Bibliography of (*Review*), 485 ; and Pasture Studies in the Mount Gellibrand Area, Western District of Victoria, G. W. Leeper, Ann Nicholls and S. M. Wadham, 520 ; Profile Development, Normal Erosion as a Factor in, G. Milne, 549 ; Classification, Prof. G. W. Robinson, 729 ; Moisture in the Field, Behaviour of, Dr. R. K. Schofield, 729 ; Science), Pedology at the British Association, 729 ; Studies, Development of, Prof. J. Hendrick, 729 ; Humus, Direct Oxidation of, C. B. Greening, 848 ; Science in the Twentieth Century, Prof. J. Hendrick, 995 ; Drift in South Australia, 1039
- Soils : Their Origin, Constitution and Classification, Prof. G. W. Robinson. Second edition (*Review*), 9
- Solar : Eclipse, Total, of June 19 : The Corona during the, Prof. M. Navashin, 73 ; Observations at Omsk, Prof. J. A. Carroll, 349 ; Activity and Terrestrial Phenomena, 397 ; System, Evolution of the, 532 ; Corona, Proportion of Polarized Light in the, J. Dufay and H. Grouiller, 599 ; Temperature, W. W. Coblentz and R. Stair, 690 ; Eruptions, Bright, Radio Fadings and, H. W. Newton, 1017 ; Rays, Rev. J. B. Reade on [1836], 1068
- Solo Man, Cultural Associations of, Dr. P. van Stein Callenfels, 293
- Solubility of Non-Electrolytes, Prof. J. H. Hildebrand. Second edition (*Review*), 742
- 'Solute', Origin of the word, Prof. J. R. Partington, 646
- Solutes in Plants, Translocation of, Dr. A. C. Léemann, 1099
- Solutions : concentrées, Les, Prof. J. Timmermann (*Review*), 306 ; Concentrated (*Review*), 306
- Sound : Light and, H. G. Lambert and P. E. Andrews (*Review*), 183 ; Localization, Differential Sensitivity in, M. Upton, 415 ; Insulation by Double Partitions, J. E. R. Constable, 890 ; Vibrations, Some New Phenomena Produced by, Prof. F. L. Hopwood, 1059
- Southampton, University College, Dr. H. S. Ruse appointed professor of mathematics in, 1067
- South : -Eastern Union of Scientific Societies, Annual Congress at Oxford, 88 ; Prof. F. E. Weiss elected president for 1937, 89 ; Africa, Industrial Development in, and Facilities for the Establishment of Factories. Edited by Dr. V. Bosman, 256 ; Australia, Wind Erosion in, F. N. Ratcliffe, 358 ; Africa, Research Grant Board, Report for 1918-35, 542 ; Australia, Mining in, 582 ; Wales, Map of, showing the Distribution of Long Barrows and Megaliths, F. W. Grimes, 613 ; Africa, Science in, Earl of Clarendon, 713 ; America, Archaeology of, E. J. Thompson, 716 ; London Entomological and Natural History Society, *Proceedings and Transactions of the*, 1935-36, 718 ; Sandwich Trench, Dr. N. A. Mackintosh, 726 ; African Marine Fishes of Commercial and Angling Importance, J. M. Marchand, 796
- Soviet : Mineral Resources, The Scientific Study of, A. E. Fersman. Edited by C. P. Dutt (*Review*), 97 ; Arctic Stations, Prof. J. Schokalsky, 593 ; Medical Encyclopædia, Completion of the, 966
- Space-Time, Discrete, Dr. L. Silberstein, 807
- Special Libraries and Information Bureaux : Association of, Annual Conference at Oxford, 597
- Species Nightmare : an Absorbing Scientific Problem, F. Chapman, 539
- Specific Heats of Liquids and Gases, R. Lucas, 896
- Spectrograph, Automatic Recording, for the Near Infra-red (6000-9500Å.), P. Barchewitz and A. Naherniac, 855
- Spectroscope in the Observatory, Prof. R. A. Sampson, 1006
- Spectroscopie appliquée, La, P. Swings (*Review*), 269
- Speech, Origins of, and the Orang-utan, Prof. C. J. Connolly, 977
- Spiders of Lahore, S. Dyal, 1104
- Spiritual Healing, Rev. Leslie D. Weatherhead, 277
- Spirogyra*, Creeping Movements of, D. R. Chesterman and C. L. Foster, 403
- Splashes and what they teach, Prof. Allan Ferguson, 499
- Sponges of the North Sea and Baltic, Dr. W. Arndt, 333
- Spontaneous Combustion [1836], 694
- Spotted Wilt Virus and the Hormone Heteroauxin, Dr. B. J. Grieve, 129
- Squirrel, Male Grey, Chromosomes of the, P. C. Koller, 178
- Staphylococcus*, Effect of Sodium Mono-iodoacetate on the Respiration of the Yellow, F. Chodat and G. Carrisson, 985
- Starlight, Selective Absorption of, by Interstellar Clouds, F. H. Seares, 378
- Stars : of the Spectral Types A0, A2, Colour of, V. Maitre, 90 ; and Nebulae, certain types of, Continuous Spectra of, Dr. W. M. Cohn, 127 ; B-type, Spectra of, E. G. Williams, 334 ; and Telescopes, J. Stokley (*Review*), 821 ; Effective Temperature of, Approximate Expression of the Colour Index as a Linear Function of the Inverse of the, P. Rossier, 985
- Statistical : *Research Memoirs*. Vol. 1, 252 ; Desiderata [1836], 257
- Statistics : Application of, to Commerce [1836], 773 ; Consumption of, Lord Kennet, 876
- Steam Locomotive Design, D. Patrick, 1092
- Steamship Communication between Europe and America, H. G. Leivesley, 925
- Stearin from Chilled Olive Oil, Inhibited Deposition of, Dr. W. Clayton, S. Back, R. I. Johnson and J. F. Morse, 801

- Steels Treated with Hot Hydrogen under Pressure, Mechanical Properties of, L. Jacqué, 985
- Steering Gear, Electrically Driven, H. G. Leivesley, 555
- Stellar : Atmospheres, Speed of Corpuscles ejected from, Y. Hagihara, 301 ; Proper Motions, Catalogue of, Dr. R. Schorr, 767 ; Atmospheres, Dissociation Energy of Carbon Monoxide and the Abundance of Elements in, M. Nicolet, 1097
- Sterckfontein Ape, The, Dr. E. Schwarz, 969
- Stereochemical Investigations, Use of Deuterium as an Indicator in, Prof. H. Erlenmeyer, H. Schenkel and A. Epprecht, 547
- Stereoscopic Photography : its Application to Science, Industry and Education, A. W. Judge. Second edition (*Review*), 637
- Stick : Insect, The Common, Sister Carmela Hayes, 886 ; Insects, Feeding Habits of, S. T. E. Dark, 1058
- Stocks, New Disease of, W. M. Ware, 766
- Stoebe, The genus, Mrs. M. R. Levyns, 217
- Stork Experiments, Anglo-German, 108
- Stratosphere : Oxygen Content of the, Prof. E. Regener, 544 ; Flight, 676 ; The Chemical Exploration of the, Prof. F. A. Paneth, 834
- Straw, Two Ends of, Dr. H. Nicol, 398
- Streamlined Trains, L. K. Silcox, 238
- Streptococcus apis*, Relation of so-called, to certain Lactic Acid Streptococci, Dr. J. G. Davis and Dr. H. L. A. Tarr, 763
- Structure : -Factor Graphs for Crystal Analysis, Prof. W. L. Bragg, 362 ; Determination, A Reagent for, R. Connor and J. H. Van Campen, 372 ; Factor and Electron Density Formulae, Dr. J. M. Robertson (*Review*), 627 ; Simplified, and Electron Density Formulae for the 230 Space Groups of Mathematical Crystallography, Dr. Kathleen Lonsdale (*Review*), 627
- Structures : in Sea Water, Deterioration of, Dr. B. Cunningham, 148 ; of Timber, Metal and Concrete exposed to the Action of Sea-Water, Deterioration of, Fifteenth Report. Edited by S. M. Dixon and H. J. Grose, 148
- Sturgeon's *Annals of Electricity*, 559
- Südamerikas, Geologie, Prof. H. Gerth. Teil 2 (*Review*), 147
- Sugars : Maple and Cane, Lead Values in, P. Riou and J. Delorme, 138 ; from the Intestine of Rat and Pigeon, Relative Velocities of the Absorption of Different, Dr. H. G. K. Westenbrink, 203
- Suicide : Scientific Study of, 583 ; at Aberdeen, Statistics of [1836], 773
- Sulfuric Acid Manufacture, A. M. Fairlie (*Review*), 568
- Sulphuric and Orthophosphoric Acids, An X-Ray study of, J. T. Randall, 842
- Sumerian Art History, Racial Elements in, Sir Leonard Woolley, 69
- Sun : Eclipse of the, of June 19, 1936, E. Esclançon, 216 ; Eclipses of the, Prof. S. A. Mitchell. Fourth edition (*Review*), 823
- Sundabogens : Die Geschichte des, eine tiergeographische Untersuchung, Dr. B. Rensch (*Review*), 622
- Sunspot, A Large, 399
- Sunspots, Three Large, 965
- Super-novæ, Physical Condition of the, Cecilia Payne Gaposchkin, 378
- Supraconductivity : Destruction of, by Electric Current and Magnetic Field, L. W. Shubnikov, 545 ; Transition Curve for the Destruction of, by an Electric Current, L. W. Shubnikov and N. E. Alexejevski, 804
- Supraconductors, Time Effects in, K. Mendelssohn and R. B. Pontius, 29
- Surface Forces, Range of Action of, Dr. B. Derjaguin, 330 ; Dr. J. M. Macaulay, 587
- Suspended Animation [1836], 215
- Sussex, Fauna of, N. F. Ticehurst and others, 592
- Swallows in Britain, A. W. Boyd, 553
- Swedish Academy of Sciences, Prof. C. Neuberg elected a foreign member of the, 502
- Swinton, Campbell, and Television, Dr. J. D. McGee, 674
- Switchgear, Testing, 877
- Switzerland, Teaching Electric Cookery in, 754
- Symbols for Heat and Thermodynamics, 281
- Syndrome produced by Diverse Nocuous Agents, A. Prof. H. Selye, 32
- Syria : and Crete : Further Discoveries, Sir Leonard Woolley, 20 ; Archaeological Investigations in, Sir Leonard Woolley, 235 ; Ancient, Minoan influences in, Sir Arthur Evans, 357
- Systematists and Text-Books, Dr. L. D. Brongersma, 280
- Tables annuelles de constantes et données numériques de chimie, physique, biologie et technologie, Dr. M. Magat. Années : 1931 à 1934 (*Review*), 743
- Teak Squares, Grading of, L. N. Seaman and V. D. Limaye, 1007
- Technical Collège Equipment, 433
- Telegraph Services, British, Developments in, L. H. Harris, E. H. Jolley and F. D. Morrell, 893
- Telephone Development in Birmingham, 541
- Telescopes : Astronomical, Dr. H. Spencer Jones (*Review*), 739 ; Stars and, J. Stokley (*Review*), 821 ; Through the, a Story of the Stars, Prof. E. A. Fath (*Review*), 821
- Telev viewers, All manner of (*Review*), 421
- Television : in the Home, 394 ; M. G. Scroggie (*Review*), 421 ; Popular, H. J. B. Chapple (*Review*), 421 ; Reception, Baron M. von Ardenne. Translated by O. S. Puckle (*Review*), 421 ; Demonstrations in London, 815 ; Campbell Swinton and, Dr. J. D. McGee, 674 ; Service, B.B.C., Opening of, 793 ; in the London Area, 962
- Tell Duweir, Palestine, Excavations at, 1935-36, 135
- Temminckia* : a Journal of Systematic Zoology. Edited by Prof. H. Boschma. Vol. 1 (*Review*), 98
- Temperature Scale, The, Prof. Keesom and Dr. W. Tuyn, 977
- Temperatures : below 1° K., Dr. F. Simon, 190 ; Low, and their Industrial Uses, 190
- Températures, Mesure des, Prof. G. Ribaud (*Review*), 905
- Terminology in Physics, Prof. C. G. Darwin, 908
- Terms used in Nutrition, Plea for Scientific Definition of, Sir Josiah Stamp, 746
- Terrestrial Magnetism in Chile [1836], 216
- Tertiary Igneous Rocks (Antrim and Staffa), New Analyses of, Prof. A. Holmes, 300
- Tetranitromethane, Constitution of, Prof. C. Krauz and Dr. J. M. Štěpanek, 807 ; Prof. R. Robinson, 975
- Tetraploidy and Hymenoptera, F. Greenshields, 330
- Textile Institute, Journal of the*, W. J. Hall appointed technical editor of the, 543
- Thermal Neutrons in Silver at Low Temperatures, Absorption of, V. Fomin, F. G. Houtermans, I. W. Kurtshatov, A. I. Leipunski, L. Shubnikov and G. Shtshepkin, 326
- Thiochrome, Aneurin and, The Structure of, F. Bergel and A. R. Todd, 76 ; 119 ; 406
- Thiocyanogen, Sulphide, Selenide and Thioselenide of, A. Baroni, 340
- Thiophosphoryl Chloride, Raman Spectrum of, Prof. V. N. Thatte, 468
- Thorium : Uranium and, Atomic Masses of, Prof. A. J. Dempster, 120 ; Artificial Radioactivity of, Elisabeth Rona and Elisabeth Neuninger, 657
- Threads, Rotating, Stability of, H. W. Hall, 932
- Thulium, Artificial Radioactivity of, Elisabeth Rona and Elisabeth Neuninger, 657
- Thunderstorms : British, E. G. Bilham, 851 ; Continuing Summer Thunderstorms. Fourth Annual Report, 1934, S. M. Bower and others. Vol. 2, Part 1, 851
- Thyratrons, Changing Direct Current to Alternating Current by means of, A. W. Hull, 415
- Thyroglobulin, Association and Dissociation Reactions of, Dr. H. P. Lundgren, 122
- Tibet, Plant Hunting and Exploration in, Capt. F. Kingdon-Ward, 516
- Tibetan Blood Groups, Prof. R. R. Gates, 293
- Tierreich, Das, Lief. 65, Bearbeitet von F. Bryk (*Review*), 146

- Tiere Deutschlands, Biologie der, Herausgegeben von Prof. P. Schulze. Lief. 37. Teil 26: Orthopteroidea II, Phasmodea, Saltatoria. Von M. Beier. Lief. 38. Teil 9: Acanthocephala, Kratzer, von F. Bock; Teil 31: Hemiptera III, von H. Weber (*Review*), 528
- Timbers, Structural, Strength Tests of, C. J. Chaplin and E. H. Nevard, 129
- Tissue: Cells, Electrolytes and a General Phenomenon in, Prof. H. Grossfeld, 31; Normal and Tumour, Comparative Effects of X-Rays and Neutrons on, J. H. Lawrence P. C. Aebersold and E. O. Lawrence, 943
- Tissues, Analysis of, for Metallic Content, H. Ramage, 762
- Titanium Salts, Electrolysis of Solutions of, Mme. H. Emmanuel-Zavizziano and M. Haïssinsky, 414
- Toad, Common, Spawning of the, G. Shrubsole, 835
- Tobacco: Mosaic Virus, Inhibitors of, Dr. J. Caldwell, 83; Downy Mildew of, Control of, Dr. H. R. Angell, J. M. Allan and A. V. Hill, 334
- Tomato Plants, Effect of Phenylacetic Acid on the Growth of, Dr. H. L. Pearse, 363
- Tonal Brightness, Nature of, E. G. Boring and S. S. Stevens, 775
- Topics of the Age for Everyman (*Review*), 901
- Toronto University, Dr. D. D. van Slyke awarded the Charles Mickle fellowship, 282
- Total Solar Eclipse, Auroral Phenomena and the Behaviour of the Ionosphere during a, Prof. L. Vegard, 974
- Trajectories in Calibrations, Errors produced by the Inclination of the, carried out by means of Hydrometric Screws with Counting Gear, L. Escande and G. Sabathe, 984
- Trans-Atlantic Steam Navigation [1836], 47
- Transformer Testing, Impulse Voltages for, Dr. T. E. Allibone, D. B. McKenzie and F. R. Perry, 937
- Transport: Development of, Sir Alexander Gibb, 794; Land, Sir Philip Dawson, 892
- Travancore, Temples and Castes in, Maharajah of Travancore, 875
- Tree: -Ring Chronology in American Prehistory, 315; Stem of a, Convection of Heat and Materials in the, Prof. H. H. Dixon, 1111
- Trees: Old, Care of, A. D. C. Le Sueur, 109; and Shrubs Hardy in the British Isles, W. J. Bean. Vol. 3 (*Review*), 346; and Shrubs, New Ornamental (*Review*), 346; and Shrubs, The Identification of, F. K. Makins (*Review*), 348; Pacific Coast, An Illustrated Manual of, Prof. H. E. McMinn and Evelyn Maino, with list of trees recommended for various uses on the Pacific Coast, Prof. H. W. Shepherd (*Review*), 570
- Tridacna* and its Relatives, Biology of, 473
- Tridacnidae, Mode of Life, Feeding, Digestion and Sym-biosis with Zooxanthellae in the, Prof. C. M. Yonge, 473
- Triodes, with Large Diameter Plate in very High Frequencies, Properties of, E. Pierret, 339
- Tripolje Settlement in Kiev Province, 1103
- Triterpene Group, A Novel Interrelationship in the, J. H. Beynon, Prof. I. M. Heilbron and Dr. F. S. Spring, 1017
- Trout Heresy, P. B. M. Allan (*Review*), 308
- Tube Trains, New, in London, 925
- Tuberculosis: Prevention of, 158; and Inheritance, Prof. R. Pearl, 333; and Cattle, 717
- Turbines, Multi-Cylinder Steam, J. T. Moore, 849
- Turf Nurseries, Sir John Stirling Maxwell, 298
- Turkey, Modern, The Making of, from Byzantium to Angora, Sir Harry Luke (*Review*), 743
- Typhoid Bacilli from Water, Isolation of, A. Charlotte Ruys, 259
- Typhoons and Indian weather, V. D. Iyer, 936
- Ukraine, Professional Workers in the, 927
- Ultra: -Violet, Extreme, Measurements of Double Refraction in the, R. Servant, 48; -Sonic Waves, Diffraction of Light by, F. H. Sanders, 285; Kurzen Wellen, Physik und Technik der, Dr. H. E. Hollman. Band 1 (*Review*), 822; -Short Waves, High-Frequency Modulation of, S. S. Banerjee and B. N. Singh, 890; -Sonic Vibrations, Effects Produced by, Dr. L. A. Chambers, 1091
- Unimolecular Elimination and the Significance of the Electrical Conduction, Racemization and Halogen Replacement of Organic Halides in Solution, Dr. E. D. Hughes, Prof. C. K. Ingold and A. D. Scott, 120
- Universities: Research and Teaching in, 303; Research in, Dr. R. Coulborn, 304; Research and Teaching in, Prof. R. A. Peters, 590; of the British Empire, Fifth Quinquennial Congress, 1108
- University: Institutions in Great Britain and Ireland, Facilities available in, for Students from Abroad, 177; Education, Purposes of, 219; Function of a, Prof. L. Cazamian, 303; Value of a, Sir James Barrett, 303; Series: The Highlights of Modern Knowledge. The Coming and Evolution of Life, Prof. H. E. Crampton; Heredity and Variation, Prof. L. C. Dunn; The Coming of Man, Dr. G. G. MacCurdy; The Races of Man, Prof. R. B. Bean; The Animal World, Prof. J. G. Needham; The Smallest Living Things, Prof. G. N. Calkins; The Earth, Dr. C. A. Reeds; Fossils, Prof. R. S. Lull; The Plant World, Dr. C. S. Gager; Energy and Matter, Prof. C. B. Bazzoni; Space, Time, and Relativity, Prof. H. H. Sheldon; Stars and Planets, Prof. D. H. Menzel (*Review*), 862
- Upper: Elastic Limit, Importance of the, F. Rinagl, 218; Palaeozoic Rocks around Yessabah near Kempsey, N.S.W., A. H. Voisey, 259; Palaeolithic, Cultures of the, Miss D. A. E. Garrod, 454; Oligocene Bryozoan Faunule, An, L. W. Stach, 520; Triassic Fossil Insect Bed in Queensland, A New, Dr. R. J. Tillyard, 719; Palaeolithic, The, in the light of Recent Discovery, Miss D. A. E. Garrod, 826; Atmosphere, Red and Sun-lit Auroras and the State of the, Prof. L. Vegard, 930
- Uranium and Thorium, Atomic Masses of, Prof. A. J. Dempster, 120
- Urethral Sinus in Rodents and Insectivores, Hall, 512
- U.S.A.: National Bureau of Standards, 22; Fertility and Contraception in, Prof. R. Pearl, 40; Patent Laws of the [1836], 47; Training of the Engineer in the, R. E. Hellmund, 174; Sterilization Operations in, 281; Appointment of Four Committees to deal with Silicosis; deaths from Motor Accidents, 282; Instruction in Salesmanship in, 518; Seismology in, 582; Power Supplies, Estimates of Future, 611; Adult Education in, Prof. F. W. Reeves, 811
- Utrecht, University of, Tercentenary of the, Prof. F. G. Donnan, 131
- U.S.S.R.: Science and Minerals in the (*Review*), 97; An Institute of Cosmetics and Hygiene at Moscow, 682
- Vaal River Basin, Rock Engravings in the, Prof. C. van Riet Lowe, 599
- Valency and Molecular Structure, Prof. R. F. Hunter and Prof. R. Samuel, 411
- Valonia, Structure of the Wall of, Prof. G. van Iterson, jun., 364
- Van der Waals Forces, Determination of, Dr. H. S. W. Massey and R. A. Buckingham, 77
- Vanadium Oxychloride and Vanadium Tetrachloride, Melting Point of, A. Morette, 90
- Vascular Disorders of the Limbs: described for Practitioners and Students, Sir Thomas Lewis (*Review*), 619
- Vasodilator Substances in Animal Tissues (*Review*), 267
- Verbenaloid, Structure of, J. Cheymol, 897
- Vererbungslehre: Praktische Übungen zur, Prof. G. Just. Zweite Auflage. Teil 1 (*Review*), 784; Grundzüge der, Prof. F. Alverdes (*Review*), 823
- Vererbungswissenschaft, Handbuch der, Herausgegeben von E. Baur und M. Hartmann. Band 3: Genetik und Tierzüchtung, C. Kronacher (*Review*), 743
- Vernalization: Dr. F. G. Gregory and O. N. Purvis, 249; of Winter Rye during Ripening, Prof. F. G. Gregory and O. N. Purvis, 973
- Veterinary Education, Appointment of a committee on, 837
- Vibrational Frequencies, Ground State, Dr. H. G. Howell, 36
- Viburnitol, Extraction of, from the Leaves of *Viburnum Tinus*, H. Hérissay and G. Poirot, 599

- Victoria Falls, Diatoms from the, Florence Rich, 180
 Victorian Soils, Sand Fractions of some, Mineralogy of the, Ann Nicholls, 91
 Vienna: Academy of Sciences, Dr. G. Haberlandt elected an honorary member of the, 240; Birth-rate of, 1008
 Virus: Apparent Transformation of one, into another, Dr. G. Berry, 208; Protein, Molecular Weight of a, I. B. Eriksson-Quensel and Prof. The Svedberg, 937; Diseases and Cytology, Dr. F. M. L. Sheffield, 1020; Disease in Plants, The Agent of, Dr. J. Caldwell, 1065
 Viscid Fluid Threads, The Nature of, Sir Joseph Larmor, 74
 Viscometry, Dr. S. Erk and Dr. A. Schmidt, 593
 Viscosity: of Liquids in the Nematic Phase, Influence of the Magnetic Field on the, M. Miesowicz, 300; of Binary Mixtures, Dr. A. J. A. Van der Wyk, 845
 Vitamin: B₁ Deficiency, Role of Adenylic Acid in, Dr. T. W. Birch and Dr. L. W. Magson, 27; P: Flavanols as Vitamins, S. Rusznyák and Prof. A. Szent-Györgyi, 27; A, Estimation of, J. F. Ward and R. T. M. Haines, 128; -C, Inhibitive Effect of, on Toxin production by *C. diphtheria*, I. J. Kligler, 291; B₁ (Antineurin), Synthesis of, Prof. Williams, 356, 372; B₁ Deficiency, Potassium in the Brain in, H. W. Kinnersley, 368; D₃, Calciferol and, Chemistry of, A. L. Bacharach, 387; B₁, Grewe, 432; Nature of Flavones, A. Bentsáth, S. Rusznyák and Prof. A. Szent-Györgyi, 798; C, Ascorbic Acid, Estimation of, by Titration, Dr. I. Gál; H. Cheftel and Marie-Louise Pigeaud, 799; B₁ Hydrogenation of, F. Lipmann, 1097
 Vitamine und Mangelkrankheiten, Dr. H. Rudy (*Review*), 994
 Vitamins, Identification of, by Molecular Distillation, Dr. K. Hickman, 881
 Voltaic Electricity, De la Rue on [1836], 475
 Vortices, Electroconvective, D. Avsec and M. Luntz, 1112
 Walden Inversion, Reaction Kinetics and the, W. A. Cowdrey, Dr. E. D. Hughes and Prof. C. K. Ingold, 759
 Waldeyer, Wilhelm von, J. D. Boyd, 761
 Wales, North, B. Smith and T. N. George, 390
 War: Scientific Workers and, Dr. E. Barrow and others, 80; Scientists and, Dr. C. N. Acharya, 469; Prevention of, Essays on, 834; and Defence, Relation of Science to, 914; The Alternative to, a Programme for Statesmen, C. R. Buxton (*Review*), 1072
 Warwickshire Natural History and Archaeological Society [1836], 694
 Water: External Use of, An Essay on the, Tobias Smollett. Edited, with Introduction and Notes, by C. E. Jones (*Review*), 142; Resources and Supply Control, 319; 'Lines' on the Surface of Moving, Dr. R. O. Hall, 466
 Watt, James, Civilization since, J. P. Boyd, 916
 Wave-forms, Two, Device for the Superposition and Simultaneous Delineation of, on a single Cathode Ray Oscillograph Screen, N. H. Roberts, 813
 Waves, Explosive, and Shock Waves, Dr. W. Payman and W. C. F. Shepherd, 942
 Wealden District, The, F. H. Edmunds, 389
 Weather, World, Prof. V. Bjerknes (*Review*), 781
 Welsh Borderland, The, R. W. Pocock and T. H. Whitehead, 390
 West Ham, Fifty Years of, 281
 Western Australia: Geology of the North-West Basin of, with particular reference to the Stratigraphy of the Permo-Carboniferous, H. G. Raggatt, 260; "Natives" in, 579
 Whale from the Wieringermeer, Zuider Zee, Bones of a, Dr. G. C. A. Junge, 78
 Whales, Antarctic Blue, The Stock of, A. H. Laurie, 33
 Wheat: Bibliography of, 110; *vulgare*, Occurrence of Haploid Pollen Mother Cells in a, Dr. R. M. Love, 589; in Peru, Production of, in 1932 and 1934, J. Costantin, 812
 Why Keep Them Alive?, Dr. P. de Kruif, in collaboration with Rhea de Kruif (*Review*), 523
 Wild: Flowers of the Wayside and Woodland, T. H. Scott and W. J. Stokoe (*Review*), 227; Life, Hunting, with Camera and Flashlight: a Record of Sixty-five Years' visits to the Woods and Waters of North America, G. Shiras. 2 Vols. (*Review*), 780
 Wind Erosion in South Australia, F. N. Ratcliffe, 358
 Wireless: Waves: Ultra-Short, The 'Specific Action' of, Prof. W. E. Curtis, Dr. F. Dickens and S. F. Evans, 63, 1100; Sir Leonard Hill and H. J. Taylor, 591; Communication, Short-Wave, A. W. Ladner and C. R. Stoner. Third edition (*Review*), 822
 Wisconsin Alumni Research Foundation, Scientific Research by the, 299
 Wolf: The Little, a Story of the Coyote of the Rocky Mountains, Wendell and Lucie Chapman (*Review*), 1079
 Woodcock, Roding of the, T. Warwick and V. D. van Someren, 977
 Wool: Characteristics, Estimations in the Fleece of Important, Dr. A. B. Wildman, 43; Research, Recent Advances in, 43; Frosted, Process, Dr. S. Townend, 44; Raw, Fundamental Principles of Washing, Dr. H. Phillips, 44
 Worcestershire Natural History Society [1836], 475
 Works as I have seen them grow, Sir Robert Mond (Messel memorial lecture), 172
 World: Power Conference, Chemical Engineering Congress of the, 44; Fellowship, 155; History: the Growth of Western Civilization, R. Flenley and W. N. Weech; F. S. Marvin (*Review*), 263; Power Conference: Third, 500; election of officers, 583; Population: Past Growth and Present Trends, Prof. A. M. Carr-Saunders (*Review*), 817; Encyclopædia, The Idea of a, H. G. Wells, 917
 Würzburg University, award of the Rinecker gold medal to Prof. A. Butenandt, 838
 X-Radiation, An Effect of, on the Blood, Dr. H. L. Brose and E. B. Jones, 687
 X-Ray Therapy, High Voltage, 1106
 X-Rays, Short, Absorption of, T. R. Cuykendall and M. T. Jones, 513
 l-Xyloketosuria, Inheritance of, 805
 Yale University Publications in Anthropology, Nos. 1-7, 197
 Yarrell's History of British Fishes [1836], 414
 Yavapai Indians, E. W. Gifford, 765
 Yeast (*Review*), 665
 Yellow Fever, Diagnosis of, by Intercerebral Inoculation of the Blood of the Patient into White Mice, M. Mathis, 656
 Young's Modulus for Steel Surveying Bands, J. A. Gilmore, 813
 Yugoslav Cultural Progress, 109
 Yunnan, Garments from, Misses Laura E. Start and Mabel C. Wright, 805
 Ziema: Fyzyka globu, mórz i atmosfery, Dr. E. Stenz (*Review*), 994
 Zinc: Metaborate, Existence of, R. Tournay, 695; Sulphide, Scintillations of, G. Destriau, 807; Halides with Tertiary Arsines, Derivatives of, G. J. Burrows and A. Lench, 813
 Zoological: Papers, A Method of Illustration for, Prof. H. G. Cannon (*Review*), 485; *Record*, The, 878
 Zoology, Systematic, Memoirs on, Dr. W. T. Calman (*Review*), 98
 Zooplankton der Binnengewässer, Das, Prof. W. M. Rylov (*Review*), 424



No. 3479

SATURDAY, JULY 4, 1936

Vol. 138

Religion—a Changing Force?

IT will always be a paradox that the gentlest and most lovable character in the whole of the recorded history of mankind should not only be the source of such bitterness and hatred as mark the story of Christianity, but also that He Himself should have been fully aware that the consequences of His teaching would constantly be averse from the spirit of His doctrine. Of all the utterances of Our Lord, that which displays most clearly His insight into the heart of man, and has been most completely fulfilled, is the declaration that he brought into the world not peace, but a sword. Not only did He knowingly set up insurmountable barriers between those who followed Him and their families, friends and fellows in the community, but also when He turned from the Jews to send the seventy disciples on their mission to the world, He informed His religion with an inflexible will to the conversion of the heathen—in other words, of those not of like belief—which in its methods and its results has belied the promise to mankind of peace and goodwill.

Too often in its history, the missionary of Christianity has been of the type of the inquisitor and the conquistador; the fate of its converts a degradation and an extinction no less complete in its results, if less drastic in its methods, than the fate which overtook so many of the Indians of Mexico and Peru. Not indeed that Christianity

here stands alone. The first great tragedy of Calvary was a prelude to the beasts of Ephesus, the spectacular slaughters, the crucifixions and the pyres of Rome. If that tragedy was re-enacted time and again in the sectarian quarrels of European civilization through the ages, elsewhere, to name one instance only, the Moslem world enlarged the circle of the Faithful by the persuasion of fire and sword.

A post-War generation, weary of strife, in its desire to build "a brave new world", would have consigned all such antagonisms to the limbo of errors and absurdities of an outworn dispensation. Frank and open discussion of differences, and co-operation, despite these differences, of all of good-will in the promotion of common aims, were to take the place of sectional rivalries and obstructions. Leagues of intellectual co-operation, and international conferences and congresses sprang up on all sides to discuss and deal with every kind of problem which stood in the way of the advancement of mankind—moral, intellectual and social. The events of more recent years have brought a bitter disillusionment to those who thought that Armageddon had passed and the millennium was due to arrive.

The present, however, is no time for pessimism; and least of all does it befit science either to belittle what has been effected by co-operative effort since the War—and the sum total is by no means

negligible as the record of the non-political activities of the League of Nations can show—or to despair of the endeavour which is being made to keep open some of the ways to interchange of thought and mutual assistance, at a time when differences of outlook and tradition are being emphasized and barriers of mistrust are being re-erected. There are still matters of universal significance for mankind in which the co-operation of all may be invited, if indeed it be not essential.

Yet, however strong the conviction that a sturdy, and at times dogged, optimism is the only creed for the man of science, as well as a necessary condition of constant progress in the understanding of Nature and the universe, there are whole departments of thought, with their corollaries in human conduct and affairs, from which the principle of universality, which is a condition of world-wide co-operation, seems to be excluded. Co-operation rests, ultimately, on a truth which, in a scientific sense, is universal—in fact, a 'law'. This is the ultimate principle, whether in dealing with the suppression of the drug traffic or with 'sanctions'. But in the field of religious beliefs, on a detached view, truth is relative to the object of belief, and departmental. The code of thought, and its materialization in action, which befits the Buddhist, cannot be reconciled with that of the Christian, however near their approach.

More than passing interest, therefore, will be aroused in many not directly concerned, and irrespective of religious belief, by the announcement that during the early half of the month of July representatives of the more important religions of the world are gathering in London at a World Congress of Faiths for the discussion of "World Fellowship" as a way to the solution of world problems—the problems of war and of social and economic difficulties, which seem inevitably to lead to disaster. Neither the validity nor the possibility of fusion of the religions represented will be under consideration; but each religion is invited to consider how, maintaining its individuality, it can best contribute to the common end.

The organization of the Congress, which opened on July 3, fully maintains the claim that it is both international and inter-religious. The international president is H.H. the Maharaja Gaekwar of Baroda, and the chairman of the British National Council is Sir Francis Younghusband. The chairmen, speakers and openers of debate at sessional meetings have been selected with strict impartiality for their ability to further discussion,

without preference of creed. For the attainment of what may be taken to be the more general purpose of the Congress, the dissemination over the widest possible field of a knowledge of the varied lines of approach to the major problems of existence among different peoples and creeds, the greatest importance must be attached to the series of public meetings at which distinguished members of the Christian, Jewish, Buddhist, Hindu and Moslem religions, as well as of independent thought, will expound their respective conceptions of "The Supreme Spiritual Ideal".

To bring together representatives of these different faiths, some of which, it might be thought, would mix as readily as oil and water, for the discussion of such a topic as "world-fellowship" is in itself no mean accomplishment. It does at least lend some colour to the expectation of a not entirely unfavourable answer to the inevitable question, whether any practical outcome is to be anticipated from this attempt to secure co-operation among the more liberal spirits of the various religious beliefs in the solution of world problems.

In view of the past history of religious animosities, the whole project may seem Utopian, the forlorn hope of enthusiasm. Has the time really come when the lion will lie down with the lamb? Have these religious differences been composed, and is the *odium theologicum* a thing of the past? Perhaps we may construe current events as a turn in the tide. In the Education Bill which has now passed through Parliament, for example, we seem to be entering upon the final phase in a settlement of a denominational religious difference which has been an obstacle to progress in popular education for well over a hundred years, and a source of social disintegration for three times that period. The Church of England, it is true, failed to reach a satisfactory conclusion in its overtures to the Orthodox Church; but in other directions, as for example, recently in Finland, it has been more successful. Do these movements and others of a like character point to a weakening of the religious fibre, manifested in a lessening of the spirit of aggression, or do they represent a further stage in progress towards a higher development of religious activity?

To attempt an answer would involve a combination of prophecy and analysis which would be neither profitable nor appropriate here. This much, however, may be said. Religion as a social phenomenon, and not as an individual experience,

as the student of religions well knows, is a sublimation of group solidarity. In a supreme self-protective effort it either proselytizes, expels, or exterminates: hence missionary effort and persecution, on the principle that he who is not for is against. This lies at the root of the quarrel of Nazi nationalism, a quasi-religious emotion, and the Confessionals in Germany, just as it inspires the persecution of the Jews. The Old Testament expresses it repeatedly in the reliance of the Hebrews on Jehovah, the god of battles, as the exclusive protector of the Chosen People.

To some extent at the present time this particularist spirit of self-protection has been diverted into the channel of nationalism. More potent,

however, is the fact that an ever-increasing number, appealing in the conditions of modern civilization to a widening circle, is not content to rest in the particular, but must pass on to the universal. To such, neither restrictions of national distinction nor differences between creeds can weigh in the balance against the ethical principles explicit or implied in all the higher forms of religion. In this composite but practical creed, analogous to the *jus gentium* of the legists, it may be that they are feeling their way towards a further and higher stage in the development of religious belief, in which the theological differences which antagonize will be forgotten in the pursuit of a common and universal ethical purpose.

Colonial Policy and Scientific Research

MR. ORMSBY-GORE has lost no time on taking up his duties as Secretary of State for the Colonies, in making clear his personal position in relation to a variety of problems with which he is confronted in colonial administration, and more particularly to the need for the active prosecution of research with a view to future development.

An address which he delivered recently, when presiding at the thirty-fifth annual Colonial Service dinner of the Corona Club, was broadcast, and was no doubt consciously directed to reach a wider public than his immediate audience. It will go far to allay some not unjustifiable feelings of uneasiness as to future developments, which for some time have disturbed informed opinion both at home and in the Dependencies. While Mr. Ormsby-Gore deprecated the discussions, in which the possibility of future sessions of territory had been debated, as likely to do more harm than good, he was emphatic in endorsing "the very clear statements" of the Prime Minister and of his predecessor in office, referring specifically among other dependencies to Tanganyika Territory. "Peace," he went on to say, "continuity of policy, social progress, and economic development are the greatest needs of the Colonial Empire."

With this all will agree, although there may be difference of opinion as to the best means by which they are to be attained. It is significant, however, of the confidence inspired by Mr. Ormsby-Gore's appointment, that it has made optimistic even so

sturdy a champion of the white settlers' claims in Kenya as Lord Frederick Scott, who, as he told the East African group of the Overseas League on June 18, sees hope for the future in the appointment of "a new Secretary of State for the Colonies, who knew East Africa, and had written . . . the best of all reports on East Africa".

While Mr. Ormsby-Gore is fully alive to the part which has been played, and must continue to be played, by the study of native institutions in their bearing on the further development of the native, there are two matters to which he directed attention as problems of public health confronting the Colonial Governments. Of these the first is the application of the newer scientific knowledge of nutrition. Mental and physical efficiency, as well as resistance to disease, he pointed out, are tremendously affected by nutrition; and he is not satisfied that the problems of nutrition have been adequately studied and the results applied in our tropical dependencies. After a reference to the generous offer of the Rockefeller Foundation to establish a special organisation in Uganda for the study of yellow fever, he spoke of the benefactions received by many Colonies from the Carnegie Corporation of New York, particularly in connexion with education, social services and libraries.

It is especially satisfactory to hear that Mr. Ormsby-Gore intends to devote his personal attention to the application of science to Colonial problems of agricultural development and public

health, and to watch with a vigilant eye the work of the education departments throughout the Colonies. In this connexion it may not be inopportune to note that Lord Linlithgow, Viceroy of India, in addressing the opening meeting of the Advisory Committee of Nutrition under the Indian Research Fund Association at Simla on June 18, referred to the relationship of improvement in sanitation, hygiene and nutrition among

the rural population to literacy among the women: "In default of female literacy," he said, "it will be found that, whenever supervision is removed, there will be a relapse into age-old customs, and that within a few months nothing will be left of the better living that has been so laboriously inculcated." The experience of India in the past ten years may not be without its lessons for the colonial administrator.

Land-Reclamation in Italy

Land-Reclamation in Italy :

Rural Revival in the Building of a Nation. By Cesare Longobardi. Translated from the Italian by Olivia Rossetti Agresti. Pp. xii + 243 + 29 plates. (London : P. S. King and Son, Ltd., 1936.) 12s. 6d. net.

ONE of the achievements of which Fascism can unreservedly be proud is the reclamation of great areas of land in Italy that for centuries had added little or nothing to the national wealth, and indeed had frequently, like the Pontine Marshes, been dangerous to human beings owing to the widespread prevalence of malaria. Waste land can be found in all countries, even in our own, densely populated as it is ; it escaped enclosure in the old days because it could not be cultivated by the methods then in use. Considerable areas are, however, amenable to modern methods of cultivation, though the cost of reclamation might be too high to permit an economical return on the money expended. For this reason land-reclamation is scarcely proceeding at all in England, though occasionally private individuals embark on the enterprise out of sheer love of the work. In Holland the great Zuyder Zee scheme is being financed by the Government, but it is regarded not as a financial but as a social investment, to provide land on to which the growing population may spread. In the western European countries the problem is complicated by the many private rights which, though long in abeyance, may burst into vitality as soon as there is any suggestion of the land being developed or taken over for public purposes. In countries ruled by a dictator as in Italy and Russia, such questions do not arise, and land-reclamation becomes simply a technical problem which can be carried out regardless of cost.

One of the greatest of the Italian schemes was described by Dr. Roberto Almagia in *NATURE* of June 15, 1935. There he shows how the great

Pontine Marshes have been converted from malarial swamps into good farming land. The present writer visited this region in April 1934 and was greatly impressed with the efficiency of the work and the adequacy of the houses and farm buildings. Hitherto it has been difficult for English experts to obtain information on the many administrative and financial problems involved. These are satisfactorily dealt with by Señor Cesare Longobardi, so that we now have a full account of the procedure and some statement of the cost of the work.

Reclamation has progressed rapidly since the Fascists came into power. In their first years of office, some 5,000,000 man days were given to this work ; in 1933-34, their twelfth year of office, this had increased to nearly 18,000,000 man days. Some 4.7 million hectares are already in hand or completed, and marked increases in output of agricultural produce have already been obtained. The production of wheat, which before the War was less than 5,000,000 metric tons per annum, has risen to nearly 7,000,000 tons ; net imports of wheat, formerly 1.4 million tons per annum, fell in 1934 to 235,700 tons only.

The Italian reclamation schemes extend also to the land which, though cultivated, is not properly utilized, especially to the well-known latifundia, agricultural properties on which farming is extremely primitive and extensive, where the farms form "a compact mass untraversed by roads, with no water system, infested by malaria, with hardly any permanent inhabitants". The latifundia are associated with what is known as the 'Southern Question', the group of problems arising out of the backward economic and social development of the south of Italy and the islands as compared with other parts of the country.

The general machinery for the reclamation is prescribed by the Mussolini Act which characteristically, as the author states, "does not lose itself in the maze of existing measures. It leaves them as they are and goes straight forward". It

makes financial provision over a period of fourteen years for work amounting to 7,000,000,000 lire; it directs special attention to works nearing completion; and it opens the way for further developments which experience may suggest. Of the 7,000,000,000 lire, 4,300,000,000 was to be chargeable to the Treasury and the remainder to the land owners. The major part of the finance is provided in the form of 30-year annuities discounted to the parties concerned by several different institutions. The whole of the money has already been taken up, but there still remains much work to be done.

The author states that the Act was received with great enthusiasm by the whole country. The projects submitted would have cost in the aggregate ten or fifteen times the amount available, and therefore rigid selection had to be exercised. The rights of the owners were in principal acknowledged, and, where curtailed, were said to be adequately but not excessively compensated. Preference was given for the execution of the work by consortia of landowners or public bodies, which appear to be something like the public utility societies of Great Britain. This method avoided the danger of supplanting private initiative by State intervention; at the same time it prevented the work from stopping directly the Government had fulfilled its part of the contract and before the landowners had completed theirs. The procedure is dealt with at considerable length. A special section of the Ministry of Agriculture deals with land-reclamation, and receives proposals or itself draws up plans. No project is accepted unless it shows considerable possibility of securing notable improvements in hygiene, demographic, economic and social conditions.

The plan being accepted by the Government, the landowners proceed to execute the works either themselves or through the consortium. They may provide all the money themselves or obtain Government grants or special loans from the agricultural banks. The arrangements seem to be very elastic. A very active body, however, is the National League of Ex-Service Men (*Opera Nazionale per i Combattenti*), whose name one sees painted up on the buildings in many of these reclaimed areas. The League has special privileges, and can demand the expropriation of landowners even if they are ready to reclaim the land. Whatever is reclaimed by the League is used for small holdings on which ex-Service men or their families are settled. Mussolini attaches great importance to this body as being, in his own words, "mobilised to perform a task with the urgency of which I am more than ever impressed, that of ruralising Italy". When the reclamation is completed, some internal migration and land settlement become necessary; a special commissariat exists to organise this. The

migrants are mainly farm workers brought from more densely settled regions; in 1933, for example, some 15,000 farm workers were moved but only 500 industrial workers.

Economic law, however, still seems to operate to some extent in Italy, for we are told that the serious fall in prices of farm products after 1929 made it impossible for the landowners in some years to meet their share of the cost, and consequently Government help had to be given. The portion of the costs chargeable to the landowners is divided between them in proportion to the advantage accruing to each as a result of the work. It is impossible to ascertain this precisely beforehand, hence a provisional apportionment is made and adjusted when reclamation is completed. The credit is held against each landowner by the consortium in the form of 30-year annuities, which rank as a charge on the land immediately after the land tax and the provincial and municipal surtaxes. As the landowners themselves were unable to pay the necessary money, various banks were established for the purpose of enabling them to do so.

Considerable details are given in regard to the larger schemes. The great Pontine Marsh is cut up into holdings of 25-75 acres according to the quality of the land, each furnished with a house, stabling for ten cattle, poultry run, pig sty, well, etc. The Ex-Service Men's League has obtained grants for the settlement of some 100,000 acres. Families are brought by the Commissariat for Internal Migrations; as they have no capital, the farms are taken from the League on a crop-sharing plan, the tenants receiving monthly advances in the shape of supplies and cash allowances from the League, which directs the management of the farm. When the head of the family has acquired the necessary experience and has returned the advances made by the League, an agreement is to be drawn up under which he will purchase the farm and the livestock from the League in fifteen annual instalments covering capital and interest at the official bank rate. The farms are grouped in batches of 130, around one of the three new towns, Littoria, Sabaudia and Pontinia. An expert adviser is available. The cost of the scheme is estimated at 7,000-25,000 lire per hectare; the purchase money therefore amounts to annual payments for fifteen years of sums varying from 200 to 630 lire per hectare, in addition to an annual payment of 70 lire per hectare as cost of upkeep and amortisation of the drainage works. These repayments, however, do not cover the Government contribution, but only that made by the concessionaires. No mention is made as to how the Government share is to be recouped. There is a similar, but somewhat smaller, reclamation scheme

in the lower Piave region running towards the Adriatic, and others on the Brisighella in the Lower Apennines, the Sele Plain, the Tirso, etc. The book ends appropriately with some long extracts from Mussolini's speeches on various important occasions in connexion with reclamations.

Señor Longobardi's book gives the best account

at present available of Mussolini's remarkable achievements in land-reclamation. They are a challenge to other countries, and in reading about them, and still more in going over them, one is repeatedly asking whether such rapid improvements would be possible under the milder methods of western Europe.

E. J. RUSSELL.

Determinism and Man

The Freedom of Man

By Arthur H. Compton. (The Terry Lectures.) Pp. xii+153. (New Haven, Conn.: Yale University Press; London: Oxford University Press, 1935.) 9s. net.

SCIENTIFIC writers who have turned to the philosophical interpretation of science are invariably concerned with the relation between man and the physical and biological science he creates. These writers fall, roughly speaking, into three schools.

The first maintains that the methods that man has evolved for the study of the physical universe can be applied, without fundamental modification, to the study of mankind, and of man as an individual; that the determinism of physical science must apply equally to characteristics of the individual, and that from this can be deduced the behaviour of the mass. The universe, including man, is a complex machine. These are mechanists.

The second school sets man and his mind apart from the rest of the universe, asserts that although he is amenable to physical laws, these do not determine the whole of his actions, and that otherwise he is 'free' to act as he wills, in accordance with or against his moral conscience. There is a great variety of such philosophical idealists, ranging from the solipsist who maintains that the universe is created out of the elements of his (the particular solipsist's) consciousness, to those who believe that man, in the exercise of his will, is working out the law of a Superior Intelligence that exists outside man.

The third class asserts that man is a product of material nature, consciousness being a complex quality of the brain; that physical science has been produced by man in his struggle with the material world; that the scientific laws he finds operative to inanimate matter are not necessarily valid as they stand for the more complex problem arising when man, the active agent, is involved, the wider problem of 'man performing the social activity science', for example; but that this, being on a different level of complexity and abstraction,

will exhibit laws of a specific nature which have themselves to be the subject of study. This class composes materialists who are not mechanists.

Prof. Compton, in the lectures before us, shows himself to belong to the second school. By a scrupulously careful analysis, frequently hesitating to commit himself, he strives to bring out the relation between his scientific and his religious thinking; in the former, standing fast by strict verifiable evidence, in the latter, supplementing the numerous lacunæ in evidence with general argument based on human and emotional needs. It is clear that there is a vital distinction in criteria between the two modes of thinking, of which Prof. Compton is not too conscious. In this way, he deals with the much discussed question of determinism, with the basis of his belief in a Superhuman Intelligence that guides the destiny of the universe, and with immortality. He concludes that there is a psychic element in the universe standing outside matter and surviving it, an element that, operating along with material indeterminacy, directs the course of human action. It is in fact an assertion of extra-material psychic determinism; and yet, alongside this, he seeks, rather inconsistently it seems, to retain freedom of action for the individual.

The case is well and interestingly argued throughout, but, as with other writings of this nature, the author assumes that in countering the case of the mechanists, he is destroying the materialist point of view. He seems unable to distinguish between the position adopted by the Encyclopædists, the mechanists of the eighteenth century, and that of the modern materialist. Had he done so, he would have recognised that there are in reality several distinct problems of determinism; but if they are to be dealt with as one, then the different levels that fall within its scope must be made clear. There is the sub-atomic level, the mass-particle level, and the human and the social level. To equate concepts at different levels is to miss the essence of scientific abstraction.

Scientific experimentation at the particle level is intrinsically deterministic, and is associated

with a particular type of prediction. The language of science, and therefore the language of scientific explanation, formulated at this level, tends naturally to be carried downward and upward in common speech to the sub-atomic and to the social levels. Immediately contradictions seem to emerge. When we talk of human or of sub-atomic determinism, are we talking about something that has a verifiable meaning of the same order as particle-determinism? What is to be meant by prediction in each of these cases? When we talk of 'freedom', how is it to be defined, or how are we to recognise it within each of the three categories? These are questions we must pose and answer before we can be certain that we are using words sensibly or asking sensible questions when we inquire: "Has determinism broken down in the sub-atomic field? Are we therefore 'free' human agents?"

The idea that there is a breakdown in detailed prediction does not disturb the materialist, as many imagine, although it has excited the idealists into thinking that they see an escape from the imaginary moral strangulation of a rigid mechanistic determinism. Determinism at the sub-atomic level with its associated 'probability prediction' is a very different story from that at the social level, where the fact that man may frequently predict his own behaviour is a crucial quality of the situation. Prof. Compton, in common with many other outstanding physicists, ought surely to see this, for the nature of the material handled and

the appropriate experimental methods are fundamentally different. Conscious living matter has qualities of a totally different order from those either of a particle or a photon. It is an active agent that can think, analyse and experiment. In the problem of 'man performing the social activity science', for example, man ranks as one of the determining forces in the situation. If we are to answer the question: "Is human action predictable?" we have first to form the appropriate abstractions and devise an experimental technique, in order to create a basis for prediction at that level for this human process, to elucidate the laws exhibited. If man's actions are sometimes accompanied by a subjective sense of free-will, as they undoubtedly are, we have to discover the laws of free-will behaviour. All social predictions (and there are many of the small scale in the commercial and industrial world) are based on such laws. Their distinctive quality is that human beings as active agents form these laws and formulate them. As conscious beings, however, they can become aware of the laws they can make and therefore they can plan their future. That is the link between science and human progress.

When viewed from this angle, 'freedom of man', the subject of these lectures, is not something already existing or to be argued into existence. It is something to be achieved. To rank it with determinism at other levels is to miss its essentially distinctive character.

H. LEVY.

Structure of Metals and Alloys

The Structure of Metals and Alloys

By Dr. William Hume-Rothery. (Monograph and Report Series No. 1.) Pp. 120 + 4 plates. (London: Institute of Metals, 1936.) 3s. 6d. net.

OF all the recent developments in metallography, the most outstanding has been that which has resulted from the invasion of the physicist and the physical chemist, both of whom have, in the past few years, applied their own methods of investigation more and more to the metals and their alloys. As a result, although most of the ideas reached by the use of the older methods have withstood this attack, other conceptions have had to be modified, and in one or two cases, drastically.

The most recent adventure of the Institute of Metals in publishing a series of monographs, each of which is to deal authoritatively with some special aspect of metallurgical interest, could not, therefore, have commenced with a more suitable

one than that under consideration, nor could a more proper author have been selected than Dr. Hume-Rothery, whose own contributions to this particular field of study are well-known. The position of metallography at the common boundaries of so many sciences renders it almost impossible for its workers to maintain contact with all the developments which have a potential bearing upon their own lines of work, and the Institute of Metals and Dr. Hume-Rothery have performed a service to the science of metals which cannot be acknowledged in terms too high.

Assuming merely that knowledge of modern physics and physical chemistry which may now reasonably be expected from the metallographer, the author has, in a manner as simple as the nature of his subject permits, described present-day conceptions of the electronic structure of the atom, the crystalline structure of the elements and their atomic radii, the solid solutions which form

the end phases of the equilibrium diagrams and the phases which occur in between. The concluding section of the book is concerned with the imperfections of crystals, a matter of supreme importance to the metallurgist, whose materials are all aggregates of crystals, which in normal circumstance are very far from perfect. It cannot be too strongly stressed, however, that the work is essentially scholarly, and although necessarily written with the needs of the metallographer chiefly in mind, contains matter of the most direct importance to the physicist, the physical chemist and the crystallographer. For many readers the general account given will probably be adequate, but for those who desire to study the subject matter of this monograph still further, the long lists of references to original work will be of first-rate value.

It is inevitable that almost every metallographer will find certain aspects of the work with which complete acquiescence is impossible—to the present writer, for example, there appears to be an inadequate appreciation of the solidity of the structure built up on the basis of what may perhaps be termed classical methods—but there can be no doubt that the author has performed the task assigned to him in a most praiseworthy fashion. Both to him and to the Institute of Metals most sincere congratulations must be offered for the publication, at a price within the reach of all, and at a time when it is perhaps most needed, of a really authoritative account of pioneer work which may well initiate an entirely new era in fundamental, theoretical metallography.

F. C. T.

Alpine Studies

The Structure of the Alps

By Prof. Léon W. Collet. Second edition. Pp. xvi + 304 + 12 plates. (London: Edward Arnold and Co., 1935.) 20s. net.

IN a review of the first edition of Prof. Collet's fascinating account of the building of the Alps (*NATURE*, 121, 412; 1928), the appeal of his work to mountaineers and holiday-seekers, as well as geologists, was emphasised. That the book should have gone out of print and a revised edition be required is a tribute to its value and interest; also to the rapid progress of Alpine studies. Indeed, as the author states in his preface to this second edition, "a brilliant international gathering of geologists has been engaged in following the Alpine structure in the Western, as well as in the Eastern, Mediterranean regions, and new ideas of the structure of the Alpine Range have been presented". Prof. Collet has therefore added a new Part 6, consisting of six short chapters dealing with the Apennines, the mountain-arcs of Corsica, Sardinia and Elba, the Alpine Chain of southern Spain and the Balearic Islands. As many of these areas are becoming increasingly popular as tourist resorts (and for residence), Prof. Collet's descriptions of the rock-structures and their effects on the scenery will be highly appreciated.

The increase in length of the book thus necessitated has been to some extent offset by a reduction of detail in some of the chapters, such as that on the Jura Mountains. In this regard, the author's policy will doubtless be welcomed by the non-technical reader, especially as opportunity

has been taken to clarify parts of the text of other chapters, to add new diagrams, and to rewrite the chapters on Mont Blanc and the Aiguilles Ranges (to the knowledge of which Prof. Collet has himself made noteworthy contributions).

Some of the minor blemishes of the first edition have been removed. Students are no longer told (without supporting evidence) that the higher Pre-Alps represent a small part of Africa resting on Europe. Indeed, the new edition of the book conveys the impression of being less extremist in the matter of belief in the long-distance travel of overthrust sheets (*nappes*) of the earth's crust. An approach to the more moderate views of the Austrian geologists is shown by the attribution of the East Alpine sheets to Kober's *Zwischengebirge* (or *Zwischenmassiv*). It is perhaps unfortunate that the author introduces the inelegant term "Betwixt Mountains" for these masses; for, although it is a literal translation of one of Kober's expressions, the areas involved are not always mountainous (as witness, the country within the Carpathian arcs). A better English equivalent, "median mass", has been in use for some years. It is a pity also that the termination *-ides* has been retained in such words as *Metamorphides*, *Dinarides* (*G. Dinariden*). Astronomers do not write "Leonides", or cause confusion by trying to pronounce the word!

But, whether or not we agree about these matters of detail, or about the views of the extremists of the Nappe theory school, Prof. Collet's volume is unquestionably of great value.

P. G. H. B.

Phenomena in High-Frequency Systems

By August Hund. (International Series in Physics.) Pp. xv + 642. (New York and London : McGraw-Hill Book Co., Inc., 1936.) 36s.

THIS well-packed book of specialised information does not appreciably overlap the author's previous "High-frequency Measurements", and is intended to give a comprehensive and up-to-date discussion of the rapidly varying phenomena which the electrical communication engineer controls for useful ends, possibly often without understanding entirely the basic physical principles.

The thermionics of gaseous and vacuous valves introduces the subject matter, after a prefatory acknowledgment of the pioneer observers and developers of electromagnetic theory and electronics ; generators of high-frequency power, modulators, demodulators, rectifiers and amplifiers receive detail treatment, and electrostriction is made an important division of the main subject ; the serious aspects of electromagnetic theory then find a place, with applications to the more practical phenomena associated with propagation through ionized space and the technique adopted in directing radiated energy.

There are useful appendixes, but the last chapter on filters seems incomplete and redundant in view of the more comprehensive treatises now being issued. The author has a critical sense of the work of others, and his 'display' diagrams are specially helpful for the elucidation of the operation of complex valves and antennæ systems ; the reviewer has still to find an explanation of what happens at the corners when a long wire is folded up to form a directive antenna.

L. E. C. H.

Die Allotropie der chemischen Elemente und die Ergebnisse der Röntgenographie

Von M. C. Neuburger. (Sammlung chemischer und chemisch-technischer Vorträge, herausgegeben von Prof. Dr. R. Pummerer, Neue Folge, Heft 30.) Pp. 106. (Stuttgart : Ferdinand Enke, 1936.) 9.30 gold marks.

THE author gives an account of all the elements which have been supposed to exist in allotropic modifications and, by taking account of the latest methods of investigation, particularly X-rays, he decides which of them actually exhibit allotropy. The crystal forms of the allotropes are specified quantitatively, with very complete references to literature and diagrams.

Although the text is commendably brief and clear, it fails in one or two cases to supply information which the reader would like to have, such for example as to whether explosive antimony is an allotropic form or not. The author, in fact, is concerned almost entirely with the results of X-ray analysis, and where this is not applicable he tends to remain silent. In its field, the book is of very considerable value and serves as a reliable guide through a large mass of data, much of it contradictory. It states clearly in which cases allotropy has been established and where it has not, and in the doubtful cases it presents the evidence in an unprejudiced way.

Soils :

their Origin, Constitution and Classification ; an Introduction to Pedology. By Prof. G. W. Robinson. Second edition. Pp. xvii + 442 + 5 plates. (London : Thomas Murby and Co., 1936.) 20s. net.

PROF. ROBINSON'S novel treatment of soil science evidently 'met a long-felt want', for a new edition has been required in less than four years. The rapidly developing subject of pedology has many more intimate links with other branches of science than had the older agricultural chemical treatment of soils. At the same time, it bears more closely on those general questions of land classification and utilisation which are becoming increasingly urgent. Surveys and planning must be preceded by careful study of the objects to be classified and their relationships to environmental and historical factors. Prof. Robinson's book shows how far the modern science of soils has been able to go in the interpretation of the formation and behaviour of soils. The geographical and genetic aspects are kept in the foreground throughout, while the more purely technical and agricultural ones are treated very briefly indeed. The book can be strongly recommended to workers in many branches of natural and applied science.

In the new edition the bibliography has been increased and the illustrations greatly improved. Quite recent work on the clay complex, base exchange and soil moisture are fully discussed, space having been gained by omitting the appendix on methods of analysis, which were well handled in Mr. C. H. Wright's recent book.

Official Year Book of the Commonwealth of Australia No. 28, 1935. Prepared by E. T. McPhee. Pp. xxxi + 971. (Commonwealth Bureau of Census and Statistics, Canberra.) (Canberra : Commonwealth Government Printer, 1936.) 5s.

THE new issue of this valuable year book is planned on the usual lines, and even if the call for economy still curtails the size of the volume and curbs the desire of the editor in the presentation of available data, the scope is so comprehensive that little of real importance can have been omitted.

After a summary of the history of the Commonwealth, with the Act of Constitution in full, there follows a chapter on the climate and meteorology provided with statistics, graphs and a rainfall map. Among the many chapters of administrative and financial statistical detail, there is especially full treatment of vital statistics as disclosed in the census of 1933. It appears that the birth-rate in Australia has fallen to the relatively low figure of 16.4 per 1,000 from 27.1 in 1901. If this is low, the death-rate of 9.3 per 1,000 is one of the lowest in the world, so that the natural increase is still higher than in European States excluding Russia, the Netherlands, Spain and Italy. Increase by immigration, which was so high as 32,000 in 1927, fell to about 1,000 in 1934 after four years of actual loss by emigration. The volume has full particulars of agricultural production and mineral output. New Guinea is included in the survey. There is a useful bibliography.

Canadian Water Power Developments during 1935

By Dr. Brysson Cunningham

THE series of reports¹ recently issued by the Dominion Water Power and Hydrometric Bureau indicate that, during the year 1935, there was steady progress in the development of water power in Canada, resulting in a substantial addition to the aggregate power installation, which on December 31 last reached a total of 7,909,115 horse power, as compared with 7,547,035 horse power at the close of the preceding year. The accompanying table shows the distribution of power among the provinces of the Dominion. It is pointed out that while the increase in generating

Available and Developed Water Power in Canada,
January 1, 1936.

Province	Available 24-hour power at 80 per cent efficiency		Turbine installation (h.p.)
	At ordinary min. flow (h.p.)	At ordinary six months flow (h.p.)	
British Columbia	1,931,000	5,103,500	718,497
Alberta	390,000	1,049,500	71,597
Saskatchewan	542,000	1,082,000	42,035
Manitoba	3,309,000	5,344,500	392,825
Ontario	5,330,000	6,940,000	2,560,155
Quebec	8,459,000	13,064,000	3,858,320
New Brunswick	68,600	169,100	133,681
Nova Scotia	20,800	128,300	116,367
Prince Edward Island	3,000	5,300	2,439
Yukon and North- west Territory	294,000	731,000	18,199
Total	20,347,400	33,617,200	7,909,115

capacity is noteworthy, there is even greater significance in the continued growth of the demand for power, as reflected in the monthly records compiled by the Dominion Bureau of Statistics, which indicate a steady increase, month by month, over the figures for the previous year, amounting in general to more than 11 per cent. This increase, it is stated, is not confined to any one part of the Dominion but extends from the Atlantic to the Pacific.

Among the chief installations inaugurated in 1935 were three additional units of 66,000 horse power each at the Canyon station of the Ontario Government on the Abitibi River, bringing the station up to its full capacity, as designed, of 330,000 horse power, and the addition of two 50,000 horse power units at Beauharnois, on the St. Lawrence River, by the Beauharnois Light, Heat and Power Company, bringing the number of units at that station up to eight, with an aggregate capacity of 400,000 horse power. This

latter installation, which has been already described in NATURE², comprises very important control works on the St. Lawrence River, with the diversion of an authorised quantity of 53,072 cu. ft. per second from the river flow. These control works have now been completed. The MacLaren-Quebec Power Company has added a fourth 30,000 horse power unit to the High Falls installation on the Lièvre River, bringing it up to its total ultimate capacity of 120,000 horse power.

It is, accordingly, evident that the activities of the various companies and authorities engaged in hydro-electric exploitation continue unabated, but there is still ample scope for further development, since it is reliably estimated that Canada has an aggregate available water power totalling 20,347,400 horse power under conditions of ordinary minimum flow, and 33,617,200 horse power ordinarily available for six months of the year. Even these figures are probably understatements, for on the basis of the actual water-wheel installation throughout the Dominion, there is a realised excess of 30 per cent over the calculated quantities, so that it may confidently be stated that the actually recorded resources of the Dominion admit of a turbine installation of some 44,700,000 horse power, of which only about 18 per cent has so far materialised. Yet, even this relatively small percentage places Canada with its 722 horse power per 1,000 inhabitants in an outstanding position amongst the water power using countries of the world. The provinces of Ontario and Quebec jointly possess more than 81 per cent of the total developed power, representing, in Quebec, a proportion of 1,258 horse power per 1,000 inhabitants, and in Ontario, 712 horse power per thousand.

It is interesting to note the uses to which the power is put. Almost 88 per cent of the total hydraulic development is utilised in central electric stations, and represents more than 95 per cent of the main generating equipment of the industry which, in turn, generates more than 98 per cent of the total electricity produced for sale in Canada and for export. Although not specially remarkable in size or power, the view in Fig. 1 is interesting as an example of a recent development at Sault Ste. Marie, on the St. Mary River, Ontario. The installation is of 28,050 horse power

and belongs to the Great Lakes Power Company. Another channel of absorption is the pulp and paper industry, Canada's predominant manufacturing activity, which has hydraulic installations of 605,346 horse power and a motor installation for operation by hydro-electricity aggregating more than 1,029,000 horse power, or a combined mechanical installation of more than 1,634,000 horse power. In addition, the industry purchases large quantities of electricity from the central

industry in Canada. A particularly notable feature is the large volume of lower grade ore which can be, and is, profitably mined as a result of the low cost of power. In the latest Annual Report issued by the Dominion Bureau of Statistics on the mineral production of Canada, it can be seen that the Dominion produces, normally, about 90 per cent of the world's supply of nickel, 60 per cent of its asbestos, nearly 35 per cent of its cobalt, 12 per cent of its gold and lead, 10 per cent of its

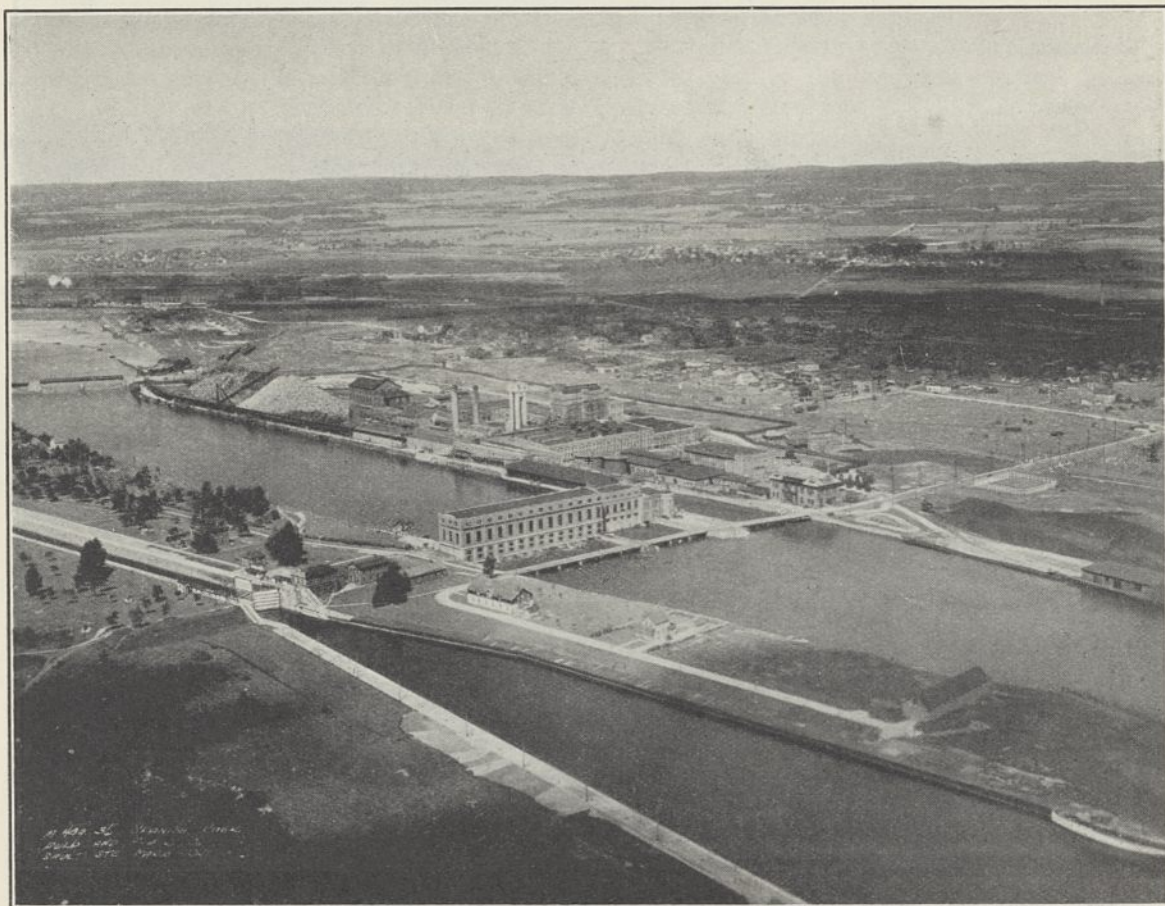


FIG. 1. Sault Ste. Marie development, St. Mary River, Ontario. 28,050 horse power. Great Lakes Power Co., Ltd.
By courtesy of the Canadian Official News Bureau, London.

electric stations for use in electric boilers. Fig. 2 shows a development of 56,250 horse power at Smoky Falls on the Mattagami River, belonging to the Spruce Falls Power and Paper Company Ltd.

Water power is also a valuable aid to the mineral industries, and indeed its importance in this respect can scarcely be overstated. The convenient location of ample supplies of hydraulic power economically adjacent to mineral fields and centres of mining activities, and the consequent low price generation of power have been dominant factors in the successful development of the mining

silver, 15 per cent of its zinc and 13 per cent of its copper, besides being one of the major producers of the platinum metals and of aluminium, radium and uranium. Moreover, there is a wide field among the rocks of the great Laurentian Plateau or Pre-Cambrian Shield for the further exploitation of mineral deposits, remarkable alike as regards variety and extent, and this area contains nearly 60 per cent of Canada's available water power, an endowment which is highly favourable to economic development. The Report of the Water Power Bureau affirms that "so far as information is available, there is no present or

prospective mineral area, with the exception of some of the coal fields of the middle plains, where hydraulic energy cannot be made available as demand arises".

One of the most enterprising administrative organisations of the Dominion is the Quebec Streams Commission, which continues to maintain efficiently the desired regulation of flow on all the controlled rivers by means of its extensive system

regard to the regulation of operations, and the levying of rates and other matters connected with the production and distribution of electrical energy in the Province.

With these evidences of the energetic exploitation of its resources of water power, so realistically described in French as *la houille blanche* (white coal), it can be seen that Canada is more than counterbalancing its deficiency in natural fuel. At

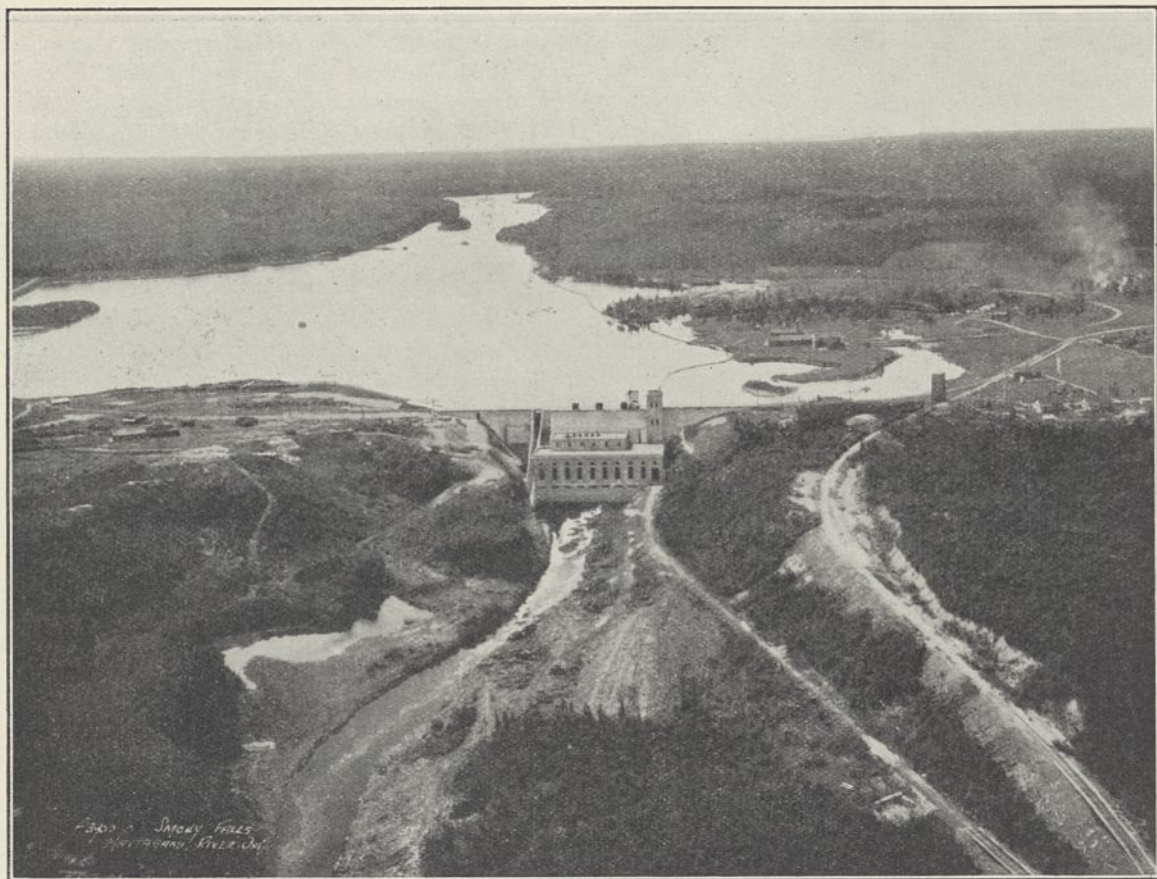


FIG. 2. Smoky Falls development, Mattagami River, Ontario. 56,250 horse power. Spruce Falls Power and Paper Co., Ltd.
By courtesy of the Canadian Official News Bureau, London.

of storage reservoirs in various parts of the province. The Commission now controls seventeen reservoirs, some of them of very considerable size. During the year under review, important legislation was passed by the Quebec Provincial Government extending the powers and activities of the Commission to the actual development and utilization of water power sites, the operation of hydro-electric installations and the production and transmission of hydro-electric energy, as also its purchase from other central electric stations and its re-sale to municipalities and other consumers. A new Commission, the Quebec Electricity Commission, has been created with wide powers in

a moderate estimate of equivalence, the present hydro-electric installations, on the record of their output for 1935, are shown capable of effecting a saving in coal of 19 million tons per annum, and since owing to the lack of geological coal deposits, the highly industrialised Provinces of Ontario and Quebec are under the necessity of importing supplies, it is obvious that the substitutionary power is of the highest importance to their commercial welfare.

¹ Hydro-electric Progress in Canada in 1935. Paper No. 1871. Water Power Resources of Canada, and Hydro-electric Progress in 1935: A Review of the Year's Activities. By the Hon. T. A. Crerar, Minister of the Interior. Paper No. 1879. (Ottawa: Dominion Water Power and Hydrometric Bureau, 1936.)

² NATURE, 131, 788 (1933).

Indeterminism and Free Will

By Prof. E. Schrödinger

IT has become the orthodox view of physicists to-day, that the momentary state of a physical system does not determine its movement or development or behaviour, to follow; Nature is supposed to be such that a knowledge of state, sufficiently accurate for sharp prediction of the future, is not only unobtainable but also unthinkable. All that can be predicted refers to a large number of identical experiments, and consists in a definite statistics among all the possible developments to follow. The relative margin of indeterminacy (the 'spread' of the statistics) is large for a small system, for example, for an atom; but for large systems the margin is usually, though not necessarily, small, which makes it possible to account for the *apparent* determinacy of inanimate Nature.

Many eminent scientific workers, especially physicists, have tried to play with the idea that the *apparent indeterminacy* of animate Nature, that is, of living matter, might be connected with the theoretical indeterminacy of modern physics. What makes this play so fascinating and thrilling is evidently the hope (whether outspoken or concealed) of extracting from the *new* physical dogma a *model of free-will*, which the *old one* would refuse to yield. I consider this hope an illusion, for the following general reasons.

When observed objectively in other creatures, free-will actions do not call for a special 'indeterminist' explanation any more than other events. When two persons (or the same person on different occasions) react differently under apparently the same conditions, we feel compelled to account for it, whether the reaction is a passive or an active one, by a real, though unknown, difference of conditions, including, of course, character and temporary disposition on the part of the reacting persons. A poet unrolling before us the objective picture of free-will actions is just as concerned about proper causation (here called motivation) as the classical physicist was for inanimate Nature.

On the other hand, when regarded as a fact of self-observation, free-will has quite a different standing from scientific experience. The two are, as it were, in different planes, which do not intersect. Self-observed free-will I would analyse into *two* facts. First, indeed, a prediction, but *not* based on previous experience, certainly not in the way in which scientific prediction is. If I am the

actor, I just *know* what is going to happen, and that, apart from pathological cases, with the greatest amount of certainty which is ever met with in life. The *second* fact is a moral one: I feel responsible for what happens.

Now, it is true that this *absolute* prescience is a matter only of the very last moment before or when the action sets in, which it rather accompanies than precedes. Before that there is frequently doubt and even entire ignorance ('hesitation'). This antecedent period, together with the remarkable feeling of responsibility, entails the idea of *choice* between different possibilities for which a clue is sought in the modern views of physics. If that were right, it would mean *either* one of two things. First, that the laws of Nature are after all at "my" mercy. For if my smoking or not smoking a cigarette before breakfast (a very wicked thing!) were a matter of Heisenberg's uncertainty principle, the latter would stipulate between the two events a definite statistics, say 30:70; which I could invalidate by firmness. Or, secondly, if that is denied, why on earth do I feel responsible for what I do, since the frequency of my sinning is determined by Heisenberg's principle? The new physics does not shift St. Augustin's paradox by a hair's breadth.

In my opinion the whole analogy is fallacious, because the plurality of possible events, in the case of an action under free-will, is a self-deception. Think of cases such as the following: you are sitting at a formal dinner, with important persons, terribly boring. *Could* you, all at once, jump on the table and trample down the glasses and dishes, just for fun? Perhaps you could: maybe you feel like it: at any rate you *cannot*. Then, which of the virtually possible events are to be called possible under the auspices of free-will? I would say, just the one that actually follows.

Against this view cases might be quoted where the decision is really difficult, serious, painful, bewildering, when we are down on our knees before the Almighty to forgo it. But in this He is inexorable! We *must* decide. One thing *must* happen, *will* happen, life goes on. There is no ψ -function in life. I have always considered this having-to-decide as a strikingly close subjective correlate to the classical, the deterministic model of Nature. It ought to be emphasized that modern physics does not compel us to abandon this correlation. The material units which determine the

processes of life seem to be large enough for—possibly and even probably—safeguarding the essential course of these processes against any perceptible direct and immediate manifestation of the Heisenberg uncertainty.

The preceding remarks have been elicited by the first page of a highly interesting sketch by Prof. F. G. Donnan, "Integral Analysis and the Phenomena of Life" (*Acta Biotheoretica*, Series A, vol. 2, Pars 1, 1936; Leyden: E. J. Brill), though not by way of contradiction. Prof. Donnan is not concerned with the question of free-will. His idea

is that an organism is to be regarded as a 'historical' system, whose reactions at a given moment are not determined alone by its surroundings and by its momentary state, but also by what has happened to that organism during a certain previous period. This is a highly attractive view, and the mathematical treatment proposed by Prof. Donnan a very suggestive one—even if one should hesitate to agree with the view (which he considers essential) that some of the historical traces are *not* engraved in the momentary state otherwise than by modifying its reactivity.

The Institute of Experimental Psychology at Oxford

THE University of Oxford has recently enacted a statute establishing an Institute of Experimental Psychology, at which active work will be begun in the autumn. Dr. William Brown, Wilde reader in mental philosophy in the University, has been appointed its first director, with Dr. William Stephenson as his assistant. The management of the Institute is in the hands of a committee consisting of the Vice-Chancellor, a representative appointed by each of the boards of the Faculties of Medicine, Literæ Humaniores, Biological Sciences and Social Studies, together with the director.

Thus Oxford has at length officially fallen into step with the movement that has been going on for more than fifty years, the aim of which has been to free psychology from the exclusive tutelage of philosophy, and establish it as an independent, empirical and experimental science. Such freedom, however, does not imply separation, nor can the independence be more than a relative one.

In taking its place among the other natural sciences, the data of all of which provide grist for the philosophical mill, psychology will still look to philosophy, as they do, for the solution of some of the ultimate problems; though it will pursue its own proximate quests by its own empirical line of approach and the use of its own appropriate methods. Grouped together with the other sciences, again, and particularly with the biological and social sciences, there will be much overlapping and interlacing, which can only result in great mutual advantage to them all. Both these points have most wisely been taken into consideration in the constitution of the committee of management of the new Institute.

The foundation of this laboratory at Oxford is in a sense a historic event. For centuries, the University

has been the home of philosophy, of which psychology has always been an integral and essential part. In the Middle Ages, Roger Bacon and Duns Scotus, no mean psychologists, stand out amongst its scholars. In the seventeenth century, the 'father' of modern psychology, John Locke, author of the famous "Essay Concerning Human Understanding", was a student of Christ Church. When the Wilde readership was founded in 1898, a distinguished psychologist, G. F. Stout, was appointed to hold it; and he was succeeded by a no less distinguished teacher of the science than William McDougall.

An age-long tradition was there; the conversion of rational into empirical psychology had already begun. But as yet there was no established laboratory in which systematic research could be prosecuted. One is tempted to ask why Oxford should have lagged behind when Cambridge, London, Manchester, Edinburgh forged ahead, in company with most other European and American universities, following the lead of Wundt at Leipzig. Was it opposition from the ancient vested interests of philosophy? Was it the belief that scientific psychology was a mere appendage of physiology? Did the terms of the Wilde readership, excluding experimental psychology explicitly from its purview, stand in the way? Of recent years, at any rate, it was none of these things. Before the Great War, McDougall was able for a time to direct a laboratory, housed in rooms belonging to the Department of Physiology, and having access to apparatus in use there. Solid work had already begun; and, but for the upheaval of the War years and their aftermath, it might have become permanent. But the accommodation was then urgently needed for other purposes, and funds were unavailable; so the project had to be abandoned.

During Brown's fifteen years' tenure of the Wilde readership, several attempts were again made in this direction; but, though encouraged by much friendly sympathy on the part of the authorities, the same lack of funds and rooms in which to house a laboratory made it impracticable. Last year, however, a generous offer of £10,000 was

made through the Wilde reader for this purpose; and it was gladly accepted by the University. The curators of the University Chest will provide the necessary accommodation; and a further sum of £500, together with a grant of £150 a year for five years from the Rockefeller benefaction for research in the social sciences, is to go to the Institute.

Centenary of Darwin's Visit to the Galapagos Islands

Issue of Commemorative Stamps by Ecuador

DISTINGUISHED men of science have, before now, been commemorated on postage stamps by countries sufficiently civilized to value their achievements, but it does not appear that any particular event in the history of science has hitherto been celebrated in this way. It has been left to the Republic of Ecuador to mark, by the issue of a special series of stamps, the centenary of a critical point in the development of the evolution theory. It was on September 16, 1835, that Darwin first landed on Chatham Island in the Galapagos group, where, as he wrote in his "Journal of Researches", "we seem to be brought somewhat near to that great fact—that mystery of mysteries—the first appearance of new beings on this earth". The influence of what he saw there on the later development of his thought is now a commonplace of biological teaching, although some modern writers on evolution might be well advised to read again his own account of his observations and the conclusions to which he was led.

The six stamps which are here reproduced bear designs associated with the islands or with Darwin's visit, the introduction of a portrait of Christopher

Columbus being apparently suggested by the Ecuadorean name for the group, "Archipelago of Colon". The portrait of Darwin is taken from a well-known photograph now hanging in Down

House; it represents him in his old age, and is probably that by which he is best remembered, although at the time of his visit to the Galapagos Islands he was, of course, a young man of twenty-six years. A view, presumably representing some place in the islands, has a group of coconut palms in the foreground. If this is correct, it indicates a change in the flora since Darwin's time, for he notes in his "Journal", "I saw nowhere any member of the palm family". Two of the designs represent reptiles characteristic of the islands, one of the land iguanas and one of the giant tortoises from which the group takes its name. How many zoologists, one wonders, associate "Galapagos" with the



FIG. 1. Stamps issued by the Ecuadorean Government in commemoration of the centenary of Darwin's visit to the Galapagos Islands in the *Beagle* in 1835.

familiar but etymologically obscure word "carapace"?

It is important to remember that one of the things that struck Darwin on visiting the islands was the abundance of individuals, especially of some of the larger reptiles. This density of

population has now become a thing of the past, and the accounts of recent travellers make it clear that unless adequate protection can be given, the disappearance of this unique fauna is only a matter of time. It is therefore a subject for congratulation that the Ecuadorean Government has taken an enlightened view of its responsibilities. It has declared the greater part of the archipelago a Nature reserve, in which no hunting or collecting is allowed except by special permission for scientific purposes. Further, a list has been drawn up of the species more immediately

threatened, and the killing or capture of these is prohibited, except that the inhabitants may kill some of them for food.

Many scientific bodies on both sides of the Atlantic have expressed their approval of the steps taken, and have offered to co-operate in rendering them effective. A committee of the British Association, under the chairmanship of Sir Edward Poulton, is at present considering what can be done to organise this international co-operation with the Ecuadorean Government.

W. T. CALMAN.

Obituary

Prof. A. A. Bowman

BY the death on June 12 of Prof. A. A. Bowman at his home in Glasgow, British philosophy has lost one of its most effective and attractive personalities.

Prof. Bowman was fifty-three years of age. Except for the period of the War, he had spent his life in the study and teaching of philosophy, first in Glasgow, then in the United States, finally again in Glasgow. He took his degree in classics and philosophy: and after a post-graduate year in Germany, he served his apprenticeship to teaching in Glasgow. In 1910 he was elected professor of logic at Princeton, New Jersey, becoming later administrative chairman of the Department of Philosophy. In 1926, at more than a little material sacrifice, he accepted a call to return to his old University. For one year he held the chair of logic: and from 1927 until his death the chair of moral philosophy. At no time in the long history of that illustrious chair has its holder exercised a stronger personal influence upon his students, upon the University as a whole, and upon Glasgow and the west of Scotland, than Bowman exercised during his short tenure.

Bowman was profoundly a man of peace, and ardent in service of its better organization. The War, however, especially the last months of it, was one of the decisive experiences of his life. He was in the United States. But from the beginning of the War he was restless. In 1915 Princeton gave him leave of absence. The British authorities in the United States, thinking him (quite rightly) medically unfit for active service, refused to recruit him. He came home at his own expense, found some complaisant medical officer to pass him for home service, then, being in the army, badgered his superiors until finally they let him go to France. After a few months campaigning, he was captured in the Lys break-through of April 1918 and sent to a prison camp. That, which seemed to be the end of his service, proved in fact to be his opportunity. Conditions in the camp were deplorable. Bowman's fluency in German made him the natural centre and unofficial leader of the camp. With tremendous

resolution, he threw himself into the task first of improving those conditions through negotiation with the German authorities, and then of raising and maintaining the morale of his fellow prisoners. His main instrument for that purpose was a system of tutorial classes which had to be carried through without books or material or facilities of any kind; indeed, with almost no other resource than his own erudition and the persuasiveness of his teaching. He gave lectures and instruction in literature, in philosophy, in contemporary history (especially German and Russian), and in the history of art; and on groups of men quite unfamiliar with these themes, he made a profound impression. He taught them really to save their souls; and he was inspired in the task. That experience sharpened and developed his powers of leadership and of public speech. He had always been a good teacher; the prison camp made him one of the most brilliant and powerful expositors of his time.

Both in the United States and in Scotland Bowman had immense influence. Of slight and even frail physique, he had superb spiritual energy and insight, unshakeable courage, and, as has been noted, quite unusual powers of expression. Scholarship was natural to him: and although his flair was for speculation at once bold and thorough, it was always backed by solid learning. All his life he was an ardent student of classical and of modern literature. He had read widely in social theory and history. He was a good critic of painting. Especially in later years, his studies in the philosophy of religion had drawn him into the field of cultural anthropology, in which he had a vast and intimate knowledge of a great variety of primitive civilizations. All this equipment he brought into fullest play in the ordinary business of his crowded class-room. His students, indeed any audience which he addressed, fell instantly under his spell. For his learning, his humour and his eloquence were no more than the instruments of a man of richest personal quality—of deep insight, of rare imaginative power, and of profound moral and social convictions. In philosophy, he held by the Idealist tradition in which he had been nurtured. He gave it

a metaphysical form of his own which his early teachers would have found strange. But he never moved from their conception as to the nature and importance of the issues with which philosophy is concerned. In his hands philosophy was a way not only of thought but also of life. He had worked out his system in the grand style, compact, articulate, thorough and comprehensive, and he presented it with uncommon power.

Bowman's great work was done in the class-room and on the public platform. The tale of his publications is small: a volume of sonnets—the fruits of his prison camp experience—two or three pamphlets and a few articles in learned journals. Happily there is a bigger book almost ready for the press; and it may be hoped that in the large mass of manuscript material which he has left, enough will be found in readily publishable form to give to others than his own students, some idea of the reflections of one of the most original, interesting and courageous minds of our time.

H. J. W. HETHERINGTON.

Prof. Margaret Benson

PROF. MARGARET BENSON, whose death on Saturday, June 20, is mourned by a wide circle of friends, is known best to botanists as one of the leading paleophytologists of the last generation. Much of her early work on fossils, which began about 1904, has long been incorporated into the text-books; but it is only a year since she published her last paper on the subject. Her best work was done at a time when the technique of fossil cutting was in its infancy, and for years she cut her own sections at a small lapidary bench in a shed in the grounds of the Royal Holloway College, with a cutting machine worked by a gas engine. She left her valuable collection of fossil slides to the College.

Prof. Benson's industry and single-mindedness were quite exceptional, and were combined with a very real flair for knowing what a fossil might yield and how a structure might be interpreted. She was trained in research at Newnham College, Cambridge, and University College, London, and her early work there on the embryology of Amentiferae, for which the D.Sc. of the University of London was conferred on her in 1894, is now a classic. In October 1893 she was appointed head of the newly founded Department of Botany at the Royal Holloway College. The Department flourished under her, and in 1912 the University conferred on her the title of University professor of botany, which chair she held at the College until her resignation in 1922.

Prof. Benson was a great traveller and collector; and the botanical garden, museum, herbarium and well-stocked laboratories of her College to-day bear witness to her indefatigable enthusiasm and wise foresight. In the Michaelmas term of 1897 she was granted leave of absence in order to visit the professors of botany of Brussels, Heidelberg, Tübingen, Basle, Strasbourg and Paris in their respective laboratories during term. This tour she made with the view of securing the best information for the

equipment of a botanical laboratory. In later years she made two journeys to the antipodes, and on both occasions brought back quantities of valuable specimens. Her botanical work is of enduring value, and she inspired many generations of students with a love of the subject.

E. M. B.

Prof. A. A. Noyes

THE death of Arthur Amos Noyes, director of the Gates Chemical Laboratory at the California Institute of Technology, which occurred at Pasadena on June 3 as the result of an attack of pneumonia at the age of sixty-nine years, has deprived physical chemistry of another of its pioneers of the Ostwald school. Noyes may be regarded, indeed, as the American prototype of Sir James Walker, who died last year. Just as Walker was Ostwald's first British student at Leipzig, Noyes was the first American. Of them, Ostwald remarks in his autobiography: "Both are not only distinguished as investigators and teachers, but belong also as men to the best examples of this diversified race".

For nearly twenty years the research laboratory of physical chemistry of the Massachusetts Institute of Technology, which Noyes directed and to which he personally contributed half the expenses of maintenance, was the centre of this branch of science in the United States, and many of the leading American physical chemists may be counted among his students. His own contributions to the ionic theory of electrolytes and to the principles of qualitative analysis were of primary importance in the modern development of these two fields.

Modesty and thoroughness were the chief characteristics both of Noyes' work and of his character. He sought no honours: he leaves many friends.

JAMES KENDALL.

WE regret to announce the following deaths:

Mr. Arthur D. Carey, known for his explorations in Central Asia, for which he was awarded the Founder's Medal of the Royal Geographical Society in 1889, on June 11, aged ninety-one years.

Prof. Ira E. Cutler, emeritus professor of zoology in the University of Denver, on May 25, aged seventy-three years.

Prof. W. E. Dalby, F.R.S., emeritus professor of engineering in the City and Guilds College, Imperial College of Science and Technology, University of London, on June 26, aged seventy-two years.

Prof. Ivan Hönl, professor of bacteriology in the University of Prague, known for his work in combating the scourge of tuberculosis in Central Europe, on June 7, aged seventy years.

Mr. Frank Merricks, past-president of the Institution of Mining and Metallurgy, and a member of the Geological Survey Board in 1920-26, on June 8, aged seventy years.

Sir Charles Nathan, C.B.E., member of the Executive Council of the Australian Commonwealth Council for Scientific and Industrial Research in 1927-28, on June 5, aged seventy-six years.

News and Views

Retirement of Prof. W. A. Bone, F.R.S.

At the end of the present session, Prof. W. A. Bone vacates, under the age limit, the chair of chemical technology at the Imperial College of Science, which he has held for the past twenty-five years. A graduate of Owens College, Manchester, he studied under Prof. H. B. Dixon and later, when lecturer there in chemistry and metallurgy, he carried out those classical investigations into the slow and explosive combustion of hydrocarbons which have done so much to elucidate the mechanism of their oxidation, and enabled him to formulate the hydroxylation theory. In 1905, he became the first Livesey professor of coal gas and fuel industries in the University of Leeds, and there laid the broad foundations of the new branch of science, fuel technology; there also, in collaboration with McCourt, he invented and developed surface combustion. At South Kensington, Prof. Bone was faced in 1912 with the task of building up a new Department of Chemical Technology, and under his inspiring leadership a research school of world-wide reputation has been created. His field has covered high-pressure explosions and gas reactions, flame spectra, the study by high-speed photography of flame movements in gaseous explosions, the chemical constitution of coal and gas reactions in the blast furnace. At a dinner on June 17, given in honour both of Prof. Bone and Mr. W. C. Hancock who is also retiring from the lecturing staff of the Department, a distinguished gathering including many old colleagues and students assembled, and suitable presentations were made. Fortunately Prof. Bone's retirement does not mean the ending of his scientific activities, for the College authorities, strongly supported by industry and other outside bodies, are providing a new research laboratory in which he will be enabled to pursue those investigations on which he is still actively engaged.

Société de l'Industrie Minérale: Foreign Members

At a general meeting of the Société de l'Industrie Minérale, St. Etienne, held on May 24, it was decided that the Society should, for the first time, elect honorary members, the terms of the modified statute being that "the title of Honorary Member can be given by the General Meeting to persons of foreign nationality who have promoted the mineral industry or the society by their works". The first elections under the new statute are: Sir Robert Hadfield; Dr. C. E. Guillaume, director of the International Bureau of Weights and Measures; Prof. L. Denoël, professor of mining in the University of Liège; and Prof. P. Fourmarier, professor of geology in the University of Liège. The Société de l'Industrie Minérale, which was founded in 1855, is one of the leading associations of French engineers, and has a roll of nearly two thousand members.

Meyer Medal for Plant Introduction

THE Meyer Medal of the American Genetic Association, for distinguished service in plant introduction, was presented on June 13 to Mr. P. H. Dorsett, who for more than forty-five years has been associated with the scientific work of the U.S. Department of Agriculture. Mr. Dorsett was instrumental in bringing together the largest collection of soy bean varieties that has ever been made. Two expeditions to China were undertaken to make this collection. On the first trip Mr. Dorsett and his son, the late James Dorsett, collected more than two thousand samples from Nanking and its vicinity. On the second expedition, Mr. Dorsett and Dr. William J. Morse, soy bean expert of the U.S. Department of Agriculture, collected more than six thousand samples which were sent to the United States for test. A total of some two thousand distinct varieties of soy beans was obtained from these samples. These are being tested to determine their value to the American farmer. Some of them are already being widely used. The soy bean is a relatively new plant immigrant in the United States, but in 1935 five and a half million acres were planted with it, and forty million bushels of the dry beans were harvested. Mr. Dorsett also took part in three expeditions to obtain new varieties of plants to Brazil (1913-14) and to the West Indies in 1927-30. He was instrumental in bringing into the U.S. valuable citrus varieties and many rare ornamental plants. The Meyer Medal is awarded at intervals by the Council of the American Genetic Association for distinguished services in plant introduction. It is named in honour of the late Frank Meyer, pioneer plant explorer of the U.S. Department of Agriculture, and had its origin in a fund left by Meyer to his fellow workers in plant introduction, who decided to use it for this purpose. Meyer spent the last nine years of his life in plant explorations in China. Among previous recipients is Mr. H. N. Ridley, who was responsible for the introduction of Para rubber into the East Indies.

Newton Manuscripts

AN interesting sale of manuscripts is advertised by Messrs. Sotheby and Co., 34 and 35 New Bond Street, on July 13 and the following day. Readers of NATURE may remember the "Portsmouth Papers", strictly a "Catalogue of the Portsmouth Collection of Books and Papers written by or belonging to Sir Isaac Newton", published by the Cambridge University Press in 1888. The then Earl of Portsmouth presented the scientific part of these papers to the University, and an influential syndicate of the University issued a catalogue of the whole, and took a copy of the more important letters that it did not keep, and returned these to Lord Portsmouth. The Portsmouth family, which has a connexion with

Newton, has put the manuscripts, or such as they have now, in the hands of all serious workers, from Horsley to L. T. More. Viscount Lymington, the heir of the Earl of Portsmouth, has now instructed Messrs. Sotheby to sell them. It might thus seem that there was little except personal matters to find. Many of the letters have been published, accurately or inaccurately, whole or in part, in various well-known sources. But the list includes, for example, such items as "three thick folio volumes", which we did not know of, relating to the Mint and containing documents in Newton's hand. It makes one leave in suspense the Cambridge report, that "Newton's manuscripts on Alchemy are of very little interest in themselves", probable as this may seem in itself, and though the syndicate contained one notable chemist. Also Messrs. Sotheby have added some celebrated portraits to their list. The sale should be well attended; for though most of the contents that are valuable are available, many would like a copy of Newton's beautiful handwriting and that of his contemporaries, apart from those that contemplate a more extensive purchase.

National Inland Water Survey

THE first Annual Report of the Committee appointed in January, 1935, jointly by the Minister of Health and the Secretary of State for Scotland, "to advise on the Inland Water Survey for Great Britain, on the progress of the measures undertaken and on further measures required and, in particular, to make an annual report on the subject", has been awaited with keen anticipation in many quarters, and especially by those engaged in the use and exploitation of the water supplies of Great Britain. It was scarcely to be expected, however, that during the first year of its existence, the Committee would be able to achieve any remarkable results. Its first duty was, naturally, to review the existing conditions and to ascertain the extent to which processes and methods in vogue could be adapted to some uniform and standardized system of procedure. The purpose of the survey, as set out in the Report now issued (London: H.M. Stationery Office. 3d. net.), "is to correlate the information at present obtained from all sources, to extend and increase the sources of information, and to make the information readily available for the use of the interests concerned". This has involved exploratory investigations in various directions and the issue of inquiries, which took the form of a detailed questionnaire (reproduced in an appendix to the Report) to which replies have been received from about 3,000 bodies and persons. The replies show that there is a good deal of information available, but that it is varied in type and date, is insufficient and lacks co-ordination and distribution—an endorsement of the conclusions arrived at by the British Association Committee in its report to the Leicester meeting, 1933.

THE present Committee has, accordingly, directed its attention to the means by which an improved system of gauging and recording could be attained. At the same time, it has been conscious of the

desirability on economical grounds of adopting as gauging stations a number of structures not originally designed for the purpose, and of obtaining measurements from weirs of a type perhaps not best suited to the end in view. It is of opinion, as advocated in NATURE (Nov. 5, 1932; and again, Aug. 4, 1934), when the matter was first under public consideration, that the Catchment Boards of England and Wales, established under the Land Drainage Act, 1930, are the appropriate bodies to instal gauging stations on rivers and to make and record the measurements of the flow of the rivers which they control. The co-operation of the Catchment Boards has therefore been sought with results which are described as encouraging, and, as there is a large area in England and Wales not yet under the jurisdiction of any catchment board, the Committee has concentrated attention for the time being on areas for which Catchment Boards have been appointed. As regards underground water, the aid of the Geological Survey has been enlisted with the approval of the Committee of the Privy Council for Scientific and Industrial Research. In estimating the value of the existing gauging stations for measuring overground water, an examination has been made of three selected rivers—the Nene, the Thames and the Clyde—and a section of the Report deals with each of them in detail. After setting out its proposals for the publication of data, the Committee concludes the Report with an expression of satisfaction at what it has been able to accomplish in the first year of its existence.

Britain's Largest Hydro-Electric Development

AN aggregate of 102,000 kilowatt of plant is installed in five power stations in Kirkcudbrightshire and Wigtownshire in the south-west of Scotland. When the Water-Power Sources Committee presented its report in 1924, this portion of Scotland was defined as a place where there were possibilities of water-power development, but it was not surveyed as no commercial outlet for the power could then be visualized. The formation of the Grid, by providing the necessary power outlet, showed how a commercial application was possible, and the present hydro-electric scheme was developed as an important factor in the Central Scotland Grid scheme. In the *Electrical Times* for June 25 there is a detailed account of this scheme, called the Galloway Water Power Scheme, which generates the greatest amount of hydro-electric power of any station in Great Britain. In any power scheme the peak units are by far the most expensive. With steam generation, for example, a large amount of plant capacity has to be provided to cover the period of maximum demand. Daily peaks also occurring at regular intervals are expensive owing to the stand-by coal required. In these circumstances, we can see that hydro-electric plant, which can pick up and drop load at very short notice either in normal operation or in emergency, is a very valuable asset. The Galloway undertaking is unique amongst power stations, as it was planned and carried out as a peak load station instead of supplying the usual basic load. It has already proved valuable

during the sharp rise and fall of the Glasgow industrial load at the midday dinner hour and other similar occasions. It is satisfactory to learn that after the results of the first twelve months' operation of the first half of the scheme, which includes the two power stations of Tongland and Glenlee, having plant aggregating 57,000 kilowatt, the financial future of the undertaking seems assured.

"Concerning Human Progress"

DR. H. S. HARRISON was characteristically stimulating in his presidential address to the Royal Anthropological Institute on June 30, when he spoke "Concerning Human Progress". Unquestionably his choice of a topic was apt to the needs of contemporary thought, which may well look to the anthropologist for guidance on such questions as the direction and mechanism of human development. Dr. Harrison's conclusions, however, gave his hearers little cause for complacency. He showed no little courage in electing neither to attempt a strict definition of progress, nor to lay down canons of discrimination between upward and downward, in the direction of change. In the event, however, when once he had pointed out that the idea of progress is a modern growth, which did not affect human development until the latter part of the nineteenth century, this deliberate omission enabled him, speaking more especially as a technologist, to demonstrate the essential opportunism of cultural development in the past, which has moved continually forward, backward and sideways, without knowledge of what the direction might be, and not infrequently has led to a dead end. Social progress, he went on to point out, has had no better guidance; but as codes of conduct and actual behaviour are the objective revelations of the mind of man, individually or collectively, and both the material and immaterial products of the human mind have trespassed far beyond the biological necessities, the question arises whether the mind of man has been moulded in response. Dr. Harrison, quite rightly, stressed the apparent paradox that, so far as the evidence goes, there is little, if any, difference to be discerned in physical character and brain power between the earliest example of *Homo sapiens* and the man of to-day. If we look for the directional factor which might have brought about a change in the heart and mind of man, of those forces which have been put forward as active in organic evolution, use-inheritance alone appears to fulfil the requirement, but is ruled out of court, owing to its general repudiation by the biologist. Hence, Dr. Harrison concluded on a note of pessimism, "the mind of man . . . has little sense of direction, and if it may be said to have an ultimate aim, that aim is too obscure for formulation."

The Osborne Reynolds Ridge

THE recent letters in NATURE from Prof. W. Schmidt and Prof. H. Stansfield, describing their observations of a capillary wave on the surface of water, are a reminder that important published observations may be forgotten for many years. Prof.

Stansfield now finds that this phenomenon was described by Osborne Reynolds in 1881. Reynolds produced the wave by dropping oil on water, and also observed it in the open air, perhaps when he was fishing, as he says it looks like a line of gut floating on a river, where the water eddies up to the surface in deep pools. About forty years later, there was fresh activity in the study of moving films. In September, 1921, the late Mr. E. Edser quoted Reynolds's paper at a meeting of the Faraday Society, and described experiments showing that the moving film of oil sets in motion a thin layer of water beneath it. Five years before, in Toronto, Prof. J. Satterly had noticed a 'ripple' which moves up a glass tube in advance of the liquid meniscus, when the tube is being filled from below; this and other effects similar to the Reynolds ridge were under investigation there. Five years later, Burdon of Adelaide published a photograph of oil spreading on the surface of water, clearly showing the Reynolds ridge in advance of the visible oil film; and in the same year, 1926, Edser included this photograph and a discussion of the ridge in Appendix IV of his "General Physics for Students". When the rising generation of physicists see the Reynolds ridge, they should recognize it at once as an old friend.

Syria and Crete: Further Discoveries

SIR LEONARD WOOLLEY's further report on his excavations in Syria is a striking justification of the prescience which sought in the area at the mouth of the Orontes evidence for the early relation of the civilizations of Crete and western Asia. The evidence which has been brought to light since the dispatch of his first report (see NATURE of June 13, p. 979) carries the story of the Aegean connexions of Syria from c. 900 B.C., the point at which the settlement at Tell Sheikh Yusuf begins, back to the Middle Minoan age of Crete, somewhere between 1700 and 1580 B.C. At Tell Atchana, a mound near the bank of the Orontes, half-way across the Amk plain in the rear of the Amanus mountains, Sir Leonard reports in *The Times* of June 25, trial excavations in a single trench, which lasted for no more than a fortnight, produced evidence of the existence in the heart of Syria of a city settlement, which was predominantly Cretan in character, and was deserted entirely not later than the twelfth century B.C. At an earlier stage of its history this city had been ravaged by fire and sword, as was shown by the evidence of the large buildings, of which the fire-scarred remains were uncovered. Here the floors were littered with fragments of pottery, among which Syrian wares were mingled with sherds showing characteristic Minoan motifs, as well as with specimens of the art of, at present, unknown provenance previously reported. The evidence indicates that the destruction of the building took place before the Late Minoan age began. The find of a Minoan bronze sword is balanced by a Mesopotamian bronze axe and chisels and cylinder seals. The link between Crete and the site on the Amk plain has yet to be demonstrated; but a clue is afforded by the ridge-

top acropolis site at the head of the delta, where surface finds on one hand match the pottery of various periods at Tell Sheikh Yusuf, and on the other include fragments of Mycenaean and Cypriote bronze age wares corresponding with the later levels of Tell Atchana.

Recent Acquisitions at the Natural History Museum

MRS. CONSTANCE THORBURN has presented to the Department of Zoology of the Museum seventeen water-colour drawings of British mammals executed by her husband the late Archibald Thorburn. Purchases for the Department include a collection of small mammals, mostly rodents, including some rare and little-known species from the Cameroons; and a small collection of European birds obtained on their northward migration in April and May by Mr. C. G. Bird, at Rio d'Oro, on the north-east coast of Africa. Dr. C. T. Trechmann has generously presented to the Department of Geology a large and valuable collection (including more than 200 type and figured specimens) of Mollusca collected by him from the West Indies. The Mineral Department has received as a gift from Mr. Arthur Earland sea-bottom deposits collected from the Weddell Sea in the Antarctic by the "Discovery" expedition, together with the crystals of gypsum, calcium oxalate, and the new mineral earlandite which had been picked by him from the samples collected. Among the purchases is a series of minerals from Brazil, including a beautiful, table-cut, strongly dichroic aquamarine, spodumene of three kinds and quartz in many different forms and habits. A series of well-shaped crystals of lapis-lazuli and three iridescent limonites from Queensland also have been bought.

Mathematics in Bombay

A VERY interesting experiment in the teaching of mathematics is being carried out in the University of Bombay. Prof. John Maclean, of Wilson College, has had the commendable courage to break away from the beaten track of academic mathematics by devising a special course for his students, dealing mainly with the uses of elementary mathematical methods in the description of quantitative phenomena. The course forms the subject matter of a recent book by Prof. Maclean entitled "Descriptive Mathematics", which was noticed in NATURE of March 7, p. 382. In the Bombay Intermediate Arts and Science examination in March, alternative papers were set; one being of the traditional academic type, whilst the other, entitled "Statistics and Nomograms", was designed to test the efficacy of the new course. Out of a total of 1,400 students, about twenty took this paper. Its questions cover a wide field, and range from Newton's interpolation formula, probability and frequency distributions to transcendental equations and the construction of various types of nomograms. It will be interesting to study the results of this experiment for, judged by the examination paper in conjunction with Prof. Maclean's book, the new course is certainly designed not only to stimulate interest, but also to render a rigorous presentation

of the basic ideas in mathematics much more vivid and powerful than that provided by the stereotyped courses.

Scientific Research in Australia

THE ninth annual report of the Council for Scientific and Industrial Research, Commonwealth of Australia (Canberra: Government Printer, 1936. 4s. 8d.), covers the year ended June 30, 1935, and gives brief accounts of the work of the various divisions in which the work is organised. Weed problems are receiving a considerable share of attention, particularly on the entomological side, through the introduction and distribution of insects which attack the plants in other countries. Investigations are being initiated into contagious bovine mastitis, a serious disease prevalent in dairy herds throughout the world, and an attempt is being made to establish at a dairy farm near Melbourne a normal herd free from the disease. The rabbit pest and the testing of seeds continue to receive attention, and in addition to its investigations on weed pests, the Division of Economic Entomology has been investigating means of preventing the attack of sheep by blowflies. The Division of Animal Health has discovered new and more effective methods of administering anthelmintics for the control of internal parasites of sheep, while the Division of Animal Nutrition has studied the 'coast disease' of sheep, drought feeding and the processes of wool growth. Soil problems, timber preservation and seasoning, the preservation and transport of fruit and chilled beef have been investigated by other Divisions. Even the brief accounts of these investigations contained in the present report indicate that the work of the Council is making noteworthy contributions to the welfare of the basic industries and occupations of Australia.

Geological Survey of Australia

WHEN the Commonwealth of Australia was established, the administration of mining affairs, including geological work, was left with the six independent States. The consequence is that Australia is to-day the only dominion without a national geological survey, a situation which is viewed with grave dissatisfaction by its scientific workers. Every effort hitherto made to remedy the position has failed owing to official opposition from some, but not all, of the State Departments of Mines. A conference between Commonwealth and State officers, held in Melbourne last month, was but little more successful than any of its predecessors. Political, rather than scientific, considerations appear to dominate the issue, and this further failure to agree upon the establishment of a national body, either by the Commonwealth alone or by the States acting jointly, is greatly to be regretted.

Economic Products of the British Empire

VOL. 34, No. 1 of the *Bulletin of the Imperial Institute* has been published by the Institute itself, but the general format remains practically unaltered. This number contains an important report by the

Imperial Institute Advisory Committee on Hides and Skins on a series of hides prepared experimentally in Southern Rhodesia with the view of improving the material turned out by the natives. It is shown that a simple method of drying the hides which was recommended by the Committee gives excellent results, as it did in the case of earlier experiments in East Africa, and is a great improvement over the ordinary native methods of sun-drying. An article by Mr. M. H. French, of the Tanganyika Veterinary Service, records the work which has been done in that Territory to improve the quality of the clarified butter (ghee) produced there. This product, although little known in Great Britain, is of great importance in tropical regions, since when properly prepared and stored it will keep almost indefinitely under conditions in which ordinary butter turns rancid in a few days. An article by Dr. E. O. Teale, mineral adviser to the Government of Tanganyika Territory, describes recent developments in gold mining in this country. Another article gives a brief outline of the mineral resources of Johore, one of the little-known Unfederated States of Malaya. Alluvial tin ore is being mined in three different areas. In another area iron ore is being mined, and unworked deposits are known to occur in three further regions. Gold and china clay are being produced in small amounts, wolfram has been found in one locality, and prospecting for coal is being carried on in two places.

National Bureau of Standards

A REPRINT from the annual report of the U.S. Secretary of Commerce, 1935, describes briefly the more important of the developments of the Bureau of Standards during the last twelve months. Scientific workers and engineers are making increasing use of its facilities. The testing of supplies and materials has increased by 15 per cent over the previous year. This is partly due to the building activities of various Government agencies. Having received an exceptionally pure sample of the metal gallium, its freezing point was determined and found to be $29.780 \pm 0.005^\circ \text{C}$. The melting point of this element is so low that the crystals melt to a liquid on a hot summer day. An investigation has been completed on the efficiency of a large number of rust-preventing materials with particular reference to their use in preventing corrosion in aviation engines during storage. Certain types of materials have been found to be extremely effective for this purpose and for use as general rust preventatives. Laboratory tests of numerous types of oil filters show that some of these devices are most efficient in removing impurities formed in the oil during service. Two formulæ were developed for ink powders which make a writing ink superior to the present federal specification. Work has shown that the superior properties of the English clays are apparently due to the presence in them of certain natural fluxes which are not found in American clays. These fluxes have been identified and studies are now being made of American clays modified by the addition of fluxes. A code for the safety glass used in automobiles has been formulated. It was

developed by the co-operation of manufacturers and users of glass and motor-cars. It specifies tests for wire glass, heat-treated glass and laminated glass which ensure satisfactory safety glass.

Scientific Horticulture

THE fourth year-book of the Horticultural Education Association ("Scientific Horticulture", from the Editor, Mr. R. T. Pearl, South Eastern Agric. Coll., Wye, Kent, 3s. 6d. net) presents many helpful contributions. Several papers describe the special considerations of gardening in various parts of England, or discuss the horticultural needs of a particular industry, such as cider-making; and the number of articles which achieve the difficult blend of science with practice shows a gratifying increase over previous year-books. There are also articles which summarize the findings of research stations. Dr. W. F. Bewley writes on "Twenty-one years' Glasshouse Research at Cheshunt", whilst Mr. R. B. Dawson portrays the origin and work of the Board of Green-keeping Research. Prof. R. J. D. Graham has collected the results of the late Laurence Baxter Stewart on vegetative propagation, and his tables, showing the times and seasons when difficult cuttings may be rooted, will be of very real value to gardeners. Plant pathology has two papers: "The *Phytophthora* Disease of Strawberry" by Mrs. N. L. Alcock and Mr. D. V. Howells, and "The Virus Diseases of Glasshouse and Garden Plants" by Dr. K. M. Smith. Very useful reviews of the present position of research into vernalisation and into photoperiod are given by Dr. O. N. Purvis and Prof. F. G. Gregory respectively. Messrs. W. J. C. Lawrence and J. Newell describe "Seedling Growth in Partially Sterilised Soil", and Drs. Kidd and West issue a warning about the gas storage of apples. They show that the harmful concentration of carbon dioxide in the atmosphere of the store varies with temperature and also with the oxygen content. The president of the Association, Mr. H. L. Jones, chose the subject "Horticultural Education in North Wales" as the title of his address. The contributions are rarely reports of new work, but serve, in an admirable manner, to make available the more abstruse, and often isolated, findings of research in pure science.

Sands, Clays and Minerals

THE April number (Vol. 11, No. 4) of *Sands, Clays and Minerals*, published by Mr. A. L. Curtis, Westmoor Laboratory, Chatteris, once again brings home to readers the fundamental purpose of this magazine. The editorial reiterates that at any rate a partial solution to the problem of unemployment lies in opening up the vast unexploited mineral resources of the British Empire. Numerous industries depend on minerals as raw materials, and increased production leads to increased activity in these industries, with a corresponding fall in unemployment. Certain minerals now being obtained from foreign sources might be produced wholly or in part within the British Empire. Obstacles to optimum development of such resources are not irremovable, though at the present time they

loom large. Possibly if the responsibility for economic development were taken from bureaucratic bodies and sharply dissociated from political circles, a more rapid advance could be achieved. It is the practical men, technologists and experts who are best equipped to regulate development of mineral wealth now lying dormant within the boundaries of the Empire. Indirectly such men are already furthering this object, both in an advisory capacity and by their contributions to magazines such as this. Several articles follow in illustration of the importance of mineral wealth. Mr. W. G. Boden writes of Canadian radium, showing how important it has become in the fight against cancer. Mr. L. Sanderson describes the rare metal niobium found in association with columbite and which is destined to play an important part in steel stabilisation and welded construction for service in the embrittling zone of temperatures. In addition there are descriptions of the mineral wealth of East Africa, Southern Rhodesia and the Gold Coast. Publicity of this character obviously furthers the case for utilization of British resources to meet British demands.

Distribution of Insecticide by Shot-Gun

In a report from Science Service (Washington, D.C.) dated April 25 a patent is announced, and briefly described, embodying the application of insecticides by means of shells discharged from a kind of gun. The idea is an American invention, which claims that shot-gun shells can be loaded with compressed wads of insecticide instead of lead shot. When such a shell is fired, the force of the explosion ejects a wad like a bullet, and when it has travelled a certain distance, it breaks down into a cloud of ultra-fine dust. The distance at which the dissolution of the wad will occur depends upon its make-up—its compactness and moisture content. This distance, it is claimed, can be calculated so that the dust cloud can be discharged on a desired tree or crop. The advantages of the method, as claimed by the inventor, are safety of the operator from the effects of a toxic dust; elimination of cumbersome and explosive spray or dusting equipment; practically no labour; and effective distribution of an insecticide in otherwise inaccessible places.

Biochemical Research at the Franklin Institute

WE have received the third volume (1934-35) of "Reports of the Biochemical Research Foundation of the Franklin Institute". In a foreword, the director, Dr. Ellice McDonald, points out that this issue marks the withdrawal of the Cancer Research Laboratories of the Graduate School of Medicine from the University of Pennsylvania and their inception as the Biochemical Research Foundation of the Franklin Institute. The ostensible reason for this withdrawal is the refusal of the University to allow patenting of medical or biochemical discoveries for the continued furtherance of research activities, though not for personal profit. The Institute has decided that the past research done on the cancer problem should be made an avenue of approach to the more general area of other diseases. The objects of the new

Foundation are the study of the processes of disease from a chemical point of view, the study of new organic chemical compounds for their therapeutic value and the study of longevity and the diseases of age, with the hope of prolonging the span of life. The present volume contains reprints of some thirty papers published by the staff of the Institute and the Cancer Research Laboratories and their colleagues, dealing in general with various aspects of both normal and abnormal tissue metabolism.

Business Mental Activity and Management

MR. W. R. DUNLOP, of 57 Gordon Square, London, W.C.1, who for a number of years has been interested in the study of business mental activity from the point of view of management and administration, and with particular reference to the logic and probability of decisions, desires to get into touch with a logician with a taste for probability arguments and a psychologist interested in the underlying psychological factors. It is desired, if possible, to arrange a private meeting for joint discussion at which an experienced business manager with introspective ability would also be present. The object would be to get a combined opinion on Mr. Dunlop's method and to make proposals for further studies and investigation. Mr. Dunlop would be greatly obliged if any reader would assist him in getting into touch with specialists willing and competent to collaborate in the direction indicated.

Thomas Gray Memorial Trust

THE Royal Society of Arts, through the Thomas Gray Memorial Trust, the objects of which are "the advancement of the Science of Navigation and the Scientific and Educational interests of the British Mercantile Marine", is offering the following prizes for competition in 1936: a prize of £100 to any person who may bring to their notice an invention, publication, diagram, etc., which is considered to be an advancement in the science or practice of navigation, proposed or invented by himself in the period January 1, 1931-December 31, 1936; a prize of £100 for an essay on the following subject: "What are your views as to the effectiveness or otherwise of Part II. of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932, with special reference to vessels engaged in the carriage of oil and timber cargoes, and with particular regard to actual sea experience?" Further information can be obtained from the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

International Association for Quaternary Studies

THE Association internationale pour l'Étude du Quaternaire européen, which met last at Leningrad in 1932, will hold its third session at Vienna on September 1-5. Prof. A. Penck is honorary president, Prof. G. Göttinger is president and Dr. O. Ampferer is president of the Organizing Committee. On this occasion, however, in accordance with a resolution passed at Leningrad, the scope of the Congress is to be the Quaternary in general and not the Quaternary of Europe only. Communications have already been

promised on questions previously arranged for discussion in relation to the Quaternary of Austria and the Alpine glaciations covering stratigraphy, chronology, morphology, climate, prehistory and speleology. MM. Menghin, Kyrle, Beninger and Liebus will devote attention to the palaeolithic period. Arrangements have been made for two excursions while the Congress is in session. Of these, one will visit the loess regions of the Danube Valley (Gottweig, Krems) and the other those in the neighbourhood of Vienna (Laaerbeg). At the close there will be a one-day excursion to the Drachenhöhle of Mixnitz, while on September 7-8 an excursion will visit the loess of Weinviertel. Finally, a long excursion has been arranged for September 9-25, to visit the Austrian Alps and adjacent terrain. An illustrated guide-book is in course of preparation. Membership is a condition of attendance at the Congress, the annual subscription being 10 schillings (Austrian) or two dollars. In addition to the privilege of attendance at the Congress, members receive copies of reports which cover the progress of quaternary studies from 1908 until 1935. There are at present 180 members of the Congress drawn from twenty-five nations. Communications relating to the Congress or to membership should be addressed to Drs. Götzinger and Ampferer, Geologische Bundesanstalt, Rasumofskygasse, Wien III, or to the General Secretary, Herr H. Gams, Botanische Institut, Innsbruck-Hötting.

Announcements

It is announced that the Right Hon. Viscount Hailsham, the Lord Chancellor, has accepted the chairmanship of the British Empire Cancer Campaign.

At the meeting of the Paris Academy of Sciences on May 25, Paul Portier was elected a member of the Section of Medicine and Surgery, in succession to the late Charles Richet.

DR. H. J. PLENDERLEITH, of the British Museum Research Laboratory, has been appointed professor of chemistry at the Royal Academy in succession to Dr. A. P. Laurie, whose term of office has expired. The professor of chemistry gives six lectures at the Royal Academy, in October and November. They are primarily intended for the Royal Academy students, but are open free to students of other art schools and Royal Academy exhibitors of the year who may wish to attend.

THE Council of the Royal Meteorological Society has awarded the Howard Prize for 1936 to Cadet John Burton Davies, of H.M.S. Worcester. The subject of the competition was an essay on "The Causes of Fog over the Open Sea and in Coastal Waters".

WE much regret that the name of Prof. A. C. Seward, who is retiring from the chair of botany in the University of Cambridge which he has held since 1906, was inadvertently omitted from the list in NATURE of June 27, p. 1063, of those on whom the honour of knighthood has been conferred.

ON the occasion of the Congress of Psychiatry held at Rome on April 3, a bust of the neurologist and psychologist, Prof. Sancte de Santis, was unveiled by Prof. Ponzo.

DR. MARSHALL C. BALFOUR, representative in Greece of the International Health Board of the Rockefeller Foundation, has been awarded the silver medal for distinguished services by the Greek Academy of Sciences, Arts and Letters in recognition of his researches on malaria control in the Peloponnese and Macedonia.

THE eleventh International Congress of Psychology will be held at Madrid on September 6-12 under the patronage of the Spanish Republic and the presidency of Prof. E. Mira of Barcelona. The official languages will be Spanish, English, French, German and Italian. Further information can be obtained from the general secretary, Dr. José German, Instituto Nacional de Psicotechnica, Alberto Aguilera 25, Madrid.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:

A lecturer in anatomy in the University of Birmingham—The Secretary (July 7).

A scientific officer (physics or engineering) in a Government establishment in the south of England—The Secretary, Royal Engineer Board, Regent's Park Barracks, Albany Street, London, N.W.1 (July 7).

A technical assistant (male) in the Air Defence Experimental Establishment, Biggin Hill, Kent—The Superintendent (July 7).

A lecturer in production engineering in the County Technical College, Wednesbury—The Director of Education, County Education Offices, Stafford (July 9).

An assistant lecturer in civil engineering in the City and Guilds College, Imperial College of Science and Technology, Prince Consort Road, South Kensington, S.W.7—The Secretary (July 10).

Chemists (male) at the War Department Chemist, Woolwich Arsenal—The Under-Secretary of State (C.5), The War Office, London, S.W.1 (July 10).

A lecturer in mechanical engineering in the Heanor Mining and Technical School—The Director of Education, County Education Office, St. Mary's Gate, Derby (July 11).

Two assistants (Grade I), one assistant (Grade II) and two junior assistants in the Directorate of Explosives Research; and an assistant (Grade II) in the Directorate of Metallurgical Research in the Research Department, Royal Arsenal, Woolwich—The Chief Superintendent (July 11).

A lecturer in mathematics in the University of Aberdeen—The Secretary (July 17).

A lecturer in physiology in the University of Birmingham—The Secretary (July 17).

A demonstrator in human physiology in the University of Manchester—The Registrar (July 18).

A professor of social anthropology in the University of Oxford—The Registrar.

Letters to the Editor

The Editor does not hold himself responsible for opinions expressed by his correspondents. He cannot undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.

NOTES ON POINTS IN SOME OF THIS WEEK'S LETTERS APPEAR ON P. 39.

CORRESPONDENTS ARE INVITED TO ATTACH SIMILAR SUMMARIES TO THEIR COMMUNICATIONS.

Correlation between Scattering and Recoil in the Compton Effect

As is well known, the experiments of Bothe and Geiger¹ and of Compton and Simon² on the correlation between scattering of individual X-ray quanta and electron recoil gave results in complete agreement with the theoretical explanation of the Compton effect, based on the conservation of energy and momentum in each scattering process. The entirely negative results of the recent attempt by Shankland³ to find such a correlation in the scattering of γ -rays from radium was therefore most unexpected, and it seems desirable to repeat the experiments under conditions as well defined as possible and especially using the much more homogeneous γ -rays from thorium⁴.

For this purpose, experiments have been carried out, using a source of 10 mgm. of RaTh filtered by 0.5 cm. lead. The γ -rays next passed through a hole of cross-section 1×1.5 cm. in a lead block 30 cm. thick. The scattering angle was 30° both for the electrons and the quanta, the scatterer was a sheet of paraffin wax of 0.05 cm. thickness. A single counter was used for the detection of the scattered quanta and one for the electrons; the two counters were identical except that the electron counter had an aluminium window with thickness 0.04 mm. and diameter 2 cm. The distance from the counter to the scatterer was about 8 cm.

In a single experiment the coincidences were counted together with the kicks in each of the counters. To determine the number of chance coincidences a lead sheet of thickness 2 mm. was placed in front of the β -counter; the reduction in the number of single kicks caused by the presence of the lead plate was counterbalanced by placing a weak source of RaD close to the electron counter. The number of kicks in the γ -counter was not changed by this procedure. The coincidences found with the lead plate in position give the number of chance coincidences in the first experiment. The following results were obtained in two different series of experiments:

Kicks per minute				Coincidences per hour		
Without scatterer		With scatterer		Total (with-out lead plate)	Chance (with lead plate)	Difference
β	γ	β	γ			
I 120	28	195	29	6.5 ± 0.6	2.3 ± 0.3	4.2
II 120	120	195	121	11.7 ± 0.9	8.6 ± 0.7	3.1

In the second experiment the number of chance coincidences was increased by exposing the γ -counter to a weak source of RaD. The experiments show that coincidences exist between the β - and the γ -counter in a number which is well beyond the experimental error.

The number of kicks in the γ -counter due to the presence of the scatterer was 1.0 per minute. This was found by replacing the scatterer by a block of paraffin wax of known weight, the proportionality

between the weight of the scatterer and the number of kicks being tested by separate measurements. If for each scattered quantum recorded by the γ -counter the corresponding electron was recorded by the β -counter, the number of coincidences would thus be 1.0 per minute. This is, however, reduced considerably by a number of circumstances, such as lack of homogeneity of the primary radiation, scattering within the scatterer, etc., which are difficult to take into account accurately. A rough estimate gives for the expected number of coincidences about 8 per hour, in substantial agreement with the value actually found.

These experiments would, therefore, seem to confirm the usual theory of the Compton effect in every respect.

J. C. JACOBSEN.

Institute of Theoretical Physics,
Copenhagen.

¹ *Z. Phys.*, **32**, 639 (1925).

² *Phys. Rev.*, **26**, 239 (1925).

³ *Phys. Rev.*, **49**, 8 (1936).

⁴ Since the experiments recorded above were finished, an account of similar experiments leading to the same results has been published by Bothe and Maier-Leibnitz (*Göttingen Nachr.*, **10**, 127; 1936).

Conservation Laws in Quantum Theory

IN connexion with the new experiments on the correlation between scattering and recoil in the Compton effect by Bothe and Maier-Leibnitz, as well as those by Dr. Jacobsen recorded above, both contradicting the conclusions regarding the absence of such a correlation arrived at by Shankland, I should like to make the following brief comments upon the renewed discussion¹ on a possible failure of the laws of conservation of energy and momentum in atomic phenomena, to which Shankland's experiments have given rise.

When in an early attempt² at a generalisation of the classical radiation theory suited to meet the puzzling dilemma of the wave and corpuscular character of radiation, doubts were expressed regarding the validity of the conservation laws for individual quantum processes, the situation was quite different from what it is to-day. Not only have subsequent experimental discoveries made us familiar with similar paradoxes regarding the behaviour of electrons and other material particles, but above all has the establishment of rational methods of quantum mechanics and electrodynamics proved the compatibility of the existence of the quantum of action with the strict validity of the conservation laws in all such phenomena as electron diffraction and Compton effect. Moreover, the examination, initiated by Heisenberg, of the complementary limitations in quantum theory of measurements of mechanical quantities as well as of electromagnetic field components³ has completely removed every paradox in

this respect. The essence of the argument may be said to be that any attempt at an unambiguous space-time co-ordination in quantum phenomena implies a renunciation of the strict application of the conservation laws, due to the essentially uncontrollable exchange of energy and momentum between the object under investigation and the rigid bodies and clocks which define the space-time frame; conversely, any well-defined application of the conservation laws in quantum phenomena implies an essential renunciation as regards space-time co-ordination⁴.

As the fundamental relations between the wave and particle aspects of light and matter can be expressed in full conformity with the relativity principle, the still unsolved difficulties of quantum electrodynamics, emphasised by Dirac in connexion with this discussion, can scarcely be attributed to any incompatibility between the foundations of quantum theory and relativity theory. The root of these difficulties may rather be looked for in the atomistic nature of electricity, which is as foreign to classical physical theories as the quantum of action itself. The rational incorporation of these different aspects of atomic problems in a comprehensive theory will probably claim entirely new points of view, taking the essentially atomistic structure of all measuring agencies into consideration; but at the moment there would seem to be no reason to expect that this would involve any real departure from the conservation laws of energy and momentum.

Finally, it may be remarked that the grounds for serious doubts⁵ as regards the strict validity of the conservation laws in the problem of the emission of β -rays from atomic nuclei are now largely removed by the suggestive agreement between the rapidly increasing experimental evidence regarding β -ray phenomena and the consequences of the neutrino hypothesis of Pauli so remarkably developed in Fermi's theory.

N. BOHR.

Institute of Theoretical Physics,
Copenhagen.
June 6.

¹ P. Dirac, *NATURE*, **137**, 298 (1936). E. J. Williams, *NATURE*, **137**, 614 (1936). R. Peierls, *NATURE*, **137**, 904 (1936).

² N. Bohr, H. A. Kramers and J. C. Slater, *Phil. Mag.*, **47**, 785 (1924).

³ N. Bohr and L. Rosenfeld, *Kgl. Danske Vidensk. Selsk. math.-fys. Medd.*, **12**, 8.

⁴ N. Bohr, *Phys. Rev.*, **48**, 696 (1935).

⁵ N. Bohr, Faraday Lecture, *J. Chem. Soc.*, 349 (1932).

[SO₃]_x

MESSRS. Gerding, Nijveld and Muller¹ infer from the Raman spectrum of sulphur trioxide that it is a mixture of polymorphs. It is interesting to have such information, but to chemists who have known the compound this has always been a necessary assumption.

I remember Frankland introducing me to sulphuric anhydride early in 1867, at the Royal Institution, where we were doing gas analysis with the Frankland and Ward apparatus. He distilled it out of Nordhausen acid, using a bulb blown on the spot from an odd bit of tube, heating the small still on a warm tile of a Hofmann combustion furnace. To-day I can see him doing this: it was the way he had of showing one how to use one's fingers. Somehow I fell in love with the silken beauty of the oxide. As a German student, it was my first research *Schatz*: I cultivated its more acquaintance by the kilo, to

the surprise of my fellow students and even of Kolbe.

I am carried back to 1868, when I tested its action on a large number of chlorides. Typical is the effect it has on carbon tetrachloride, forming carbonyl chloride and pyrosulphuryl chloride, S₂O₅Cl₂, it would seem directly, as SO₂Cl₂ and SO₃ do not combine. On the other hand, the anhydride combines readily with HCl and EtCl forming simple chlorides—compounds which behave, however, as though they were the trioxide: they are not active apparently through their chlorine, as indeed is the case with acid chlorides generally. Pyrosulphonyl chloride is both a sulphonating and a chlorinating agent; sulphonyl chloride chlorinates.

The peculiarities of the 'trioxide' are not sufficiently recognized. It has high residual affinity. It is the perfect sulphonating agent, used alone but preferably diluted with sand. SO₃HCl is a convenient form in which to administer it—not nearly so powerful; the anhydride may even be used in solution in SO₃HCl with effect. I always feel proud of having introduced this chloride into use; it has played a big part in the manufacture of saccharin.

No text-book does justice to the protean character of the sulphuric acids: their properties have been Ostwaldized into oblivion. $\frac{1}{2}$ H₂SO₄ is not the equivalent of the acid: it is 90 per cent a monosulphonic acid—the lactic acid of the sulphur series—not dihydric sulphate. The well-defined stable acid of the series is anhydrosulphuric acid—*oxodisulphonic acid*. The first product of the interaction of vitrollic acid and, say, salt or sodium nitrate is not the acid sulphate of the text-books but H₃Na(SO₄)₂—a fact which makes the use of nitre in nitrations uneconomic. When chemists some day recover the full use of symbols and pay attention to facts, these and not a few other matters will receive the attention too long denied to them. Sulphonation is the most important of all the processes in the dyestuff industry—and we owe it to Faraday.

HENRY E. ARMSTRONG.

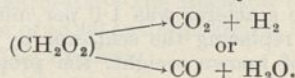
55 Granville Park,
Lewisham, S.E.13.

¹ *NATURE*, **137**, 1033 (June 20, 1936).

Kinetics of Gas Reactions: an Attempt to Connect Thermal Decomposition and Oxidation Processes

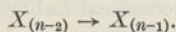
THE thermal decomposition of formaldehyde¹ and of acetaldehyde² can be represented by $x-t$ graphs which indicate a period of rapid decomposition, followed by one of slow decomposition. The experimental results of Spence³ for the rates of oxidation of formaldehyde appear to be represented by similar graphs, indicating a similarity in the processes. Seddon and I have pointed out⁴ that, in the case of acetaldehyde, the total rate of thermal decomposition appeared to be independent of all conditions except temperature and initial concentration, the nature of the final products, whether methane and carbon monoxide on one hand, or propylene, carbon dioxide and water on the other, being materially dependent on certain other conditions.

Now in the case of the oxidation of formaldehyde, it appears that the final stage in the process follows two alternative courses, which may be represented by,

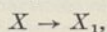


Spence refers to the penultimate stage as involving the formation of "activated formic acid", but it is perhaps wise to avoid the nomenclature of organic chemistry, and speak of a "short-lived intermediate" of composition (CH_2O_2).

One may imagine that the system passes through a series of states defined by symbols $X, X_1 \dots X_x \dots X_{(n-2)}, X_{(n-1)}, X_n$. To account for the similarity between oxidation and thermal decomposition processes, it seems to be necessary to assume that there is some change which is dominant and common to both, and I suggest that this is to be found in the transition represented by,



This is the change involved in the formation of the short-lived intermediates. The probability of reversal of this process is, as Seddon and I suggest, small, and the energy drop considerable. The energy is utilized in a process represented by,



that is, in increasing the probability of the formation of new primary centres.

The suggestion is somewhat similar to one of those put forward by Semenoff. Qualitatively, it would involve the initial acceleration of the process, which would afterwards slow down. In a considerable number of processes, involving relatively small energy changes, which have been investigated in this laboratory by means of detailed analyses, the form of the $x-t$ graphs is very similar, showing a very sudden transition from rapid to slow reaction generally at or before 50 per cent change. This seems to happen in the case of the oxidation of formaldehyde and in the thermal decomposition of acetaldehyde.

M. W. TRAVERS.

Chemistry Department,
University, Bristol.

¹ Fletcher, *Proc. Roy. Soc., A*, **146**, 357.

² Travers and others, *Proc. Roy. Soc., A*, **146**, 250, and in the press.

³ *J. Chem. Soc.*, 649 (1936).

⁴ *NATURE*, **137**, 906 (1936).

Vitamin P: Flavonols as Vitamins

VARIOUS chemical and clinical observations have led to the assumption that ascorbic acid is accompanied in the cell by a substance of similar importance and related activity. In absence of both substances, the symptoms of lack of ascorbic acid (scurvy) prevail and conceal symptoms of the deficiency of the second substance. In the lack of suitable experimental animals or conditions, progress was dependent on spontaneous pathological conditions, caused or influenced by this second factor.

In collaboration with L. Armentano and A. Bensáth, we have found that in certain pathological conditions, characterised by an increased permeability or fragility of the capillary wall, ascorbic acid is ineffective, while the condition can readily be cured by the administration of extracts of Hungarian red pepper ('vitapric') or lemon juice. The extracts were effective in cases of decreased resistance of the capillary wall toward whole blood (vascular type of hæmorrhagic purpura) as well as in cases in which the capillary wall showed an increased permeability towards plasma protein only (various septic conditions). The extracts were fractionated. The active substance was found in the end in a fraction

consisting of practically pure flavon or flavonol glycoside. 40 mgm. of this fraction given daily intravenously to man restored in a fortnight regularly the normal capillary resistance. Spontaneous bleeding ceased, the capillary walls lost their fragility towards pressure differences and no more plasma protein left the vascular system on increased venous pressure.

These results suggest that this great group of vegetable dyes, the flavons or flavonols, also play an important role in animal life, and that the dyes are of vitamin nature. The group is not to be confused with the yellow dye, discovered by one of us and termed 'flaves' (like cytoflave), which dye forms the prosthetic group of Warburg's yellow enzyme and has later been renamed by R. Kuhn 'flavins'. We propose to give the name 'vitamin P' to the substance responsible for the action on vascular permeability.

This research is sponsored by the Josiah Macy Jr. Foundation, New York.

ST. RUSZNYÁK.

A. SZENT-GYÖRGYI.

I. Medical Clinic and
Biochemical Department,
University, Szeged.
May 27.

Role of Adenylic Acid in Vitamin B₁ Deficiency

THE work of Peters¹ and his collaborators has shown that abnormal amounts of lactic and pyruvic acid accumulate in the brain of the polynuritic pigeon. Further evidence of the Oxford school has demonstrated that the brain tissue of such polynuritic pigeons exhibits a lowered oxygen consumption in the presence of either pyruvic or lactic acid. The addition of vitamin B₁ *in vitro* to such tissue restores the oxygen uptake to a large extent. Other workers² have also pointed out the presence of excessive amounts of lactic acid in the tissues of the vitamin B₁ deficient animal. This emphasis on the 'lactic acid' theory of the vitamin B₁ syndrome led Drury, Harris and Maudsley³ to suggest that the bradycardia found by them in vitamin B₁ deficient rats was due to the excessive accumulation of lactic acid in the heart. No direct evidence was brought forward to support this theory, although the results of Birch and Harris⁴ showed that the severity of the bradycardia went parallel with the lactic acid level in the blood.

The attention which has been devoted to this theory has obscured the similarity between the effect of adenine nucleotides on the normal heart and the effect of vitamin B₁ deficiency on this organ. In the rat, the bradycardia produced by certain adenine compounds apparently resembles in all respects that produced by avitaminosis B₁. For example, with moderate avitaminosis or with small doses of adenylic acid, the heart exhibits a simple slowing. In severe avitaminosis when the heart rate is below 350 beats per minute the auricular wave disappears⁵. This disappearance of the auricular wave also occurs when a large enough dose of adenylic acid is injected.

These facts have led us to study the action of adenine nucleotides on the heart of both the normal and vitamin B₁ deficient animal.

It was found possible to increase further the bradycardia already present, due to vitamin B₁ deficiency, by the injection of small amounts of adenosine, or either of the adenylic acids from muscle or yeast. Using normal animals, a much smaller effect was

obtained with the same dosage of these substances. The results using muscle adenylic acid are shown in Fig. 1.

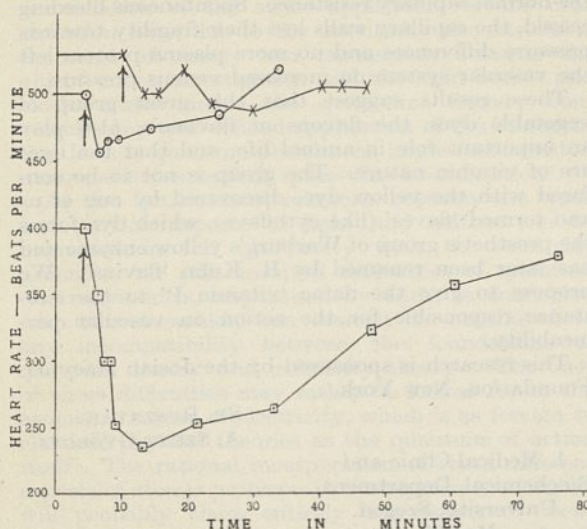


FIG. 1. Effect of muscle adenylic acid on heart rate. 3 mgm. of the acid were injected at points marked by the arrows. \square , Vitamin B_1 deficient animal; \times , same animal 18 hours after administration of vitamin B_1 ; \circ , animal on 'stock diet'.

These experiments demonstrate that the vitamin B_1 deficient animal is more sensitive to the action of these compounds. This increased sensitivity disappears completely 18 hours after the administration of vitamin B_1 , the heart rate having by this time returned to its normal value.

These results suggest that the B_1 deficient animal is unable to render these compounds innocuous at the same rate as does the normal animal.

The two known mechanisms whereby the adenylic acids are converted into substances having little or no effect on cardiac muscle are (1) deamination to ammonia and inosinic acid; (2) phosphorylation to adenosine di- or tri-phosphate.

We have as yet studied only the first of these mechanisms, and have established the fact that the deaminase activity of vitamin B_1 deficient cardiac tissue is on the average more than 20 per cent lower than similar tissues from control animals on a full 'stock diet'. Moreover, tissue obtained from cured animals 18 hours after administration of the vitamin shows a deaminase activity equal to that of normal animals.

Ammonia Produced in 40 minutes per gram of Heart Tissue

Normal	B_1 deficient
1,010 γ	778 γ
998 "	710 "
1,041 "	752 "
987 "	807 "
918 "	955 "
875 "	695 "
995 "	725 "
1,072 "	845 "
Average 982 "	Average 783 "

We have not yet succeeded in obtaining this restoration of deaminase activity by the direct addition of vitamin B_1 to deficient tissue *in vitro*. This fact, as well as the delayed recovery in the heart rate after administration of vitamin B_1 , may indicate that in the rat the vitamin must first be

synthesised into another compound before its biological action is manifest.

It seems possible that this failure of the deaminase mechanism may result in an increased accumulation of adenylic acid in the tissue, which is the cause of the bradycardia. Likewise, many of the effects obtained with vitamin B_1 deficient tissues (for example, increased lactic acid and decreased oxygen consumption) may be due to the inhibition by adenylic acid of the oxidative mechanisms which are responsible for the removal of these metabolites.

T. W. BIRCH.

L. W. MAPSON.

Nutritional and Biochemical Laboratories,
Cambridge.
May 22.

¹ Kinnersley and Peters, *Biochem. J.*, **23**, 1126 (1929). Melklejohn, Passmore and Peters, *Proc. Roy. Soc., B*, **111**, 291 (1932).

² Hayasaka, *Tôhoku J. Exp. Med.*, **14**, 72, 85, 283, 487 (1930).

³ Drury, Harris and Maudsley, *J. Biol. Chem.*, **73**, 335 (1930).

⁴ Birch and Harris, *Biochem. J.*, **28**, 602 (1934).

Equivalent Particle-Observers

MILNE¹ and Page² have attempted to build up relativistic theories without employing the concepts of *rigid body* or *absolute clock*. Now we can certainly abandon one of these concepts. The possibility of getting rid of the rigid body (assuming an absolute clock) was pointed out by me some time ago³, while (assuming rigid bodies) we can avoid the absolute undefined clock by employing a light ray oscillating between mirrors at the end of a rigid rod. But to proceed with *neither* concept, as Milne and Page appear to do, is not possible.

Basic in the theories of Milne and Page is the concept of *equivalent particle-observers*. A *particle-observer* is simply a particle equipped with a clock,

not an absolute clock, of course, but just any clock that assigns a monotonically increasing sequence of numbers to the events that occur at the particle. According to Milne (*loc. cit.*, p. 30) two particle-observers are *equivalent* if their clocks can be so regulated that, on exchange of light signals between them, there exist certain relations between times of departure and reception of the signals. Page (*loc. cit.*, p. 256) states that in similar circumstances the *clocks* are equivalent, "or

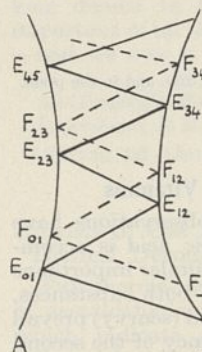


FIG. 1.

that the two particle-observers are equivalent".

This idea of equivalence, at least so far as just two particle-observers are concerned, seems quite a hollow one, because (as will be shown below) *any two particle-observers are equivalent*. Further, the statement that two particles have a *constant relative velocity* is devoid of any absolute physical meaning in terms of the definitions employed (provided that we think only of two particles), because it is always possible by proper choice of 'equivalent' clocks to make this velocity zero.

Consider the world-lines of two particle-observers A, B (Fig. 1). Starting with any event E_{01} in the history of A, we may construct a 'ladder' by means of a light ray passing to and fro between A and B, the 'corners' of the ladder being the events $\dots E_{10}$,

$E_{01}, E_{12}, E_{23}, \dots$ as shown. Let us choose any positive number k and assign to the events of A between E_{01} and E_{23} a time parameter t , arbitrary except for the conditions that it shall increase monotonically from $t=0$ at E_{01} to $t=2k$ at E_{23} . Let F_{01} be any event in the interval (E_{01}, E_{23}) and let its time be t . Let us construct the ladder having F_{01} for a corner and let us assign to the events at the corners of this ladder (both on A and on B) values of t such that

$$t(F_{n,n+1}) = t(F_{n-1,n}) + k, \quad (n = \dots -1, 0, 1, 2, \dots).$$

Letting F_{01} range over (E_{01}, E_{23}) , we assign by this process a value of t to every event in the histories of both particles, the assignment of t over (E_{01}, E_{23}) remaining arbitrary except for the terminal values $(0, 2k)$.

The time-systems assigned as above satisfy the conditions of equivalence of Milne and Page. Thus any two particles are equivalent. Incidentally, on account of the arbitrary choice of t in (E_{01}, E_{23}) it is obvious that the following statement of Page is not true (*loc. cit.*, p. 257): "The readings of the clocks of P and P' are fixed to within an arbitrary additive constant by the condition that they be equivalent." Furthermore, the 'distance' of Milne and Page between the two particles is constant for equivalent clocks defined as above. Their 'relative velocity' is zero.

It would seem that both Milne and Page have permitted their partially arbitrary clocks to assume an absolute significance. It must be understood, however, that the above remarks apply only to a system of two particles. With more particles the question of equivalence may take on more physical reality.

J. L. SYNGE.

Department of Applied Mathematics,
University of Toronto.
April 23.

¹ E. A. Milne, "Relativity, Gravitation and World-Structure" (Oxford, 1935).

² L. Page, *Phys. Rev.*, **49**, 254-268 (1936).

³ J. L. Synge, *NATURE*, **108**, 275 (1921).

Time Effects in Supra-conductors

IN continuation of previous investigations on the magnetic hysteresis phenomena in supra-conductors, we have recently reported on experiments concerning the time effect¹. We observed that after a sudden change of one of the variables of state (magnetic induction or temperature), a final value of the induction in a long supra-conducting cylinder was only attained after a considerable time (up to 20 minutes). The effect was strongest in single crystals and very pure polycrystalline specimens.

As a possible explanation, we tentatively suggested that the redistribution of supra-conductive and normal material was perhaps delayed by the slow dying-out of induced currents in the boundary surface between the two states. Such an explanation necessitates, of course, the existence of macroscopic supra-conductive and normal regions in the specimen. It has been recently worked out by R. Peierls² and F. London³ independently (we are much indebted to both authors for giving us an opportunity to acquaint

ourselves with the theories before publication, and for the permission to quote their results), that the existence of such macroscopic regions is unlikely in a sphere,

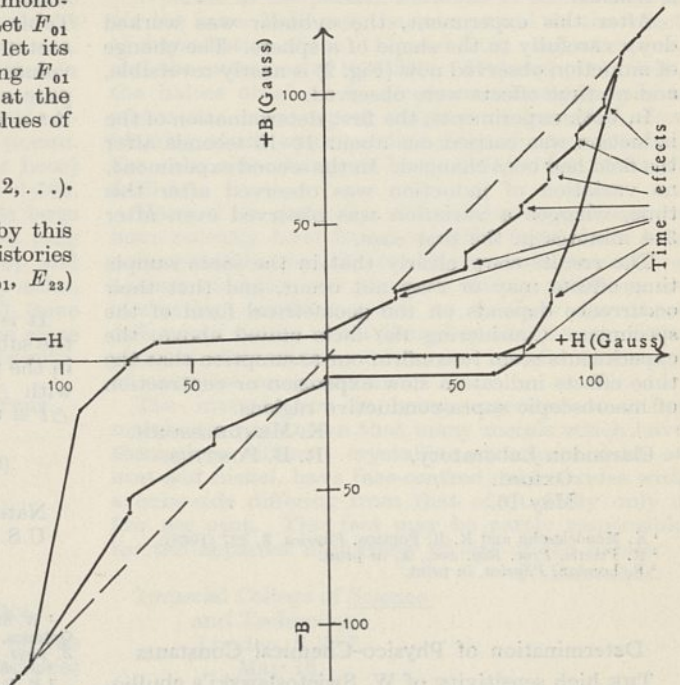


FIG. 1. B/H curve of short cylinder of polycrystalline tin, temperature constant, 2.842°K .

whereas the assumption of such a region seems to us necessary in a body of a more complicated form, for example, a short cylinder.

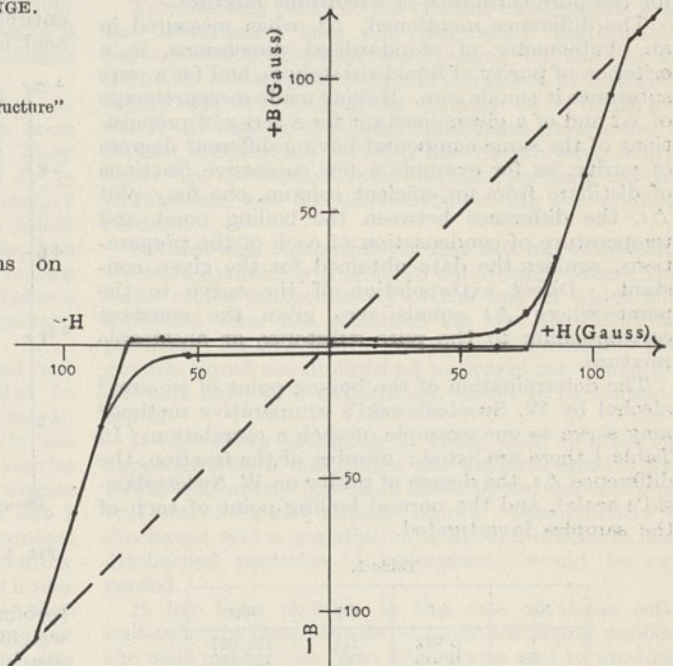


FIG. 2. B/H curve of sphere made from cylinder of Fig. 1, temperature constant, 2.85°K .

We have therefore determined the relation of the induction (B) to the external field (H) in a short cylinder of very pure polycrystalline tin. The result

is given in Fig. 1, and it can be seen that when the external field is altered, it takes in many cases an appreciable time before a final value of the induction is reached.

After this experiment, the cylinder was worked down carefully to the shape of a sphere. The change of induction observed now (Fig. 2) is nearly reversible, and no time effects were observed.

In both experiments, the first determination of the induction was carried out about 10–15 seconds after the field had been changed. In the second experiment, no variation of induction was observed after this time, whereas a variation was observed even after 3–4 minutes in the first case.

The results show clearly that in the same sample time effects may or may not occur, and that their occurrence depends on the geometrical form of the specimen. Considering the facts stated above, the experiments seem to confirm our assumption that the time effects indicate a slow expansion or contraction of macroscopic supra-conductive regions.

K. MENDELSSOHN.
R. B. PONTIUS.

Clarendon Laboratory,
Oxford.
May 16.

¹ K. Mendelssohn and R. B. Pontius, *Physica*, 3, 327 (1936).

² R. Peierls, *Proc. Roy. Soc., A*, in print.

³ F. London, *Physica*, in print.

Determination of Physico-Chemical Constants

THE high sensitivity of W. Swietoslawski's ebulliometric test of the purity of liquid substances¹ permits the correlation of data for any physico-chemical property with Δt , the difference between the boiling point and condensation temperature of the substance under investigation, in order to calculate the constants for the pure substance or azeotropic mixture.

The difference mentioned, Δt , when measured in an ebulliometer of standardised dimensions, is a criterion of purity of liquid substances, and for a pure substance it equals zero. Having made measurements of Δt and of a given constant for a series of preparations of the same compound having different degrees of purity, as for example a few successive fractions of distillate from an efficient column, one may plot Δt , the difference between the boiling point and temperature of condensation of each of the preparations, against the data obtained for the given constant. Direct extrapolation of the curve to the point where Δt equals zero gives the constant corresponding to the pure substance or azeotropic mixture.

The determination of the boiling point of iso-amyl alcohol by W. Swietoslawski's comparative method² may serve as one example of such a correlation. In Table 1 there are listed: number of the fraction, the difference Δt , the degree of purity on W. Swietoslawski's scale³, and the normal boiling point of each of the samples investigated.

Table 1.

No.	Δt	d.p.	b.p.
1	0.032	III	131.067
2	0.019	IV	131.450
3	0.005	V	131.779
4	0.002	V	131.802

The boiling point of pure iso-amyl alcohol obtained by extrapolation of these data is 131.806° C.

The precise determination of density by means of the twin pycnometer method³ furnishes another example of measurements which may be correlated with Δt to obtain the densities of pure liquids. In Table 2 the densities of two fractions of *n*-propyl acetate are given, together with the corresponding values of Δt and degree of purity. The density of pure *n*-propyl acetate obtained by extrapolation to $\Delta t = 0$ is 0.88299, gm./cm.³ at 25° C.

Table 2.

Δt	d.p.	d (gm./cm. ³ at 25° C.)
0.011	IV	0.882832
0.004	V	0.882939

It is worth noting that as the degree of purity of the substance investigated becomes higher, the change in the property measured becomes more nearly linear with Δt , thus permitting a reliable extrapolation to $\Delta t = 0$. Details will be published elsewhere.

M. WOJCIECHOWSKI.

(Guest Worker, Polytechnic Institute, Warsaw.)
EDGAR R. SMITH.

National Bureau of Standards,
U.S. Department of Commerce,
Washington, D.C.
April 30.

¹ W. Swietoslawski, *J. Phys. Chem.*, 38, 1169 (1935); IX Con. Inter. Quimica, Madrid, 1934, 13; *Roczniki Chem.*, 13, 176, 227 (1933); *Z. phys. Chem.*, A, 160, 257 (1932).

² *J. chim. phys.*, 27, 496 (1930).

³ E. R. Smith and M. Wojciechowski, *Bull. intern. acad. Polonaise*, A, 1936.

Metabolism of Cartilage

IT has been found by means of Warburg's manometric method that the metabolism of cartilage is entirely anaerobic; it splits glucose to form lactic acid at a rate of about 0.2 c.mm. carbon dioxide

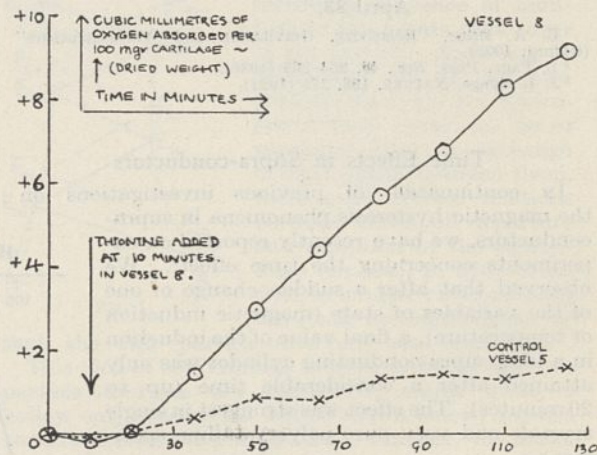


FIG. 1. Diagram showing oxygen uptake of cartilage with addition of dyestuff.

(produced from bicarbonate solution) per mgm. dry weight per hour, that is, about a tenth the rate of nearly related connective tissues forming the synovial villi, and a fiftieth the rate of the choroid plexus¹. By means of cell counts and corrections for specific gravity and drying, it has been shown that this glycolysis is essentially of the same order per cell as in most other adult tissues. This glycolysis is the

same whether measured under aerobic or anaerobic conditions. Rabbit cartilage was kept for a fortnight under aseptic anaerobic conditions in bicarbonate Ringer solution with glucose, and its glycolysis measured throughout. At the end of the experiment it had only fallen to 0.09 from an initial Q_{O_2} (c.mm. carbon dioxide per mgm. dry weight per hour in nitrogen) of 0.34.

There is no oxygen uptake that can be measured certainly by this method; if it exists, the Q_{O_2} (c.mm. oxygen consumed per mgm. dry weight per hour) must be at most 0.01, and probably below 0.005. With methylene blue, however, an immediate large increase in oxygen uptake occurs, paralleled only by the similar behaviour described by Harrop and Barron² of non-nucleated mammalian red corpuscles. The Q_{O_2} rises from an average of -0.003 (nine experiments) before, to an average, using the same slices, after addition of dye, of -0.065—a twenty-fold increase.

E. G. L. BYWATERS.

Courtauld Institute of Biochemistry,
Middlesex Hospital,
London, W.1.

¹ Krebs, *Tab. Biol. Period.*, 3, 209 (1933).

² Harrop and Barron, *J. Exp. Med.*, 48, 207 (1928).

Oxide Layer on a Polished Copper Surface

THE application of electron diffraction to the problem of the structure of polished metal surfaces has greatly extended the knowledge gained from microscopical methods. In general, in the course of polishing, the rings of the electron diffraction pattern become blurred until they run into two broad haloes. As these changes may be explained by assuming that the metal crystals become smaller and smaller as the polishing progresses, the above-mentioned results are strongly in favour of Beilby's supposition that the topmost layer of highly polished metal is amorphous¹.

There is, however, considerable difficulty in accounting for the fact that the haloes have been found to be practically the same for all metals. They correspond to the spacings 2.25 Å., and 1.28 Å. \pm 5 per cent respectively. This apparent uniformity could scarcely be expected. If we assume the polish layer to be composed of very small crystals, the radius of the haloes should depend on the lattice constants, while if the layer be completely amorphous it would be the atomic volume which should govern their size.

As the majority of the metals investigated are known to be easily oxidisable, it was decided to examine how far these difficulties might be due to the formation of an oxide film on the surface in the course of polishing. After having obtained results concordant with those of other authors for copper polished in the usual way with wet rouge, in air, I polished a specimen under the surface of benzene. This gave haloes of quite different size corresponding to spacings of 1.91 Å. and 1.16 Å. As polishing under pentane yielded the same result, it seemed likely that the pattern commonly attributed to polished copper is actually due to the oxide. To make sure, the specimen which had been polished under benzene was left in the air and the changes in the pattern were traced by taking pictures every few hours. It was possible to follow the gradual decay of the original haloes and gradual appearance of the pattern

corresponding to the spacings 2.24 Å. and 1.28 Å. The last pattern, which is the one obtained after polishing in air, is thus clearly due to an oxide.

Whereas in the pattern obtained in the absence of air the inner halo may be interpreted as the effect of degeneration of the (111) and (200) rings of copper, and the outer one of the (220), (311) and (222) rings, the haloes obtained in air occur exactly in places where one may expect maxima of intensity after blurring of the corresponding rings of cuprous oxide, the cube side of copper being 3.61 Å. and of Cu_2O 4.25 Å.

Many of the properties of a polished copper surface have recently been found to differ from those of a polycrystalline one¹. As usually no special precautions against oxidation are observed during polishing, an interesting question arises as to how far these differences are to be attributed to the change of the physical state of the surface, and how far to change of chemical composition.

The investigation is being extended to other metals, as it is known that many metals which have themselves different crystalline structures, such as iron and nickel, have face-centred cubic oxides with a cube-side differing from that of Cu_2O by only a few per cent. This fact may be partly responsible for the apparent uniformity of size of the haloes.

S. DOBINSKI.

Imperial College of Science
and Technology,
London, S.W.7.
May 12.

For references see G. I. Finch and A. G. Quarrell, *NATURE*, 137, 516 (1936).

Electrolytes and a General Phenomenon in Tissue Cells

THE starting point of the present experiments was the assumption that the practically undiffusible particles of protoplasm are charged by the *per se* diffusible electrolytes with the formation of a double layer, and are maintained thereby in a dispersed state. If this be the case, then there must exist a certain equilibrium between the electrolytes, which build up the double layer on the particles of the protoplasm, and the electrolytes in the surrounding medium.

It must also be considered that this might concern thermodynamically a Donnan equilibrium—since the latter exists independently of the way in which the diffusible ions are adsorbed on the non-diffusible particles. In this case, if the salt ion contents of the outside liquid are diminished to nearly zero, then all the salt ions, as is well known, travel to the outside liquid.

If the above reasoning is valid, then it must be expected that if one makes the medium outside the tissue cells nearly free from electrolytes, the salt ions will travel to the outside liquid. Consequently a discharge, and a coagulation of the non-diffusible and discharged particles of protoplasm, would be expected.

It has been possible in the case of tissue cells cultivated in liquid media to make the liquid outside the cells nearly free from electrolytes and to produce thereby a discharge (most active Brownian movement in the protoplasm as a sign of a minimum of viscosity; obviously advancing aggregation of the particles of the protoplasm). The following results have been obtained:

(1) If tissue cells are brought from their liquid culture medium, after several washings, into a medium free from electrolytes, then within a few seconds the following phenomena, consisting of three main effects, take place: (a) an assumption of globular form by the cells; (b) the appearance of a vivid Brownian movement of the granules and vacuoles in the cytoplasm, as a sign of a maximal reduction of the viscosity in consequence of a discharge with simultaneous increasing absorption of water; (c) a process of slow coagulation in the cytoplasm, which manifests itself in the appearance of new particles in vivid Brownian movement, which continuously increase in size. The gradual multiplication and increase of the particles is best seen with dark field illumination, but the vivid Brownian movement is also well seen with direct illumination.

(2) In some of the cells which have become globular, there occurs a bursting of the cell, with extrusion of liquid contents containing particles in Brownian movement (analogous to hypotonic hæmolysis with extrusion of hæmoglobin). Sometimes the torn parts adhere together again after diminution of the interior pressure.

(3) The presence of non-electrolytes in the medium ($n/36-n/12$ dextrose: $n/5-n/1$ urea) does not hinder the appearance of the phenomena described, but naturally reduces the activity of the Brownian movement in the cytoplasm.

(4) The phenomena described are reversible. The reversal can be produced after several minutes by means of Ringer solution, $n/10$ sodium chloride, or $n/10$ sodium bromide. The cells regain their former shape extremely quickly, with immediate stoppage of the Brownian movement in the cytoplasm. The cells then show normal vital staining.

(5) The phenomena can only be produced with living and not with dead cells. Failure is a sure sign of cell death.

The results of these experiments prove the justness of the above assumptions. Furthermore, they show that hypotonic hæmolysis is only a special case of a general phenomenon in tissue cells. They reveal, furthermore, a fundamental property of tissue cells in which the salt ions of the tissue liquid participate decisively in the maintenance of the particle charge of the protoplasm.

H. GROSSFELD.

Anatomical Institute,
Turin.

A Syndrome produced by Diverse Nocuous Agents

EXPERIMENTS on rats show that if the organism is severely damaged by acute non-specific nocuous agents such as exposure to cold, surgical injury, production of spinal shock (transsection of the cord), excessive muscular exercise, or intoxications with sublethal doses of diverse drugs (adrenaline, atropine, morphine, formaldehyde, etc.), a typical syndrome appears, the symptoms of which are independent of the nature of the damaging agent or the pharmacological type of the drug employed, and represent rather a response to damage as such.

This syndrome develops in three stages: during the first stage, 6-48 hours after the initial injury, one observes rapid decrease in size of the thymus, spleen, lymph glands and liver; disappearance of fat tissue; oedema formation, especially in the thymus and loose retroperitoneal connective tissue; accumulation of pleural and peritoneal transudate; loss of muscular

tone; fall of body temperature; formation of acute erosions in the digestive tract, particularly in the stomach, small intestine and appendix; loss of cortical lipoids and chromaffin substance from the adrenals; and sometimes hyperæmia of the skin, exophthalmos, increased lachrymation and salivation. In particularly severe cases, focal necrosis of the liver and dense clouding of the crystalline lens are observed.

In the second stage, beginning 48 hours after the injury, the adrenals are greatly enlarged but regain their lipid granules, while the medullary chromaffin cells show vacuolization; the oedema begins to disappear; numerous basophiles appear in the pituitary; the thyroid shows a tendency towards hyperplasia (more marked in the guinea pig); general body growth ceases and the gonads become atrophic; in lactating animals, milk secretion stops. It would seem that the anterior pituitary ceases production of growth and gonadotropic hormones and prolactin in favour of increased elaboration of thyrotropic and adrenotropic principles, which may be regarded as more urgently needed in such emergencies.

If the treatment be continued with relatively small doses of the drug or relatively slight injuries, the animals will build up such resistance that in the later part of the second stage the appearance and function of their organs returns practically to normal; but with further continued treatment, after a period of one to three months (depending on the severity of the damaging agent), the animals lose their resistance and succumb with symptoms similar to those seen in the first stage, this phase of exhaustion being regarded as the third stage of the syndrome.

We consider the first stage to be the expression of a general alarm of the organism when suddenly confronted with a critical situation, and therefore term it the 'general alarm reaction'. Since the syndrome as a whole seems to represent a generalised effort of the organism to adapt itself to new conditions, it might be termed the 'general adaptation syndrome'. It might be compared to other general defence reactions such as inflammation or the formation of immune bodies. The symptoms of the alarm reaction are very similar to those of histamine toxicosis or of surgical or anaphylactic shock; it is therefore not unlikely that an essential part in the initiation of the syndrome is the liberation of large quantities of histamine or some similar substance, which may be released from the tissues either mechanically in surgical injury, or by other means in other cases. It seems to us that more or less pronounced forms of this three-stage reaction represent the usual response of the organism to stimuli such as temperature changes, drugs, muscular exercise, etc., to which habituation or inurement can occur.

HANS SELYE.

Department of Biochemistry,
McGill University,
Montreal, Canada.
May 18.

Estimation of Fatty Acids in Organic Mixtures

For the determination of the volatile fatty acids in cheese, it is usual to subject the acidified cheese mush to a normal steam distillation at constant volume. In this laboratory, it is the custom to collect a volume of distillate equal to three times the volume of the liquid in the distillation flask, and

to use this for further estimations of the individual acids.

The study of the rate of recovery of various volatile acids, added in known quantities to the cheese mush, led to doubt as to whether this method of distillation resulted in the complete extraction of the volatile acids (especially the higher members of the series) from the cheese. It appeared that the higher acids were to some extent held back by the constituents of the cheese, and did not therefore distil over at the rate suggested by Dyer's figures¹.

This view was strengthened by a series of experiments in which several acids were distilled from water, and a mixture of fresh, washed butter fat and water. It was evident that there was retention of some of these acids by the butter fat, very marked for lauric acid and high for caprylic, but decreasing through caproic to butyric and the lower members of the series, in which no retention was demonstrated.

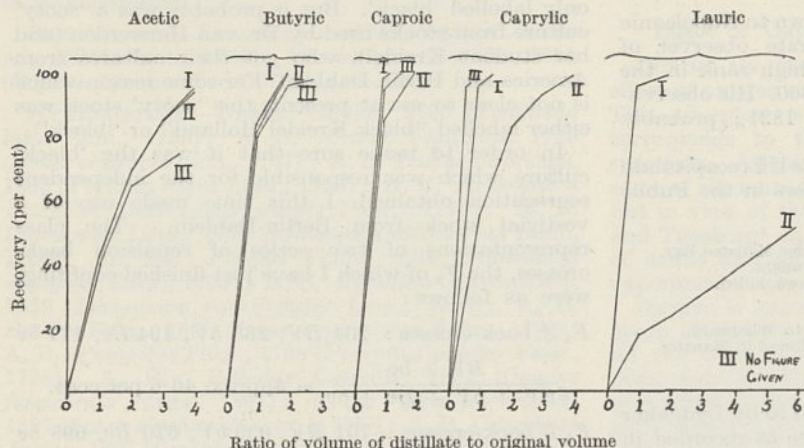


Fig. 1. Fatty acid recovery by steam distillation: I, acid distilled from distilled water; II, acid distilled from pure butter fat; III, distillation figure given by Dyer.

It was found, however, that although the rate of distillation of the higher acids was retarded by the presence of butter fat, almost complete recovery could be effected if the steam distillations were continued for a sufficiently long period. For the acids up to and including caprylic, more than 90 per cent of the added acid could be recovered by collecting a distillate of three times the original volume. For lauric acid, on the other hand, only 50 per cent was recovered even after collecting six times the original volume (cf. Fig. 1).

If the rate of distillation of these acids from a cheese mush is comparable with that from a mixture of butter fat and water, then the practice of collecting a distillate of three times the original volume would allow an estimate of the distribution of volatile acids in cheese which would be sufficiently accurate for many purposes. It is suspected, however, that a still greater retention occurs in the cheese mush, and the influence of cheese fat (as distinct from butter fat) and the protein and salt mixtures of cheese is being examined in an effort to elucidate this question.

E. R. HISCOX.
J. HARRISON.

National Institute for Research in Dairying,
Shinfield, Nr. Reading, Berks.
May 25.

¹ D. C. Dyer, *J. Biol. Chem.*, 28, 445 (1916-17).

The Stock of Antarctic Blue Whales

DURING the current investigations into the conditions of Southern whaling, I have had occasion to consult the publications¹ of the Norwegian Whaling Bureau, in which the catch statistics given in "International Whaling Statistics" have been amplified and to some extent analysed. From these data I have calculated the average length of female Blue whales taken from 1930 to 1935. The results are shown in the following table.

Season	No. of whales considered	Average length (ft.)
1930-31	4,532	82.36
1931-32	close season	—
1932-33	5,285	81.97
1933-34	6,487	81.85
1934-35	7,253	79.88

A slight annual decrease in length up to 1933-34 is followed by a sharp drop of nearly two feet in 1934-35. Blue females become sexually mature at about 78 ft., when they are approximately two years old. They arrive at maturity in the southern winter, and are found in the Antarctic the following summer with an average length of 80 ft. Pairing in July may result in pregnancy which lasts for ten months².

Blue females taken in 1934-35 were, therefore, on the average, killed at the outset of their reproductive career. The consequences of continued intensive killing need scarcely be emphasized.

Average lengths were shown in the Norwegian publications, but the data had been divided, and average lengths were given for immature and adult whales

separately. The constancy of the averages from season to season was invoked as evidence that undue depletion of the stock is not yet taking place, but since no account was taken of the rapidly mounting percentage of immature whales in the catch the results are liable to be misleading.

ALEC H. LAURIE.

"Discovery" Investigations,
52 Queen Anne's Chambers,
London, S.W.1.
June 3.

¹ Hjort, Lie and Ruud, "Hvalrædets Skrifter", 3, 8, 9, 12.
² Mackintosh and Wheeler, "Discovery Reports", 1, pp. 468-9 (1929).

The Manatee of St. Helena

IN NATURE of March 17, 1934, p. 417, Prof. T. Mortensen quotes Dampier's reasons for refusing to believe in the existence of the sea-cow in St. Helena. The bibliography on the subject appears to be far from complete; but fortunately records by two eye-witnesses are available.

Probably the best account of the St. Helena manatee will be found in Barnes's "Tour of St. Helena" (Richardson, London, 1817, pp. 116 and 117), where a detailed description of the animal is quoted from the manuscript of Lieut. Thomas Leech, "written many years ago". The Leechs were a well-known and highly respectable Island family, and Thomas

Leech, who affirmed that the sea-cow was really a sea lion, is mentioned in Brooke's "History of St. Helena" (1824 ed., p. 51), as one "who by his unwearied pursuits in historical research, and his surprisingly retentive memory had acquired a great degree of general information".

There is another very important reference in Dr. Walter Henry's "Events of a Military Life" (2nd ed., Pickering, London, 1843, vol. 2, pp. 66 and 67), which is as follows:

"We had sea-cows at St. Helena, the Trichechus Dugong, but they were not common. When shooting near Buttermilk Point with another officer one calm evening, we stumbled on one lying on a low rock close to the water's edge, and a hideous ugly brute it was, shaped like a large calf, with bright green eyes as big as saucers. We only caught a glimpse of it for a few seconds, for as soon as it noticed us, it jumped into the sea, in the most awkward and sprawling manner."

Dr. Henry, whose book is well known to Napoleonic students, was an alert and accurate observer of current events, who later reached high rank in the Army Medical Service and died in 1860. His observations were made between 1817 and 1821; probably in 1819.

It may be a convenience to students if I recapitulate the references to be found to sea-cows in the Public Records of Jamestown:

1679, January 27.	First use of the name Manatee Bay.
1682, August 28.	Several sea-cows caught.
1690, March 20.	A very small sea-cow killed.
1691, May 11	
(a month before	
Dampier's visit).	Sea-cow on shore to Windward.
1716, August 29.	400 lb. ambergris found in Manatee Bay.
1739, September 11.	A sea-cow killed.

Burnham's sea-cow of 1810 referred to by Lydekker and Mortensen, I am unable to trace as recorded in the Public Records; but the latter quotes Janisch's confirmation of it to be found in "Scraps from Records" (Government Printer, Jamestown, 1880, to accompany the St. Helena Almanack of that year).

G. C. KITCHING.

The Castle,
St. Helena.
April 18.

A Case of 50 per cent Crossing-over in the Male *Drosophila*

WITH the view of synthesising a double recessive black-vestigial stock of *Drosophila melanogaster*, Dr. G. Eloff¹ made a cross of black and vestigial, both of which are contained in the second chromosome. The F_2 generation, to his surprise, contained many $b\ vg$ flies. To solve the question, the F_1 males were mated with double recessive females ($b\ vg$), when an independent segregation of black and vestigial was found. He applied the fact to the F_2 data to calculate the crossing-over value between b and vg in the female, and estimated it to be 17.8 per cent. The value is close to the standard value of 17.0 per cent (18.5 per cent, according to the recent census). For his 50 per cent crossing-over in the male, he writes: "Some other explanation (for example, of chromosomal mutation) must be offered".

In my opinion, Dr. Eloff used by mistake the other mutant, ebony for example, that appears in another chromosome. If so, the black body colour should be inherited independently with vestigial, and it would be quite the natural thing that there should

be a 50 per cent crossing-over in the male. According to my understanding, his F_2 data seem to be nothing but the result of an independent segregation, although deviation was considerable.

DAIGORO MORIWAKI.

Furitsu Koto-Gakko,
Biological Institute,
Meguro, Tokyo.
March 6.

¹ G. Eloff, NATURE, 137, 151 (1936).

SINCE the appearance of my letter in NATURE of January 25, Prof. Tammes of Groningen has written to me as follows: "Gottschewski (of Berlin-Dahlem) is of opinion that the 'black' which you used was probably not the normal black but the so-called 'black Kreidel Holland' which is the same as sooty..."

The stock which I received from Groningen was only labelled 'black'. But it probably was a 'sooty' culture from stocks used by Dr. van Herwerden (and her student Kreidel), who got their cultures from America and Berlin-Dahlem. For some reason which is not clear to me at present, this 'sooty' stock was either labelled "black Kreidel Holland" or "black".

In order to make sure that it was the 'black' culture which was responsible for the independent segregation obtained, I this time made use of a vestigial stock from Berlin-Dahlem. The class representations of two series of repulsion back-crosses, the F_2 of which I have just finished counting, were as follows:

$F_1 \text{ } \delta$ back-crosses: 204 BV, 235 bV, 194 Bv, 171 bv

$$\frac{BV + bv}{BV + bV + Bv + bv} = \text{approx. } 46.6 \text{ per cent.}$$

$F_1 \text{ } \phi$ back-crosses: 701 BV, 839 bV, 670 Bv, 698 bv

$$\frac{BV + bv}{BV + bV + Bv + bv} = \text{approx. } 48.1 \text{ per cent.}$$

As the data refer to repulsion crosses only, the unequal representation of the classes may be explained by (1) difficult separation of bV and BV phenotypes in some experiments, with the result that BV phenotypes may be included in class bv; (2) poorer viability of classes homozygous for vestigial, namely, Bv and bv. Making allowance for these disturbing factors, it is quite possible that the correct percentage will be 50.

I am satisfied, therefore, that the stock I have used and which was labelled "black" may have been "sooty", so that the results must of necessity show independent segregation.

I regret the misleading results arrived at due to erroneous labelling of the stock, and I wish to thank Mr. Moriwaki for his comment.

G. ELOFF.

Department of Zoology,
University of the Witwatersrand,
Johannesburg.
April 22.

Suggested Cases for Suspension of Rules of Nomenclature

ATTENTION of the zoological profession is invited to the fact that request for the "Suspension of the Rules" has been made in the following cases, on the ground that "the strict application of the Règles will clearly result in greater confusion than uniformity".

According to procedure, one year's notice is hereby published "making it possible for zoologists, particularly specialists in the group in question, to present arguments for or against the suspension under consideration".

Note A.—Suspend rules. Note B.—Insert in Official List with the type as given in parentheses.

COELENTERATA.—*Monographus* Geinitz, 1852 (*priodon*); A. B. *Retiolites* Barrande, 1850 (*geinitzianus*); A. B. *Graptolithus* Linn., 1768, to be suppressed; A.

ECHINODERMATA.—*Luidia* Forbes, 1839 (*fragilissima*); A. B.

NEMATODA.—*Anguina* Scopoli, 1777 (*Vibrio tritici*), to be suppressed; A.

CRUSTACEA.—*Squilla* Fabricius, 1787 (*mantis*); A. B.

INSECTA.—The so-called "Erlangen List" of 1801 to be suppressed.

ORTHOPTERA.—*Locusta* Linn., 1758 (*Gryllus Locusta migratorius* Linn., 1758); *Phaneroptera* Serville, 1831 (*Gryllus falcatus* Poda, 1761); A. B.

HYMENOPTERA.—*Cimbex* Olivier, 1790 (*Tenthredo lutea* Linn., 1758); A. B. *Crabro* Fabricius, 1775 (*Sphex cribraria* Linn., 1767); A. B. *Lasius* Fabricius, 1805 (*Formica nigra* Linn., 1758); A. B. *Anthophora* Latreille, 1803 (*Apis pilipes* Fabr., 1775); A. B. *Ichneumon* Linn., 1758 (*Ichneumon extensorius* Linn., 1758); A. B. *Pimpla* Fabr., 1804 (*Ichneumon instigator* Fabr., 1793); A. B. *Ephialtes* Gravenhorst, 1829 (*Ichneumon manifestator* Linn., 1758); A. B. *Bracon* Fabr., 1805 (*Bracon minutator* Fabr., 1798); A. B. *Pompilus* Fabr., 1798 (*Pompilus pulcher* Fabr., 1798); A. B. *Bethylus* Latreille, 1802 (*Omalus fuscicornis* Jurine, 1807); A. B. *Prospis* Jurine, 1807 (*Sphex signator* Panzer, [1798]); A. B. *Ceraphron* Jurine, 1807 (*Ceraphron sulcatus* Jurine, 1807); A. B. *Torymus* Dalman, 1820 (*Ichneumon bedeguaris* Linn., 1758); A. B. *Proctotrupes* Latreille, 1796 (*Proctotrupes brevipennis* Latreille, 1802); A. B. *Sphex* Linn., 1758 (*Sphex flavipennis* Fabr., 1793); A. B. *Ammophila* Kirby, 1798 (*Sphex sabulosa* Linn., 1758); A. B.

LEPIDOPTERA.—In interpreting the generic names assigned by Freyer in his "Neuere Beiträge zur Schmetterlingskunde" to the species there described, each species is to be regarded as having been described by Freyer as belonging to the genus cited by him at the head of each description and not to the genus with which he actually associated the specific name. For example, Freyer described, under the genus *Hipparchia* Fabricius, a species to which he gave the specific name *eriphyle*, and which he proceeded to name *Papilio eriphyle* Freyer. Freyer is to be deemed to have described this species under the name *Hipparchia eriphyle*, and not under the name *Papilio eriphyle*. A.

Potamis Hübner, *Rusticus* Hübner, and *Mancipium* Hübner to be suppressed in favour of *Morpho* Fabr., *Helicopsis* Fabr., and *Pontia* Fabr.; A.

LEPIDOPTERA (RHOPALOCERA).—*Euploea* Fabr., 1807 (*Papilio corus* Fabr., 1793); A. B. *Satyrus* Latreille, 1810 (*Papilio actaea* Esper, [1780]); A. B. *Argynnis* Fabr., 1807 (*Papilio paphia* Linn., 1758); A. B. *Vanessa* Fabr., 1807 (*Papilio atalanta* Linn., 1758); A. B. *Euthalia* Hübner, [1823] (*Papilio lubentina* Cramer, 1777); A. B. *Nymphidium* Fabr., 1807 (*Papilio caricae* Linn., 1758); A. B. *Colias* Fabr., 1807 (*Papilio hyale* Linn., 1758); A. B.

Species in parentheses are to be declared the types *Lycæides* Hübner, [1823] (*Papilio argyrognomon* Bergstrasser, 1779); A. *Agriades* Hübner, [1823] (*Papilio glandon* Prunner, 1798); A. *Polyommatus* Latreille, 1804 (*Papilio icarus* Rottemburg, 1775); A. *Euchloë* Hübner, [1823] (*Euchloë ausonia* Hübner, var. *erperi* Kirby, 1871). *Princeps* Hübner, [1807] and *Orpheides* Hübner, [1823] (*Papilio demodocus* Esper, 1798). *Carcharodus* Hübner, [1823] and *Spilothyrus* Duponchel, 1835 (*Papilio fritillarius* Poda, 1761); A.

C. W. STILES,
Acting Secretary,
International Commission
on Zoological Nomenclature.

U.S. National Museum,
Washington, D.C.
May 1.

Effect of Oxygen on the Auroral Afterglow

DURING the past year, I have been studying the effect of oxygen on the auroral afterglow in nitrogen. This afterglow is the one the spectrum of which corresponds to the nitrogen part of the auroral spectrum. Attention has been directed elsewhere¹ to some of the more general results of these experiments, but in view of the recent communication by Vegard and Tønsberg² on the difference between the spectra of sunlit and ordinary auroras, one aspect of my experiments seems worth special mention here.

Oxygen is introduced into the tube until the blue-green afterglow with continuous spectrum appears. As the tube is allowed to run, the oxygen slowly disappears and the spectrum of the afterglow undergoes some striking changes. The stage of the afterglow which follows the initial blue-green continuous stage is one in which the glow consists of a blue-green background that fills the entire bulb, possesses a banded spectrum and lasts about ten seconds. Superposed on this blue-green glow is an orange-red flash of shorter duration and greater intensity than the background glow. This flash is confined to the centre of the bulb, and its spectrum consists of first-positive bands of N₂ and some relatively weak first-negative bands.

Visual examination as well as photographic reproduction of the spectrum shows that the effect of the oxygen is to enhance the first-positive bands relative to the first-negative group. This phenomenon agrees very well with the results of Vegard and Tønsberg on sunlit auroras. The blue-green continuous glow is generally regarded as resulting from the reaction between ozone and nitric oxide. There is therefore probably some ozone present in the orange-red flash stage that follows when the oxygen concentration is slightly reduced.

It is of interest to note that the green auroral line is weaker in this stage of the glow than one would expect, and this also is in agreement with Vegard and Tønsberg's results. It is believed that further study of this orange-red flash will reveal detailed agreement between the laboratory phenomenon here described and the sunlit auroras.

JOSEPH KAPLAN.

University of California
at Los Angeles.
May 21.

¹ Kaplan, *Trans. Amer. Geophys. Union*, April, 1936.
² Vegard and Tønsberg, *NATURE*, 137, 778 (1936).

Ground State Vibrational Frequencies

A STUDY of the ground state vibrational frequencies of diatomic molecules in relation to the Periodic Table has shown that the arithmetic mean ω_m of the vibrational frequencies of the two elementary molecules A_2 and B_2 which belong to the same Periodic Group is approximately equal to the frequency of the compound molecule AB . All the relevant data are collected in the accompanying table.

Group 1			Group 5			Group 6			Group 7		
Mol.	ω	ω_m	Mol.	ω	ω_m	Mol.	ω	ω_m	Mol.	ω	ω_m
Li ₂	352		N ₂	2360		O ₂	1568		Cl ₂	565	
Na ₂	159		P ₂	778		S ₂	727		Br ₂	324	
K ₂	93		As ₂	432		Se ₂	388		I ₂	214	
Rb ₂	58		Sb ₂	268		SO	1124 1148		ICl	385 389	
Cs ₂	41		Bi ₂	173		SeO ₂	(910) 978		IBr	267 269	
LiK	(207) 223		PN ²	1337 1569					BrCl	(440) 445	
LiRb	(185) 205		AsN ³	1063 1396							
LiCs	(170) 196		BiSb ⁴	220 221							
NaK	123 126										
NaRb ¹	107 109										
NaCs	96 90										

Bracketed values are uncertain.

In Group 5 the BiSb molecule conforms to this rule, whereas the PN and AsN molecules do not. The ω value of the former molecule definitely refers to the ground state, as it is derived from absorption measurements, but there is no such certainty in the case of the latter molecules as their ω values are derived from emission spectra. It is suggested, therefore, that these discrepancies are due to the fact that the ω values presented here for PN and AsN do not refer to their ground states but to excited states. If this is so, it is probable that the actual ground state frequencies will be of the order of 1570 cm.⁻¹ and 1400 cm.⁻¹ respectively.

This subject will be discussed in greater detail in a future publication.

H. G. HOWELL.

Physics Department,
Armstrong College,
Newcastle-on-Tyne.
May 16.

¹ Kusch, *Phys. Rev.*, **49**, 218 (1936).

² Curry, L. Herzberg and G. Herzberg, *Z. Phys.*, **86**, 348 (1933).

³ Spinks, *Z. Phys.*, **88**, 511 (1934).

⁴ Nakamura and Shidei, *Jap. J. Phys.*, **10**, 11 (1935).

⁵ Asundi, Jan-Khan and Samuel, *NATURE*, **136**, 642 (1935).

Remaining data have been obtained from Jevon's "Report on Band Spectra" (Physical Society, 1932).

the sheath becomes very indistinct. This dark sheath is only visible in a definite pressure range :

In helium	between 3	and 0.7	mm. rather indistinct
" neon + (0.1-1 per cent argon)	0.6	0.2	" sharp
" argon	0.2	0.02	" "
" krypton	0.14	0.01	" "
" xenon	0.08	0.008	" "
" mercury vapour	0.03 (60° C.)	0.007 (40° C.)	sharp.

In pure neon the sheath was barely visible. In argon, krypton and xenon the colour changes at the lower pressure limit mentioned above and at lower pressures a sheath is observed, which is brighter than the arc plasma, with almost the same dimensions as the dark sheath. At still lower pressures it disappears. In hydrogen, at 0.5 mm., a bright sheath is observed round the cathode with about the same thickness as in the case of the noble gases. Below 0.1 mm. we can see in hydrogen concentric with the dark space-charge sheath a bright and an almost dark sheath followed by the light of the discharge plasma (very distinct at 0.005 mm.).

These last phenomena were also observed in argon (though very indistinct) at such a low pressure that the bright sheath had disappeared.

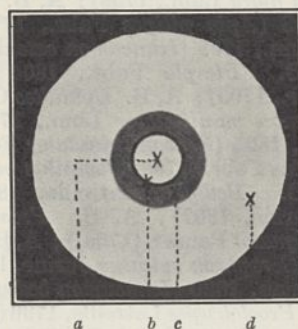


FIG. 1. Diagram of glow from an oxide-coated cathode, in argon at 0.05 mm. pressure, current 2.0 amp., diameter of cathode 4 mm., emitting surface 2.9 sq. cm.

A more extensive report will be published in the Dutch journal *Physica*.

N. WARMOLTZ.

Natuurkundig Laboratorium
der N. V. Philips' Gloeilampenfabrieken,
Eindhoven, Holland.
May 18.

A Second Sheath near the Cathode of an Arc Discharge

IN the course of some investigations on arc discharges with oxide-coated cathodes in rare gases, a new dark sheath with a sharp boundary was seen between the well-known Langmuir double space-charge sheath on the cathode and the light of the arc plasma. Fig. 1 shows diagrammatically (a) the cylindrical (indirectly heated) barium-strontium oxide coated cathode (viewed end-on), with (b) the well-known absolutely dark space-charge sheath, a few tenths of a millimetre in width and concentric with it, and (c) the almost dark sheath a few millimetres wide, followed by (d) the light of the plasma.

The thickness of this new sheath (c) varies approximately inversely with the square root of the current density and only slightly with the gas pressure. At low current density, for example, 0.1 amp. per cm.²,

Parallel-Plane Diode Magnetron

IN the discussion on a paper¹ by W. E. Benham on "Electronic Theory and the Magnetron Oscillator", it is remarked that although oscillations should be expected from plane diodes with magnetic field², no experimental evidence had been brought forward to support this.

We have constructed a plane diode of the Müller³ type consisting of a plane indirectly heated oxide-coated cathode, 17 mm. in diameter, and an anode the two plane plates of which were approximately 15 mm. in diameter, situated on either side and at 1 mm. distance from the cathode. The anode plates provide the capacitance of the oscillating circuit, and the conductor joining these two plates (assumed

for calculation in this case to be a ring of 21 mm. in diameter), provides the inductance. The anode current is fed to this ring at a voltage node. The arrangement can be seen from Fig. 1.

It was hoped with this valve to obtain diode oscillations³ of the order of 30 cm. without a magnetic field, but having failed to detect any, owing perhaps to the lack of exact symmetry in the apparatus, a magnetic field was applied parallel to the electrodes. Weak oscillations could be detected with a Lecher wire system coupled capacitatively to the valve, together with rectifier and sensitive galvanometer.

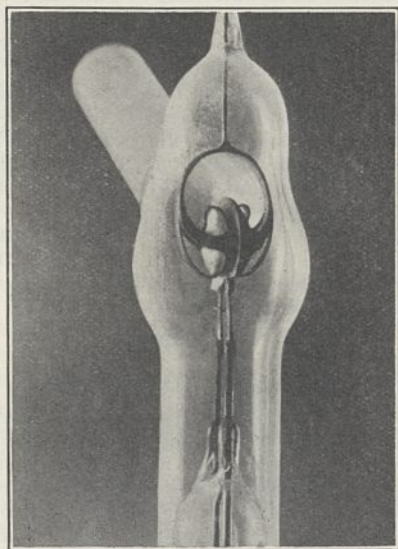


FIG. 1. Parallel-plane diode magnetron.

Until a further valve is built, little more can be said than :

(1) the oscillations occur where the magnetic field starts to cause a reduction in the anode current,

(2) the oscillation intensity falls off as the direction of the magnetic field is altered from that parallel to the electrodes, to that perpendicular to the plane of the electrodes.

(3) the wave-length of the oscillations is of the order of that determined by the oscillating circuit (the anode plates plus connecting wire).

D. M. TOMBS.

Institut für Schwingungsforschung,
Franklinstrasse 1,
Berlin, N.W. 87.
May 12.

¹ W. E. Benham, *Proc. Phys. Soc.*, **47**, pt. 1, No. 258 (Jan. 1935).

² J. Müller, *Z. Hochfreq. und Elektroak.*, **46**, Heft 5 (Nov. 1935).

³ J. Müller, *Z. Hochfreq. und Elektroak.*, **43**, Heft 5 (June 1934).

Collisional Friction Frequency in the Ionosphere at Allahabad

APPLETON¹ has shown that for the ordinary ray the integrated absorption coefficient k for absorption in the deviating region (that is, in the region where μ approaches zero) may be calculated from the following formula :

$$-2 \int_{\mu=1}^{\mu=0} k dh = \ln \rho_0 = -\frac{\nu}{2c} (P_0' - P_0), \dots (1)$$

where ν , the collisional friction frequency per electron per second, is assumed to be constant throughout the deviating region ; ρ_0 is the reflection coefficient for the ordinary ray ; P_0' is the group path ; and P_0 is the optical path of the wave.

Late in the night after the magneto-ionic splitting has taken place and the ordinary ray has undergone much group retardation, we are justified in assuming that

$$\Delta (\ln \rho_0) = -\frac{\nu}{2c} \Delta (P_0') \dots (2)$$

Thus if we plot $\ln \rho_0$ against the equivalent height $P_0'/2$, we should expect a straight line, the slope of which will give us the value of ν . The observations made in this laboratory during last winter show the validity of formula (2) and give an average value of ν of 1.2×10^4 per electron per second.

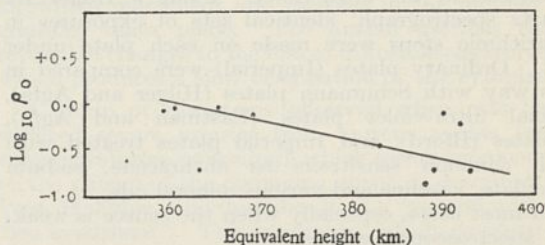


FIG. 1. *F*-layer reflections, March 1, 1936, time 0319-0402 I.S.T.

In Fig. 1, $\log_{10} \rho_0$ has been plotted against the equivalent height for reflections from the *F*-layer. ν comes out to be 1.2×10^4 per electron per second.

The value of ν has also been determined by similar methods in England by Eckersley² and Farmer and Ratcliffe³. Eckersley has found $\nu = 3.6 \times 10^3$ in the daytime for the *F*-region, while Farmer and Ratcliffe's night-time value of ν for the *F*-region is 2.1×10^3 and the daytime value is 1.2×10^3 per electron per second. Thus we see that the value found by us differs considerably from that found by workers in England. At present it is not possible to account for this difference, unless more data extending over a large period are available.

Further observations are being made and details will be published elsewhere.

G. R. TOSHNIWAL.
B. D. PANT.
R. R. BAJPAI.

Physical Laboratory,
University, Allahabad.
May 7.

¹ Appleton, *NATURE*, **122**, 879 (1928) ; **135**, 618 (1935).

² Eckersley, *NATURE*, **135**, 435 (1935).

³ Farmer and Ratcliffe, *Proc. Roy. Soc., A*, **151**, 370 (1935).

Sensitivity of Photographic Plates in the Region $\lambda\lambda$ 2500-2100 Å.

It is well known that the sensitivity of an ordinary photographic emulsion begins to fall rapidly just below λ 2500 Å., and is very low at λ 2100 Å. This fall is due to the absorption of short-wave radiation by the gelatin of the emulsion. It is commonly stated¹ that higher sensitivity in this region may be obtained by greatly reducing the gelatin content of the emulsion, as in the Schumann plate, or by bathing an ordinary plate in a fluorescent substance which can

convert the short waves into radiation able to penetrate the gelatin.

Having had occasion recently to photograph spectra of low intensity in this region, we were surprised to find that better results could be obtained with ordinary plates than with plates recommended as having much higher ultra-violet sensitivity. We have therefore carried out some experiments with the view of clearing up this apparently anomalous behaviour.

The procedure was as follows. A heavy-current discharge tube, through which passed a slow stream of air, provided a steady source of the γ -bands of nitric oxide. These bands are characterised by strong, well-defined heads, with long branches slowly degraded in the direction of shorter wave-lengths. The range of intensity thus available makes this band system very suitable for comparison of plate characteristics in the ultra-violet. Using a Hilger E2 quartz spectrograph, identical sets of exposures in logarithmic steps were made on each plate under test. Ordinary plates (Imperial) were compared in this way with Schumann plates (Hilger and Agfa), special ultra-violet plates (Eastman and Agfa), Q-plates (Ilford), and Imperial plates treated with such common sensitisers as anthracene, sodium salicylate, vaseline and various mineral oils.

In most cases, especially when the source is weak, the spectroscopist wishes

(a) to obtain a measurable record of the spectrum with the least possible exposure, and

(b) to reproduce, as a range of perceptible density differences, the intensity differences present in the actual spectrum.

Our results show that

(a') every plate tested, except the Ilford Q2 plate, gives less blackening for short exposures than does an ordinary plate. That is to say, an ordinary plate fulfils condition (a) better than the 'sensitised' plates, with this one exception.

(b') the 'sensitised' plates are capable of showing more intensity contrast than ordinary plates, because they have a greater saturation density. This increased density, however, is obtained only by prolonging exposure beyond that which is needed to reach saturation with ordinary plates.

If, therefore, it is desired merely to detect a weak spectrum in this region, it is undesirable to use 'sensitised' plates. If, on the other hand, the source of radiation is intense, or short exposure time is not aimed at, these plates will give greater contrast and higher saturation density than ordinary ones.

It is perhaps also worth noting that considerable over-exposure in this region does not produce on an ordinary plate densities comparable with those attainable in the nearer ultra-violet or visible region. Apart altogether from considerations of fogging, excessive exposure is detrimental in that it smooths out what little intensity contrast is present in a correctly exposed plate. This is shown by the fact that, on an over-exposed plate, even such a spectrum as that of NO appears almost continuous.

A full account of the experiments will be published shortly.

A. HUNTER.

Royal College of Science,
South Kensington,
London, S.W.7.
June 3.

R. W. B. PEARSE.

¹ For example, Hopfield and Appleyard, *J. Opt. Soc. America*, **22**, 488 (1932). Weichmann, *Z. wiss. Phot.*, **34**, 140 (1935).

Nova Lacertæ, 1936

SLIT spectra of the nova have been obtained at this Observatory on every night, with one exception, since the discovery was announced on June 19.

The most prominent feature in the spectra is the broad emission bands of the Balmer series of hydrogen, $H\alpha$ being particularly bright. The width of the $H\beta$ and $H\gamma$ emissions on the evening of June 22 was about 50 angstroms. These emissions are flanked on the side of shorter wave-length by rather weak absorption lines. The more displaced component of the two $H\gamma$ absorptions indicated a velocity of about -1100 km./sec. on the morning of June 20; this rose to about -1900 km./sec. by the evening of June 22.

Fe II, Ti II, Mg II, and Ca II are also represented by broad weak emission bands and displaced absorption lines. These absorption lines are weak and hazy, but the sharp interstellar H and K lines are strongly shown on a plate taken on the evening of June 22.

The general appearance of the spectrum is in sharp contrast with that of Nova Herculis, 1934, at a corresponding stage of development.

T. W. WORMELL.
J. C. DOBBIE.

Solar Physics Observatory,
Cambridge. June 26.

The Background of the Galaxies

IN NATURE of May 30, M. Leontovski¹ shows that "To a most sensitive eye, the background of the galaxies would appear as a dark red." Since the irresolvable background consists of nebulae receding with nearly the speed of light, the age of these nebulae, as observed, reckoned in our own time-scale, must be approximately one half the present age of our own surroundings; that is, if t is the conventional value of the age of the universe, $\frac{1}{2}t$ is the age of the observed background². Combining these results, we see that the background realizes the poet's dream of

"A rose-red city, half as old as time."³

E. A. MILNE.

19 Northmoor Road,
Oxford.

¹ NATURE, **137**, 904 (1936).

² *Mon. Not. Roy. Ast. Soc.*, **93**, 674 (1935); "Relativity, Gravitation and World-Structure" (1935), p. 108 (diagram).

³ J. W. Burgon, "Petra", Newdigate Prize Poem, 1845.

Glycosides of Madder

THE glycoside obtained from various species of *Galium* and *Rubia* already described in NATURE¹ has now been found to be a primveroside of purpurin carboxylic acid.

The sugar of ruberythric acid, the glycoside of alizarin, which has been known for many years, has been isolated in the pure crystalline condition from the products of enzymic hydrolysis and identified as primverose. A primveroside of rubiadin has also been obtained from the roots of *Galium Verum*.

The three glycosides are rapidly hydrolysed by enzymes present in members of the Primulaceæ. They would appear to be the first examples known of primverosides occurring in the Rubiaceæ.

R. HILL.
D. RICHTER.

Biochemical Laboratory,
Cambridge. June 2.

¹ NATURE, **134**, 628 (1934).

Points from Foregoing Letters

NEW experiments to find whether there is a correlation between the scattering of gamma radiation and electron recoil are described by Dr. J. C. Jacobsen. In agreement with Bothe and Maier-Leibnitz, and unlike Shankland, the author finds a number of coincidences which is well beyond the experimental error. Commenting on these results, Prof. N. Bohr considers that the grounds for serious doubts concerning the validity of conservation of energy and momentum in atomic phenomena are largely removed. The root of the still unsolved difficulties of quantum electrodynamics may be looked for, he states, in the atomistic nature of electricity, which is as foreign to the classical physical theories as the quantum of action itself.

With reference to the complex molecular nature of solid sulphur trioxide, Prof. H. E. Armstrong directs attention to its value as a sulphonating agent, and recalls incidents in connexion with its early preparation by Frankland.

To account for the similarity in the graphs representing the rate of thermal decomposition and the rate of oxidation of formaldehyde and of acetaldehyde, Prof. M. W. Travers suggests that short-lived intermediates are formed in both cases.

A new vitamin, 'P', which cures pathological permeability of the walls of capillaries to plasma protein, is reported by St. Rusznyák and Prof. A. Szent-Györgyi. The new vitamin, closely allied to vitamin C, is found in Hungarian red pepper and lemon juice, and is apparently flavon or flavonol glycoside, one of the vegetable dyes.

Adenylic acid and adenosine (obtained from muscle or yeast) are found by Dr. T. W. Birch and Dr. L. W. Mapson to accentuate considerably the slowing down of the heart-beat (bradycardia) produced in rats by deficiency of vitamin B₁. The authors find, further, that vitamin B₁ helps in the elimination of adenylic acid and suggest that, when the vitamin is absent, there is an accumulation of adenylic acid and that it and similar decomposition products of nuclein are the cause of the bradycardia, not lactic acid, as sometimes stated.

The concept of a pair of equivalent particle-observers, as employed by Milne and Page, is criticised by Prof. J. L. Synge, who deduces that any two particle-observers are equivalent, and their relative velocity is zero for suitably chosen equivalent clocks.

The variations of the magnetic induction with the field applied are found by K. Mendelssohn and R. B. Pontius to follow a smooth and nearly reversible curve in the case of a sphere of tin at very low temperature (in the supra-conducting state), while in a cylindrical specimen, the graph shows step-wise changes, with considerable hysteresis. This behaviour agrees with the assumption that the time effects observed indicate a slow expansion or contraction of macroscopic supra-conducting regions.

Examples showing how the exact value of physical constants (such as density and boiling point) of pure liquids can be estimated with a high degree of accuracy from the change in boiling point of the liquids as they become purer on distillation are given by Dr. M. Wojciechowski and Dr. E. R. Smith.

A greatly increased consumption of oxygen by cartilage tissue, upon addition of methylene blue, is reported by E. G. L. Bywaters. Under ordinary conditions, cartilage splits glucose into lactic acid without the use of oxygen.

Dr. S. Dobinski finds that the haloes obtained by diffraction of electrons on a copper surface polished in air are due to cuprous oxide. Polishing in absence of air gives rise to different haloes of such size as might be expected from degeneration of the usual copper pattern.

On placing living tissue cells in pure water or in a medium free from salts, Prof. H. Grossfeld finds that the cells take a globular shape, and that a vivid Brownian movement and increase in the number of granules takes place. The author ascribes these reversible changes to the loss of diffusible electrolytes, which produces a slow coagulation of the cytoplasm.

A group of symptoms observed when rats have suffered severe injuries from various agents (cold, surgical injuries, poisoning), which seems independent of the nature of the damaging agent, is described by Prof. H. Selye, who describes it as a "general adaptation syndrome". This syndrome, which develops in several stages, includes decrease in the size of thymus, spleen, lymph glands and liver, disappearance of fat tissue, formation of acute erosions in the digestive tract, increase in adrenals, etc.

Prof. J. Kaplan finds that when oxygen is introduced into the auroral afterglow in nitrogen, the spectrum of the resulting afterglow resembles very closely the spectrum of sunlit auroras as reported by Vegard and Tensberg. He believes that the effect is brought about by ozone as postulated by Vegard and Tensberg.

Evidence is submitted by Dr. Howell that the ground state vibrational frequency of a molecule AB is very nearly equal to the mean of the frequencies of the elementary molecules A_2 and B_2 , where A and B belong to the same group of the Periodic Table.

A new 'dark sheath', with a sharp boundary, near the cathode of an arc discharge between the Langmuir double space-charge sheath on the cathode and the light of the 'arc plasma', is described by N. Warmoltz.

According to theoretical considerations put forward by J. Müller, electromagnetic oscillations are to be expected from a parallel-plane diode magnetron, when the magnetic field is arranged parallel to the plane of the electrodes. D. M. Tombs observes oscillations of the order of 30 cm. confirming this.

A. Hunter and Dr. R. W. B. Pearse find that in the region $\lambda\lambda$ 2500–2100 Å., certain specially sensitised ultra-violet plates are actually less sensitive than ordinary plates when exposures are short or the radiation is weak. 'Sensitisation' in general increases contrast and maximum attainable density, but decreases threshold speed.

Spectra of the new star reported in last week's NATURE are briefly described by Drs. T. W. Wormell and J. C. Dobbie. The hydrogen absorptions indicate velocities which have risen from 1100 to 1900 km./sec. in two and a half days. Certain enhanced metallic lines are also present, in displaced positions, and the sharp lines of interstellar calcium are a prominent feature.

Research Items

Fertility and Contraception in the United States

DATA relating to the reproduction histories of 30,949 women (white and negro) overtly fertile in 1931 and 1932, and residing in or near twenty-six large cities in fifteen States east of the Mississippi and north of the southernmost tier of States, have been collected and are in course of analysis by Prof. Raymond Pearl. An important factor in any discussion of this material is the extent and effectiveness of contraception. It can alter completely the expression of variation in natural innate fertility. An attempt to evaluate the influence of this factor (*Science*, 83, May 22, 1936) shows that among the white population under investigation, 54 per cent have not practised contraception and among the negroes 83 per cent. Contrasting the two classes of contraceptors and non-contraceptors in white and negro respectively, it appears that in white and negro non-contraceptors, the pregnancy rates are identical; but among contraceptors, in the whites contraception is effective in reducing pregnancy 25-50 per cent in the various age classes, while among negroes it is without significant statistical effect in lowering the pregnancy rates below those of comparable classes of non-contraceptors. This confirms the experience of clinics that negroes do not practise contraception effectively, even after instruction. Clearly if no other variables were involved, this would result in a change in the relative proportions of the two elements in the population, which would be apparent in a very short time. There is, however, a much higher rate of production wastage (abortions, miscarriages and still-births), largely owing to the prevalence of venereal disease, among the negroes. This acts as one of several compensating factors in the birth-rate.

Antiscorbutic Activity of a Derivative of Gluconic Acid

It is now known that a number of compounds chemically related to *L*-ascorbic acid or vitamin C can exert some degree of antiscorbutic activity. An addition to the list is announced in a letter addressed to the Editor by Prof. B. A. Lawrow, Prof. W. M. Rodionow, E. M. Bomdas and N. S. Jarussowa, of the Vitamin Department of the Institute of Nutrition, Moscow. They have found that the methyl ester of 2-ketogluconic acid exerts antiscorbutic activity in guinea-pigs in doses of 100 mgm. or more : 50 mgm. had a curative action in about half of a group of animals suffering from scurvy, but 25 mgm. had very little effect. This ester is an intermediate product in the synthesis of *D*-arabo-ascorbic acid, which has about one-twentieth of the antiscorbutic potency of vitamin C itself (see S. S. Zilva, *Biochem. J.*, 29, 1612; 1935). It thus appears that the ester of ketogluconic acid has about 1 per cent of the activity of *L*-ascorbic acid or vitamin C. The chemical difference between the two ascorbic acids lies in the position of a hydroxyl group in the chain. The Russian authors do not discount the possibility that the gluconic ester is converted first into *D*-arabo-ascorbic acid in the animal body and that the antiscorbutic activity is due to this compound: they also state they they are extending their investigation

to include an examination of the action of the ester of ketogluconic acid, which occupies a corresponding position in the synthesis of *L*-ascorbic acid. The question whether antiscorbutic activity depends upon the presence of a cyclic structure in the molecule or can also be exerted by open-chain compounds must await further investigation, but may be difficult to decide if the conditions of conversion *in vitro* can be duplicated in the body.

Sex Change in a Fish

THE actual change of sex that takes place in a teleostean fish, *Sparus longispinis*, is the subject of a memoir by Kinoshita (*J. Sci. Hiroshima Univ.*, Ser. B, Div. 1, 4; 1936). In early life the gonad consists of a thread-like testis. Shortly after, oocytes make their appearance in tissue alongside the testis which now contains ripe spermatozoa. More of them make their appearance until a hermaphrodite condition is realized, but only functional sperms are produced. The final stage is brought about by the degeneration of the gonad of one sex, either male or female, thus leaving the old fish of the other sex. It is only when this stage is reached that functional ova are produced.

Fungi and Graft Unions

THE partnership between stock and scion of a grafted plant is usually well adjusted. There is, however, undoubted evidence that fruit-tree stocks can influence the type of scion growth, and the scion can, under different conditions, control growth of the whole tree. Mr. T. E. T. Bond has investigated the possibility that such relations would have an effect upon the relative susceptibility of herbaceous stocks and scions to attack by disease-producing fungi (*Ann. App. Biol.*, 23, No. 1, 11-29, February 1936). Various graft combinations of potato, tomato, woody nightshade, deadly nightshade, thorn-apple, *Physalis* sp. and henbane were prepared, and were inoculated on one side of the union with either of the fungi *Phytophthora infestans* or *Cladosporium fulvum*. The resulting attacks by these fungi were the same as upon ungrafted material, thus showing no influence of the other participant in the graft union, either in preventing, or helping, fungal attack in the herbaceous plants used for the experiment.

A Disease of the Japanese Laurel

THE common variegated Japanese laurel, *Aucuba japonica*, is but rarely the host of any fungus or bacterial parasite. Dr. G. Trapp has, however, isolated an organism, *Pseudomonas aucubicola*, a new species, which is very closely concerned in a 'die-back' disease of this popular shrub ('A *Bacillus* isolated from Diseased Plants of *Aucuba japonica* (Thunb.)', *Phytopath.*, 26, No. 3, 257-265, March 1936). Though the organism was consistently isolated from stem, leaf and root lesions of infected plants, very intensive attempts to re-inoculate healthy plants failed to reproduce the malady. It is considered that *P. aucubicola* is not a primary parasite, but can avail

itself of a slightly diseased condition induced by some other cause. Morphological, cultural and physiological characters of the organism are set forth at length in the paper.

Atmospheric Vorticity

The *Journal of the Faculty of Science*, Imperial University of Tokyo, Section 1, vol. 3, part 2, August 1935, contains a number of meteorological papers dealing with atmospheric vorticity. The first, by K. Nakata, with an introduction by Prof. S. Fujiwhara, is a study of the vertical component of vorticity. A number of synoptic weather charts are shown on which are drawn lines of isovorticity together with ordinary isobars for sea-level, for the neighbourhood of Japan for certain dates in the winters of 1922 and 1923. These show that the areas of positive (cyclonic) and negative (anticyclonic) vorticity generally nearly coincide with the cyclonic and anticyclonic areas, but that the two pairs of systems often differ in detail; that the different systems travel together; but that the distribution of vorticity is irregular in the regions lying between an anticyclone and a cyclone. The centres of maximum and minimum vorticity, in spite of the irregularities just mentioned, appeared to coincide very nearly with the main centres of low and high pressure. Later papers in the series by other Japanese writers extend the relationship to features other than the distribution of atmospheric pressure, including cloud and rainfall, and deal with the case of the typhoon. Very little is said of the difficulties that must have arisen from lack of sufficient observational material, and in the application of the classical hydro-dynamical equations to a complex and highly compressible fluid like the atmosphere; it is difficult to assess the importance for meteorology of the very laborious and difficult computations involved in this attack upon a subject which is undoubtedly of the greatest importance for progress in meteorology.

Electrical Contacts

ALL engineers who are familiar with the working of spark coils and the phenomena which take place where the brushes press on the commutator of a dynamo realize the importance of the study of electrical arcs and discharges, but it is only recently that their effects on the resistances of the materials in contact have been considered. In *World Power* of May, G. Windred has given a useful review of recent literature on the subject. The value of the contact resistance between two metals depends largely upon the conditions at the interface between them, but it is also largely affected by the formation of oxides on the faces. It is known that copper oxides produce a marked increase on the contact resistance. For a given current this increases the heating and the cumulative rate of deposit of the oxide. At a certain critical temperature, there is a sudden fall in the contact resistance, and this is of importance in the design of heavy-current contact breakers. The main factors which influence the life of electrical contacts are their hardness and their resistance to the effects of arcing. The relays used in modern telephone practice must operate faultlessly over long periods of time and with the minimum of inspection; their effective life depending on the duty cycle which they perform and the amount of attention which they receive. The disadvantages of using copper and brass are their low melting points and their susceptibility

to corrosion. This led in the early days to the use of precious metals for electrical contacts. Papers by Carter and Kingsbury published in America (*Bell Journal Reprints*, April 1928) contain practically all our knowledge of this important subject. Kingsbury deals with the important subject of contact erosion and gives experimental data obtained from eight different contact metals showing their losses in weight, volume and atomic proportions relative to platinum.

Organic Derivatives of Silicon

IN the Bakerian Lecture to the Royal Society delivered on June 25, Prof. F. S. Kipping reviewed the work of the past thirty-five years at University College, Nottingham, on organic derivatives of silicon. With the object of determining whether silicon could give rise, like carbon, to dissymmetric molecules, a number of derivatives belonging to the two types $\text{SiR}_1\text{R}_2\text{R}_3\text{R}_4$ and $(\text{R}_1\text{R}_2\text{R}_3\text{Si})_2\text{O}$ and each containing at least one aromatic nucleus, were prepared. These optically inactive compounds were converted to sulphonic acids, and resolutions with active bases were attempted. In each case only one active base gave the desired result. A remarkable feature was that in many cases the *d*- and *l*-acids, when combined separately with another active base, gave salts which were indistinguishable in all physical properties, including specific rotation. In the course of other investigations, it was found possible to direct attention to the great differences in behaviour between similarly constituted compounds of carbon and silicon. Thus the chlorides SiR_3Cl are easily hydrolysed by cold water to silicols SiR_3OH , which pass readily into oxides $\text{SiR}_3\cdot\text{O}\cdot\text{SiR}_3$. In no case has the formation of a simple silicone, $\text{R}_2\text{Si}\cdot\text{O}$, been observed, and indeed it seems probable that the group $\text{>Si}\cdot\text{O}$ does not exist, nor is there any evidence of the formation of an ethylenic bond between carbon and silicon or between two silicon atoms. The diols $\text{SiR}_2(\text{OH})_2$ and triols $\text{SiR}(\text{OH})_3$ give rise to complex mixtures by progressive condensations, the study of which throws light on the structure of mineral silicates. Acids of the type $\text{R}\cdot\text{SiO}\cdot\text{OH}$ are probably not formed. The general conclusion is that corresponding carbon and silicon compounds show very little similarity in behaviour, only a few types of carbon compounds being represented by analogous derivatives of silicon.

Monogenic Functions

A FUNCTION of a complex variable is called monogenic at a point if at that point it possesses a unique finite derivative. It is well known that such a function satisfies the differential equations of Cauchy-Riemann; but the converse is not true. The problem of determining conditions that are sufficient for monogeneity and yet are free from unnecessary restrictions has not yet been completely solved, but an account of recent progress is given by Prof. D. Menchoff of Moscow ("Les conditions de monogénéité"; *Actualités scientifiques et industrielles* 329. Paris: Hermann et Cie., 1936). It is surprising to find that the demonstrations seem necessarily to involve complicated ideas of the modern theory of functions, even when the properties dealt with are apparently independent of these ideas. Perhaps some mathematician will take up the challenge, and supply the simpler proofs which, one is tempted to say, must exist.

The Indian Institute of Science, Bangalore

IN 1926 the Government of India appointed a committee with Sir William Pope as chairman to report upon the Indian Institute of Science, and one of its recommendations was that the activities of the Institute should be subject to review by a committee every five years. Early this year, Sir James Irvine was appointed chairman of the statutory quinquennial committee, and the issue of the report of this committee is awaited with interest. It is untimely, therefore, that the March issue of our Calcutta contemporary, *Science and Culture*, should publish a severely critical article on the present administration of the Institute. Anyone cognisant of the large volume of original work which has issued from the Institute since its foundation cannot doubt that it has more than justified the hopes of its munificent founder, the late Mr. J. N. Tata. The two main heads of the recent criticisms would appear to be (a) that the work of the Institute is too academic and (b) that, since the students are drawn very largely from South India, it is no longer an all-India research institute.

Whilst it may be true that much of the work carried out in the laboratories of the Institute is concerned mainly with problems of purely scientific interest, it is difficult to see how this could be otherwise. The research work in the Institute is done by young students who go there for a training in the methods of research. If they are not to be discouraged in their early years, it is essential that they should be assigned problems likely to yield results within a reasonable time. Furthermore, we very

much doubt if it is possible to undertake *ad hoc* research on industrial problems. The industrial research institutions in Great Britain work in close contact with established industries, and they study fundamental problems related to these. It is very rare indeed that a new industry results directly from an isolated piece of research. We are of opinion that the Indian Institute of Science can best assist industrial development by working in collaboration with industry, as do the universities in Great Britain with Imperial Chemical Industries, Ltd.

The contributions of the Institute to industrial development have not been negligible; we need only instance the valuable researches made in collaboration with the Forest Research Institute at Dehra Dun on the causation of sandal wood disease, the investigations on wireless transmission in the tropics, and the work leading to the establishment of the sandalwood oil and white lead industries.

All industrial advancement is dependent upon pure scientific research, and it is a matter for congratulation that Sir C. V. Raman, the present director, has already built up a school of research in physics and that he was able to attract as a visitor to Bangalore so eminent a theoretical physicist as Dr. Max Born. Whilst the rapid development of research in Indian universities, not foreseen by its founders, has doubtless made necessary a new orientation of the activities of the Institute, we cannot doubt that it will continue to play a great part in the scientific advancement of India.

Progress in Atomic Physics

CONFERENCE AT COPENHAGEN

PROF. NIELS BOHR held a conference on atomic physics on June 17-20 in the Institute for Theoretical Physics at Copenhagen. About eighty physicists attended the discussions, including many from foreign countries.

The outstanding communication to the conference was a paper by W. Heisenberg on the quantum-mechanical theory of cosmic ray showers. Up to the present, no explanation of the fact that particles of very high energy can produce simultaneously, or in a single process, a large number of secondary particles, has been given in terms of the quantum theory of electrodynamics. Such showers of secondary particles have been observed by Hoffmann, Blackett and other experimenters.

According to quantum electrodynamics, the effective cross-sections for the simultaneous formation of n pairs of electrons lead to an extremely small probability for the occurrence of large showers. This calculation was made on the assumption that only the ordinary known electrical forces are of importance in the interaction between charged particles.

The phenomenon of β -disintegration has, however, suggested the idea, as in Fermi's theory, that there exist interaction forces of a new type between electrons and heavy elementary particles such as protons and neutrons. In this new type of interaction, a fourth elementary particle, the neutrino, probably takes part, as has been suggested by Pauli. Without the neutrino, it is impossible to preserve the law of the conservation of energy in the description of β -disintegration. It follows from the existence of these new interaction forces that an electron and neutrino can be created in an atomic nucleus, the electron being emitted as a β -ray, as Fermi pointed out.

Heisenberg has given a general proof that all interaction forces of the type that produce β -disintegration lead to the production of multiple processes and particles, when initiated by particles of high energy. The process may be of the following sort. A high-speed proton strikes a nucleus and produces in the field of the nucleus a great number of β -rays in one elementary action. Heisenberg suggests that the mechanism of the cosmic ray showers is of this type.

He has succeeded in calculating the minimum energy needed by the incident particle to produce this effect, and finds that the order of magnitude is in quite good agreement with the experimental observations of cosmic ray energies.

It is hoped that this new conception of the interaction between elementary particles will suggest methods of solving the difficulties in the theory of quantum electrodynamics, which arise from the incomplete knowledge of the physical laws governing the behaviour of particles of high energy.

V. Weisskopf discussed the Dirac theory of positrons, and showed that its formulation can be simplified, and some of its paradoxes removed. P. Jordan discussed the theoretical possibility of conceiving a light quantum as a pair of neutrinos. M. Born gave an account of his theory of quantum electrodynamics. Kalckar and Bohr gave a detailed mathematical account of their theory of nuclear disintegration. O. R. Frisch and G. Placzek gave an account of the structures of energy levels in heavy nuclei, and the possibility of investigating it by means of the absorption of slow neutrons. Rosenfeld and Bohr discussed the problem of the measurement of charges, and the importance of field and charge fluctuations for the definition of theoretical concepts.

The course of the discussions was, as always, directed by the masterly fundamental criticisms of Bohr. On these occasions, when so many able theorists are gathered together, it is clear that Bohr's physical insight is the power which contributes most to the advance of theoretical atomic physics, and creates the conditions which fertilize the mathematical abilities of theoretical workers elsewhere.

The most interesting and important paper on experimental physics was, perhaps, Jacobsen's account of his repetition of the Shankland experiment (see p. 24 of this issue). Shankland failed to observe coincidences between recoil electrons and scattered quanta when observing with counters at the angles expected according to the Compton theory of the photon scattering process. He used γ -rays from radium, which cover a large range of frequencies. Jacobsen, and Bothe and Maier-Leibnitz have now repeated

the experiment with the almost non-chromatic γ -rays from thorium C'. They have taken great care in defining the angles used, and have found the expected number of coincidences. These results are confirmed by some less well-defined experiments by Fermi's collaborators. Thus the suggested failure of the conservation of energy in the Compton effect, so eagerly seized upon by Dirac, in order to get rid of some of the difficulties found in the formulation of a satisfactory relativistic quantum dynamics, is not confirmed. Bohr, Pauli, Heisenberg and other theoretical workers expressed satisfaction at this result, and hoped that further discoveries would mitigate the difficulties on which Dirac comments (see p. 24).

Heitler reported that Anderson has withdrawn his claim that the energy lost by fast electrons in the cosmic rays is much less than expected on general theoretical grounds.

Miss Meitner gave an account of some work on the radioactive effects produced in uranium by the action of slow neutrons. She showed that it is very probable that elements of atomic number 93 and 94 are both formed in the process. Dr. M. L. Oliphant described some recent work carried out in Cambridge, while Goldhaber showed that the mean free path in paraffin of the neutrons produced by the photo-electric disintegration of deuterium does not have the value predicted by the accepted theoretical picture of the interactions between neutrons and protons.

Uhlenbeck described how the modification of the Fermi theory of β -decay, proposed by Uhlenbeck and Konopinski, is in good accord with experiments on the energy distribution of β -particles from both electron and positron emitters of low atomic number. Richardson gave similar evidence in the case of β -emitters of high atomic number.

The general impression left by the conference was that progress in experimental research on the atomic nucleus is very rapid, but that the advance in the theoretical description of the new results is much slower. This is due largely to inadequate theories of the interaction forces between particles of high energy separated by small distances, which are of fundamental importance in the region of the nucleus.

Recent Advances in Wool Research

SEVERAL papers read at the Annual Conference of the Textile Institute held in London on June 3-5 dealt with wool and its characteristics.

Dr. A. B. Wildman, biologist of the Wool Industries Research Association, discussed estimations in the fleece of important wool characteristics, such as fineness variability, length, fleece density and kemp proportion. Emphasis was laid on the necessity for devising speedy and accurate methods of fleece analysis, in order that the relative merits of fleeces from breeders' flocks and from experimental sheep could be accurately measured. A historical résumé of earlier work was given, indicating that conflicting results were often due to lack of representative sampling methods. The author gave an account of his methods, which are subject to statistical control, in commencing analyses of thoroughly sampled fleeces. These investigations are intended to show the kind of variations occurring in fleeces of different

types of sheep, and represent an essential prerequisite in the evolution of suitable methods for quality determination.

The quality of a fleece may be modified by exposure to light, air and water. This is attributed by Dr. J. B. Speakman, of the University of Leeds, in a paper on "The Reactivity of the Sulphur Linkage in Animal Fibres", to the oxidation of intact disulphide bonds or their hydrolysis products. More regulated changes of this nature occur in the milling, carrotting, crabbing and blowing processes. Dr. Speakman produced evidence to show that the cystine disulphide cross-linkage is more susceptible to hydrolysis in the stretched than it is in the unstretched fibre. He also showed that the contractile power of treated stretched fibres is dependent on the extent of the hydrolysis of the cystine disulphide cross-linkages, which vary with the pH value of the solution in which the fibre is treated.

Raw wool may contain fifty per cent of its weight of grease, suint, dirt and vegetable matter. Its cleaning is, therefore, an intricate process, and was the subject of two papers from the Wool Industries Research Association. Some of the fundamental principles of washing raw wool with solutions of soap and soda were dealt with by Dr. H. Phillips, who showed that the pH values of the detergent solutions used influence their wetting and emulsifying powers, and the stability of the emulsions which they form. Variations in the relative proportions of the different impurities in raw wool, caused by variations in the health of the sheep and the climatic conditions, have to be met by alterations in the washing process, which can only be foreseen when the process is under scientific control. Inherent weaknesses in the process

are the effect of the alkali used on the wool and the incomplete removal of vegetable matter.

Dr. S. Townend described the frosted wool process, recently developed in the United States, by which it is claimed that large quantities of vegetable matter and grease can be removed from raw wool without subjecting it to alkaline solutions. The wool is cooled to -40°F. , and the frozen grease and vegetable matter are broken up and removed by mechanical treatment. The process removes more vegetable matter than the normal washing process, but the finer qualities of wool still require carbonising after treatment. The grease content of the wool cleaned by this process is also relatively high, and for certain purposes the wool has to be washed with soap and soda.

Chemical Engineering Congress of the World Power Conference

H. R.H. THE DUKE OF KENT, in opening on Monday, June 22, the First International Chemical Engineering Congress at the Central Hall, Westminster, and welcoming delegates and members from thirty-seven countries, said: "Proud as each country is of the achievements of her great scientists and inventors, their work once done becomes international and contributes to the well-being and happiness of every race". The Right Hon. Viscount Leverhulme, in his presidential address which followed, dealt with the subject of chemical engineering and stated that the conception of holding an international congress of this kind was due to the late Sir Frederic Nathan, and that the development of that ideal into the present meeting was brought about by the World Power Conference.

About 120 papers from fifteen different countries were presented for discussion, whilst the membership numbered 850, comprising about 350 representatives from thirty-six overseas countries.

Two technical sessions were held before lunch and two in the afternoon on Tuesday, June 23, and Friday, June 26, but as visits to colleges, research institutions and works in and around London had been arranged for Wednesday afternoon and Thursday afternoon, the technical sessions on these days were limited to the forenoon.

Since chemical plant may have to resist corrosive conditions and may have to withstand high temperatures and/or high pressures, both the material of which it is constructed and the method of fabrication are important factors to the chemical engineer. It was therefore not surprising that the papers and discussions at the first two sessions on Tuesday morning were devoted to materials of construction. At the first of these, eight papers were presented dealing with ferrous metals and their alloys designed to resist heat, rust and acid corrosion, the forging of autoclaves and vessels for withstanding liquids at high temperatures and pressures. Nor was cast iron omitted, for included in this section were papers showing the result of recent research work on this material and its application in chemical industry, as well as others on the prevention of corrosion in underground pipe lines made of ferrous metals. The following session covered a much wider field since it contained papers on refractory materials, stoneware,

plastics, rubber and such lesser known fibres as jute, coir, and sisal, as well as non-ferrous metals and their alloys, and their application in the construction of chemical plant.

Separation in the chemical industry is such a wide subject that at the third session, after lunch, the papers ranged from the theory of coal-washing through the recovery of benzol and the removal of carbon monoxide from town's gas to the production and treatment of road tars and to problems connected with the distillation of absolute alcohol, fractionation of heavy oils, modern cracking processes and graphical calculations relating to plate columns. Included in this section were other papers on filtration, recent developments in evaporation, crystallization, solvent extraction and drying.

The fourth session, which followed immediately, contained several papers relating to some interesting aspects of size reduction, among which was one describing a plant wherein low-grade fuel such as lignite can be pulverized and fired into the furnace of a boiler in one process, the boiler operating at a very high efficiency.

Another group of papers in this session considered electro-metallurgical and electro-chemical industries, as well as the electrolytic treatment of water for the prevention of corrosion and boiler scale and methods of removing small quantities of iron from soluble aluminium salts, the pasteurization of liquids, anodic oxidation of aluminium and arc welding of low carbon steels.

At the first session on Wednesday morning, the subject under discussion was destructive distillation, in which in addition to a paper on the underground gassification of coal, there was a number of papers on the problems connected with the manufacture of water gas and town's gas from lignite and similar fuels, as well as several papers on the various aspects of the development which has taken place in the gas industry in various parts of the world.

With the rapid growth of large industrial units, the disposal of waste material, whether solid, liquid or gaseous, has become a pertinent and pressing problem to the chemical engineer. It formed the subject of several papers at the next session. Coupled with this series were other papers which showed the recent developments which have taken place in the preparation and treatment of lubricating oils.

Within comparatively recent times, considerable attention has been directed towards the use of high pressures in the synthesis of organic compounds, the hydrogenation of tar and tar distillates and gaseous liquid phase reactions. The first session on Thursday morning was devoted to this subject. Included with this group of papers was one on the use of high vacua.

Few chemical engineers escape the problem of considering the transmission of heat to or the removal of heat from the product at one or more stages in the course of its manufacture. The importance of this subject therefore demanded the attention of the members during the second session on Thursday morning, when papers dealing with the evaporation of solutions liable to be affected by high temperatures, and the use of waste heat for low-temperature evaporation as well as methods by which waste heat may be recovered from intermittent sources, were under discussion.

The attendance and discussion which followed the report upon the papers on Friday morning dealing with the training of a chemical engineer indicated how this subject has been claiming the attention of both industrialists and teachers in America, Austria, Canada, France, Germany, Great Britain, Japan and the U.S.S.R.

In the session which followed were papers from Germany, Great Britain and the United States of America on administration, safety and welfare, and the statistical duties which fall to the lot of the chemical engineer in industry. These papers show how the countries concerned are taking precautionary measures to reduce accidents and occupational risks attendant upon chemical industry, and the factors

which influence the choice of site for a works and the cost of the product.

Trend of development was the title allotted to the first session on Friday afternoon, at which papers were presented on a variety of subjects in which amongst others are those relating to water treatment and softening, fumigation, developments in the sulphuric acid industry and the production of concentrated fertilizers from poor phosphates. Although the papers in this group deal with many subjects, their importance to the technical worker cannot be denied, since they consider problems arising in many industries.

The organization of research stations both of a public and private character and the part which fundamental research must play in industrial organizations were the subjects of some of the papers presented at the last session, which also included other papers on rapid methods of determining the standard of the product, the standardization of chemical apparatus and its future development, as well as a number of other aspects of interest to the chemical engineer.

Sir Harold Hartley, chairman of the International Executive Council of the World Power Conference, presided on Saturday morning at the closing meeting of the Congress, at which various reports were presented. Thanks were also tendered by numerous speakers to the various committees and officers, and a striking tribute not only to the success but also to the utility of the Congress was given when it was announced that an invitation had been received from the German National Committee to hold a second International Congress on Chemical Engineering in Berlin in 1940.

Oceanic Macroplankton of the *Dana* Expeditions*

DR. P. JESPERSEN has compared the amount of macroplankton in the various waters investigated by the Carlsberg Foundation's Oceanographical Expedition round the world in 1928-30. Volume determinations were made of 2231 pelagic hauls, distributed in eight regions—North Atlantic and Caribbean Sea, Pacific and Tasmanian Sea, Indo-Malayan region, waters west of Sumatra, Indian Ocean, South Atlantic, Straits of Gibraltar and adjacent waters, and the Mediterranean.

The paper deals solely with the purely quantitative side of the macroplankton as a whole, the only exception being a determination of the fish and fish fry of the different water layers in the regions of the Pacific: otherwise only occasional notice is taken of what organisms may be dominant—so far as volume is concerned—in the composition of the plankton. It is usually the salps which are thus noted, sometimes siphonophores, *Sagitta*, euphausiids and decapods.

A comparison of the microplankton on the two sides of the Panama Isthmus shows a very great difference. Thus in the upper water layers (50-100 metres wire) the quantity is greater in the Caribbean

Sea, but in all deeper hauls the volumes are very much greater in the Gulf of Panama. It is shown that in layers corresponding to hauls with 300-600 metres wire the amount of macroplankton in the Gulf of Panama is about twice the amount in the Caribbean Sea, and in depths corresponding to hauls with 1,000-3,000 metres wire the quantities of plankton are six to eight times larger in the Gulf of Panama than in the Caribbean Sea. The remarkably rich plankton fauna in the deeper waters of the Gulf of Panama is of peculiar interest, as nowhere else in the areas of the Pacific, Indian Ocean or the South Atlantic investigated is anything like such large quantities met with. It is only in the North Atlantic at about 30° N. that corresponding quantities of plankton are found in the deeper layers.

It is characteristic of the plankton fauna of the Gulf of Panama that it is considerably richer in the deeper than in the surface layers, a condition quite unique, since at all other places in the regions investigated the quantities of plankton are greatest in the upper layers. It may be said that, on the whole, the quantity of macroplankton in the deeper layers (hauls with at least 1,000 metres wire) is comparatively small and fairly uniform in most of the tropical and temperate oceanic regions. The one exception is the Gulf of Panama, where we find a remarkably large quantity of plankton in the deeper layers.

* The Carlsberg Foundation's Oceanographical Expedition round the World, 1928-30, and previous *Dana*-Expeditions. *Dana*-Report No. 7: Quantitative Investigations on the Distribution of Macroplankton in different Oceanic Regions. By P. Jespersen. Pp. 44. (Copenhagen C. A. Reitzel's Forlag; London: Oxford University Press, 1935. 7s.

Educational Topics and Events

BIRMINGHAM.—The degree of D.Sc. has been awarded to the following: C. T. Barber, for published papers dealing mainly with the geology of certain districts of Burma, with particular reference to natural gas and oil resources; Mabel E. Tomlinson, for papers in the *Quarterly Journal of the Geological Society* on river terraces of the lower valley of the Warwickshire Avon, and on the superficial deposits of the country north of Stratford-on-Avon, and a paper on the drifts of the Stour-Evenlode watershed (*Proc. Birmingham Nat. Hist. and Phil. Soc.*); G. D. Elsdon, for published work on edible oils and fats, analysis of drugs and chemicals, and numerous papers on chemical investigations in subjects relating to public health.

CAMBRIDGE.—G. C. Evans, of St. John's College, has been appointed to the Frank Smart University studentship in botany, and Dr. L. E. R. Picken of Trinity College to the Balfour studentship.

A grant of £25 has been made from the Balfour Fund to J. D. Robertson, of St. John's College, for research on the calcareous skeletons formed by marine animals.

GLASGOW.—The Bellahouston Bequest Fund Trustees have made a grant of £5,000 towards the cost of erection of the new chemistry buildings.

Prof. Gilbert Cook, professor of mechanical engineering, King's College, University of London, has been appointed regius professor of civil engineering and mechanics in succession to the late Prof. J. D. Cormack.

Prof. J. Shaw Dunn, St. Mungo-Notman professor of pathology in the University, has been elected professor of pathology in succession to Sir Robert Muir, who has retired.

Dr. H. B. Cott has been appointed lecturer in zoology.

The Gibson Lecture for 1936-37, on the history of mathematics, will be delivered by Dr. John Dougall at the Royal Technical College, Glasgow.

LEEDS.—Dr. Archibald Durward has been elected to the chair of anatomy in the University in succession to Prof. J. Kay Jamieson, who has resigned. Dr. Durward has been a member of the anatomical staff of University College, London, since 1931; he was educated in New Zealand, and held appointments for six years in the Anatomy Department of the University of Otago.

Mr. Frank Parkinson, of Messrs. Crompton Parkinson, Ltd., Manufacturing Electrical Engineers, has placed a fund of £50,000 in the hands of the Council on loan, free of interest, which is to become the absolute property of the University after seven years. The gift is to be used as a Scholarship Endowment Fund, to be applied to the foundation of research fellowships or scholarships for graduates and scholarships or grants for undergraduates. Pending receipt of interest from the fund, Mr. Parkinson has offered a sum up to £1,500 to be granted in scholarships during the first year.

LIVERPOOL.—The following appointments have recently been made: Dr. A. G. Walker, lecturer in the Department of Pure Mathematics, in succession

to Dr. Haslam-Jones, who has been elected a fellow of Queen's College, Oxford; Dr. H. R. Hulme, lecturer in the Department of Applied Mathematics, in succession to Dr. G. C. McVittie, who has been elected to a readership at King's College, London; Dr. C. J. Williams, Leverhulme Foundation lecturer in the Department of Physics, in succession to Dr. Norman Feather, who has been elected to a fellowship at Trinity College, Cambridge.

LONDON.—The title of reader in neurological anatomy in the University has been conferred on Miss U. L. Fielding in respect of the post held by her at University College.

The degree of D.Sc. in botany has been conferred on Mr. D. G. Catcheside, a recognised teacher at King's College.

University postgraduate travelling studentships of the value of £275 for one year have been awarded to Dr. C. J. B. Clews (Queen Mary College), and K. Stewart (Imperial College—Royal College of Science). Dr. Clews proposes to do further research in X-rays under the direction of Prof. K. M. G. Siegbahn at the University of Uppsala, and Mr. Stewart intends to study the chemical reactions in the electric discharge under the supervision of Prof. P. Harteck at Hamburg. University postgraduate studentships of the value of £150 for one year have been awarded to W. A. Cowdrey (University College); A. J. P. Crick (King's College); J. A. Downes (Imperial College—Royal College of Science); J. Gold (University College); A. M. Houghton (King's College); Margaret M. Jamison (Bedford College); L. J. Jolley (University College); J. Lawton (University College); and the studentship awarded to Joel Hirschfeld in 1935 has been renewed for a second year.

OXFORD.—At Encænica on June 24, the honorary degree of D.Sc. was conferred on Prof. E. D. Adrian, Foulerton research professor of the Royal Society.

Sir George Macdonald has been elected an honorary fellow of Balliol College.

W. E. Grimshaw, Corpus Christi College, has been granted the degree of D.Sc. for his work on plastic-viscous deformation and on combustion problems.

Dr. W. Stephenson, of the Psychology Department, University College, London, has been appointed assistant director of the newly-founded Institute of Experimental Psychology (see p. 14 of this issue).

ST. ANDREWS.—On June 26, the honorary degree of LL.D. was conferred on the following, among others: Prof. E. Waymouth Reid, emeritus professor of physiology, University College, Dundee; Prof. J. E. Littlewood, Rouse Ball professor of mathematics in the University of Cambridge; Mr. David Anderson, consulting engineer, London.

The degree of D.Sc. has been conferred upon H. Greene, for a thesis entitled "Investigations on the Soil of the Eastern Gezira, Anglo-Egyptian Sudan", and on G. J. Robertson for his investigations on Walden inversions in the sugar group.

The fifth Congress of the Universities of the British Empire will be held in Cambridge on July 13-17, under the presidency of the Right Hon. Stanley Baldwin. Further information can be obtained from the Secretary, Universities Bureau of the British Empire, 88a Gower Street, London, W.C.1.

Science News a Century Ago

Patent Laws of the United States

THE act of Congress establishing the United States Patent Office under a commissioner was passed on July 4, 1836, and from that time American patents have been numbered serially. The issue of patents was provided for in the first article of the Constitution, where Congress was given power "To promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive rights to their respective writings and discoveries", and the first act of Congress specifying how patents were to be issued was passed on April 10, 1790. The act of July 4, 1836, was the outcome of a Select Committee of Congress appointed "to take into consideration the State and Condition of the Patent Office and the laws relating to the issuing of Patents for New and Useful Inventions and Discoveries". In the report of this Committee, it was stated that the average number of patents issued annually from 1790 until 1800 was but 26; from 1800 until 1810 the average was 71; from 1810 until 1820 it was 200 and for the ten years previous to 1836 it had been 535. The whole number of patents issued under the laws of the United States up to March 31, 1836, was 9,731. This was more than double the number which had been issued in France or England during the same period.

The Entomological Society

At a meeting of the Entomological Society held on July 4, 1836, the Rev. F. W. Hope, president, being in the chair, Count Gotthelf Fischer de Waldheim, of Moscow, was elected an ordinary foreign member of the Society. The secretary made some observations upon an extensive series of specimens, represented by anglers as their artificial flies, collected by Mr. Ronalds for his work entitled "The Fly-fisher's Entomology". The president also made some observations upon the system adopted in North America whereby two crops of silk are produced in a season, as described by Mr. Kenrick in his work lately published upon that subject in the United States. (*Athenaeum*.)

The Rev. Frederick William Hope (1797-1862) who was elected president of the Entomological Society in 1835 and 1846 was a graduate of Christ Church, Oxford. He presented his collection of insects and prints to the University and was the founder of the professorship of zoology.

Lyell and Mantell

WRITING on July 6, 1836, from Kinnordy, Kirriemuir, N.B., to Mantell at Brighton, Lyell said: "Here I am rusticated in a very beautiful country, not too hot, but with weather much like a fine English spring. I am now and then devoting some stray hours to my 'Elements', like Buckland's 'Bridgewater' long promised—but not yet reviewed, thank heavens. I have received a very pleasant letter from Alexander Burnes, who has returned to Cutch and re-examined the delta of the Indus. He reports that the submerged tract which sank in 1819 is *in statu quo*. He has sent me off some Cutch secondary fossils, ammonites, belemnites, etc. His letter came in nine weeks per steamer from Cutch! A letter from Dr. Silliman informs me that my 'Principles' are being printed in Philadelphia, and nearly ready. John Murray was in hopes he had reduced the price so as to prevent this happening."

Darwin at St. Helena

SAILING from Mauritius on May 9, 1836, H.M.S. *Beagle* called at the Cape of Good Hope and on July 8 arrived at St. Helena. "The next day," Darwin wrote in his Journal, "I obtained lodgings within a stone's throw of Napoleon's tomb: it was a capital central situation, whence I could make excursions in every direction. During the four days I stayed here, I wandered over the island from morning to night, and examined its geological history. My lodgings were situated at a height of about 2000 feet. . . . Near the coast the rough lava is bare; in the central and higher parts, feldspathic rocks by their decomposition have produced a clayey soil which, where not covered by vegetation, is stained in broad bands of many bright colours. . . . Beneath the upper and central green circle, the wild valleys are desolate and untenanted. Here, to the geologist, there are scenes of high interest, showing successive changes and complicated disturbances. According to my views, St. Helena has existed as an island from a very remote epoch; some obscure proofs, however, of the elevation of the land are still extant. I believe that the central and highest peaks form part of the rim of a great crater, the southern half of which has been entirely removed by the waves of the sea: there is, moreover, an external wall of black basaltic rocks, like the coast mountains of Mauritius, which are older than the central volcanic streams."

Trans-Atlantic Steam Navigation

IN July 1836 the books of subscription were opened of the British and American Steam Navigation Company, the first of the pioneer companies to construct a steam vessel for regular work on the North Atlantic. The company had been formed through the exertions of the American lawyer and business man Junius Smith (1780-1853). In 1832-33 he had crossed from England to the United States and back again by sailing packets. His outward journey had taken 54 days, his return journey 32 days, and it was these passages which led to his determination to promote steam navigation across the Atlantic. At first he met with no encouragement, but finally with the aid of Macgregor Laird (1808-61), the African explorer, he was able to float a company. When sufficient money was forthcoming, a contract for the *British Queen* was made with Messrs. Curling and Young, of Limehouse, and Smith wrote to his New York correspondents: "I have the pleasure to inform you that the Directors of the 'British and American Steam Navigation Company' have contracted for the building of the largest and intended to be the most splendid steamship ever built expressly for the New York and London trade. She will measure one thousand seven hundred tons, two hundred feet keel, forty feet beam, three decks and everything in proportion. She will carry two engines of two hundred and twenty-five horse-power each, seventy-six inch cylinder, and nine feet stroke. The expense of this steam frigate is estimated at £60,000."

The *British Queen* was the first steam vessel constructed expressly for the Atlantic trade; but she did not make her first passage until July 1839, by which time the *Sirius*, *Great Western*, *Royal William* and *Liverpool* had all made passages to the United States and back.

Societies and Academies

Edinburgh

Royal Society, June 1.

E. M. ANDERSON : The dynamics of the formation of cone-sheets, ring-dykes, and caldron-subsidences. Cone-sheet and ring-dyke systems are best known in Scotland and Northern Ireland, but are not confined to these districts. Cone-sheet formation may be explained by an excess of pressure, and ring-dyke formation by a defect of pressure, in an underlying magma basin, with a more or less dome-shaped roof. Solutions of the equations of equilibrium corresponding to certain shapes of basin have been found by the author.

J. B. SIMPSON : Fossil pollen in Scottish Tertiary coals. Lignites of early Tertiary age from Ardnurchan and Mull, treated with Schulze's solution and alkali, yield a residue rich in well-preserved pollen. By this means, twenty genera of plants have been identified so far, including several not previously recorded as Scottish fossils. Of the gymnosperms *Cedrus* pollen is most abundant; *Abies* also has been noted. Dicotyledons include *Alnus*, *Engelhardtia*, *Magnolia*, *Planera*, five of the Asiatic genera of the Hamamelidaceæ and the Madagascan genus *Dicoryphe*. The present-day eastern Asiatic flora shows marked affinities with this ancient Scottish flora. (See also NATURE, Feb. 22, p. 321.)

H. P. DONALD : On the suppression of Tangled in *Drosophila pseudo-obscura*. An additive interaction of genes causing gaps in the venation with one causing extra tangled venation has shown that the phenotypic manifestation of a gene is no indication of its capacity to suppress the effects of another, and that genes with a recessive manifestation may have a dominant suppressing action which is not localized to the regions where the gene itself has visible effects.

H. W. TURNBULL : The revised prepared system of the quadratic complex. This deals with one aspect of the invariant theory of quadratic forms in six variables by supplementing a previous communication in 1928 to the Society.

W. LEDERMANN : On singular pencils of Zehfuss, compound and Schläflian matrices. The paper is concerned with obtaining the canonical form of pencils of matrices related to two given matrices. The types considered are the compound, power and product transformations. Quite recently Roth, Aitken and Littlewood have dealt with the non-singular cases of these. The present paper completes the work of these authors by enumerating and solving all the outstanding singular cases.

Paris

Academy of Sciences, May 25 (C.R., 202, 1725-1824).

DIMITRI RIABOUCHINSKY : Comparative research on the aerodynamics of small and of large velocities.

JACQUES DE LAPPARENT : The formula and structural scheme of attapulgitic.

DANIEL DUGUÉ : Certain modes of convergence of laws of estimation.

SERGE FINIKOFF : Some conjugated networks.

CONSTANTIN DRAMBA : The singularities of the restricted problem of three bodies.

EUGÈNE LEIMANIS : The solutions of a differential system in the neighbourhood of a singular multiplicity.

A. D. MICHAL and E. W. PAXSON : The differential in linear abstract spaces with a topology.

FLORIN VASILESCO : The generalized problem of Dirichlet and its relations with *balayage*.

RAYMOND VALTAT : A calculating machine based on the use of binary numeration.

MAURICE D'OCAGNE : Remarks on the preceding note of Raymond Valtat.

PAULINO CASTELLS VIDAL : A machine for resolving systems of linear equations.

JOSEPH CHALOM : Reaction pumps.

A. TOUSSAINT and S. PIVKO : Guided plane stream. The influence on the aerodynamical characteristics of supporting wings.

LOUIS BREGUET : The possibilities of speed and radius of action of gyroplanes. From a theoretical study it is concluded, that in addition to the advantages of vertical take-off and alighting, gyroplanes (helicopters) should, other conditions being equal, have a higher velocity and greater radius of action than ordinary aeroplanes.

MAX SERRUYS : The influence of turbulence on the polytropic coefficient of expansion in petrol motors.

STÉPHAN SERGHIESCO : The formula of Fresnel in a corpuscular theory of light.

GEORGES DURAND : The application of the mass-luminosity relation to the visual double stars.

PIERRE VERNOTTE : The theoretical dimensions of the cellular vortices of Bénard.

ROGER JULIA and JEAN FALLOU : The extension of the properties of the quadrupole to the most general balanced polyphase systems.

ANDRÉ MICHEL : The conditions of demagnetization of rhombohedral ferric oxide.

ROGER SERVANT : Measurements of double refraction in the extreme ultra-violet. The measurements of P. Sève were given to 2400 Å.; the author extends these to about 1860 Å. and intends to extend the work in the Schumann region up to the extreme limit of transparency of the crystalline specimens.

LÉANDRE CAPATOS and NICOLAS PERAKIS : The magnetic study of the mixed crystals of divalent copper and silver. Measurements made with the complex compounds of pyridine with persulphate of copper and of silver, and of mixed crystals of the type $(Ag_xCu_{y-4}Py)_2S_2O_8$, where x and y vary from 0 to 1.

GEORGES AHIER : Christiansen filters. These light filters consist of a cell containing powdered glass rendered transparent by immersion in a liquid of the same refractive index. For the liquid, solutions of bromomercurate or iodomercurate of potassium and barium fulfil the required conditions better than the organic liquids usually employed.

VICTOR LOMBARD, CHARLES EICHNER and MAXIME ALBERT : The permeability of palladium to hydrogen. Loss of the diffusing power of pure palladium under the action of temperature. Regeneration of the poisoned palladium. A sheet of pure palladium, after exposure to a temperature of 500° C. or higher, suffers a marked diminution in its permeability to hydrogen. Oxidation in a current of air at 500° C. with subsequent reduction in hydrogen below 140° C. restores the permeability almost to the original figure.

MLLE. O. HUN : The determination of the total hydration of the ions of potassium iodide, by the cryoscopic method.

AUGUSTIN BOUTARIC and Mlle. PAULETTE BERTHIER: The mechanism of the ascent of hydrosols and of coloured solution through porous bodies.

Mlle. LUCIENNE CHAUMETON: The silver salts of amidosulphonic acid.

OSIAS BINDER and PIERRE SPACU: The action of malonic acid on cobaltidichloro-*trans*-diethylene-diamine chloride.

ANDRÉ BOUILLÉ: Calcium metaphosphates and pyrophosphates.

PAUL LACOMBE and GEORGES CHAUDRON: The mechanism of the decomposition of aluminium-magnesium solid solutions.

HENRI FOURNIER: The application of the methods of micro-chemical analysis to the study of the corrosion of light aluminium alloys. Two alloys were studied, duralumin and an aluminium alloy with 8 per cent magnesium. The amounts of aluminium determined were of the order of micrograms.

ROGER PAJEAU: The action of bromine in excess on some benzene derivatives in the presence of beryllium bromide.

LOUIS DANGEARD: Study of the oolitic limestones by staining and decalcification. Staining followed by slow decalcification brings out details of certain micro-organisms concerned in the precipitation of calcium carbonate and in the evolution of a large number of ooliths.

THÉODORE MONOD: New data on the structure of the western Sahara.

MARCEL GAUTIER: The stratigraphy of the region of Nemours (Algeria).

ARMAND RENIER: The structural plan of the subsoil of Belgium, chiefly from mining operations.

EMILE BELOT: Geophysical and mineralogical consequences of the hypothesis that the earth has had a vortex tube for origin.

HUBERT GARRIGUE: New results on the light of the night sky.

HENRI MARCELET: The presence of hydrocarbons in the product removed by deodorization in the refining of arachis oil.

PAUL RIOU, GÉRARD DELORME and HORMISDAS: The distribution of manganese and iron in the pines of Quebec.

ETIENNE FÈX and MAURICE LANSADÉ: The pathogenic action of a form of *Fusarium oxysporum* isolated from the potato.

DOMINGO M. GOMEZ: The decrease of arterial pressure as a function of time. Its determination in man by a piezoelectric method.

LÉOPOLD NÈGRE, ALBERT BERTHELOT and JEAN BRETEY: The action of ethyl stearate on the evolution of experimental tuberculosis of the guinea pig. In guinea pigs submitted to the action of ethyl stearate, the lesions appear later than in untreated animals.

PIERRE DRACH: The water absorbed in the process of exuviation; fundamental data for the physiological study of moulting. Definitions and quantitative determinations.

MME. VÉRA DANTCHAKOFF: Some factors determining secondary sexual characters.

Mlle. N. CHOUCROUN: Superficial electrification, a specific character of bacteria.

Vienna

Academy of Sciences, April 23.

GUNTHER LOCK and GÜNTHER NOTTES: Derivatives of 3,5-dimethoxybenzaldehyde (5). The Cannizzaro reaction. In the chlorination, bromination and nitration of 3,5-dimethoxybenzaldehyde, only the hydrogen atom next to the aldehyde group undergoes substitution.

OTTO DISCHENDORFER and AUGUST VERDINO: Condensation of benzoin and thymol (2). Determination of the constitution of the nitration products of 4-methyl-7-isopropyl-2,3-diphenylumarone.

MAX PESTEMER and FRIEDRICH MANCHEN: Ultra-violet absorption of some aromatic hydrocarbons (4). Constitution of hexahydropyrene.

OTTO REDLICH and WALTER STRICKS: Raman spectra of *o*-dideuteriobenzene and *N*-deuteriopyrrole.

ANTON KAILAN and SIEGFRIED ROSENBLATT: Velocity of esterification of alcohols in formic and acetic acid, and of formic acid in tertiary butyl alcohol.

L. ZECHMEISTER and L. V. CHOLNOKY: Thirty years of colour science.

R. JAGITSCH and A. MASCHIN: Reactions in the solid state (2). A study of the formation of copper ferrite by the Hahn emanation method.

LUDWIG ECKHART: The line of striction of a hyperbolic ruled surface.

HUGO BONDY and VIKTOR VANICEK: Relative abundance of potassium and lithium isotopes and the emission of alkali ions from glass melts. The abundance ratios of potassium and lithium isotopes from different glass melts were found to be $^{39}\text{K}/^{41}\text{K} = 14.1$ and $^7\text{Li}/^6\text{Li} = 12$. If a glass melt contains several alkali metals, the emission at low temperatures is due almost entirely to the element with the lowest ionization potential, and the surface of the melt undergoes impoverishment of the elements of higher ionization potential.

ERWIN FISCHER COLBRIE: Nuclear disintegration by a radium B + C source (2). Nitrogen. Protons liberated by radium C' α -particles from nitrogen are found, by absorption measurements, to form two groups of different energy.

ADRIAN SCHUSTER: Tenebrionid (Col.) finds of Prof. Franz Werner and Dr. Otto Wettstein in the Greek Aegean Isles and in the Italian Dodecanese in 1934 and 1935.

E. STEINACH, H. KUN and O. PECZENIK: Recent researches on the action of sex hormones. (1) Castrated male rats do not show hyperæmia of the brain on injection with androsterone unless this contains oestrogenic substances. (2) The minimum dose of free male hormone required by castrated rats before copulation with a female occurs is reduced to nearly a third by the injection of female hormone. (3) The male organism is capable of converting excess male hormone into a substance with oestrogenic properties.

KARL KARAS: Kinematics of an expanding sheet.

April 30.

F. E. SUESS: Interpretation of the occurrence of pumice stone at Köfels in Ötztale. It is suggested that this occurrence and the peculiarities of the surrounding terrain are best explained as the result of the impact of a large meteorite.

FRITZ LIEBEN and BELLA BAUMINGER: The behaviour of sugars and formic acid in the presence of oxidizing bacteria.

RICHARD SCHUMANN: The moon, sun, and variations of latitude (1).

Forthcoming Events

Friday, July 10

ASSOCIATION OF APPLIED BIOLOGISTS.—Summer Meeting to be held at the Royal Horticultural Society's Gardens, Wisley, Sussex.

Saturday, July 11

BRITISH MYCOLOGICAL SOCIETY, at 11.45.—Annual Phytopathological Meeting to be held at the University of Bristol Research Station, Long Ashton, near Bristol.

MUSEUMS ASSOCIATION, July 6–10. Forty-seventh Annual Conference to be held at Leeds.

July 7, at 10 a.m.—Sir Eric MacLagan: Presidential Address.

SOCIETY OF CHEMICAL INDUSTRY, July 6–10. Fifty-fifth Annual Meeting to be held at Liverpool.

July 7, at 10.45.—W. A. S. Calder: "The Chemist as World Citizen" (Presidential Address).

July 8, at 11.30.—Sir Robert Mond: "Works as I have seen them grow" (Messel Lecture).

DECHEMA (Deutsche Gesellschaft für Chemisches Apparateswesen), July 9–10. To be held in Munich.

GENERAL ASSEMBLY OF THE INTERNATIONAL ASTRONOMICAL UNION, July 10–17. To be held in Paris.

Official Publications Received

Great Britain and Ireland

Report of the Astronomer Royal to the Board of Visitors of the Royal Observatory, Greenwich, read at the Annual Visitation of the Royal Observatory, 1936 June 6. Pp. 28. (London: Royal Observatory.) [86]

Joint Board of Research for Mental Disease: City and University of Birmingham. Annual Report, 1935–36. Pp. 14. (Birmingham: The University.) [106]

Technical Publications of the International Tin Research and Development Council. Series A, No. 40: The Detection and Colorimetric Determination of Tin by means of Substituted 1:2-Dimercaptobenzenes: A Specific Reagent for Tin. By Dr. R. E. D. Clark. Pp. 6. Free. Series A, No. 41: The Preparation of Substituted Benzene-*o*-dithiols for use as Specific Reagents for Tin. By Dr. R. E. D. Clark. Pp. 7. Free. (London: International Tin Research and Development Council.) [106]

The Lister Institute for Preventive Medicine. Report of the Governing Body, 1936. Pp. 28. (London: Lister Institute.) [116]

Experimental and Research Station, Nursery and Market Garden Industries' Development Society, Ltd. Twenty-first Annual Report, 1935. Pp. 96. (Cheshunt: Nursery and Market Garden Industries' Development Society, Ltd.) [116]

Imperial Bureau of Plant Genetics (for Crops other than Herbage). Plant Breeding Abstracts. Supplement 2: Summary of Reports received from Stations in the British Empire, 1932–35. Pp. 63. (Cambridge: School of Agriculture.) 5s. [126]

Air Ministry: Aeronautical Research Committee: Reports and Memoranda. No. 1669 (Strut. 235): Behaviour in Bending of Thin-Walled Tubes and Channels. By D. Williams. Pp. 13+5 plates. 1s. net. No. 1670 (Strut. 256): Successive Approximation Method of Solving Continuous Beam Problem. By D. Williams. Pp. 21+6 plates. 1s. 3d. net. No. 1672 (Strut. 241): Loads and Bending Moments in Members of a Plane Braced Frame with Rigid Joints. By J. Morris. Pp. 42+4 plates. 2s. net. (London: H.M. Stationery Office.) [126]

British Science Guild. The Annual Report of the Council of Management, 1935–1936. Pp. 23. (London: British Science Guild.) 1s. [156]

London Shellac Research Bureau. Technical Paper No. 7: Fundamental Physical Properties of Lac. Part 3: Electrical Properties. By Dr. L. C. Verman. Pp. 21. Technical Paper No. 8: Darkening of Lac Solutions and the Effect of Oxalic Acid Thereon. By Dr. Lal C. Verman and Dr. R. Bhattacharya. Pp. 22. (London: London Shellac Research Bureau.) [166]

City of Leeds Public Libraries: Commercial and Technical Library Bulletin. Engineering Series No. 1: Mechanics and Materials. Pp. 6. Engineering Series No. 2: Mechanical Engineering. Pp. 6. Engineering Series No. 3: Workshop Practice. Pp. 6. Engineering Series No. 4: Civil Engineering. Pp. 6. Engineering Series No. 5: Mining Engineering. Pp. 4. Engineering Series No. 6: Metallurgy and Metal Working. Pp. 6. Engineering Series No. 7: Electrical Engineering, Part 1. Pp. 6. Engineering Series No. 8: Electrical Engineering, Part 2. Pp. 4. (Leeds: Public Libraries.) [176]

Department of Scientific and Industrial Research. Report of Test by the Director of Fuel Research on a Report of the Coal Research Syndicate, Ltd., at Mansfield Colliery, Mansfield, Nottinghamshire—Test carried out 28th September to 4th October 1935. Pp. iv+28. (London: H.M. Stationery Office.) 9d. net. [186]

Other Countries

Union of South Africa. Report of the South African Museum for the Year ended 31st December 1935. Pp. 18. (Pretoria: Government Printer.) [26]

Indian Forest Records, New Series. Vol. 2, No. 1: A Glossary of Technical Terms for use in Indian Forestry. Pp. iv+45. (Delhi: Manager of Publications.) 5 annas; 6d. [26]

A Shellac Patent Index. By Dr. R. W. Aldis. Pp. vi+115. (Namkum: Indian Lac Research Institute.) 2.8 rupees. [26]

Report of the Aeronautical Research Institute, Tōkyō Imperial University. No. 138: Properties of Aluminium Sheet. By Sadao Horiguchi. Pp. 191–238. (Tōkyō: Kōgyō Toshō Kabushiki Kaisha.) 55 sen. [26]

Department of Public Instruction: Technical Education Branch: New South Wales. Technological Museum: Curator's Annual Report for Year ended 31st December 1935. Pp. 8. (Sydney: Government Printer.) [26]

Publikationer fra det Danske Meteorologiske Institut. Aarbøger. Isforholdene i de Arktiske Have (The State of the Ice in the Arctic Seas) 1935. Prepared by I. C. Mangor. Pp. 18+5 plates. (København: G. E. C. Gad.) [26]

Publications of the Dominion Astrophysical Observatory, Victoria, B.C. Vol. 5, No. 4: The Motions of the O and B Type Stars and the Scale of the Galaxy. By J. S. Plaskett and J. A. Pearce. Pp. 241–328+2 plates. 60 cents. Vol. 6, No. 13: The Spectroscopic Orbit of Boss 3102. By W. E. Harper. Pp. 261–264. Vol. 6, No. 14: Periods and Light Curves of the Variable Stars in the Globular Cluster Messier 2. By Helen B. Sawyer. Pp. 265–284+1 plate. Vol. 6, No. 15: The Spectroscopic Orbits of Boss 4745. By R. M. Petrie. Pp. 285–289. 25 cents. (Ottawa: King's Printer.) [26]

Obras completas y Correspondencia científica de Florentino Ameghino. Vol. 20: Correspondencia científica. Edición Oficial ordenada por el Gobierno de la Provincia de Buenos Aires. Dirigida por Alfredo J. Torcelli. Pp. 621. (La Plata.) [46]

Commonwealth Bureau of Census and Statistics, Canberra. Official Year Book of the Commonwealth of Australia. No. 28, 1935. Prepared by E. T. McPhee. Pp. xxxi+971. (Canberra: Government Printer.) 5s. [46]

University of Illinois: Engineering Experiment Station. Bulletin 281: An Investigation of the Durability of Molding Sands. By Prof. Carl H. Casberg and Carl E. Schubert. Pp. 52. 60 cents. Bulletin No. 282: The Cause and Prevention of Steam Turbine Blade Deposits. By Prof. Frederick G. Straub. Pp. 50. 55 cents. (Urbana, Ill.: University of Illinois.) [56]

Studies in Comparative Seismology: East African Plateaus and Rift Valleys. By Bailey Willis. (Publication No. 470.) Pp. x+358+73 plates. (Washington, D.C.: Carnegie Institution of Washington.) [56]

Scientific Reports of the Imperial Institute of Agricultural Research, Pusa (including the Reports of the Imperial Dairy Expert, Physiological Chemist and Sugarcane Expert), 1933–34. Pp. v+213. (Delhi: Manager of Publications.) 4.8 rupees; 7s. 6d. [86]

Bulletin of the Department of Zoology, Panjab University. Vol. 1: Fauna of Lahore. 4: Spiders of Lahore. By Sukh Dyal. Pp. ii+119–252+plates 11–17. (Lahore: Panjab University.) 4.8 rupees. [86]

Royal Observatory, Hong Kong. Meteorological Results, 1935. Prepared under the direction of C. W. Jeffries. Pp. iv+144+15. (Hong Kong: Government Printer.) 3 dollars. [106]

Fiskeridirektoratets Skrifter: Serie Havundersøkelser. Hummer og Hummerkultur. Av Alf Dannevig. Pp. 60. (Bergen: A.S. John Griegs Boktrykkeri.) [106]

Report of the Aeronautical Research Institute, Tōkyō Imperial University. No. 139: Experimentelle Untersuchungen über Licht-Schleier. Von Yenziro Awadi, Tutosi Ogisaka, Sinito Kawasime. Pp. 241–300. (Tōkyō: Kōgyō Toshō Kabushiki Kaisha.) 60 sen. 126 The Imperial Council of Agricultural Research. Miscellaneous Bulletin No. 6: Bee-keeping. By C. C. Ghosh. Third revised edition. Pp. vi+91+8 plates. (Delhi: Manager of Publications.) 1.14 rupees; 3s. 3d. [156]

Index to the Records of the Geological Survey of India. Vols. 1–65 (1868–1932). By T. H. D. LaTouche. Pp. ix+718. (Calcutta: Geological Survey of India.) 6.12 rupees; 11s. [156]

Catalogues

British Chemical Plant Exhibition, 22–27 June 1936, at Central Hall, Westminster, London, S.W.1: Catalogue of Exhibits. Pp. 102. (London: British Chemical Plant Manufacturers' Association.)

A Catalogue of Books: Americana, Botany, Bibliography, Classics and Classical Archaeology and Early Continental Presses, also some Illuminated and other Manuscripts, including the Celebrated 15th Century MS. of three Morality Plays, known as The Macro Plays, and a Selection of Important New Books. (No. 520.) Pp. 132. (London: Bernard Quaritch, Ltd.)

Laboratory Animals for Experimental, Diagnostic and Clinical Research. Pp. 16. (New York: Breeding and Laboratory Institute.) Nouvelles acquisitions: alchimie, astrologie, astronomie, botanique, chiromancie, hiéroglyphes, mathématique, médecine, minéralogie, occultisme, physique. (Bulletin No. 2.) Pp. 12. (Paris: Émile Offenbacher.)

Apparatus for Stereoscopic Tele-Radiography and Screen Examination. Pp. 8. (London: Newton and Wright, Ltd.)

Rare Books, Autograph Letters, Illuminated Manuscripts, etc. (Catalogue No. 600.) Pp. 74+7 plates. Selected List of Publishers' Remainders, being New Books offered at Greatly Reduced Prices. (Catalogue No. 601.) Pp. 26. (London: Francis Edwards, Ltd.)

A Catalogue of Books and Periodicals on all Classes of Zoology; including a Selection of Books from the Important Entomological Library of the late Robert Adkin. (No. 521.) Pp. 88. (London: Bernard Quaritch, Ltd.)

Lessing Contact Rings. Pp. 8. (London: The Hydronyl Syndicate, Ltd.)