

His long connexion with the University Chemical Laboratory at Cambridge dates from 1891, when he entered the University as an undergraduate at Fitzwilliam Hall. After graduating in the Natural Sciences Tripos, he attached himself to Trinity Hall, and for many years was a successful private tutor. He was also engaged in the teaching work of the Chemical Department, first as demonstrator and in later years as a University lecturer.

In conjunction with the late W. J. Sell, Dootson published a paper on citrazinic acid, which was followed by a systematic series of investigations on the chlorine derivatives of pyridine. He also published papers on derivatives of acetone dicarboxylic esters, in one of which he demonstrated a very simple method for transforming an aliphatic into a benzenoid compound. His last paper, published jointly with Dr. S. Chapman, was entitled "A Note on Thermal Diffusion".

In later years, the gradual increase in his administrative duties drew Dootson away from research. During the period of the War, however, he was occupied with experimental preparative work on various substances of national importance. His success as a teacher continued to the end; indeed many generations of Cambridge students will remember with gratitude his kindly and unsparing help, and his friends among the teaching staff will mourn the loss of a congenial and gifted colleague.

A. J. BERRY.

DR. DONALD H. A. HUTCHINSON.

DR. DONALD H. A. HUTCHINSON, a master of the art of photomicrography, died of cancer on Feb. 1, at the age of fifty-six years. An ardent naturalist all his life, he concerned himself latterly with the photography of living microscopic animals by means of both still and moving pictures. Many will remember the remarkable films of protozoan life which he exhibited at the Zoological Society of London in 1924 and at the British Association meeting at Oxford in 1926; but only his intimate

friends will know of the amount of his work and of the patience and ingenuity with which it was achieved. It was work carried out in the spare moments of a busy general practice. He never sought publicity, but hoped eventually to produce an atlas of photographs of as many kinds of protozoa as possible. He was always trying to get better and still better results.

A few of Dr. Hutchinson's photographs have recently been published in "The Science of Life", but there remain a large number of magnificent studies which have been seen by only a few. The writer of this brief notice, who, during a few years at Lowestoft, spent many wonderful evenings in Dr. Hutchinson's laboratory, intends to publish a volume of his photographs and some of the more interesting sections of his films; he believes that they will be of great value to students of animal life, and in addition a source of inspiration to workers in the field of photomicrography.

A. C. H.

WE regret to announce the following deaths:

Dr. F. Arnall, head of the Department of Pure and Applied Chemistry at the Cardiff Technical College, whose interest was mainly in organic chemistry, on Feb. 7, aged thirty-four years.

Sir William Atkinson, I.S.O., formerly Divisional Inspector of Mines, Home Office, a past-president and honorary member of the North Staffordshire Institute of Mining Engineers, on Feb. 15, aged seventy-nine years.

Dr. G. G. Chisholm, formerly reader in geography in the University of Edinburgh and secretary of the Royal Scottish Geographical Society from 1910 until 1925, on Feb. 9, aged seventy-nine years.

Prof. Felix M. Exner, director of the Zentralanstalt für Meteorologie und Geodynamik and professor of terrestrial physics in the University of Vienna, who was an honorary member of the Royal Meteorological Society, on Feb. 7, aged fifty-three years.

Mr. A. A. Campbell Swinton, F.R.S., known for his pioneer work on X-rays and radio communication, on Feb. 19, aged sixty-six years.

News and Views.

THE problem of the structure of cellulose is one which has not only a fascination for the organic chemist but is also of the greatest importance in many industrial processes. The method of X-ray crystal analysis has been applied to supplement the older chemical methods, and the results of this work were set out by Sir William Bragg in a recent discourse at the Royal Institution which we are glad to be able to print as a supplement to this issue of NATURE. X-rays have gone far to confirm modern views of the structure of cellulose and have succeeded in shedding new light on some aspects of the problem. It has been shown, for example, that cellulose contains large numbers of small crystals which tend so to arrange themselves that they have one direction in common. The outward sign of this selective orientation is the fibrous nature of the material. In the direction of length of the fibre it is found that the atomic pattern repeats itself every 10.3 Å. The other dimensions of

the crystal cell are less certain, but the evidence is consistent with the values of 7.9 Å. and 8.35 Å. at 84° to each other and perpendicular to the fibre axis. Such a cell contains the substance of four C₆H₁₀O₅ groups. Along the fibre direction there are chains of glucose rings (five carbons and one oxygen) linked together by oxygen atoms, the pattern repeating itself identically after every two rings, the length of which is 10.3 Å. One such chain starts from each corner and one from the centre of the base of the crystal cell.

THE structure of cellulose suggested by the X-ray examination throws light on its physical and chemical behaviour. The atoms forming the chains of glucose rings along the fibres are very tightly linked together, while the chains are joined sideways by much weaker bonds due to the hydroxyl groups attached to the ring atoms. The cellulose micelle resembles a bundle of sticks, each stick strong in itself but loosely at-

tached to its neighbours. The atomic arrangements and dimensions of the cell can be altered by physical and chemical means, but there is a strong tendency for the chains which lie along the axis of the fibre to remain unchanged. The length of 10.3 Å. in this direction is affected by temperature much less than are the other dimensions. Such a process as mercerisation leaves the periodicity of 10.3 Å. unaltered, and the change accompanying this process can be explained as due to a slewing round of the chains about the fibre axis. Many chemical derivatives such as nitrocellulose and acetyl cellulose show also this characteristic 10.3 Å. dimension, and the additional atoms introduced by the chemical actions result in an increase in the distance between adjacent chains. It is interesting to note that when such atoms are removed, the structure reverts sometimes to that of the original cellulose and sometimes to that characteristic of the mercerised material.

THE Council of the Royal Society, at its meeting on Feb. 20, recommended for election into the Society the following fifteen candidates: Herbert Stanley Allen, professor of natural philosophy, University of St. Andrews; Edward Battersby Bailey, professor of geology in the University of Glasgow; Frederick T. Brooks, University lecturer in botany, Cambridge; Paul Adrien Maurice Dirac, University lecturer in mathematics, Cambridge; Harold Ward Dudley, chemist, National Institute for Medical Research, Hampstead; Charles Alfred Edwards, principal and professor of metallurgy, University College, Swansea; Harry Eltringham, entomologist, Hope Collections, University of Oxford; Charles Edward Inglis, professor of mechanism and applied mechanics, University of Cambridge; Harold Spencer Jones, H.M. Astronomer at the Cape of Good Hope; Eric Keightley Rideal, lecturer in physical chemistry, University of Cambridge; Robert Robison, assistant chemist, Department of Biochemistry, Lister Institute; John Stephenson, formerly lecturer in zoology, University of Edinburgh; George Paget Thomson, professor of natural philosophy, University of Aberdeen; Charles Todd, Department of Experimental Pathology, National Institute for Medical Research; William Whiteman Carlton Topley, professor of bacteriology and immunology, London School of Hygiene and Tropical Medicine.

ON Feb. 19 an interesting lecture was delivered to the Royal Aeronautical Society by Prof. Walter Georgii of Darmstadt and Mr. Fritz Stamer on "Ten Years' Gliding and Soaring in Germany", and on "The Flying School at Wasserkuppe". The post-War restrictions on the use of power units for aircraft in Germany turned the attention of the younger generation in 1920 towards gliding as a substitute. Since this form of flight depends on the use of slowly rising currents in the air, a practical glider is chiefly characterised by its small vertical component of velocity. This is effected by reducing the total resistance, and the wing loading. Thus a large span of good aspect ratio is adopted in order to give a small induced resistance. The body is closed and cantilever construction is used in order that there shall be no external bracing.

Launching is done by the usual method with a rubber cable, and the starting carriage is dropped. In practice, in designing for low resistance, the structural weight is increased to a restricted degree and the result is to produce a medium heavy glider, with a margin of strength for high performance and for flying in gusty weather. The additional weight gives greater air speed required for progress against strong winds and for passing rapidly through unfavourable belts of down winds. For long distance soaring flight, a light compass and a Pitot tube are carried; but in research flights pressure gauges, inclinometers, and meteorographs are carried for recording air conditions.

THE first impetus to gliding in Germany was given by W. Klemperer in 1920, when he attained a glide of 2 minutes 22 seconds duration, traversing a distance of 1830 metres. Progress came rapidly. By 1922 gliding flights lasting more than one hour were attained. Hentzen actually reached an altitude of 350 metres, remaining aloft for 3 hours 10 minutes. Schultz, at Rossitten in 1924, recorded a flight lasting 8 hours 24 minutes; and in 1925, 14 hours 7 minutes. This record was beaten in 1929 by Dinort with 14 hours 43 minutes. It is characteristic of these flights that the best course between any two points is not necessarily the straightest, but may involve long detours in reaching up-wind areas and lengthy soaring over a particular region to gain sufficient height. The pilot, in fact, must fly on sound topographical and meteorological information.

THE Essex Field Club commemorated the fiftieth anniversary of its foundation by a gathering on Feb. 22, held in the Great Hall of the Municipal College, Stratford. Among those who were present at the function were Lieut.-Col. Sir David Prain (president-elect of the Club), Sir Arthur Smith Woodward, Sir William Lister, Sir Henry Miers, Sir R. Armstrong-Jones, Prof. J. W. Gregory, Prof. E. J. Salisbury, Prof. A. G. Green, Mr. Reginald Smith, Mr. J. Ramsbottom, and Mr. Arthur Cotton. The Mayor of West Ham and the president of the Club, Mr. D. J. Scourfield, jointly received the guests and in turn welcomed them to the function. Speeches were made by the Right Hon. Frances, Countess of Warwick, who made an eloquent appeal that the modern desecration of the countryside by petrol-pumps and the like should be stopped by legislation; by Brigadier-General Colvin, Lord Lieutenant of Essex, by Sir Henry Miers, by Sir Arthur Smith Woodward, and by Sir David Prain, each referring to those aspects of the Club's activities with which he was personally acquainted. During the evening a *conversazione* was held, when there were many interesting exhibits of natural history objects and prehistoric relics, and an extensive series of topographical photographs and prints of Essex localities. Lantern lectures were given by Mr. William Glegg on "Some Features of Essex Bird-Life", and by Mr. S. Hazzledine Warren on "The Land of Lyonesse in Essex", which were well attended. Music was provided by a trio of ladies. The Club's Museum, which adjoins the College, was closed to the general public on the occasion, and was inspected by the guests during the evening.

THE latest discoveries in the Antarctic reported in the *Times* are the result of the Norwegian expedition in the *Norvegia*. Working westward from their discoveries of land adjoining Enderby Land, the Norwegians discovered a shallow bank, named after the ship, in about lat. 67° S., long. 32° E. Bad weather and heavy ice made it impossible to find land which certainly must exist to the south. The *Norvegia* therefore stood south-west, and in lat. 71° S., long. 12° 29' W., sighted a long chain of icebergs aground, and to the south of them shallow water extending to new land. The north-west point of this land is in lat. 71° 26' S., long. 11° 31' W. From an aeroplane Capt. Riiser Larsen and Capt. Luetzow Holm charted this land for a few miles and saw it extending to the south-west. Part of the coast appears to be free from ice and part is faced by an ice cliff. No peaks showed above the ice of the interior. This new land is clearly an extension of Coats Land, which Dr. W. S. Bruce discovered a little farther to the south-west in 1904. There is little doubt that it is continuous with Enderby Land in the east.

At a meeting of the Royal Society of Edinburgh on Feb. 17, Prof. Carl Størmer, of Oslo, delivered an address entitled "Do the Wireless Echoes of Long Delay come from Space outside the Moon's Orbit?" Prof. Størmer mentioned first his mathematical researches on the aurora made in 1904, which gave among other things the result that streams of electrons sent out from the sun towards the earth could not penetrate into a certain definite region. This region has the form of a torus or anchor-ring which may be obtained by rotating an oval, which touches the earth's magnetic axis in its centre, round this axis. This will be familiar to the readers of *NATURE* from two letters published in November 1928 and January 1929. Prof. Størmer then gave an account of the observations of long-delayed wireless echoes made in Norway, England, and Scotland, and especially by a French expedition to observe the solar eclipse in Indo-China in May 1929, where about two thousand echoes were observed, some of them coming 30 seconds after the signal with one-third of its strength. These echoes are explained by reflection of the wireless waves from currents and surfaces of electrons at the boundary or outside the above-mentioned toroidal region, and corresponding to distances from the earth several times as great as the moon's distance. Prof. P. O. Pedersen's reasons for adopting this explanation were also referred to.

In his Friday evening discourse, delivered at The Royal Institution on Feb. 21 on "Principles of Plant Breeding", Mr. J. B. S. Haldane said that the very numerous types of *Primula sinensis* in cultivation, including the new giant species or subspecies which is practically sterile with the ancestral form, have all arisen in cultivation in the last century. They are determined by combinations of Mendelian genes, of which about thirty are known. These have varied suddenly and spontaneously. The laws governing their assortment in the progeny of hybrids are simple, but the result of new combinations is often unex-

pected. Thus, on dark-stemmed plants, flowers which were expected to be a uniform blue proved to be mottled. By the application of Mendelism the establishment of new races is greatly simplified, but, for the production of a first-rate horticultural variety, selection is still needed. The laws of inheritance in the giant subspecies, which has twice the original chromosome number, are more complicated than those enunciated by Mendel, and lead to quite different practical consequences. A failure to realise these consequences has handicapped the practical breeder. The application of these principles to other plants was briefly considered.

A NOVEL use of the mobility of radio communication will shortly be put into operation by the Egyptian State Telegraph Department. Six radio sets mounted on three motor lorries have been ordered from the Marconi Company. These sets are to be used as stations in areas not supplied by the land telegraph and telephone system. This enables any place in a wide range of country on both sides of the Nile to be linked up at very short notice with the main telegraph system. The motor lorries are of the six wheel type fitted with caterpillar attachments so that they will be equally mobile on hard or soft sand. Each lorry will carry a medium-wave half kilowatt telephone transmitter and a small portable short-wave transmitter the power of which is a hundred watts. The aerials are suspended from 70 ft. portable masts. Medium waves having lengths ranging from 600 metres to 2150 metres will be used, and also short waves having lengths ranging from 20 metres to 50 metres. Egypt is a country in which, apart from the Delta, the towns and cities with their connecting railway and telegraph communications lie along a narrow strip of land bordering the Nile, with large areas of thinly populated or desert country on either side. In these circumstances, these mobile radio stations should prove of value in providing extensions of the system either periodically as a regular service or in times of emergency.

ENGINEER REAR-ADMIRAL W. S. HILL read a paper on powdered coal for ship propulsion to the North-East Coast Institution of Engineers and Shipbuilders on Feb. 21, giving a review of the general position regarding the introduction of the use of pulverised coal afloat. Particulars were given of some sixteen British and foreign vessels in which the boilers have been converted from hand firing to pulverised coal firing, or in which the boilers were originally fitted for burning pulverised coal. The advantages claimed for pulverised coal are that it leads to a saving of labour approaching that saved by oil-firing, that it improves the steaming of ships, and that there is a gain in overall efficiency. Much depends on the actual power used for pulverising. Two years ago, 25 h.p. per ton of coal milled was common; this figure, however, has been reduced to 14, and in a new mill about to be fitted afloat to 8. The burners have now taken a secondary place to the mill. The general question of pulverised fuel burning, it may be added, is among the subjects now being investigated by the Fuel Research Board.

THE Medical Research Council has appointed the following committee to advise upon the further investigation of pulmonary silicosis and of other pulmonary conditions associated with the inhalation of dusts arising from industrial processes: Prof. Arthur J. Hall (Chairman); Dr. A. E. Barclay; Mr. J. C. Bridge; Prof. S. L. Cummins; Prof. E. H. Kettle; Dr. E. L. Middleton (Secretary); Prof. M. J. Stewart; Dr. Cecil Wall. The Committee will survey the present state of knowledge, will advise the Council upon new lines of inquiry that may be profitably pursued, and will assist in the supervision of such investigations as it may be decided to initiate or support. The work will be directed particularly towards obtaining, in co-operation with the Factory Department of the Home Office, more accurate knowledge of the causes and diagnosis of silicosis and of other industrial pulmonary disorders. The need for better knowledge of these subjects has been emphasised by the recent Report of the Silicosis (Medical Arrangements) Committee, the recommendations of which to the Secretary of State for extended research work have been referred to the Council by the Home Office.

THE second volume of the *Transactions* of the Seventh Congress of the Far Eastern Association of Tropical Medicine, held in British India in December 1927, of which the first volume was referred to in our issue of June 22, 1929 (p. 954), has been issued (Calcutta: Thacker's Press and Directories). It consists of 871 large pages, and comprises the proceedings of Sections III. and IV. Nearly a hundred papers, with the discussions to which they gave rise, are recorded in full; those of Section III. deal with plague, cholera, dysentery, sprue and intestinal infections, bacteriophage, leprosy, tuberculosis, and bacteriology; while Section IV. was concerned with typhus-like diseases and leptospiræ, etc., protozoology, and malaria in all its aspects. Malaria forms the subject of no fewer than thirty papers; leprosy takes ten; and five are concerned with the bacteriophage, an ultra-virus parasitic on bacteria and provoking in them an extremely infectious disease which results in their destruction and solution. The whole volume is important for all who are concerned with the cure, and especially the prevention, of disease in the tropics, and much of it is of high interest to scientific workers on more general lines. The volume is well printed and the general get-up excellent; it is illustrated by numerous maps and charts, as well as by twenty-six plates, mostly in half-tone, the reproductions of photographs which show the character of certain areas in Lower Bengal in relation to the prevalence of malaria being extremely good. The editor, Lieut.-Col. J. Cunningham, is to be congratulated on the result of his labours.

IN the past, submarine cables have played an invaluable part in submarine communications. Until, however, the advent of 'loaded' cables, their use for telephone communication was very restricted. Nowadays the distances which submarine telephone cables span are continually extending, and in a few years it seems probable that all the continents will be

interconnected by a submarine telephone network. We have received from Messrs. Siemens Brothers and Co., Ltd., of Woolwich, a volume giving interesting particulars of some of the loaded submarine telephone and telegraph cables which they have put down. In the early types of loaded cable the insulating material employed was gutta-percha, but the development of submarine telephony led to the replacement of this material by paper, the resistivity of which is much greater. A study of Heaviside's theories led to the adoption of the continuously loaded cable. Commercial iron or silicon iron was used at first for the loading, but, as only low magnetising forces were obtainable, the increase in the speed was not great. The discovery of permalloy, one of the nickel iron group of alloys which after appropriate heat treatment develops a very high permeability at a very low magnetising force and shows practically no hysteresis loss, greatly improved the quality of the loading. It showed that submarine telephony over long distances was possible and greatly accelerated the speed at which submarine telegraph messages can be sent. For example, in the Fanning-Suva section of the Pacific cable, the speed has been increased to seven times that of the unloaded cable. Particulars are given of the Isle of Man, Anglo-French, Anglo-Belgian, and Anglo-Dutch submarine telephone cables.

IN connexion with the Shannon hydro-electric power station, it has been feared that the factories which will probably be built in the neighbourhood of Limerick will detract from the beauty of the west coast of Ireland. At present the station helps to supply electric power to Dublin, but without the steam stations in Dublin the hydro-electric power would be quite inadequate. To supply power to Dublin from the station 120 miles away is not economical. In our opinion, the water power available on the Liffey will sooner or later have to be harnessed for the benefit of Dublin, and possibly also the huge amount of peat available in the Bog of Allen will have to be utilised. The natural place to utilise the Shannon power is along the west coast. As the population increases, it is necessary to provide houses and factories for them, and many of the beauty spots will suffer. In *Distribution*, the journal of Henley's Telegraph Works, for February, an account is given of the Cadbury-Fry-Pascall Ltd. factory which was built seven years ago at Claremont, Tasmania. The factory is built near the sea and is surrounded by picturesque mountains, including Mount Wellington. The buildings are lighted by more than 800 windows and the floor space is 120,000 square feet. A model garden village has been laid out for the workers, the cottages each containing two or three bedrooms and two sitting-rooms. Tennis courts, golf-links, and everything that human ingenuity can do has been done to make the workers contented. The 85 motors and 12,000 lights are supplied with power purchased from the hydro-electric system. Special shower baths and dressing-rooms are provided for the workers, and electric lifts transport passengers and materials to the upper floors. Whenever possible, Australian raw material and machinery are used. There are many suitable

sites for similar factories within fifty miles of Limerick.

IN the second Rickman Godlee lecture delivered at University College, London, on Nov. 7 last and recently published by the College, Viscount Grey of Falodon gave a charming account of "Natural History, the Pleasure and Purpose of Observation". In simple language, more expressive than technicalities could ever be, and with many touches of humour, he pointed out the need for accuracy and caution in observation, and at the same time the danger of sterility which lies in over-caution. His speech itself expressed his own pleasure in the study of Nature, and this he visualised as having four aspects: the pleasure in common things; the pleasure in observing changes caused by the change of the seasons and the variety of light; the pleasure of noting the recurrence of things which come round regularly, for which we have learned to care; and last, the interest in seeing something rare. The address (which has been published by the College at 1s.) should become a text for the teacher of nature study in schools, for if nature study could but open the eyes and minds of youth to these beauties of sense and thought, it would fulfil its main purpose of adding to the fullness and happiness of life.

AMONG recent accessions to the British Museum (Natural History) are six photographs of East African elephants taken by Mr. Marcuswell Maxwell and presented by the proprietors of the *Times*. Of the collection of birds purchased for the Museum, some 300 of them, of about eighty different species, were collected by Mr. G. L. Bates during a trip in 1928 in a part of the interior of West Africa through which no ornithologist has previously travelled. The Entomological Department has received a collection of 1362 tiger-beetles from all parts of the world, presented by Mr. H. E. Andrewes, and a collection of Coleoptera and Hymenoptera from the Algerian Sahara, numbering 1224 specimens and including the types of several new species, from Dr. Ernst Hartert. The most interesting acquisitions to the Department of Geology are a complete *Ichthyosaurus* on a slab of Lower Lias limestone from Street, Somersetshire; and a large collection of Permian echinoderms and brachiopods, Triassic ammonites, and Tertiary gastropods and lamellibranchs from the island of Timor. The collection of minerals has received gifts of three new species: bismutstantalite, from Uganda, from the Director of the Geological Survey of Uganda; probertite, a borate mineral from California, from Prof. F. H. Probert; and larnite, from Larne, Co. Antrim, from Dr. C. E. Tilley. Recent acquisitions for the general library include Carlo Ruini's "Anatomia et Medicina Equorum nova", 2 volumes, Franckfurt am Mayn, 1603; the astronomer Olof Peter Hiorter's "Almanach för skott-ahret . . . 1744", an official Swedish almanack, about three inches square, with an article by Linnæus on Swedish plants, one of the only two copies known; and a copy of the anonymous skit on monasteries by the great mineralogist, Baron Ignaz von Born, in the style of a Linnæan zoological dissertation, entitled "Joannis Physiophili

Specimen Monachologiæ methodo Linneana Augustæ Vindelicorum, 1783", one of three copies known.

BARON KOI FURUICHI, of Tokyo, has been elected an honorary member of the Institution of Civil Engineers.

AN earthquake was recorded at Kew Observatory on Feb. 23. The first impulse was received at 18 h. 23 min. 50 sec. G.M.T. The epicentre was off the south of Greece near lat. 37° N., long. 23° E. The shock was of about the same intensity as that which occurred on Feb. 14 in the same region and caused considerable damage in Greece and Crete.

PROF. W. E. GIBBS, Ramsay professor of chemical engineering at University College, London, will deliver an address before the Institution of Chemical Engineers on "The Formation and Growth of Crystals", in the rooms of the Geological Society, Burlington House, London, W.1, on Mar. 5, at 8 P.M. All who are interested in the subject are invited to attend.

RECENT promotions and transfers in the Colonial Agricultural and Forestry Services include the following: Mr. D. C. Edwards, agricultural instructor, Sierra Leone, to be agricultural officer, Kenya; Mr. C. B. Taylor, superintendent, Agricultural Department, Nigeria, to be botanist, Nigeria; Mr. D. B. Palmer and Mr. L. R. Swindells, to be produce inspectors, Nigeria; Mr. J. C. Rammell, assistant conservator of forests, Kenya, to be senior assistant conservator of forests, Kenya.

AT a meeting of the Geological Society of London, held on Feb. 21, the following officers and new members of council were elected: *President*: Prof. E. J. Garwood; *Secretaries*: Mr. W. Campbell Smith and Prof. W. T. Gordon; *Foreign Secretary*: Sir Arthur Smith Woodward; *Treasurer*: Mr. F. N. Ashcroft; *New Members of Council*: Prof. P. G. H. Boswell, Prof. C. G. Cullis, Mr. J. F. N. Green, Sir Albert Ernest Kitson, and Dr. Bernard Smith.

AT the annual general meeting of the Quekett Microscopical Club, held on Feb. 11, the following officers and new members of the committee were elected: *President*: Mr. John Ramsbottom; *Hon. Treasurer*: Mr. C. H. Bestow; *Hon. Secretary*: Mr. W. S. Warton; *Hon. Reporter*: Mr. A. Morley Jones; *Hon. Librarian*: Mr. C. S. Todd; *Hon. Curator*: Mr. C. J. Sidwell; *Hon. Editor*: Mr. W. S. Warton; *New Members of Committee*: Mr. E. A. Robins, Mr. F. W. Chippis, Mr. J. J. Jackson, and Mr. C. Harvey.

APPLICATIONS are invited until Oct. 11 next from British subjects of either sex for the Smithson Research Fellowship, which has been established under the bequest of Mr. E. W. Smithson for research in natural science, with a view to the discovery of new laws and principles. Normally the research work of the holder of the fellowship will be carried out in the University of Cambridge. The appointment will be for four years in the first instance, with possible renewals up to eight years. The yearly stipend for the first two years will be £800. Copies of the regulations governing the fellowship, and forms of application, may be obtained from the Assistant Secretary of the Royal Society, Burlington House, Piccadilly, W.1.

A COMPREHENSIVE and attractive tour of Great Britain and Northern Ireland has been arranged to follow the World Poultry Congress to be held at the Crystal Palace on July 22-30. The tour, which is limited exclusively to delegates, will extend from July 31 to Aug. 11, and has been designed to combine a visit to places of interest to agriculturists in general and poultry farmers in particular, with a run through the beauty spots and historic centres of England, Scotland, Wales, and Ireland. The project has been assisted by the Irish Free State, which has organised a tour to be taken *en route*. Governments, municipalities, and other bodies will entertain the visitors. The cost of the tour will be twenty-five guineas.

THE Ministry of Health has issued a memorandum on the treatment of tuberculosis (*Memo.* 131 B/T.), being an analysis of work done during the year 1928 under the scheme of local authorities for the treatment of the disease. The returns include the death-rates from tuberculosis per million of population in different areas, which show considerable variations. The counties with the highest rates are Durham (1059) and Cornwall (1032), while Rutland has the lowest (501). Of the county boroughs, South Shields has the highest rate (2135) and Southport the lowest (631). Gloucester and Canterbury, which might be expected to be very similar, have rates of 689 and 1235 respectively. Of Metropolitan boroughs, Hampstead has the lowest rate (536) and Finsbury the highest (1639), the City of London being second with 1537. The average rate for all England is 924. Another memorandum (*Memo.* 146/T.) details changes necessi-

tated by the Local Government Act, 1929, in the arrangements for the treatment of tuberculous ex-service men so far as chargeable to the Ministry of Pensions.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—An assistant bacteriologist in the Department of Pathology and Bacteriology of the University of Sheffield—The Registrar, The University, Sheffield (Mar. 3). A head of the Chemistry and Industrial Chemistry Department of the Cardiff Technical College—The Principal, Technical College, Cardiff (Mar. 8). A resident radiologist at St. Bartholomew's Hospital, Rochester—The Secretary, St. Bartholomew's Hospital, Rochester (Mar. 11). A lecturer in mining subjects at University College, Nottingham—The Registrar, University College, Nottingham (Mar. 15). A Montague Burton professor of industrial relations at the University College of South Wales and Monmouthshire—The Registrar, University College, Cardiff (Mar. 15). A chemist in the Cereal Division of the Experimental Farms Branch, Department of Agriculture, Canada—(Particulars and application forms from The Secretary, High Commissioner for Canada, Canada House, Trafalgar Square, S.W.1) The Secretary, Civil Service Commission, Ottawa, Canada (April 17). A professor of engineering at University College, Southampton—The Registrar, University College, Southampton (April 22). An assistant professor of physiology and pharmacology in the University of Alberta—The Secretary to the Board of Governors, University of Alberta, Edmonton, Alberta.

Our Astronomical Column.

New Comet 1930a.—The first cometary discovery of 1930 appears to have been made independently in two places: (1) by Mr. L. Peltier, at Delphos, Ohio; and (2) by Drs. Schwassmann and Wachmann at Bergedorf. The following observations have come to hand from the I.A.U. Bureau, Copenhagen, the second being made by Prof. G. van Biesbroeck:

U.T.	R.A. 1930-0.	N. Decl. 1930-0.	Place.
Feb. 18 ^d 22 ^h 29 ^m 4	9 ^h 39 ^m 40 ^s 27	34° 46' 11"	Bergedorf
20 4 19-9	9 22 38-93	40 21 55	Yerkes

The magnitude was given as 10 on Feb. 18, and 11 on Feb. 20. The deduced daily motion is -13½ min., North 4½°. The comet is probably fairly near the earth, from its very rapid motion. Owing to its high north declination, it is observable throughout the night. Mr. Peltier was the co-discoverer with Mr. Wilk of Comet 1925 XI.

The following elements and ephemeris of Comet 1930a, computed by Mr. J. P. Möller, Copenhagen, have been telegraphed by the I.A.U. Bureau:

T	1930 Jan. 15-686	U.T.
ω	325° 10'	} 1930-0
Ω	147 33	
i	99 55	
log q	0.03655	

EPHEMERIS FOR 0^h U.T.

	R.A.	N. Decl.
Mar. 1.	7 ^h 44 ^m 52 ^s	58° 24
„ 5.	7 16 24	60 58
„ 9.	6 56 0	62 24

Astro-Photography of the Future.—Dr. G. W. Ritchey contributes another article, in continuation of that referred to in NATURE of Feb. 1, p. 180, to *L'Illustration* of Jan. 18. Several further photographs of nebulae, both diffuse and planetary, are beautifully reproduced; all except one of these (the obscure nebula south of ζ Orionis, photographed by Duncan) are taken from his own plates obtained with the 60-inch reflector at Mount Wilson Observatory. Dr. Ritchey gives a brief history of our knowledge of nebulae, and describes with a certain amount of detail the particular objects illustrated. It is not clear, he says, why the chief observatories of the world, which are richly endowed, and the principal institutions formed for the advancement of science, do not unite to establish a large photographic telescope at some carefully chosen, elevated, and unpopulated place, in latitude about 25° S., where the star clouds and nebulae of the Sagittarius region—which certainly form the most important and interesting part of the Milky Way and have been comparatively unexamined by powerful modern instruments owing to the situation of the latter in northern latitudes—could be effectively investigated. If some friend of astronomy would provide the funds for such an undertaking, unsuspected and incredible discoveries would be made, to the great profit of science and education. The resources and possibilities of celestial photography have scarcely begun to be explored. Vital details have been almost totally neglected. When they are given the attention they deserve, a new celestial photography will be born, and the results will be incomparably more useful and important for thinking humanity than those obtained up to the present.