

Royal Society Election.

SELECTED CANDIDATES.

THE president and council of the Royal Society have recommended the following candidates for election as fellows of the Society:

G. ANREP, M.D., D.Sc. Distinguished as a physiologist, especially for his work on conditioned reflexes, nature of the secretory process, physiology of digestion, and significance of adrenaline. Has during the last few years conducted a series of masterly researches on the central and reflex regulation of the heart and circulation, and of the blood supply to the heart muscle, based on the use of the innervated heart lung preparation, which was invented for this purpose.

H. BATEMAN, M.A., Ph.D. Professor of Mathematical Physics in the California Institute of Technology, Pasadena. Formerly Fellow of Trinity College, Cambridge. Introduced (*Proc. Lond. Math. Soc.*, 1909) into the relativity theory of the electromagnetic equations a general quadratic form whose coefficients are characteristic of the medium supporting the field—partial anticipation of general relativity. Discovered the integral equation by which seismic rays in the earth's interior were afterwards calculated by Knott (*Phil. Mag.*, 1910). Has greatly extended the theory of solutions of partial differential equations, especially those occurring in physics. Has published solutions, both analytical and numerical, of various types of integral equations; also papers on radiation and geometry.

C. H. BROWNING, M.D., D.P.H. Professor of Bacteriology, University of Glasgow. Distinguished for his researches in bacteriology, immunity, and chemotherapy. Author of "Recent Methods in the Diagnosis and Treatment of Syphilis" (with J. Mackenzie, 1911); "Applied Bacteriology" (1918); "Chemotherapy in Trypanosome Infections" (*Jour. Path.*, 1908); a number of papers on an analysis of the Wassermann reaction, especially on the action of cholesterin and lecithin; "Isolation of Typhoid Bacilli by means of Brilliant Green" (*Jour. Hyg.*, 1913); "On Flavine and Brilliant Green" (*Brit. Med. Jour.*, 1917); "Bactericidal Action of Ultra-violet Radiation" (*Proc. Roy. Soc.*, 1917, with S. Russ); "Bactericidal Properties conferred on the Blood by Diamino-Acridine Sulphate" (*ibid.*, 1918); papers on antiseptic action and chemical constitution (*ibid.*, 1922, 1924, jointly); and others.

STANLEY S. COOK. Engineer. Since 1906, controlling calculation steam turbines for Parsons' Marine Steam Turbine Co., and licences all principal countries. On Sub-Committee of B.I.R., calculated pressures attained by collapsing water cavities, results independently confirmed by Lord Rayleigh. Calculated temperatures reached by compression of flame. Joint author of "Compressibility" (*Proc. Roy. Soc.*); "Erosion of Propellers" (*Inst. Naval Arch.*, 1919); "Mechanical Double Reduction Gears, investigating Torsional Vibration" (*ibid.*, 1921); "Mechanical Gearing, investigating Oil-quenched Nickel Steel Pinions" (*ibid.*, 1923). Roy. Soc. Arts, Howard Lectures, 1923.

W. D. DYE, D.Sc. (Lond.), A.C.G.I. Head of Electrical Standards and Measurements Section of the National Physical Laboratory. Has established accurate and permanent standards of capacity and inductance suitable for radio frequencies, and has developed a self-contained standard of radio frequencies of high accuracy embodying a tuning fork control. Member of the National Committee for Wireless Telegraphy and of the International Committee for Radio Standards and Measurements. An authority on electrical standard measurements and

precision measurements and on the magnetic properties of materials. Publications: "Calculation of a Primary Standard of Mutual Inductance" (*Proc. Roy. Soc.*, A, 101); "The Valve maintained Tuning Fork as a Precision Time Standard" (*ibid.*, A, 103); "A Self-contained Standard Harmonic Wavemeter" (*Phil. Trans.*, A, 224). Author of articles on magnetic measurements and on radio measurements in Glazebrook's "Dictionary of Physics."

C. C. FARR, D.Sc. Professor of Physics, Canterbury College, N.Z. Fellow and Hector Medallist, New Zealand Institute. Distinguished for his contributions to general physics. As Director of Christchurch Magnetic Observatory, he made a complete magnetic survey of New Zealand and outlying islands. The results were published by the New Zealand Government. Author of many papers including "Interpretation of Milne Seismograms" (*Phil. Mag.*, 1903); "Continuous Observations of Dissipation of Electric Charges in Open Air" (*Proc. Roy. Soc.*, 1905); "Radium Contents of Igneous Rocks from Subantarctic Islands of New Zealand," with D. C. Florence (*Phil. Mag.*, 1909); "The Viscosity of Sulphur," with D. B. Macleod (*Proc. Roy. Soc.*, 1920).

MAJOR GREENWOOD, F.R.C.P. Has applied the statistical method to the elucidation of many problems of physiology, pathology, hygiene, and epidemiology. Is the author, or joint author, of more than sixty papers dealing with these applications, including important contributions to the experimental study of epidemiology (*Jour. Hyg.*, 24, 1925, Greenwood and Topley; *ibid.*, 25, 1926, Greenwood, Newbold, Topley, and Wilson). Has done much to encourage and develop the use of modern statistical methods by medical laboratory investigators, and, as chairman of the Medical Research Council's Statistical Committee, to secure the adequate planning and execution of field investigations.

J. W. H. HARRISON, D.Sc. Lecturer in Zoology at University College (Armstrong College), Newcastle-on-Tyne. Distinguished for his original work in experimental zoology, demonstrating the non-Mendelian inheritance of specific characters and the breaking down of a Mendelian unit-character (melanism) in interspecific crosses in Lepidoptera; the induction of melanism in Lepidoptera by feeding larvæ on plants charged with metallic salts and its subsequent inheritance on a Mendelian basis; the inheritance of acquired egg-laying instincts in Hymenoptera and the importance of extraneous influence in the determination of sex. He has also studied the cytology of the varieties and hybrids of British roses and willows.

W. N. HAWORTH, D.Sc. (Manc.), Ph. D. (Göttingen). Professor of Chemistry in the University of Birmingham. Author or joint author of many memoirs, published chiefly in the *Journal of the Chemical Society*, on organic synthesis and on the constitution of some terpenes and carbohydrates. He had determined the structure of many of the di- and tri-saccharides, including sucrose, maltose, lactose, melibiose, cellobiose, gentiobiose, raffinose, and gentiarcrose, and has synthesised amygdalin.

D. KEILIN, M.A. (Cantab.), D.Sc. (Paris). University Lecturer in Parasitology, Cambridge. Distinguished for his researches on (a) Insecta, their anatomy, biology, and physiology; (b) Protista, having made important contributions dealing with the life history of new parasitic forms; (c) Cellular respiration, having made a fundamental discovery in the intra-

cellular pigment 'cytochrome' which is present in all organisms.

F. L. KITCHIN, Sc.D. (Camb.), Ph.D. (Munich). Palaeontologist to the Geological Survey of Great Britain. Distinguished for his researches in invertebrate palaeontology, especially in its application to stratigraphical geology. Has elucidated the lower Cretaceous fauna of South Africa (*Annals S. African Museum*, 1908) and the Jurassic Brachiopoda and Lamellibranchia of India (*Palaeontologia Indica*, 1900, 1903). Has thoroughly investigated the faunas and correlation of zones in the concealed Mesozoic rocks of the Weald (*Mem. Geol. Survey*, 1911, 1923); has investigated the zonal representation and relations of the Gault of England (*Geol. Mag.*, 1920, 1922). Author of many palaeontological contributions to Geological Survey memoirs.

F. S. MACAULAY. Distinguished for his contributions to the theory of modular systems. Author of "On the Resolution of a Firm Modular System into Primary Systems" (*Math. Ann.*, 74, 1913); "The Algebraic Theory of Modular Systems" (Camb. Math. Tracts, No. 19, 1916); "The Resultant of a Number of Polynomial of the same Degree" (*Proc. Lond. Math. Soc.*, 21, 1922); "Some Properties of Enumeration in the Theory of Modular Systems" (*ibid.*, 26, 1927). Also of various papers on algebraic geometry.

S. B. SCHRYVER, Ph.D., D.Sc. Professor of Biochemistry, Imperial College of Science and Technology. Distinguished for original investigation in chemistry, especially biochemistry. He has made valuable contribution to our knowledge of morphia alkaloids (*Trans. Chem. Soc.*, 1900); autolysis (*Jour. of Physiol.*, 1904); Aggregation in colloids, especially clotting (*Proc. Roy. Soc.*, 1910-16); "The Chemical Aspects of Proteins, especially Gelatine" (*Biochem. Jour.*, 1920, onwards). He has done valuable work in

chemistry in relation to plant physiology, including studies of the nitrogenous metabolism of plants (*ibid.*, 1920), of pectic substances and hemicelluloses (*ibid.*, 1918, onwards). In addition he has been the instigator of much other research work issuing from his laboratory. A series of papers has been published on the hydrolysis of proteins and on the discovery of hitherto unknown hydrolysis products of these substances.

W. STILES, Sc.D. Professor of Botany, University of Reading. Distinguished for contributions to plant physiology. In his work on permeability he developed new methods, and his investigation of the equilibria concentrations of salts within and without the cell are of particular importance. He has made valuable contributions to knowledge of the action of cold on tissues, "The Preservation of Food by Freezing" (1922), and on "Diffusion through Gels." His books on the assimilation of plants (Jørgenson and Stiles), "Carbon Assimilation" (1917), and on "Cell Permeability" (1923), exhibit critical powers of a very high order and are of great value in the further development of research work in these fields.

R. WHYTLAW-GRAY. Professor of Chemistry, University of Leeds. Distinguished for his researches in physical and inorganic chemistry, especially in the application of the determinations of the densities and combining volumes of gases to the atomic weights of the constituent elements. Was the first to correct Stas' atomic weight of nitrogen. With Sir William Ramsay determined the density of radium emanation and the atomic weight of radium. With collaborators carried out various researches on the compressibilities and limiting densities of various gases. Determined the critical constants and orthobaric densities of xenon. Has carried out extensive researches for the Chemical Warfare Department on the behaviour of clouds and smokes.

The Gold Coast Forests.

AN important monograph has been drawn up recently by Dr. T. F. Chipp, entitled the "Gold Coast Forests: a study in Synecology" (Oxford Forest Memoirs, No. 7, 1927). In the introduction it is pointed out that no purely ecological study of the Gold Coast forests has been recorded, and that such a study has been impossible so long as the component units forming the structure of this mass of tropical vegetation have remained undetermined and uninvestigated. Considerable progress has been made in the floristic study of this forest area, as evidenced in the gradual expansion of the enumeration of the flora in the successive volumes of the "Flora of Tropical Africa," a work commenced in 1868 and only now approaching completion. A similar advance has also been made in the study of the plant distribution, and Engler's comprehensive survey in "Die Vegetation der Erde" (1908-10) is passing out of date.

The study of economic botany has made rapid progress with the establishment and expansion of the Agricultural and Forestry Departments. This progress is also depicted by such publications as "The Useful Plants of Nigeria" (*Kew Bull.*, Ad. Ser. 9) which includes the economic plants of the Gold Coast. Climatology has also recently received considerable attention. Apart from ecology, the area covered by the forest mass has been definitely determined, the chief physiognomic types of the forest have been recognised, and variations corresponding to the chief changes in climatic and edaphic factors have been recorded. Thompson's "Report on Forests: Gold Coast" (1910) recognises certain serial stages, plants, and communities of indicator value, and discusses the reaction of the population to the forest; he also

adds lists of species occurring in different parts of the forest. Dr. August Chevalier in "Les végétaux utiles de l'Afrique tropicale française" has enabled the Gold Coast Forest, as a whole, to be viewed in its right perspective in relation to the rest of the vegetation in West Africa. During the War, A. Bertin, Conservateur des Eaux et Forêts, travelled extensively in some of the forest areas in the French possessions in this region, and published descriptions of the trees and their economic uses in five volumes, "Mission forestière coloniale," of high interest. As an outcome, soon after the termination of the War, Bertin was entrusted with the formation of a forest department to have charge of these areas. At the International Forestry Congress held at Rome in May 1926, Bertin read a paper on these forests, having for its object the placing of some of their timbers on the Italian market, Italy importing a considerable proportion of her annual timber requirements.

As Dr. Chipp points out, and the remark applies equally to several of our other Colonies and Protectorates. In a new country like the Gold Coast, where agriculture and forest exploitation have only assumed importance during the present generation, the tendency has been to concentrate all study and investigation on these, for they alone have an immediate economic bearing. In the meantime, the natural covering, a knowledge of the stages in development of which may prove of great economic importance to the inhabitants, is rapidly disappearing. The value of a study, in time, of the indicator communities and individuals may prove of equal importance from the protective point of view; such a study will indicate the parts of a country which it is