

Biblioteka Główna i OINT
Politechniki Wrocławskiej

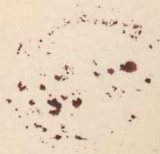


100100353944

A 610 I

~~m~~





ILLUSTRATED JOURNAL OF SCIENCE

Nature,
October 9, 1919]

Nature

A WEEKLY

ILLUSTRATED JOURNAL OF SCIENCE

Vol 103

2 = 85



W & Co. 1911

Nature,
October 9, 1919.]

Nature

A WEEKLY

ILLUSTRATED JOURNAL OF SCIENCE

VOLUME CIII

MARCH, 1919, to AUGUST, 1919



*"To the solid ground
Of Nature trusts the mind which builds for aye."*—WORDSWORTH

London

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

Nature

ILLUSTRATED JOURNAL OF SCIENCE



INDEX.

NAME INDEX.

- A. A., The "Atom," 104
Abbott (Prof. J. F.), elected Secretary of the Council of the American Association, 37
Abe (M.), Analyses and Tests of Rigidly Connected Reinforced Concrete Frames, 373
Abelous (J. E.), and J. Aloy, The Inversion of Saccharose by Mechanical Ionisation of Water, 340
Abonnenc (L.), The Laws of Flow of Liquids by Drops in Cylindrical Drops, 119
Ackermann (A. S. E.), Experiments with Clay in its Relation to Piles, 72
Adami (Col. J. G.), elected Vice-Chancellor of Liverpool University, 278; Medical Contributions to the Study of Evolution, 21
Adams (W. S.), The Absorption Spectrum of the Novæ, 19
Addison (Dr. C.), approved by the King first Minister of Health, 328
Adney (Prof. W. E.), and H. G. Becker, Determination of the Rate of Solution of Atmospheric Nitrogen and Oxygen by Water. Part ii., 298
Agnew (P. G.), Labour and Scientific Research, 425
Aitken (Prof.), The Masses of Binary Stars, 392
Alexander (F. M.), Man's Supreme Inheritance. Conscious Guidance and Control in Relation to Human Evolution in Civilisation. Second edition, 444
Alilaire (E.), The Spontaneous Inflammation of Mixtures of Air and Ether Vapour, 170
Allbutt (Sir Clifford), Proposed Presentation to, of his portrait, 408
Allcock (H.), Industrial Reconstruction and the Metric System, 173
Allen (Dr. E. J.), The Quantitative Study of Plankton, 239
Allen (Dr. H. S.), appointed Lecturer in Natural Philosophy in Edinburgh University, 336; Optics and Mechanics, 302
Allen (Miss N. C. B.), and Prof. T. H. Laby, The Sensitiveness of Photographic Plates to X-rays, 177
Allmand (Major A. J.), appointed Professor of Chemistry at King's College, Strand, 278
Amar (Prof. J.), The Physiology of Industrial Organisation and the Re-employment of the Disabled. Translated by B. Miall. Edited, etc., by Prof. A. F. Stanley Kent, 341
Amos (H. R.), Wheat-breeding in Argentina, 98
Anderson (Miss Doris), awarded the Fream Memorial Prize, 489
Andrews (Dr. C. W.), Curious Markings on Chalk, 25
Andrews (Capt. W. A.), appointed Lecturer in Wireless Telegraphy at the Cardiff Marine Technical School, 172
Annandale (N.), and H. G. Carter, The Vegetation of Seistan, 299
Annett (H. E.), Process of Producing Palm-sugar in India, 272; Recent advances in Vaccine Therapy, 455
Appert (L.), The Welding of Glasses, 271
Ansey (G. M.) [obituary], 210
Archbutt (S. L.), and D. Hanson, Methods of Preparing Specimens of Aluminium Alloys for Microscopic Examination, 251
Ariès (E.), Application to Eight Different Substances of the Formula which Expresses the Heat of Evaporation of a Liquid, 79; Direct determination of the Temperature exponent in the equation of state of Fluids, 280; The Saturated Vapour Pressures and Latent Heats of Evaporation of Propyl Acetate at various temperatures, 379
Armstrong (Dr. E. F.), and Dr. T. P. Hilditch, The Catalytic Actions at Solid Surfaces, 337
Armstrong (Prof. H. E.), Coal Conservation, 393
Artini (Prof. E.), Le Rocce. Concetti e Nozioni di Petrografia, 304
Ashcroft (E. A.), Some Chemically Reactive Alloys, 459
Aston (Dr. F. W.), Distribution of Intensity along Positive-ray Parabolas of Atoms and Molecules of Hydrogen, 297; Experiments with Perforated Electrodes on the nature of the discharge in gases at Low Pressure, 398; Use of Neon Lamps in Technical Stroboscopic Work, 297
Astor (Major), and others, The Ministry of Health Bill, 7
Auld (Lt.-Col. S. J. M.), Awarded the U.S. Distinguished Service Medal, 409
Austin (Major L. J.), Research on Wounds of War, 223
Ayyar (T. V. R.), Habits and Life History of *Pempheres affinis*, Faust, 137
Bacot (Mr.), Experiments on ridding the Troops of Lice, 454
Bailey (A.), The Water Birds of Louisiana, 192
Baillie (Prof. J. B.), The Stereoscopic Character of Knowledge, 239
Bailly (O.), Action of Alkyl Iodides on Neutral Sodium Phosphate in Aqueous Solution, 119
Bairstow (L.), Developments in Aviation in the War Period, 414; The Progress of Aviation in the War Period, 327
Baker (Dr. E. A.), appointed Director of a School of Librarianship at University College, London, 439
Baker (G. S.), Gift to University College, London, for a Prize in memory of Dr. Sarah N. Baker, 96
Balfour (Prof. I. Bayley), presented with the Gold Medal of the Linnean Society, 268; W. W. Smith and W. G. Craib, The Flora of South-West China, 151
Ball (H. S.), Work of the Miner on the Western Front, 230
Balls (Dr. W. L.), Existence of Daily Growth-rings in the Cell-wall of Cotton Hairs, 78
Bancroft (C. K.), [obituary], 191
Banerji (S.), The Vibrations of Elastic Shells partly filled with Liquid, 174
Banta (A. M.), Sex and Sex Intergrades in Cladocera, 19
Barbellion (W. N. P.), The Journal of a Disappointed Man, 363
Barclay (Dr.), and Dr. Smith, Determination of the Efficiency of the Turbo-alternator, 91
Barcroft (J.), appointed Reader in Physiology in Cambridge University, 56
Barlow (G. T.), [obituary], 172

- Barnard (J. E.), appointed Lecturer in Microscopy at King's College, London, 479
- Barnard (Prof.), Dark Markings on the Sky, 34; The Gegenschein or Counter-glow, 134
- Barnes (A. A.), Rainfall in England, 177
- Barnett (E. de Barry) Coal-tar Dyes and Intermediates, 221
- Barrett (Sir J. W.), Research and Service, 404
- Barrett (S. A.), Rites performed by the Wintun Indians, 351
- Bartlett (Sir H. H.), acknowledged the donor to the University of London of money for the erection of a School of Architecture, etc.; further gift by, 96
- Barton (R. F.), Ifugao Law, 371
- Bateson (Prof. W.), Dr. Kammerer's Testimony to the Inheritance of Acquired Characters, 344
- Bauer (Dr. L. A.), Proposed Magnetic and Allied Observations during the Total Solar Eclipse of May 29, 1919, 44; Selection by, of Cape Palmas, Liberia, for Magnetic and Electric Observations in connection with the Solar Eclipse, 131; H. W. Fisk and S. J. Mauchly, Magnetic Observations taken during the Solar Eclipse of June 8, 1918, 193
- Baume (G.), and M. Robert, A Glass Manometer with Elastic Walls, 379
- Bawtree (A. E.), A new Colour Transparency Process for illustrating Scientific Lectures, 296
- Bayet (A.), and A. Slosse, Arsenical Poisoning in Industries involving Coal and its Derivatives, 160
- Bayliss (Prof. W. M.), Injection of a Solution of Gum Arabic in Cases of Wound Shock, 136; Intravenous Injections in Cholera, 264; Intravenous Injection in Wound Shock, 122
- Becker (Dr. G. F.), [obituary], 250
- Beddard (Dr. A. P.), to deliver the Bradshaw Lecture, 450
- Beddard (Dr. F. E.), Three Fœtal Sperm Whales, 140
- Beebe (W.), Jungle Peace, 22
- Béhal (A.), Isolation and Characterisation of Alcohols as Allophanates, 280
- Beit (O.), Gift to the Imperial College of Science, South Kensington, 258
- Bellingham and Stanley, Ltd., Refractometers, 146
- Bengough (Capt.), and Dr. Hudson, Fourth Report of the Corrosion Committee of the Instituté of Metals, 152
- Benoist (L.), A Reaction and Method for the Estimation of Ozone, 119; New Porous Walls Filtering Unsymmetrically, 419
- Benedict (F. G.), W. R. Miles, and Miss A. Johnson, Temperature of the Human Skin, 513
- Bennett (G. R.), appointed Principal of the Technical Institute, Newport, Mon., 218
- Bernard (Archbishop), appointed Provost of Trinity College, Dublin, 295
- Berry (E.), A Standardisation of Digitalis Preparations, 455
- Bertrand (G.), High Toxic Power of Chloropicrin towards certain of the Lower Animals, 170; The Preservation of Fruit without the addition of Sugar, etc., 340; and Mme. M. Rosenblatt, Comparative Toxic Action of some Volatile Substances upon various Insects, 259
- Beveridge (Sir W. H.), appointed Director of the London School of Economics, 439
- Bews (Prof. J. W.), The Grasses and Grasslands of South Africa, 62
- Bidder (Dr. G. P.), Gift to the Marine Biological Association, 191
- Biffen (Prof.), Demonstration of Wheat Material, 432
- Bigelow (Prof. F. H.), A Treatise on the Sun's Radiation and other Solar Phenomena in continuation of the Meteorological Treatise on Atmospheric Circulation and Radiation, 1915, 261
- Bigourdan (G.), Co-ordinates and Instruments of the Observatory for Navigation, 340; Reform of the Calendar, 34; The Observatory of Le Monnier in the Rue Saint-Honoré, 159; Unification of Astronomical and Civil Time, 339
- Biquard (R.), A Modification of the Fluorometric Method of Measuring X-rays, and its Application to the Measurement of the Radiation from Coolidge Bulbs, 200
- Birley (Dr. J. L.), to be the Goulstonian Lecturer of the Royal College of Physicians of London, 328
- Bishop (C. W.), The Horses of Tang T'ai-Tsung and the Antecedents of the Chinese Horse, 489
- Blackman (Miss W. S.), The Rosary in Magic and Religion, 231
- Bledisloe (Lord), Agriculture Dependent upon Science, 313; elected Chairman of the Governors of the Royal Agricultural College, Cirencester, 267
- Bloch (Mme. E.), Anatomical Modifications of Roots by Mechanical Action, 500
- von Bohlen (Krupp), Co-operation and Profit-sharing, 211
- Boné (Prof.), Coal Conservation, 393; and R. J. Sarjant, Researches on the Chemistry of Coal. Part I., 258
- Bonnet (P.), Relations between the Ootoceras Layer of Armenia and those of the Himalayas, 519
- Boon (Dr.), appointed to the Chair of Chemistry at Heriot-Watt College, Edinburgh, 198
- Boring (Miss A. M.), and Prof. R. Pearl, The Presence or Absence of Interstitial Cells in the Testes of Male Birds, 332
- Borradaile (L. A.), A Manual of Elementary Zoology. Second edition, 83
- Bose (Sir J. C.), Life Movements in Plants, 381
- Boswell (Prof. P. G. H.), Sands: considered Geologically and Industrially, 490; The Passing of the American Potash Famine, 473
- Bourquelot (E.), and M. Bridel, Application of the Biochemical Method to the Study of several Species of Indigenous Orchids, 160; and H. Hérissé, Application of the Biological Method to the Study of the Leaves of *Hakea Laurina*, 39
- Butaric (A.), Application of the Gibbs-Helmholtz Equation to Monovariant Systems, 280
- Bowly (Sir Anthony), Experimental Medicine and the Sick and Wounded in the War, 354
- Bowman (Major), A Filter-passing Germ, 136
- Boyd (Dr. F. D.), appointed Professor of Clinical Medicine in Edinburgh University, 418
- Boyd (J.), Afforestation, 83.
- Boyd (W. E.), Conferment upon of the Degree of M.D. by Glasgow University, 158
- Brabrook (Sir Edward W.), Elected President of the South-Eastern Union of Scientific Societies, 1920, 314
- Bracher (Miss Rose), Behaviour of *Euglena deses* on mud, 511
- Bradford (Sir J. Rose), to be the Lumleian Lecturer of the Royal College of Physicians of London, 328; F. F. Bashford, and J. A. Wilson, Acute Infective Polyneuritis, 150
- Braesco (P.), Precipitated Amorphous Silica, 18
- Bragg (Prof. W. H.), Transmitting and Picking up Sounds in Water, 393
- Bragg (W. L.), appointed Professor of Physics in the University of Manchester, 317
- Brammall (A.), Andalusite (Chiastolite), 359
- Brander (A. J.), The Machinery of Government, 104
- Branner (Dr. J. C.), Purchase of Count de Montessus de Ballore's Seismological Library, and Presentation to Stanford University, 350
- Bravetta (Rear Admiral E.), L'Insidia Sottomarina e Ceme fu Debellata, etc., 504
- Bredow (H.), appointed Director-General of the German Imperial Postal Department, 88
- Breton (A. C.), Mexican Clay Heads, etc., found on the Site of Teotihuacan, 192
- Breuil (l'Abbé H.), Paintings in Spanish Caves, 210
- Brierley (W. B.), An Albino Mutant of *Botrytis cinerea* Pers., 139; "Orchid Spot," 10
- Bristol (Miss B. M.), awarded an 1851 Exhibition Scholarship, 397
- Britten (S. E.), Possibilities of the Exploitation of the River Dee, 311
- Brock (Major R. W.), Geology of Palestine, 239
- Brodsky (G.), A new Polariser, 97
- Brooks (C. E. P.), The Secular Variation of Rainfall, 177
- Brooks (F. T.), appointed a University Lecturer in Botany at Cambridge University, 278
- Brown (Prof. Adrian J.), [obituary article], 369

- Brown (G. E.), The British Journal Photographic Almanac and Photographer's Daily Companion, 1919, 3
- Brown (J. C.), The Cassiterite Deposits of Tavoy, 290
- Brown (Prof. Rudmose), awarded the Cuthbert-Peek Grant by the Royal Geographical Society, 52
- Browne (Dr. E. G.), to deliver the FitzPatrick Lectures, 450
- Browne (E. T.), Gift to the Marine Biological Association, 191
- Browning (Dr. C. H.), appointed Gardiner Professor of Bacteriology in Glasgow University, 439
- Bruce (Sir David), Analysis of Tetanus Cases occurring in Home Military Hospitals, 454
- Brunetti (F.), Revision of the Oriental Tipulidæ, 269
- Brunner (Sir John T.), [death], 350; [obituary], 389
- Brunt (Captain D.), A Periodogram Analysis of the Greenwich Temperature Records, 338
- Bryan (Prof. G. H.), Supposed Effect of Sunlight on Water Drops, 125; Tables of Bordered Antilogarithms, etc., 452; The Folk Songs of the Teton Sioux, 515
- Bryant (W. W.), Galileo, 23
- Bucher (W. A.), Ripple Marks in Sedimentary Rocks, 450
- Buckman (S. S.), Jurassic Chronology: I.—Lias, 310
- Buckmaster (Dr. G. A.), appointed Professor of Physiology in Bristol University, 397
- Bullock (W. E.), and W. Cramer, A new Factor in the Mechanism of Bacterial Infection, 17
- Burnet (A.), Occultation of Small Stars by Jupiter, 492; Occultation of Stars by Venus, 174
- Burns (D.), conferment upon of the Degree of D.Sc. by Glasgow University, 158
- Burrard (Col. Sir S. G.), The Theory of Isostatic Compensation of Inequalities in the Earth's Crust, 351
- Burrell (Prof. J.), [death], 267
- Bürrow (Dr. J. le Fleming), War Wounds, 501
- Burton (Prof. E. F.), A new Method of Weighing Colloidal Particles, 258
- Burton (R. F.), Wasps, 245
- Butler (E.), Carburettors, Vaporisers and Distributing Valves used in Internal Combustion Engines. Second edition, 445
- Butler (Dr. E. J.), *Tylenchus augustus*, 269
- Butler (Prof. G. M.), A Manual of Geometrical Crystallography. Treating solely of those portions of the subject useful in the Identification of Minerals, 103
- Butler (H. R.), Painting the Corona, 374
- Butterfield (W. J. A.), Poisoning of Fish by Road-washings, 250
- Byl (A. J.), and N. H. Kolkmeier, Structure of White and Grey Tin, 373
- C. Science and Salaries, 404
- Cabannes (J.), Diffusion of Light by the Molecules of the Air, 18
- Caldwell (Prof. O. W.), and Prof. W. L. Eikenberry, Elements of General Science. Revised edition, 63
- Calman (Dr. W. T.), Marine Boring Animals 219
- Camichel (Prof.), Proposed Granting of State Degrees in Applied Science in France, 118
- Campbell (C. I. R.), Airship Construction, 134
- Campbell (Sir J.), appointed Vice-Chancellor of Dublin University, 318
- Campbell (Dr. Norman R.), Electro-Atomic Phenomena in the Magnetic Field, 384
- Canning (Alderman T.), [death], 51
- Card (Instructor Capt. S. F.), Air Navigation. Notes and Examples, 481
- Carnegie (Andrew), [obituary], 471; [obituary article], 507
- Carnot (P.), and P. Gérard, Mechanism of the Toxic Action of Ureaæ, 460
- Carpenter (Dr. G. D. Hale), Protozoal Parasites in Cainozoic Times, 46
- Carpenter (Prof. H. C. H.), The Metallography of Iron and Iron-Carbon Alloys, 436
- Carr (F. H.), Memorial lecture on the late Lt.-Col. E. F. Harrison, 432; The Post-Graduate Training of the Works Chemist, 58
- Carter (Dr. N.), awarded 150l. by the Department of Scientific and Industrial Research to continue research work in Birmingham University, 397
- Carus (Dr. P.), [obituary], 191
- Castellani (Prof.), Control of Malaria, 132
- Cathcart (Dr. E. P.), appointed Gardiner Professor of Physiological Chemistry in Glasgow University, 439
- Cave (Capt. C. J. P.), and J. S. Dines, Further Measurements on the Rate of Ascent of Pilot-balloons, 259
- Cebrian de Besteiro (Mme. D.), and M. Michel-Durand, Influence of Light on the Absorption of Organic Material of the Soil by Plants, 79
- Césari (E. P.), The Maturation of the Sausage, 180
- Cesari (Prof. G.), Course of the Curve joining the points at which Molten Iron-Carbon Alloys commence to Solidify, 436
- Chalmers (T. W.), The Production and Treatment of Vegetable Oils, 41
- Chantemesse (Prof. A.), [obituary], 8.
- Chapman (A. Chaston), Plea for a National Institute of Industrial Biology, 511
- Chapman (F.), Girvanella and the Foraminifera, 4; New or Little-known Victorian Fossils in the National Museum. Part xxiv., 440
- Chapman (Dr. F. M.), The Distribution of Bird Life in Colombia: a Contribution to a Biological Survey of South America, 462
- Chapman (J. E.), Share of "Colonies" in the Treatment of Tuberculosis, 112
- Chapman (Dr. S.), appointed to the Second Chair of Mathematics in Manchester University, 458; Electrical Phenomena occurring at High Levels in the Atmosphere, 311; The Lunar Atmospheric Tide, 272; The Lunar Tide in the Atmosphere, 185
- Charbonnier (H. J.), The Lustre of Some Feathers of Humming Birds, 324
- Charlier (Dr. C. V. L.), Distances and Configuration of Star Clusters, 73
- de Chardonnet (H.), An Application of the Eight-hour Day, 319
- Charpy (G.), and G. Decors, Conditions of Formation of Coke, 419
- Chatley (Dr. H.), The Order of the Planets, 10
- Chaudhuri (Prof. T. C.), Modern Chemistry and Chemical Industry of Starch and Cellulose (with Reference to India), 243
- Chavanne (G.), and L. J. Simon, Composition of some Asiatic Petrols, 519; The Critical Solution Temperatures in Aniline of the Principal Hydrocarbons contained in Petrol, 339; Use of the Critical Solution Temperature ("T.C.D.") in Aniline for the Rapid Analysis of Petrol, 459
- Chéneveau (C.), and R. Audubert, Absorption by Turbid Media, 119
- Cheshire (Prof. F. J.), The Polarisation of Light, 239
- Chick (Dr. H.), Experimental investigation on Scurvy, 454; E. M. Hume, R. F. Skelton and A. H. Smith, Prevention of Scurvy, 71; and M. Rhodes, Anti-scorbutics, 71
- Chinnery (Lt. E. W. P.), Reactions of Certain New Guinea Primitive People to Government Control, 199
- Chree (Dr. C.), Magnetic Storms of March 7-8 and August 15-16, 1918, and their discussion, 97; New Procedure at American Magnetic Observatories, 54; The Magnetic Storm of August 11-12, 1919, 505
- Christy (M.), The Ancient Legend as to the Hedgehog carrying Fruit upon its Spines, 119
- Church (Sir W.), Work of the Imperial Cancer Research Fund during the War, 435
- Clark (Dr. A. J.), appointed Professor of Pharmacology at University College, London, 358
- Clark (J. Edmund), and H. B. Adames, Report on the Observations for the Phenological Year, December, 1917, to November, 1918, 259
- Clarke (J. M.), Possible Derivation of the Lepadid Barnacles from the Phyllopod, 19
- Claude (C.), An Important Consequence of the Commercial Synthesis of Ammonia, 299
- Clay (H.), elected a Fellow of New College, Oxford, 479
- Clerc (L. P.), Calculations in Aerial Photography, 352; Use of Alcohol for the Rapid Drying of Gelatine Negatives and Prints, 251
- Clerk (Sir Dugald), Distribution of Heat, Light, and Motive

- Power by Gas and Electricity, 233; Limits of Thermal Efficiency in Diesel and other Internal-combustion Engines, 395
- Clibborn (Lt.-Col.), Plea for a British Standard Microscope, 89
- Clifford (Sir Hugh C.), appointed Governor and Commander-in-Chief of Nigeria, 172
- Close (Sir C.), The Rainfall at Southampton and London, 1862-1918, 338
- Cluver (Capt. E. H.), appointed Professor of Physiology at the South African School of Mines and Technology, Johannesburg, 258
- Cochrane (A. H. J.), Principal Industries of the North-East Coast during the War, 395
- Cockerell (Prof. T. D. A.), Glossina and the Extinction of Tertiary Mammals, 265; The Oldest Mosquitoes, 44
- Cocking (T. T.), J. D. Kettle, and E. J. Chappel, The Examination of Eosins and Erythrosins, 455
- Cohen (R. Waley), Gift of British Oil Companies to endow a Chemical School at Cambridge, 218, 278
- Cole (Prof. G. A. J.), Aids in Practical Geology. Seventh edition, 263
- Cole (S. W.), Practical Physiological Chemistry. Fifth Edition, 504
- Colgan (N.), Tropical Drift Seeds on the Irish Atlantic Coasts, 219
- Colin (H.), Utilisation of Glucose and Lævulose by the Higher Plants. 150; and Mlle. A. Chandun, The Law of Action of Sucrase, 419, and O. Liévin, The Spontaneous Oxidation of Complex Organic Compounds of Cobalt 499
- Collinge (Dr. W. E.), Plea for the Establishment of a Bureau of Economic Ornithology, 231; The Food of Wild Birds, 133; Wild Birds and Distasteful Insect Larvæ, 404, 483
- Collins (W. H.), Rocks of the Onaping Map-area, 390
- Conn (Dr. H. W.), Agricultural Bacteriology. Third edition, revised by H. J. Conn, 304
- Constantine (the late H. R.), Co-ordination of Research in Works and Laboratories, 152
- Constantinesco (Mr.), a New Method of Transmitting Energy, 93
- Conway (Sir W. Martin), elected President of the Museums Association, 395
- Coover (Dr. J. E.), Experiments in Psychological Research at Leland Stanford Junior University, 135
- Cope (J. L.), to lead a New Expedition to the Antarctic, 171
- Corneé (E.), The Spectrographic Study of the Ashes of Marine Plants, 99
- Cortie (Rev. A. L.), The Magnetic Storm of August 11-12, 1919, 483; The Spectrum of Nova Aquilæ, 53
- Coulter (J. M. and M. C.), Plant Genetics, 21
- Coupaux (H.), A Method of Extracting Glucina from Beryl, 119
- Coupin (H.), Absorption of Mineral Salts by the Root-tip, 519; The Absorbing Power of the Root-tip, 99; The Place where Water is Absorbed by the Root, 299
- Coursey (P. R.), Simplified Inductance Calculations, with Special Reference to Thick Coils, 97
- Cousens (H.), awarded the Gold Medal of the Hyderabad Archæological Society, 510
- Craib (W. G.), The Regional Spread of Moisture in Deciduous-leaved Trees during the Felling Season, 232
- Crawford (Dr. R.), to Deliver the Harveian Oration, 450
- Crewdson (Miss), appointed Demonstrator in Inorganic and Physical Chemistry at Bedford College for Women, 479
- Crewe (the Marquess of), Address at the Opening of the British Scientific Products Exhibition, 374
- Crisp (Sir F.), [obituary], 101
- Crompton (Mr.), appointed Head of the Department of Organic Chemistry and Director of the Laboratories at Bedford College for Women, 479
- Crooke (Dr. W.), A Remarkable form of Headdress worn by Women of the Banjara Tribe, 310; Hut-burning in India, 32
- Crookes (Sir William), [obituary article], 109; The Funeral of, 131
- Crosby (C. R.), and M. D. Leonard, Manual of Vegetable-garden Insects, 425
- Crowther (Dr. J. A.), Molecular Physics. Second edition, 303
- Crozier (W. J.), The Method of Progression in Polyclads, 19
- Cullis (Dr. Winifred), Acceptance of Membership of the Industrial Fatigue Research Board, 172
- Cunningham (Dr. Brysson), Water-power Developments, 246
- Cunningham (Archdeacon W.), [death], 289
- Cunington (A.), Lighting of Railways, 53
- Curie (Mme.), appointed Professor of Radiology in the Warsaw University, 517
- Curteis (W. S.), Cobar Stope-measurement Methods, 99
- Curtis (Prof. H. D.), The Spiral Nebulæ, 411
- Curtis (R. H.), [obituary], 250
- Dale (Dr.), Nature and Causation of Wound Shock, 136
- Dale (Dr. H. H.), The Croonian Lecture of the Royal Society to be delivered by, 230
- Dana (E. S.), and others, A Century of Science in America. With special reference to the "American Journal of Science," 1818-1918, 183
- Danne (J.), [death], 69; [obituary], 90.
- Darbishire (Dr. O. V.), appointed Professor of Botany in Bristol University, 397
- Darling (C. R.), Electric Furnaces, 235
- Darnell-Smith (G. P.), Life History of *Phoma citricarpa*, McAlp., 59
- Das (B.), The Aphididæ of Lahore, 269
- Das-Gupta (H. C.), A Mammalian Fossil from Bhavanagar (Kathiawar); The Panchet Reptile, 400
- Davidson (Sir J. Mackenzie), [obituary], 111
- Davie (Robert Chapman), [obituary article], 189
- Davies (G. M.), Petrological Notes on the Beds at Worms Heath (Surrey), 178
- Davis (W. G.), [obituary article], 508
- Davis (Prof. W. M.), awarded the Patron's Medal of the Royal Geographical Society, 52.
- Davison (Dr. C.), The Earthquake in the Midlands on Jan. 14, 1916, 473; The Experimental Firing of High Explosives, 31
- Dawe (M. T.), A Journey in Colombia, 133
- Dawkins (Prof. W. Boyd), and others, The Directorship of the Natural History Museum, 3
- Dawnay (Sir A. D.), Bequests by, 479
- De Booy (T.), Explorations in Venezuela, 511
- Debenham (F.), appointed University Lecturer in Surveying and Cartography in Cambridge University, 336; A new theory of Transportation by Ice: the raised Marine Muds of South Victoria Land (Antarctica), 319
- Deeley (R. M.), Temperature Distribution in a Cyclonic Depression, 72
- Delbet (Prof. P.), and N. Fiessinger, Biologie de la Plaine de Guerre, 501
- Dendy (Prof. A.), Effect of Air-tight Storage upon Grain Insects, 325; The Calcareous Sponges collected by the Australian Antarctic Expedition, 54; The Conservation of our Cereal Reserves, 55; and H. D. Elkington, Effect of Air-tight Storage upon Grain Insects, 326
- Denning (W. F.), Wasps, 185
- Densmore (Dr. F.), Teton Sioux Music, 515
- Depage (Dr. A.), and others, Ambulance de "l'Océan," La Panne. Tome II., fasc. 1, 223
- Desch (Prof. C.), The Aims of a Glasgow School of Metallurgy, 114
- Deslandres (H.), Constitution of the Atom and the Properties of Band Spectra, 259; Observations relating to the Total Eclipse of the Sun on May 29, made at the Meudon Observatory, 330; Reform of the Calendar, 34
- Deterding (Mr.), gift towards a Chemical School at Cambridge, 218
- Dewar (Sir J.), presentation to, of the Franklin Medal, 309
- Dewev (Col. B.), Defence against Deadly Gases used in War, 317
- Diépart (F.), and F. Wandenbulcke, Action of Sodium Thiosulphate upon Hypochlorites, 439
- Dixon (H. N.), Mosses from Deception Island, 310
- Dobbie (Sir J. J.), elected President of the Chemical Society,

- 89; and Dr. J. J. Fox, Constitution of Sulphur Vapour, 38
- Dobbin (Dr. L.), Presence of Formic Acid in the Stinging Hairs of the Nettle, 339
- Doidge (Miss Ethel M.), South African Microthryaceæ, 480
- Doncaster (Dr. L.), appointed Professor of Zoology in Liverpool University, 397; Mutation in Bacteria, 58
- Doolittle (Prof. C. L.), [obituary], 69
- Dootson (F. W.), appointed University Lecturer in Chemistry in Cambridge University, 418
- Downie (Capt. F.), appointed Head of the Electrical Engineering Department of Rutherford Technical College, 518
- Drage (G.), The Collection and Presentation of Public Statistics, 385
- Drever (Dr. J.), appointed Coombe Lecturer in Psychology in Edinburgh University, 158
- Dreyer (Dr. J. L. E.), Indian Astronomical Instruments, 166; Tycho Brahe's Original Observations, 134
- Dru-Drury (Dr.), An extreme case of Microcephaly, 460
- Drummond (J. M. F.), The Flora of a small Area in Palestine, 219
- Ducroquet (Dr.), Prothèse Fonctionnelle des Blessés de Guerre. Troubles Physiologiques et Appareillage, 383
- Duddington (Mrs. N. A.), Our Knowledge of Other Minds, 57
- Dudgeon (Col. L.), The Bacillary Form of Dysentery, 137
- Duffield (Dr. W. G.), T. H. Burnham, and A. H. Davis, Pressure of the Poles of the Electric Arc, 38
- Dunlop (Lt. W. R.) The Cultivation of Sponges, 184, 230
- Dunn (Dr. J. S.), appointed Professor of Pathology in Birmingham University, 379
- Dunoyer (L.), and G. Reboul, Utilisation of Measurements of the Velocity of Wind at different Altitudes for the Prediction of Barometric Variations, 179
- Dunstan (Dr. R.), Acoustic Experiments in connection with Whistles and Flutes, 97
- Dunwoody (Prof. H.), Notes, Problems, and Laboratory Exercises in Mechanics, Sound, Light, Thermomechanics, and Hydraulics, 302
- Durham (Lord), installed Chancellor of Durham University, 279
- Dymes (T. A.), Life History of *Iris pseudacorus*, Linn., 360
- Dyson (Sir F.), The Movement of the Earth's Pole, 392
- Eaton, Grantham and Day, Researches at Kuala Lumpur on the Preparation and Vulcanisation of Plantation Rubber, 176
- Ebden (J. W.), L. Abel, M. Hounsfeld, M. Joll, appointed Demonstrators of Anatomy at the London (Royal Free Hospital) School of Medicine for Women, 458
- Ebell (M.), Kopff's Periodic Comet, 453, 492
- Eccles (Prof. W. H.), Vector Diagrams of some Oscillatory Circuits used with Thermionic Tubes, 38; and F. W. Jordan, A small Direct-current Motor using Thermionic Tubes instead of Sliding Contacts, 38
- Eddington (Prof. A. S.), awarded the Pontécoulant Prize of the Paris Academy of Sciences, 470; Report on the Relativity Theory of Gravitation, 2; The Cepheid Variables, 92
- Edge (Lieut. A. B.), Siliceous Sinter from Lustleigh, Devon, 98
- Edser (E.), Comparison of Concentration Results, with special reference to the Cornish method of concentrating Cassiterite, 17
- Effront (Prof. J.), Biochemical Catalysts in Life and Industry. Proteolytic Enzymes. Translated by Prof. S. C. Prescott, assisted by C. S. Venable, 403
- Eginitis (Prof. D.), E. Goulandris, N. Critikes, Earthquakes in Greece, 1912-14, 473
- Elliott (W.), appointed Principal of the Technical Institute, Rathmines, Dublin, 358
- Ellmore (W. P.), The Cultivation of Osiers and Willows, 144
- Eredia (Prof. F.), The Climate of Gorizia, 310
- Esclangon (E.), The Mechanical Transformation of Sidereal Time into Mean Time, 519
- Esposito (M.), Early History of the Mariner's Compass, 35
- Etchells (E. F.), Mnemonic Notation for Engineering Formulæ, 2
- Etheridge (R.), The Dendroglyphs, or Carved Trees of New South Wales, 269
- Evans (Sir A.), Plea for the Creation of an Imperial British Institute of Archæology in Cairo, 32
- Evans (Miss Alwen M.), The Structure and Occurrence of Maxillulæ in the Orders of Insects, 319
- Evans (Dr. C. Lovatt), resignation of the Chair of Experimental Physiology and Experimental Pharmacology at the Leeds Medical School; to engage in research work for the Medical Research Committee, 96
- Evans (E. V.), Manufacture of Intermediate Products in the Dyestuff Industry, 412
- Evans (H. A.), Highways and Byways in Northamptonshire and Rutland, 103
- Evans (Dr. J. W.), Cole's Aids in Practical Geology, Seventh Edition, 263; Globular Clusters, Cepheid Variables and Radiation, 64
- Evershed (J.), An Earth-effect on the Sun, 272; The Sun-spot Maximum, 291
- Fagan (C. E.), to be entitled Secretary of the Natural History Departments, British Museum, 89
- Farlow (Prof. W. G.), [obituary], 328; [obituary article], 509
- Fay (Prof. H.), An Advanced Course in Quantitative Analysis, with Explanatory Notes, 362
- Fessenden (Prof. R. A.), Velocity of Electric Currents, 505
- Filippi (Cav. Filippo de), The Finger-print System in the Far East, 125
- Finch (Dr. J. E. M.), Bequest for the Endowment of a University for Leicester, 178
- Findlay (Prof. A.), appointed Professor of Chemistry in Aberdeen University, 397; Osmotic Pressure. Second edition, 322
- Firth (E.), F. W. Holden, and Dr. W. E. S. Turner, The Properties of British Fireclays suitable for Glassworks use. Part I., 419
- Fischer (Prof. E.), [death], 408; [obituary article], 430
- Fischer (Prof. M. H.), and Dr. M. O. Hooker, Fats and Fatty Degeneration, 504
- Fisher (H. A. L.), Education in the Army, 313; The Functions of Government in Relation to Education, 78; The Organisation and Financial Position of the Universities of Oxford and Cambridge, 397
- Flack (Dr. M.), and Dr. L. Hill, A Text-book of Physiology, 402
- Fleming (Prof. J. A.), The Principles of Electric-wave Telegraphy and Telephony. Fourth edition, 423
- Fleming (A. P. M.), Needs of Heads of Departments well educated in a general as well as in a technical sense, 313
- Fletcher (Sir L.), retirement from the Directorship of the Natural History Museum, 6
- Fletcher (Prof. S. W.), The Strawberry in North America. History, Origin, Botany, and Breeding, 164
- Flexner (Dr. S.), elected President of the American Association, 37
- Flippance (F.), appointed Assistant Curator of the Botanic Gardens, Singapore, 309
- de Forcrand (R.) and F. Taboury, Stability of the Sulphones formed by the Iodides of Sodium, Rubidium, and Cæsium, 499; and F. Taboury, The Sulphones formed by Sodium, Rubidium, and Cæsium Iodides, 419
- Forster (Dr. M. O.), The Profession of Chemistry, 24
- Forsyth (J. A. Cairns), awarded the Jacksonian Prize for 1918 of the Royal College of Surgeons of England, 131
- Forsythe (W. E.), The Disappearing-filament Type of Optical Pyrometer, 459
- Forth (F. C.), [obituary], 53
- Fosse (R.), The formation of Cyanic Acid by the Oxidation of Organic Substances, 460
- Foulerton (Dr. J.), bequest to the Royal Society for awards for research in Medicine, etc., 89

- Fox (P.), Measurements of Stellar Parallax at the Dearborn Observatory, 339
- Foye (W. G.), Geological Observations in Fiji, 270
- Franchimont (Prof. A. P. N.), [obituary], 431
- Frankland (Prof. P. F.), F. Challenger and N. A. Nicholls, A new method of preparing Monomethylamine, 252
- Franklin (Capt. T. B.), The Cooling of the Soil at Night, 298
- Franklin (Prof. W. S.), A Change of Emphasis in Meteorological Research, 211
- Fraser (Sir A.), [obituary], 8
- Frazer (Sir J. G.), and Rai Bahadur K. Ranga Achariyar, Customs of the Todas in connection with the Milk of their Sacred Dairies, 173
- French (J. W.), Modern Single-observer Range-finders, 405; The Unaided Eye, 159
- Friend (Rev. H.), Luminous Worms, 446; Sparganophilus: A British Oligochaet, 426
- Froggatt (W. W.), Notes on Australian Sawflies (Fenthredinidae), 19; The External Breathing Apparatus of the Larvæ of some Muscoid Flies, 19
- Frost (Prof.), The Light of the Aurora and the Auroral Line, 411
- Fryer (P. J.), and F. E. Weston, Technical Handbook of Oils, Fats and Waxes, Vol. II., "Practical and Analytical," 262
- Gallenkamp and Co.'s small Electric Furnaces, 492
- Gallardo (Dr. A.), The Ants of the Argentine, 269
- Galloway (J. J.), Rounding of Sand Grains by Solution, 490
- Gamgee (L.), appointed Professor of Surgery in Birmingham University, 379
- Gardiner (C. I.), The Silurian Rocks of May Hill, 296
- Gardiner (Prof. J. Stanley), A Crocodile on Rotuma, 264
- Gardner (Dr. E. G.), appointed Professor of Italian at Manchester University, 518
- Gardner (Prof. W. M.), resignation of the Principalship of the Bradford Municipal Technical College, 295, 439
- Garnett (D. G.), Birds seen in the North-Eastern Atlantic and the English and St. George's Channels, 113
- Garnett (Principal J. C. M.), An Educational Chart, 318
- Gaster (L.), Industrial Lighting, 437; Lighting in Factories, 70; H. C. Wheat, E. G. W. Souster, Industrial Lighting, 513
- Gautier (A.), Influence of Fluorides on Vegetation, 299; and P. Clausmann, Action of Fluorides upon Vegetation, 479
- Gauthier (H.), La Température en Chine et à quelques stations voisines d'après des observations quotidiennes, 3 vols., 42
- Geddes (Sir A.), appointed Principal of McGill University, Montreal, 111; appointed President of the Board of Trade, 250
- Geddes (Sir Eric), appointment as Minister of Transport approved by the King, 489
- Gemmill (Dr. J. F.), The Development of Asteroids, 150
- Gessard (C.), An Achromogenic Variety of the Pycocyanic Bacillus, 320
- Ghosh (J. C.), Strong Electrolytes and Ionisation, 376
- Ghosh (P. N.), The colours of the Striæ in Mica, and the Radiation from Laminar Diffracting Boundaries, 337
- Giacobini (M.), A new Comet, 514
- Gibson (Major G.), Major Bowman, and Capt. Connor, The Etiology of Influenza, 90
- Gibson (Major H. G.), [obituary], 31
- Gibson (Miss M. M.), provision for a Scholarship for Medical Research by Women in memory of Mr. W. Gibson, 118
- Gilchrist (Dr. J. D. F.), *Cnidonema capensis*, 390; Luminosity and its origin in a South African Earthworm, 433; The Post-plerulus stage of *Jasus lalandii* (Milne, Edw.), Ortmann, 139; The shells of *schizoderma spengleri*, 460
- Giles (Dr. P.), elected Vice-Chancellor of Cambridge University, 278
- Gilligan (Dr. A.), The Petrography of the Millstone Grit Series of Yorkshire, 297
- Gilmore (G.), Globular Lightning, 284
- Giolitti (Prof. F.), awarded the Bessemer Medal of the Iron and Steel Institute, 489
- Giuffrida-Ruggeri (Prof.), Analysis of the population of Abyssinia and Eritrea, 192; Identity of the Mediterranean Peoples who took part in the conflicts with Egypt during the Nineteenth and Twentieth Dynasties, 70
- Glazebrook (Sir R.), Metrology in the Industries, 238
- Gleichen (Dr. A.), The Theory of Modern Optical Instruments. Translated by H. H. Emsley and W. Swaine. With an appendix on "Range-finders," 101
- Godman (Dr. F. Du Cane), [obituary article], 5; proposed memorial to the late, 449
- Goethals (Major-Gen. G. W.), awarded the John Fritz Medal, 370
- Golla (Dr. J. L.), to be the Croonian Lecturer of the Royal College of Physicians for 1921, 328
- Goodchild (W. H.), The Genesis of Igneous-ore Deposits, 338
- Goodrich (E. S.), Development of the pericardiac-peritoneal canal in the dogfish, 231; elected membre-correspondant of the Société de Biologie of Paris, and associé of the Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique, 370
- Goodwin (H. B.), Graphical Methods in Nautical Astronomy, 44
- Goring (Dr. C.), [obituary], 269
- Grace (G.), Protective Coloration of Birds and Eggs, 446
- Gravely (Dr. F. H.), Revision of the Passalidæ of the World, 251
- Graveson (W.), Joys of the Open-air, 263
- Gray (Prof. A.), A Treatise on Gyrostatics and Rotational Motion. Theory and Applications, 121
- Gray (Dr. F. W.), Smith's Electro-Analysis. Sixth edition, 363
- Gray (Rev. Dr. H. B.), America at School and at Work, 203
- Green (Lt. G.), Propagation of Sound in the Atmosphere, 338
- Green (W. G.), awarded the Elgar Scholarship of the Institution of Naval Architects, 489
- Greenfield (Prof. W. S.), [obituary], 489
- Greenhill (Sir G.), Geometrical and Mechanical Fit, 193; Gyroscopics, 121; The Directorship of the Natural History Museum, 24
- Greenwood (Capt. M.), Problems of Industrial Organisation, 329; The Epidemiology of Influenza, 136; C. Hodson and A. E. Tebb, Report on the Metabolism of Female Munition Workers, 279; and C. M. Thompson, German and English War-time Diets, 132
- Gregory (Prof. J. W.), awarded the Victoria Medal of the Royal Geographical Society, 52
- Gregory (Sir Richard), elected a member of the Athenæum Club, 111; elected President of the Old Students' Association of the Royal College of Science, London, 258; Scarcity of University-trained Scientific Workers for Industrial and other purposes, 274; The Lesson to be learned from the British Scientific Products Exhibition, 472
- Gregory (W. K.), and C. L. Camp, Studies in Comparative Myology and Osteology, 90
- Greig-Smith (Dr. R.), The Germicidal Activity of the Eucalyptus Oils, Part I., 420
- Grey (E. C.), conferment upon of the degree of D.Sc. by the University of London, 96
- Grignard (V.), and G. Rivat, The addition compounds of Halogen Acids to Diphenylarsenic Acid, 479; and Ed. Urbain, Preparation of Phosgene by means of Carbon Tetrachloride and oleum or ordinary Sulphuric Acid, 439
- Grinnell (J.), H. C. Bryant, and T. I. Storer, The Game Birds of California, 281
- Groom (Prof. P.), Preservation of Timber in India, 81
- Gudgeon (C. W.), The Giblin Tin Lode of Tasmania, 18
- Guilbert (G.), Some examples of "Cyclone Compression," 159; Anomalies of the Meteorological Station of Skudness (Norway), 79
- Guillaume (J.), Observations of the Sun made at the Lyons Observatory during the fourth quarter of 1918, 79;

- Observations of the Sun made at the Lyons Observatory during the first quarter of 1919, 459
- Gurney (J. H.), Ornithological Notes from Norfolk for 1918, 211; nominated President of the Wild Bird Investigation Society, 289
- Guthnick (P.), Photo-electric determinations of Stellar Magnitudes of Planets, 53
- Guyot (J.), and L. J. Simon, Action of Dimethyl Sulphate on the Sulphates of the Alkalis and Alkaline Earths, 380; Action of Heat on the Methylsulphates of the Alkalis and Alkaline Earths, 320
- Gyllenberg (W.), The Variables of the Long Period, 53
- Haddock (M. H.), appointed County Mining Organiser for Leicestershire, 499
- Hadfield (Sir Robert), Relations of Employers and Employed, 472; The Occlusion of Gases by Metals, 168; and others, Patents in Relation to Industry, 453
- Hadley (P.), M. Elkins, and D. Caldwell, Bacteria of the Para-typhoid Group and the Causation of Disease in Poultry, 310
- Hadow (Sir Henry), appointed Vice-Chancellor of the University of Sheffield, 318; Free Interchange of Students for Research Work, 313
- Haeckel (Prof. Ernst), [death], 471; [obituary article], 487
- Haldane (J. B. S.), Experiments with Two New Colour Varieties of Rats, 432
- Haldane (Dr. J. S.), Acidosis, 162; The New Physiology, and other Addresses, 261; and others, Life and Finite Individuality. Edited by Prof. H. Wildon Carr, 342
- Haldane (Lord), Acceptance of the Presidency of Birkbeck College, 117; The Forestry Bill, 431
- Hale (A. J.), The Applications of Electrolysis in Chemical Industry, 203
- Hale (Prof. G. E.), elected a Foreign Associate of the Paris Academy of Sciences, 489; Sun-spots as Electric Vortices, 292; The Structure of the Solar Atmosphere, 426
- Hales (Rev. S.), The Life of, Prof. F. Smith, 150
- Hall (A. L.), Asbestos in the Union of South Africa, 270
- Hall (Dr. C.), A New Species or Form of Eucalyptus, 59
- Hallimond (A. F.), An Anorthic Metasilicate from Acid-steel Furnace Slags, 98
- Hallopeau (Prof. F. H.), [death], 69
- Hampshire (C. K.), and C. E. G. Hawker, A Note on Vitamines: A Suet Emulsion for Infant-feeding, 456
- Hamy (M.), Perturbations of the Optical Axis of a Meridian Telescope, 99; Study of the Perturbations of the Optical Axis of a Meridian Telescope, 79
- Hannay (H. B.), Ancient Roman Chronology, 500
- Hansen (Dr. H. J.), *Sergestidae* Collected by the Siboga Expedition, 511
- Harcourt (Dr. A. G. Vernon), [death], 510
- Harcourt (Viscount), The Re-opening of Museums and Picture Galleries, 69
- Harden (Dr.), and others, Researches concerned with Food Problems, 454
- Harding (Miss M. E.), The William Gibson Research Scholarship awarded to, 336
- Hare (A. T.), Clock Escapements, 155
- Hargrave (J.), The Great War brings it Home. The Natural Reconstruction of an Unnatural Existence, 143
- Harley (Dr. Vaughan), Resignation of the Chair of Pathological Chemistry in the University of London, 96
- Harmer (Dr. S. F.), appointed director of the Natural History Museum, 49; Cetacea Stranded on the British Coasts during 1918, 237; Sub-Antarctic Whales and Whaling, 293; The directorship of the Natural History Museum, 31
- Harris (J. A.), and F. G. Benedict, A Biometric Study of Human Basal Metabolism, 19
- Harris (Prof. D. Fraser), Science and Character-building, 418
- Harrison (Dr.), Extent and Character of the Saline Lands of the Madras Presidency; Manures in Southern India, 137
- Harrison (Lt.-Col. E. F.), A Memorial Lecture as a Tribute to the late, 210
- Harrison (Sir Heath), Gift to Oxford University, 318
- Harrison (J. B.), and C. B. W. Anderson, The Extraneous Minerals in the Coral-limestones of Barbados, 399
- Harrison (W. J.), Distribution of Electric Force between two Electrodes, one of which is covered with Radio-active Matter, 58
- Hartley (C.), T. C. Merrill, and A. S. Rhoads, Seedling Diseases of Conifers, 354
- Hartridge (Dr. H.), appointed Demonstrator of Physiology in Cambridge University, 198; appointed University Lecturer in the Physiology of the Senses in Cambridge University, 56
- Hart-Smith (J.), Recent Discoveries in Inorganic Chemistry, 322
- Harvey-Gibson (Prof.), and Miss E. Horsman, Anatomy of the Lower Dicotyledons, II., 18
- Harwood (L. M.), The late Sir Edward Stirling, 446
- Haslam (Prof.), appointed Lecturer in Applied Anatomy in Birmingham University; appointed Dean of the Faculty of Medicine of Birmingham University, 379
- Hassé (Dr. H. R.), appointed Professor of Mathematics in Bristol University, 397
- Hatch (Dr. F. H.), Recent Iron-Ore Developments in the United Kingdom, 477
- Haviland (Miss M. D.), Bionomics of *Aphis grossulariae*, Kalt, and *A. viburni*, Shrank, 58; Life history and Bionomics of *Myzus ribis*, Linn. (red-currant Aphid), 18
- Hawk (Prof. P. B.), Practical Physiological Chemistry. Sixth edition, 462
- Hawken (R. W. H.), appointed to the Chair of Engineering in the University of Queensland, 198
- Hayes (Dr. H. C.), Defection of Submarines, 317
- Hayward (Dr. F. H.), and A. Freeman, The Spiritual Foundations of Reconstruction: A Plea for New Educational Methods, 143
- Haywood (W.), appointed Lecturer in Town-planning in Birmingham University, 379
- Head (Dr. H.), Researches based on the Treatment of War Injuries, 413
- Heath (A. E.), The Scope of the Scientific Method, 97
- Hcbert-Stevens (J.), and A. Larigaldie, Radio-telegraphy by Infra-red Radiation, 479
- Heller (E.), Leader of an African Expedition, 510
- Henderson (A.), appeal for Increase in the Exchequer Grants to Universities and University Colleges, 117
- Henderson (Dr. G. G.), appointed Regius Professor of Chemistry in Glasgow University, 438; Catalysis in Industrial Chemistry, 281
- Hendrick (E.), Everyman's Chemistry, 62
- Henry (Prof. A.), The Origin and History of the London Plane, *Platanus acerifolia*, 334; and Miss M. G. Flood, History of *Larix eurolepis*, 399; History of the London Plane, *Platanus acerifolia*, 38
- Henry (Miss M.), Some Australian Fresh-water Copepoda and Ostracoda, 520
- Hepworth (Capt. M. W. C.), [obituary], 8
- Herdman (Prof. W. A.), Resignation of the Derby Chair of Natural History in Liverpool University: Record of his Work, 56; A. Scott, and Miss H. M. Lewis, The Marine Plankton around the South End of the Isle of Man, 472
- d'Hérelle (F.), Rôle of the Filterin^g Anti-bacterial Micro-organism in Typhoid Fever, 119
- Herman (C. L.), Carbohc Acid as a Fixative for Histological Preparations, 480
- Hernaman-Johnson (Dr.), Protective Measures in Diagnostic Work by Radiographers, 309
- Herring (Prof. P. T.), Weight of the Suprenals of White Rats, 390
- Herringham (Sir W.), The Clinical Aspects of Influenza, 136
- Hesselman (H.), Composition of Forest Soils and the Formation of Humus, 176
- Hewitt (Dr. C. Gordon), The Canadian Government and the Proposed Hunting of Caribou with Aeroplanes, 244
- Hey (J. A.), Election of, to a Beit Fellowship, 439
- Hildebrandsson (H. H.), The General Movements of the Atmosphere, 119
- Hilger, Ltd. (Adam), Optical Research, 236; Refractometers, 146; The Wave-length Spectrometer and Accessories, 311
- Hill (A. V.), appointed University Lecturer in Physiology in Cambridge University, 56
- Hill (A. W.), approved for the Degree of D.Sc. by Cambridge University, 336

- Hill (G. H.), [death], 51
 Hill (Prof. L.), Atmospheric Conditions which Affect Health, 79; awarded the Baly Medal of the Royal College of Physicians, 450
 Hill (M. D.), Teeth of Sea-otter, 446
 Hird (W. B.), Electrical Ship Propulsion, 232
 Hirst (E. W.), Self and Neighbour: An Ethical Study, 361
 Hobley (C. W.), A Volcanic Eruption of Donyo L'Engai, 310
 Hocart (Capt. A. M.), Early Fijians, 279
 Hofer (Dr. B.), [obituary], 132
 Holmes (Dr. A.), The Pre-Cambrian and Associated Rocks of Mozambique, 490
 Holtedahl (O.), Relations of Land and Sea in the North Atlantic Region, 433
 Honda (Prof.), The Allotropic Forms of Iron, 436
 Honoré (M.), The French Steel and Iron Masters' Association, 233
 Hope (Sir W. H. St. John), [obituary], 510
 Hopkinson (J.), [obituary], 409
 Hopwood (Dr. F. L.), Submarine Acoustics, 467
 Horne (Dr. J.), The Endowment of Scientific and Industrial Research, 27
 Hospitalier et Roux, Formulaire de l'Electricien et du Mécanicien. Vingt-neuvième édition, G. Roux, 403
 Hostetter (J. C.), Growth of Crystals under Controlled Conditions, 512
 Hotedahl (O.), The "Tillite" with Scratched Boulders in the Varanger District of Finmarken, 330
 Houston (Dr. R. A.), Ionisation and Radiation, 145; X-ray Optics. Part I., 339
 Howard (B. F.), Terebene and its Pharmacopœia Standards, 455
 Howard (H. Eliot), Behaviour of a Cuckoo, 426
 Howard (S.), Forest Research in Europe, 55
 Howell (Capt. G. C. L.), and the Writer of the Note, National Fisheries, 84
 Hoyle (B.), Standard Tables and Equations in Radio-telegraphy, 144
 Hudson (W. H.), Far Away and Long Ago. A History of My Early Life, 22
 Humphreys (H. F.), appointed Lecturer on Dental Anatomy and Physiology, etc., in Birmingham, 397
 Hunter (J. de Graaff), The Earth's Axes and Triangulation, 381
 Huntington (Prof. A. K.), The Title of Emeritus Professor Conferred upon, by the University of London, 439
 Hurry (Dr. J. B.), Gift to Increase the Value of the Michael Foster Research Studentship in Cambridge University, 16
 Hutchins (D. E.), The "Waipoua Kauri Forest," 309
 Hutchinson (A.), Graphic Methods in Nautical Astronomy, 25
 Huxley (J. S.), elected a Fellow of New College, Oxford, 479
- Ifford, Ltd., "Photographic Vision" Colour-filters, 513
 Illing (V. C.), Indications of Oil in Derbyshire, 265
 Imbeaux (Ed.), The Navigable Waterways of Alsace and Lorraine, 259
 Imms (Dr. A. D.), Grain Pests and their Investigation, 325
 Inge (Dean), Platonism and Human Immortality, 297
 Inglis (C. E.), elected Professor of Mechanism and Applied Mechanics in Cambridge University, 78
 Inglis (Dr. J.), [obituary], 409
 Inglis (J. G.), Decimal Coinage and British Commerce, 113
 Innes (R. T. A.), Determination of Proper Motions, 194
 Ioteyko (Dr. J.), The Science of Labour and its Organisation, 343
 Isaacs (Godfrey), Progress in Practical Radio-telegraphy, 249
 Italy (King of), elected an Honorary Member of the Institution of Civil Engineers, 192
 Ivens (Dr. W. G.), Dictionary and Grammar of the Language of Sa'a and Ulawa, Solomon Islands, 102
- Jack (Col. E. M.), awarded the Founder's Medal of the Royal Geographical Society, 52
 Jackson (Sir H.), The work of the Institute of Chemistry during the War, 7
 Jackson (J. W.), "Shell-pockets" on Sand Dunes on the Wirral Coast, Cheshire: A new Middle Carboniferous Nautiloid (*Coelonautilus trapezoidalis*), 18
 Jackson (S.), The Letter-winged Kite and Rats, 150
 Jacoby (Prof. H.), Navigation. Second edition. With a chapter on Compass Adjusting and a collection of Miscellaneous Examples, 481
 Jaggar (Prof. T. A.), approval of the appointment of, as director of the work on Vulcanology at Kilauea, 131; and A. Romberg, The Registration of Distant Earthquakes, 251
 James (M. C.), and L. E. Smith, Ship repairing, 395
 James (W. H. N.), appointed head of the Electrical Engineering Department, Bradford Municipal Technical College, 498
 Jauffret (A.), Determination of the Woods of two species of Dalbergia from Madagascar, 159
 Jeans (J. H.), Cepheid Variables, 10; Globular Clusters, Cepheid Variables, and Radiation, 64; The Evolution of Binary Stars, 115; to deliver a lecture on "The Quantum Theory and New Theories of Atomic Structure" to the Chemical Society, 131
 Jeffreys (Dr. H.), Relation between Wind and the Distributing Pressure, 398; The Movement of the Earth's Pole, 392
 Jenkinson (S. N.), Impressions of a recent tour of the German Glass Factories, 419
 Jennison (G.), A Chimpanzee in the Open Air in England, 219
 Joannis (A.), Some properties of the Acid Phosphates, 380
 John (W. J.), appointed Lecturer in Electrical Engineering at the East London College, 198
 Johnston (Sir H. H.), A South African Pioneer, 125
 Johnston (T. B.), appointed Professor of Anatomy at Guy's Hospital Medical School, 358
 Johnston (Prof. T. H.), and O. W. Tiegs, Pseudobonellia, a new echiuroid genus from the Great Barrier Reef, 519
 Johnstone (Dr. J.), The Dietetic Value of Sprats, etc., 472
 Jones (A. E.), appointed Professor of Agriculture in the University College of Wales, Aberystwyth, 499
 Jones (A. J.), Purified Ether and the Variations of Commercial Samples, 455
 Jones (B. M.), Elected to a junior fellowship at Emmanuel College, Cambridge, 198
 Jones (Dr. F. Wood), appointed an Arris and Gale lecturer, 350
 Jones (Dr. I. H.), Equilibrium and Vertigo. With an Analysis of Pathologic Cases, by Dr. L. Fisher, 182
 Jones (Prof. O. T.), appointed Professor of Geology in the University of Manchester, 317
 Jones (W. M.), appointed Lecturer in Physics at the University College of North Wales, Bangor, 178
 Jørgensen (E.), The Norwegian Species of Euphrasia, 433
 Jost (Prof. L.), appointed Professor of Botany in Heidelberg University, 96
 Jourdain (P. E. B.), A Proof that any Aggregate can be Well-ordered, 45; The Philosophy of Mr. B*tr*nd R*ss*ll. With an appendix of Leading Passages from certain other works, 303
 Julien (Dr. A. A.), [obituary], 268
- Kanthack (R.), Edited by Dr. J. N. Goldsmith, Tables of Refractive Indices. Vol. i., "Essential Oils," 43
 Kapp (Prof. G.), Impending Resignation of the Chair of Electrical Engineering in Birmingham University, 257
 Kapteyn (Prof.), The Parallax of the Pleiades, 374
 Kaye (G. R.), Hindu Astronomical Deities, 500; The Astronomical Observatories of Jai Singh, 166
 Kaye (Major G. W. C.), X-Rays and British Industry, 194
 244
 Keene (Miss M. L.), appointed Lecturer in Anatomy and Head of the Anatomy Department of the London (Royal Free Hospital) School of Medicine for Women, 458
 Keith (Prof. A.), Gustav Magnus Retzius, 448; The Functions of the Internal Ear, 182
 Kenyon (Sir F. G.), Education: Secondary and University, 286

- Kerr (Dr. J.), Congenital or Developmental Aphasia, 139
 Kerr (Prof. J. Graham), "Camouflage" of Ships in War, 204; Science and Education, 318
 King (H.), appointed Organic Chemist in the Department of Biochemistry and Pharmacology of the Medical Research Committee, 267; Resolution of Hyosine into the lævo-form and the dextro-form, 114
 King (Prof. L. W.), [death], 510
 King (W. J. Harding), awarded the Gill Memorial by the Royal Geographical Society, 52
 Kingon (Rev. J. R. L.), Cattle as a Factor in the Economic Development of South Africa, 432
 Kinney (J. P.), The Development of Forest Laws in America; The Essentials of American Timber Law, 321
 Kirkaldy (Prof. A. W.), appointed Professor of Economics and Commerce in University College, Nottingham, 78
 Kitson (A. E.), Outlines of the Geology of Southern Nigeria, with especial reference to the Tertiary Deposits, 399
 Klein (Major A.), and Dr. J. C. Mottram, Military Camouflage, 364
 Kling (A.), and R. Schmutz, Characterisation and Estimation of Carbon Oxychloride, 179; The Estimation of Traces of Carbonyl Chloride in Air, 259
 Knott (Dr. C. G.), Further Note on Earthquake Waves and the Interior of the Earth, 18
 Knowles (F.), A Possible Case of Partial Sterilisation in Soil, 205
 Kobert (Prof. R.), [obituary], 111
 Koch (Miss M. L.), and Dr. O. Riddle, Brains of the "Ataxic" Pigeons, 437
 Kolderup (N. H.), Excursions of the First Geological Congress in Denmark, 269
 Kopaczewski (W.), and A. Vahram, The Suppression of Anaphylactic Shock, 519
 Kunz (Dr. G. F.), The Production of Precious Stones for the year 1917, 326

 Lacroix (A.), The Leucitic Lavas of Trebizond and their Transformations, 159; and A. de Gramont, Presence of Boron in some Natural Basic Silico-aluminates, 259
 Ladd (Prof. G. T.), The Secret of Personality: The Problem of Man's Personal Life as Viewed in the Light of an Hypothesis of Man's Religious Faith, 303
 Laird (T. P.), appointed Professor of Accounting and Business Method in Edinburgh University, subject to the approval of the ordinance for the new chair, 418
 Lamb (Prof. H.), The Halley Lecture on the Tides, 257
 Lambert, Vlès, and de Watteville, An Opacimeter for use in Bacterial Estimations, 180
 Lamme (B. G.), awarded the Edison Medal of the American Institute of Electrical Engineers, 289
 Lamplugh (G. W.), Structure of the Weald and Analogous Tracts, 38; The admission of Women to the Fellowship of the Geological Society, 89
 Lander (Miss Kathleen F.), Maceration by Tryptic Digestion, 64; The Tryptic Digestion Process for Skeletonising Purposes, 9
 Langlois (G.), A new Synthesis of Benzylidene-acetone, 320
 Langmuir (I.), The Mechanism of the Surface Phenomena of Flotation, 459
 Larmor (Sir J.), The Doppler effect in the Molecular Scattering of Radiation, 165
 La Touche (T. H. D.), A Bibliography of Indian Geology and Physical Geography, with an Annotated Index of Minerals of Economic Value. 2 Parts, 223
 Laughlin (Dr. H. H.), Durations of arbitrarily delimited progress-stages in cell-division, 330
 Laveran (A.), The Artificial Acentrosomic varieties of Trypanosomes, 179; and G. Franchini, Some Flagellæ of Insects obtained in a pure Culture, and in particular *Critthidia melophagi*, 499
 Lawson (Prof. A. A.), awarded the Makdougall-Brisbane Prize of the Royal Society of Edinburgh, 309
 Lawson (R. W.), Photophoresis, 514
 Ledoux-Lebard (R.), and A. Dauvillier, The Spectral Structure of the J-rays, 119
 Lee (Prof. F. S.), The Human Machine and Industrial Efficiency, 261
 Lee of Fareham (Lord), appointment as President of the Board of Agriculture and Fisheries approved by the King, 489
 Leechman (D.), Efficient Invention, 213
 Lees (S.), appointed University Lecturer in Thermodynamics, 418; re-elected a fellow of St. John's College, Cambridge, 498; Superposing of two cross-line screens at small angles, 178
 Leffmann (H.), Prof. S. P. Langley's experiments in Aviation, 134
 Léger (L.), and E. Hesse, A new parasitic Coccidium of the Trout, 259
 Lehmer (D. N.), Jacobi's extension of the continued Fraction Algorithm, 19
 Leishman (Sir W.), to be the Horace Dobell lecturer of the Royal College of Physicians of London, 328
 Lesley (J. W.), elected to a junior fellowship at Emmanuel College, Cambridge, 198
 Levallant (R.), and L. J. Simon, Action of Chlorosulphonic Acid on Methyl Hydrogen Sulphate, 480
 Léveillé (H.), [obituary], 191
 Lévine (J.), The Periodicity of Atmospheric Waves, 119
 Levinstein (Dr. H.), Connection between the German Dye Manufactures and the supply of Explosives and Poison Gases, 412
 Levy (L. E.), [obituary], 51
 Lewis (F.), A Visit to Kunadiyaparawitta Mountain, with a list of the Plants obtained and their Altitudinal Distribution, 98
 Lewis (Prof. W. C. McC.), A System of Physical Chemistry. Second edition. Three volumes, 161; Colloids and Chemical Industry, 454; Inorganic and Physical Chemistry, 322
 Lienhart (M.), The Possibility of Chicken-breeders obtaining at pleasure Male or Female chickens, 460
 Lindemann (Dr. F. A.), appointed Professor of experimental Philosophy in Oxford University, 178
 Lineham (W. J.), [obituary], 172
 Living (Dr. E.), [death], 111
 Liveing (Dr. R.), [death], 8
 Livens (G. H.), The Fundamental Formulations of Electrodynamics, 398; The Theory of Electricity, 142
 Livingston (Prof. B. E.), Some Responsibilities of Botanical Science, 154
 Lockyer (Sir Norman), elected an Associate of the Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique, 350; Notes on Stellar Classification, 484
 Lodge (Sir O.), awarded the Albert Medal of the Royal Society of Arts, 267; Impending retirement from the Principalship of Birmingham University, 16; presented with the Albert Medal of the Royal Society of Arts, 289
 Loeb (Prof. Jacques), Forced Movements, Tropisins, and Animal Conduct, 163
 Logan (Lt.-Col. D.), Mine-gas Poisoning, 137
 Logie (Lt. J.), Tornadoes, 338
 Loud (L. L.), The Ethnogeography and Archæology of the Wiyst Territory, 371
 Louis (Prof. H.), Coal in Thrace, 45; Mineral Production in Relation to the Peace Treaty, 205
 Love (Lt.-Col. A. G.), and Major C. B. Davenport, Comparison of White and Black Troops in respect to incidence of Disease, 330
 Lowe (E. E.), The Control of Municipal Museums, 394
 Lowe (R. H.), Mother-right, 351
 Lowson, Text-book of Botany (Indian edition). Revised and adapted by Birbal Sahni and M. Willis. New and revised edition, 301
 Luce (S. B.), The Study of Greek Vase-painting, 472
 Luciani (Prof. L.), Translated by F. A. Welby. Human Physiology. Vol IV. "The Sense-organs," 61
 Luckiesh (M.), Influence of Temperature on the transmission of a number of Commercial Coloured Glasses, 352; Reduction of the Visibility of Aeroplanes, 290
 Lumiere and Seyewetz, Acidified Chromate replaced by a solution of Potassium Chlorochromate, 491
 Lunt (Dr. J.), The Spectrum of Nova Aquilæ, 53
 Lynch (R. I.), resignation of the curatorship of the Cambridge University Botanic Garden, 257

- Lyon (Prof. T. L.), Soils and Fertilisers, 323
 Lyons (Col. H. G.), Meteorology during and after the War, 12
- Maanen, van (A.), Planetary Nebulae, 353; The Distances of Six Planetary Nebulae, 19
 MacAlister (Sir Donald), The diversity of British Universities, 313
 Macalister (Prof. R. A.), An early story of Dar-Lughdach, 472
 MacBride (Prof. E. W.), The Inheritance of Acquired Characters, 225
 MacCurdy (Dr. J. T.), War Neuroses, 101
 Macdonald (Sir J. H. A.), [obituary], 209
 Macdonald (Prof. J. S.), Translated Sense and Senses, 61
 Macfadyen (Lt. W. A.), Electrolytic Iron Deposition, 178
 Macfie (Dr. J. W. Scott), presented with the Mary Kingsley Medal of the Liverpool School of Tropical Medicine, 131
 Macgregor (Prof. D. H.), appointed Professor of Economics in the University of Manchester, 317
 Macgregor (Sir William), [obituary], 370
 Mackinder (H. J.), Democratic Ideals and Reality. A Study in the Politics of Reconstruction, 423
 MacLeod (Prof. J.), The Quantitative Method in Biology, 202
 MacMillan (D. B.), to lead an expedition to the Arctic Regions, 510
 Maddick (Major E. D.), moving Films illustrating the application of the Kinema to the teaching of Anatomy, 327
 Magnus (Sir Philip), The Forestry Bill, 449
 Maiden (J. H.), Notes on Eucalyptus, No. VII., with descriptions of new species 520
 Maignon (F.), Mechanism of the Action of Fats in the Utilisation and Assimilation of Albuminoids, 79; Mechanism of the Action of Fats in the Utilisation and Assimilation of Albuminoids, 119
 Mallock (A.), Diffusion of Light by Rain, Cloud, or Fog, 398; Question Relating to Prime Numbers, 305
 Mann (Dr. H. H.), Variation in Flowers of *Jasminum malabaricum*, Wight, 139
 Mappin (G. E.), Can we Compete? Germany's Assets in Finance, Trade, Education, Consular Training, etc. and a Proposed British War-cost Reduction Programme. 241
 Maquenne (L.), and E. Demoussy, A very Sensitive Reaction for Copper, 99
 Marchal (P.), The Evolution Cycle of the Woolly Aphis of the Apple-tree, 518
 Marett (Dr. R. R.), Current Modes of interpreting Folk-beliefs, 210
 de Margerie (E.), awarded the Cullum Geographical Medal of the American Geographical Society, 230
 Marr (C. K.), bequest for educational purposes, 138
 Marr (Col. R. A.), Samples of Encysted Wood, 339
 Marriott (J. A. R.), to resign the secretaryship to the University Extension Delegacy, 498
 Marsden (Dr. F.), A Hot-water Process for the extraction of Indigo, 137
 Marshall (Prof. C. R.), some conditions influencing the Reaction-velocity of Sodium Nitrate on Blood; The Mode of Action of Metal Sols, 298; appointed to the Regius chair of Materia Medica in the University of Aberdeen, 218
 Marshall (J.), An Analysis of an Electron-transference Hypothesis of Chemical Valency and Combination, 298
 Marston (R. B.), Sound of the explosion of a Munition Dump, 511
 Marti (M.), A measurement of the Velocity of Sound-waves in Sea-water, 519; A method of sounding at sea from a Moving Vessel, 339
 Martin (E. A.), The Boulders in the Rubble-drift of Brighton, 269
 Martin (L. C.), The Performance of Night Glasses, 251; Transparency of Biotite to Infra-red Radiations, 97
 Martinet (J.), The Mobility of the Hydrogen Atoms in Organic Molecules, 159
 Mascart (Prof. J.), A striking Cloud Phenomenon, 371; The Winters of 1916-17, and 1917-18 in the neighbourhood of Lyons, 433
 Mason-Jones (A. J.), appointed Biologist to assist with experiments on washings from tar-treated roads in connection with their alleged damage to fisheries, 389
 Maxted (Dr. E. B.), Catalytic Hydrogenation and Reduction, 281
 Maxwell (Sir H.), The Supposed "Fascination" of Birds, 4
 Mayor (Dr. A. G.), Growth-rate of Samoan Coral Reefs, 19; Report on the Department of Marine Biology of the Carnegie Institution of Washington, 1916, 211
 McAdie (Prof.), The Freedom of the Skies, 491
 McAtee (W. L.), Food Habits of the Mallard Ducks of the United States, 113
 McCall (Sir J.), Science and Industry in Australia, 434
 McClelland (Prof. J. A.), Globular Lightning, 284; and P. J. Nolan, Nature of the Ions produced by Phosphorus, 39
 McClure (Canon E.), Coal in Thrace, 45, 85
 McCombie (Major H.), elected to a fellowship at King's College, Cambridge, 96
 McDowall (Rev. S. A.), Evolution and the Doctrine of the Trinity, 103
 McHenry (A.), [obituary], 172
 McIntosh (Prof. W. C.), re-elected President of the Ray Society, 70; Scientific Research at St. Andrews University, 64; The Fisheries and the International Council, 355, 376
 McLennan (Prof. J. C.), Science and Industry in Canada, 247; Science and its application to Marine Problems, 395
 McMullen (A. P.), appointed Adviser on Education to the Admiralty, 96
 McRae (W.), A new Fungus Disease of *Hevea brasiliensis*, 355
 Meakin (Dr.), appointed Professor of Therapeutics in Edinburgh University, 418
 Meek (Prof. A.), Marine Research at St. Andrews, 104
 Meerwarth (Dr. A. M.), Andamanese and other objects in the Indian Museum, Calcutta, 511
 Melle (H. A.), Agricultural Grasses and their Culture, 33
 Mendenhall (Major C. E.), appointed scientific attaché to the U.S. Legation in London, 8, 370
 Mercer (R. G.), and others, Electric Furnaces, 235
 Merriam (Prof. C. Hart), elected President of the American Society of Mammalogists, 329
 Merrill (P. W.), The Variables of Long Period, 53
 Merton (Dr. T. R.), and Prof. J. W. Nicholson, Intensity Decrement in the Balmer series, 118
 Messel (L.), A Garden Flora: Trees and Flowers grown in the gardens at Nymans, 1890-1915, notes by M. Messel, 362
 Metcalf (Mr.), A new Comet, 514
 Metzger (H.), La Genèse de la Science des Cristaux, 184
 Michaud (F.), The Vapour-pressure of Liquids in thin Layers, 340
 Michaux (F.), Emissive theories and the Doppler-Fizeau principle, 99
 Mickle (Dr. W. J.), Bequest to London University, 16
 Middleton (Sir T. H.), appointed a Commissioner under the Development and Road Improvement Funds Acts, 250
 Miers (Sir H.), Some features in the growth of crystals, 239
 Mignonac (G.), The Synthesis of Ketimines by the Catalytic Method, 219
 Miles (Dr. W. R.), Effect of Alcohol on Psycho-Physiological Functions, 151
 Mill (Dr. H. R.), retirement from the directorship of the British Rainfall Organisation, the editorship of "British Rainfall," and that of Symons's *Meteorological Magazine*, 409
 Millais (I. G.), Life of Frederick Courtenay Selous, D.S.O., 125
 Mills (W. H.), appointed University Lecturer in Organic Chemistry in Cambridge University, 418
 Mitchell (Dr. A. C.), Pulsations of the Vertical Component of Terrestrial Magnetic Force, 339; The Magnetic Storm of August, 11-12, 1919, 506

- Moir (J. Reid), A remarkable piece of Carved Chalk, 9;
Contents of the Tumuli on Martlesham Heath, Suffolk,
250; Curious Markings on Chalk, 45; Flint Imple-
ments from glacial gravel north of Ipswich, 359
- Moll (Prof. J. W.), and Dr. H. H. Janssonius, Mikro-
graphie des Holzes der auf Java vorkommenden
Baumarten, im Auftrage des Kolonial-Ministeriums,
Fünfte Lief., 303
- Monk (S. C.), appointed Lecturer in Electrical Engineer-
ing at the Devonport Technical School, 336
- Montagu (D. P.), Regeneration in Wheat, 219
- Moore (Dr. G. T.), elected General Secretary of the Ameri-
can Association, 37; *Gomontia lignicola*, 71
- Moore (H.), appointed Assistant Director of Research by
the British Scientific Instrument Research Association,
328
- Moore (Sir Norman) elected to the Standing Committee
of the British Museum, 230
- Moore (R. L.), A characterisation of Jordan Regions by
properties having no reference to their Boundaries, 19
- Moore (S. L.), The Flora of Australia, 360
- Morant (Sir R.), designated first secretary of the Ministry
of Health, 88
- Morgan (Mrs. E.), bequest to Liverpool University for a
scholarship, 198
- Morgan (P. G.), Magnesite and Dolomite in Australia and
New Zealand, 450
- Morison (Lt.-Col. Sir Theodore), Appointed Principal of
Armstrong College, 459
- Morley (Prof. F.), elected President of the American
Mathematical Society, 131
- Morrison (J.), The Shap Minor Intrusions, 473
- Most (S. O.), The Study of Behaviour, 71
- Mott (Lt.-Col.), and others, War Neuroses, 136
- Moulton (Lord), The Rede lecture on Science and War, 292;
and others, War Work of British Chemists, 92
- Moureu (Prof. C.), The work of Sir William Ramsay;
Helium in Fire-damp, etc., 412
- Muguet (A.), A Fluorometer, 459
- Muir (Prof. Ramsay), The Universities of India, 313
- Munro (Prof. J.), granted the title of Emeritus Professor
in Mechanical Engineering by Bristol University, 358
- Murakami, The structure of Ferro-carbon-chromium Alloys,
391
- Muraour (H.), Determination of Temperatures reached in
Explosive Reactions, 299
- Murgoci (Mrs. A.), Customs connected with Death and
Burial among the Rumanians, 410
- Muttkowski (R. A.), Survey of the Fauna of Lake Men-
dota, 232
- Myers (Col. C. S.), elected a fellow of Gonville and Caius
College, Cambridge, 317; Improved Methods in an
Iron Foundry, 493; Present day Applications of Psy-
chology, with special reference to Industry, Education,
and Nervous Breakdown, 101
- Nakamura (S. T.), Different forms of "Tsunamis," 270
- Nash (Vaughan), appointed a Commissioner under the De-
velopment and Road Improvement Funds Acts, 250
- Newall (Prof.), Report of the Solar Physics Observatory
at Cambridge, 434
- Newman (Sir G.), appointed Chief Medical Officer of the
Ministry of Health, 409; elected a member of the
Athenæum Club, 30
- Newsholme (Sir A.), offered the Chair of Public Health at
Johns Hopkins University, 138
- Newstead (Prof. R.), and Miss H. M. Duvall, The
Acarids of stored Grain and Flour, 325
- Nicolardot (P.), Tempering of Lead, Tin, and Thallium,
119; and A. Reglade, Estimation of Zirconium, 18
- Nicholas (T. C.), appointed assistant to the Woodwardian
Professor of Geology in Cambridge University, 336
- Nicholson (Prof. J. W.), Energy Distribution in Spectra,
495
- Nicolle (C.), and C. Lebailly, Hidden Experimental Infec-
tions, 180
- Norton (A. P.), A Star Atlas and Telescopic Handbook
(Epoch 1920) for Students and Amateurs. New and
enlarged edition, 283
- Noyes (A.), The counter e.m.f. of Polarisation in Sulphuric
Acid, 320
- Noyes (Prof. W. A.), Valency, 270
- Oddone (Prof.), The Earthquake in the Upper Tiber Valley,
April 26, 1917, 71
- Ogilvie (Dr. F. Grant), Report on the Sheffield City
Museums, 133
- Ogilvie (Mrs. M.), presentation to the Natural History
Museum of Dr. M. Ogilvie's British Bird-skins, 409
- O'Meara (Lt.-Col. W. A. J.), The training of Engineers,
387
- Omori (Prof.), The Eruptions and Earthquakes of the
Asama-Yama, 450
- Onslow (Hon. H.), The Colour of the Scales of Iridescent
Insects in Transmitted Light, 84; Wild Birds and
Distasteful Insect Larvæ, 464
- Orrin (H. C.), X-ray demonstration of the Vascular system
by Injections, 290
- Osborn (Prof. H. F.), The Origin and Evolution of Life on
the Theory of Action, Reaction, and Interaction of
Energy, 201
- Osborne (Miss Ethel E.), The Output of Women Workers
in relation to Hours of work in Shell-making, 493
- Osler (Sir W.), Man's Redemption of Man. Third edition,
23; Presentation of a collection of essays on his
seventieth birthday, 389; The Old Humanity and the
New Science, 234
- Ostwald (Dr. W.), A Handbook of Colloid-Chemistry. The
Recognition of Colloids, the Theory of Colloids, and
their general Physico-Chemical Properties. Second
English edition, translated from the third German
edition by Prof. M. H. Fischer, with notes added by
E. Hatschek, 401
- Owen (Prof. G.), appointed Professor of Physics in the
University College of Wales, Aberystwyth, 499
- Oxley (Dr. A. E.), Influence of Molecular Constitution and
Temperature on Magnetic Susceptibility, Part IV., 398
- Page (Capt. H. J.), appointed Research Chemist and
Head of the Chemical Department at Wisley, 389
- Pagé (Capt. V. W.), The A B C of Aviation., 243
- Paillet (A.), Parasitic Cocobacilli of the Caterpillar of
Pieris brassica, 79
- Panikkar (K. M.), The Nayars of Malabar, 450
- Parenty (H.), A Miniature Model of a Steam Recorder, 200
- Parker (Prof. G. H.), The elementary Nervous System,
322
- Parsons (Lady), Women's Work in Engineering and Ship-
building during the War, 395
- Parsons (R. H.), Coal Consumption of Steam-power Plant,
33
- Partington (Capt. J. R.), appointed Professor of Chemistry
at East London College, 96
- Pascoe (Lt. E. H.), The Early History of the Indus,
Brahmaputra, and Ganges, 78
- Paterson (Prof. A. M.), [obituary], 9
- Paterson (C. C.), and N. Campbell, Some characteristics
of the Spark Discharge and its effect in igniting Ex-
plosive Mixtures, 118
- Patterson (Dr. S. W.), appointed Director of the Eliza Hall
Institute of Research, Melbourne, 498
- Patterson (Dr. T. S.), appointed Gardiner Professor of
Organic Chemistry in Glasgow University, 439
- Pattison (Prof. Pringle), impending resignation of the Chair
of Logic and Metaphysics in Edinburgh University,
237
- Paul (J. H.), Boiler Chemistry and Feed-water Supplies,
421
- Peacock (D. H.), Joseph Priestley, 463
- Pearl (Prof. R.), Measuring the net reproductive ability
of mated pairs of the Domestic Fowl, 332; The con-
cept of Inbreeding, 333; The Sex-ratio in the Domestic
Fowl, 332; and Miss A. M. Boring, Hermaphroditism
in Poultry, 333; The Corpus Luteum in the Hen, 332;
and S. W. Patterson, Milk Production changing with
Age, 333

- Pearn (Capt. O. P. N.), Psychoses in the Expeditionary Forces, 371
- Pearson (Prof. Karl), National Life from the Standpoint of Science; The Function of Science in the Modern State, 112; The financial difficulties of the Galton Laboratory, 470
- Pearson (Miss L. K.), The Pungency of Synthetic Aromatic Ketones related to Zingerone, 455
- Pearson (R. S.), The Indian Forest Records. Vol. VI., Part IV.: "A Further Note on the Antiseptic Treatment of Timber, recording Results obtained from Past Experiments," 81
- Peddie (Prof. W.), The Thermo-dynamics of Unstable States, 299
- Pedersen (P. O.), Lichtenberg's Dust Figures, 352
- Penard (Dr. E.), *Folliculina boltoni*, S. Kent, 219; Some Flagellata from the vicinity of Geneva, 360
- Percival (Bishop), bequests by, 198
- Perkin (Prof. A. G.), and Dr. A. E. Everest, The Natural Organic Colouring Matters, 241
- Perring (W. G.), awarded the Earl of Durham Prize of the Institution of Naval Architects, 489
- Perrins (C. W. D.), an honorary degree conferred upon, by Oxford University, 318
- Peters (R. A.), appointed Senior Demonstrator of Biochemistry in Cambridge University, 37
- Petrie (Dr. J. M.), Occurrence of Methyl Lævoinositol in an Australian poisonous plant, 59
- Phear (Lt. H. W.), elected a fellow of Gonville and Caius College, Cambridge, 317
- Philip (A.), Calendar Reform and the Date of Easter, 264
- Phillips (L.), gift to University College, Aberystwyth, for a Plant-breeding Institute for Wales, 178
- Phillips (Rev. T. E. R.), Changes on Jupiter, 152
- Philpott (A.), The introduction of foreign Birds into New Zealand, 90
- Picard (E.), B. Baillaud, and M. Ferrié, Project as to the Determination of a Network of Longitudes and Latitudes all over the World, 339
- Pickering (Prof. E. C.), [obituary article], 28
- Pickering (Prof. W. H.), A Planet beyond Neptune, 514; The Origin of Novæ, 153; The Parallax of the Orion Nebula, 353
- Picon (M.), Action of the Monosodium derivative of Acetylene on some Halogen Esters of Secondary and Tertiary Alcohols, 200; Preparation of some true substituted Acetylenes by means of the Monosodium derivative of Acetylene, 440
- Pierce (W. D.), Second Supplement to monograph on the Strepsiptera, 289
- Piers (H.), The Orthoptera of Nova Scotia, 289
- Pike (Capt. O. G.), Birdland's Little People, 505
- Pilon (H.), Le Tube Coolidge. Ses Applications Scientifiques, Médicales et Industrielles, 224
- Pitt-Rivers (G.), Conscience and Fanaticism: An Essay in Moral Values, 342
- Plant (M. F.), bequest to the Connecticut College for Women, 138
- Plaskett (Dr. J. S.), The Dominion of Canada's 72-in. Telescope, 105
- Pocock (R. I.), External characters of existing Chevrotains (Tragulina), 17; Structural Characters by which the genera of Felidae may be distinguished from each other, 140
- Poirson (E.), A Method of Secret Telephony, 499
- Poitevin and Graham, The Mineralogy of Black Lake Area. Quebec, 372
- Poole (H. H.), Matter and Radiation, 84
- Pope (Sir W. J.), Chemistry in the National Service, 214
- Porter (Prof. A. W.), The Equation for the Chemical Equilibrium of Homogeneous Mixtures. Part I., 459
- Portevin and Garvin, The formation of Troostite at Low Temperatures in Carbon Steels, etc., 179
- Portier (Prof. P.), Les Symbiotes, 482
- Posey (Dr. W. C.), Hygiene of the Eye, 63
- Posnjak and Merwin, Natural Hydrated Ferric Oxides, 490
- Posternak (S.), Synthesis of the Hexaphosphate of Inosite and its Identity with the Phospho-organic reserve principle of Green Plants, 480; Two crystallised Salts of the phospho-organic reserve principle of Green Plants, 380
- Powell (H. J.), Glass-making before and during the War, 352
- Powell (R. F.), Visualisation of Features, 104
- Praeger (K. L.), Species of Sedum collected in China by L. H. Bailey in 1917, 38
- Preumont (G. F. J.), Wolfram Mining in Bolivia, 17
- Priem (Dr. F.), [obituary], 172
- Prince (Prof. E. E.), Lue in the Ocean: A Review of Recent Deep-sea Researches, 438
- Pringle (Dr. H.), appointed Professor of Physiology in Trinity College, Dublin, 257; elected King's Professor of the Institutes of Medicine in the School of Physic in Ireland, 78
- Prior (Dr. G. T.), The Meteorites Adare and Ensishem, 98
- Procter (Miss J. B.), Skull and Affinities of *Rana sub-sigillata*, 38
- Pugh (Capt. W. T.), appointed Professor of Geology in the University College of Wales, Aberystwyth, 499
- Punnett (Prof.), Experiments with Sweet Peas, 432
- Purefoy (Dr. R. D.), [death], 350
- Quinlan (Miss C. E.), Anatomy of the Lower Dicotyledons, III., 18
- Quinton (Major J.), appointed Lecturer in Mathematics at King's College, London, 479.
- Radcliffe (L. G.), awarded the gold medal of the Company of Dyers, 328
- Raman (Prof. C. V.), On the Mechanical Theory of the Vibrations of Bowed Strings and of Musical Instruments of the Violin Family, with Experimental Verification of the Results. Part I., 207; The Doppler Effect in the Molecular Scattering of Radiation, 165
- Rambaut (Dr. A. A.), The Visual Magnitudes of Nova Aquilæ, 53
- Ramsay (Sir W.), The Life and Letters of Joseph Black, M.D., 181
- Rankine (Dr. A. O.), The transmission of Speech by Light, 296
- Rastall (R. H.), appointed University Lecturer in Economic Geology in Cambridge University, 336; The Mineral Composition of Oolitic Ironstones, 359
- Rateau (A.), The flow of Gas at very high Pressures, 18
- Rathbone (Miss M.), Specimens of Plants preserved by submitting them to the action of Formalin Vapour, 98
- Raunkiaer (C.), Statistical Investigations on Plant Formations, 33
- Rawling (S. O.), appointed Lecturer in Chemistry at Robert Gordon's Technical College, Aberdeen, 295
- Rawson (E.), appointed head of the Mechanical and Civil Engineering Department of the Portsmouth Municipal College, 458
- Rây (Sir Prafulla Chandra), Essays and Discourses, 1; India and the cultivation of the Physical Sciences, 353
- Ray (Rai Bahadur Joges Chandra), The Sugar Industry in Ancient India, 251
- Ray (S. H.), A Melanesian Dictionary, 102
- Rayleigh (Lord), [death], 349; [obituary articles], 365, 366, 368
- Rayner (E. H.) approved for the degree of D.Sc. by Cambridge University, 336
- Reboul (G.), The Phenomena of Luminescence accompanying the Oxidation of Potassium and Sodium, 379
- Redwood (Sir Boverton), [obituary article], 287
- Reed (E. C.), Education for Genius, 518
- Reeves (E. A.), and others, A Transformation of the Magnetic Dip Chart, 72
- Reeves (Pember), resignation of the directorship of the London School of Economics, 278
- Regan (C. Tate), appointed Assistant Keeper of Zoology at the Natural History Museum, 49
- Régnier (R.), The Bacterial Nodule of the Poplar (*Micrococcus populi*), 460

- Reilly (Dr. J.), The production of Industrial Alcohol, 330; and E. Ralph, The System *n*-butyl Alcohol-acetone-water, 179
- Reinking (O. A.), Fungus diseases of Philippine Economic Plants, 354
- Renaud (J.), Difficulties met with in the study of Storms as a result of the uncertainty of the time of the Observations, 39
- Retzius (Gustav Magnus), 448
- Rey (J.), The Physical Properties of Petrol Vapour, 99
- Rheinberg (J.), Graticules, 239
- Richards (Prof. C. B.), [obituary], 210
- Richards (Prof. T. W.), The Problem of Radio-active Lead, 74; II., 93; and S. Boyer, Purification of Gallium by Electrolysis, etc., 19; W. M. Craig, and J. Same-shima, Purification by Sublimation and the Analysis of Gallium Chloride, 19; and W. C. Schumb, Refractive Index and Solubilities of the Nitrates of Lead Isotopes, 19
- Richardson (A. E.), appointed Professor of Architecture at University College, London, 278
- Richardson (L. F.), Atmospheric Stirring measured by Precipitation; Measurement of Water in Clouds, 57
- Richet (C.), P. Brodin, and Fr. Saint-Girons. Some Hæmatic Phenomena in Anaphylaxy and Antianaphylaxy, 39; The Immunising Action of Sodium Chloride against Anaphylactic Injection, 439; and H. Cardot, Sudden Mutations in the formation of a new race of Micro-organisms, 159; and G. Noizet, An Unsinkable Garment, protecting against Cold, 119
- von Richter (V.), Organic Chemistry, or Chemistry of the Carbon Compounds. Vol. I., "Chemistry of the Aliphatic Series," newly Translated and Revised by Dr. P. E. Spielmann. Second edition, 243
- Riddle (Dr. O.), An Egg of a Pigeon produced under the weakening influence of "reproductive over-work" 437; Sex Reproduction, and Heredity in Pigeons, 436; and C. E. Anderson, Quinine and the reduction in the yolk size and total size of eggs, 437; and J. A. Harris, Correlation between Fat Content in the blood of Fowls and the total Egg records, 437; and V. K. La Mer, Postmortem formation of Melanin in the pigmentless Retinas an Choroids of Embryo White Ring-doves, 437
- Rideal (Dr. S.), Catalytic Chemistry, 281
- Ridewood (Dr. W. G.), Cephalodiscus from Adelle Land and Queen Mary Land, 54
- Ridgeway (Sir W.), Ancestor Worship and the Chinese Drama, 231
- Riet (B. de St. J. v.d.), Coloration produced in Clay by injured roots of *Pinus pinea*, 460
- Righi (Prof. A.), Electro-Atomic Phenomena in the Magnetic Field, 384; I Fenomeni Elettro-Atomici sotto l'Azione del Magnetismo, 82
- Rintoul (D.), [death], 150; [obituary], 231
- Ripper (Prof.), Science and Reconstruction, 296
- Ritchie (Dr. J.), Wasps, 245
- Rivers (Dr. W. H. R.), Dreams and Primitive Culture, 70
- Robert (M. H.), A new Laboratory form of Fractionating Column and the Measurement of its Efficiency, 299
- Roberts (Major C. G. D.), The Ledge on Bald Face, 22
- Roberts (Prof. H. F.), A Darwinian Statement of the Mendelian Theory, 463
- Robertson (Major A.), appointed Professor of Mechanical Engineering in Bristol University, 358, 397
- Robertson (Dr. J.), appointed Professor of Hygiene and Public Health in Birmingham University, 379
- Robertson (J. B.), appointed Lecturer in Chemistry in the South African School of Mines, Johannesburg, 358
- Robertson (Miss M.), the Anaerobic Bacteria which infect wounds, 454
- Robertson (Prof. T. B.), appointed Professor of Physiology in Adelaide University, 418
- Robin (A.), The Hydration, Soluble Residue, and Insoluble Residue in Cancer of the Liver, 320
- Roepke (Dr. W.), Entomological Papers by, 269
- Rogers (Lt.-Col. Sir L.), Recent Researches on Cholera, 254; Scientific Enthusiasm and Official Apathy, 229
- Rose (B. T.), appointed Demonstrator of Anatomy in Birmingham University, 379
- Rose (Sir T. K.), The Volatilisation of Gold, 98
- Rosenbaum (Mr.), Comet, 1915a (Mellish), 92
- Rosenhain (Dr. W.), Some Phenomena of Pot Attack, 297; and S. L. Archbutt, The Inter-Crystalline fracture of Metals under Prolonged Application of Stress, 118
- Rosenheim (O.), A Preliminary Study of the Energy Expenditure and Food Requirements of Women Workers, 279; and the title of Assistant Professor of Physiology conferred upon, 479
- Ross (D. W.), H. Insley and A. A. Klein, Properties of Refractory Materials used in high-temperature furnaces, 513
- Ross-Johnson (M.), and D. Woodman, appointed Demonstrators of Physiology at the London (Royal Free Hospital) School of Medicine for Women, 458
- Roubertie (P.), and A. Nemirovsky, New Fluorescent screens for use in Radioscopy, 519
- Rouch (J.), The ascensional velocity of Pilot Balloons, 459; The Velocity of the Wind in the Stratosphere, 419
- Row (Mrs.), thanked for her donation to King's College, London, for a scholarship, 358
- Row (R. W. H.), [obituary], 51
- Ruddiman (Prof. E. A.), Pharmacy, Theoretical and Practical, including Arithmetic of Pharmacy, 83
- Ruedemann (R.), Phylogeny of the Acorn Barnacles, 19
- Ruhland (Dr. W.), appointed Professor of Botany in Tübingen University, 96
- Runnström (J.), Movements and Physiology of Sea-urchin Larvæ, 390
- Russell (Dr. A.), The Principles of Radio-communication, 423
- Russell (B.), Propositions: What they are and how they Mean, 413
- Russell (Dr. E. J.), elected a foreign member of the Royal Swedish Academy of Agriculture, 111; Prof. J. J. T. Schløesing, 169; The Credibility of Long-continued Experiments, 324; The Development of Agricultural Research and Education in Great Britain, 227
- Rutherford (Sir E.), appointed Cavendish Professor of Experimental Physics in Cambridge University, 117; Collision of α -Particles with Light Atoms, 415; elected to a fellowship at Trinity College, Cambridge, 198
- Ruttan (Prof. R. F.), elected President of the Royal Society of Canada, 438
- Sabatier (P.), A Mailhe, and G. Gaudion, Action of finely divided Metals upon Pinene Vapour, 280; and A. Mailhe, The Catalytic formation of Alkyl Chlorides, 479; and G. Gaudion, Catalytic Dehydrogenation by Nickel in presence of Hydrogen, 159
- Safford (W. E.), The Xochipalli, or Flower-paint of the Aztecs, 32
- Salter (C.), awarded the President's Premium of the Institution of Water Engineers, 471; The Relation of Rainfall to Configuration in the British Isles, 91
- Samaan (K.), An Experimental Study of Strophanthus, Kombé, Seeds, 455
- Sampson (Prof.), Report of the Royal Observatory, Edinburgh, 453
- Sanfourche (A.), The Oxidation Cycle of Nitric Oxide in Presence of Water, 39
- Sargent (F.), Observed changes on Jupiter, 134
- Saunders (Miss E. R.), The Genetics of Stocks, 432
- Sauvageau (C.), and L. Moreau, Marine Algæ as food for Horses, 419
- Sayles (R. W.), A Model of the Volcano Kilauea, Hawaii, 456
- Scarborough (E.), appointed Demonstrator in Pharmacology at the London (Royal Free Hospital), School of Medicine for Women, 458
- Schafer (Sir E. S.), The Position of Physiology in Medicine, 173, 210
- Schaumasse (A.), Observations of the Kopff Comet at Nice Observatory, 519
- Schimpf (Prof. H. W.), A Systematic Course of Qualitative Chemical Analysis of Inorganic and Organic Substances, with Explanatory Notes. Third edition, 362; Essentials of Volumetric Analysis: An Introduction to

- the Subject, adapted to the needs of Students of Pharmaceutical Chemistry. Third edition, 362
- Schlesing (Prof. J. J. T.), [death], 8; [obituary article], 169
- Schneider (E.), Address at Banquet of the Iron and Steel Institute, 209
- Schotte (Prof. G.), Cultivation of the Larch in Sweden, 176
- Schouten (Dr. W. J. A.), The Parallax of the Pleiades, 374
- Schryver (Prof. S. B.), An Introduction to the Study of Biological Chemistry, 43
- Schwarz (E. H. L.), The Progressive Desiccation of Africa, 91
- Schweizer (K.), a Method of producing Glycerol, 252
- Seely (Major-Gen. J. E. B.), Research in Aviation, 312; Military Aviation, 48
- de Segundo (Ed. C.), How the Cotton Plant provides us with Foodstuffs and other Commodities as well as with Clothing, 451; The Interdependence of the Cotton and the Cotton-seed Industries, 414; The Removal of the Residual Fibres from Cotton-seed and their value for Non-textile Purposes, 153
- Sellards (Dr. A. Watson), The Principles of Acidosis and Clinical Methods for its Study, 162
- Selous (Mrs.), presentation of Big-game trophies and European Birds' Eggs to the Natural History Museum, 274
- Seward (Prof. A. C.), New Knowledge of a Puzzling Group of Gymnosperms, 115
- Shaiffer (Dr.), Appointed Expert in Animal Husbandry to the Government of Mysore, 471
- Shand (A. F.), Emotion and Value, 140
- Shann (Capt. E. W.), Comparative Anatomy of the Shoulder-girdle and Pectoral Fin of Fishes, 18
- Shapley (Dr. H.), Distribution of Globular Clusters and Spiral Nebulae, 514; Globular Clusters, Cepheid Variables, and Radiation, 25; The Age of the Stars, 284
- Shaw (Sir Napier), Introductory Meteorology, 123; Resumption of the administrative duties of the Directorship of the Meteorological Office, 210; Meteorology: The Society and its Fellows, 475
- Sheldon (Prof. W. H.), Strife of Systems and Productive Duality: An Essay in Philosophy, 361
- Shelton (H. S.), The Syllogism and other Logical Forms, 351
- Sheppard (T.), Martin Simpson and his Geological Memoirs, 433
- Shinjo (S.), and Y. Watanabe, Celestial Systems, 153; Mass and Momentum of Stellar Systems, 474
- Sidgreaves (Father W.), [obituary article], 307
- Sidgwick (Miss), a fellowship founded as a memorial to, 336
- Silsbee (F. B.), and R. K. Honaman, Insulating Materials used in Sparking-plugs, 391
- Simmonds (C.), Beverages, 482; Peacock's Joseph Priestley, 463
- Simpson (E. S.), The Sources of Industrial Potash in Western Australia, 450
- Simpson (Prof. F. M.), the title of Emeritus Professor conferred upon, by the University of London, 439
- Simpson (Dr. J. J.), appointed Keeper of Zoology in the National Museum of Wales, 289
- Simpson (J. W.), elected President of the Royal Institute of British Architects, 370
- Singer (Dr. C.), Roger Bacon (1214-94), 35
- Sivan (M. R. R.), Phosphatic Nodules of Trichinopoly and their availability as Manure, 137
- Skinner (H. D.), Moriori Vessels, 329
- Skinner (S.), and R. W. Burfitt, Temperature Coefficient of Tensile Strength of Water, 38
- Slade (Dr. R. E.), appointed Director of Research by the British Photographic Research Association, 132; Report on work in progress or contemplation by the British Photographic Research Association, 434
- Sladen (F. W. L.), The Stinging Instinct in Bees and Wasps, 325
- Slaughter (Prof. H. E.), elected President of the Mathematical Association of America, 131
- Slessor (H. H.), The Nature of Being: An Essay in Ontology, 342
- Slipher (Prof.), The Light of the Aurora and the Auroral Line, 411
- Small (Dr. J.), *Triticum repens*: A Commercial Rarity, 455
- Smallwood (Prof. W. M.), A Text-book of Biology. For Students in General, Medical, and Technical Courses. Third edition, 202
- Smart (W. M.), appointed Chief Assistant at Cambridge Observatory, 16
- Smiles (Dr. S.), appointed Professor of Organic Chemistry at Armstrong College, 458
- Smith (Prof. E. F.), Electro-analysis. Sixth edition, 363; and W. K. van Haagen, The Atomic Weights of Boron and Fluorine, 347
- Smith (Prof. F.), The Life of the Rev. S. Hales, 150
- Smith (Dr. F. J.), [obituary], 191
- Smith (G. Carlton), Trinitrotoluenes and Mono- and Dininitrotoluenes: their Manufacture and Properties, 421
- Smith (Prof. G. Elliot), appointed an Arris and Gale Lecturer, 350; appointed Professor of Anatomy at University College, London, 278; elected President of the Manchester Literary and Philosophical Society, 210; Significance of the Cerebral Cortex, 396; The Bird's Brain, 118; The Primitive Nervous System, 322
- Smith (Dr. G. F. H.), A Student's Goniometer, 98
- Smith (J.), Forms assumed by the Pappus in Compositæ, 219
- Smith (R. A.), Discovery of Flint Implements from Victoria West, South Africa, 410
- Smith (Dr. S. W. J.), elected to the Poynting Chair of Physics in Birmingham University, 198
- Smith (T.), The Spacing of Glass-working Tools, 159
- Smith (T. Alford), A Geography of America, 444
- Smith (Watson), The Spontaneous Combustion of Haystacks, 491
- Smith (Lt.-Col. W. D.), foundation of a scholarship at the Madras Medical College, 517
- Smith (W. P.), and E. G. Jewett, An Introduction to the Study of Science: A First Course in Science for High Schools, 424
- Snow (A.), Calculation of Occultations of Stars by the Moon, 194
- Soddy (Prof. F.), elected to the Second Chair of Chemistry in Oxford University, 178; elected a foreign member of the Swedish Academy of Sciences, 328; Globular Clusters, Cepheid Variables, and Radiation, 43; Labour and the Higher Values, 447; New Wine into old Bottles, 308; Research and Service, 404; The Conditions attached to Government Grants for Scientific Research, 226
- Sollas (Prof. W. J.), Structure of Lysorophus as exposed by serial sections, 279; The Face of the Earth, 502
- Sollier (P.), Chartier, F. Rose, and Villandre, *Traité Clinique de Neurologie de Guerre*, 501
- Southall (Prof. J. P. C.), Mirrors, Prisms, and Lenses. A Text-book of Geometrical Optics, 302
- Southern (R. W. A.), [death], 51
- Spencer (Dr.), appointed Head of the Department of Inorganic and Physical Chemistry at Bedford College for Women, 479
- Spencer (Dr. G. L.), *Manual de Fabricantes de Azucar de Caña y Químicos Azucareros. Traducción Autorizada de la 6ª Edición Inglesa*, Dr. G. A. Cuadrado, 383
- Spencer (L. J.), Curvature in Crystals, 98
- Speyer (E. R.), Wild Birds and Distasteful Insect Larvæ, 445
- Spilsbury (B. H.), appointed Lecturer in Forensic Medicine and Toxicology at the London (Royal Free Hospital) School of Medicine for Women, 458
- Sprague (Dr. A. E.), appointed University Lecturer in Actuarial Science in Edinburgh University, 78
- Squier (Major-Gen. G. O.), presentation to, of the Franklin Medal, 309
- Squier (Gen.), Trees as antennæ in Radio-Telegraphy and Radio-telephony, 373
- Stamp (Dr. J. C.), awarded the Guy Medal of the Royal Statistical Society, 309
- Stanley (Sir A.), resignation of the Presidency of the Board of Trade, 250
- Stapleton (R. G.), appointed Professor of Agricultural

- Botany and Director of the Plant-breeding Institute at University College, Aberystwyth, 178
- Starling (Prof. E. H.), Report on the Food Conditions in Germany, 471
- Stebbing (Rev. T. R. R.), Faith in Fetters, 224
- Stebbins (Dr. J.), The American Astronomical Society, 325; and E. Dershem, Magnitude of Nova Aquilæ, 474
- Steel (T.), The External Parasites of the Dingo, 420; Food of Rats, 345
- Stefanescu (S.), Structure of the Plates of the Molars of *Elephas indicus* and the different origin of the two species of living elephants, 380
- Stefanik (Genl. M.), [obituary], 231
- Steinheil (Dr. A.), and Dr. E. Voit, Applied Optics: The Computation of Optical Systems. Translated and edited by J. W. French. Vol. II., 401
- Stenhouse (A. S.), and Major W. Bisset, presentation of minerals, rocks and fossils to the Geology department of Edinburgh University, 78
- Stenning (E. H.), A Brilliant Auroral Display, 9
- Stevens (F.), The Educational Work at the Salisbury Museum, 1916-19, 337
- Stewart (Dr. A. W.), appointed Professor of Chemistry in the Queen's University of Belfast, 479; Recent Advances in Physical and Inorganic Chemistry. Third edition, 322
- Stirling (Sir E. C.), [death], 69; [obituary article], 87
- Stone (H.), appointed University Lecturer in Forestry in Cambridge University, 336
- Stopes (Dr. Marie C.), The Ingredients of Bituminous Coal, 473; The Bennetiales, 116
- Storkerson (S.), Arrival with his party on the Alaskan Coast, 8
- Strachan (J.), The Chemistry of Dendritic Growths in Paper, 219
- Strong (Dr. J.), appointed Professor of Education in Leeds University, 418
- Strong (Dr. W. M.), awarded the Murchison grant by the Royal Geographical Society, 52
- Strutt (Hon. R. J.), Bakerian lecture: A Study of the Line-spectrum of Sodium as excited by Fluorescence, 359; Scattering of Light by Solid Substances, 37
- Stuart (Capt. M.), The Earthquake in Eastern Bengal, etc., on July 8, 1918, 91
- Stuck (Ven. Archdeacon), awarded the Back grant by the Royal Geographical Society, 52
- Sturge (Dr. W. A.), [obituary], 111
- Sturtevant (A.), Experiments with *Drosophila melanogaster* (*ampelophila*), 354
- Styles (Sir H. H.), appointed Professor of Clinical Surgery in Edinburgh University, 418
- Sudeley (Lord), and others, Museums as Educational Instruments, 49
- Suess (Prof. Ed.), La Face de la Terre (Das Antlitz der Erde), Tome III., 4e Partie; Tables Générales de l'Ouvrage, Tomes I., II., III., 502
- Sutton (J. R.), Some Controversial Notes on the Diamond, 299; The Study of the Diamond Macle, with a note on the Internal Structure of Diamond, 480
- Svärdson (J.), Comet 1914c (Neujmin), 92
- Swaine (J. M.), The Canadian Bark-beetles, 269
- Swinton (A. A. Campbell), Wireless Telephony, 284, 304
- Sydenham (Lord), Address at the opening of the British Scientific Products Exhibition, 374; Science and Labour Unrest, 312
- Sylov (Prof. L.), [obituary article], 49
- Sylvén (N.), Variety of the Common Pine indigenous in Northern Sweden, 176
- Taboury (F.), and M. Godchot, A new method for the preparation of Bicyclic Ketones, 459
- Tait (Capt. J.), appointed Drake Professor of Physiology at McGill University, 336
- Tallantyre (S. B.), The Formaldehyde process for estimating Bismuth, 455
- Tasaki (B.), and U. Tanaka, Isolation of "Robitin," 132
- Tattersall (Dr. W. M.), elected Secretary of the Museums Association, 395
- Taylor (F. H.), Australian Tabanidæ, No. IV., 420; Contributions to a Knowledge of Australian Culicidæ, No. 4, 59
- Taylor (Dr. Griffith), An Orographical Map of Australia, 251; The Australian Environment (especially as controlled by Rainfall), 447
- Teed (Major P. L.), The Chemistry and Manufacture of Hydrogen, 442
- Tempany (Dr. H. A.), The Casuarina Woods in Mauritius, 290
- Thane (Sir G.), The title of Emeritus Professor conferred upon, by the University of London, 439
- Thoday (D.), Botany: A Text-book for Senior Students. Second edition, 301
- Thomas (Dr. C. J.), and Sir G. Newman, Health of School Children, 11
- Thomas (Dr. Ethel N.), appointed Keeper of Botany in the National Museum of Wales, 289
- Thomas (J. W.), appointed Lecturer in the Electrical Engineering Department of the Birmingham Municipal Technical School, 458
- Thompson (Prof. D'Arcy W.), Mean Sea-level, 493; Tropisms, 163; Whales landed at the Scottish Whaling Stations, 32
- Thompson (Dr. J. M'L.), The Stellar Anatomy of *Platy-zoma microphyllum*, R.Br., 18
- Thompson (Prof. P.), Resignation of the position of Dean of the Faculty of Medicine of Birmingham University, 379
- Thomson (Prof. Arthur), The Maturation of the Human Ovum, 472
- Thomson (H.), Mars, 212; Nova Aquilæ, 353
- Thomson (Dr. J. Allan), The Brachiopoda collected by the Australian Antarctic Expedition, 54
- Thomson (Sir J. J.), appointed a member of the Advisory Council to the Committee of the Privy Council for Scientific and Industrial Research, 230; Developments in Applied Science, etc., 312; elected Professor of Physics in Cambridge University, 418; elected to the Standing Committee of the British Museum, 230; resignation of the Cavendish Professorship of Experimental Physics in Cambridge University, 37; The Ideal of Science Teaching, 273
- Thomson (W.), appointed Principal of the Croydon Polytechnics, 257
- Thorpe (Sir T. E.), Some Recent Atomic Weight Determinations, 346; The Life-work of a Hindu Chemist, 1
- Tieghem (Prof. Ph. Van), *Éléments de Botanique*. Tome I., *Botanique Générale*; Tome II., "*Botanique Spéciale*." Cinquième édition, remaniée et augmentée par Prof. J. Costantin, 301
- Tilden (Sir W. A.), Absorption of Gases by Charcoal, 24; Chemistry in Reconstruction, 392
- Tilly (S. H.), International Use of Patent Searches, 70
- Tillyard (Dr. R. J.), A Fossil Insect Wing belonging to the new order Paramecoptera, 519; Australian Megaloptera or Alder-flies, with descriptions of new genera and species, 59; Mesozoic Insects of Queensland. Part V., Mecoptera, 520; Morphology and Systematic position of the family Micropterygidae (sens. lat.). Introduction and Part I.: The Wings, 420; Studies in Australian Neuroptera. No. 6: The family Psychopsidæ, 58; Studies in Australian Neuroptera. No. 7: The life-history of *Psychopsis elegans*, Guérin, 59; The Panorpid Complex. Part II., 19
- du Toit (A. L.), Zoning of the "Karoo System" of South Africa, 330
- Torday (E.), The Northern Babunda Tribe, 251
- Torii (R.), Les Ainou des Iles Kouriles, 432
- Tower (Dr. W. L.), The Mechanism of Evolution in Lepidoptera, 517
- Townsend (Prof. E.), [death], 191
- Travers (Dr. M. W.), Experiments with a Gas-fired Pot-furnace, 419
- Trémont (C.), New Methods for the Mechanical Testing of Metals, 518
- Triffitt (Miss), appointed Demonstrator in Organic Chemistry at Bedford College for Women, 479
- Trow (Dr. A. H.), appointed Principal of the University College of South Wales and Monmouthshire, 336

- Trowbridge (Col. A.), Work of the Sound-ranging Service of the A.E.F., 317
- True and Geise, The Value of Greensand (Glauconite) deposits as a source of the potassium required by growing plants, 271
- Truffaut (G.), and H. Colt, Army Gardens in France, Belgium, and Occupied German Territory, 343
- Truscott (S. J.), Slime Treatment on Cornish Frames: Supplements, 17
- Tulloch (Major W. J.), Distribution of the Serological types of *B. tetani* in Wounds of Men who received Prophylactic Inoculation, 17.
- Turner (A. J.), appointed to the Chair of Textile Technology in the Manchester College of Technology, 37
- Turner (Dr. A. Logan), Sir William Turner, K.C.B., F.R.S., 341
- Turner (Sir William), K.C.B., F.R.S., Dr. A. Logan Turner, 341
- Tutton (Dr. A. E. H.), Monoclinic Double Selenates of the Cobalt Group, 398; The Crystallographic and Physical Investigation of the Sulphates and Selenates, 452
- Tweedy (Sir J.), asked to deliver the Thomas Vicary Lecture, 350
- Twenhofel (W. H.), Chert in Kansas and Oklahoma, 433
- Tyndall (Dr. A. M.), appointed Professor of Physics in Bristol University, 397
- Unwin (E. E.), The reproduction of *Asellus aquaticus*, 319
- Urbain (Ed.), and C. Scal, The decomposition of Dielectric Liquids surrounding an Arc, 259
- Vanderstichele (Miss), appointed Demonstrator in Organic Chemistry at Bedford College for Women, 479
- Van Hise (Dr. C. R.), Proposal to erect a Geological Building in the University of Wisconsin as a memorial to, 499
- Van Nostrand's, Chemical Annual, Fourth Issue, 1918, Edited by Prof. J. C. Olsen. Assistant Editor, M. P. Matthias, 221
- Varley (Dr. W. M.), appointed Principal of the Brighton Municipal Technical College, 278
- Vayssière (P.), Some methods for the destruction of Crickets and their application, 519
- Vernon (Dr. H. M.), Dr. W. C. Sullivan, Capt. M. Greenwood, and N. B. Dreyer, Influence of Alcohol on Manual Work, etc., 511
- Vickers (A.), [obituary], 390
- Violle (H.), The Peroxydases in Milk, 519
- Viès (F.), The Absorption Spectra of the Hæmoglobins from Annelids, 519; The Serial Constitution of Absorption Spectra, 319
- Vogel (Dr. Ph.), The Sign of the Spread Hand, or Five-finger Token, in Pali Literature, 489
- Vournasos (A. C.), The Normal Nitrides of Nickel and Cobalt, 259
- Wager (Dr. H.), The Colour-sense of Wasps, 58
- Waite (E. R.), Feeding-habits of Nestling Bee-eaters, 4
- Walcott (R. H.), Origin of the Volcanic Tuff of Pejark Marsh, Victoria, 440
- Walden (A. E.) appointed Professor of Chemistry in the Wilson College, Bombay, 358
- Wales (Prince of), elected an honorary member of the Institution of Civil Engineers, 192; elected to the Standing Committee of the British Museum, 230; to be proposed for election to the Royal Society, 230
- Walker (Miss H.), appointed Lecturer in Physiology in Birmingham University, 379
- Walker (Prof. J.), Inorganic Chemistry. Eleventh edition, 283
- Walkom (Dr. A. B.), Jurassic Plants from Bexhill, near Lismore, N.S.W., 420; The Mesozoic Floras of Queensland, 450
- Wallace (Major-Gen. C.), and Major J. Fraser, Surgery at a Casualty Clearing Station, 282
- Waller (Dr. E.), [obituary], 408
- Wallis (T. E.), The Use of Lycopodium in Quantitative Microscopy, 455
- Walter (A. J.), [obituary], 131
- Walter (Prof. H. E.), The Human Skeleton: An Interpretation, 383
- Wanach (B.), Variation of Latitude, 10
- Ward (Prof. A. W.), [obituary], 432
- Ward (H.), [death], 471
- Ward (Prof. R. De C.), Weather Controls over the Fighting during the Autumn of 1918, 73
- Wardlaw (Dr. H. S. H.), Relation between the Fat-content and the electrical conductivity of Milk, 19; The Temperature of *Echidna aculeata*, 59
- Warnes (A. R.), Coal-tar and some of its Products, 221
- Washington (Col. F. P.), [death], 51
- Waters (A. W.), Selenariadæ and other Bryozoa, 360
- Waters (H. J.), and Prof. J. D. Elliff, Agricultural Laboratory Exercises and Home Projects adapted to Secondary Schools, 124
- Watkins (A.), Photography: Its Principles and Applications. Second edition, 461
- Watson (Prof. G. N.), Question Relating to Prime Numbers, 364
- Watson (Lt.-Col. W.), [obituary article], 29
- Watt (James), Scheme at Birmingham for celebrating the centenary of the death of, 217; Centenary Commemoration at Birmingham, 507
- Watts (F.), Echo Personalities: A Short Study of the Contributions of Abnormal Psychology towards the solution of some of the Problems of Normal Education, 382
- Watts (Rev. W. W.), Some Notes on *Neurosoria pteroides*, 520
- Webb (W. M.), The Brent Valley Bird Sanctuary, 426
- Webster (Prof. A. G.), A grant to, by the Rumford Committee of the American Academy of Arts and Sciences, 131
- Wedmore (E. B.), appointed Director of Research by the Electric Research Committee, 191
- Weighton (Dr. R. L.), Resignation of the Chair of Engineering at Armstrong College, 336
- Weir (Lord), Developments in Aircraft Design and Application during the War, 395
- Weiss (Dr. E.), [obituary], 190
- West (Prof. G. S.), Gift of mosses, hepatics, and lichens to Birmingham University, 397; [obituary], 470
- Wherry (E. T.), and E. Q. Adams, Classification of Mimetic Crystals, 473
- Whiddington (R.), appointed University Lecturer in Experimental Physics in Cambridge University, 418; The Self-oscillations of a Thermionic Valve, 298
- Whipple (F. J. W.), Absolute Scales of Pressure and Temperature, 296
- Whipple (R. S.), Electrical Methods of Measuring Body Temperatures; The Electro-Cardiograph, 133; The Design of Optical Munitions of War, 475
- Whitaker (W.), The Section at Worms Heath (Surrey), with remarks on Tertiary Pebble-beds and on Clay-with-flints, 178; and Dr. J. C. Thresh, The Water Supply of Essex from Underground sources; the Rain-fall by Dr. H. R. Mill, 242
- White (E. G.), The Voice Beautiful in Speech and Song. A Consideration of the Capabilities of the Vocal Chords and their work in the Art of Tone Production, 124
- White (G. T.), appointed Head of the Engineering and Building Department of Goldsmiths' College, 479
- White (Major N.), The Influenza Epidemic in India, 52
- White (S. A.), and A. M. Morgan, The food of Cormorants, 150
- Whitehouse (B.), To deliver the Ingleby Lecture in 1920, 397
- Whitehouse (Prof. R. H.), Indian Land Planarians, 211
- Whitmell (C. T.), The Whiteness of the Daylight Moon, 145
- Whitnal (Capt. S. E.), appointed Professor of Anatomy at McGill University, 336
- Wiechmann (Dr. F. G.), [obituary], 210
- Wild (L. A.), Method of Measuring the Magnetic Hardness of Ferrous Metals, 459
- Wilde (Dr. H.), [death], 89; [obituary article], 129
- Wiley (Dr. H. W.), Beverages and their Adulteration.

- Origin, Composition, Manufacture, Natural, Artificial, Fermented, Distilled, Alkaloidal, and Fruit Juices, 482
- Wilkinson (Lt.-Commr. N.), Camouflage of Ships of War, 304; Dazzle-painting of Ships, 395
- Wilkinson (the late W. H.), The collection of lichens and associated library of, presented to Birmingham University, 397
- Willcocks (Sir W.), The Sudd Reservoir, 233
- Williams (Lt.-Col. A. C.), The Design and Inspection of Certain Optical Munitions of War, 475
- Williams (E. O.), The Economic Size of Concrete Ships, 33
- Williams (S. H.), A new Process of Printing on Paper in Natural Colours, 133
- Willows (Dr. R. S.), and E. Hatschek, Surface Tension and Surface Energy and their Influence on Chemical Phenomena. Second edition, 23
- Wilson (C. T. R.), A Micro-voltmeter, 298; appointed Reader in Electrical Meteorology in Cambridge University, 379
- Wilson (Prof. E.), and Prof. E. F. Herroun, The Magnetic Properties of Varieties of Magnetite, 399
- Wilson (Sir Henry), Lord Gorell's work, 313
- Wilson (Miss Mona), Acceptance of membership of the Industrial Fatigue Research Board, 172
- Wilson (M. E.), Rocks of Timiskaming County, Quebec, 390
- Wilson (Dr. W.), appointed Senior Lecturer in Physics at King's College, London, 479
- Winchell (A. N.), and E. R. Miller, A remarkable Dustfall at Madison, Wisconsin, 310
- Winterbotham (Lt.-Col. H. S. L.), British Survey Work on the Western Front, 173
- Witherby (H. F.), A Practical Handbook of British Birds. Part I., 323
- Witting (Prof. R.), Hafsvtan, Geoidvtan och Landhöjningen utmed Baltiska Hafvet och vid Nordsjön, 493
- Wodehouse (Dr. H. M.), appointed Professor of Education in Bristol University, 397
- Wolf (Dr. C. G. L.), The National Research Council of the United States, 245
- Wood (Dr. J. K.), appointed Lecturer in Physical Chemistry at the Manchester College of Technology, 518
- Wood (Mrs. Orson), appointed Demonstrator in Physics at Bedford College for Women, 479
- Wood (R. C.), Grading Cotton, 137
- Wood (Prof. R. W.), Uses of Invisible Light in Warfare, 138
- Woodman (Miss), appointed Part-time Demonstrator in Physiology at Bedford College for Women, 479
- Woodward (Dr. A. Smith), elected President of the Linnean Society, 268; Presidential address to the South-Eastern Union of Scientific Societies, 314; The Dentition of the Petalodont Shark, *Climaxodus*, 319
- Woodward (Dr. H.), re-elected President of the Palæontographical Society, 172
- Wordie (J. M.), appointed Demonstrator of Petrology in Cambridge University, 336
- Wren (T. L.), appointed Reader in Geometry at University College, London, 439
- Wright (Sir Almroth), The Lessons of the War and some new Prospects in the Field of Therapeutic Immunisation, 112
- Wright (R.), Effect of some simple Electrolytes on the Temperature of Maximum Density of Water, 113
- Wright (R. S.), Manufacture of the Snook Machine, 271; X-Rays and British Industry, 244
- Wright (W. B.), The Palæozoic floor of North-Eastern Ireland, with predictions as to concealed Coalfields, 58
- Yamamoto (I.), Variation of Latitude, 10
- Yamanouchi, Iwashima, and Sakakami, The Influenza Epidemic of 1918-19, 420
- Yeri (M.), and T. Kaburaki, The Polyclad Turbellaria of the Japanese Coasts, 472
- Yorke (Dr. W.), Amoebic Dysentery, 137
- Young (A. W.), appointed Lecturer on Pure and Applied Mathematics at the Sir John Cass Technical Institute, 218
- Young (J.), Explosives, 414
- Young (Prof. W. H.), appointed Professor of Mathematics in the University College of Wales, Aberystwyth, 499; The Area of Surfaces, 258
- Younger (Dr. and Mrs.), Gift to St. Andrews University for a Memorial Hall, 198
- Zilva (S. S.), and E. M. Wells, Dental Changes in the Teeth of the Guinea-pig produced by a Scorbutic Diet, 17

TITLE INDEX.

- Aberdeen: Robert Gordon's Technical College, S. O. Rawling appointed Lecturer in Chemistry at, 295; University, Prof. A. Finlay appointed to the Chair of Chemistry in, 397; Prof. C. R. Marshall appointed Regius Professor of Materia Medica in, 218
- Abortion of Cattle, Contagious, 329
- Absorption: by Turbid Media, C. Chéneveau and R. Audubert, 119; of Gases by Charcoal, Sir W. A. Tilden, 24; Spectra, The Serial Constitution of, F. Vlès, 319; of the Hæmoglobins from Annelids, F. Vlès, 519
- Abyssinia and Eritrea, Analysis of the Population of, Prof. Giuffrida-Ruggeri, 192
- Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique: E. S. Goodrich elected an Associate of the, 370; Sir Norman Lockyer elected an Associate of the, 350
- Academy, The Royal, 188
- Acetylenes, Preparation of some true Substituted, by means of the Monosodium Derivative of Acetylene, M. Picon, 440
- Acid: Phosphates, Some Properties of the, A. Joannis, 380; -steel Furnace Slags, An Anorthic Metasilicate from, A. F. Hallimond, 98
- Acidified Chromate replaced by a Solution of Potassium Chloro-chromate, Lumiere and Seyewetz, 491
- Acidosis: Dr. J. S. Haldane, 162; The Principles of, and Clinical Methods for its Study, Dr. A. W. Sellards, 162
- Acorn Barnacles, Phylogeny of the, R. Ruedemann, 19
- Acoustic Experiments in connection with Whistles and Flutes, Dr. R. Dunstan, 97
- Acoustics, Submarine, Dr. F. L. Hopwood, 467
- Acquired Characters: Dr. Kammerer's Testimony to the Inheritance of, Prof. W. Bateson, 344; The Inheritance of, Prof. E. W. MacBride, 225
- Adelaide University, Dr. T. B. Robertson appointed Professor of Physiology in, 418
- Admiralty: A. P. McCullen appointed Adviser on Education, 96; Tide-Tables, 331
- Aerial Photography, 115; Calculations in, L. P. Clerc, 352
- Aeronautical Research, The Air Force Estimates and, Gen. Seely, 48
- Aeronautics, Forthcoming Exhibition of, 510
- Aeroplanes: and Seaplanes, The Government Competition for, 510; Reduction of the Visibility of, Luckiesh, 290
- Afforestation, J. Boyd, 83
- Africa: East Central, A Scientific Expedition to, 208; The Progressive Desiccation of, E. H. L. Schwarz, 91
- Africa, Expedition to, under Leadership of E. Heller, 510
- Aggregate, A Proof that any, can be Well-ordered, P. E. B. Jourdain, 45
- Agricultural: Bacteriology, Dr. H. W. Conn. Third Edition revised by H. J. Conn, 304; Grasses and their Culture, H. A. Melle, 33; History Society, an, Established in Washington, 518; Laboratory Exercises and Home Projects Adapted to Secondary Schools, H. J. Waters and Prof. J. D. Elliff, 124; Policy, Forthcoming Appointment of a Royal Commission on, 190; Research and Agricultural Education, The Government and, 218; Research and Education in Great Britain, The Development of, Dr. E. J. Russell, 227; in Madras, 137
- Agriculture: and Fisheries, Board of, Appointment of Lord Lee of Fareham as President of the, 489; Machines for, Appointment of a Departmental Committee of the Board of Agriculture and Fisheries for the Testing, etc., of, 328
- Ainou, Les, des Iles Kouriles, R. Torii, 432
- Aircraft: Design and Application during the War, Developments in, Lord Weir, 395; Production in the United States, A Committee Appointed on, 149
- Air: Force Estimates, The, and Aeronautical Research, General Seely, 48; Navigation: Notes and Examples, Instructor Capt. S. F. Card, 481; Routes, Civilian 175; Proposed, 268
- Airship Construction, C. I. R. Campbell, 134
- Airships, The Commercial Use of, 4
- Alcohol: -Acetone-Water, The System *n*-butyl, Dr. J. Reilly and E. Ralph, 179; Effect of, on Psycho-Physiological Functions, Dr. W. R. Miles, 151; Industrial, Production of, in Ireland, Dr. J. Reilly, 330; Influence of, on Manual Work, etc., Dr. H. M. Vernon and others, 511; Power, 469; Use of, for Rapid Drying of Gelatine Negatives and Prints, L.-P. Clerc, 251
- Alcohols as Allophanates, Isolation and Characterisation of, A. Béhal, 280
- Alkyl: Chlorides, Catalytic Formation of, Starting with the Primary Alcohols, P. Sabatier and A. Mailhe, 479; Iodides, Action of, on Neutral Sodium Phosphate in Aqueous Solution, O. Bailly, 119
- Allied Red Cross Societies, Conference of the, 132
- Alloys, Some Chemically Reactive, E. A. Ashcroft, 459
- Aluminium: Alloys, Preparation of, for Microscopic Examination, S. L. Archbutt and D. Hanson, 251; Solders, Tests on, 474
- Alsace and Lorraine, The Navigable Waterways of, Ed. Imbeaux, 259
- America: A Century of Science in, with Special Reference to the "American Journal of Science," 1818-1918, E. S. Dana and others, 183; at School and at Work, Rev. Dr. H. B. Gray, 203; Mathematical Association of, Prof. H. E. Slaughter Elected President of the, 131; The Geography of, T. Alford Smith, 444
- American: Association for the Advancement of Science, The 71st Meeting of the, 36; Dr. S. Flexner elected President of the, Dr. G. T. Moore elected General Secretary, and Prof. J. F. Abbott elected Secretary of the Council of the, 37; Astronomical Society, The, Dr. J. Stebbins, 325; Astronomy, 394; Institute of Electrical Engineers, The Edison Medal of the, Awarded to B. G. Lamme, 289; Magnetic Observatories, New Procedure at, Dr. C. Chree, 54; Mathematical Society, Prof. F. Morley Elected President of the, 131; Philosophical Society, Annual General Meeting of the, 317; Society of Mammalogists, Inauguration of the, 329; Timber Law, The Essentials of, J. P. Kinney, 321; Union of Scientific Federal Employees, Formation of an, 328
- Ammonia, Commercial Synthesis of, An Important Consequence of the, G. Claude, 299
- Amundsen Expedition, Relief Expedition, 308
- Anaphylactic Shock, Suppression of, W. Kopaczewski and A. Vahram, 519
- Ancestor Worship and the Chinese Drama, Sir W. Ridgeway, 231
- Andalusite (Chiastolite): Its Genesis, Morphology, and Inclusions, A. Brammall, 359
- Aniline of the Principal Hydrocarbons Contained in Petrol, The Critical Solution Temperatures in, G. Chavanne and L. J. Simon, 339
- Animals: (Anæsthetics) Bill, Second Reading of the, 190; The, Read a Second Time in the House of Lords, 370; Experiments on, Report for 1918 on, 510; The Use of, in Medical Research, 108
- Annual Report for 1917 of the Chief Medical Officer of the Board of Education, 11
- "Annuaire de l'Observatoire Royal de Belgique," 1915-1918, 234
- Anomalies of the Meteorological Station of Skudesness (Norway), G. Guilbert, 79
- Antarctic, Forthcoming New Expedition to the, 171

Anthrax, Bill to Control the Importation of Goods Infected with, Second Reading of the, 190
 Anthropometric and Kindred Data Collected by the Ministry of National Service, Utilisation of, 408
 Anti-Scorbutics, H. Chick and M. Rhodes, 71
 Aphasia, Congenital or Developmental, Dr. J. Kerr, 139
 Aphididæ of Lahore, The, Bachambar Das, 269
Aphis grossulariæ, Kalt, and *A. viburni*, Shrank, Bionomics of, Miss M. D. Haviland, 58
 Appleby Grammar School, Bequest to, by Bishop Percival, 198
 April Meteoric Display, The, 114
 Arctic Expedition: A New American, 209; Forthcoming, to be led by D. B. MacMillan, 510
 Argentine, The Ants of the, Dr. A. Gallardo, 269
Argus, The, Seaplane-Carrying Ship, 233
 Aristotelian Society, British Psychological Society, and Mind Association: Forthcoming Joint Session of the, 288; Joint Session of the; The 1920 Meeting to be Held at Oxford, 412
 Armstrong College: Lt.-Col. Sir Theodore Morison Appointed Principal of, 439; Dr. S. Smiles Appointed Professor of Organic Chemistry at, 458; Notice of Awards at, 218; Resignation of Dr. R. L. Weighton of the Chair of Engineering at, 336
 Army: Gardens in France, Belgium, and Occupied German Territory, G. Truffaut and H. Colt, 343; Medical Department, Institution of a Director of Pathology and a Director of Hygiene, 190; of Occupation, Education of A. iv. Boys of the, 138; Educational Facilities for the, 238
 Arsenical Poisoning in Industries Involving Coal and its Derivatives, A. Bayet and A. Slosse, 160
 Asama-Yama, Eruptions and Earthquakes of the, Prof. Omori, 450
 Asbestos in the Union of South Africa, A. L. Hall, 270
Assellus aquaticus, Reproduction of, E. E. Unwin, 319
 Asiatic Petrols, Composition of Some, G. Chavanne and L. J. Simon, 519
 Astrographic Catalogue, The, 312; Vol. ii. of the Hyderabad Section of the, 34

ASTRONOMICAL NOTES.

Comets:
 Comets of the Jovian Family, Schorr's Comet 1918d, 73; Comet 1914c (Neujmin), J. Svårdson, 92; Comet 1915a (Mellish), Rosenbaum, 94; Kopff's Periodic Comet, M. Ebell, 453, 474, 492, 514; A New Comet, Mr. Metcalf, M. Giacobini, 514
 Instruments:
 The Blink Microscope, 194
 Meteors:
 The April Meteoric Display, 114; The April Meteors of 1919, 174; The Meteoric Shower of Halley's Comet, 174; June Meteors, 252; An Interesting Meteor, 291; A Bright Meteor, 411; The August Perseids, 453
 Observatories:
 "Annuaire de l'Observatoire Royal de Belgique," 1915, 1916, 1917, 1918, 234; Reports of the French National Observatory, 1916-18, 252; The Mount Wilson Observatory, 291; Report of the Solar Physics Observatory, Cambridge, 434; Report of the Royal Observatory, Edinburgh, 453
 Planets:
 The Order of the Planets, Dr. H. Chatley, 10; Photo-Electric Determinations of Stellar Magnitudes of Planets, P. Guthnic, 53; Venus and Jupiter, 73; Observed Changes on Jupiter, F. Sargent, 134; Drawings of Mars, 134; Changes on Jupiter, Rev. T. E. R. Phillips, 152; Coming Conjunctions, 212; Mars, H. Thomson, 212; Jupiter, 234; The Lunar Atmospheric Tide, Dr. S. Chapman, 272; The Planets, 331; A Planet beyond Neptune, Prof. W. A. Pickering, 514
 Stars:
 Cepheid Variables, J. H. Jeans, 10; The Astrographic Catalogue, vol ii. of the Hyderabad Section, 34; Nova

Aquilæ, Rev. A. L. Cortie, Dr. J. Lunt, Dr. A. A. Rambaut, 53; The Variables of Long Period, W. Gyllenberg, P. W. Merrill, 53; Star Clusters, Dr. C. V. L. Charlier, 73; The Cepheid Variables, Prof. A. S. Eddington, 92; The Evolution of Binary Systems, J. H. Jeans, 115; The Origin of Novæ, Prof. W. H. Pickering, 153; Occultation of Stars by Venus, A. Burnet, 174; Determination of Proper Motions, R. T. A. Innes, 194; Calculation of Occultations of Stars by the Moon, A. Snow, 194; Nova Aquilæ, 1918, 234; Nova Aquilæ, H. Thomson, 353; The Parallax of the Orion Nebula, Prof. W. H. Pickering, 353; Planetary Nebulæ, van Maanen, 353; The Parallax of the Pleiades, Prof. Kapteyn, Dr. W. J. A. Schouten, 374; The Masses of Binary Stars, Prof. Aitken, 392; The Spiral Nebulæ, Prof. H. B. Curtis, 411; The Spectrum of Nova Aquilæ, 435; Mira Ceti, 453; Magnitude of Nova Aquilæ, Stebbins and Dershem, 474; Mass and Momentum of Stellar Systems, Shinjo and Watanabe, 474; Occultation of Small Stars by Jupiter, A. Burnet, 492; Distribution of Globular Clusters and Spiral Nebulæ, Dr. H. Shapley, 514
 Sun:
 The Solar Eclipse, 252; An Earth-effect on the Sun, J. Evershed, 272; The Sun-spot Maximum, J. Evershed, 291; Sun-spots as Electric Vortices, Prof. Hale, 292; The Solar Eclipse of May 29, 311; The Eclipse and Wireless Telegraphy, 374; Painting the Corona, H. R. Butler, 374; The Recent Solar Eclipse, 492
 Miscellaneous:
 Variation of Latitude, B. Wanach, I. Yamamoto, 10; Reform of the Calendar, G. Bigourdan, H. Deslandres, 34; Dark Markings on the Sky, Prof. Barnard, 34; Unification of the Astronomical and Civil Day, 115; the Gegenschein or Counter-glow, Prof. Barnard; Tycho Brahe's Original Observations, Dr. J. L. E. Dreyer, 134; Celestial Systems, S. Shinjo and Y. Watanabe, 153; The Astrographic Catalogue, 312; Admiralty Tide-tables, 331; The Movement of the Earth's Pole, Sir F. Dyson, Dr. H. Jeffreys, 392; The Light of the Aurora and the Auroral Line, Prof. Slipher, 411; A World Survey, 434; A Magnetic Storm, 492
 Astronomical: and Civil Day, Unification of the, 115; Time, Unification of, G. Bigourdan, 339; Observatories of Jai Singh, The, G. R. Kaye, 166
 Athenæum Club: R. A. Gregory elected a Member of the 111; Sir G. Newman elected a Member of the, 30
 Atlantic Flight: The, 130, 147, 149, 190, 226, 253, 267, 288, 306; by "R.34," 349
 Atmosphere: General Movements of the, H. H. Hildebrandsson, 119; The Lunar Tide in the, Dr. S. Chapman, 185
 Atmospheric: Conditions which Affect Health, Prof. L. Hill, 79; Nitrogen and Oxygen, Determination of the Rate of Solution of, by Water, Part ii., Prof. W. E. Adeney and H. G. Becker, 298; Pollution, Fourth Report of the Advisory Committee on, 451; Stirring Measured by Precipitation, L. F. Richardson, 57; Waves, Periodicity of, J. Lévine, 119
 "Atom": The, A. A., 104; Constitution of the, and the Properties of Band Spectra, H. Deslandres, 259
 Atomic: Weight Determinations, Some Recent, Sir T. E. Thorpe, 346; Weights of Boron and Fluorine, The, E. F. Smith and W. K. van Haagen, 347
 August Perseids, The, 453
 Aurora: The Light of the, and the Auroral Line, Prof. Slipher; Prof. Frost, 411
 Auroral Display, A Brilliant, E. H. Stenning, 9
 Australia: An Orographical Map of, Dr. G. Taylor, 251; Science and Industry in, Sir J. McCall, 434; The Flora of, S. L. Moore, 360
 Australian: Antarctic Expedition, Reports of the, 54; Commonwealth, Bulletins of the Advisory Council of Science and Industry for the, 310; Culicidæ, Contributions to a Knowledge of, No. 4, F. H. Taylor, 59; Environment, The, (especially as Controlled by Rainfall), Dr. Griffith Taylor, 447; Freshwater Copepoda and Ostracoda,

- Some, Miss M. Henry, 520; Megaloptera or Alder-flies, Dr. R. J. Tillyard, 59; Neuroptera, Studies in, No. 6; The Family Psychopsidae, Dr. R. J. Tillyard, 58; No. 7: Life History of *Psychopsis elegans*, Guérin, Dr. R. J. Tillyard, 59; Rainfall, 447; A Remarkable, 51; Sawflies (Fenthredinidae), W. W. Froggatt, 19; Tabanidae, No. iv., F. H. Taylor, 420
- Aviation: and Weather, 212; Developments in, in the War Period, L. Bairstow, 414; Essays Relating to, The Shephard Prizes for, 510; in the War Period, The Progress of, L. Bairstow, 327; Prof. S. P. Langley's Experiments in, H. Leffmann, 134; The A.B.C. of, Capt. V. W. Pagé, 243
- Bacon, Roger (1214-94), Dr. C. Singer, 35
- Bacterial Infection, A New Factor in the Mechanism of, W. E. Bullock and W. Cramer, 17
- Bakerian Lecture: A Study of the Line-Spectrum of Sodium as Excited by Fluorescence, Hon. R. J. Strutt, 359
- Balkan Review, The, No. 1, 9
- Balloons, Pilot, Ascensional Velocity of, J. Rouch, 459
- Balmer Series, The Intensity Decrement in the, Dr. T. R. Merton and Prof. J. W. Nicholson, 118
- Baly Medal of the Royal College of Physicians, The, Awarded to Dr. L. Hill, 450
- Banjara Tribe, A Remarkable Head-Dress of Women of the, Dr. W. Crooke, 310
- Barbados, The Extraneous Minerals in the Coral-Limestones of, J. B. Harrison and C. B. W. Anderson, 399
- Bee-Eaters, Feeding Habits of Nestling, E. R. Waite, 4
- Behaviour, The Study of, S. O. Most, 71
- Being, the Nature of, An Essay in Ontology, H. W. Slessor, 342
- Beit Fellowship for Scientific Research, Election of J. A. Hey to a, 439
- Belfast, the Queen's University of, Dr. A. W. Stewart Appointed Professor of Chemistry in, 479
- Belgium, Excursion to the Forests of, 513
- Benedick Galvanometer, Tests on a, to Determine the Cause of Variations in its Zero Reading, 391
- Bennettiales, Two Papers on the, Dr. M. C. Stopes, 116
- Benzylidene-Acetone, A New Synthesis of, G. Langlois, 320
- Bessemer Medal of the Iron and Steel Institute Awarded to Prof. F. Giolitti, 489
- Beverages: C. Simmonds, 482; and Their Adulteration, Dr. H. W. Wiley, 482
- Bhavanagar (Kathiawar), A Mammalian Fossil from, H. C. Das-Gupta, 400
- Binary Stars: The Masses of, Prof. Aitken, 392; Systems, The Evolution of, J. H. Jeans, 115
- Biochemical: Catalysts in Life and Industry, Proteolytic Enzymes, Prof. J. Effront, assisted by C. S. Venable, 403; Method to the Study of Several Species of Indigenous Orchids, Application of the, E. Bourquelot and M. Bridel, 160
- Biological Method, Experiments in, 202; Problems, 21
- Biology: A Text Book of, for Students in General, Medical, and Technical Courses, Prof. W. M. Smallwood, Third edition, 202; The Quantitative Method in, Prof. J. MacLeod, 202
- Biotite, Transparency of, to Infra-red Radiations, L. C. Martin, 97
- Bird-Life in Colombia, The Distribution of, Dr. F. M. Chapman, 462
- Birdland's Little People, Capt. O. G. Pike, 505
- Bird's Brain, The, Prof. G. Elliot Smith, 118
- Birds: British, A Practical Handbook of, Edited by H. F. Witherby. Part I., 323; Food of Australian, S. Jackson, S. A. White and A. M. Morgan, 150; Migratory, Convention for the Protection of, Between the United States and Canada, 133; Seen in the North-Eastern Atlantic, etc., from August to October, 1917, D. G. Garnett, 113; The Game, of California, J. Grinnell, H. C. Bryant, and T. I. Storer, 281; Wild, and Distasteful Insect Larvæ, Dr. W. E. Collinge, 404; Wild, The Food of, Dr. W. E. Collinge, 133
- Birkbeck College, Acceptance by Lord Haldane of the Presidency of, 117
- Birmingham: University, Impending Resignation of Sir Oliver Lodge, 16; Dr. S. W. J. Smith Elected to the Poynting Chair of Physics in, 198; Provisional Scheme for Celebrating the Centenary of the Death of James Watt, 217; Representation of the Non-Professional Members of the Teaching Staff on the faculties; Impending Resignation of Prof. G. Kapp, 257; Award of Degrees, 378; Dr. J. Robertson Appointed Professor of Hygiene and Public Health; Dr. J. S. Dunn, Professor of Pathology; L. Gamgee, Professor of Surgery; Prof. Haslam, Lecturer in Applied Anatomy; Resignation of Prof. P. Thompson as Dean of the Faculty of Medicine; Prof. Haslam Appointed Dean of the Faculty of Medicine, 379; W. Haywood Appointed Lecturer in Town-Planning; B. T. Rose, Demonstrator of Anatomy; Miss H. Walker, Lecturer in Physiology, 379; H. F. Humphreys Appointed Lecturer on Dental Anatomy and Physiology, and Curator of the Odontological Museum; The Ingleby Lecture to be Delivered by B. Whitehouse; Miss B. M. Bristol Awarded an 1851 Exhibition Scholarship; Grant to Dr. N. Carter; Gifts of Lichens, etc., 397; Municipal Technical School, J. W. Thomas appointed Lecturer in the Electrical Engineering Department of the, 458
- Birthday Honours, The King's, 470
- Bismuth, Applicability of the Formaldehyde Process for Estimating, S. B. Tattentire, 455
- Black, Joseph, The Life and Letters of, M.D., Sir W. Ramsay, 181
- Black Lake Area, Quebec, Mineralogy of, Poitevin and Graham, 372
- Blessés de Guerre, Prothèse Fonctionnelle des, Troubles Physiologiques et Appareillage, Dr. Ducroquet, 383
- Blink Microscope, The, 194
- Board: of Agriculture and Fisheries: Guides to Small-holders, Nos. 1, 5, 6, 7, 9, 283; of Trade, Resignation of Sir A. Stanley of the Presidency of the; Sir A. Geddes Appointed President of the, 250
- Body Temperatures, Electrical Methods of Measuring, R. S. Whipple, 133
- Bonn, 2nd Army Agricultural College at, The Work of the, 138
- Boron in some Natural Basic Silico-Aluminates, Presence of, A. Lacroix and A. de Gramont, 259
- Botanical Science, Some Responsibilities of, Prof. B. E. Livingston, 154
- Botanique, Eléments de, Prof. Ph. Van Tieghem, Tomes I. and II., Cinq. édition, Prof. J. Costantin, 301
- Botany: Lowson's Text-book of (Indian edition), revised and adapted by Birbal Sahni and M. Willis, new and revised edition, 301; D. Thoday, Second edition, 301; Text-books of, 301
- Botrytis cinerea*, Pers., An Albino Mutant of, W. B. Brierley, 139
- Bowed Instruments, Theory of, 207
- Brachiopoda Collected by the Australian Antarctic Expedition, Dr. J. A. Thomson, 54
- Bracken Rhizomes as Food for Stock, 71
- Bradford Municipal Technical College: Resignation by Prof. W. M. Gardner of the Principalship of, 295, 439; W. H. N. James Appointed Head of the Electrical Engineering Department of the, 498
- Brain-Power in the Army, Measurement and Utilisation of, 173
- Brent Valley Bird Sanctuary, The, W. M. Webb, 426
- Brighton: Municipal College, Dr. W. M. Varley Appointed Principal of the, 278; The Boulders in the Rubble-Drift of, E. A. Martin, 269
- Bristol, Merchant Venturers' Secondary School, Transfer to the Bristol Education Committee, 379
- Bristol University: Business Training at, 96; Major A. Robertson Appointed Professor of Mechanical Engineering, 358; Prof. J. Munro Granted the Title of Emeritus Professor in Mechanical Engineering, 358; Dr. O. V. Darbishire Appointed Professor of Botany; Dr. H. M. Wodehouse, Professor of Education; Dr. H. R. Hassé, Professor of Mathematics; Major A. Robertson, Professor of Mechanical Engineering; Dr. A. M. Tyndall, Professor of Physics; Dr. G. A. Buck-

- master, Professor of Physiology, 397; Introduction of Commercial Courses in the Faculty of Engineering of, 458
- British: Association, Forthcoming Meeting of the, at Bournemouth, 30; Fuel Economy Committee, Re-appointment of the, 52; Programme of the Educational Section of the, 238; The Forthcoming Meeting of the, 248; The Bournemouth Meeting of the, 407; The Provisional Programmes of Sections, 435; The Bournemouth Meeting of the, 466; Bird-Skins, Dr. M. Ogilvie's Collection of, Presented to the National History Museum, 409; Birds, A Practical Handbook of, edited by H. F. Witherby, Part I., 323; Chemical Manufacturers, Association of, Third Annual Meeting of the, 390; Chemists, War Work of, Lord Moulton, and others, 92; Esperanto Congress, The Tenth, 318; Fireclays Suitable for Glassworks use, Properties of, E. Firth, F. W. Holden, and Dr. W. E. S. Turner, Part I., 419; Air Effort During the War, Synopsis of, 171; Medical Association, Forthcoming Clinical and Scientific Meeting of the, 32; Meeting of the, 136; Museum, The Prince of Wales, Sir J. J. Thomson and Sir Norman Moore Elected to the Standing Committee of the, 230; Optical Research, 236; Petroleum, 306; Pharmaceutical Conference, a Memorial Lecture as a Tribute to the Memory of the late Lt.-Col. E. F. Harrison, 210, 455; Photographic Research Association, Issue of a Programme of Research; Dr. R. E. Slade Appointed Director of Research, 132; Report upon the Work in Progress or Contemplated by the, Dr. R. E. Slade, 424; Psychological Society, Changes in the Membership and Scope of the, 7; Rainfall Organisation, etc., Retirement of Dr. H. R. Mill, 409; School at Athens, The Annual of the, No. xxii., Sessions 1916-17, 1917-18, 424; Science Guild, Forthcoming Annual Meeting of the, 268; Annual Meeting of the, Speeches by Lord Sydenham and others, 312; British Scientific Products Exhibition, Descriptive Catalogue, Edited by Sir R. Gregory, 461; Scientific Instrument Research Association, H. Moore Appointed Assistant Director of Research of the, 328; Scientific Products Exhibition, 7, 289, 333; Addresses by the Marquess of Crewe and Lord Sydenham, 374; Lectures at the, 392, 414; Visit of the King and Queen to the, 408; Visit of Representatives of Hadfield's, Ltd., to the, Speeches by Sir R. Hadfield and Sir R. Gregory, 472; Survey Work on the Western Front, Lt.-Col. H. S. L. Winterbotham, 173
- B. *tetani* in Wounds of Men who Received Prophylactic Inoculation, Distribution of the Serological Types of, Major W. J. Tulloch, 17
- Calendar: Reform and the Date of Easter, A. Philip, 264; Reform of the, G. Bigourdan and H. Deslandres, 34
- Californian Game Birds, 281
- Cambridge, Solar Physics Observatory, Sixth Annual Report of the, 434
- Cambridge University: Gifts by Dr. J. B. Hurry and another; W. M. Smart Appointed Chief Assistant at the Observatory, 16; Resignation of Sir J. J. Thomson of the Cavendish Professorship of Experimental Physics; Proposed New Professorship of Physics; R. A. Peters Appointed Senior Demonstrator of Biochemistry, 37; J. Barcroft Appointed Reader in Physiology; A. V. Hill Appointed University Lecturer in Physiology; Dr. Hartridge Appointed University Lecturer in the Physiology of the Senses; Subject for the Adams Prize for 1919-20, 56; C. E. Inglis Elected Professor of Mechanism and Applied Mechanics, 78; Major H. McCombie Elected to a Fellowship at King's College, 96; Sir E. Rutherford Appointed Cavendish Professor of Experimental Physics; Sir J. J. Thomson to be Honorary Professor of Physics, 117; Sir E. Rutherford Elected to a Fellowship at Trinity College; Dr. H. Hartridge Appointed Demonstrator of Physiology; B. M. Jones and J. W. Lesley Elected to Junior Fellowships at Emmanuel College, 198; Gift for a Chemical School, 218; The Financial Position of, 229; Question of Financial Assistance from the Government; Gift by the Goldsmiths' Company; Resignation of R. I. Lynch of the Curatorship of the University Botanic Gardens, 257; The Proposed Financial Inquiry; Offer of the British Oil Companies for the School of Chemistry; F. T. Brooks Appointed a University Lecturer in Botany; Dr. P. Giles Elected Vice-Chancellor, 278; Exhibitions at Emmanuel College, 295; Col. C. S. Myers and Lt. H. W. Phear Elected Fellows of Gonville and Caius College, 317; R. H. Rastall Appointed University Lecturer in Economic Geography; H. Stone, University Lecturer in Forestry; F. Debenham, University Lecturer in Surveying and Cartography; T. C. Nicholas Assistant to the Woodwardian Professor of Geology, 336; J. M. Wordie Appointed Demonstrator of Petrology; A. W. Hill and E. H. Rayner Approved for the Degree of D.Sc., 336; C. T. R. Wilson Appointed Reader in Electrical Meteorology, 379; Sir J. J. Thomson Elected Professor of Physics; F. W. Dootson Appointed University Lecturer in Chemistry; W. H. Mills, University Lecturer in Organic Chemistry; R. Whiddington, University Lecturer in Experimental Physics; S. Lees, University Lecturer in Thermodynamics, 418; S. Lees Re-elected a Fellow of St. John's College, 408
- Camouflage: Military, Major A. Klein and Dr. J. C. Mottram, 364; of Ships in War, Prof. J. Graham Kerr, 204; of Ships of War, Lt.-Commr. N. Wilkinson, 305
- Canada: a Scientific Research Bureau to be Established in, 89; The Royal Society of, Sessions on May 19-22, 437; Prof. R. F. Ruttan Elected President of the, 438
- Canada's 72-in. Telescope, The Dominion of, Dr. J. S. Plaskett, 105
- Canadian: Arctic Expedition, Results of the, 7; Bark-beetles, J. M. Swaine, 269; Government, The, and the Proposed Hunting of Caribou with Aeroplanes, Dr. C. Gordon Hewitt, 244
- Cancer of the Liver, The Hydration, Soluble Residue, and Insoluble Residue in, A. Robin, 320; Research Fund, Imperial, Report of the Work of the, during the War, Sir W. Church, 435
- Cape Town: University of, A Scheme for the Development of the, 458; University, Gift to, by the National Bank of South Africa, 198
- Carbolic Acid as a Fixative for Histological Preparations, C. L. Herman, 480
- Carbon Oxchloride, The Characterisation and Estimation of, A. Kling and R. Schmutz, 179
- Carbonyl Chloride in Air, Estimation of Traces of, A. Kling and R. Schmutz, 259
- Carburettors, Vaporisers, and Distributing Valves used in Internal Combustion Engines, E. Butler. Second edition, 445
- Cardiff Marine Technical School, Capt. W. A. Andrews Appointed Lecturer in Wireless Telegraphy at the, 178
- Caribou, Protests Against the Proposed Slaughter of, 112
- Carnegie: Institution of Washington, Report of Department of Marine Biology of the, Dr. A. G. Mayor, 211; Libraries and Educational Welfare, 253; United Kingdom Trust, Fifth Annual Report of the, 253
- Cass Technical Institute, Sir John, A. W. Young Appointed Lecturer on Pure and Applied Mathematics at the, 218
- Cassiterite Deposits of Tavoy, The, J. C. Brown, 290
- Casuarina Woods in Mauritius, The, Dr. H. A. Tempany, 290
- Catalysis in Industrial Chemistry, Prof. G. G. Henderson, 281
- Catalytic: Actions at Solid Surfaces, Dr. E. F. Armstrong and Dr. T. P. Hilditch, 337; Chemistry, Dr. S. Rideal, 281; Dehydrogenation by Nickel in Presence of Hydrogen, P. Sabatier and G. Gaudion, 159; Hydrogenation and Reduction, Dr. E. B. Maxted, 281
- Celestial Systems, Shinzo Shinjo and Yoshikatsu Watanabe, 153
- Cell-Division, Progress-Stages in, Dr. H. H. Laughlin, 330
- Cephalopodiscus from Adelie Land and Queen Mary Land, Dr. W. G. Ridewood, 54

- Cepheid Variables: J. H. Jeans, 10; Prof. A. S. Eddington, 92
- Cereal Reserves, The Conservation of our, Prof. A. Dendy, 55
- Cerebral Cortex, The Significance of the, Prof. G. Elliot Smith, 396
- Cetacea stranded on the British Coasts during 1918, Dr. S. F. Harmer, 237
- Chalk, A Remarkable Piece of Carved, J. Reid Moir, 9; Curious Markings on, Dr. C. W. Andrews, 25; J. Reid Moir, 45
- Channel Tunnel, The Proposed, 50
- Chemical: Age, No. 1, 373; Analysis of Inorganic and Organic Substances, Qualitative, A Systematic Course of, with Explanatory Notes, Prof. H. W. Schimpf, Third edition, 362; Analysis, Text-books of, 362; Annual, Van Nostrand's, Fourth issue, 1918. Edited by Prof. J. C. Olsen; Assistant editor, M. P. Matthias, 221; Industry, Society of, Forthcoming Annual Meeting of the, 150; Annual Meeting of the, 412; Science and the State, 247; Service, A Suggested Government, 34; Society, Extension of the Hours of Opening of the Library of the, 131; Sir J. J. Dobbie Elected President of the, 89; Valency and Combination, An Analysis of an Electron-Transference Hypothesis of, J. Marshall, 298; Waste Products Committee, Report on the Investigations Carried out by the, 285
- Chemistry: Applied, 221, 421; Reports of the Progress of, Vol. III., 421; Biological, An Introduction to the Study of, Prof. S. B. Schryver, 43; Boiler, and Feed-Water Supplies, J. H. Paul, 421; Catalytic, 281; Colloidal, 62; Everyman's, E. Hendrick, 62; Inorganic, Prof. J. Walker. Eleventh edition, 283; Recent Discoveries in, J. Hart-Smith, 322; Inorganic and Physical, Prof. W. C. McC. Lewis, 322; in Reconstruction, Sir W. Tilden, 392; in the National Service, Sir W. J. Pope, 214; Institute of, Work of the, During the War, Sir H. Jackson, 7; Inter-Allied Co-operation in, 187; Modern, and Chemical Industry of Starch and Cellulose (with reference to India), Prof. T. C. Chaudhuri, 243; Organic, or Chemistry of the Carbon Compounds, V. von Richter. Vol. I., "Chemistry of the Aliphatic Series," Newly Translated and Revised by Dr. P. E. Spielmann. Second (revised) edition, 243; Physical, A System of, Prof. W. C. McC. Lewis. Second edition. In three volumes, 161; Physical and Inorganic, Recent Advances in, Dr. A. W. Stewart. Third edition, 322; Physiological, Practical, Prof. P. B. Hawk. Sixth edition, 462; The Profession of, Dr. M. O. Forster, 24; The Profession of, The *Chemist and Druggist* on, 50
- Chemists: British, War Work of, Lord Moulton and others, 92; in Conference, 412
- Chert in Kansas and Oklahoma, W. H. Twenhofel, 433
- Chevrotains (*Tragulina*), External Characters of Existing, R. I. Pocock, 17
- Chickens, Male or Female, Possibility of Chicken-Breeders obtaining at Pleasure, M. Lienhart, 460
- Children's Newspaper, Nos. 2 and 3 of the, 114
- Chimpanzee, A, in the Open Air in England, G. Jennison, 219
- China, South-West Flora of, Prof. I. Bayley Balfour, W. W. Smith, and W. G. Craib, 151; Temperature in, 42
- Chinese Astronomical Instruments, Impending Return of the, by Germany, 51
- Chloropicrin, The High Toxic Power of, Toward Certain of the Lower Animals, G. Bertrand, 179
- Chlorosulphonic Acid, Action of, on Methyl Hydrogen Sulfate, R. Levailant and L. J. Simon, 480
- Cholera, Recent Researches on, Lt.-Col. Sir L. Rogers, 254
- Civil: List Pensions Granted for the Year ended March 31, 389; Service Estimates, Education and Science in the, 116
- Civilian Air Routes, 175
- Classical Association, Annual Meeting of the, 234
- Classics, The, in British Education, 387
- Clay in its Relation to Piles, Experiments with, A. S. E. Ackermann, 72
- Clays, Electrical Purification of, 516
- Clifton College, Bequest to, by Bishop Percival, 198
- Climaxodus, The Dentition of, Dr. A. Smith Woodward, 319
- Clock Escapements, A. T. Hare, 155
- Cloud Phenomenon, A Striking, Prof. J. Mascart, 371
- Cnidonema capensis*, Dr. J. D. F. Gilchrist, 390
- Coal: Bituminous, Ingredients of, Dr. Marie C. Stopes, 473; Combustion of, in the Flue-Gases, 91; Conservation, Prof. H. E. Armstrong; Prof. W. A. Bone, 393; Consumption of Steam-Power Plant, R. H. Parsons, 33; in Thrace, Rev. Canon E. M'Clure; Prof. H. Louis, 45; Rev. Canon E. M'Clure, 85; Meter for Boilers, A, 91; in Railway Locomotives, Economic Use of, 213; Researches on the Chemistry of, Part I., Prof. W. A. Bone and R. J. Sarjant, 258; Tar and Some of its Products, A. R. Warnes, 221; Dyes and Intermediates, E. de Barry Barnett, 221
- Cobalt, Organic Compounds of, Spontaneous Oxidation of Complex, H. Colin and O. Liévin, 499
- Cobar Stope-Measurement Methods, W. S. Curteis, 99
- Cocoa Production of the Empire, 410
- Coelonautilus trapezoidalis*, J. W. Jackson, 18
- Coir: Philippine and Coir-Cordage, The Mechanical Properties of, 433; The Mechanical Extraction of, 433
- Coke, Conditions of Formation of, G. Charpy and G. Decorps, 419
- Colloidal Particles, A New Method of Weighing, Prof. E. F. Burton, 258
- Colloid-Chemistry: A Handbook of, Dr. W. Ostwald. Second English edition, translated from the third German edition by Prof. M. H. Fischer. With notes added by E. Hatschek, 401; and its General and Industrial Applications. Second Report of the British Association Committee on, 454
- Colloids and Chemical Industry, Prof. W. C. McC. Lewis, 454
- Colombia: A Journey in, M. T. Dawe, 133; The Birds of, 462
- Colour: -filters, "Photographic Vision," 513; -sense of Wasps, H. Wager, 58; Transparency Process, A new, for Illustrating Scientific Lectures, A. E. Bawtree, 296
- Comet: A New, Mr. Metcalf; M. Giacobini, 514; 1914c (Neujmin), J. Svärdson, 92; 1915a (Mellish), Rosenbaum, 92
- Comets of the Jovian Family, 73
- Compete? Can We, G. E. Mappin, 241
- Concentration Results, Comparison of, with Special Reference to the Cornish Method of Concentrating Cassiterite, E. Edser, 17
- Concrete: Frames, Reinforced, Analyses and Tests of Rigidly Connected, M. Abe, 373; Roads, 33; Ships, Economic Size of, E. O. Williams, 33
- Conifers, Seedling Diseases of, C. Hartley, T. C. Merrill, and A. S. Rhoads, 354
- Conjoint Board of Scientific Societies, Second Report of the, 193
- Conjunctions, Coming, 212
- Connecticut College for Women, Bequest to the, by M. F. Plant, 138
- Conscience and Fanaticism: An Essay in Moral Values, G. Pitt-Rivers, 342
- Consumption, The Cost of, 71
- Coolidge, Le Tube, Ses Applications Scientifiques, Médicales et Industrielles, H. Pilon, 224
- Co-operation and Profit-Sharing, Krupp von Bohlen, 211
- Co-ordination of Research in Works and Laboratories, the late H. R. Constantine, 152
- Copper: A very Sensitive Reaction for, L. Maquenne and E. Demoussy, 99; near Beaudoinville, Belgian Congo, Discovery of, 310
- Corona, Painting the, H. R. Butler, 374

CORRESPONDENCE.

- Absorption of Gases by Charcoal, Sir W. A. Tilden, 24
- Acquired Characters, The Inheritance of, Prof. E. W. MacBride, 225; Dr. Kammerer's Testimony to Prof. W. Bateson, 344
- Aggregate can be Well-ordered, A Proof that any, P. E. B. Jourdain, 45

- American Astronomical Society, The, Dr. J. Stebbins, 325
 "Atom," The, A. A., 104
 Bee-Eaters, Nestling, Feeding Habits of, E. R. Waite, 4
 Brent Valley Bird Sanctuary, The, W. M. Webb, 426
 Calendar Reform and the Date of Easter, A. Philip, 264
 Camouflage, Military, Major A. Klein and D. J. C. Mottram, 364
 "Camouflage" of Ships in War, Prof. J. Graham Kerr, 204; Lt.-Commr. N. Wilkinson, 304
 Canadian Government and the Proposed Hunting of Caribou with Aeroplanes, The, Dr. C. Gordon Hewitt, 244
 Chalk, Curious Markings on, Dr. C. W. Andrews, 25; J. Reid Moir, 45
 Chemistry, The Profession of, Dr. M. O. Forster, 24
 Coal in Thrace, Canon E. M'Clure, Prof. H. Louis, 45; Canon E. M'Clure, 85
 Crocodile on Rotuma, A, Prof. J. Stanley Gardiner, 264
 Cuckoo, Behaviour of a, H. Eliot Howard, 426
 Daylight Moon, The Whiteness of the, C. T. Whitmell, 145
 Doppler Effect in the Molecular Scattering of Radiation, The, Prof. C. V. Raman, Sir J. Larmor, 165
 Electric Currents, Velocity of, Prof. R. A. Fessenden, 505
 Electro-Atomic Phenomena in the Magnetic Field, Prof. A. Righi, Dr. N. R. Campbell, 384
 "Fascination" of Birds, The Supposed, Sir H. Maxwell, 4
 Finger-Print System in the Far East, The, Cav. Filippo de Filippi, 125
 Fisheries, National, Capt. G. C. L. Howell, 84; the Writer of the Note, 85
 Girvanella and the Foraminifera, F. Chapman, 4
 Globular Clusters, Cepheid Variables, and Radiation, Dr. H. Shapley, 25; Prof. F. Soddy, 43; J. H. Jeans, Dr. J. W. Evans, 64
 Globular Lightning, Prof. J. A. McClelland, G. Gilmore, 284
 Glossina and the Extinction of Tertiary Mammals, Prof. T. D. A. Cockerell, 265
 Government Grants for Scientific Research. The Conditions Attached to, Prof. F. Soddy, 226
 Government, The Machinery of, A. J. Brander, 104
 Ionisation and Radiation, Dr. R. A. Houstoun, 145
 Intravenous Injections in Cholera, Prof. W. M. Bayliss, 264
 Iridescent Insects, The Colour of the Scales of, in Transmitted Light, Hon. H. Onslow, 84
 Labour and Scientific Research, P. G. Agnew, 425
 Long-continued Experiments, The Credibility of, Dr. E. J. Russell, 324
 Luminous Worms, Rev. H. Friend, 446
 Lustre of some Feathers of Humming Birds, The, H. J. Charbonnier, 324
 Maceration by Tryptic Digestion, Kathleen F. Lander, 64
 Magnetic and Allied Observations, Proposed, during the Total Solar Eclipse of May 29, 1919, Dr. L. A. Bauer, 44
 Magnetic Storm of August 11-12, 1919, The Rev. A. L. Cortie, 483; Dr. C. Chree, 505; Dr. A. C. Mitchell, 506
 Matter and Radiation, H. H. Poole, 84
 Mendelian Theory, A Darwinian Statement of the, Prof. H. F. Roberts, 463
 Mosquitoes, The Oldest, Prof. T. D. A. Cockerell, 44
 Natural History Museum, The Directorship of the, Prof. W. Boyd Dawkins and others, 3; Sir G. Greenhill, 24
 Nautical Astronomy, Graphic Methods in, Dr. A. Hutchinson, 25; H. B. Goodwin, 44
 Partial Sterilisation in Soil, A Possible Case of, F. Knowles, 205
 Prime Numbers, Question Relating to, A. Mallock, 305; Prof. G. N. Watson, 364
 Protective Coloration of Birds and Eggs, G. Grace 446
 Protozoal Parasites in Cainozoic Times, Dr. G. D. Hale Carpenter, 46
 Public Statistics, The Collection and Presentation of, G. Drage, 385
 Rats, The Food of, T. Steel, 345
 Research and Service Sir J. W. Barrett, Prof. F. Soddy, 404
 St. Andrews University, Scientific Research at, Prof. W. C. McIntosh, 64; Marine Research at, Prof. A. Meek, 104
 Science and Salaries, C., 404
 Sea-Otter, Teeth of, M. D. Hill, 446
 Sparganophilus: A British Oligochaet, Rev. H. Friend, 426
 Sponges, The Cultivation of, Lt. W. R. Dunlop, 184
 Stars, The Age of the, Dr. H. Shapley, 284
 Stinging Instincts in Bees and Wasps, The, F. W. L. Sladen, 325
 Stirling, The late Sir Edward, L. M. Harwood, 446
 Sunlight on Water-drops, Supposed Effect of, Prof. G. H. Bryan, 125
 Visualisation of Features, R. F. Powell, 104
 Wasps, W. F. Denning, 184; Dr. J. Ritchie, R. F. Burton, 245
 Wild Birds and Distasteful Insect Larvæ Dr. W. E. Collinge, 404; E. R. Speyer, 445; Hon. H. Onslow, 464; Dr. W. E. Collinge, 483
 Wireless Telephony, A. A. Campbell Swinton, 284, 304
 X-Rays and British Industry, R. S. Wright, 244; Major G. W. C. Kaye, 245
 Corrosion Research Committee of the Institute of Metals, Report of the, 152
 Cotton: and the Cotton-seed Industries, Interdependence of the, E. C. de Segundo, 414; Grading, R. C. Wood, 137; Hairs, Existence of Daily Growth-rings in the Cell-Wall of, Dr. W. L. Balls, 78; Industries Museum, Proposed Establishment of a, 510; Plant Provides us with Foodstuffs and other Commodities as well as with Clothing, How the, Ed. C. de Segundo, 451; -seed By-products, 153; -seed, The Removal of the Residual Fibres from, and their Value for Non-textile Purposes, Ed. C. de Segundo, 153
 Crichton Royal Institution, Report for 1918 of the, 290
 Crickets, Destruction of, Some Methods for the, and Their Application, P. Vayssièrre, 519
 Cristaux, La Genèse de la Science des, H. Metzger, 184
 Crocodile on Rotuma, A, Prof. J. Stanley Gardiner, 264
 Croonian Lecture of the Royal Society, The, to be delivered by Dr. H. H. Dale, 230
 Croydon Polytechnics, W. Thomson appointed Principal of the, 257
 Crystallography, Geometrical, A Manual of, Prof. G. M. Butler, 103
 Crystals: Curvature in, L. J. Spencer, 98; Growth of, J. C. Hostetter, 512; Mimetic, Classification of, E. T. Wherry and E. Q. Adams, 473; Some Features in the Growth of, Sir H. Miers, 239
 Cuckoo, Behaviour of a, H. Eliot Howard, 426
 Cullum Geographical Medal of the American Geographical Society, The, awarded to E. de Margerie, 230
 Cyanic Acid, Formation of, by the Oxidation of Organic Substances, R. Fosse, 460
 "Cyclone Depression," Some Examples of, G. Guilbert, 159
 Cyclonic Depression, Temperature Distribution in a, R. M. Deeley, 72
 Dar-Lughdach, An Early Story about, Prof. R. A. Macalister, 472
 Dark Markings on the Sky, Prof. Barnard, 34
 Date-Palm Sugar Industry of India, The, H. E. Annett, 272
 Dazzle-Painting of Ships, Lt.-Comm. N. Wilkinson, 395
 DEATHS.
 Apsey (G. M.), 210
 Bancroft (C. K.), 191
 Barlow (G. T.), 172
 Becker (Dr. G. F.), 250
 Brown (Prof. Adrian J.), 369
 Brunner (Sir John T.), 350
 Canning (Ald. T.), 51
 Carnegie (A.), 471, 507
 Carus (Dr. P.), 191
 Chantemesse (Prof. A.), 8
 Crisp (Sir F.), 191
 Crookes (Sir William), 109
 Cunningham (Archdeacon W.), 289

- Curtis (R. H.), 250
 Danne (J.), 69, 90
 Davidson (Sir J. Mackenzie), 111
 Davis (W. G.), 508
 Doolittle (Prof. C. L.), 69
 Farlow (Prof. W. G.), 328, 509
 Fischer (Prof. Emil), 408, 430
 Forth (F. C.), 53
 Fraser (Sir A.), 8
 Gibson (Major H. G.), 31
 Goring (Dr. C.), 269
 Greenfield (Prof. W. S.), 489
 Haeckel (Prof. E.), 471, 487
 Hallopeau (Prof. F. H.), 69
 Hepworth (Capt. M. W. C.), 8
 Hill (G. H.), 51
 Hofer (Dr. B.), 132
 Julien (Dr. A. A.), 268
 Kobert (Prof. R.), 111
 Léveillé (H.), 191
 Levy (L. E.), 51
 Lineham (W. J.), 172
 Liveing (Dr. E.), 111
 Liveing (Dr. R.), 8
 Macdonald (Rt. Hon. Sir J. H. A.), 209
 Macgregor (Sir W.), 370
 McHenry (A.), 172
 Paterson (Prof. A. M.), 9
 Pickering (Prof. E. C.), 28
 Priem (Dr. F.), 172
 Purefoy (Dr. R. D.), 350
 Rayleigh (Lord), 349, 365-368
 Redwood (Sir B.), 287
 Retzius (Prof. G. M.), 448
 Richards (Prof. C. F.), 210
 Rintoul (Col. D.), 150, 231
 Row (R. W. H.), 51
 Schloesing (Prof. J. J. T.), 8, 169
 Sidgreaves (Father W.), 307
 Smith (Dr. F. J.), 191
 Southern (R. W. A.), 51
 Stefanik (Genl. M.), 231
 Stirling (Sir E. C.), 69, 87
 Sturge (Dr. W. A.), 111
 Townsend (Prof. E.), 191
 Vickers (A.), 390
 Waller (Dr. Elwyn), 408
 Walter (A. J.), 131
 Ward (Prof. A. W.), 432
 Ward (H.), 471
 Washington (Col. F. P.), 51
 Watson (Lt.-Col. W.), 29
 Weiss (Dr. E.), 190
 West (Prof. G. S.), 470
 Wiechmann (Dr. F. G.), 210
 Wilde (Dr. H.), 89; 129
- Decimal: Association, Annual Report of the, 330; Coinage and British Commerce, J. Gall Inglis, 113; System, James Watt and the, 512
 Democratic Ideals and Reality, A Study in the Politics of Reconstruction of, H. J. Mackinder, 423
 Dendritic Growths in Paper, Chemistry of, J. Strachan, 219
 Dendroglyphs, The, or Carved Trees of New South Wales, R. Etheridge, 269
 Dental Changes in the Teeth of the Guinea-pig produced by a Scorbutic Diet, S. S. Zilva and E. M. Wells, 17
 Development and Road Improvement Funds Acts, V. Nash and Sir T. H. Middleton appointed Commissioners under the, 250
 Devonport Technical School, S. C. Monk appointed Lecturer in Electrical Engineering at the, 336
 Diamond: Macle, Study of the, and the Internal Structure of Diamond, J. R. Sutton, 480; Some Controversial Notes on the, J. R. Sutton, 299
 Dicotyledons, Anatomy of the Lower, II., Prof. Harvey-Gibson and Miss E. Horsman; III., Miss C. E. Quinlan, 18
 Dielectric Liquids surrounding an Arc, Decomposition of, Ed. Urbain and C. Scal, 259
 Digitalis Preparations, A Standardisation of, E. Berry, 455
 Dimethyl Sulphate, Action of, on the Sulphates of the Alkalis and Alkaline Earths, J. Guyot and L. J. Simon, 380
 Dingo, External Parasites of the, T. Steel, 420
 Direct-current Motor, A Small, using Thermionic Tubes instead of Sliding Contacts, Prof. W. H. Eccles and F. W. Jordan, 38
 Dogfish, Development of the Pericardiac-peritoneal Canal in the, E. S. Goodrich, 231
 Dogs, Experiments on, 130
 Dogs Protection Bill: Protest against the, by the Research Defence Society, 230; Petition in opposition to the, 249; Rejection of the, 350
 Donyo L'Engai, Volcanic Eruption of, C. W. Hobley, 310
 Doppler Effect, The, in the Molecular Scattering of Radiation, Prof. C. V. Raman, Sir J. Larmor, 165
 Dreams and Primitive Culture, Dr. W. H. R. Rivers, 70
Drosophila melanogaster (ampelophila), A. Sturtevant, 354
 Drought, End of the, 329
 Drugs, The Supply of, during the War, 486
 Dry Cells in Use in America, Methods of Testing and the Characteristic Behaviour of the Various Types of, 451
 Dublin: Trinity College, Archbishop Bernard appointed Provost of, 295; University, Sir J. Campbell appointed Vice-Chancellor, 318
 Durham: Earl of, Prize of the Institution of Naval Architects awarded to W. G. Perring, 489; University, Lord Durham installed Chancellor of, 279
 Dustfall, A Remarkable, at Madison, Wis., A. N. Winchell and E. R. Miller, 310
 Dyers, Worshipful Company of, Gold Medal of the, L. G. Radcliffe awarded the, 328
 Dyes, Synthetic, Statistics of, 207
 Dyestuff Industry, Manufacture of Intermediate Products in the, E. V. Evans, 412
 Dysentery: Amoebic, Dr. W. Yorke, 137; The Bacillary Form of, Col. L. Dudgeon, 137
- Ear, Internal, The Functions of the, Prof. A. Keith, 182
 Earth: The Face of the, Prof. W. J. Sollas, 502; The Figure of the, 381; -Effect on the Sun, An, J. Evershed, 272
 Earthquake: A Severe, in Eastern Bengal, etc., on July 8, 1918, Capt. M. Stuart, 91; in the Midland Counties on January 14, 1916, The, Dr. C. Davison, 473; in the Mugello Valley, near Florence, 371; in the Upper Tiber Valley, April 26, 1917, The, Prof. Oddone, 71; Shocks in the Districts of Florence and Bologna, 350; Waves and the Interior of the Earth, Dr. C. G. Knott, 18
 Earthquakes: Distant, Registration of, T. A. Jaggard and A. Romberg, 251; in Greece, 1912-14, Prof. D. Eginitis, E. Goulandris, and N. Critikos, 473
 Earth's: Axes, The, and Triangulation, J. de Graaff Hunter, 381; Pole, The Movement of the, Sir F. Dyson, Dr. H. Jeffreys, 392
 East: Indian Seas, Monthly Meteorological Chart of, September, 512; London College, W. J. John appointed Lecturer in Electrical Engineering at the, 198
Echidna aculeata, The Temperature of, Dr. H. S. H. Wardlaw, 59
 Echo Personalities: A Short Study of the Contributions of Abnormal Psychology towards the Solution of some of the Problems of Normal Education, F. Watts, 382
 Eclipse, The, and Wireless Telegraphy, 374
 Economic Ornithology, Plea for the Establishment of a Bureau of, Dr. W. E. Collinge, 231
 Edinburgh, Royal Observatory, Prof. Sampson's Report of the, 453
 Edinburgh University: Gifts to; Dr. A. E. Sprague appointed University Lecturer in Actuarial Science; Presentation of Minerals, Rocks, and Fossils by A. S. Stenhouse and Major W. Bisset, 78; Dr. J. Drever appointed Coombe Lecturer in Psychology; Proposed Invitation to the British Association for 1921; Purchase of Land for University Extension, 158; Impending institution of a Lectureship on the Organisation of Industry and Commerce; Resignation of the Chair of Logic and Metaphysics, by Prof. Pringle Pattison, 237;

- Re-establishment of the Lectureship in Military History and Strategy; Resolution to institute a Diploma in Public Health; Dr. H. S. Allen appointed Lecturer in Natural Philosophy, 336; Sir H. H. Styles appointed Professor of Clinical Surgery; Dr. Meakin, Professor of Therapeutics; Dr. F. D. Boyd, Professor of Clinical Medicine; T. P. Laird, Professor of Accounting and Business Method, subject to the Approval of the Ordinance for the New Chair, 418
- Education: Act, 1918, Section 28 of the, to come into Operation on April 1, 16; and Industry, 241; and Science in the Civil Service Estimates, 116; for Genius, E. C. Reed, 518; Importance of, Address by the King on the, 459; in Industry and Commerce, Association for the Advancement of, Establishment of an, 279; of the Youth of the Country, A Chart showing Desirable, Principal J. C. M. Garnett, 318; Part-time, in the United States, 127; Secondary and University, Sir F. G. Kenyon, 286; The Advancement of, 143
- Educational: Problems presented to the Imperial Education Committee of the War Office, for the Coming Conference on, 258; Purposes, Bequest for, by C. K. Marr, 138
- Efficient Invention, D. Leechman, 213
- Eight-hour Day, An Application of the, H. de Chardonnet, 319
- Electric: Arc, Pressure upon the Poles of the, Dr. W. G. Duffield, T. H. Burnham, and A. H. Davis, 38; Currents, Velocity of, Prof. R. A. Fessenden, 505; Force between Two Electrodes, Distribution of, W. J. Harrison, 58; Furnaces, A. Gallenkamp and Co.'s Small, 492; C. R. Darling, 235; Light and Power Industry of the U.S.A., The, 372; -Wave Telegraphy and Telephony, The Principles of, Prof. J. A. Fleming, Fourth Edition, 423; Welding Developments, 72
- Electrical: Phenomena occurring at High Levels in the Atmosphere, Dr. S. Chapman, 311; Research Committee, appointment of E. B. Wedmore as Director of Research, 191; Ship Propulsion, W. B. Hird, 232; Theory, Foundations of, 142
- Electricity: (Supply) Bill, 1919, 408; The Theory of, G. H. Livens, 142
- Electro: -analysis, Prof. E. F. Smith, Dr. F. W. Gray, 363; -atomic Phenomena in the Magnetic Field, Prof. A. Righi, Dr. N. R. Campbell, 384; -cardiograph, The, R. S. Whipple, 133; -dynamics, The Fundamental Formulations of, G. H. Livens, 398
- Electrodes, Experiments with Perforated, on the Nature of the Discharge in Gases at Low Pressure, Dr. F. W. Aston, 398
- Electrolysis in Chemical Industry, The Applications of, A. J. Hale, 203
- Electrolytes, Strong, and Ionisation, J. C. Ghosh, 376
- Electrolytic Iron Deposition, Lt. W. A. Macfadyen, 178
- Elephants in the Addo Bush Reserve, Proposed Extinction of the, 308
- Elephas indicus*, Structure of the Plates of the Molars of, and the Different Origin of the Two Species of Living Elephants, S. Stefanescu, 380
- Elettro-Atomici, I Fenomeni, sotto l'Azione del Magnetismo, Prof. A. Righi, 82
- Elgar Scholarship of the Institution of Naval Architects awarded to W. G. Green, 489
- Eliza Hall Institute of Research, Dr. S. W. Patterson appointed Director of the, 498
- Emissive Theories and the Doppler-Fizeau Principle, F. Michaux, 99
- Emotion and Value, A. F. Shand, 140
- Encysted Wood, Samples of, Col. R. A. Marr, 339
- Energy: Expenditure and Food Requirements of Women Workers, O. Rosenheim, 279; Distribution in Spectra, Prof. J. W. Nicholson, 495; Transmission, A New Method of, Constantinesco, 93
- Engineer, The Title of, in Austria, 372
- Engineering: Trades (New Industries) Committee, Report of the, 128; Training, An Undeveloped Aspect of, 387
- Engineers: Society of, Scheme to Associate the, with other Engineering Societies, 329; The Training of, Lt.-Col. W. A. J. O'Meara, 387
- English (Language and Literature) in the Educational System of England, Appointment of a Departmental Committee on the Position of, 198
- Entomological Papers, Dr. W. Roepke, 269
- Eosins and Erythroins, Examination of, T. T. Cocking, J. D. Kettle, and E. J. Chappel, 455
- Equilibrium and Vertigo, Dr. I. H. Jones, with an Analysis of Pathologic Cases by Dr. L. Fisher, 182
- Essays and Discourses, Sir Prafulla Chandra Ray, 1
- Essex Water Supply, 242
- Ether, Purified, and the Variations of Commercial Samples, A. J. Jones, 455
- Eucalyptus: A New Species or Form of, Dr. C. Hall, 59; Notes on, No. vii., with Descriptions of New Species, J. H. Maiden, 520; Oils, Germicidal Activity of the, Part I., Dr. R. Greig-Smith, 420
- Euglena deses*, Behaviour of, on Mud, Miss R. Bracher, 511
- Euphrasia, The Norwegian Species of, E. Jørgensen, 433
- Evolution: and the Doctrine of the Trinity, Rev. S. A. McDowall, 103; Dynamics of, 201; Medical Contributions to the Study of, Prof. J. G. Adami, 21
- Exhibition of Shipping, Engineering, and Machinery, Forthcoming, 471
- Experimental and Research Station at Turner's Hill, Cheshunt, Report of the, 151
- Experiments, The Credibility of Long-continued, Dr. E. J. Russell, 324
- Explosions, Experimental, The suggested, Dr. C. Davison, 31
- Explosive Reactions, Temperatures reached in, H. Muraour, 299
- Explosives: J. Young, 414; 43rd Annual Report of H.M. Inspectors of, 491
- Eye: Hygiene of the, Dr. W. C. Posey, 63; The Unaided, J. W. French, 159
- Faith in Fetters, Rev. T. R. R. Stebbing, 224
- Falmouth Observatory, Meteorological Tables and Notes for 1918, 451
- Far Away and Long Ago, A History of my Early Life, W. H. Hudson, 22
- "Fascination" of Birds, The supposed, Sir H. Maxwell, 4
- Fats: and Fatty Degeneration, Prof. M. H. Fischer and Dr. M. O. Hooker, 504; Mechanism of the Action of, in the Utilisation and Assimilation of Albuminoids, F. Maignon, 79, 119
- Fauna Brasileiraense, Peixes, Archivos do Museu nacional do Rio de Janeiro, vol. xvii., 425
- Felidæ may be distinguished from each other, Structural Characters by which the Genera of, R. I. Pocock, 140
- Ferric Oxides, Natural Hydrated, Posnjak and Merwin, 490
- Ferro: -carbon-chromium Alloys, Structure of, Murakami, 391; -cerium Flints, Manufacture of, in France, 270
- Ferrous Alloy, A New, 173; Metals, Measuring the Magnetic Hardness of, and its Utility for carrying out Research Work on Thermal Treatment, L. A. Wild, 459
- Fertilisers, Soils and, Prof. T. L. Lyon, 323
- Fiji, Geological Observations in, W. G. Foye, 270
- Fijians, Early, Capt. A. M. Hocart, 279
- Filter-passing Germ, A, Major Bowman, 136
- Finger-print System in the Far East, The, Cav. Filippo de Filippi, 125
- Fisheries: Alleged damage to, by Washings of Tar-treated Roads, A. J. Mason-Jones appointed as Biologist and Observer, 389; National, Capt. G. C. L. Howell, 84; The Writer of the Note, 85; The, and Scientific Research, 385; The, and the International Council, Prof. W. C. McIntosh, 355; The, and the International Council, Prof. W. C. McIntosh, 376
- Fishes, the Shoulder-girdle and Pectoral Fin of, Comparative Anatomy of, Capt. E. W. Shann, 18
- Fishing Industry, Plea for the Unification of the Administration and Further Development of the, 31
- Flagellæ of Insects obtained in a Pure Culture, A. Laveran and G. Franchini, 499
- Flagellata from the Vicinity of Geneva, Dr. E. Penard, 360
- Flint Implements: from Glacial Gravel North of Ipswich, J. Reid Moir, 359; from Victoria West, South Africa, R. A. Smith, 410
- Flotation, Mechanism of the Surface Phenomena of, I. Langmuir, 459

- Flow of Liquids, The Laws of, by Drops in Cylindrical Tubes, L. Abonnenc, 119
- Fluorescent Screens, New, for use in Radioscopy, A. Roubertie and A. Nemirovsky, 519
- Fluorides: Action of, upon Vegetation, A. Gautier and P. Clausmann, 479; Influence of, on Vegetation, A. Gautier, 299
- Fluorometric Method of Measuring X-rays, A Modification of the, and its Application to the Measurement of the Radiation from Coolidge Bulbs, R. Biquard, 200
- Fluorometer, A, A. Muguet, 459
- Folk-beliefs, Current Modes of Interpreting, Dr. R. R. Marett, 210
- Folk-songs of the Teton Sioux, The, Prof. G. H. Bryan, 515
- Folliculina boltoni*, S. Kent, Dr. E. Penard, 219
- Food: Problems, Researches concerned with, Drs. Harden and Zilva, 454; Requirements of Man, Report on the, and their Variations according to Age, Sex, Size, and Occupation, 148
- Forced Movements, Tropisms, and Animal Conduct, Prof. J. Loeb, 163
- Forest: Law in America, The Development of, J. P. Kinney, 321; Policy and Law in the United States, 321; Research in Europe, S. Howard, 55; Soils and the Formation of Humus, H. Hesselman, 176
- Forestry: Bill, The, 431, 441, 449; Third Reading of the, 469; Research in Sweden, 175
- Formulaire de l'Electricien et du Mécenicien, Hospitalier et Roux, Vingt-neuvième Edition, G. Roux, 403
- Forthcoming Books of Science, 11, 34, 92, 114, 134, 152, 194, 211, 234, 274, 291, 311, 331, 353, 374, 391, 411, 434, 452, 492
- Fossil: Insect Wing belonging to the New Order Paramecoptera, Dr. R. J. Tillyard, 519; Vertebrates in the American Museum of Natural History, vol. vi., 31
- Foulerton: Fund of the Royal Society for Original Research in Medicine, etc., 89; John, Studentships, Impending Award of, 370
- Foxhall Human Mandible, The, 50
- Fractionating Column, A New Laboratory Form of, and the Measurement of its Efficiency, M. H. Robert, 299
- Franklin Medals presented to Sir J. Dewar and Major-Gen. G. O. Squier, 309
- Fream Memorial Prize for 1919 awarded to Miss Doris Anderson, 489
- "Free Place System" in Secondary Schools in England and Wales, Report of the Committee of the British Association on the, 57
- French: Exhibition of Optical Instruments and Perfumery in London, A, 248; Steel and Iron Masters' Association, The, M. Honoré, 233
- Fritz, John, Medal, awarded to Major-Gen. G. W. Goethals, 370
- Fuel Economy, 213
- Fungus Diseases of Economic Plants, 354
- Galileo, W. W. Bryant, 23
- Gallium Chloride, Purification by Sublimation and the Analysis of, T. W. Richards, W. M. Craig, and J. Sameshima, 19; Purification of, by Electrolysis, etc., T. W. Richards and S. Boyer, 19
- Galton Laboratory, The Financial Position of the, Prof. Karl Pearson, 470
- Game Birds of California, The, J. Grinnell, H. C. Bryant, and T. I. Storer, 281
- Garden: Flora, A, Trees and Flowers grown in the Gardens at Nymano, 1890-1915, L. Messel. Notes by M. Messel, 362; The Value of a, 362
- Gas, The Flow of, at very High Pressures, A. Rateau, 18
- Gases: Deadly, Defence against, Col. B. Dewey, 317; The Occlusion of, by Metals, Sir R. Hadfield, 168; Prof. McBain, 169
- Gas-fired Pot-furnace, Experiments with a, Dr. M. W. Travers, 419
- Gegenschein, The, or Counter-glow, Prof. Barnard, 134
- Genetical Society, Visit to Cambridge of the, 432
- Genetics for the Botanist, 21
- Geodetic and Geodynamic Institute, A British, 154
- Geological: Bibliography of India, A, 223; Society, Women to be admitted as Fellows of the, 89
- Geology: and Topography, Military, A Presentation of certain Phases of Geology, Geography, and Topography for Military Purposes, edited by H. E. Gregory, 183; Practical, Aids in, Prof. G. A. J. Cole, Seventh Edition, Dr. J. W. Evans, 263
- Geometrical: and Mechanical Fit, Sir G. Greenhill, 193; Crystallography, A Manual of, Prof. G. M. Butler, 103
- Geophysical Journal of the Meteorological Office, The, 352
- German: Dye Manufactures and the Supply of Explosives and Poison Gases, Connection between the, Dr. H. Levinstein, 412; Glass Factories, Impressions of a Recent Tour of the, S. N. Jenkinson, 419; Imperial Postal Department, H. Bredow appointed Director-General of the, 88
- Germany: Co-operation in, 308; Food Conditions in, Prof. E. H. Starling, 471
- Gibbs-Helmholtz Equation, Application of the, to Monovariant Systems, A. Boutaric, 280
- Giblin Tin Lode of Tasmania, The, C. W. Gudgeon, 18
- Gibson Memorial Scholarship: Gift for a, by Miss M. M. Gibson, 118; awarded to Miss M. E. Harding, 336
- Gilchrist Scholarship, A Special, offered through the London (Royal Free Hospital) School of Medicine for Women, 358
- Girvanella and the Foraminifera, F. Chapman, 4
- Glasgow School of Metallurgy, The Aims of a, Prof. C. Desch, 114
- Glasgow University: Conferment of Doctorates, 158; Conferment of Degrees, 358; Prof. G. G. Henderson appointed Regius Professor of Chemistry, 438; Dr. C. H. Browning Gardiner Professor of Bacteriology; Dr. T. S. Patterson Gardiner Professor of Organic Chemistry, Dr. E. P. Cathcart Gardiner Professor of Physiological Chemistry, 439
- Glass: Optical, 65; Research Association, The, 149; -making before and during the War, H. J. Powell, 352; -working Tools, The Spacing of, T. Smith, 159
- Glasses: for the Protection of the Eyes of Furnacemen, Properties of, 290; Welding of, L. Apert, 271
- Globular: Clusters and Spiral Nebulae, Distribution of, Dr. H. Shapley, 514; Cepheid Variables, and Radiation, Dr. H. Shapley, 25; Prof. F. Soddy, 43; J. H. Jeans, Dr. J. W. Evans, 64; Lightning, Prof. J. A. McClelland, G. Gilmore, 284
- Glossina and the Extinction of Tertiary Mammals, Prof. T. D. A. Cockerell, 265
- Glucina from Beryl, A Method of extracting, H. Copaux, 119
- Glucose and Lævulose, Utilisation of, by the Higher Plants, H. Colin, 159
- Glycerol, Method of Obtaining, K. Schweizer, 252
- Godman, F. Du Cane, Proposed Memorial to the late, 449
- Gold, Volatilisation of, Sir T. K. Rose, 98
- Gomontia lignicola*, G. T. Moore, 71
- Goniometer, A Students', Dr. G. F. H. Smith, 98
- Gorizia, The Climate of, Prof. F. Eredia, 310
- Government: Grants for Scientific Research, The Conditions attached to, Prof. F. Soddy, 226; The Functions of, in Relation to Education, H. A. L. Fisher, 78; The Machinery of, 85; A. J. Brander, 104
- Grain Pests: and their Investigation, Dr. A. D. Imms, 325; (War) Committee, Royal Society, Report No. 1, May, 1918, 325
- Grasses and Grasslands of South Africa, The, Prof. J. W. Bews, 62
- Graticules, J. Rheinberg, 239
- Gravitation and Relativity, 2
- Greek Vase-painting, The Study of, S. B. Luce, 472
- Greenwich: Temperature Records, A Periodogram Analysis of the, Capt. D. Brunt, 338; The Royal Observatory, Report of the Astronomer Royal, 313
- Greensand (Glauconite) Deposits, Value of, as a Source of the Potassium required by Growing Plants, True and Geise, 271
- Guy Medal of the Royal Statistical Society, The, awarded to Dr. J. C. Stamp, 309
- Gymnosperms, New Knowledge of a Puzzling Group of, Prof. A. C. Seward, 115
- Gyroscopics, Sir G. Greenhill, 121
- Gyrostatics and Rotational Motion, A Treatise on, Theory and Applications, Prof. A. Gray, 121

- Hæmatic Phenomena in Anaphylaxy and Antianaphylaxy, Some, C. Richet, P. Brodin, and Fr. Saint-Girons, 39
- Hakea laurina*, Application of the Biological Method to the Study of the Leaves of, E. Bourquelot and H. Hérissé, 39
- Hales, Rev. Stephen, Life of, Prof. F. Smith, 150
- Halogen Acids, The Addition Compounds of, to Diphenylarsenic Acid, V. Grignard and G. Rivat, 479
- Harrison, Lt.-Col. E. F., Memorial Lecture on the late, F. H. Carr, 432
- Harvard University, Provision for a Choate Memorial Scholarship, 237
- Hastings and East Sussex Naturalist*, The, 273
- Häuy, René-Just, Articles on, 290
- Haystacks, Spontaneous Combustion of, W. Smith, 491
- Health: Bureau, Central, Proposal to set up a, 112; Bill, The Ministry of, Major Astor and others, 7; Third Reading Passed after Alteration, 139; Sir R. Morant designated First Secretary of the, 88; Minister of, Dr. C. Addison appointed, 328; of our Children, The, 11
- Heat: Light, and Motive Power, Distribution of, by Gas and Electricity, Sir Dugald Clerk, 233; of Evaporation of a Liquid, Application to Eight Different Substances of the Formula which expresses the, E. Ariès, 79
- Hedgehog carrying Fruit upon its Spines, The Ancient Legend as to the, M. Christy, 119
- Heidelberg University, Prof. L. Jost appointed Professor of Botany in, 96
- Helium in Fire-damp, etc., Prof. C. Moureu, 412
- Heriot-Watt College, Edinburgh, Dr. Boon appointed to the Chair of Chemistry at, 198
- Higher Education Grants and Training for ex-Service Officers and Men, 499
- Highways and Byways in Northamptonshire and Rutland, H. A. Evans, 103
- Hindu: Astronomical Deities, G. R. Kaye, 500; Chemist, The Life-work of a, Sir T. E. Thorpe, 1
- Holzes, Mikrographie des, der auf Java vorkommenden Baumasten, im Auftrage des Kolonial-Ministeriums, Funfte Lief, Prof. J. W. Moll and Dr. H. H. Janssonius, 303
- Home Civil Service, New Regulations for Examinations for Clerkships in the, 237
- Homogeneous Mixtures, Equation for the Chemical Equilibrium of, part i., Prof. A. W. Porter, 459
- Horses of Tang T'ai-Tsung, The, and the Antecedents of the Chinese Horse, C. W. Bishop, 489
- Human: Basal Metabolism, A Biometric Study of, J. A. Harris and F. G. Benedict, 19; Machine, The, and Industrial Efficiency, Prof. F. S. Lee, 261; Ovum, Maturation of the, Prof. A. Thomson, 472; Skeleton, The, An Interpretation, Prof. H. E. Walter, 383
- Humanity, The Old, and the New Science, Sir W. Osler, 234
- Humming Birds, The Lustre of some Feathers of, H. J. Charbonnier, 324
- Hut-burning in India, Dr. W. Crooke, 32
- Hyderabad Archæological Society, The Gold Medal of the, awarded to H. Cousins, 510
- Hydraulic Experiments with Valves, etc., 270
- Hydrogen: Atoms, Mobility of the, in Organic Molecules, J. Martinet, 159; in War and Industry, 442; The Chemistry and Manufacture of, Major P. L. Teed, 442
- Hydrographic Conference, The International, 328
- Hydrophobia, Society for the Prevention of, Reorganisation of the, 249
- Hyoscine, Resolution of, into the Lævo-form and the Dextra-form, H. King, 114
- "Hyporit," Manufacture of, at the Griesheim-elektron Chemical Works, 111
- Ice: A New Theory of Transportation by, F. Debenham, 319; in the Arctic Seas, State of the, in 1918, 270
- Ifugau Law, R. F. Barton, 371
- Igneous-ore Deposits, Genesis of, W. H. Goodchild, 338
- Illinois University Buildings, Laboratories, etc., of, 238
- Illiteracy in Eastern Europe, 158
- Illuminating Engineering Society, Tenth Anniversary Dinner of the, 70
- Imperial: British Institute of Archæology in Cairo, Plea for an, Sir A. Evans, 31; College of Science and Technology, Free Places at the, 237; Gifts to, by O. Beit and an Old Student of the Royal College of Science, 258; Education Conference, 313; Speeches by H. A. L. Fisher and others, 313; Mineral Resources Bureau, Incorporation of the, 350
- Incaescent Larva, "Smoke" from, 433
- India: and the Cultivation of the Physical Sciences, Sir Prafulla Chandra Rây, 353; Board of Scientific Advice for, Annual Report of the, 434; Food-crops in, Means of rapidly increasing the Produce of, 113; The Government of, and Scientific Medicine, 229
- Indian: Association for the Cultivation of Science, Report of the, for 1917, 113; Astronomical Instruments, Dr. J. L. E. Dreyer, 166; Forest Records, vol. vi., part iv.: A Further Note on the Antiseptic Treatment of Timber, recording Results obtained from Past Experiments, R. S. Pearson, 81; Geology and Physical Geography, A Bibliography of, with an Annotated Index of Minerals of Economic Value, T. H. D. La Touche, two parts, 223; Land Planarians, Prof. R. H. Whitehouse, 211; Mineral Production in 1917, 372; Museum, Guide to Andamanese and other Objects in the, Dr. A. M. Meerwarth, 511; Science Congress, The Seventh Annual Meeting of the, 450; Survey Report, vol. xi., 293
- Indigo, A Hot-water Process for the Extraction of, Dr. F. Marsden, 137
- Individuality, The Problem of, 342
- Inductance Calculations, Simplified, with Special Reference to Thick Coils, P. R. Coursey, 97
- Indus, Brahmputra, and Ganges, The Early History of the, Lieut. E. H. Pascoe, 78
- Industrial: Biology, National Institute of, Plea for a, A. Chaston Chapman, 511; Efficiency, 261; Electrolysis, 203; Fatigue, Reports on, 493; Research Board, Dr. Winifred Cullis and Miss M. Wilson accept Membership of the, 172; *Hygiene, Journal of*, No. 1, 489; Lighting, L. Gaster, 437; L. Gaster, H. C. Wheat, E. G. W. Souster, 513; Organisation, Capt. M. Greenwood, 329; The Physiology of, and the Re-employment of the Disabled, Prof. J. Amar, Translated by B. Miall, Edited, etc., by Prof. A. F. Stanley Kent, 341; Reconstruction and the Metric System, H. Allcock, 173; Research and the Supply of Trained Scientific Workers, Report of the Education Committee of the British Science Guild on, 318; The Government Scheme for, 31
- Infections, Hidden Experimental, C. Nicolle and C. Lebaillly, 180
- Influenza: Epidemic in India, Major N. White, 52; Etiology of, Major G. Gibson, Major Bowman, and Capt. Connor, 90; Returns of, 9, 32, 52; The Clinical Aspects of, Sir W. Herringham, 136; The Epidemiology of, Capt. Greenwood, 136
- Inosite, Synthesis of the Hexaphosphate of, etc., S. Posternak, 480
- Institut d'Optique: The, 473; Higher Instruction at the, 490
- Institute of Metals, The Autumn Meeting of the, 449
- Institution of: Civil Engineers, The King of Italy and the Prince of Wales elected Honorary Members of the, Awards of the, 192; Mining Engineers, Forthcoming General Meeting of the, 268
- Intensity, Distribution of, along Positive-ray Parabolas of Atoms and Molecules of Hydrogen, and its Possible Explanation, F. W. Aston, 297
- Inter-allied: Confederation for Pure and Applied Chemistry, Arrangements for the First Meeting of the Council of the, 149; Co-operation in Chemistry, 187
- International: Hydrographic Conference, Forthcoming Meeting of an, 289; Research Council, Forthcoming Meeting of the, 308; Meeting of the, 449; The Brussels Meeting of the, 464
- Intravenous: Injection in Wound Shock, Prof. W. M. Bayliss, 122; Injections in Cholera, Prof. W. M. Bayliss, 264
- Inventions, The Efficiency of, 213
- Invisible Light in Warfare, Uses of, Prof. R. W. Wood, 138
- Ionisation and Radiation, Dr. R. A. Houston, 145
- Ions produced by Phosphorus, Nature of the, Prof. J. A. McClelland and P. J. Nolan, 39

- Ireland, School of Physic in, Dr. H. Pringle elected King's Professor of the Institutes of Medicine in the, 78
- Iridescent Insects, The Colour of the Scales of, in Transmitted Light, Hon. H. Onslow, 84
- Iris pseudacorus*, Linn., Life-History of, T. A. Dymes, 360
- Irish Atlantic Coasts, Occurrence of Tropical Drift-seeds on the, N. Colgan, 219
- Iron: and Iron-carbon Alloys, The Metallography of, Prof. H. C. H. Carpenter, Prof. G. Cesaro, Prof. Honda, 436; and Steel Institute, Forthcoming Autumn Meeting of the, 488; Jubilee Banquet of the, 209; Foundry, Improved Methods in an, Col. C. S. Myers, 493; -ore Developments in the United Kingdom, Recent, Dr. F. H. Hatch, 477
- Isostatic Compensation in Inequalities in the Earth's Crust, Col. Sir S. G. Burrard, 351
- Italian Society for the Progress of the Sciences, Tenth Meeting of the, 132
- J-rays, Spectral Structure of the, R. Ledoux-Lebard and A. Dauvillier, 119
- Jacksonian Prize of the Royal College of Surgeons of England for 1918, The, awarded to J. A. Cairns Forsyth, 131; Subject for the, for 1920, 150
- Jacobi's Extension of the Continued Fraction Algorithm, D. N. Lehmer, 19
- Jasminum malabaricum*, Wight, Variation in Flowers of, Dr. H. H. Mann, 139
- Jewelry Trade in War-Time, The, 326
- Johns Hopkins University: Gift for a Woman's Clinic, 57; Sir A. Newsholme offered the Chair of Public Health at, 138
- Jordan Regions, A Characterisation of, by Properties having no Reference to their Boundaries, R. L. Moore, 19
- Journal of a Disappointed Man, The, W. N. P. Barbellion, 363
- Jungle Peace, W. Beebe, 22
- Jupiter, 234; Changes on, Rev. T. E. R. Phillips, 152. Observed Changes on, F. Sargent, 134; Occultation of Small Stars by, A. Burnet, 492; Venus and, 73
- Jurassic: Chronology, I.—Lias, S. S. Buckman, 310; Plants from Bexhill, near Lismore, N.S.W., Dr. A. B. Walkom, 420
- Kammerer's, Dr., Testimony to the Inheritance of Acquired Characters, Prof. W. Bateson, 344
- "Karoo System" of South Africa, Zoning of the, A. L. du Toit, 330
- Kapok, The Use of, for Life-Jackets, 490
- Ketimines, Synthesis of, by the Catalytic Method, G. Mignonac, 519
- Ketones: Bicyclic, A new Method for the Preparation of, F. Taboury and M. Godchot, 459; Related to Zingerone, Synthetic Aromatic, The Pungency of, Miss L. K. Pearson, 455
- Kilauea, Hawaii: A Model of the Volcano, R. W. Sayles, 456; The Work on Vulcanology at, placed under the U.S. Weather Bureau; The Appointment of Prof. T. A. Jaggar as Director approved, 131
- Kinema, Application of the, to the Teaching of Anatomy, Major E. D. Maddick, 327
- King's Birthday Honours, The, 267, 288
- Kingsley, Mary, Medal of the Liverpool School of Tropical Medicine, The, presented to Dr. J. W. Scott Macfie, 131
- Knowledge, The Stereoscopic Character of, Prof. J. B. Baillie, 239
- Kopff's Periodic Comet, 453, 474, 492, 514, 519
- Kunadiyaparawitta Mountain, Notes on a visit to, with a list of the Plants obtained and their Altitudinal Distribution, F. Lewis, 98
- L'Aéronautique*, No. 1, 451
- Labour: and its Organisation, The Service of, Dr. J. Ioteyko, 343; and the Higher Values, Prof. F. Soddy, 427; and Scientific Research, P. G. Agnew, 425
- Lac Industry in India, The, 289
- Lake Mendota, A Qualitative and Quantitative Survey of the Fauna of, R. A. Muttikowski, 232
- Lancashire Sea-Fisheries Laboratory, Report for 1918 of the, 472
- Land and Sea, Relations of, in the North Atlantic Region, O. Holtedahl, 433
- Lankester, Ray, Investigators, at the Plymouth Marine Biological Laboratory, Appointment of, 250
- Larch, Cultivation of the, in Sweden, Prof. G. Schotte, 176
- Larix eurolepis*, History of, Prof. A. Henry and Miss M. G. Flood, 399
- Latin in the Curriculum, Abolition of Compulsory, by Yale and Princeton Universities, 78
- Latitude, Variation of, B. Wanach; I. Yamamoto, 10
- Lava-flow, Artificial, in Kinghorn, Products of the, G. V. Wilson, 351
- Lead: Isotopes: Refractive Index Solubilities of the Nitrates of, T. W. Richards and W. C. Schumb, 19; Radio-active, The Problem of, Prof. T. W. Richards, 74, 93; Tin, and Thallium, The Tempering of, P. Nicolardot, 119
- Ledge on Bald Face, The, Major C. G. D. Roberts, 22
- Leeds University: Acceptance of the resignation of Dr. C. Lovatt Evans of the Chair of Experimental Physiology and Experimental Pharmacology, 96; Dr. J. Strong appointed Professor of Education, 418; Evening Courses in Technology at, 499
- Leicester, Bequest by Dr. J. E. M. Finch for the Endowment of a University for, 178
- Le Monnier, The Observatory of, in the rue Saint-Honoré, G. Bigourdan, 159
- Lens Calculations, A Guide to, 401
- Leicestershire, County Mining Organiser for, M. H. Haddock appointed, 499
- Lepadid Barnacles, Possible derivation of the, from the Phyllopod, J. M. Clarke, 19
- Leptinotarsa, Mechanism of Evolution in, Dr. W. L. Tower, 517
- Leucitic Lavas of Trebizond, The, and their Transformations, A. Lacroix, 159
- Lewis's Medical and Scientific Circulating Library, Catalogue of New Edition, Revised to the end of 1917, 204
- Lice, Processes and Methods for Ridding the Troops of, Bacot, 454
- Lichtenberg's Dust Figures, P. O. Pedesen, 352
- Life and Finite Individuality: Two Symposia, Dr. J. S. Haldane, and others, Edited by Prof. H. Wildon Carr, 342; The Origin and Evolution of, on the Theory of Action, Reaction, and Interaction of Energy, Prof. H. F. Osborn, 201
- Light: Diffusion of, by Rain, Cloud, or Fog, A. Mallock, 398; by the Molecules of the Air, J. Carbannes, 18; Influence of, on the Absorption of Organic Material of the Soil by Plants, Mme. D. Cebrian des Besteiro and M. Michel-Durand, 79; Invisible, Uses of, in Warfare, Prof. R. W. Wood, 138; Scattering of, by Solid Substances, Hon. R. J. Strutt, 37
- Lighting: in Factories and Workshops, L. Gaster, 70; of Railways, A. Cunningham, 53
- Linnean Society, Election of Officers and Council of the, 268
- Lister Institute of Preventive Medicine, Twenty-fifth Annual Report of the; Proposed Change of Name to that of the Lister Institute for Medical Research, 454
- Liverpool University: Acceptance of Prof. Herdman's Resignation; Record of his work, 56; Bequest to, for a Scholarship, by Mrs. E. Morgan, 108; Col. J. G. Adami, elected Vice-Chancellor, 278; Tidal Institute, 206; Dr. L. Doncaster appointed Professor of Zoology, 397
- "L'Océan," La Panne, Ambulance de, Tome II., fasc. 1, 223
- Locomotive Piston-valve Leakage, Tests on, 391
- London: County Council, Handbook of Classes and Lectures for Teachers, 518; Hospital, Forthcoming Appointment of Paid Medical Officers of the, 30; Offer by the Goldsmiths' Company for the Endowment of a Chair of Bacteriology at the, 278; Plane, The History of the, Prof. A. Henry, 333; (Royal Free Hospital), School of Medicine for Women, Appointments at the, 258; University, Tenth Annual Report of the Military Education Committee; Bequest by Dr. W. J. Mickle, 16; Capt. J. R. Partington appointed Professor of

- Chemistry at East London College; Gifts to, by Sir H. H. Bartlett; Gift by G. S. Baker for a Prize in Memory of Dr. S. M. Baker; Resignation of Prof. Vaughan Harley; Degree of D.Sc. conferred upon E. C. Grey, 96; Proposed Course of Study for Intending Journalists, 97; Grant by the Ramsay Memorial Committee for a Laboratory of Chemical Engineering at University College, 117; Annual Report of the Vice-Chancellor, 218; Conferment of Doctorates; Resignation of Pember Reeves of the Directorship of the London School of Economics, 278; Prof. G. Elliot Smith appointed Professor of Anatomy at University College; Major A. J. Allmond appointed Professor of Chemistry at King's College, 278; A. E. Richardson appointed Professor of Architecture at University College; Degrees in Commerce; The Ph.D. Degree; A Chair of Aeronautics to be instituted at East London College, 278; A War Memorial Scheme, 295; T. B. Johnston appointed Professor of Anatomy at Guy's Hospital Medical School; Dr. A. J. Clark appointed Professor of Pharmacology at University College; Conferment of Degrees; Mrs. Row thanked for Donation for a Scholarship; Approval of Syllabuses for the Intermediate Science Examination, 358; J. C. Flügel appointed Lecturer in Psychology at University College; E. J. Salisbury Lecturer in Botany; Dr. P. Haas Lecturer in Plant Chemistry; Dr. F. W. Goodbody Lecturer in Medical Chemistry; H. T. Davidge Lecturer in Applied Mathematics; C. C. Hawkins Lecturer in Electrical Design, 379; Institution of a Faculty of Commerce, 379; The forthcoming Appointment of Principal, 379; T. L. Wren appointed Reader in Geometry at University College; Sir W. H. Beveridge Director of the London School of Economics; E. A. Baker Director of the School of Librarianship at University College, 439; Gifts for the establishment of a Degree in Commerce; Sir G. Thane, Prof. F. M. Simpson, and Prof. A. K. Huntington granted the title of Emeritus Professor; A Chair of Botany to be instituted at Bedford College; Conferment of Doctorates, 439; Appointments in, 479; School of Librarianship, Appointments at the, 498
- Longitudes and Latitudes all over the World, Project for the Determination of a Network of, E. Picard, B. Baillaud, and M. Ferrié, 339
- Luminescence, The Phenomena of, accompanying the Oxidation of Potassium and Sodium, G. Reboul, 379
- Luminous Worms, Rev. H. Friend, 446
- Lunar: Atmospheric Tide, The, Dr. S. Chapman, 272, 185
- Lycopodium in Quantitative Microscopy, The Use of, T. E. Wallis, 455
- Lyons Neighbourhood, The Winters 1916-17 and 1917-18 in the, Prof. J. Mascart, 433
- Lysorophus, The Structure of, as exposed by Serial Sections, Prof. W. J. Sollas, 279
- McGill University, Montreal; Sir A. Geddes appointed Principal of, 111; Capt. S. E. Whitnall appointed Professor of Anatomy, and Capt. J. Tait appointed Drake Professor of Physiology at, 336
- Mackinnon Research Studentships, The, of the Royal Society, 89
- Madras: Agricultural Department, Year-book, 1918, of the, 137; Medical College, Gift for a Scholarship at the, Lt.-Col. W. D. Smith, 517
- Magnesite and Dolomite in Australia and New Zealand, P. G. Morgan, 450
- Magnetic: and Allied Observations during the Total Solar Eclipse of May 29, 1919, Proposed, Dr. L. A. Bauer, 44; Dip Chart, A Transformation of the, E. A. Reeves and others, 72; Observations taken during the Solar Eclipse of June 8, 1918, Dr. L. A. Bauer, H. W. Fisk, and S. J. Mauchly, 193; Observatories, American, New Procedure at, Dr. C. Chree, 54; Storm, A., 492; Storm of August 11-12, 1919, The, Rev. A. L. Cortie, 483; Dr. C. Chree, 505; Dr. A. C. Mitchell, 506; Storms of March 7-8 and August 15-16, 1918, and their Discussion, Dr. C. Chree, 97; Susceptibility, Influence of Molecular Constitution and Temperature on, Dr. A. E. Oxley, Part IV., 398
- Magnetite, Magnetic Properties of Varieties of, Profs. E. Wilson and E. F. Herroun, 399
- Makdougall-Brisbane Prize of the Royal Society of Edinburgh, The, awarded to Prof. A. A. Lawson, 309
- Mallard Ducks of the United States, Food Habits of the, M. L. McAtee, 113
- Manchester: City Council, Approval by the, of a New Method for the Selection of Elementary School Pupils for Secondary Education, 279; Municipal College of Technology, A. J. Turner appointed to the Chair of Textile Technology in the, 37; University Courses in the, 479; Dr. J. K. Wood appointed Lecturer in Physical Chemistry at the, 518; Literary and Philosophical Society, Prof. G. Elliot Smith elected President of The, 210; University of, W. L. Bragg appointed Professor of Physics; Prof. D. H. Macgregor, Professor of Economics; Prof. O. T. Jones, Professor of Geology, 317; Dr. S. Chapman, Professor of Mathematics, 458; Dr. E. G. Gardner, Professor of Italian, 518
- Manila, Weather Bureau at, Report for 1916 of the, 290
- Manometer, A Glass, with Elastic Walls, G. Baume and M. Robert, 379
- Man's: Redemption of Man, Sir W. Osler. Third edition, 23; Supreme Inheritance. Conscious Guidance and Control in relation to Human Evolution in Civilisation, F. M. Alexander. Second edition, 444
- Manual de Fabricantes de Azúcar de Caña y Químicos Azucareros, Dr. G. L. Spencer; Traducción Autorizada de la 6ª Edición Inglesa, Dr. G. A. Cuadrado, 383
- Manures in Southern India, Dr. Harris, 137
- March Weather, 90
- Marine: Algæ as Food for Horses, C. Sauvageau, and L. Moreau, 419; Biological Association, Gifts to, by Dr. G. P. Bidder and E. T. Browne, 191; Boring Animals, Dr. W. T. Calman, 219; Plankton around the South End of the Isle of Man, Prof. Herdman, A. Scott, and Miss H. M. Lewis, 472; Plants, Ashes of, Spectrographic Study of the, E. Cornec, 99
- Mars, H. Thomson, 212; Drawings of, 134
- Mass, Standards of, 515
- Matter and Radiation, H. H. Poole, 84
- Mauritius, Royal Alfred Observatory, Annual Report for 1917, 372
- Maxillulæ in the Orders of Insects, Structure and Occurrence of, Miss A. M. Evans, 319
- Mechanics, Sound, Light, Thermo-mechanics, and Hydraulics, Notes, Problems, and Laboratory Exercises in, Prof. H. Dunwoody, 302
- Medical: Research, The Use of Animals in, 108; Committee, Proposed Reconstitution of the, Dr. C. Addison, 50; Dr. C. Lovatt Evans to undertake Research Work under the, 96; H. King appointed Organic Chemist in the Department of Biochemistry and Pharmacology of the, 267; Science in the War, 354
- Medicine: Experimental, and the Sick and Wounded in the War, Sir Anthony Bowlby, 354; Scientific, The Government of India and, 229
- Mediterranean Peoples, Identity of the, who took part in the Conflicts with Egypt during the Nineteenth and Twentieth Dynasties, Prof. Giuffrida-Ruggieri, 70
- Melanesian Dictionary, A, S. H. Ray, 102
- Melbourne, University of, Grant to, by the Victorian Government, 237
- Mendelian Theory, A Darwinian Statement of the, Prof. H. F. Roberts, 463
- Merchant Venturers' Technical College, Prospectus of the, 518
- Meridian Telescope, Study of the Perturbations of the Optical Axis of a, M. Hamy, 79
- Mesozoic Insects of Queensland. Part V., Mecoptera, Dr. R. J. Tillyard, 520
- Metabolism of Female Munition Workers, Report on the, M. Greenwood, C. Hodson, and A. E. Tebb, 279
- Metal Sols, Mode of Action of, Prof. C. R. Marshall, 208
- Metals: Action of Finely Divided, upon Pinene Vapour, P. Sabatier, A. Mailhe, and G. Gaudion, 280; Institute of, Journal of the, No. 2, 1918. Vol. xx., 165; Spring and Autumn Meetings of the, Prof. Soddy to deliver the May Lecture, 150; Inter-crystalline Frac-

- ture of, under Prolonged Application of Stress, Dr. W. Rosenhain and S. L. Archbutt, 118; Mechanical Testing of, New Methods for the, C. Trémont, 518; The Occlusion of Gases by, Sir R. Hadfield, 168; Prof. McBain, 169
- Meteor: A Bright, 411; An Interesting, 291
- Meteoritic: Iron from Klondike, Acquired by the British Museum, 69; Shower, The, of Halley's Comet, 174
- Meteorites Adare and Ensisheim, The, Dr. G. T. Prior, 98
- Meteorological: Chart, Monthly, of the East Indian Seas, February, 10; Charts, North Atlantic and East Indian, 491; Office, Sir Napier Shaw resumes the Administrative Duties of the Directorship of the, 210; Research, Change of Emphasis in, Prof. W. S. Franklin, 211; Science, The Outlook of, Sir Napier Shaw, 475; Services of the British Dominions, Forthcoming Conference of Representatives of the, 488
- Meteorology: During and After the War, Col. H. G. Lyons, 12; Introductory, Sir Napier Shaw, 123; The Society and its Fellows, Sir Napier Shaw, 475
- Meteors: The April, of 1919, 174; June, 252
- Methyl Lævoinositol in an Australian Poisonous Plant, Occurrence of, Dr. J. M. Petrie, 59
- Methylsulphates of the Alkalis and Alkaline Earths, Action of Heat on the, J. Guyot and L. J. Simon, 320
- Metric System: Industrial Reconstruction and the, H. Allcock, 173; Letter of the World Trade Club on the Introduction of the, in the United Kingdom, 310
- Metrology in the Industries, Sir R. Glazebrook, 238; Discussion on, 373
- Mexican Clay Heads, etc., found on the site of Teotihuacan, A. C. Breton, 192
- Microcephaly, An extreme case of, Dr. Dru-Drury, 460
- Micrococcus populi*, The Bacterial Nodule of the Poplar, R. Régnier, 460
- Micropterygidae (sens. lat.), Morphology and Systematic Position of the Family, Introduction and Part I., Dr. R. J. Tillyard, 420
- Microscope, British Standard, Plea for a, Lt.-Col. Clibborn, 89
- Micro-voltmeter, A, C. T. R. Wilson, 298
- Military: Camouflage, Major A. Klein and Dr. J. C. Mottram, 364; Geology and Topography, 183
- Milk. Relation between the Fat-content and the Electrical Conductivity of, Dr. H. S. H. Wardlaw, 19
- Millstone Grit. Series of Yorkshire, Petrography of the, Dr. A. Gilligan, 297
- Minds, Other, Our Knowledge of, Mrs. N. A. Duddington, 57
- Mine-gas Poisoning, Lt.-Col. D. Logan, 137
- Miner on the Western Front, Work of the, H. S. Ball, 230
- Mineral: Production in Relation to the Peace Treaty, Prof. H. Louis, 205; Salts, Absorption of, by the Root-tip, H. Coupin, 519
- Miners' Lamps, Appointment of a Committee upon Possible Improvements in, 210
- Mining Engineers, Institution of, Forthcoming Annual General Meeting of the, 510
- Ministry: of Health, Appointments in connection with the, 409; of Munitions, a Portion of the, Transferred to the Board of Trade, 268
- Mira Ceti, 453
- Mirrors, Prisms, and Lenses, Prof. J. P. C. Southall, 302
- Mitta Mitta Dam, The, on the Murray River, 452
- Mnemonic Notation for Engineering Formulæ, E. F. Etchells, 2
- Moisture in Deciduous-leaved Trees during the Felling Season, Regional Spread of, W. G. Craib, 232
- Molecular Physics, Dr. J. A. Crowther. Second edition, 303
- Monomethylamine, New Method for the Preparation of, Prof. P. F. Frankland, F. Challenger and N. A. Nicholls, 252
- Monosodium Derivative of Acetylene, Action of the, on some Halogen Esters of Secondary and Tertiary Alcohols, M. Picon, 200
- Moon, the Daylight, The Whiteness of, C. T. Whitmill, 145
- Morioli, The, H. D. Skinner, 329
- Mosquitoes, The Oldest, Prof. T. D. A. Cockerall, 44
- Mosses from Deception Island, H. N. Dixon, 319
- Mother-right, R. H. Lowe, 351
- Mount Wilson Observatory, Name changed from that of the Mount Wilson Solar Observatory, 291
- Mozambique, The Pre-Cambrian and Associated Rocks of, Dr. A. Holmes, 490
- Munition Dump, Sound of an Explosion of, R. B. Marston, 511
- Muscoid Flies, The External Breathing Apparatus of the Larvæ of some, J. L. Froggatt, 19
- Museums: as Educational Instruments, Lord Sudeley and others, 49; Association, Forthcoming Annual Conference of the, 288; Thirtieth Annual Conference of, 394; Sir W. M. Concay elected President; Dr. W. M. Tattersall Secretary, 395; Municipal, The Control of, E. E. Lowe, 394; Re-opening of, 7, 69
- Mutation in Bacteria, An Experiment dealing with, Dr. Doncaster, 58
- Mutations, Sudden, in the Formation of a New Race of Micro-organisms, C. Richet and H. Cardot, 159
- Muzzling of Dogs, 149
- Myology and Osteology, Studies in Comparative, W. K. Gregory and C. L. Camp, 90
- Mysore, Government of, Dr. Shaiffer appointed Expert in Animal Husbandry to the, 471
- Myzus ribis*, Linn., Life-history and Bionomics of, Miss M. D. Haviland, 18
- National: Alliance of Employers and Employed, Offer of Prizes for Essays on Industrial Subjects, 249; Illumination Committee of Great Britain, Election of the Executive of the, 268; Life from the Standpoint of Science, Prof. K. Pearson, 112; Physical Laboratory, Annual Visitation and Inspection of the, 331; Research Council of the United States, The, Dr. C. G. L. Wolf, 245
- Nation's Debt to Science, The, 141
- Natural History: in the New World, 22; Museum, The Directorship of the, Prof. W. Boyd Dawkins and others, 3; Retirement of Sir L. Fletcher from the Directorship of the, 6; The Directorship of the, 6; Sir G. Greenhill, 24; Dr. S. F. Harmer, 31; Dr. S. F. Harmer appointed Director of the; C. Tate Regan appointed Assistant Keeper of Zoology in the, 49; Staff Association, Inaugural Scientific Reunion of the, 52; Official Title of C. E. Fagan of the, 89
- Natural: Organic Colouring Matters, 241; Science in British Education, 387; in the Educational System of Great Britain, The L.C.C. and, 218
- Nautical Astronomy: Graphic Methods in, A. Hutchinson, 25; Graphical Methods in, H. B. Goodwin, 44; Navigation and, 481
- Naval Architects, Institution of, Offer of Two Scholarships of the, 358
- Navigation: Prof. H. Jacoby, Second Edition, 481; and Nautical Astronomy, 481
- Nayars of Malabar, The, K. M. Panikkar, 450
- Neon Lamps in Technical Stroboscopic Work, Use of, F. W. Aston, 297
- Nervous System: The Elementary, Prof. G. H. Parker, 322; The Primitive, Prof. G. Elliot Smith, 322
- Neurologie de Guerre, Traité Clinique de, P. Sollier, Chartier, F. Rose, and Villandre, 501
- Neuroses, War, Dr. J. T. MacCurdy, 101
- Neurospora pteroides*, Notes on, Rev. W. W. Watts, 520
- New: Guinea Primitive People, Reactions of certain, to Government Control, Lt. E. W. P. Chinnery, 199; South Wales, Report of the Director-General of Public Health, 1916, 211; Wine into Old Battles, Prof. F. Soddy, 308; Year Honours, The, 170; York Association for the Advancement of Medical Education and Medical Science, Formation of the, 499; Zealand Flax, Growth of, in the British Isles, 410; Institute, A Science Congress of the, 192; Introduction of Foreign Birds into, A. Philpott, 90
- Newport, Mon., Technical Institute, G. R. Bennett appointed Principal of the, 218
- Nickel and Cobalt, The Normal Nitrides of, A. C. Vournasos, 259
- Night Glasses, Performance of, L. C. Martin, 251

- Nitric Oxide, Oxidation Cycle of, in Presence of Water, A. Sanfourche, 39
- Non-ferrous Mining in the United Kingdom, Appointment of a Departmental Committee on, 471
- Northamptonshire and Rutland, Highways and Byways in, H. A. Evans, 103
- North-east: Coast Institution of Engineers and Shipbuilders Forthcoming Summer Meeting of the, 210, 309; Victory Meeting of the, 395; Work of the Principal Industries of the, during the War, A. H. J. Cochrane, 395; Ireland, Analysis of the Palæozoic Floor of, W. B. Wright, 58
- Northern Babunda Tribe, The, E. Torday, 251
- Norwich Public Library "Readers' Guide," July, 379
- Nottingham, University College, Prof. A. W. Kirkaldy appointed Professor of Economics and Commerce at, 78
- Nova Aquilæ: The Spectrum of, Rev. A. L. Cortie; Dr. J. Lunt; Visual Magnitudes of, Dr. A. A. Rambaut, 53; 1918, 234; H. Thomson, 353; The Spectrum of, 435; Magnitude of, Stebbins and E. Dershem, 474
- Nova Scotia, The Orthoptera of, H. Piers, 289
- Novæ: Absorption Spectrum of the, W. S. Adams, 19; The Origin of, Prof. W. H. Pickering, 153
- Observatory for Navigation, Co-ordinates and Instruments of the, G. Bigourdan, 340
- Occultation of Stars by Venus, A. Burnet, 174
- Occultations of Stars by the Moon, Calculation of, A. Snow, 194
- Ocean, Life in the, A Review of Recent Deep-sea Researches, Prof. E. E. Prince, 438
- Oil: -fuel Reservoir at Rosyth, Large, 193; in Derbyshire, Indications of, V. C. Illing, 265
- Oils: Essential, Tables of Refractive Indices, vol. i., R. Kanthack, Edited by Dr. J. N. Goldsmith, 43; Fats, and Waxes, Technical Handbook of, P. J. Fryer and F. E. Weston, vol. ii., "Practical and Analytical," 262; Vegetable, The Production and Treatment of, T. W. Chalmers, 41
- Okapi, Presentation of a Live, to Belgium, Mme. Landaghem, 490
- Onaping Map-area, Rocks in the, W. H. Collins, 390
- Oolitic Ironstones, The Mineral Composition of, R. H. Rastall, 359
- Opacimeter for Use in Bacterial Estimations, An, Lambert, Vlès, and de Watteville, 180
- Open Air, Joys of the, W. Graveson, 263
- Ophthalmological Training of Medical Students, 155
- Optical: Glass, 65; Instruments, Modern, The Theory of, Dr. A. Gleich, Translated by H. H. Emsley and W. Swaine, with an Appendix on "Range-finders," 101; Munitions of War, The Design of, Lt.-Col. A. C. Williams, R. S. Whipple, 475; Pyrometer, The Disappearing Filament-type of, W. E. Forsythe, 459; Research, British, 236
- Optics: and Mechanics, 302; Applied, The Computation of Optical Systems, Drs. A. Steinheil and E. Voit, Translated and Edited by J. W. French, vol. ii., 401
- "Orchid Spot," W. B. Brierley, 10
- Organic: Colouring Matters, The Natural, Prof. A. G. Perkin and Dr. A. E. Everest, 241; Readjustments, 444
- Oriental Tipulidæ, Revision of the, E. Brunetti, 269
- Orion Nebula, The Parallax of the, Prof. Pickering, 353
- Ornithological Notes from Norfolk for 1918, J. H. Gurney, 211
- Osiers and Willows, The Cultivation of, W. P. Ellmore, 144
- Osmotic Pressure, Prof. A. Findlay, Second Edition, 322
- Otoceras Layers of Armenia and those of the Himalayas, Relations between the, P. Bonnet, 519
- Oxford: and Cambridge Universities, The Government and the Position of, H. A. L. Fisher, 397; Christ Church, Forthcoming Appointment of a Lee's Reader in Chemistry, 379; Queen's College and Trinity College, Bequests to, by Bishop Percival, 198; University, Preamble of a Statute to make Greek Optional in Responsions, 16; Forthcoming Elections to Two Professorships; Number of Undergraduates at, 78; Prof. F. Soddy elected to the Second Chair of Chemistry, Dr. F. A. Lindemann appointed Professor of Experimental Philosophy; Forthcoming Lectures on Geography, Anthropology, and Primitive Law, 178; Amendments to the Statute to make Greek Optional in Responsions, 218; Question of Financial Assistance from the Government; The Halley Lecture, Prof. H. Lamb, 257; Optional Greek; Suspension for a Year of the Romanes Lecture; Proposed New Rooms at the Physiological Laboratory, 278; Restoration of Professorships; The Preamble of a Statute admitting Women for Diplomas in Science, etc., passed by Congregation; Impending Changes in the First Public Examination, 237; The Question of a Government Grant, 295; The Statute for the Reform of Responsions; Doctorate conferred upon C. W. D. Perrins, 317; Gift from Sir Heath Harrison, 318; J. S. Huxley and H. Clay elected Fellows of New College, 479
- Ozone, A Reaction and Method for the Estimation of, L. Benoist, 119
- Palæontographical Society, The 72nd Annual Meeting of the, Dr. H. Woodward re-elected President of the, 172
- Palestine: Geology of, Major R. W. Brock, 239; The Flora of a small area in, J. M. F. Drummond, 219
- Panorpid Complex, The, Part II., Dr. R. J. Tillyard, 19
- Pappus in Compositæ, Forms assumed by the, J. Smith, 219
- Parasitic Coccobacilli of the Caterpillars of *Pieris brassicæ*, A. Paillot, 79
- Paris: Academy of Sciences, Prof. G. E. Hale elected a Foreign Associate of the, 489; Observatory Reports, 1916-18, 252
- a-Particles, Collision of, with Light Atoms, Sir E. Rutherford, 415
- Passalidæ of the World, Revision of the, Dr. F. H. Gravely, 251
- Patent: Law and the Legal Standard of Novelty, "Historicus," 350; Empire, Scheme for a Proposed, 512; Searches, International Use of, S. H. Tilly, 70
- Patents in Relation to Industry, Sir Robert Hadfield, Lord Moulton, and others, 453
- Peace: Conference Atlas, The, 344; Treaty, Mineral Production in relation to the, Prof. H. Louis, 205; Signing of, 349
- Peas, Sweet, experiments with, Prof. Punnett, 432
- Pejark Marsh, Victoria, Origin of the Volcanic Tuff of, R. H. Walcott, 440
- Pempheres affinis*, Faust, Habits and Life-history of, T. V. R. Ayyar, 137
- Pensions for Hospital Officers, Report on, 113
- Pentécoulant Prize, The, awarded to Prof. A. S. Eddington, 470
- Peroxydases in Milk, The, H. Violle, 519
- Persian Mineral Oil, Impending Exploitation of, 390
- Personality, The Secret of, Dr. G. T. Ladd, 303
- Perturbations of the Optical Axis of a Meridian Telescope, M. Hamy, 90
- Peru-Bolivia Boundary Commission, 1911-13, Reports of the British Officers of the Peruvian Commission, 46
- Petrol, Rapid Analysis of, Use of "T.C.D." in Aniline for the, G. Chavanne and L. J. Simon, 459
- Petrol Vapour, The Physical Properties of, J. Roy, 99
- Petroleum, British, 306
- Pharmaceutical Conference, The British, 455
- Pharmacv, Theoretical and Practical, including Arithmetic of Pharmacy, Prof. E. A. Ruddiman, 83
- Phenological Observations, Dec., 1917 Nov., 1918, J. E. Clark and H. B. Adames, 259
- Philippine Economic Plants, Fungus Diseases of, O. A. Reinking, 354
- Philosophical Institute of Canterbury, New Zealand, Annual Report of the, for 1918, 289
- Philosophy of Mr. B*rt*nd R*ss*ll, The, With an Appendix of Leading Passages from certain other Works, edited by P. E. B. Jourdain, 303
- Phoma citricarpa*, McAlp, Life-history of, G. P. Darnell-Smith, 59
- Phosgene, Preparation of, by means of Carbon Tetrachloride and Oleum or ordinary Sulphuric Acid, V. Grignard and E. Urbain, 439

- Phosphatic Nodules of Trichinopoly and their Availability as Manure, M. R. R. Sivan, 137
- Phospho-organic reserve principle of Green Plants, Two crystallised Salts of the, S. Posternak, 380
- Photographic: Almanac, The British Journal, and Photographer's Daily Companion, 1919. Edited by G. E. Brown, 3; Plates, The Sensitiveness of, to X-rays, Miss N. C. B. Allen and Prof. T. H. Laby, 177
- Photography: Aerial, 115; Its Principles and Applications, A. Watkins. Second edition, 461
- Photophoresis, F. Ehrenhaft; R. W. Lawson, 514
- Physical Chemist, The Complete, 161
- Physiological Chemistry, 504; Practical, S. W. Cole. Fifth edition, 504
- Physiology: A Text-book of, Drs. M. Flack and L. Hill, 402; and Metaphysics, 412; Applied, 341; for Students and Practitioners, 402; Human, Vol. IV. "The Sense-organs," Prof. L. Luciani. Translated by F. A. Welby, 61; in Medicine, The position of, Sir E. S. Schafer, 173, 210; The New, and other Addresses, Dr. J. S. Haldane, 261
- Phytophthora meadii*, a new Fungus Disease of *Hevea brasiliensis*, W. McRae, 355
- Pilot-balloons, Further Measurements on the rate of Ascent of, Capt. C. J. P. Cave and J. S. Dines, 259
- Pine, The Common, indigenous in Northern Sweden, N. Sylven, 176
- Pinus pinea*, Coloration produced in Clay by Injured Roots of, B. de St. J. v. d. Reit, 460
- Plaie de Guerre, Biologie de la, Prof. P. Delbet and N. Fliessinger, 501
- Planchet Reptile, The, H. C. Das-Gupta, 400
- Plane, London, History of the: Prof. A. Henry and Miss M. G. Flood, 38; Prof. A. Henry, 333
- Planet beyond Neptune, A, Prof. W. H. Pickering, 514
- Planetary Nebulæ: Distances of Six, A. van Maanen, 19; 353
- Planets, Order of the, Dr. H. Chatley, 10; 331
- Plankton, The Quantitative Study of, Dr. E. J. Allen, 239
- Plant: Formations, Statistical Investigations on, C. Rannkjaer, 33; Genetics, J. M. and M. C. Coulter, 21; Physiology, 381
- Plantation Rubber Research, 176
- Plants: Life Movements in, Sir J. C. Bose, 381; Preserved by submitting them to the Action of Formalin Vapour, Miss M. Rathbone, 98
- Platonism and Human Immortality, Dean Inge, 297
- Platyzoa microphyllum*, R. Br., The Stellar Anatomy of, Dr. J. M'L. Thompson, 18
- Pleiades, The Parallax of the, Dr. W. J. A. Schouten, 374
- Polarisation of Light, Prof. F. J. Cheshire, 239
- Polariser, A new, G. Brodsky, 97
- Polyclad Turbellaria of the Japanese Coasts, The, M. Yeri and T. Kaburaki, 472
- Polyclads, Method of Progression in, W. I. Crozier, 10
- Polyneuritis, Acute Infective, Sir J. R. Bradford, E. F. Bashford, and J. A. Wilson, 150
- Porous Walls, New, filtering unsymmetrically, L. Benoist, 419
- Port Erin Biological Station, Easter Vacation Work at the, 112
- Portsmouth Municipal College, E. Rawson appointed Head of the Mechanical and Civil Engineering Department of the, 458
- Pot Attack, Some Phenomena of, Dr. W. Rosenhain, 297
- Potash Famine, Passing of the American, Prof. P. G. H. Boswell, 473
- Potato: -Beetles. Evolution in, 517; The Cultivation, Composition, and Diseases of the, Articles on, 133
- Potatoes, Report on the Composition of, Grown in the United Kingdom, 192
- Poultry: Bacteria of the Paratyphoid Group and the Causation of Disease in, P. Hadley, M. Elkins, and D. Caldwell, 310; Physiology of Sex and Reproduction in, Prof. R. Pearl and Miss A. M. Boring, 332
- Precious Stones, The Production of, for the year 1917, Dr. G. F. Kunz, 326
- Preservation of Fruit without the Addition of Sugar, etc., G. Bertrand, 340
- Pressure and Temperature, Absolute Scales of, F. J. W. Whipple, 296
- Prickly Pear, Possibilities of the, as a source of Industrial Alcohol, etc., 232
- Priestley, Joseph, D. H. Peacock, 463
- Prime Numbers, Question Relating to, A. Mallock, 305; Prof. G. N. Watson, 364
- Printing on Paper in Natural Colours, a New Process of, S. H. Williams, 133
- "Pritzel's Index," Revision of, 328
- Productive Duality, 361
- Professorial and Non-professorial Teaching Staffs of England, Wales and Ireland, Conference of, 199
- Proper Motions, Determination of, Innes, 194
- Propositions: What they are and how they mean, B. Russell, 413
- Propyl Acetate, Saturated Vapour Pressures and Latent Heats of Evaporation of, at various temperatures, E. Ariès, 379
- Protective Coloration of Birds and Eggs, G. Grace, 446
- Protozoal Parasites in Cainozoic Times, Dr. G. D. Hale Carpenter, 46
- Pseudobonellia*, Prof. T. H. Johnston and O. W. Tiegs, 519
- Psychical Research. Experiments in, at Leland Stanford Junior University, Dr. J. E. Coover, 135
- Psychology: Abnormal, and Education, 382; and Physiology, Proposed Establishment of an Institute of Commercial and Industrial, 300; Present-day Applications of, with Special Reference to Industry, Education, and Nervous Breakdown, Lt.-Col. C. S. Myers, 101; The Usefulness of, 101
- Psychoses in the Expeditionary Forces, Capt. O. P. N. Pearn, 371
- Public Statistics, The Collection and Presentation of, G. Drage, 385
- Pulverised-fuel Locomotive, A, 193
- Punjab, Irrigation Schemes in the, 329
- Pyocvanic Bacillus, An Achromogenic Variety of the, C. Gessard, 320
- Quantitative Analysis, An Advanced Course in, with Explanatory Notes, Prof. H. Fay, 362
- Queen's University, Kingston, Ontario: An Additional Endowment, 318; Grant by the Carnegie Corporation to the Medical Department of, 96
- Queensland: The Mesozoic Floras of, Dr. Walkom, 450; University, R. W. H. Hawken appointed to the Chair of Engineering in, 198
- R 34: Description of, 411; The Return of, 388
- Rabies, Cases of, in England, 149
- Radiation, Ionisation and, Dr. R. A. Houstoun, 145
- Radio: -active Lead, The Problem of, Prof. T. W. Richards, 74, 93; -communication, The Principles of, Dr. A. Russell, 423; -telegraphic Investigations in connection with the Solar Eclipse of May 29, 1919, 196; -telegraphy by Infra-red Radiation, J. Hebert-Stevens and A. Larigaldie, 479; Practical, Progress in, G. Isaacs, 249; Standard Tables and Equations in, B. Hoyle, 144
- Rainfall: at Southampton and London, 1862-1918, Sir C. Close, 338; in England, A. A. Barnes, 177; to Configuration, Relation of, in the British Isles, C. Salter, 91; The Secular Variation of, C. E. P. Brooks, 177; Variations, 177
- Ralegh, Sir Walter, A Memorial Tablet to, unveiled in Jersey, 471
- Ramsay: Memorial Fellowships, Forthcoming Appointment of, 370; Fund, The, 248, 295; Sir William, Work of, Prof. C. Moureu, 412
- Rana subsigillata*, Skull and Affinities of, Miss J. B. Procter, 38
- Range-finders, Modern Single-observer, J. W. French, 405
- Rathmines Technical Institute, W. Elliott appointed Principal of the, 358
- Rats: Experiments with Two New Colour Varieties of, J. B. S. Haldane, 432; The Food of, T. Steel, 345
- Ray Society: Annual General Meeting of the, 69; Prof. McIntosh re-elected President of the, 70
- Reconstruction: Problems, 387; The Spiritual Foundations of, A Plea for New Educational Methods, Dr. F. H. Hayward and A. Freeman, 143

Red Cross Conference at Cannes, 111
 Rede Lecture, The, Lord Moulton, 292
 Refractive Indices, Tables of, Vol. I., "Essential Oils,"
 R. Kanthack, Edited by Dr. J. N. Goldsmith, 43
 Refractometers, Adam Hilger, Ltd.; Bellingham and
 Stanley, Ltd., 145
 Refractory Materials, Properties of, D. W. Ross, H. Inslay,
 and A. A. Klein, 513
 Refrigerator-cars, Interim Report on, 232
 Regional Association, First Annual Report of the, 69
 Relativity Theory of Gravitation, The, Prof. A. S. Edding-
 ton, 2
 Research: and Service, Sir J. W. Barrett; Prof. F. Soddy,
 404; and University Education, 27; Associations, Con-
 ditions of Payment to, 31; Defence Society, Annual
 Meeting of the, 328

REVIEWS AND OUR BOOKSHELF.

Agriculture and Horticulture:

Board of Agriculture and Fisheries. Guides to Small-
 holders. Nos. 1, 5, 6, 7, 9, 283
 Conn (Dr. H. W.), Agricultural Bacteriology. Third
 edition, raised by H. J. Conn, 304
 Ellmore (W. P.), The Cultivation of Osiers and Willows,
 144
 Fletcher (Prof. S. W.), The Strawberry in North
 America. History, Origin, Botany, and Breeding, 164
 Kinney (J. P.), The Development of Forest Land in
 America, 321; The Essentials of American Timber Law,
 321
 Lyon (Prof. T. L.), Soils and Fertilisers, 323
 Messel (L.), A Garden Flora: Trees and Flowers Grown
 in the Gardens at Nymans, 362
 Truffaut (G.), and H. Colt, Army Gardens in France,
 Belgium, and Occupied German Territory, 343
 Waters (H. J.), and Prof. J. D. Elliff, Agricultural
 Laboratory Exercises and Home Projects adapted to
 Secondary Schools, 124

Anthropology and Archæology:

Annual of the British School at Athens, The, No. xxii.
 Sessions 1916-1917, 1917-1918, 424

Biology:

Alexander (F. M.), Man's Supreme Inheritance. Con-
 scious Guidance and Control in Relation to Human
 Evolution in Civilisation. Second edition, 444
 Beebe (W.), Jungle Peace, 22
 Bews (Prof. J. W.), The Grasses and Grasslands of South
 Africa, 62
 Borradaile (L. A.), A Manual of Elementary Zoology.
 Second edition, 83
 Bose (Sir J. C.), Life Movements in Plants, 381
 Boyd (J.), Afforestation, 83
 Chapman (Dr. F. M.), The Distribution of Bird Life in
 Colombia: a contribution to a Biological Survey of
 South America, 462
 Coulter (I. M. and M. C.), Plant Genetics, 21
 Crosby (C. R.), and M. D. Leonard, Manual of Vege-
 table-garden Insects, 425
 Fauna Brasiliense. Peixes, 425
 Grinnell (J.), H. C. Bryant, and T. I. Storer, The Game
 Birds of California, 281
 Hudson (W. H.), Far Away and Long Ago. A History
 of My Early Life, 22
 Loeb (Prof. J.), Forced Movements, Tropisms, and
 Animal Conduct, 163
 Lowson's Text-book of Botany (Indian edition). Revised
 and adapted by Birbal Sahni, and M. Willis. New and
 revised edition, 301
 MacLeod (Prof. J.), The Quantitative Method in Bio-
 logic, 202
 Moll (Prof. J. W.), and Dr. H. H. Janssonius Mikro-
 graphie des Holzes der auf Java vorkommenden
 Baumarten, im Auftrage des Kolonial-Ministeriums.
 Fünfte Lief., 303
 Osborn (Prof. H. F.), The Origin and Evolution of Life
 on the Theory of Action, Reaction, and Interaction
 of Energy, 201

Pearson (R. S.), The Indian Forest Records. Vol. vi.,
 Part iv.: The Antiseptic Treatment of Timber, 81
 Pike (Capt. O. G.), Birdland's Little People: Twelve
 Nature Studies for Children, 505
 Portier (Prof. P.), Les Symbiotes, 482
 Roberts (Major C. G. D.), The Ledge on Bald Face, 22
 Smallwood (Prof. W. M.), A Text-book of Biology.
 Third edition, 202
 Thoday (D.), Botany: A Text-book for Senior Students.
 Second edition, 301
 Tieghem (Prof. Ph. Van), Eléments de Botanique, Tome
 i.; Tome ii. Cinq édition, 301
 Witherby (H. F.), A Practical Handbook of British Birds.
 Part i., 323

Chemistry:

Barnett (E. de Barry), Coal-tar Dyes and Intermediates,
 221
 Chalmers (T. W.), The Production and Treatment of
 Vegetable Oils, 41
 Chaudhuri (Prof. T. C.), Modern Chemistry and Chemi-
 cal Industry of Starch and Cellulose (with Reference to
 India), 243
 Cole (S. W.), Practical Physiological Chemistry. Fifth
 edition, 504
 Efront (Prof. J.), Biochemical Catalysts in Life and In-
 dustry. Proteolytic Enzymes. Translated by Prof.
 S. C. Prescott and C. S. Venable, 403
 Fay (Prof. H.), An Advanced Course in Quantitative
 Analysis, with Explanatory Notes, 362
 Findlay (Prof. A.), Osmotic Pressure. Second edition, 322
 Fischer (Prof. M. H.), and Dr. M. O. Hooker, Fats and
 Fatty Degeneration, 504
 Fryer (P. J.), and F. E. Weston, Technical Handbook
 of Oils, Fats, and Waxes. Vol. ii. "Practical and
 Analytical," 262
 Hale (A. J.), The Applications of Electrolysis in Chemical
 Industry, 203
 Hart-Smith (J.), Recent Discoveries in Inorganic
 Chemistry, 322
 Hawk (Prof. P. B.), Practical Physiological Chemistry.
 Sixth edition, 462
 Henderson (Prof. G. G.), Catalysis in Industrial
 Chemistry, 281
 Hendrick (E.), Everyman's Chemistry, 62
 Kanthack (R.), Tables of Refractive Indices. Vol. i.,
 "Essential Oils," edited by Dr. J. N. Goldsmith, 43
 Lewis (Prof. W. C. McC.), A System of Physical
 Chemistry. Second edition. Three vols., 161
 Maxted (Dr. E. B.), Catalytic Hydrogenation and Re-
 duction, 281
 Ostwald (Dr. W.), A Handbook of Colloid-chemistry.
 Second English edition, translated from the third Ger-
 man edition by Prof. M. H. Fischer; with notes by
 E. Hatschek, 401
 Paul (J. H.), Boiler Chemistry and Feed-water Supplies,
 421
 Peacock (D. H.), Joseph Priestley, 463
 Perkin (Prof. A. G.), and Dr. A. E. Everest, The Natural
 Organic Colouring Matters, 241
 Ramsay (Sir W.), The Life and Letters of Joseph Black,
 M.D., 181
 Rây (Sir Prafulla Chandra), Essays and Discourses, 1
 Reports of the Progress of Applied Chemistry. Vol. iii.,
 421
 von Richter (V.), Organic Chemistry, or Chemistry of
 the Carbon Compounds. Vol. i., "Chemistry of the
 Aliphatic Series," translated and revised by Dr. P. E.
 Schimpf (Prof. H. W.), A Systematic Course of Quali-
 tative Chemical Analysis of Inorganic and Organic Sub-
 stances, with Explanatory Notes. Third edition, 362;
 Essentials of Volumetric Analysis. Third edition, 362
 Schryver (Prof. S. B.), An Introduction to the Study of
 Biological Chemistry, 43
 Sellards (Dr. A. Watson), The Principles of Acidosis and
 Clinical Methods for its Study, 162
 Smith (Prof. E. F.), Electro-Analysis. Sixth edition, 363
 Smith (G. C.), Trinitrotoluenes and Mono- and Dinitro-
 toluenes: their Manufacture and Properties, 421
 Spencer (Dr. G. L.), Manual de Fabricantes de Azucar
 de Caña y Químicos Azucareros. Translated by Dr.
 G. A. Cuadrado, 383

- Spielmann. Second edition, 243
 Stewart (Dr. A. W.), Recent Advances in Physical and Inorganic Chemistry. Third edition, 322
 Teed (Major P. L.), The Chemistry and Manufacture of Hydrogen, 442
 Van Nostrand's Chemical Annual. Fourth issue, 1918: Edited by Prof. J. C. Olsen; Assistant Editor, M. P. Matthias, 221
 Walker (Prof. J.), Inorganic Chemistry. Eleventh edition, 283
 Warnes (A. R.), Coal-tar and some of its Products, 221
 Watkins (A.), Photography: Its Principles and Applications. Second edition, 461
 Wiley (Dr. H. W.), Beverages and their Adulteration, 482

Engineering:

- Butler (E.), Carburettors, Vaporisers, and Distributing Valves used in Internal Combustion Engines. Second edition, 445
 Etchells (E. F.), Mnemonic Notation for Engineering Formulæ, 2
 Pagé (Capt. V. W.), The A B C of Aviation, 243

Geography and Travel:

- Evans (H. A.), Highways and Byways in Northamptonshire and Rutland, 103
 Mackinder (H. J.), Democratic Ideals and Reality: A Study in the Politics of Reconstruction, 423
 Peace Conference Atlas, The, 344
 Peru-Bolivia Boundary Commission, 1911-13. Reports of the British Officers of the Peruvian Commission, 46
 Smith (T. Alford), A Geography of America, 444

Geology and Mineralogy:

- Artini (Prof. E.), Le Rocce: Concetti e Nozioni di Petrografia, 304
 Butler (Prof. G. M.), A Manual of Geometrical Crystallography: Treating solely of those portions of the subject useful in the Identification of Minerals, 103
 Cole (Prof. G. A. J.), Aids in Practical Geology. Seventh edition, 263
 La Touche (T. H. D.), A Bibliography of Indian Geology and Physical Geography, with an Annotated Index of Minerals of Economic Value. Two parts, 223
 Metzger (H.), La Genèse de la Science des Cristaux, 184
 Military Geology and Topography: A Presentation of certain Phases of Geology, Geography, and Topography for Military Purposes, 183
 Suess (Prof. Ed.), La Face de la Terre (Das Antlitz der Erde). Tome iii., 4^e. Partie, Tables Générales de l'Ouvrage, Tomes i., ii., iii., 502
 Whitaker (W.), and Dr. J. C. Thresh, The Water Supply of Essex from Underground Sources, the Rainfall, by Dr. H. R. Mill, 242

Mathematical and Physical Science:

- Bieglow (Prof. F. H.), A Treatise on the Sun's Radiation and other Solar Phenomena, in Continuation of the Meteorological Treatise on Atmosphere Circulation and Radiation, 1915, 261
 Bryant (W. W.), Galileo, 23
 Card (Instructor Capt. S. F.), Air Navigation: Notes and Examples, 281
 Crowther (Dr. J. A.), Molecular Physics. Second edition, 303
 Dunwoody (Prof. H.), Notes, Problems, and Laboratory Exercises in Mechanics, Sound, Light, Thermodynamics, and Hydraulics, 302
 Eddington (Prof. A. S.), Report on the Relativity Theory of Gravitation, 2
 Fleming (Prof. J. A.), The Principles of Electric-wave Telegraphy and Telephony. Fourth edition, 423
 Gleichen (Dr. A.), The Theory of Modern Optical Instruments. Translated by H. H. Emsley and W. Swaine, with an appendix on "Range-finders," 101
 Grav (Prof. A.), A Treatise on Gyrostatics and Rotational Motion. Theory and Applications, 121
 Hospitalier et Roux, Formulaire de l'Electricien et du Mécanicien. Vingt-neuvième édition, G. Roux, 403

- Hoyle (B.), Standard Tables and Equations in Radiotelegraphy, 144
 Hunter (J. de Graaff), The Earth's Axes and Triangulation, 381
 Jacoby (Prof. H.), Navigation. Second edition. With a chapter on Compass Adjusting and a Collection of Miscellaneous Examples, 481
 Kaye (G. R.), The Astronomical Observations of Jai Singh, 166
 Livens (G. H.), The Theory of Electricity, 142
 Norton (A. P.), A Star Atlas and Telescopic Handbook (Epoch 1920) for Students and Amateurs. New and Enlarged edition, 283
 Pilon (H.), Le Tube Coolidge. Ses Applications Scientifiques Médicales et Industrielles, 224
 Righi (Prof. A.), I Fenomeni Elettro-Atomici sotto l'Azione del Magnetismo, 82
 Southall (Prof. J. P. C.), Mirrors, Prisms, and Lenses: A Text-book of Geometrical Optics, 302
 Steinheil (Dr. A.), and Dr. E. Voit, Applied Optics: The Computation of Optical Systems. Translated and edited by J. W. French. Vol. ii., 401
 Willows (Dr. R. S.), and E. Hatschek, Surface Tension and Surface Energy and their Influence on Chemical Phenomena. Second edition, 23

Medical Science:

- Adami (Prof. J. G.), Medical Contributions to the Study of Evolution, 21
 Amar (Prof. J.), Translated by B. Miall, The Physiology of Industrial Organisation and the Re-employment of the Disabled, 341
 Bayliss (Prof. W. M.), Intravenous Injection in Wound Shock, 122
 Delbet (Prof. P.) and N. Fiessinger, Biologie de la Plaie de Guerre, 501
 Depage (Dr. A.) and others, Ambulance de "L'Océan," La Panne, Tome ii, fasc. 1, 223
 Ducroquet (Dr.), Prothèse Fonctionnelle des Blessés de Guerre, Troubles Physiologiques et Appareillage, 383
 Flack (Dr. M.) and Dr. L. Hill, A Text-book of Physiology, 402
 Haldane (Dr. J. S.), The New Physiology, and other Addresses, 261
 Jones (Dr. I. H.), Equilibrium and Vertigo, with an Analysis of Pathologic Cases by Dr. L. Fisher, 182
 Lee (Prof. F. S.), The Human Machine and Industrial Efficiency, 261
 Luciani (Prof. L.), Translated by F. A. Welby, Human Physiology, vol. iv., "The Sense Organs," 61
 Osler (Sir W.), Man's Redemption of Man, third edition, 23
 Parker (Prof. G. H.), The Elementary Nervous System, 322
 Posev (Dr. W. C.), Hygiene of the Eye, 63
 Ruddiman (Prof. E. A.), Pharmacv. Theoretical and Practical, including Arithmetic of Pharmacy, 83
 Sollier (P.), Chartier, F. Rose, and Villandre, Traité Clinique de Neurologie de Guerre, 501
 Turner (Dr. A. L.), Sir William Turner, K.C.B., F.R.S., 341
 Wallace (Major-Genl. C.) and Major J. Fraser, Surgery at a Casualty Clearing Station, 282
 Walter (Prof. H. E.), The Human Skeleton, 383

Metallurgy:

- Institute of Metals, Journal of the, vol. xx., 165

Meteorology:

- Gauthier (H.), La Température en Chine et à quelques Stations voisines d'après des observations quotidiennes, 42
 Meteorology, Introductory, 123

Miscellaneous:

- Barbellion (W. N. P.), The Journal of a Disappointed Man, 363
 Bravetta (Rear-Admiral E.), L'Insidia Sottomarina e Come fu Debellata, etc., 504

British Journal Photographic Almanac and Photographer's Daily Companion, 1919, edited by G. E. Brown, 3
 British Science Guild: British Scientific Products Exhibition, Descriptive Catalogue, 461
 Caldwell (Prof. O.) and Prof. W. L. Eikenberry, Elements of General Science, revised edition, 63
 Dana (E. S.) and others, A Century of Science in America, with special reference to the "American Journal of Science," 1818-1918, 183
 Graveson (W.), Joys of the Open Air, 263
 Gray (Rev. Dr. H. B.), America at School and at Work, 203
 Hargrave (J.), The Great War Brings it Home. The Natural Reconstruction of an Unnatural Existence, 143
 Hayward (Dr. F. H.) and A. Freeman, The Spiritual Foundations of Reconstruction. A Plea for New Educational Methods, 143
 Ioteyko (Dr. J.), The Science of Labour and Its Organisation, 343
 Ivens (W. G.), Dictionary and Grammar of the Language of Sa'a and Ulawa, Solomon Islands, 102
 Kenyon (Sir F. G.), Education: Secondary and University, 286
 Lewis's Medical and Scientific Circulating Library, Catalogue of, new edition, 204
 MacCurdy (Dr. J. T.), War Neuroses, 101
 Mappin (G. E.), Can We Compete? Germany's Assets in Finance, Trade, Education, Consular Training, etc., and a Proposed British War-Cost Reduction Programme, 241
 McDowall (Rev. S. A.), Evolution and the Doctrine of the Trinity, 103
 Millais (J. G.), Life of Frederick Courtenay Selous, D.S.O., 125
 Myers (Lt.-Col. C. S.), Present-day Applications of Psychology, with Special Reference to Industry, Education, and Nervous Breakdown, 101
 Newbolt (Sir H.), Submarine and Anti-submarine, 263
 Smith (W. P.) and E. G. Jewett. An Introduction to the Study of Science: A First Course in Science for High Schools, 424
 Stebbing (Rev. T. R. R.), Faith in Fetters, 224
 White (E. G.), The Voice Beautiful in Speech and Song. A Consideration of the Capabilities of the Vocal Cords and their Work in the Art of Tone Production (new and enlarged edition of "Science and Singing"), 124
 Year-Book of the Scientific and Learned Societies of Great Britain and Ireland, The 35th annual issue, 63

Philosophy and Psychology:

Haldane (Dr. J. S.), and others, Life and Finite Individuality. Two symposia, 342
 Hirst (E. W.), Self and Neighbour: an Ethical Study, 361
 Jourdain (P. E. B.), The Philosophy of Mr. B*tr*nd R*ss*ll, with an Appendix of Leading Passages from certain other works, 303
 Ladd (Prof. G. T.), The Secret of Personality: The Problem of Man's Personal Life as viewed in the Light of an Hypothesis of Man's Religious Faith, 303
 Pitt-Rivers (G.), Conscience and Fanaticism: An Essay in Moral Values, 342
 Sheldon (Prof. W. H.), Strife of Systems and Productive Duality: An Essay in Philosophy, 361
 Slessor (H. H.), The Nature of Being: An Essay in Ontology, 342
 Watts (F.), Echo Personalities, 382
 Rhodes Scholarships, Statement for 1918, 37
 Rice Worm, The, Dr. E. J. Butler, 269
 Righi's, Prof., Researches, 82
 Ripple-marks in Sedimentary Rocks, W. H. Bucher, 450
 River Dee, Possibilities of the Exploitation of the, S. E. Britten, 311
 Road-washings and Fish, W. J. A. Butterfield, 250
 "Robinin," Isolation of, B. Tasaki and U. Tanaka, 132
 Rocce, Le, Prof. E. Artini, 304
 Romic Chronology, Ancient, H. B. Hannay, 500

Root-tip, Absorbing Power of the, H. Coupin, 99
 Roots, Anatomical Modifications of, by Mechanical Action, Mme. E. Bloch, 500
 Rosary in Magic and Religion, The, Miss W. S. Blackman, 231
 Roumanians, Customs connected with Death and Burial among the, Mrs. A. Murgoci, 410
 Royal: Academy, The, 188; Agricultural College, Cirencester, Lord Bledisloe elected Chairman of the Governors of the, 267; Astronomical Society, Additional Meeting to Receive American Astronomers, 328; College of Physicians of London, Lectureships of the, 328; of Science, London, Forthcoming General Meeting of the Old Students' Association of the, 199; O'd Students' Association of the, Eighth Annual Meeting of the; Sir R. Gregory elected President, 258; of Surgeons of England, Sir J. Tweedy asked to deliver the First Thomas Vicary Lecture; Prof. Elliot Smith and Dr. F. Wood Jones appointed Arris and Gale Lecturers, 350; English Arboricultural Society, Forthcoming Summer Meeting of the, 510; Geographical Society Awards, 52; Horticultural Society, Research Station and School of Horticulture of the, at Wisley, Capt. H. J. Page, Research Chemist and Head of the Chemical Department of the, 389; Institute of British Architects, J. W. Simpson elected President of the, 370; of Public Health, Forthcoming Conference arranged by the, 268; Institution Lecture Arrangements after Easter, 132; Meteorological Society, Summer Meeting of the, 328; Observatory, Greenwich, Report of the Astronomer Royal, 313; Society Conversazione, The, 275; Elections to the, 230; Recommended Candidates for Fellowship of the, 6; The Prince of Wales to be Proposed for Election to the, 230; Grain Pests (War), Committee, Report No. 1, May, 1918, 325; of Arts, Awards of the Silver Medal of the, 350; The Albert Medal of the, awarded to Sir O. Lodge, 267; Presentation of the Albert Medal of the, to Sir O. Lodge, 289; of Edinburgh, Election of Fellows of the, 7; of Medicine, Formation of a War Section of the, 471; Swedish Academy of Agriculture, Dr. E. J. Russell elected a Foreign Member of the, 111
 Rubber Researches in Kuala Lumpur, Malaya, Eaton, Grantham, and Day, 176
 Rumford Committee of the American Academy of Arts and Sciences, Grant from the, to Prof. A. G. Webster, 131
 Russian Hydrographical Expedition, A New, 209
 Rutherford Technical College, Capt. F. Downie appointed Head of the Electrical Engineering Department of, 517

Sa'a and Ulawa, Solomon Islands, Dictionary and Grammar of the Language of, Dr. W. G. Ivens, 102
 Saccharose, Inversion of, by Mechanical Ionisation of Water, J. E. Abelous and J. Aloy, 340
 St. Andrews, Marine Research at, Prof. A. Meek, 104; University, Scientific Research at, Prof. W. C. McIntosh, 64
 Salisbury Museum, Educational Work at the, 1916-19, F. Stevens, 337
 Salters' Institute of Industrial Chemistry, Award of Fellowships of the, 51; Appointment of further Fellowships, 318
 Salvage Operations, Submersible Pumps and Engines for, 152
 Samoan Coral Reefs, Growth-rate of, A. G. Mayor, 19
 Sand Grains, Rounding of, by Solution, J. J. Galloway, 490
 Sands: considered Geologically and Industrially, under War Conditions, Prof. P. G. H. Boswell, 490; The Texture of, 315
 Sausage, The Maturation of the, E. P. Césari, 180
 Scandinavian Geological Congress in Denmark, Excursions of the first, N. H. Kolderup, 269
 Schizoderma spengleri, The Shells of, Dr. J. D. F. Gilchrist, 460
 School Science Review, No. 1, 336
 Schorr's Comet (d 1918), 73
 Science Abstracts for 1918, 151
 Science: An Introduction to the Study of, a first course

- in Science for High Schools, W. P. Smith and E. G. Jewett, 424; and Character-building, Prof. D. Fraser Harris, 418; and Education, Prof. J. Graham Kerr, 318; and its Application to Marine Problems, Prof. J. C. McLennan, 395; and Industrial Development, 333; and Industry, No. 1 of, 434; Reconstruction, Prof. Ripper, 296; and Salaries, C., 404; and the Classics, 234; and the Educational System of the Country, Conference on, 199; and War, Lord Moulton, 292; Education and, in the Civil Service Estimates, 116; General, Elements of, Prof. O. W. Caldwell and Prof. W. L. Eikenberry. Revised edition, 63; in America, A Century of, with special reference to the "American Journal of Science," 1818-1918, E. S. Dana and others, 183; in Education, League for the Promotion of, forthcoming Conference arranged by the, 139; in Industry, 414; Lectures at the British Scientific Products Exhibition, 392; in the Modern State, The Function of, Prof. K. Pearson, 112; Teachers, New Ideals of, Sir J. J. Thomson, 273; Sir R. Gregory, 274; The Nation's Debt to, 141
- Scientific: and Industrial Research, Committee of the Privy Council for, Advisory Council to the, Sir J. J. Thomson appointed a member of the, 230; The Endowment of, Dr. J. Horne, 27; Learned Societies of Great Britain and Ireland, The Year-book of the, Thirty-fifth Issue, 63; Industries, The Future of, 128; Instruments, Early, Loan Exhibition at Oxford of, 235; Management, The Benefit to the Workman of, forthcoming Conference on, 267; Method, The Scope of the, A. E. Heath, 97; Progress, A Record of, 461; Research, Government Grants for, The Conditions attached to, Prof. F. Soddy, 226
- Scottish Marine Biological Association, Annual Report of the, 150
- Scurvy: Experimental Investigation on, Dr. H. Chick, 454; The Prevention of, Dr. H. Chick, and others, 71
- Sea-level, Mean, Prof. R. Witting; Prof. D'Arcy W. Thompson, 493
- Sea-otter, Teeth of, M. D. Hill, 446
- Sea-urchin Larvæ, Movements and Physiology of, Dr. J. Runnström, 390
- Secret or Mystery?, 303
- Sedum, Species of, collected in China by L. H. Bailey in 1917, R. L. Praeger, 38
- Seismological Library of Count F. de Montessus de Ballore, The, Purchased by Dr. J. C. Branner, and Presented to Stanford University, 350
- Seistan, The Vegetation of, N. Annandale and H. G. Carter, 299
- Selection, Experimental Studies of, 354
- Selenariadæ and other Bryozoa, A. W. Waters, 360
- Selenates of the Cobalt Group, Monoclinic double, Dr. A. E. H. Tutton, 398
- Self and Neighbour: An Ethical Study, E. W. Hirst, 361
- Selous: Collections of Big-game Trophies and European Birds' Eggs, presented by Mrs. Selous to the Natural History Museum, 274; Life of Frederick Courtenay, J. G. Millais, 125
- Sense and Senses, Translated, Prof. J. S. Macdonald, 61
- Sergestidæ collected by the Siboga Expedition, Dr. H. J. Hansen, 511
- Sex, Physiology of, and Reproduction in Poultry, Prof. R. Pearl and Miss A. M. Boring, 332; Reproduction and Heredity in Pigeons and Fowls, Dr. O. Riddle, and others, 436
- Shap Minor Intrusions, The, J. Morrison, 473
- Sheffield: City Museums, Report on the, Dr. F. Grant Ogilvie, 133; University, Sir Henry Hadow appointed Vice-Chancellor, 318
- "Shell-pockets" on Sand dunes on the Wirral Coast, Cheshire, J. W. Jackson, 18
- Ship Repairing, M. C. James and L. E. Smith, 395
- Ship's Rudder, A New Form of, 271
- Sidereal Time into Mean Time, Mechanical Transformation of, E. Esclanong, 519
- Sidgwick, Miss, a Fellowship founded in Memory of, 336
- Silica, Precipitated Amorphous, P. Braesco, 18
- Siliceous Sinter from Lustleigh, Devon, Lieut. A. B. Edge, 98
- Silurian Rocks of May Hill, The, C. I. Gardiner, 296
- Simpson, Martin, and his Geological Memoirs, T. Sheppard, 433
- Singapore Botanic Gardens, F. Flippance appointed Assistant Curator of the, 309
- Skies, The Freedom of the, Prof. McAdie, 491
- Slime Treatment on Cornish Frames, Supplements, S. J. Truscott, 17
- Smithsonian Institution, Proposed Establishment of Additional Observing Stations for Solar Radiation, 210
- Snook Machine, The, 271
- Snowstorm, A severe, on April 27, 171
- Société de Biologie of Paris, E. S. Goodrich elected Membre-correspondant of the, 370
- Society of Chemical Industry, Forthcoming Annual General Meeting of the, 309
- Sodium: Chloride, Immunising Action of, against Anaphylactic Injection, C. Richet, P. Brodin, and F. Saint-Girons, 439; Nitrate on Blood, the Reaction Velocity of, Some conditions influencing, Prof. C. R. Marshall, 298; Thiosulphate, Action of, upon Hypochlorites, F. Diéner and F. Wandenbulcke, 439
- Soil: A possible-case of Partial Sterilisation in, F. Knowles, 205; at Night, Cooling of the, Capt. T. B. Franklin, 298
- Soils and Fertilisers, Prof. T. L. Lyon, 323
- Solar: Atmosphere, The Structure of the, Prof. G. E. Hale, 426; Eclipse, selection of Cape Palmas, Liberia, by Dr. L. A. Bauer for Magnetic and Electric Observations, 131; Radio-telegraphic Investigations in connection with the, 196, 252, 265; Dr. L. Bauer, 311, 492; Radiation, Effect of, upon Balloons from the Thermal point of view, 410; Thermodynamics, 261
- Somatic Mitosis of *Stegomyia fasciata*, glossary of terms employed in article on the, Miss L. A. Carter, 192
- Somersetshire Archæological and Natural History Society, Excursions and forthcoming Annual Meeting of the, 370
- Sottomarina, L'Insidia, e Come fu Debellata, Rear-Admiral E. Bravetta, 504
- Sounding at Sea from a Moving Vessel, A Method of, M. Marti, 339
- Sound: -waves, Velocity of, A Measurement of the, in Seawater, M. Marti, 519; in the Atmosphere, Propagation of, Lt. G. Green, 338; -ranging Service of the A.E.F., Work of the, Col. A. Trowbridge, 317
- Sounds in Water, Transmitting and Picking up, Prof. W. H. Bragg, 393
- South: Africa, Cattle as a Factor in the Economic Development of, Rev. J. R. L. Kingon, 432; African Earthworm, Luminosity and its origin in a, Dr. Gilchrist, 433; Grasslands, 62; Microthyriaceæ, Miss E. M. Doidge, 480; Pioneer, A, Sir H. H. Johnston, 125; School of Mines and Technology, Johannesburg, Capt. E. H. Cluver appointed Professor of Physiology at the, 258; J. B. Robertson, appointed Lecturer in Chemistry in the, 358; Eastern Union of Scientific Societies, Address of Dr. A. Smith Woodward; Election of Sir E. W. Brabrook as President, 314; London Entomological and Natural History Society, Proceedings of the, 410
- Southern Nigeria, Outlines of the Geology of, with especial reference to the Tertiary Deposits, A. E. Kitson, 399
- Spanish: Association for the Advancement of the Sciences, forthcoming Congress of the, 510; Caves, Paintings in, l'Abbé, H. Breuil, 210
- Sparganophilus: A British oligochaet, Rev. H. Friend, 426
- Spark Discharge, Some Characteristics of the, and its effect in igniting Explosive Mixtures, C. C. Paterson and N. Campbell, 118
- Sparkling-plugs, the Relative Merits of the various Insulating Materials used in, F. B. Silsbee, and R. K. Honaman, 391
- Spectra, Energy Distribution in, Prof. J. W. Nicholson, 495
- Spectrometer, Wave-length, Hilger's, 311
- Speech, Transmission of, by Light, Dr. A. O. Rankine, 296
- Sperm Whales, Three foetal, Dr. F. E. Beddard, 140
- Spiral Nebulæ, The, Prof. H. D. Curtis, 411
- Sponges: Calcareous, Collected by the Australian Antarctic

- Expedition, Prof. A. Dendy, 54; The Cultivation of, Lt. W. R. Dunlop, 184, 230
- Spontaneous Inflammation of Mixtures of Air and Ether Vapour, The, E. Alilaire, 179
- Sporotrichum globuliferum*, Experiments with, 90
- Sprats, etc., The Dietetic Value of, Dr. J. J. Johnstone, 472
- Spread Hand, The Sign of the, or Five-finger Token, in Pali Literature, Dr. Ph. Vogel, 489
- St. Andrews University, Gift to, for a memorial hall, by Dr. J. and Mrs. Younger, 198
- Staffordshire Education Committee, Horticultural Work under the, 518
- Standards, The U.S. Bureau of, Report on, 197
- Star: Atlas, A, and Telescopic Handbook (Epoch 1920) for Students and Amateurs. A. P. Norton. New and enlarged edition, 283; Clusters, Dr. C. V. L. Charlier, 73
- Stars, The Age of the, Dr. H. Shapley, 284
- State degrees in Applied Science in France, Proposed, Prof. Camichel, 118
- Steam Recorder, A Miniature Model of a, H. Parenty, 200
- Stellar: Classification, Notes on, Sir Norman Lockyer, 484; Magnitudes of Planets, Photo-electric Determinations of, P. Guthnick, 53; Systems, Mass and Momentum of, Shinjo and Watanabe, 474
- Still Combined Internal-combustion and Steam Engine, The, 291
- Stinging: Hairs of the Nettle, Presence of Formic Acid in the, Dr. L. Dobbin, 339; Instinct in Bees and Wasps, The, F. W. L. Sladen, 325
- Stirling, The late Sir Edward, L. M. Harwood, 446
- Stocks, The Genetics of, Miss E. R. Saunders, 432
- Storms, Difficulties met with in the Study of, as a result of the uncertainty of the time of the Observations, J. Renaud, 39
- Strawberry in North America, The, History, Origin, Botany, and Breeding; Prof. S. W. Fletcher, 164
- Straw-compound as a Substitute for Coal, 330
- Streetfeld Research Scholarship in Medicine and Surgery, The, 117
- Strepsiptera, Second Supplement to Monograph on the, W. D. Pierce, 289
- Striae in Mica, etc., Colours of the, P. N. Ghosh, 337
- Strife of Systems and Productive Duality: An Essay in Philosophy, Prof. W. H. Sheldon, 361
- Strophanthus, Kombé, Seeds, An Experimental Study of, K. Samaan, 455
- Submarine: Acoustics, Dr. F. L. Hopwood, 467; and Anti-submarine, Sir H. Newbolt, 263
- Submarines: built for the British Navy during the War by Messrs. Vickers, 91; Detection of, Dr. H. C. Hayes, 317
- Sub-Antarctic Whales and Whaling, Dr. S. F. Harmer, 293
- Sucrase, Law of Action of, H. Colin and Mlle. A. Chaudun, 419
- Sudd Reservoir, The, Sir W. Willcocks, 233
- Sugar Industry in Ancient India, Rai Bahadur Joges Chandra Ray, 251
- Sulphates and Selenates, Crystallographic and Physical Investigation of the, Dr. A. E. H. Tutton, 452
- Sulphones: formed by Sodium, Rubidium, and Cæsium Iodides, R. de Forcrand and F. Taboury, 410; Stability of the, formed by the Iodides of Sodium, Rubidium, and Cæsium, R. de Forcrand and F. Taboury, 499
- Sulphur Vapour, Constitution of, Sir J. Dobbie and Dr. J. J. Fox, 38
- Sulphuric Acid: after the War, 67; The Counter e.m.f. of Polarisation in, A. Noyes, 320
- Summer Time in Great Britain and Canada, 80
- Sun: Observations of the, made at the Lyons Observatory during the Fourth Quarter of 1918, J. Guillaume, 79; Observations of the, made at the Lyons Observatory during the First Quarter of 1919, J. Guillaume, 159; Total Eclipse of the, Observations relating to the H. Deslandres, 330
- Sun-spot Maximum, The, J. Evershed, 291
- Sun-spots as Electric Vortices, Prof. Hale, 292
- Sunlight on Water-drops, Supposed Effect of, Prof. G. H. Bryan, 125
- Sun's Radiation, A Treatise on the, and other Solar Phenomena in continuation of the Meteorological Treatise on Atmospheric Circulation and Radiation, 1915, Prof. F. H. Bigelow, 261
- Superposing of two Cross-line Screens at Small Angles, and the Patterns obtained thereby, S. Lees, 178
- Suprarenals of Female and Male White Rats, Prof. P. T. Herring, 390
- Surface Tension and Surface Energy and their Influence on Chemical Phenomena, Dr. R. S. Willows and E. Hatschek. Second edition, 23
- Surfaces, The Area of, Prof. W. H. Young, 258
- Surgery at a Casualty Clearing Station, Maj.-Gen. C. Wallace and Major J. Fraser, 282
- Surveyors' Institution Scholarships, 397
- Sussex Natural History, 273
- Sweden: Forestry Research in, 175; Hydro-electric Installations in, 72
- Swedish Academy of Sciences, Prof. F. Soddy elected a Foreign Member of the, 328
- Syllogism, The, and other Logical Forms, H. S. Shelton, 351
- Symbiotes, Les, Prof. P. Portier, 482
- Symons's Meteorological Magazine*, July and August, 512
- Synthetic Dyes, Statistics of, 207
- Tables of Bordered Antilogarithms, etc., Prof. G. H. Bryan, 452
- Tar-treated Roads and Fisheries, Appointment of a Subcommittee on, 250
- Tasmania, National Park Board, Report of the, 192
- Teachers, Inadequate Payment of, 296
- Technical Inspection Association, The, 172
- Telephony: Secret, A method of, E. Poirson, 499; wireless, 266
- Temperature: Coefficient of Tensile Strength of Water, S. Skinner and R. W. Burfitt, 38; en Chine, La, et à quelques Stations voisines d'après des observations quotidiennes, H. Gauthier, 42; Exponent in the Equation of State of Fluids, Direct Determination of the, E. Ariès, 280; Influence of, on the Transmission of Commercial Coloured Glasses, M. Luckiesh, 352; of Maximum Density of Water, Effect of some Simple Electrolytes on the, R. Wright, 113; the Human Skin, F. G. Benedict, W. R. Miles, and Miss A. Johnson, 513
- Tennessee, University of, Vote for a New Medical School in Connection with the, 359
- Terebene and its Pharmacopœia Standards, B. F. Howard, 455
- Terre, La Face de la, Prof. Ed. Suesse, Tome iii., 4e Partie; Tables Générales de l'Ouvrage, Tomes i., ii., iii., 502
- Terrestrial Magnetic Force, Pulsations of the Vertical Component of, Dr. A. C. Mitchell, 339
- Tetanus Cases occurring in Home Military Hospitals, Analysis of, Sir D. Bruce, 454
- Teton Sioux Music, Dr. F. Densmore, 515
- Thermal Efficiency, Limits of, in Diesel and other Internal-combustion Engines, Sir Dugald Clerk, 395
- Thermionic Valve, Self-oscillations of a, R. Whiddington, 298
- Thermometers: Clinical, Testing of, at the National Physical Laboratory, 88; for Industrial Use, The Cambridge Scientific Instrument Co.'s, 291
- "Tillite" with Scratched Boulders in the Veranger District of Finmarken, The, O. Holtedahl, 330
- Timber in India, Preservation of, Prof. P. Groom, 81
- Timiskaming County, Quebec, Rocks of, M. E. Wilson, 390
- Tin, White and Grey, X-ray Analysis of the Structure of, A. J. Byl and N. H. Kolkmeier, 373
- Todas, Customs of the, in connection with the Milk of their Sacred Dairies, Sir J. G. Frazer, 173
- Tokyo, Imperial University of, Calendar of the, for 1917-18, 158
- Tornadoes, Lt. J. Logie, 338
- Toxic Action of some Volatile Substances upon Various Insects, Comparative, G. Bertrand and Mme. M. Rosenblatt, 259

- Trans-Atlantic: Flight, The, 171, 369; Flying and Weather, 227
- Transmission Factors for Diffusive Glasses for Illumination, 151
- Transport, Minister of, Sir Eric Geddes appointed, 489
- Trees as Antennæ in Radio-telegraphy and Radio-telephony, Use of, Gen. Squier, 373
- Triennial Prize of the Royal College of Surgeons of England, Subject for the, 150
- Trinitrotoluenes and Mono- and Di-nitrotoluenes: their Manufacture and Properties, G. C. Smith, 421
- Trinity, Evolution and the Doctrine of the, Rev. S. A. McDowall, 103
- Triticum repens*: A Commercial Rarity, Dr. J. Small, 455
- Troostite, The Formation of, at Low Temperatures in Carbon Steels, etc., Portevin and Garvin, 179
- Tropisms, Prof. D'Arcy W. Thompson, 163
- Trout, A New Parasitic Coccidium of the, L. Léger and E. Hesse, 259
- Trypanosomes, The Artificial Acentrosomic Varieties of, A. Laveran, 179
- Tryptic Digestion Process for Skeletonising Purposes, The, Miss K. F. Lander, 9, 64
- "Tsunamis," Different Forms of, S. T. Nakamura, 270
- Tuberculosis, Share of "Colonies" in the Treatment of, J. E. Chapman, 112
- Tübingen University, Dr. W. Ruhland appointed Professor of Botany in, 96
- Tumuli on Martlesham Heath, Suffolk, Work on the, J. Reid Moir, 250
- Turbo-alternator, Efficiency of the, Drs. Barclay and Smith, 91
- Turner, Sir William, K.C.B., F.R.S., Dr. A. Logan Turner, 341
- Tycho Brahe's Original Observations, Dr. J. L. E. Dreyer, 134
- Typhoid Fever, *Rôle* of the Filtering Anti-bacterial Micro-organism in, F. d'Hérelle, 119
- United States: A Bill for the Creation of a Department of Education in the, 118; Board of Standards and the War, The, 197; Chemical Warfare Service, The, 208; Commission of Mining and Metallurgical Experts appointed to visit Europe to assist Reconstruction in France and Belgium, 89; Distinguished Service Medal, The, awarded to Lt.-Col. S. J. M. Auld, 409; Legation in London, Major C. E. Mendenhall appointed Scientific Attaché to the, 7; National Academy of Sciences, Annual Meeting of the, 209; National Museum, Report of the, 74; Part-time Education in the, 127; Scientific Attaché, Notification of Major C. E. Mendenhall as, 370; The National Research Council of the, Dr. C. G. L. Wolf, 245
- Universities: A League of, 413; and University Colleges, Appeal for a Large and Immediate Increase in Exchequer Grants to, A. Henderson, 117; Conference of, 413
- University: and Higher Technical Education in the United Kingdom, Existing Provision of, 158; College, Aberystwyth, Offer by L. Philipps for the Foundation of a Plant-breeding Institute; Appointment of R. G. Stapleton to a Chair of Agricultural Botany and the Directorship of the Plant-breeding Institute, 178; of N. Wales, W. M. Jones appointed Lecturer in Physics at the, 178; of South Wales and Monmouthshire, Dr. A. H. Trow appointed Principal of the, 336; of Wales, Aberystwyth, Appointments in the, 499; Education in the United Kingdom, Appointment of a Standing Committee to Inquire into the Financial Needs of, 337; Research and, 27; Extension Delegacy, Oxford, Forthcoming Resignation of J. A. R. Marriott of the Secretaryship of the, 498; Graduates and Employment, Scheme for an Organisation to deal with, 249
- Unsinkable Garment, An, Protecting against Cold, C. Richet and G. Noizet, 119
- Unstable States, The Thermo-dynamics of, Prof. W. Peddie, 299
- Urease, Mechanism of the Toxic Action of, P. Carnot and P. Gérard, 460
- Vaccine Therapy, Recent Advances in, H. E. Annett, 455
- Valency, The Theory of, Prof. W. A. Noyes, 270
- Vapour-pressure of Liquids in thin Liquids, F. Michaud, 340
- Variables of Long Period, W. Gyllenberg; P. W. Merrill, 53
- Vector Diagrams of some Oscillatory Circuits used with Thermionic Tubes, Prof. W. H. Eccles, 38
- Vegetable: -garden Insects, Manual of, C. R. Crosby and M. D. Léonard, 425; Oil Industries, The, 41
- Velocity of Wind, Utilisation of Measurements of the, at different altitudes for the Prediction of Barometric Variations, L. Dunoyer and G. Reboul, 179
- Venezuela, Explorations in, T. De Booy, 511
- Venus and Jupiter, 73
- Vibrations: of Bowed Strings, and of Musical Instruments of the Violin Family, with Experimental Verification of the Results, on the Mechanical Theory of the, Part I., by Prof. C. V. Raman, 207; of Elastic Shells partly filled with Liquid, S. Banerji, 174
- Victorian Fossils, New or little-known, in the National Museum, Part xxiv., F. Chapman, 440
- Visualisation of Features, R. F. Powell, 104
- Vitamines, A Note on, a Suet Emulsion for Infant-feeding, C. K. Hampshire and C. E. G. Hawker, 456
- Voice Beautiful in Speech and Song, The, A Consideration of the Capabilities of the Vocal Cords and their work in the Art of Tone Production, E. G. White, 124
- Volumetric Analysis, Essentials of, Prof. H. W. Schimpf. Third edition, 362
- Waipoua Kauri Forest, Report on the, D. E. Hutchins, 309
- Wales: National Museum of, Dr. J. J. Simpson appointed Keeper of Zoology, and Dr. Ethel N. Thomas appointed Keeper of Botany in the, 289; Secondary Education in, Appointment of a Committee to inquire into the Organisation of, 397
- War: and Waste, 284; Injuries, Researches based on the Treatment of, Dr. H. Head, 413; Meteorology during and after the, Col. H. G. Lyons, 12; Neuroses, Dr. J. T. MacCurdy, 101; Lt.-Col. Mott, and others, 136; Surgery, 282; A Physiologist's Contribution to, 122; The Great, brings it Home. The Natural Reconstruction of an Unnatural Existence, J. Hargrave, 143; The Lessons of the, and some New Prospects in the field of Therapeutic Immunisation, Sir A. Wright, 112; Time Diets, German and English, Dr. M. Greenwood and C. M. Thompson, 132; Work of British Chemists, Lord Moulton, and others, 92; Wounds, Dr. J. le Fleming Burrow, 501
- Warble-flies, Larvæ of Ox, Experimental Researches on the, 30
- Warsaw University, Mme. Curie appointed Professor of Radiology in, 517
- Washington School of Medicine, St. Louis. Fund for the Endowment of the Department of Pharmacology of the, 359
- Wasps: W. F. Denning, 185; Dr. J. Ritchie; R. F. Burton, 245
- Water: -birds of Louisiana, The, A. Bailey, 192; Engineers, Institution of, The President's Premium of the, awarded to C. Salter, 471; in Clouds, Measurement of, L. F. Richardson, 57; is absorbed by the Root. Place where, H. Coupin, 299; Power Developments, Dr. B. Cunningham, 246; Supply of Essex, The: from Underground Sources, W. Whitaker and Dr. J. C. Thresh: the Rainfall, by Dr. H. R. Mill, 242
- Watt, James: Forthcoming Centenary Commemoration, 327; Centenary Commemoration at Birmingham, 507
- Ways and Communications Bill, Ministry of, read a third time; Prospective Heads of Departments, 389
- Weald, Structure of the, and Analogous Tracts, G. W. Lamplugh, 38
- Weather: Aviation and, 212; Controls over the Fighting during the Autumn of 1918, Prof. R. De C. Ward, 73; Influences on the War, 71; Over the British Isles, the, January to March, 30; Report, Daily, Change in the, 112
- Western Australia, Sources of Industrial Potash in, E. S. Simpson, 450

- Whale, A new British, 237
Whales: and Whaling, Sub-antarctic, Dr. S. F. Harmer, 293; Landed at the Scottish Whaling Stations, Prof. D'Arcy Thompson, 32
Wheat: a Study in Regeneration in, D. P. Montagu, 219; Breeding in Argentina, H. R. Amos, 98; Material, Demonstration of, Prof. Biffen, 432
White and Coloured Troops and the incidence of Disease, Lt.-Col. A. G. Lowe and Major C. B. Davenport, 339
Wild: Bird Investigation Society, Nomination of Officers and Council of the, 289; Birds and Distasteful Insect Larvæ, E. R. Speyer, 445; Hon. H. Onslow, 464; Dr. W. E. Collingë, 483
Wilson College, Bombay, A. E. Walden appointed Professor of Chemistry in the, 358
Wind: and the Distribution of Pressure, Relation between, Dr. H. Jeffreys, 398; in the Stratosphere, Velocity of the, J. Rouch, 419
Wintun Indians, Rites performed by the, S. A. Barrett, 351
Wireless: Telegraphy, Long-distance, 40; Telephonic Communication between Ireland and Canada, 69; Telephony, 266; A. A. Campbell Swinton, 284, 304; A Demonstration in, 470; Being Installed in the Folkestone-Cologne Aerial Mail Service, 130
Wisconsin, University of, Proposed Erection of a Geological Building as a Memorial to Dr. C. R. Van Hise, 499
Wiyot Territory, Ethnogeography and Archæology of the, L. L. Loud, 371
Wolfram Mining in Bolivia, G. F. J. Preumont, 17
Women Workers, Output of, in relation to Hours of Work in Shell-making, Mrs. E. E. Osborne, 493
Women's Work in Engineering and Shipbuilding during the War, Lady Parsons, 395
Woods of two species of *Dalbergia* from Madagascar, Determination of the, A. Jauffret, 159
Woolly Aphis of the Apple-tree, Evolution cycle of the, P. Marchal, 518
Works Chemist, Post-graduate Training of the, F. H. Carr, 58
World: Politics, Geographical Aspects of, 423; Survey, A, 434
Worms Heath, Surrey, The Section at, with remarks on Tertiary Pebble-beds and on Clay-with-flints, W. Whitaker, with Petrological Notes, G. M. Davies, 178
Wound Shock: Injection of a Solution of Gum-arabic in cases of, Prof. W. M. Bayliss, 136; Nature and Casuation of, Dr. Dale, 136
Wounds of War, Research on, Major L. J. Austin, 223
Wright, Wilbur, Lecture, L. Bairstow, 327
Xochipalli, or flower-paint of the Aztecs, The, W. E. Safford, 32
X-ray: Demonstration of the Vascular System by Injections, H. C. Orrin, 290; Optics. Part I., Dr. R. A. Houston, 339
X-rays and British Industry: Major G. W. C. Kaye, 194; R. S. Wright, 244; Major G. W. C. Kaye, 245; Protective Measures Against, Dr. Hernaman-Johnson, 309; The Examination of Materials by, Discussion on, 170; The Sensitiveness of Photographic Plates to, Miss N. C. B. Allen and Prof. T. H. Laby, 177
Zirconium, Estimation of, P. Nicolardot and A. Reglade, 18
Zoology, Elementary, A Manual of, L. A. Borradaile, Second edition, 83

NATURE

A WEEKLY ILLUSTRATED JOURNAL OF SCIENCE.

*"To the solid ground
Of Nature trusts the mind which builds for aye."*—WORDSWORTH.

THURSDAY, MARCH 6, 1919.

THE LIFE-WORK OF A HINDU CHEMIST.

Essays and Discourses. By Sir Prafulla Chandra Rây. With a Biographical Sketch and a Portrait. Pp. xxxii+349. (Madras: G. A. Natesan and Co., 1918.) Price 3 rupees.

SIR PRAFULLA CHANDRA RÂY, professor of chemistry in the Presidency College, Calcutta, is well known to chemists in this country as the author, either alone or in collaboration with his pupils, of more than a hundred papers, chiefly on the inorganic and organic nitrites, published in the Transactions of the Chemical Society, in Continental journals, or in the Journal of the Asiatic Society of Bengal. In his own country he is also known as the founder of a successful chemical industry, which, from small beginnings, now occupies factories spreading over an area of eight acres. It is one of the most successful concerns in India, and proved of considerable service to the Government during the war, when the supply of Western chemicals and drugs was seriously interfered with. It is entirely staffed with Bengali workers, and its research chemists are of its creator's training.

Naturally, such a man has had a great influence in India. He has succeeded in founding a school of native chemists capable of attacking and elucidating modern scientific problems. He has roused and quickened the Bengali brain from the torpor which had overtaken it, and by his example and precept has proved that the Hindu only needs training, encouragement, and direction to revive the ancient glories of his race in philosophy and science. The success of the commercial undertaking which he initiated also indicates that the Bengali is not lacking in the power of organisation, application, and steadfastness of purpose needed to conduct successfully a business enterprise.

It was to be expected, therefore, that Sir P.

Chandra Rây should, as he expressed it, sooner or later find himself "the property of anybody and everybody," and be called upon by various educational institutions, by conferences, and by the periodical Press and leading newspapers interested in the social reform and development of the industrial and political life of India to address his countrymen on subjects which so closely affect their national welfare and prosperity; and it was equally certain that a demand should arise that these essays and discourses should be collected and published in some permanent form.

The little book before us is the outcome of this demand. It contains a series of addresses and articles on scientific education in India; on the pursuit and progress of chemistry in Bengal; on science in the vernacular literature; on the antiquity of Hindu chemistry; on the Educational Service of India; on the Bengali brain and its misuse; on Government and Indian industries, together with a number of appreciations of men who have signalised themselves in the national evolution of India.

The collection is prefaced by a short biographical sketch of the author, and concludes with a list of original contributions from the Indian School of Chemistry.

Such a book, as a literary production, cannot be judged wholly from a Western point of view. To do justice to it one must have some knowledge of, and sympathy with, the Oriental mind. Its language is at times suffused with a glow characteristic of the East, and its excessive eulogy and altisonant phrases, as Evelyn would have styled them, are apt to provoke a smile in the stolid and more cold-blooded Englishman. At the same time, it is impossible not to recognise and appreciate the earnestness, courage, and sense of duty of the author, or fail to perceive his sincerity or the strength of his convictions in warring against the galling restrictions of caste, of social inequalities and depression, which are at the bottom of India's degradation. Her elevation will not come in Sir P. Chandra Rây's time. A small, spare man, in feeble health, and a con-

firmed dyspeptic, he will be spent in her service. But the memory of these services will survive, and the little book to which we direct attention will serve to perpetuate it.

T. E. THORPE.

GRAVITATION AND RELATIVITY.

The Physical Society of London. Report on the Relativity Theory of Gravitation. By Prof. A. S. Eddington. Pp. vii+91. (London: Fleetway Press, Ltd., 1918.) Price 6s. net.

IN the year 1905 a paper was published by Dr. A. Einstein which gave to the world of physical science a new subject for controversy under the title of "The Principle of Relativity." For ten years discussion reigned between those who held to the æther as a firm basis to the universe, and those who, treading more mathematically, felt a safer foothold on Einstein's elegant abstraction, little caring that æther, space, and time all trembled.

While men talked, the author of the disturbance was quietly preparing a greater. His first effort had left to the materialist a little comfort and cause for self-conceit in that it had not succeeded in resolving the old contradiction between a metaphysical theory of the relativity of space and time and the apparent existence of an absolute standard of rotational motion. The new theory, however, claims, not only that the complete relativity of space and time is true to the facts, but also that it can throw light on gravitational phenomena which was not shed by the more limited principle. To quote the author of this report: "*Einstein's theory has been successful in explaining the celebrated astronomical discordance of the motion of the perihelion of Mercury without introducing any arbitrary constant; there is no trace of forced agreement about this prediction.*"

Any theory of gravitation which succeeded in doing this would be worthy of serious consideration, but what words should be applied to one which transcends the limitations of Newton's marvellous achievement through the acceptance of the doctrine of complete relativity of space and time?

In the earlier theory the one essential constant and invariant magnitude was the velocity of light (c). In mathematical signs, $dx^2 + dy^2 + dz^2 - c^2 dt^2$ was invariant. It is obvious that this cannot be so for a complete relativity, but a general quadratic expression in dx , dy , dz , dt will remain through all changes an expression of the same type, though the coefficients of the several terms will be functions of position and time instead of constants. In the new theory it is assumed that the physical properties of space are such that there is a quadratic form of this kind which remains invariant. The physical state at any point and instant is summarised in the values of the coefficients. It is Einstein's achievement to have been able to apply the work of the pure mathematician to find equa-

tions between these quantities which, while reducing to the equations of Newtonian gravitation for all frames of reference to which the old principle of relativity applies, have a completely invariant form.

While we wonder at the feat, and at the vision of a hitherto uncomprehended unity of thought, there remain some obstinate questionings. If this dream of complete relativity be true we are getting near the point at which it is so general as to lose touch with common experience. The new law of gravitation has not that astounding simplicity of expression which distinguishes that of Newton. The old problem of absolute rotation is thrown further back; but it remains true that there are systems of reference for which dynamical phenomena present their greatest simplicity. We ask why our first naive choice of a system of measurement ready to hand is such that within it material bodies have a nearly permanent configuration, and light has an approximately constant velocity.

Generalisation is the supreme intellectual achievement, but it may leave us thirsting for the particular and for simplicity. This report on what may be the most remarkable publication during the war leaves us wondering in which direction the greater satisfaction is given.

OUR BOOKSHELF.

Mnemonic Notation for Engineering Formulae. Report of the Science Committee of the Concrete Institute. With explanatory notes by E. F. Etchells. Pp. 116. (London: E. and F. N. Spon, Ltd., 1918.) Price 6s. net.

THIS book contains a series of miscellaneous papers dealing with the application of mnemonic notation to various branches of pure and applied science, and especially to structural engineering. The formulæ of science should not be expressed in misleading symbols which are not suggestive of the quantities concerned, but in a notation which is the "embodiment of organised common sense." The key to the notation adopted is to be found in the abbreviation of the significant words in any term until only the initial letter remains. In a few instances the second, or even the final, letter may be retained to form a subscript to the initial letter. "The greater letters are used to indicate greatness of quantity or greatness of complexity."

There is no doubt that the scheme proposed is founded on sound principles, which have been long recognised by competent teachers. To some it may seem that in parts of the present volume there is a tendency to elaborate the obvious, and that the report would have been more convincing if there had been fewer repetitions and less frequent use of odd and unfamiliar language. A series of useful appendices dealing with various practical questions, such as calculations for business purposes and the printing of mathematical formulæ, occupies more than two-thirds of the book.

The British Journal Photographic Almanac and Photographer's Daily Companion, 1919. Edited by George E. Brown. Pp. 644. (London: Henry Greenwood and Co., Ltd., 1918.) Price 1s. 6d. net.

It is very satisfactory that this annual has survived the war, for it is indispensable wherever photography other than mere routine work is actively carried on. The present volume is the fifth issued since August, 1914, and suffers the most severely of all from the restrictions that necessity has imposed upon us. However, even this is a substantial volume, in which none of the main features that we have been led to expect are omitted. The article by the editor is on "Photographic Definitions," and these are arranged according to subject in a series of sections, each of which is a kind of running commentary on the subject of its title. The commercial uncertainty of the present time is shown by the comparatively few prices that are given in the advertisements. The most useful section to the student, the "Epitome of Progress," shows that notable advances have been made in the science of photography, as well as in the prices of materials. We regret that formulæ for the use of metol and glycin as developers are not given. Metol, certainly, is as generally useful as ever it was. Perhaps these were removed because of their "enemy origin," but they have for some time been "British-made," and figure in at least two or three places in the advertisement pages.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he 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.]

The Directorship of the Natural History Museum, London

THE Director of the British Museum (Natural History) is about to retire, and we learn with deep apprehension that the principal trustees, with whom the appointment rests, have received, or are about to receive, from the general body of trustees a recommendation to pass over the claims of scientific men and to appoint a lay official, who is at present assistant secretary. The former directors, Sir Richard Owen, Sir William Flower, and Sir Ray Lankester, like the present director, Sir Lazarus Fletcher, were all distinguished scientific men. The Natural History Museum is a scientific institution. There is a large staff of scientific keepers and assistants. The director has to represent natural history to the public, to other scientific institutions at home, in the Dominions and Colonies, and in foreign countries, and to the many Government Departments with which the museum has relations. He must represent it with knowledge and authority. There are few posts with such possibilities of advancing the natural history sciences, of making them useful to the nation, and of interpreting them to the public. The existence of the post is a great stimulus to the zeal and ambition of zoologists and geologists.

The arguments alleged in favour of the recommendation are trivial. It is stated that a former director was allowed by the trustees to leave the administrative details to the member of the clerical staff whom it is proposed to promote, that he per-

formed these duties with ability, and during the tenure of the present director retained and extended his powers. It is urged that the tenure of the new director would be short, as he would have to retire in two years under the age limit. It is pleaded that promotion would entitle him to a larger pension, and that he need not be called director, but only acting-director.

Plainly, if the assistant secretary be the only man who knows the details of administration, it is important that the permanent director should be appointed at once, in order to have the opportunity of learning them before taking them over. In actual fact there is nothing in the administrative work of the directorship that could not be learned in a few weeks or months by any person of ordinary intelligence. At least two of the present keepers are eligible for the vacancy, have attained the necessary scientific standing, and have ample experience of the museum itself. To pass over these or several eminent and eligible men not on the staff in favour of one of the ordinary office staff would be an affront to scientific men and of grave detriment to science.

W. BOYD DAWKINS, F.R.S. (Honorary Professor of Geology and Palæontology, Manchester).

J. COSSAR EWART, F.R.S. (Professor of Natural History, Edinburgh).

F. W. GAMBLE, F.R.S. (Professor of Zoology, Birmingham).

J. S. GARDINER, F.R.S. (Professor of Zoology, Cambridge).

WALTER GARSTANG, D.Sc. (Professor of Zoology, Leeds).

E. S. GOODRICH, F.R.S. (Aldrichian Demonstrator of Comparative Anatomy, Oxford).

W. A. HERDMAN, F.R.S. (Foreign Secretary, Royal Society, Professor of Natural History, Liverpool).

S. J. HICKSON, F.R.S. (Professor of Zoology, Manchester).

J. P. HILL, F.R.S. (Jodrell Professor of Zoology, London).

W. E. HOYLE, D.Sc. (Director, National Museum of Wales).

ARTHUR KEITH, F.R.S. (Hunterian Professor and Conservator of the Museum of the Royal College of Surgeons).

J. GRAHAM KERR, F.R.S. (Regius Professor of Zoology, Glasgow).

E. W. MACBRIDE, F.R.S. (Professor of Zoology, Imperial College of Science).

W. C. MCINTOSH, F.R.S. (Emeritus Professor of Natural History, St. Andrews).

J. E. MARR, F.R.S. (Woodwardian Professor of Geology, Cambridge).

P. CHALMERS MITCHELL, C.B.E., F.R.S. (Secretary, Zoological Society of London).

E. B. POULTON, F.R.S. (Hope Professor of Zoology, Oxford).

R. C. PUNNETT, F.R.S. (Arthur Balfour Professor of Genetics, Cambridge).

A. C. SEWARD, F.R.S. (Master of Downing College, and Professor of Botany, Cambridge).

A. E. SHIPLEY, F.R.S. (Master of Christ's College and Reader of Zoology, Cambridge).

W. J. SOLLAS, F.R.S. (Professor of Geology, Oxford).

JETHRO J. H. TEALL, F.R.S. (lately Director of the Geological Survey of Great Britain).

J. ARTHUR THOMSON, LL.D. (Professor of Natural History, Aberdeen).

February 27.

The Supposed "Fascination" of Birds.

It is well known that the stoat (*Putorius ermineus*) sometimes performs extravagant antics by way of ruse in approaching rabbits or small birds, which, in the opinion of some persons, are "fascinated" or hypnotised by the display. I incline to believe that the subject of these manoeuvres becomes so deeply interested, amused, or puzzled by the movements of the acrobat that it defers flight until too late. This view has been strengthened by what I witnessed from my library window in the spring of 1917. A male blackbird was sitting on the open lawn; a stoat was racing round the bird at high speed, now rolling itself into a ball, racing again, then leaping fully 2 ft. high and turning an aerial somersault, and again racing in circles. How long the performance had been going on before I happened to become a spectator I know not, but it went on under my eyes for perhaps seven minutes, during which time the blackbird never stirred and the stoat continued in violent movement. Every moment I expected that it would spring upon the bird, which it might easily have done, but nothing of the kind happened. Suddenly, in the middle of the performance, the blackbird flew away; and the stoat, apparently not caring to exhibit without a "gallery," resumed its normal gait and disappeared in the bushes.

Now if the blackbird was "fascinated" in the sense of an arrest of motor volition, what broke the spell? The acrobat was at the height of its antics when the bird flew off. One may assume, I think, that the latter's interest in the performance was absorbing up to a certain point, for it is contrary to the habits of a blackbird to sit motionless for many minutes on a spring morning; but it does not seem as if its volition had been affected.

In his great work on British mammals Mr. J. G. Millais describes instances of the stoat (than which there is no more bloodthirsty animal) resorting to these acrobatic feats with no deadly purpose, finishing up by romping with its audience of young rabbits and worrying them in make-believe. In the case I have described it does not appear that the stoat had any intention of making its breakfast off the blackbird.

HERBERT MAXWELL.

Monreith, Whauphill, Wigtonshire, N.B.

Girvanella and the Foraminifera.

BULLETIN No. 104 of the United States National Museum contains the first part of Mr. J. A. Cushman's "Foraminifera of the Atlantic Ocean." Workers in this group will find it of much value to have a complete and well-illustrated account of the foraminifera as occurring in the Atlantic. In this paper there is, however, one doubtful point in regard to affinity in which two distinct organisms are confused, and this, if not corrected, will mislead the student. I refer to the relegation of Brady's *Hyperammia vagans* to the genus *Girvanella*, Nicholson and Etheridge. It is a generally accepted opinion that *Girvanella* is probably related to the blue-green algæ (Cyanophyceæ), as shown by Röhrlitz, Wethered, Seward, Garwood, and the writer. In the earliest descriptions Nicholson and Etheridge, it is true, held *Girvanella* to be of foraminiferal affinities, and Brady compared it to *H. vagans*, but the consensus of opinion is now in favour of its plant origin. As I have elsewhere shown (Aust. Assoc. Adv. Sci., Adelaide, 1907), its larger dimensions, arenaceous shell-wall, bulbous primordial chamber, simple, not branching, tube, and absence of septation separate it from *Girvanella*. In following Rhumbler (1913),

Cushman includes other species of thread-like rambling and attached organisms. Whether they are all foraminiferal or algal in affinities can be determined only by careful examination by means of microscope sections, at the same time bearing in mind that the structure of the true *Girvanella* tube is not a mosaic of particles held by cement, but a finely granular structure such as is seen in other living calcareous algæ. The point here raised is directed against the placing of the genus *Girvanella*, as defined by Nicholson and Etheridge, with the Foraminifera.

FREDK. CHAPMAN.

National Museum, Melbourne,
December 23, 1918.

Feeding Habits of Nestling Bee-eaters.

THE paragraph in NATURE of March 28, 1918, p. 70, upon a paper in which Mr. W. Rowan describes the defæcation of the nestlings of the British kingfisher, leads me to mention the habits of a bird also nesting in tunnels. I refer to the bee-eater (*Merops*). Mr. J. E. Ward, recently a fellow-passenger from New Guinea, told me that the young of a Papuan species defæcate outside the nest but within the tunnel. The fæces attract flies, which breed in the mass, and the resulting larvæ form the food of the very young nestlings. As the flies later emerge, the young birds have grown sufficiently to be able to catch the insects on the wing.

Mr. Ward noticed that nestlings in captivity did not gape for food as do most young birds, and he was thus led to investigate the subject, with the result above mentioned.

EDGAR R. WAITE.

S.A. Museum, Adelaide, September 6, 1918.

Aeronautics THE COMMERCIAL USE OF AIRSHIPS.

THE future of the rigid airship from the commercial point of view is brought prominently into notice by a paper lately issued by the Air Ministry entitled "Notes on Airships for Commercial Purposes." This memorandum discusses at length the possibility of the use of airships in the immediate future, and enters into a detailed comparison between the large aeroplane and the rigid airship. At the outset it is stated, however, that the two types of aircraft, as at present developed, are not likely to compete with one another seriously, since their characteristics are widely different, the aeroplane being essentially a high-speed, short-distance machine, while the rigid airship is a long-distance, weight-carrying craft. The great endurance of the airship and its power of remaining in the air during a temporary breakdown of the machinery are valuable assets when long flights over sea or mountainous country are contemplated. The safety and comfort of passengers are considered to be greater in the case of the airship than in that of the aeroplane. In connection with the possibility of loss by fire in the former case the Air Ministry points out that there has been only one such loss since 1914, despite the fact that about 2½ million miles have been covered, and that in this one case the cause of fire has been ascertained and eliminated. It is conceded that at present the airship is more affected by bad weather than the aeroplane, but it is stated

that up to the end of November there were only nine days in 1918 on which no airship flight took place in the British Isles.

Having thus indicated the suitability of the airship for commercial purposes, the paper goes on to discuss the developments which have taken place during the last four years in the design of both airships and aeroplanes, and it is considered that the development of the airship has been even more marked than that of the aeroplane when regarded from the point of view of weight-carrying. Considerable emphasis is laid on the fact that for a given increase in the gross weight of an aeroplane a more than proportional increase is necessary in the weight of the structure itself if the same factor of safety is to be maintained; whereas in the case of the airship the strength of the structure is maintained if the structural weight is directly proportional to the gross weight. This difference is explained by the fact that the lift of similar aeroplanes is proportional to the square of their linear dimensions, whereas the lift of similar airships varies as the cube of the dimensions. If, therefore, the size of aeroplanes is increased very greatly, while still adhering to the present materials and constructional methods, a point would be reached where the machine could only just lift its own weight, with no reserve for carrying useful load. With the airship, however, the useful load increases continuously, no matter how large the ship.

It therefore appears that, while airships of great carrying capacity are theoretically possible on the present lines of design, it is impossible to build aeroplanes to carry anything like the same loads unless methods of design can be radically altered. A comparison of this kind is not necessarily an argument in favour of the airship, as it may be ultimately found better to carry a given load by a number of aeroplanes of reasonable dimensions rather than by a single huge airship.

Numerical illustrations are given of the improvement since 1914 in the cases of aeroplanes and rigid airships, and a rough indication of the results arrived at is given in the table below:—

Type of aircraft	Speed (miles per hour)	Horse-power	Useful load (tons)
1914 Avro	70	80	0.27
1918 D.H. 10A	125	810	1.45
1914 Zeppelin (average)	50	800	8.5
1918 Zeppelin (L.70)	78	2100	38.8
Proposed 10,000,000 cu. ft. rigid airship	86	6000	170

The table shows the possibilities of the airship as a weight-carrier in a marked manner, but it is somewhat difficult to make a comparison of merit when the size and the speed of flight are so variable for the various aircraft. If it be assumed that the horse-power varies as the cube of the speed (an assumption which is true for the airship, and approximately correct for the aeroplane), it is possible to compare roughly the performances by noting the value of $\frac{WV^3}{\text{horse-power}}$ for the various craft, where W is the useful load in tons, and

V the speed in miles per hour. For the five machines above considered, the values are:—

1914 Avro	1,100
1918 D.H. 10A	3,300
1914 Zeppelin	1,300
1918 L.70	8,200
10,000,000 cu. ft. rigid	18,000

These figures indicate clearly that, from the point of view of fuel consumption, the large airship is much more efficient than the aeroplane for carrying great loads at a moderate speed. It is possible, however, that this superiority may in practice be outweighed by the greater cost of upkeep of the airship, and, in particular, by the cost of the large housing sheds which are at present necessary, with their attendant need of a large *personnel* to handle the ships. The aeroplane will, of course, always be the better machine where small loads are to be carried at the highest possible speeds, and it is quite likely that a combination of aeroplane and airship services will often prove the best practical solution. For instance, as suggested in the paper under discussion, a rigid airship service might run between Lisbon and New York, passengers being taken to Lisbon from Paris, Rome, etc., by aeroplane. The aeroplane would thus compete with the express train, and the airship with the ocean liner, and a gain of not less than 50 per cent. in the time of transit would be realised in both cases.

In conclusion, the Air Ministry appears very optimistic as to the possibilities of the rigid airship in commerce, and produces excellent reasoning to support its optimism. One note of warning is sounded, and cannot be sounded too often, namely, that progress in point of size of aircraft must be made gradually. A premature attempt to build a very large aeroplane or airship is doomed to failure, and would do much to prejudice future development. If, however, progress is attempted in easy stages, giving time to overcome difficulties gradually, and to apply experience so gained to the next stage of development, there is every reason to hope that vast improvement will result in both aeroplanes and airships, and that the success of commercial aviation will be assured.

DR. F. DU CANE GODMAN, F.R.S.

THE death of Dr. Frederick Du Cane Godman on February 19 removes a familiar figure from the meetings of our scientific societies. Few men had greater opportunities of benefiting the science of their choice; none made a better use of them.

There is something characteristically British in the development of Godman's life-work out of the associations and friendships of his student days at the university. For it was at Cambridge in Godman's time and with Godman's help that the Ornithological Union and its journal, the *Ibis*, were founded, and at Cambridge that his fruitful friendship with Osbert Salvin was begun. Of that friendship, which closed with the death of Salvin in 1898, he wrote in his introduction to

the "Biologia Centrali-Americana": "The severance of a friendship such as ours had been for forty-four years was a terrible blow to me, for we were more intimately connected than most brothers, and, besides the personal loss, I missed his knowledge and experience in all things connected with our book. . . . It was with a heavy heart that I took up my pen again."

The choice of Central America as the field for their great enterprise was determined by an accident—the search for commercially profitable palm-nuts by Salvin in 1857—but no accident could have been more fortunate, for it hit upon the most interesting and exciting of all links between the tropics and the great northern land-belt. Prolonged isolation has led to the development, upon the great continent to the south, of a fauna unequalled in the world for combined peculiarity and richness. Then, in the fullness of time, the area supporting this teeming and varied population lost its isolation. What more exciting problem than a study of the intermediate tract which would show how far the southern forms have pushed to the north, the northern to the south? We know, as the result of this study, that the boundary between the two areas is concave towards the north, for the lower temperature of the high central Mexican plateau favours the northern forms, while the heat of the lower slopes and flats on the two coasts favours the southern.

It is unnecessary, on the present occasion, to speak in any detail of the sixty-three quarto volumes and 1677 plates in which this splendid contribution to zoology, botany, and anthropology is contained, for an admirable and yet brief statement of the history and scope of the work will be found in Godman's introduction, published in 1916. But a word must be said of the great band of naturalists who gathered round and assisted the two editors. Of this band, some, like H. W. Bates, Albert Günther, Joseph Hooker, O. Pickard-Cambridge, and P. L. Sclater, were veterans in 1879, when the first part appeared, and are now great memories. Others, again, found in the "Biologia" the whole of their training, and nearly the whole of their experience, as systematists. It is as Godman and Salvin would have wished, that their memories should always be bound up with those of the great body of experts who laboured with them.

Godman was the most modest of men. He found his reward in his love of the work he had undertaken, and looked neither for honours nor for recognition; but when they came the evidence of appreciation by his scientific comrades was a great pleasure and encouragement to him.

Outside his own subject Godman took a keen interest in all that concerned the advancement of science, and its neglect in this country was a real grief to him. He saw clearly the double importance of science for its own sake and for the sake of the intellectual training it gives. In these essential things he felt strongly that the country was being starved, and he feared for the future when he thought of our politicians and the way

they had accepted their responsibilities in the past.

In failing health at the end of his long life, Godman's interest and sympathy remained unclouded, and in his dying hours he sent a last message to his colleagues giving his opinion on a much-debated subject about which he felt strongly. His last thoughts were with the great National Museum to which he had made so many noble contributions.

E. B. PEV

NOTES.

THE following fifteen candidates were selected on Thursday last by the council of the Royal Society to be recommended for election into the society:—Prof. F. A. Bainbridge, Dr. G. Barger, Dr. S. Chapman, Sir C. F. Close, Dr. J. W. Evans, Sir Maurice Fitzmaurice, Dr. G. S. Graham-Smith, Mr. E. Heron-Allen, Dr. W. D. Matthew, Dr. C. G. Seligman, Prof. B. D. Steele, Major G. I. Taylor, Prof. G. N. Watson, Dr. J. C. Willis, and Prof. T. B. Wood.

SIR LAZARUS FLETCHER retired on March 3 from the directorship of the Natural History Museum after forty-one years in the service of the Trustees. Previous to his appointment as director on May 22, 1909, he had served two years as assistant and twenty-nine years as keeper in the Mineral Department. As keeper of minerals his first arduous task was to superintend the removal of the mineral collections from Bloomsbury to South Kensington, and to re-arrange them in the Natural History Museum. His next work was the preparation of those admirable guides, the introductions to the study of minerals rocks, and meteorites respectively, and the selection and arrangement of series of specimens to illustrate them, which have earned him the gratitude of all students of the subject. "The Introduction to the Study of Minerals" is a highly successful attempt on the part of a great mathematician and chemist to surmount the difficulty of explaining a very technical subject without the aid of mathematics and chemical formulæ. In the intervals of this work, and later, Sir Lazarus Fletcher found time, in the chemical laboratory which had been fitted up in the museum, for his well-known researches on meteorites and minerals. After this exacting work as keeper of the Mineral Department, his tenure of office as director of the museum was still not devoid of care, for soon after his accession an attempted encroachment upon the grounds which had been allotted for the future expansion of the museum had to be repelled, and more recently during the war certain proposals which, if carried out, would have been disastrous to the collections had to be met.

A FEW weeks ago (January 23, p. 409) we referred to the approaching retirement of Sir Lazarus Fletcher from the directorship of the Natural History Museum, and the duty thus placed upon the Trustees of finding a successor who will maintain the high prestige of the museum among the corresponding institutions of the world. From the letter which appears in our correspondence columns, signed by twenty-three naturalists of distinguished eminence, it appears that, as a temporary measure, the appointment of an administrative official to the post of director has been contemplated. We can scarcely believe that the Trustees will adopt such a course of action, which would be most derogatory to the position of science and the interests of the museum. The shortness of tenure, and the provision of an increased retiring

pension at the end, are merely matters of expediency, and are as nothing by the side of the principle and precedent involved. Scientific men should not for a moment accept the view that they are incapable of administration, or that the high posts which their knowledge qualifies them to fill can be occupied efficiently by administrators not possessing it. Skilled secretarial work, no doubt, facilitates communication between Government Departments, but it signifies routine and stagnation when it controls the activities of a scientific institution. Knowledge gives the driving power required for progressive development, and administrative functions should be subsidiary to it. Throughout the Civil Service there is already far too much of the reverse condition. We are glad, therefore, that a strong protest has been made against the assumption that the highest post open to naturalists in this country can be filled by an officer without the necessary scientific qualifications to do credit to it and the nation in the eyes of the world.

THE facts made known by Lord Gainford and Lord Harcourt in the House of Lords on February 26 show that a long time must elapse before our museums and the staff of the Board of Education can resume their work unhindered. The latter body is scattered throughout London, while its records are stored in the galleries of the Victoria and Albert Museum. Half that museum is closed to the public, its circulation department shut down, its textile classes and other aids to industry suspended. The priceless Wallace collections are still in underground tubes. The National Portrait Gallery, the London Museum, the Tate Gallery, and the British Museum galleries of prints and of Egyptian and Assyrian antiquities, as well as much of its storage space, are occupied by huge clerical staffs. Finally, the exhibition galleries of the Imperial Institute continue to be filled with a succession of other Departments; the institute's lectures and demonstrations are in abeyance, and its own research work is hampered because the raw materials are stored elsewhere. The result is not only to disappoint the American and Dominion troops, and to deny the British taxpayer the enjoyment of his great educational establishments; it is, above all, a serious check on the commercial and industrial development of the country. Unavoidable the delay may be, yet we cannot help feeling that the situation would not have arisen had Ministers a truer appreciation of the work done by and in our public museums.

THE KING has consented to act as patron of the British Scientific Products Exhibition, 1919, which will be held at the Central Hall, Westminster, during the month of July. The president of the exhibition is the Marquess of Crewe, and the vice-presidents include the Prime Minister and all the leading members of the Government. Prof. R. A. Gregory is chairman of the organising committee. The British Science Guild has been encouraged to organise this exhibition by the success which attended that held at King's College last summer and the more recent exhibition at Manchester. Now that many inventions can be shown which could not be put before the public during the war, there is every prospect that this year's exhibition will be even more successful than its predecessors. The objects of the exhibition will be to illustrate recent progress in British science and invention, and to help the establishment and development of new British industries. Such an exhibition will enable new appliances and devices to be displayed before a large public, and will provide progressive manufacturers with an opportunity of examining inventions likely to be of service to them, thus serving as a kind of clearing-house

for inventors and manufacturers, as well as illustrating developments in science and industry. The exhibition will include sections dealing with chemistry, metallurgy, physics, agriculture and foods, mechanical and electrical engineering, education, paper, illustration and typography, medicine and surgery, fuels, aircraft, and textiles. Firms desirous of exhibiting are invited to communicate with the organising secretary, Mr. F. S. Spiers, 82 Victoria Street, London, S.W.1.

At the forty-first annual general meeting of the Institute of Chemistry held on Monday, March 3, Sir Herbert Jackson, the president, referred to the work of the institute during the war. The record afforded an example of the value to the country of organised professional bodies in times of crisis. The institute is now co-operating with the Appointments Department of the Ministry of Labour in the re-settlement in civil life of those who have been so engaged, and it is hoped that with the return of more normal conditions chemists will be utilised to the fullest advantage in the application of their science to the industries of the country. The president, in referring to the losses sustained by the profession, mentioned especially Lt.-Col. E. F. Harrison, who will always be remembered for his exceptional work in the provision of means of defence against poisonous gas attacks, in which work he undoubtedly sacrificed his life. The institute has before it a period of reconstruction, and will endeavour to bring together in one body the trained and competent chemists both for their own benefit and for that of the community. The events of the war have done much to establish the claim of chemists to greater recognition than has been accorded them in the past. The council has recently prepared a scheme of Government Chemical Service, which it is hoped will secure better conditions for chemists holding appointments under various Departments. The vital importance of chemical service to the State has been clearly demonstrated in recent years, and a good example set by the Government will go far to bring home to the public the importance of chemistry to industry and commerce. Sir Herbert Jackson was re-elected president of the institute for the ensuing year.

WHEN the Ministry of Health Bill passed its second reading in the House of Commons on February 26 Major Astor, Parliamentary Secretary to the Local Government Board, who replied on the debate, expressed gratification that a first-class measure had practically secured unanimous support from all parts of the House. From all accounts this is exactly what happened, and, apart from certain of the Welsh members, who desire to see separate provision made for the Principality, and some of the Irish members who do, and some who do not, wish to see the proposed Bill extended to Ireland, there were few voices raised in criticism. Clearly the majority had come to the second reading convinced that the Bill was the best likely to be obtained, and prepared to support it and accept all it proposed in the way of transference of powers, consultative councils, etc. Dr. Addison's advocacy, sound though it was, apparently was also quite dispassionate. His attitude suggested that he was addressing the members of a learned society and engaged in reading a paper upon a scientific subject. This impression was heightened by the fact that a large proportion of those who took part in the debate were medical men. These, led by Sir Watson Chéyne, devoted themselves largely to the question of research and the provision in clause 3 for placing this most important work in the hands of the Privy Council. It is interesting to note that, not only inside the House,

but also outside, and particularly amongst medical officers of health, whose society has issued a memorandum dealing with the Bill, medical opinion is strongly against any Department other than the Ministry of Health having control of research. In regard to the failure of the Bill to provide for the taking over by the Ministry of lunacy and mental deficiency there was comment also, and here again medical opinion is in favour of transference. As Dr. Addison pointed out, however, there was much detail that must be left to the future. The main and pressing business of the moment is to get the Ministry formed and to see that the definite fundamental health matters are brought within its purview. Other things will follow when the Ministry and the Minister have shown themselves worthy of the trust which everybody seems to be so willing to give them and of the high hopes that are based upon them.

CAPT. G. P. THOMSON will deliver his postponed lecture on "The Dynamics of Flying" at the Royal Institution on Monday next, March 10, at 3 o'clock.

THE death is announced, at eighty-five years of age, of Dr. Robert Liveing, consulting physician to the skin department of the Middlesex Hospital, and formerly lecturer on anatomy at Middlesex Hospital.

WE regret to announce the death on February 8, at ninety-four years of age, of Prof. J. J. T. Schloesing, doyen of the section of rural economy of the Paris Academy of Sciences, and professor of agricultural chemistry in the Paris Conservatoire des Arts et Métiers.

Science for February 7 announces that Major C. E. Mendenhall, professor of physics in the University of Wisconsin, has been appointed scientific attaché to the United States Legation in London, and has been given leave of absence from the University to take up the duties of this post immediately.

At the ordinary meeting of the Royal Society of Edinburgh, held on March 3, the following were elected ordinary fellows:—Dr. A. R. Cushny, Dr. W. J. Dundas, Dr. R. O. Morris, Dr. T. S. Patterson, Mr. B. D. Porritt, Mr. A. H. Roberts, Mr. W. A. Robertson, Dr. A. Scott, Dr. A. R. Scott, Mr. W. W. Smith, and Capt. D. A. Stevenson.

THE following lectures will be delivered at the Royal College of Physicians during March and April:—Milroy lectures, Half a Century of Smallpox and Vaccination, Dr. John C. McVail; Goulstonian lectures, The Spread of Bacterial Infection, Dr. W. W. C. Topley; Lumleian lectures, Cerebro-spinal Fever, Sir Humphry D. Rolleston.

THE Paris correspondent of the *Morning Post* announces the death, at sixty-eight years of age, of Prof. André Chantemesse, professor of hygiene in the faculty of medicine in Paris, member of the Academy of Medicine, and Inspector-General of Sanitary Services. Prof. Chantemesse was the author of works on typhoid fever, and others entitled "Moustiques et Fièvre Jaune," "Mouches et Choléra," and "Frontières et Prophylaxie."

At a special general meeting of the British Psychological Society held in London on February 19 it was unanimously resolved that persons interested (instead of, as heretofore, engaged) in the various branches of psychology shall be eligible for membership. It was also decided to institute three special sections of the society, devoted respectively to the educational, industrial, and medical aspects of psycho-

logy. Further particulars may be obtained from the honorary secretary of the British Psychological Society, the Psychological Laboratory, University College, W.C.1.

It is with regret we record that Capt. Melville Willis Campbell Hepworth, Marine Superintendent of the Meteorological Office, died at his residence at Ealing on February 25. Capt. Hepworth was in his seventieth year, and had held his official position since 1899. He was a Younger Brother of Trinity House, and received his C.B. in 1902 at the coronation of King Edward VII. The Monthly Meteorological Charts of the North Atlantic and Mediterranean, as well as of the East Indian seas, were initiated during his tenure of office, and the later editions of "The Barometer Manual for the Use of Seamen" and the "Seaman's Handbook of Meteorology" were compiled under his direction, and attained a large circulation. Capt. Hepworth was much interested in marine biology and in the temperature and salinity of the sea. Prior to his association with the Meteorological Office he was in command of mail steamers trading to the Cape and Australia, and later of vessels engaged on the Canadian-Australian steam route. For many years while at sea he made a study of meteorology which prepared him for his official position.

SIR ANDREW FRASER, K.C.S.I., whose death has recently been announced, was the son of a missionary and one of the many Scottish Presbyterians who have been distinguished members of the Indian Civil Service, and began his work in India in 1871. He served with distinction in the Central Provinces, and in 1903 was appointed Lieutenant-Governor of Bengal. He was in some ways unsuited for this difficult office, because he was unacquainted with the Bengali character, and was not qualified to deal with the organised resistance against the partition of the Provinces. While his policy of attempting to conciliate the revolutionary party, as is usual in India, served only to encourage anarchism, he met with courage at least five attempts against his life. Sir Andrew Fraser was a typical official of the secretariat type, and beyond his official duties his interests were limited, as is shown by the account of his experiences in his book "Among Indian Rajahs and Ryots," which, while interesting as a record of his official life, is lacking in first-hand knowledge of the ethnology, religions, customs, and manners of the races of India.

It is reported from Ottawa that Mr. S. Storkerson, of the Canadian Arctic Expedition, with his party of five men, safely reached the Alaskan coast on November 19 last. When Mr. Stefansson was incapacitated by illness in December, 1917, and had to return to civilisation, his place was taken by Mr. Storkerson, who immediately made preparations for a journey from the coast of Alaska northward over the ice of the Beaufort Sea. He left Cross Island in about long. 146° W. on March 15, 1918, with a large party, including several Eskimo. When about two hundred miles north of the coast he sent back several of his men, and with the remainder continued his journey, expecting to be carried westward with the ice to the coast of Siberia. Practically no provisions were carried, the party relying on seal-meat and polar bears, as had been done in all the journeys of the Stefansson expedition. Contrary to expectations, based on the drift of the *Karluk* and other evidence, the ice did not move westward, but drifted around in a great eddy. The most northerly point reached was lat. 74° N., long. 152° W., in a part of the Arctic Ocean not previously explored. The problematical Keanan's

Land, which appeared in many maps in about lat. 74° N., long. 140° W., does not exist.

PROF. ANDREW MELVILLE PATERSON, who died after a brief illness on February 13 at the age of fifty-six, held a conspicuous place amongst modern British anatomists. Graduating in medicine at Edinburgh University in 1883, Prof. Paterson served his anatomical apprenticeship as a demonstrator in the dissecting-rooms of Edinburgh University under Sir Wm. Turner, and afterwards in Owens College, Manchester, under Prof. Morrison Watson. In 1888 he was invited to become the first occupant of the chair of human anatomy in University College, Dundee, and after labouring there for six years was elected to the Derby chair of anatomy in the University of Liverpool, a position which he occupied with distinction until his death. His intense public spirit led him to offer his services to the Medical Department of the War Office soon after the war commenced, and there is no doubt that his arduous duties as Assistant Inspector of Military Orthopædic Hospitals were accessory to his sudden and premature death. As an anatomist Prof. Paterson will be remembered for his contributions to our knowledge of the basal pattern in which nerves are distributed to the body, and particularly to the limbs, of vertebrate animals. That was the subject which first attracted his attention; his investigations led him on to an examination of the segmental character of the vertebrate body, particularly the variations which attend the segmentation of the sacral region. Most of his researches were published in the *Journal of Anatomy and Physiology*—now the *Journal of Anatomy*—but his monograph on "The Human Sacrum" appeared in the Transactions of the Royal Dublin Society (vol. v., 1893). In 1903, as a Hunterian professor at the Royal College of Surgeons of England, Prof. Paterson gave a series of lectures on "The Morphology of the Sternum," which was published in book form in the following year. In these lectures he maintained that the sternum must be regarded as a derivative, not of the ribs, but of the shoulder-girdle. He was also the author of several brochures on anatomy and embryology, as well as a contributor to standard text-books on human anatomy. Some of the essays which he printed for private circulation were pieces of real literature.

MR. E. H. STENNING, King William's College, Isle of Man, sends a description of a brilliant auroral display seen there on February 27. The luminous areas appeared at about 8.30 p.m., and increased in intensity until 10.10 p.m. They took the form of two large parallel arcs, extending across the northern sky. The brighter of the two bands, the inner, was so bright that no star appeared to shine through it. It was separated from the outer arc by a broad black band. The inner band seemed to be of fixed intensity, but the outer varied incessantly. In altitude the highest portion of the outer band was well above the central star of Cassiopeia, and the brightest portion of the band was about 4° below the lower stars of this constellation (10.10 p.m.). The luminosity of the outer band faded rapidly, beginning from the ends, and at 10.45 could not be seen. The inner band was still visible, though faintly, at 11.15.

INFLUENZA has again further increased in severity over the British Isles, and the Registrar-General's return for the week ending February 22 shows that the deaths in London and in the ninety-six great towns of England and Wales were more than double those of the preceding week. In London (county) the deaths from influenza were 653, which is greater

than in any week since that ending December 7, and the deaths in the ninety-six great towns were 3046. The deaths from influenza in London had risen from 13 per cent. of the deaths from all causes in the preceding week to 25 per cent. in the week ending February 22. The deaths are still highest at the ages from twenty to forty-five, being 44 per cent. of the total, and there is some increase in the percentage of deaths above sixty-five years. Out of 12,939 deaths in London from influenza during the last twenty weeks there have been 5987 deaths at the ages twenty to forty-five, which is 46 per cent. of the total deaths from the epidemic. At the ages up to five years there were 12 per cent. of the total deaths, at five to twenty years 16 per cent., at forty-five to sixty-five years 17 per cent., at sixty-five to seventy-five years 6 per cent., and above seventy-five years only 3 per cent.

MR. J. REID MOIR describes in the February issue of *Man* a remarkable piece of carved chalk recently found by the Hon. R. Gathorne-Hardy in his park at Great Glemham House, Saxmundham, Suffolk. The specimen, measuring $4\frac{1}{2}$ in. by $2\frac{3}{4}$ in. by $2\frac{3}{8}$ in., is of a dull white colour, and has sandy material embedded in the interstices. It is believed that it was brought to the surface by the action of rabbits, the burrows of which are very numerous at Great Glemham. Mr. Moir believes that, in its outline, the piece of chalk bears a very close resemblance to the outline of the mammoth (*E. primigenesis*), with which the scientific world has become familiar by an examination of carcasses of this animal found in the frozen ground of Siberia, and by drawings and outlines upon bone and other materials discovered in the Aurignacian and later Palæolithic deposits in France and elsewhere. The specimen certainly exhibits many remarkable points of resemblance to the mammoth, but the question remains whether these resemblances may not be accidental or the result of weathering. It may be advisable to await further examination by experts before we express a decided opinion upon this remarkable discovery.

We have received a copy of the first issue of the *Balkan Review*, which is to be published monthly by the Rolls House Publishing Co. at the price of 1s. 3d. The editor is Mr. Crawford Price. The review aspires to cultivate financial and commercial relations between Britain and the Balkans, and to act as an organ of liaison between the West and the East. Its scope covers social, political, historical, and geographical aspects of Balkan lands. "While supporting the existing entente between Greece, Serbia, and Rumania, we shall hold the door ever open for the admission of a regenerated and reformed Bulgaria." The first number contains several interesting articles, including one on the Jugo-Slavs and another on the group of islands known as the Dodecanese.

THOUGH for skeletonising purposes the use of the tryptic digestion process has long been known, the method does not appear to have been much used in England. Miss Kathleen F. Lander directs attention to its great value in the *Museums Journal* for February. She finds that half a gram of trypsin in a litre of water makes the best solution, and to this is added a pinch of sodium bicarbonate to ensure alkalinity. If allowed to digest at a temperature of 37° C., the preparation of a skeleton can generally be completed within twenty-four hours. The method is superior to maceration in warm water only in so far as rapidity of action is concerned, and it is certainly costly. Trypsin—sold by Messrs. Burroughs and Wellcome—costs 50s. per ounce, and the solu-

tion, when ready for use, is. per litre. Fortunately, however, it retains its digestive action for a fortnight before the ferment is destroyed by bacteria, but its action becomes slower and slower.

IN the *Gardeners' Chronicle* of February 8 Mr. W. B. Brierley, writing from the recently established Institution of Pathological Research, Rothamsted, discusses the question of the diseased areas on orchid-leaves known to horticulturists as "orchid spot." This, he points out, is not a single and specific disease, but a congeries of diseases, all little understood and urgently in need of detailed investigation. From the casual examination of diseased specimens during the past two or three years Mr. Brierley has recognised seven distinct types of disease. Of these it is highly probable that four are the result of the action of parasitic organisms, one of local chilling of the leaf-tissues, one probably of atmospheric poisoning, and one of some other physiological derangement of the protoplasm, due probably to unsuitable cultural conditions in the plant's physical environment. A continuous and intensive study of "orchid spot" would doubtless show that the seven diseases are but a few of the many covered by this name. At present all these diseases are lumped together as "orchid spot," and horticulturists endeavour to control a disease of physical causation by a fungicidal spray, or a fungal epidemic by regulating to a nicety the temperature of the water supply. There is needed a detailed investigation of this group of diseases, a critical experimental study of the physiological relations of the plants to their environment, an understanding of all the complex hygienic factors involved, and a thorough elucidation of the life-histories and biological relations of the pathogenic organisms which may be present. Only on such a foundation can a rational scheme of prophylactic and therapeutic treatment be based.

THE Monthly Meteorological Chart of the East Indian Seas for February, issued by the Meteorological Office, shows in great detail the various meteorological data. Winds are given in an extremely intelligible and useful form for navigators, and aircraft can use much which has been primarily prepared for the seaman. The wind-zones show for each 5° of latitude by 5° of longitude both frequency and strength. The limits of the trades and monsoons are shown on the face of the chart, and tracks of some cyclonic storms are given. Results for the several elements are obtained from records extending over a period of about sixty years. Ice information is given on the back of the chart, and navigators voyaging in high southern latitudes will find the information very helpful in avoiding a common source of danger. There is a desire on the part of the Meteorological Office for captains who are interested in meteorology to assist in the work by observing for the Office. Naturally, the organisation has been seriously interrupted by the war, so that the assistance of voluntary observers is now the more urgent. The series of charts for the several months shows in the clearest possible manner the change of monsoon over the area of the sea embraced.

OUR ASTRONOMICAL COLUMN.

THE ORDER OF THE PLANETS.—In the oldest cuneiform inscriptions the planets are given in the order Jupiter, Venus, Saturn, Mercury, Mars (*vide* "Encycl. Brit.," eleventh edition, vol. ii., p. 796, "Astrology"). Dr. Herbert Chatley writes from Shanghai to point out that if we calculate the total gravitational force between the sun and each planet (*viz.* product of

masses ÷ square of distance) we obtain results which in order of magnitude agree with the list above. With the latest values of the planetary masses the numbers are:—

Mercury, 0.24.	Mars, 0.05.
Venus, 1.58.	Jupiter, 11.76.
(Earth, 1.00.)	Saturn, 1.04.

This cannot be anything more than a coincidence, but it is sufficiently curious to justify mention. Dr. Chatley notes that if by chance the ancients had possessed the necessary knowledge, they would have grouped the planets, not by the simple attractions, but by their tide-raising power, which would have involved the inverse cubes of the distances.

CEPHEID VARIABLES.—The *Observatory* for February contains a letter by Mr. J. H. Jeans on the Cepheid problem. Mr. Jeans gives the following functional formula for the Cepheid light variation:—

$$a \cos nt + bf[n(t-\eta)],$$

where a , b , η are adjustable constants, and f is the same function for all stars. The spectral type follows the second term of the expression fairly closely, maximum value of f corresponding with early or B type, minimum value with late or K type.

The graph of the function f shows a steep rise followed by a much less steep and approximately exponential descent; its period is the same as that of the first term in the formula. This latter fact leads the author to the conjecture that the $a \cos nt$ term arises from the rotation of a single elongated body, and the bf term from an explosion which occurs in a particular orientation of the body, this explosion producing the change in spectral type. He shows that Mr. Phillips's Group I. of light-curves would be explained by one explosion per rotation, and Group II. by two explosions per rotation. There is, however, a difficulty in picturing a mechanism that could produce explosions in fixed orientations, for any external disturbing body would necessarily be changing its orientation.

VARIATION OF LATITUDE.—The observatories of Mizusawa, Carloforte, and Ukiah (all in N. lat. 39° 8') continued their series of latitude observations throughout 1917. The results are discussed by B. Wanach in *Ast. Nach.*, No. 4969. The minimum latitude in the meridian of Greenwich was $-0.14''$ at the end of March, the maximum $+0.16''$ early in November. The track of the pole is considerably more contracted than in the two preceding periods.

Issei Yamamoto contributes a paper on the "Kimura" or "z" term in the latitude variation (*Proc. Tokyo Math. Phys. Soc.*, second series, vol. ix., No. 17). He has made observations to test Prof. Shinjo's suggestion that the term arose from an annual term in the distribution of temperature in and above the observing-room, and consequent dissymmetry in the refraction.

He made a specially designed observing-room, with precautions to equalise the temperature of the air above it, and found that the "z" term was greatly reduced. His results thus tend to confirm Shinjo's suggestion:

The values of the variation of latitude that are adopted for the Greenwich reductions are deduced from the results obtained with the Cookson floating telescope. They are ready long before the publication of the results at the international stations, and it is found that they do not differ much from the latter.

THE HEALTH OF OUR CHILDREN.¹

ONE feels on reading the report referred to below that the nation possesses in Sir George Newman a general with a plan, who, having consolidated the gains of ten years' work, is pressing on to his objective: the prevention of disabling diseases and the winning for every child of his birthright of a happy and healthy childhood. Such is the impression gained by a careful study of this most interesting and comprehensive report.

In section iii. will be found the results of a typical medical inspection conducted by a most competent observer—Dr. C. J. Thomas, of the London County Council. Two sets of three hundred unselected elder children each, in typical London and country schools, were inspected, and the results are described and analysed. One reads with dismay that "after deduction of the blind, deaf, mentally and physically defective, and invalid children drafted to special schools or absent from school, there were of the children present at school 21 per cent. found to be suffering from one or more serious defects . . . 12 per cent. were ill-nourished; 19 per cent. were unclean in body; of the London children 40 per cent., and of the country children 65 per cent., had some carious teeth; 11 per cent. suffered from disease of nose or throat; 10 per cent. had 'very serious' defects of vision; 6 per cent. suffered from defective hearing and 6 per cent. from severe anæmia; and of middle ear disease, of organic heart disease, of skin disease, and of spinal curvature of 'worst grade' there were in each case 4 per cent. of sufferers."

We agree with Sir George Newman's comment on these grim facts:—"No one, I think, can consider these findings or read Dr. Thomas's account of the physical condition of these children about to leave school for industrial occupations without understanding, once and for all, the gravity of the situation."

It is with a sense of relief one finds that a good deal is being done by several education authorities to remedy the defects found. There are still, however, a good many C₃ authorities. Most hopeful of all, however, is the policy "broad and deep" which the Board of Education's Chief Medical Officer, since translated to the Local Government Board, has all along had in mind—the safeguarding of each and every child's health from babyhood up to and including school-life. This policy we find explained in his excellent exposition of those sections of the new Education Act which deal with the health of children and young persons.

"The Act," writes Sir George, "lays emphasis upon the broad fact that the purposes of the School Medical Service are not the detection of defects, the discovery of child-patients, and the treatment of such sick children, but the advancement of the health and physical development of the whole child population of school age."

The author of this report does not rest content with a recital of first principles. He points the way to their realisation. Thus we find much practical advice on the teaching of hygiene and mothercraft, on the control of juvenile employment, on open-air schools, on physical education, on play-centres, and on holiday camps. We note with pleasure his reference to the cheery brotherhood of Boy Scouts.

Everyone interested in education, and therefore in our children, should study this inspiring report. Certainly the personnel of the School Medical Service must realise that they have had as chief, not only an eminent expert, but also a man of large vision, a leader who really leads.

W. E. H.

¹ Annual Report for 1917 of the Chief Medical Officer of the Board of Education. (Cd. 9206.) (H.M. Stationery Office.) Price 1s. net.

FORTHCOMING BOOKS OF SCIENCE.

BIOLOGY.

Ginn and Co. (Boston, Mass., and London).—An Elementary Biology, Gruenberg; Manual to Elementary Biology, Gruenberg. *Oxford University Press.*—Mammalian Physiology: A Course of Practical Exercises, Prof. C. S. Sherrington. *John Wiley and Sons, Inc. (New York), and Chapman and Hall, Ltd.*—Economic Woods of the United States, Prof. S. J. Record; Forest Management, A. B. Recknagel and J. Bently, jun.; Bacteriology and Mycology of Foods, Dr. F. W. Tanner, illustrated.

CHEMISTRY.

Ginn and Co. (Boston, Mass., and London).—Notes on Qualitative Analysis, Test and McLaughlin. *John Wiley and Sons, Inc. (New York), and Chapman and Hall, Ltd.*—Commercial Oils, I. F. Lauchs; Manual of the Chemical Analysis of Rocks, Dr. H. S. Washington.

ENGINEERING.

Benn Bros., Ltd.—Electrical Measuring Instruments: Their Design, Construction, and Application, Dr. C. V. Drysdale and A. C. Jolley; Electric Traction on Railways, P. Dawson, illustrated; The Handling of Materials: A Manual on the Design, Construction, and Application of Cranes, Conveyors, Hoists, and Elevators, being the second edition of Electric Cranes and Hoists, H. H. Broughton, in four volumes, vol. i.; The "Electrician" Annual Tables of British and Foreign Electricity Undertakings; and new editions of Electric Mains and Distributing Systems, J. R. Dick and F. Fernie, and Electric Switch and Controlling Gear, Dr. C. C. Garrard. *Sir Isaac Pitman and Sons, Ltd.*—Electric Mining Machinery, S. F. Walker, containing chapters on prime-movers, signalling, telephony, shot-firing, etc.; Reinforced Concrete, W. N. Twelvetrees, dealing with the subject from the theoretical and practical points of view; Gas and Oil Engine Operation, J. O'Kill; Papers on the Design of Alternating-current Machinery, C. C. Hawkins, Dr. S. P. Smith, and S. Neville; Storage Battery Practice, R. Rankin; Electrical Engineers' Pocket-Book, edited by R. E. Neale, being a thoroughly revised edition of the volume originated and edited by K. Edgcombe. *John Wiley and Sons, Inc. (New York), and Chapman and Hall, Ltd.*—Waterproofing Engineering: For Engineers, Architects, Builders, Roofers, and Waterproofers, J. Ross; Geodesy and Geodetic Surveying, Prof. G. L. Hosmer; Principles of Transformer Design, Prof. A. Still; Oxy-Acetylene Welding Manual, Lieut. L. Campbell, jun.; Essentials of Alternating-current Electricity, W. H. Timbie and Prof. H. H. Higbie; Vital Statistics, Prof. G. C. Whipple; and new editions of Irrigation Engineering, Dr. A. P. Davis and H. M. Wilson; Compressed Air Plant: The Production, Transmission, and Use of Compressed Air, with special reference to Mine Service, Prof. R. Peele.

MATHEMATICAL AND PHYSICAL SCIENCES.

Ginn and Co. (Boston, Mass., and London).—Advanced Book of Arithmetic, Wentworth and Smith; General Mathematics, First Year, Schooling and Reeve; Projective Geometry, Wentworth, Smith, and Ling; Plane Analytic Geometry, Wentworth, Smith, and Siceloff; and a revised edition of Elements of Astronomy, Young. *John Wiley and Sons, Inc. (New York), and Chapman and Hall, Ltd.*—The Sunner Line, or Line of Position as an Aid to Navigation, Prof. G. C. Comstock.

TECHNOLOGY.

Sir Isaac Pitman and Sons, Ltd.—Petroleum, A. Lidgett; Salt, A. F. Calvert; Coal-Tar, A. R.

Warnes (Common Commodities and Industries Series).—John Wiley and Sons, Inc. (New York), and Chapman and Hall, Ltd.—Mechanical Drawing, J. S. Reid.

MISCELLANEOUS.

Oxford University Press.—The Bantu and the Semi-Bantu Languages: A Comparative Study, Sir Harry H. Johnston; Slavic Europe: A Selected Bibliography in the Western European Languages, R. J. Kerner; World Power and Revolution, E. Huntington; Some South Indian Villages, by a number of Indian Students, the first volume of Economic Studies, edited by Prof. G. Slater, illustrated.

METEOROLOGY DURING AND AFTER THE WAR.¹

European war - G. H. Brit

DURING the past four years and a half of hostilities meteorology has, like many other branches of knowledge, been utilised in naval and military operations to a far greater extent than ever before. Consequently, there are now a large number of officers in the Services who have had practical experience of the value of meteorological information when it has been prepared from sufficient data, and by men who have been thoroughly trained in the subject. It is, therefore, highly desirable that full advantage should be taken of the experience which has been gained during the war in order to meet, as adequately as possible, those demands which will be made upon meteorology in the general reconstruction which is now beginning.

In some ways the conditions which prevailed during hostilities were favourable to advances in the subject. Special facilities were given for the rapid transmission of reports; kite-balloons could furnish series of observations at various heights; aeroplanes were available to observe the temperature in successive layers of the atmosphere up to 12,000 ft. or 14,000 ft.; the velocity and direction of air-currents up to even 25,000 ft. were determined by the bursting of shells fired at high angles; pilot-balloons at perhaps a hundred stations were observed four or more times daily. In these and other ways a vast store of information has been amassed which has already been utilised, but remains available for much more detailed study in the immediate future; and not the least difficult problem will be to reduce the mass of information to a manageable and orderly arrangement.

There were in 1914 in this country the State Meteorological Service (the Meteorological Office) and a Naval Meteorological Service, which had been formed in 1913 to meet the needs of the Royal Naval Air Service. Besides these, a private institution, the British Rainfall Organisation, collected and discussed observations of the rainfall of the British Isles and studied all questions connected with rainfall; also two scientific societies—the Royal Meteorological Society and the Scottish Meteorological Society—specially devoted themselves to the advancement of meteorological science. It will be seen, therefore, that only the State service could provide a career for anyone desiring to take up meteorology as a profession, and as the staff of this service was comparatively small, it is scarcely surprising that the great majority of meteorologists were amateurs in the sense that they studied the subject from their interest in it, outside their ordinary occupations.

In the Meteorological Office the policy for some years had been to bring in men who had had a thorough scientific education at a university and to encourage them to devote it to the study of the many problems which meteorology had to offer. This was

¹ From a paper read before the Royal Society of Arts on January 22 by Col. H. G. Lyons, F.R.S., Acting Director of the Meteorological Office.

a great advance from the empirical treatment of the subject, and has been amply justified by the success obtained when this policy has been tested under the conditions of active service.

For the general public current meteorology was mainly represented by the daily forecasts and the weather summaries which appeared in the Press, and the cases in which these failed to describe accurately the weather in the reader's immediate locality usually impressed him more than their general accuracy as tersely worded descriptions of conditions which were likely to prevail over an extended area, such as south-eastern England, but those who had only been brought into contact with meteorology in this superficial way on the outbreak of hostilities soon found that the weather affected their preparations and their operations at every turn. It was scarcely to be expected in these circumstances that all Staff officers would at once realise what information trained meteorologists could provide, or to what extent their reports and warnings could be relied upon in practice.

In the course of the last two decades investigations have been extended from the surface of the earth into the air by means of kites and balloons, and our knowledge of the conditions prevailing up to ten, and even fifteen, miles above the earth's surface has thereby been steadily increased. Self-recording instruments continuously registering the pressure, temperature, and humidity have been carried up through the lower seven miles (11 kilometres), the troposphere—the region in which the temperature falls with increasing height—and far into the stratosphere above it, sometimes to heights of 12½ miles (20 kilometres) or more. In this way the remarkable fact of the differentiation of the atmosphere into the lower troposphere and the overlying stratosphere has been established, and further investigations indicate the great importance of these upper regions of the atmosphere in the solution of many problems relating to the weather.

With the gradual introduction of balloons and aircraft into the Army, and the subsequent formation of the Royal Flying Corps, meteorological establishments were formed at South Farnborough in 1910 and at Upavon in 1913, where the study of the upper air was carried on regularly. In this way, and with the material furnished by the meteorologists of other countries, a very large amount of information had been collected, and, to a large extent, discussed and utilised, before the outbreak of war, but this was, for the most part, known and appreciated only by those who were especially interested in the subject, and the bearing of the results obtained had not reached the wide circle of those who were later to become acquainted with them under the exacting conditions of active service.

On the outbreak of hostilities some lines of work had to be abandoned, and new lines taken up at once. Many of the staff of the State service joined the Army in those early days who would have been very profitably employed in the meteorological units which were formed later, or even in the Office itself, where the work became ever increasingly heavy, while the task of replacing those who went on service became constantly more difficult.

On the outbreak of war in August, 1914, meteorologists were at first considerably handicapped by the reduction of their supply of information. Wireless reports from ships ceased; weather telegrams from Germany and Austria were no longer available; and Central Europe became a blank on the working charts of the Meteorological Office. The censorship over all inward and outward telegrams disorganised the supply of meteorological information from Allied and neutral

countries for a while, but this was soon rectified, and daily weather reports could again be prepared, though lacking part of the Continental information. As time went on the need for more and more distant stations was felt, and by 1916 reports were being regularly received from Spitsbergen to the North African coast and Cairo, and from Iceland and the Azores to the Russian stations of Petrograd, Nicholaieff, Sebastopol, and Batum.

The supply of daily weather reports and forecasts to the public was stopped, but their preparation was continued actively in the Meteorological Office, where the telegraphic reports which were collected several times daily reached the number of about one hundred, and the information which they contained was compiled on working charts from which the forecasts were prepared. These were issued to the Admiralty, to various dockyards, to the Grand Fleet, various battle squadrons, submarine flotillas, etc., each of which required reports and forecasts adapted to their special needs. Similarly information was supplied to the Naval Meteorological Service for the Royal Naval Air Service, and to numerous units of the Royal Flying Corps, or the Royal Air Force as it afterwards became.

To provide information for aviators in the early morning or for use in preparing plans for the day's operations, it became necessary to take observations in the early hours of the morning, and 3 a.m. was the hour chosen at first, but this was not found to be early enough, and 1 a.m. was finally adopted, making the observing hours 1 a.m., 7 a.m., 1 p.m., and 6 p.m. Thus a continuous twenty-four-hour forecasting service was established, and has been maintained in operation up to the present time, to prepare forecasts and reports four times daily; and to telegraph the observations taken at selected stations to the Meteorological Section at the British General Headquarters in France, and to other stations that required them, as well as to the Meteorological Service of the French Army, and later to that of the American Expeditionary Force.

Under service conditions something simpler, plainer, and more direct in its presentation of the opinions of the trained meteorologist who prepared it than the ordinary daily weather report with its statistical data was needed. Those who had to make use of the daily weather reports were usually far too busy to wish to study the statistical material before accepting the meteorological opinions which were offered to them. They wanted a direct statement of expert opinion which they could make use of in preparing their own plans of action. The desire for such expert assistance was also shown by many requests that forecasts should be expressed in "perfectly simple and non-technical language." To this very reasonable request it is not so easy to accede as it may seem. Such expressions as "a depression advancing from the westward," "a secondary depression developing over the Channel," "an anticyclone spreading northward," are more than mere statements of fact; they convey to all who are acquainted with meteorology much additional information depending on the weather conditions described, which it would take several paragraphs to state simply and in non-technical language.

So far as meteorological conditions could be set out in plain language, this was done in these special daily weather reports, which were issued in the early morning, before noon, and in the afternoon to all who required them; and these were supplemented by special summaries, one of which dealt with the prevailing and the prospective weather conditions on all fronts where military operations were in progress, and another with the weather conditions in the various sea areas round Europe.

The whole of this information was of a highly confidential character, since Germany and Austria were

cut off from all weather reports from meteorological stations to the westward, except those of neutral countries, Norway and Spain.

We shall doubtless learn eventually to what extent the precautions taken sufficed to prevent information about the weather conditions over the British Isles and to the westward reaching the Central Empires, but at the time we had to depend mainly on negative evidence. It was not difficult to estimate from the working weather-chart what sort of forecast the enemy meteorologists would probably make on the assumption that the information from a wide area to the westward of them was not available, and this was done daily as part of the routine of the Meteorological Office. In the case of attacks by enemy aircraft it was fair to assume that his meteorological service considered the conditions to be reasonably favourable; and this was compared with the estimate of his opinion which had been formed here. Occasionally enemy forecasts were available, and these were compared in the same way. Negative evidence is not conclusive, but the impression that we gained was that little, if any, meteorological information of value was obtained from our area.

Many cases could be cited where operations were undertaken by the enemy which it seemed very unlikely that he would have undertaken had he possessed the information which we had here.

By the spring of 1915 two branches of the Army, the Royal Flying Corps and the Special Brigade, R.E. (Chemical Warfare), had decided that they required the co-operation of trained meteorologists who could explain the meaning and the limits of the forecast, answer questions or give advice, and arrange for fuller or more suitable information being furnished when required.

These demands for the provision of trained meteorologists in France led to the formation of a meteorological section as a unit of the Corps of Royal Engineers which had at first a strength of about four officers and twenty non-commissioned officers, but the establishment was repeatedly increased until, when hostilities ceased, it consisted of thirty-two officers and about two hundred other ranks, and provided sections for duty, not only in France, but also on the Italian and Macedonian fronts, besides a reserve section at home. From a small unit at General Headquarters in France the organisation developed until there was a meteorological unit with each army and one with the Independent Force, R.A.F., these units having their groups of observers and pilot-balloon stations reporting to them. The telegraphic weather reports from the stations in the British Isles, as well as those received from a large number of European stations, were at first thrice daily, and later four times daily, telegraphed from the Meteorological Office in London to the Meteorological Section at General Headquarters in France, in order that weather-maps might be drawn and forecasts prepared there as might be required. This information was supplemented by data which the Meteorological Section collected from its station on the British front, and also from other parts of France through the French Meteorological Services.

In this way on the Western front, and similarly at later dates on the Italian and Macedonian fronts, a network of meteorological stations was built up, which, with the addition of the data and reports furnished by the Meteorological Office, enabled the meteorological officers to supply the information which the different Services required for their special purposes, to issue forecasts and weather warnings, and also, as will be seen later, to increase very materially the accuracy of the work of some of the Services.

The task of providing the *personnel* for this military unit was no easy one, for, as has been already men-

tioned, the staff of the Meteorological Office was small, and outside it there were very few expert meteorologists who were available. At first three of the senior staff of the Meteorological Office received commissions for duty in France, and afterwards a number of men who had a thoroughly scientific education at a university joined the Meteorological Office for longer or shorter periods of training before being posted to the Meteorological Section, and in this way a high-grade scientific staff was formed and maintained. To a training which included especially mathematics and physics was added as much instruction and practice in advanced meteorology as could be given in the time available, and on the basis of such an education the meteorological aspect of the problems was quickly appreciated.

As time went on the scope and number of such reports and warnings steadily increased until there was a regular and continuous flow of information sent out from meteorological offices to various branches of the Service for them to utilise as best fitted the operations in hand. The Royal Air Force required forecasts of weather for short periods which it could use for its reconnoitring and bombing squadrons; for day operations reports of the wind direction and velocity obtained from pilot-balloon ascents and high-angle shell-bursts were communicated from different altitudes up to 20,000 ft.; for night operations information for lower levels sufficed, and the arrangements had to be modified. For high altitudes a central station could supply information adequately, but when data concerning lower levels became important, where the air turbulence set up by friction with the earth's surface became a material factor, the reports were more effectively supplied by local stations where the special conditions could be more effectively studied. For all this the most rapid means of transmission is essential; for the shorter the forecast period, and the more detailed the forecast in its information, the more rapidly must it be placed at the disposal of the aviator if it is not to mislead him. These reports were largely supplemented by telephone inquiries by those interested, and a precision was demanded which was often very difficult, and sometimes impossible, to attain. Success in answering these inquiries is reached by having as meteorological officers men who have an acquaintance with the physical condition of the region, and also possess such a scientific training that they instinctively proceed from cause to effect, and facts at once fall into their place in their minds. This is very different from the acquired skill of an empirical forecaster, who can never attain the same confidence in his opinion. The work of a meteorological officer who has to advise on the suitability of conditions for long flights, especially on active service, is very responsible, and throws a great strain on him, since he cannot but feel that on his advice great risks may be taken and grave danger encountered. In regions where high plateaux exist near the sea-coast, as in Macedonia, the cold-air currents which stream downwards, by reason of their greater density, to lower levels often attain full-gale velocity, blowing in violent gusts, and constitute an element of serious danger to aviators. The conditions which favour such a phenomenon are known and recognisable, but it may be very difficult to say precisely whether or not the descent of cold air will take this violent form.

In chemical warfare a different set of problems was encountered. Here we are concerned with the movement of air-currents close to the surface of the ground, affected by all its irregularities, diverted this way and that by obstacles, and generally in that state of irregular motion known as turbulence in which eddies form, break up, and re-form, greatly com-

plicating the conditions. At night, too, when the surface wind may die down to a calm and the ground cools under a clear sky, the colder and heavier air streams down from higher ridges into valleys and low ground. Consequently the direction and velocity of air-currents along the front had constantly to be observed and studied in relation to the relief and conditions of each section; so long as the wind was favourable for enemy operations, or even likely to shift into a favourable quarter, observations, reports, and warnings were unceasingly needed.

But, besides the aviators, there are other branches which are vitally interested in the conditions which prevail in the upper air. Projectiles leave the firing-point and traverse a considerable thickness of the atmosphere during their flight, reaching an altitude of about 10,000 ft. for a fifty-second trajectory. In its passage through the air a projectile traverses strata of different temperatures, and consequently of various densities, so that a correction has to be applied to the range-tables. On a winter day, when the temperature at the surface is 3° F., the temperature at 3000 ft., 6000 ft., and 9000 ft. may be 15° F., 16° F., and 12° F. respectively, so that any correction based on the temperature near the ground would be wrong. Also the wind varies considerably, and often irregularly, both in velocity and direction as the ground is left, so that a correction based on mean conditions here will probably be widely different from that which should be used on any particular occasion.

These considerations led to a much wider application of meteorological information to the practical correction of gunnery than had hitherto been employed, and reports of upper-air temperature and of the velocity and direction of the wind at various altitudes were regularly prepared and transmitted from meteorological stations along the various fronts. This increased application of meteorology to ballistics raises many problems of interest and importance, which demand for their solution the co-operation of scientific gunnery and meteorological science of the highest order.

To mention another field, the sound-waves which are recorded in sound-ranging, that wonderful adaptation of the physical instruments of the laboratory to practical use on the field of battle, traverse the lower layers of the atmosphere, and as higher and higher accuracy was aimed at, it became clear that meteorological observation must be made concurrently, and utilised in order to attain the desired precision.

Frequent mention was made during the war of the meteorological efficiency of the enemy's organisation and of the very favourable conditions which he experienced during many of his operations; his superiority in these directions was not infrequently assumed. It is not possible to compare the effectiveness and success of the rival organisations until much more information is available and, in the discussion and investigation of past operations, the various contributing factors have been sorted out and duly weighed. No doubt Germany started with a much larger number of men who had received a scientific training in the subject, for professors of meteorology existed at several universities; the appreciation of the subject and its practical value, too, may have been more general among that nation; but, as a personal opinion, I do not believe that it attained a higher standard than our own. Many apparently did not realise that the occurrence of bad weather during operations did not necessarily mean that the commander and his staff had no information regarding the impending weather changes; but weather is only one of many factors which have to be taken into consideration, and it must often be

that operations planned and prepared must be carried out whatever the weather may be, though a good forecast may at the last moment enable him to judge whether nearer or more distant objectives are likely to be attained.

Free discussions and conjectures on the subject of the enemy's advantages and the necessity for maintaining a strict silence regarding the details of our organisation naturally led many to doubt whether adequate steps had been taken to utilise meteorology to the full. Many offered their services as forecasters of experience, or as having methods which they considered could give highly trustworthy results, but they did not realise that much more was needed than a brief description of general weather conditions. They did not know that a large and somewhat intricate organisation had been found necessary, in which each man played his appointed part, and from the combined results of whose labours the required information was evolved.

There are now four State meteorological services in operation—the Meteorological Office, the Admiralty Meteorological Service, the Meteorological Section, R.E., for the Army, and the Meteorological Service, R.A.F., of the Air Ministry—and the relations and the means for co-operation between these four services will have to be worked out, and a number of considerations taken into account.

So far as the study of the weather and the issue of forecasts is concerned, short-period meteorology, as it may be called—rapidity of transmission of the observations to the Central Office, where they are discussed and compared, and of the forecasts, warnings, etc., which are sent from it—is the first essential, and the needs of aviation have only accentuated this. Observations should be in the Central Office for the forecaster's use not later than one hour after they are taken if he is to get out his reports and warnings early enough to be of effective use to aviators. This will mean a considerable acceleration in the collection and transmission of reports from some parts, for a country's own reports are not enough; those from selected stations in the surrounding countries are needed in order to form a correct view of the changes that are taking place. Wireless telegraphy will assist in meeting such requirements, and each country will soon, it is hoped, send out the meteorological observations taken at some ten to fifteen of its selected stations four times daily at fixed hours. French observations are already being sent out thrice daily from the Eiffel Tower in this manner, but some organisation will be necessary to bring this into operation as a general practice. With foreign reports collected in this way, and special priority for the necessary number of inland reports, forecasts could be got out more quickly, and, consequently, be of far greater utility.

Only a small proportion of the observations which are taken can ever be printed and published, so all working meteorologists must often refer to the voluminous collection of manuscript data which every meteorological service accumulates. Where research into the problems of the atmosphere is to be actively carried on there must be free access to such a collection, as well as to a well-stocked library on the subject.

All these considerations indicate the desirability of a close contact and co-operation between all the meteorological services in a country, so that the whole material may be available to each, that the scientific staff of each may be able to discuss the points which may arise, and that information may be quickly and easily distributed.

Aviation, with its prospect of long-distance communication, has rendered necessary a readjustment

of meteorological relations within the Empire. Canada, South Africa, Australia, New Zealand, India, and Egypt and the Sudan have all their well-equipped meteorological services, which include networks of stations so selected as to represent most suitably the different meteorological conditions prevailing in those regions. In each there is a scientific staff studying the problems that arise or affect the economic life of the country. Except as students of the same science, the interests of each service have been somewhat diverse from the nature of the requirements which each had to meet, but in future we must organise the provision of all information that aviation may require; and since aviators are going to pass from continent to continent and from one country to another, uniformity of some kind must be attained in respect of the assistance that meteorology is to give.

From the organisation necessary for Imperial co-operation to that of international co-operation is but a step, and the same requirements have to be considered; but some additional complications, such as variety of units, have to be reckoned with. But these have been successfully dealt with in the past; and as for many years the international work of meteorological services has paved the way for steady advance in our science, we may look with confidence to even greater progress in the future. The problems that press for early investigation are too numerous to recite, but a few may be mentioned.

The relation of meteorology to gunnery must be continued and the study of the many problems involved carried on by competent men.

The air routes of aerial transport will have to be studied and all the information now available must be sorted out, investigated, and discussed in order that it may be put in the form most suitable for use by airmen. This will demand much additional observing at many places besides the discussion of existing material, but unless this is done as part of a concerted scheme much unnecessary expense will be incurred, and the results will fall far short of what they should be, since all the data must eventually be worked up in connection with that from other places, and if all are not of the same scientific standard they cease to be comparable, and must often be rejected in discussion.

Many of the stations in the Crown Colonies can afford most valuable information in this connection if expert meteorologists are available to carry out the work. An observant traveller in Dahomey has remarked upon the presence of a steady north-easterly current at about 6000 ft. to 7000 ft. over the lower currents of the south-western monsoon of West Africa, and such information, if substantiated and extended, may be of material importance in this region.

While overland observations are numerous, and have been extended by means of *ballons-sondes*, aeroplanes, etc., to very great heights, our knowledge of the atmosphere over the sea is much less complete. By means of ships equipped for the purpose, such observations can be, and have been, made in certain parts, but this line of investigation must be extended if our knowledge is to be adequate.

Besides these more evident needs of aviation there are many problems of great practical importance which merit a closer and more thorough investigation than they have yet received. Among these may be suggested those violent disturbances known as hurricanes and typhoons. Recent theoretical investigations have thrown much light on their nature, and a further study of the evidence which exists should greatly add to our knowledge of them.

Variation of rainfall is always a matter of import-

ance, and in countries where it is barely adequate for agriculture any diminution of it is a serious matter, and such cases call for careful investigation.

The war has given a great impulse to meteorology by showing its possibilities to all, and aviation has made, and is still making, more and more demands upon it for information of every kind. Co-ordination between the services of each country and effective co-operation between the meteorologists in all parts of the Empire are the first essentials for meeting quickly and adequately the demands which will be made.

The "Manual of Meteorology" which Sir Napier Shaw has in hand will be of the greatest value in the work before us, for it will place in the hands of every meteorologist and student of meteorology a masterly treatise on those aspects of our science which he has studied for years, and of which he is the acknowledged exponent.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—At the annual meeting of the Court of Governors of the University, held on February 27, the Principal, Sir Oliver Lodge, announced his intention of resigning his post at the end of the present session. He said that, having passed the age-limit of the professorial staff, he wished to make way for a younger and more ambitious man, who would begin his duties with the period of reconstruction. He himself intended to devote the remainder of his life to the study of the æther of space in both its physical and psychical aspects. In seconding a resolution of deep regret, proposed by the Vice-Chancellor, Sir Richard Threlfall spoke in warmly appreciative terms of Sir Oliver Lodge's scientific work, especially in electrolysis, in the electrical deposition of smoke, and in wireless telegraphy, which had been of very great benefit to industry and to the world at large.

Sir Oliver Lodge, who took office nineteen years ago as first Principal of the University, has rendered invaluable service both to the University and to the city, and the close connection between the two which now exists is perhaps the best tribute to his work as head of the former. When the University first came into existence, as the result of the efforts of a very small but far-sighted body of men, it is not too much to say that the great majority of the citizens regarded it as a very unnecessary and entirely useless institution, which for some obscure reason Mr. Joseph Chamberlain considered a subject of vital importance to the city. To-day, however, this attitude has changed, and the University has become an integral part of the civic life of the city. This change, the magnitude and significance of which can be fully appreciated only by those who have witnessed it, is due in a very large measure to the personality and activity of Sir Oliver Lodge. He has not only convinced the public of the material advantage to be derived from having in its midst a centre of scientific teaching and research, but has also unceasingly insisted on the value of the humane studies to the life of the community. He has, in fact, taken a large and honourable share in laying well and truly the foundations of higher education in Birmingham.

CAMBRIDGE.—Dr. J. B. Hurry has offered to increase the value of the Michael Foster research studentship in physiology, founded by him in 1912, and tenable biennially, from a hundred guineas to 200l. A gift of three successive sums of 100l. to be paid at intervals of six months, has been offered for the assistance of research in the zoological laboratory by a benefactor who desires to remain anonymous.

Mr. W. M. Smart, of Trinity College, has been appointed chief assistant at the observatory.

The professorship of mechanism and applied mechanics, which was held by the late Prof. Bernard Hopkinson, has been formally declared vacant, and candidates are requested to communicate with the Vice-Chancellor on or before Monday, March 17.

LONDON.—The tenth annual report of the Military Education Committee of the University (for the year 1918), which has been presented to the Senate, refers with gratification to the letter from the King in which his Majesty sent an assurance of the interest with which he had learnt that the University of London Officers Training Corps continued "to uphold the record of splendid services which it has rendered in the past." The number of commissions granted to cadets and ex-cadets of the University of London O.T.C., and to other graduates and students recommended by the committee, increased during the year from 4040 to 4413. First commissions in the Army, Navy, or Air Force have been granted to 4101 former cadets. Of these officers 584 have fallen in the war. The number of distinctions gained by former cadets up to the end of 1918 is 1175, including V.C., 4; D.S.O., 39 (including three with a bar); Military Cross, 442 (including three with two bars and twenty-nine with one bar); Croix de Guerre, 21; Médaille Militaire, 1; mentioned in despatches, 480 (mentioned four times, 3; thrice, 16; twice, 56). A roll of war service for the University of London O.T.C. is being prepared, and will be published as soon as possible.

A sum of about 5133l. has been accepted by the Senate on the bequest of the late Dr. William Julius Mickle for the establishment, in honour of his great-grandfather, William Julius Mickle, the poet, of an annual fellowship to be awarded to graduates of the University resident in London who have specially distinguished themselves in the advancement of medical art or science.

OXFORD.—On March 4 the preamble of a statute making Greek optional in Responsions passed Congregation by 123 votes to 63. The statute was introduced by Mr. E. Barker, of New College, supported by the Regius professor of Greek, and opposed by the Regius professor of divinity and Mr. E. M. Walker, of Queen's. If the statute passes Convocation in its present form, natural science will be brought into Responsions for the first time, either this subject or mathematics, or a combination of the two, being made compulsory.

UNDER section 28 of the Education Act, 1918, which the Board of Education has now announced will come into operation on April 1, the persons responsible for the conduct of schools and educational institutions in England and Wales are, subject to certain exceptions, required to send to the Board of Education, Victoria and Albert Museum, South Kensington, S.W.7, before July 1, the name and address and a short description of the school or institution. The information is not required from the following schools and educational institutions:—(1) Schools and educational institutions in receipt of grants from the Board of Education or the Board of Agriculture. (2) Elementary schools certified by the Board of Education as efficient. (3) Secondary schools recognised as efficient under the Board's regulations. (4) Universities and university colleges. (5) Poor Law schools and schools certified under Part IV. of the Children Act, 1908. (6) Educational establishments under the administration of the Army Council or of the Admiralty. The responsibility for giving the

required information attaches to the secretary or person performing the duties of secretary to the governing body, or, if there is no governing body, the headmaster or person responsible for the management of the school or institution. Notice will be given in due course as to any further particulars which may be required under regulations made by the Board of Education. The Act lays it down that if such responsible person fails to furnish the information required, he will be liable to certain specified penalties. The particulars now demanded are necessary so that the Board of Education may have available the full facts as to the provisions for education in England and Wales, and of the use which is being made of them.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 20.—Sir J. J. Thomson, president, in the chair.—S. S. Zilva and E. M. Wells: Dental changes in the teeth of the guinea-pig produced by a scorbutic diet. The structure of the teeth of guinea-pigs subsisting on a scorbutic diet undergoes radical changes. The ultimate change is characterised by the total disorganisation of the pulp, including the odontoblastic cells. The earliest modification is observed at a period when no other systemic abnormality can be recorded with certainty, and is characterised by the alterations in the odontoblastic cells and by the dilatation of the blood-vessels of the pulp. Monkeys' teeth are also affected when these animals exist on a scorbutic diet. The bearing of the above results on human subjects is discussed.—W. E. Bullock and W. Cramer: A new factor in the mechanism of bacterial infection. The bacteria of gas-gangrene (*B. welchii*, *Vibrio septique*, and *B. oedematiens*) and of tetanus, when completely freed from their toxins, either by washing or by heating to 80° for half an hour so that spores are formed, do not produce the specific disease when injected into a mouse or a guinea-pig. The normal animal disposes of the bacteria mainly by lysis, and partly also by phagocytosis, and this defensive mechanism is so efficient as to render these bacteria non-pathogenic when injected by themselves. If a small dose of a soluble, ionisable calcium salt is injected together with the bacteria of their spores, the specific disease is elicited in a very virulent form. The chlorides of sodium, potassium, ammonium, strontium, and magnesium, when injected together with *B. welchii*, are not capable of producing gas-gangrene. From these experiments and other experimental evidence the conclusion is drawn that calcium salts, when injected subcutaneously, produce a local change in the tissues at the site of injection. The effect of this dosage is to bring about a local breaking down of the defensive mechanism against the bacteria of gas-gangrene and tetanus. The term "kataphylaxis" is proposed to designate this new phenomenon. Sterile watery extracts of earth are capable of producing this phenomenon.—Major W. J. Tulloch: The distribution of the serological types of *B. tetani* in wounds of men who received prophylactic inoculation, and a study of the mechanism of infection in, and immunity from, tetanus. In a previous communication to the Royal Society it was shown that *B. tetani* was susceptible of classification into a number of groups differing one from another in their serological reactions. As this finding might have an important bearing on the preparation of anti-toxin, as many strains of *B. tetani* as possible were investigated by the agglutination method: (i) from cases of the disease; (ii) from wounds of men showing no evidence of tetanus. The

results obtained show that Type I. bacilli are but relatively infrequently obtained from wounds of inoculated men suffering from tetanus. Thus 19 out of 25 (76 per cent.) strains obtained from the wounds of men who showed no evidence of tetanus proved to be Type I. bacilli, while 41 per cent. of the strains obtained from men suffering from the disease proved to be of this type. This observation suggested that there was possibly a mono-typical immunity to each serological type, for the serum used for prophylaxis was prepared mainly from the products of Type I. bacilli. Experiments show that mono-typical anti-toxin neutralises the toxins of all the types. The precise quality, as well as the degree, of tissue debility produced by injury is of importance in initiating the process of infection in tetanus.

Zoological Society, February 18.—Dr. A. Smith Woodward, vice-president, in the chair.—R. I. Pocock: External characters of existing Chevrotains (*Tragulina*). The Indian species, commonly cited as *Tragulus meminna*, differs in so many important characters from the Malaysian species that it is necessary to sever it from them as a distinct genus, for which the name *Maschiola*, used by Thomas in a sub-generic sense, is available. In the absence of the interramal scent-gland, in the structure of the penis, and in the retention of shots on the pelage, *Maschiola* is a more primitive type than *Tragulus*, and resembles the still more primitive West African genus *Hymoschus*.—K. M. Smith: A comparative study of certain sense-organs in the antennæ and palpi of Diptera.

Institution of Mining and Metallurgy, February 20.—Mr. Hugh F. Marriott, president, in the chair.—S. J. Truscott: Slime treatment on Cornish frames: supplement. This paper, which is one of a series published by request of the Tin and Tungsten Research Committee, relates to a number of experiments conducted with the view of determining the comparative values of fluted and plane surfaces, the most suitable length of bed, and other details connected with the improved recovery of tin in Cornish mills. A number of tests are recorded, made under varying conditions, and the results are embodied in a *résumé* which, after noting the factors governing frame-working, which are thereby established, further deals with conclusions in respect to policy, with particular regard to rapid enrichment and complete fine grinding. The paper is illustrated by flow sheets explaining the practice on various Cornish properties.—E. Edser: The comparison of concentration results, with special reference to the Cornish method of concentrating cassiterite. This paper embodies an attempt to determine the relation between the enrichment attained by repetition of the concentration process, and the cassiterite that is lost. It is first assumed that the assay of any small increment washed off the surface used for concentration is proportional to the assay of the material on the surface, and it is shown that the assumption is correct, the amount of cassiterite lost during a complete washing being inversely proportional to the n^{th} power of the enrichment effected. The value of n thus indicates the economy of the process; the smaller the value of n the more economical will be the process. Experimental data are shown to support the conclusions reached, but additional investigations are called for.—G. F. J. Preumont: Wolfram mining in Bolivia. In view of the fact that wolfram is a product of outstanding importance, and that Bolivia is now yielding quite a considerable proportion of the world output, this paper should be of timely interest. A collection of statistics showing the production and distribution of wolfram in Bolivia

is followed by detailed descriptions of the principal mines and deposits, and particulars of the costs, system of working, conditions of labour, and mining laws.—**C. W. Gudgeon**: The Giblin tin lode of Tasmania. This is a deposit which has so far not been the subject of any published description. Like many another property which has since made good, this lode experienced a chequered career before reaching its present position. The author considers this to be a good example of persistence of ore in depth.

MANCHESTER.

Literary and Philosophical Society, February 18.—**Mr. W. Thomson**, president, in the chair.—**Dr. H. Wilde**: The mutual relations of natural science and natural religion.—**J. Wilfrid Jackson**: (1) "Shell-pockets" on sand dunes on the Wirral coast, Cheshire. The paper consisted of a short account of "shell-pockets" in general, and contained remarks on the age of the buried land surfaces in the neighbourhood. (2) A new Middle Carboniferous Nautiloid (*Coelonautilus trapezoidalis*). The species is founded upon two specimens: one from the Lower Coal Measures near Colne, erroneously figured by Wild in 1802 as *Nautilus subsulcatus*, the other from the Pendleside series, Pule Hill, Marsden. The species differs from *C. subsulcatus* in several important details, but presents some affinity with *C. quadratus*.

EDINBURGH.

Royal Society, January 20.—**Dr. John Horne**, president, in the chair.—**Prof. Harvey-Gibson** and **Miss Elsie Horsman**: Contributions towards a knowledge of the anatomy of the lower Dicotyledons. II.: The anatomy of the stem of the Berberidaceæ.—Also **Miss Christine E. Quinlan**: Contributions towards a knowledge of the anatomy of the lower Dicotyledons. III.: The anatomy of the stem of the Calycanthaceæ. These two papers are parts of a general investigation into the affinities of the lower Dicotyledons and the Monocotyledons, and contain a number of anatomical facts regarding the stem which support the view that the Dicotyledons are the primitive forms, from which the Monocotyledons have been derived.—**Miss Maud D. Haviland**: The life-history and bionomics of *Myzus ribis*, Linn. (red-currant Aphis). Among the many facts established it was shown that there are two forms of this species which differ in the minute structure of the antennæ and in the dimensions of the abdomen and wings, and are apparently correlated with the nature of the food. The species is migratory, and in summer colonises certain species of labiate and other weeds, but this change of host-plant is not obligatory, and the entire life-cycle may be passed on the red currant. There is a decline in fertility in the later summer, caused probably by lower birth-rate. This may be considered as one of the factors accounting for the frequent disappearance of the species in August and September.—**Dr. C. G. Knott**: Further note on earthquake waves and the interior of the earth. There was evidence that as the compressional and distortional seismic waves penetrated to greater depths, the distortional wave reached its maximum velocity at a less depth than the compressional wave. In other words, the rigidity showed signs of falling off in value, while the incompressibility continued to increase. The hypothesis that the earth consisted of a nucleus of non-rigid, highly compressed material encompassed by a shell possessing the properties of an elastic solid was found to fit well in with the facts, the radius of the nucleus being assumed to be four-tenths of the radius of the earth. These conclusions were based on the accurate determinations of

the velocities of the seismic waves at various depths, and are in fair agreement with the views formerly advanced by **Mr. R. D. Oldham**.

February 3.—**Dr. John Horne**, president, in the chair.—**Dr. J. M'L. Thompson**: The stelar anatomy of *Platyzoma microphyllum*, R. Br. The conductive system of the stem of the Australian fern *Platyzoma* lies between the two extreme types of conductive systems in modern ferns. These are known as the protosteles, with a solid cylinder, and the solenostele, characterised by a pithed tubular cylinder with both outer and inner pith and with gaps in its wall. In the *Platyzoma* there is the pithed cylinder, but no gaps and no inner pith. In the majority of specimens examined the conductive system was an unbroken and unperforated pithed cylinder, but in the smallest, and apparently youngest, specimen the conductive system was locally a protostele which was directly transformed as the stem was followed forward into the pithed cylinder without gaps in the wall and without inner pith. The facts were in favour of the view that the stele of *Platyzoma* is the result of upgrade development directly from within an original protostele.—**Capt. E. W. Shann**: The comparative anatomy of the shoulder-girdle and pectoral fin of fishes. The observations extend over a wide series of fish types, such as *Rhina*, *Callorhynchus*, *Accipenser*, *Polypterus*, and *Zeus*. A new nomenclature was introduced based on the divisions of the great lateral muscles which are found to be constant for any particular group of fishes. The primitive nature of the muscle system in Selachians is emphasised. Among the Holocephali certain characters foreshadow the condition which obtains in the higher vertebrates.—**Sir Thos. Muir**: Note on the determinant of the primary minors of a special set of $(n-1)$ -by- n arrays.

PARIS.

Academy of Sciences, February 17.—**M. Léon Guignard** in the chair.—**A. Rateau**: The flow of gas at very high pressures. The classical formulæ are based on the gas law $pV=RT$, and these become inexact when p is high, several hundred atmospheres. Formulæ based on the characteristic equation $p(v-a)=RT$ are developed.—**J. Drach**: The integration by quadrature of the equation $d^2y/dx^2=\phi(x)+h/y$.—**J. Cabannes**: The diffusion of light by the molecules of the air. The proportionality predicted by the theory of Lord Rayleigh, between the luminous intensity diffused laterally by a transparent gas and the number of molecules in the illuminated volume, has been exactly verified by a method of photographic photometry devised by **MM. Fabry and Buisson**. Since certain ultra-violet radiations cause some complications, it is advisable, in the experimental verification, to suppress radiation with a wave-length below 0.3μ .—**P. Braesco**: Precipitated amorphous silica. From experiments on the coefficient of expansion it is concluded that precipitated silica, dehydrated and heated to 600°C ., is really amorphous silica, but if calcined at temperatures above 1000°C . it becomes crystalline in the form of cristobalite.—**M. Portevin**: The influence of various factors on the critical speed of tempering in carbon steels.—**P. Nicolardot** and **A. Reglade**: The estimation of zirconium. In a solution containing 20 per cent. of sulphuric acid zirconium can be quantitatively separated from iron, aluminium, and chromium by ammonium phosphate.—**G. Delépine**: The carboniferous limestone in the Lille district.—**A. Vacher**: An old direction of the Rance valley.—**G. Reboul** and **L. Dunoyer**: A rule for predicting barometric variations and its coefficient of certainty.—**E. Mathias**: Sketch of a theory of rain. The influence

of altitude.—**M. Molliard**: The production of citric acid by *Sterigmatocystis nigra*.—**E. Fauré-Frémiet** and **F. Viès**: Are the laws of cicatrization of wounds reducible to the general laws of growth of organisms?—**A. Lécaillon**: The reproduction and development of accidental bivoltins and of the first generation derived from them in the silkworm.

SYDNEY.

Linnean Society of New South Wales, October 30, 1918.—**Prof. H. G. Chapman**, president, in the chair.—**Dr. R. J. Tillyard**: The Panorpid complex. Part ii.: The wing-trichiation and its relationship to the general scheme of venation. The hairs found upon the wings of all Holometabolous orders are classed as (1) *microtrichia*, minute hairs developed in connection with every unspiculated hypoderm cell of the wing, and (2) *macrotrichia*, larger hairs of the nature of sensillæ, only developed from special trichogen cells of large size. The arrangement of these hairs is called the wing-trichiation. The venational scheme is shown to consist of (1) *main veins* and their branches, which are preceded by tracheæ in the pupal wing; (2) true *cross-veins*, not preceded by tracheæ; and (3) the *archedictyon*, or original Palæodictyopterous meshwork formed of irregular venules, and only found complete in fossils. The Triassic fossil Archipanorpa possesses all these elements, but the archedictyon is aphantoneuric, or in process of becoming absorbed into the wing-membrane. With this fossil as a basis, the trichiation of the wings of all the orders of the complex is studied. It is shown that the most archaic forms all agree in having microtrichia all over the wing, but macrotrichia only upon the main veins and upon the membrane (the latter were originally carried upon the archedictyon, but became seated on the membrane when the meshwork disappeared), and not upon the true cross-veins. The various lines of evolution are followed out, showing a tendency in some orders to suppression of both kinds of hairs, and in others to the specialisation of the macrotrichia as scales, as in the Lepidoptera. Conclusions are drawn as to the probable phylogenies of the Orders.—**Dr. H. S. H. Wardlaw**: The relation between the fat-content and the electrical conductivity of milk. Removal of fat from milk increases the electrical conductivity. In a given sample of milk the increase of conductivity is directly proportional to the volume of fat removed. The increase of conductivity due to the removal of a given amount of fat is not the same, however, in different samples of milk. The average increase of conductivity due to the removal of 1 per cent. by volume of fat is 1.5 per cent.—**J. L. Froggatt**: A study of the external breathing apparatus of the larvæ of some Muscoid flies. It is shown that the maggots of blowflies of five species pestilent to sheep can be identified by the characters of the anterior and posterior spiracles, especially of the latter.—**W. W. Froggatt**: Notes on Australian sawflies (Fenthredinidæ). Particulars about four species are given, including a record of the death of cattle in Queensland from the abnormal habit of eating the larvæ of *Pterygophorus analis*.—**R. H. Cambage**: Notes on the native flora of New South Wales. Part x.: The Federal capital territory.

WASHINGTON, D.C.

National Academy of Sciences, December, 1918 (Proceedings, vol. iv., No. 12).—**W. S. Adams**: The absorption spectrum of the novæ. A discussion of Nova Aurigæ of 1892, Nova Persei of 1901, Nova Geminorum of 1912, and Nova Aquilæ of 1918. The displacements of the lines in all these stars

are directly proportional to wave-lengths, and divide themselves into two pairs of equal amount. Of these the first pair of stars has exactly twice the displacement of the second. In the case of Nova Aquilæ there is a progressive increase in the values of the displacements of the absorption lines at successive dates. Various hypothetical explanations are discussed.—**D. N. Lehmer**: Jacobi's extension of the continued fraction algorithm. A closer study of Jacobi's expansion reveals a number of remarkable points. Six theorems are stated.—**R. L. Moore**: A characterisation of Jordan regions by properties having no reference to their boundaries. The theorem is proved. In order that a simply connected, limited, two-dimensional domain R should have a simple closed curve as its boundary, it is necessary and sufficient that R should be uniformly connected *im kleinen*.—**J. A. Harris** and **F. G. Benedict**: A biometric study of human basal metabolism. An analysis of measurements on 136 men, 103 women, and 94 new-born infants.—**A. M. Banta**: Sex and sex intergrades in Cladocera. The presentation of facts in regard to Cladocera, with the discussion of their significance with regard to sex intergrades in general, leading to the tentative conclusion that sex is always relative; and that while most individuals of whatever species are prevailing male or prevailing female, every individual may have something of the other sex intermingled with its prevailing sexual characters.—**W. J. Crozier**: The method of progression in Polyclads. In Turbellarians generally muscular operations analogous to those executed by the foot of Chitons and of Gastropods are essentially concerned in creeping locomotion.—**R. Ruedemann**: The phylogeny of the acorn barnacles. The derivation of an Eobalanus from a Rhinocaris-like Phyllopod is illustrated in a set of diagrams.—**J. M. Clarke**: Possible derivation of the Lepadid barnacles from the Phyllopods. So far as present knowledge extends, the metamorphoses of the Phyllopods into the two great branches of the barnacles were essentially contemporaneous.—**T. W. Richards** and **W. C. Schumb**: Refractive index and solubilities of the nitrates of lead isotopes. The difference in atomic weight of the lead (207.20 and 206.41) has no appreciable effect on the refractive index or on the molar solubility of the different samples of lead nitrate.—**T. W. Richards**, **W. M. Craig**, and **J. Sameshima**: The purification by sublimation and the analysis of gallium chloride. The method rests on the fact that gallium trichloride sublimes and distils at a low temperature, whereas the other chlorides likely to be associated with it are much less volatile.—**T. W. Richards** and **S. Boyer**: The purification of gallium by electrolysis, and the compressibility and density of gallium. The method of separating gallium from indium by means of the different solubilities of the hydroxides in caustic alkali was tested without success; much more promising results were obtained by the electrolytic method. The compressibility of solid gallium was found to be 2.09×10^{-6} , and of liquid gallium 3.97×10^{-6} , nearly twice as great, although its volume is less. The density of the liquid was 6.081, and of the solid 5.885.—**A. G. Mayor**: The growth-rate of Samoan coral reefs. The growth-rate of Acropora, Porites, Pocillopora, Pavona, and Psammocora are given, and the weight of limestone added per year to the upper surface of the Aua reef-flat is estimated as 805,000 lb. Other similar estimates are given.—**A. van Maanen**: The distances of six planetary nebulae. The nebulae N.G.C. 2302, 6720, 6804, 6905, 7008, and 7662 are examined. The parallaxes range from 0.002" to 0.021", and the diameters from 10,000 to 1350 astronomical units.

BOOKS RECEIVED.

What is Psycho-analysis? By Dr. I. H. Coriat. Pp. 124. (London: Kegan Paul, Trench, Trübner, and Co., Ltd., 1919.) 3s. 6d. net.

Calcolo delle Probabilità. By Prof. Guido Castelnuovo. Pp. xxiii+373. (Milano-Roma-Napoli: Società Editrice Dante Alighieri di Albrighi Segati & C., 1919.)

Ethnogeography and Archæology of the Wiyot Territory. By L. L. Loud. Vol. xiv., No. 3. (University of California Publications in American Archæology and Ethnology.) Pp. 221-436+plates 21. (Berkeley: University of California Press, 1918.)

Chimica delle Sostanze Esplosive. By Prof. Michele Giua. Pp. xvi+556. (Milano: Ulrico Hoepli, 1919.) 28 lire.

Sanitation Practically Applied. By Dr. Harold Bacon Wood. Pp. vi+473. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1917.) 13s. 6d. net.

The Game Birds of California. Contribution from the University of California Museum of Vertebrate Zoology. By Joseph Grinnell, Harold Child Bryant, and Tracy Irwin Storer. Pp. x+642+16 coloured plates. (Berkeley: University of California Press, 1918.) 6 dollars net.

The Secret of Personality. The Problem of Man's Personal Life as Viewed in the Light of an Hypothesis of Man's Religious Faith. By Dr. G. T. Ladd. Pp. ix+287. (London: Longmans, Green, and Co., 1918.) 7s. 6d. net.

Osmotic Pressure. By Prof. Alexander Findlay. Second edition. (Monographs on Inorganic and Physical Chemistry.) Pp. xi+116. (London: Longmans, Green, and Co., 1919.) 6s. net.

An Advanced Course in Quantitative Analysis. With explanatory notes. By Prof. Henry Fay. Pp. vi+111. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1917.) 6s. net.

A Systematic Course of Qualitative Chemical Analysis of Inorganic and Organic Substances. With explanatory notes. By Prof. Henry W. Schimpf. Third edition, revised. Pp. ix+187. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1917.) 7s. net.

Differential Calculus. By Prof. H. B. Phillips. Pp. v+194. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1916.) 9s. 6d. net.

Empirical Formulas. By Prof. Theodore R. Running. (Mathematical Monographs, No. 19.) Pp. 144. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1917.) 7s. net.

DIARY OF SOCIETIES.

THURSDAY, MARCH 6.

ROYAL SOCIETY, at 4.30.—L. F. Richardson: (1) Atmospheric Stirring Measured by Precipitation; (2) Measurement of Water in Clouds.

ROYAL SOCIETY OF ARTS, at 4.30.—W. R. Gourlay: The Need for a History of Bengal.

LINNEAN SOCIETY, at 5.—Dr. Harold Wager: The Colour-sense of Wasps.—F. Lewis: Notes on a Visit to Kunadiparawitta Mountain, Ceylon, with List of the Plants observed and their Altitudinal Distribution.

INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—G. L. Addenbrooke: Dielectrics in Electric Fields.

CHILD-STUDY SOCIETY, at 6.—Miss S. Walker: The Training of Teachers from the Child-Study Standpoint.

CHEMICAL SOCIETY, at 8.—Prof. J. W. Nicholson: Emission Spectra and Atomic Structure.

FRIDAY, MARCH 7.

ROYAL INSTITUTION, at 5.30.—Prof. H. C. H. Carpenter: The Hardening of Steel.

SATURDAY, MARCH 8.

ROYAL INSTITUTION, at 3.—Sir J. J. Thomson: Spectrum Analysis and its Application to Atomic Structure.

MONDAY, MARCH 10.

ROYAL INSTITUTION, at 3.—Capt. G. P. Thomson: The Dynamics of Flying
ROYAL SOCIETY OF ARTS, at 4.30.—Prof. W. A. Bone: Coal and its Conservation.

ROYAL SOCIETY OF ENGINEERS, at 5.30.—A. S. E. Ackermann: Experiments with Clay in its Relation to Piles.
ROYAL GEOGRAPHICAL SOCIETY, at 8.—Major J. E. Noel: The Eastern Approaches to Mt. Everest.

TUESDAY, MARCH 11.

ROYAL INSTITUTION, at 3.—Prof. H. Maxwell Lefroy: Insect Problems.
ROYAL ANTHROPOLOGICAL INSTITUTE, at 3, with Prehistoric Society of East Anglia.—R. S. Smith: Presidential Address—Foreign Relations in the Neolithic Period.—At 5.15.—S. H. Warren: The Dating of Surface Flint Implements and the Evidence of the Submerged Peat Surfaces.—M. Léon Couill: Note on an Allée Couverte Discovered in the Course of making Trenches for the Defence of Paris.

INSTITUTION OF CIVIL ENGINEERS, at 5.30.—J. Caldwell and H. B. Sayers: Electric Welding Developments in Great Britain and the United States of America.—W. S. Abell: Experiments on the Application of Electric Welding to Large Structures.—J. R. Smith: The Application of Electric Welding in Ship Construction and Repairs.

WEDNESDAY, MARCH 12.

ROYAL SOCIETY OF ARTS, at 4.30.—W. L. Lorkin: Electric Welding and its Applications.

GEOLOGICAL SOCIETY, at 5.30.—E. H. Pascoe: The Early History of the Indus, Brahmputra, and Ganges.

ROYAL AERONAUTICAL SOCIETY, at 8.—H. Levy: From Model to Full Scale in Aeronautics.

THURSDAY, MARCH 13.

ROYAL SOCIETY, at 4.30.—Frobable Papers: Dr. A. D. Waller: Concerning Emotive Phenomena. III.: The Influence of Drugs upon the Electrical Conductivity of the Palm of the Hand.—Dr. W. L. Balls: The Existence of Daily Growth-rings in the Cell Wall of Cotton Hairs.

ROYAL SOCIETY OF ARTS, at 4.30.—D. T. Chadwick: The Report of the Indian Industrial Commission.

INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—G. L. Addenbrooke: Dielectrics in Electric Fields.

OPTICAL SOCIETY, at 7.—Major C. W. Gamble: Some Photographic Apparatus used in Aerial Photography.

FRIDAY, MARCH 14.

PHYSICAL SOCIETY, at 5.—C. C. Paterson and Dr. Norman Campbell: Some Characteristics of the Spark Discharge, and its Effect in Igniting Explosive Mixtures.

ROYAL INSTITUTION, at 5.30.—Prof. A. Keith: The Organ of Hearing from a New Point of View.

SATURDAY, MARCH 15.

ROYAL INSTITUTION, at 3.—Sir J. J. Thomson: Spectrum Analysis and its Application to Atomic Structure.

CONTENTS.

PAGE

The Life-work of a Hindu Chemist. By Sir T. E. Thorpe, C.B., F.R.S. 1

Gravitation and Relativity 2

Our Bookshelf 2

Letters to the Editor:—

The Directorship of the Natural History Museum.—Prof. W. Boyd Dawkins, F.R.S., and Others 3

The Supposed "Fascination" of Birds.—Right Hon. Sir Herbert Maxwell, Bart., F.R.S. 4

Girvanella and the Foraminifera.—Fredk. Chapman Feeding Habits of Nestling Bee-eaters.—Edgar R. Waite 4

The Commercial Use of Airships 4

Dr. F. Du Cane Godman, F.R.S. By E. B. P. 5

Notes 6

Our Astronomical Column:—

The Order of the Planets 10

Cepheid Variables 10

Variation of Latitude 10

The Health of Our Children. By W. E. H. 11

Forthcoming Books of Science 11

Meteorology During and After the War. By Col. H. G. Lyons, F.R.S. 12

University and Educational Intelligence 16

Societies and Academies 17

Books Received 20

Diary of Societies 20

Editorial and Publishing Offices:

MACMILLAN AND CO., LTD.,
ST. MARTIN'S STREET, LONDON, W.C.2.

Advertisements and business letters to be addressed to the Publishers.

Editorial Communications to the Editor.

Telegraphic Address: PHUSIS, LONDON.

Telephone Number: GERRARD 8830.