News and Views.

SIR ALFRED EWING'S intimation that he desires to retire from the principalship of the University of Edinburgh on Sept. 30 came as a great surprise to his colleagues. He refers in his letter to the University Court to the fact that in a few weeks he will be seventy-four years of age, but his friends have noted no sign of failing in his wide scientific outlook or in his grasp of the business of the University. Since 1916, when Sir Alfred was offered and accepted the principalship in succession to the late Sir William Turner, the University has expanded greatly—thirteen new chairs have been founded. Especially noteworthy is the acquisition of a site of 115 acres on the southern edge of the city, on which now stand the departments of chemistry and geology, and on which the new departments of zoology and animal breeding are in course of erection. Other extensions include the purchase of premises near the Old College for English and modern languages, the reconstruction of the Department of Surgery and the building of a laboratory for clinical medicine at the Royal Infirmary. Early in his tenure of office Sir Alfred successfully carried through the negotiations which resulted in the admission of women to full privileges as students in the Faculty of Medicine, and later he brought into closer co-operation with the University the Training College for Teachers and the Edinburgh and East of Scotland College of Agriculture, the heads of which are professors in the University. Sir Alfred has shown himself throughout to be a man of great energy and resource. He has never spared himself when he could serve the University, and he has done much to bring about a better understanding between the University and the city. It was entirely fitting, therefore, that at a meeting of the Lord Provost's Committee, held on the day on which Sir Alfred's resignation was announced, it was unanimously resolved to recommend that the freedom of the city be conferred upon him.

THE paper read by Mr. G. Fletcher at the Royal Society of Arts on Wednesday, Jan. 30, on the Shannon hydro-electric scheme, attracted a very large audience. It will be remembered that four years ago the Irish Free State decided to undertake an ambitious scheme for supplying hydro-electric power to Ireland. The scheme was devised by an eminent firm of German electrical engineers, and after being slightly modified by a committee of four continental experts, who spent a few weeks making a local study of the problem, was adopted, the whole undertaking being at the expense of the Government. Provision was made not only for the existing needs of a large part of the country, but also for the needs of industries which it is hoped will be established when power is available. Next October the first stage of the scheme is to be completed, the expense up to this stage being about five million pounds.

THERE are about 130 towns and villages in the area of supply of the Shannon hydro-electric scheme which have not an electric supply. It is proposed to charge consumers on the basis of 2*d*. per unit and an additional charge varying from 6*d*. to half-a-crown per week, depending on their Poor-law valuation. For small houses the wiring will be done on the hire-purchase system, a fixed weekly charge being made until the cost has been refunded. Public institutions and factories will be charged 6d. per unit for lighting. As Dublin has a very active and efficient municipal supply by steam generating plant, it is difficult to see how it can benefit from the Shannon scheme. The annual cost of the interest and the power losses in the 'grid' to Dublin from the Shannon power house will be very appreciable. Whilst it is easy to criticise the scheme from the business point of view, the new power station when finished will be a valuable asset. Every effort must be made to attract industries requiring electric power to Ireland. The danger lies in political pressure leading to a rapid expansion of the grid unjustified by the demand and to the scrapping of profitable steam undertakings.

A NUMBER of papers dealing with band spectra have appeared recently in the *Proceedings of the Royal Society*. Following on the investigations of Lord Rayleigh on mercury, and of Prof. W. E. Curtis and Dr. Jevons on helium, and of Sir Robert Robertson on ammonia, phosphine, and arsine, to mention only a few of the more important that were published last year, there is now a group of six communications by various authors in the first number of the *Proceedings* for 1929. One of these, by Dr. Kapuscinski and Miss Eymers, on intensity measurements in the secondary spectrum of hydrogen, is purely descriptive, although it constitutes a valuable appendix to the wave-length tables of this spectrum which were recently issued from Bonn, and provides rich material for its further analysis. The other papers all deal with problems of molecular structure, and include independent contributions by Dr. R. C. Johnson and Dr. Jevons on the spectra of certain fluorides, a paper by F. A. Jenkins and H. A. de Lazlo on the celebrated bands of silicon nitride, and one by J. M. Walter and S. Barratt on the band spectra associated with the vapours of zinc, cadmium, and mercury.

THE main interest of band spectra appears now to have shifted to the problems which have been raised by the new mechanics, and to the elucidation of the nature of the electronic transitions involved in the production of bands in the visible and ultra-violet regions. In cases where a definite decision is possible, the new quantum theory, here as elsewhere, predicts results which are in better agreement with experiment than those which would follow from the older quantum theory ; in the matter of electronic energy levels, there can also be little doubt that the theories which are being developed by Dr. Hund in Germany and by Prof. Mulliken in America, to which several references have been made in NATURE, are essentially correct, although there still remains a great deal to be done in this connexion. It is unfortunate that very many

substances which give rise to well-developed band-spectra cannot be isolated as chemical individuals; there seems to be no immediate prospect of obtaining molecular helium outside of a discharge tube, for example, and even the fluorides which were mentioned above are probably chemically unstable or unimportant compounds. Hydrogen and carbon monoxide are two notable exceptions *inter alia*, and in such cases identity of the molecular constants deduced from the band spectra and from physico-chemical data respectively provides a valuable test of the theoretical interpretations of both sets of measurements.

CABLE advices from the *Carnegie* after her arrival at Callao on Jan. 14 state that on Jan. 8 a new submarine ridge, which has been named Merriam Ridge, was discovered. At the point of crossing, Merriam Ridge is ten miles wide and rises 3000 metres above the 4000-metre depth on either side. The top of the ridge, in lat. 24° 57′ S., long. 82° 15′ W., is at 1168 metres, this value being checked by three sounding methods, namely, sonic, wire, and thermometer, to within 20 metres. When 60 miles west of Callao, the surface temperature, which had been 21·5° C., dropped to 19° C. and remained at that value until arrival at Callao. Captain Ault's report shows that the activities in the various observational programmes are being successfully continued, the work between Easter Island and Callao (Dec. 12, 1928–Jan. 14, 1929) including 38 declination stations, 15 horizontal-intensity and inclination stations, 17 oceanographic stations, 72 sonic depth stations, 12 pilot balloon flights, 25 complete photographic 24-hour potential-gradient records, 4 24-hour series of other atmospheric-electric observations, 20 biological stations, 6 evaporation series. The vessel was expected to leave Callao about Feb. 3 en route to Papeete, Tahiti, Society Islands, where she is due to arrive early in March.

PRIOR to the War, all the medical schools of the University of London (with the exception of the London School of Medicine for Women) were restricted to men, but it will be remembered that during the War seven of the schools admitted women in addition. These facilities for women were withdrawn a short time ago, except in the case of University College Hospital, which still admits a limited quota. The action of the authorities of the medical schools aroused considerable discussion, and a Committee was appointed by the Senate of the University of London "to consider the question of the Limitations placed upon the Medical Education of Women Undergraduates." According to the report which has just been issued, it is considered that the facilities in London for *pre-clinical* instruction of women are ample, and it is only the withdrawal of those for *clinical* instruction which has given rise to the present inquiry. The Committee thinks that there is no valid argument against the provision of co-education, but that co-education to be successful must be voluntary. No countenance is therefore given to the suggestion which has been made that the University should enforce a policy of co-education upon the medical (and other) schools by withdrawal of recognition or other means. Such a policy, to be logical, would have to be applied all round, and this would force men upon women's colleges, and men upon the London School of Medicine for Women! Nor does it seem desirable that co-education should be universal in the medical schools of London, for such a policy might result that in some schools there would be only a very small number of women—possibly only one woman—which on various grounds is highly undesirable. The Committee recommends, therefore, and the Senate has given general approval, that its report be communicated to the schools in the Faculty of Medicine, and that the vice-chancellor be requested to invite them to consider the possibility of admitting a quota of women students in the future.

THE Joint Expedition of the Percy Sladen Memoria Fund and the American School of Prehistoric Research, which has recently been investigating caves in the Sulaimani district of north-east Iraq, has discovered Palæolithic remains in two of the sites in which soundings were made. A small cave near Zarzi, about 30 miles north-west of Sulaimani, which was excavated completely, yielded an abundant late Upper Palæolithic industry which has marked affinities with the Upper Aurignacian of Central Europe and of the Grotte des Enfants at Mentone. The presence of Tardenoisian microliths in the upper part of the deposit shows that this industry, although typologically Aurignacian, represents the final development of the Upper Palæolithic in a region into which the Magdalenian never penetrated. The second Palæolithic site discovered was near Hazar Merd, 10 miles due west of Sulaimani. A large cave known locally as the 'Dark Cave' (*Ashkot-i-Tarik*) contained Mousterian hearths three metres in thickness, underlying a mixed layer with pottery of various ages. The Mousterian industry is true to type, and contains no elements that are not already well known in the Mousterian of Europe. It is marked by an abundance of well-made points and a relative scarcity of side-scrapers. Owing to its size the 'Dark Cave' could only be partially excavated, but it is hoped that the American School of Prehistoric Research will be able to complete the work next season. These are the first recorded Palæolithic finds in southern Kurdistan, but there is no doubt that the whole area is rich in promise, and the comparatively settled state of the country should now make it possible to carry on work in this region, which for many years has been practically closed to Europeans.

THE executive committee of the Cambridge Preservation Society, which was formed in March of last year, has published a short statement of a particular part of its work during the past year. It was felt that at all costs the pleasant road to Madingley, the view from Madingley Hill and the approach to Coton village by the footpath should be secured. Finding that the risk was acute, it was decided to use whatever funds were available to this end. Assisted by Col. ffennell of Whytham, near Oxford, Prof. Trevelyan, and other benefactors, the Society was enabled to purchase for £22,300 about 380 acres of land, including the south side of Madingley Hill. The danger to a most beloved part of the countryside west of Cambridge has thus

been averted for the time, but by the acquisition of this land the Society has incurred a considerable debt. The generous benefactors who have lent money must be repaid, and it is certain that further help will be required. The Society intends, however, to postpone to a later date any public appeal for funds in order not to interfere with the efforts of the University to raise money for meeting the conditions of the recent benefaction from the International Education Board.

AMONG the many scientific investigations being made into food storage and preservation are those relating to the handling and carriage of fruits to Great Britain from various parts of the Empire, and every fruiterer's shop in London is evidence of the value of those investigations. Few people, however, realise the extent of our fresh-fruit trade with Australia and South Africa, the latter of which exports annually 27,000 tons of soft fruits such as grapes, pears, and peaches, and 45,000 tons of citrus fruit, principally oranges. A few years back, such fruits were placed directly in the refrigerated holds of ships and much waste occurred. To-day, all the fruit is pre-cooled before shipment, and *Engineering* for Jan. 25 contains a description of the buildings and methods used at Cape Town for this purpose. Fruit on arrival by train is run into a large insulated air-lock, unloaded on to standard-size trolleys and then electrically hoisted and traversed into cooling chambers, of which there are 72, each capable of holding 12 trolleys. Soft summer fruits such as grapes and peaches are then cooled from 90° to 34° F., while winter fruits have to be cooled from a temperature of about 60° to 40° F. In shipping, the trolleys are run out and hoisted directly aboard. Many problems of construction, refrigeration, and insulation were involved in the design of the building and machinery, the consulting engineer for which was Mr. E. A. Griffiths, physicist to the South African Government.

SIR WILLIAM BRAGG delivered the first of a course of three lectures at the Royal Institution on "The Early History of X-Rays" on Jan. 31. Sir William stated that no scientific discovery before or since that of Röntgen in 1895 has excited such immediate or universal interest. The effect was all the greater because scientific workers everywhere were able to repeat the experiment without difficulty. From a scientific point of view the new departure was equally remarkable. As Maxwell pointed out long ago, the problem of the relation between electricity and matter was more likely to receive explanation from the study of the electric spark than in any other way, but the key had not been found in 1895. Röntgen's discovery so increased the facilities for experiment, and was so suggestive of the directions in which to move, that the world was soon led to the recognition of the electron as the all-important factor. Before 1895 the wealth of experimental results lacked co-ordination. The work of Faraday had shown that molecules in a liquid were broken into parts of which some carrying negative electricity moved towards the negative and others towards the positive pole. But the puzzle was as to why it was so easy to send the current through the liquid and so difficult to send it through a gas. Yet in certain circumstances, such as heating by a flame or the action of ultra-violet light, a gas could be made to conduct quite well. It became clear that the molecules of the gas must be broken before the electricity could pass, just as in a liquid. The knowledge of the fact that the atom was not the unchangeable entity which it had been assumed to be, and that an electron could be torn from it and become free to move and shatter other atoms, was still hidden from the experimenter, and it was this which caused all his results to lack cohesion. But he could at once appreciate the new discovery and move on towards the explanations that were forthcoming almost immediately.

AT a meeting of the Newcomen Society on Jan. 23, Mr. Rhys Jenkin read a paper entitled "A Chapter in the History of the Water Supply of London," in which he dealt mainly with the pumping apparatus erected by Sir Edward Ford on the banks of the Thames a little to the east of Somerset House. Ford, who was born in 1605 and died in 1670, was a royalist soldier of good family and married the sister of Ireton, son-in-law of Cromwell. During the Commonwealth he turned his attention to practical invention, and in 1655 was granted a patent for a pumping apparatus. The patent is not merely of interest in the history of mechanics, but also it was one of only about a dozen such patents granted by Cromwell, and it is the only one the enrolment of which is to be found at the Public Record Office. The machinery, which was horse worked, was in a tower and, according to the description contained in the *Journal des Voyages de Monsieur de Conconys*, published in 1666, it consisted of four suction pumps in series worked by levers and rods moved by a cam wheel turned by the horses. The tower is shown in a contemporary plan of the district by Hollar. Ford's pumping engine was one of several which were erected on the Thames between Chelsea and Wapping in the seventeenth century.

PARTICULARS of America's longest railway tunnel were recently given in a *Daily Science News Bulletin* published by Science Service, Washington, D.C. The tunnel is on the Great Northern Railway, and pierces the Cascade Range of mountains about a hundred miles east of Seattle. Up to now, the longest railway tunnel in America was the Moffatt tunnel in Colorado, 6·11 miles long. The Cascade tunnel is 8 miles long, and is said to be exceeded in length by only the St. Gothard, Simplon, Loetschberg, and Mt. Cenis tunnels through the Alps. Another very long tunnel, however, is the Apennine Tunnel on the Apulian Aqueduct in southern Italy. This is about 9½ miles long. In constructing the Cascade tunnel, advantage was taken of the existence of a deep valley over the projected line, and from this a shaft more than 600 feet deep was sunk. From this shaft auxiliary tunnels were bored east and west, and these again were used to give access to several working faces in the main tunnel. By this means, progress was so rapid that the work was carried through in three years. The tunnel was open for traffic on Jan. 12, trains being worked through by powerful electric locomotives supplied with current at 11,000 volts.

ACCORDING to the Report of the Building Research Board for the year 1927 (London: H.M. Stationery Office; 3s. net), which has recently appeared, the staff of the Board at the end of the year was 111, and committees on weathering, on structures and on acoustics, assist the Board. The work in progress deals with weathering, building materials, cements, plasters, asphalts, with wind pressure and vibrations, and with heating, ventilation, and acoustics of buildings. The sulphuric acid from coal fires appears to be greatly responsible for weathering, and capillary effects for the decay of sandstone in the vicinity of limestone. Thermal stresses due to unequal temperature or to freezing cause spalling. Washing a surface at intervals and plastic repairs with oxychloride cement retard decay. The tests of structures show that their strength cannot be predicted from that of the bricks of which they are composed. Although results of such importance as these are being obtained and are made public by reports and by articles in the technical and the daily Press, the Board feels that full advantage is not being taken of the information by the industry. Closer co-operation between the Board and the industry is much to be desired.

THE nature of the work done by research associations does not as a rule lead to immediate and sensational achievements. It does, however, often lead to considerable improvements in manufacture and consequent reductions of price. To take a concrete case, the British Electrical and Allied Industries Research Association, which has just issued its eighth annual report, points out that its researches on cables have led to very appreciable economies being effected in the distribution of electrical energy. The consumer gets part of this saving as the price of supply is reduced. Similarly, the researches on the properties of steam which Prof. H. L. Callendar carried out for the Association will probably result in improvements in the manufacture of steam turbines, and again the public will get part of the benefit. The Association spent last year £25,000, of which the Government contributed £7200. This grant will rapidly diminish as the end of the second five years of the existence of the Association approaches, and it is necessary to take immediate action. At present the manufacturing section of the industry provides the larger part of the cost and eighty per cent of the personnel of the numerous technical committees. It has been pointed out that if every consumer of electrical energy contributed one farthing for each pound paid for electrical energy consumed, then the sum provided would pay for the whole annual cost of the researches of the Association, and the consumer would doubtless reap the benefit. We are afraid, however, the procedure underlying this suggestion could not be generalised and applied to researches in other directions. It would, therefore, even if it were equitable, be impossible to put directly into practice.

Two recent communications, one to the Manchester Literary and Philosophical Society, by Mr. H. Garnett, and another to the International Photographic Conference, have directed attention to the work of John Benjamin Dancer, one of that numerous class of scientific worthies whose names remain almost unknown, while their work is the property of all. Who, for example, knows that Dancer was the inventor of the porous earthen pot used in millions of 'wet' batteries? Who remembers that he devised the spring contact breaker or current interrupter originally applied to the induction coil, and still employed in almost the same form in every electric bell throughout the world? He was also the inventor of the minute photographs on glass which attracted attention at one time; he was one of the earliest workers on the form of photography introduced by Daguerre; and he experimented on the electro-deposition of copper. Another of his inventions was the binocular stereoscopic camera, the original example of which is preserved at Manchester and was described to the International Photographic Conference last summer. Like his father and grandfather, an optician by calling, Dancer made all the apparatus used by Joule in his classical experiments on the mechanical theory of heat. Born in London in 1812, he died in straitened circumstances in Manchester on Nov. 22, 1887, having for many years been blind.

THE Royal Cornwall Polytechnic Society was founded in 1833 at the suggestion of Miss Anna Maria Fox, its first purpose being to encourage a number of clever workmen who spent their spare time in constructing models and devising inventions. It set itself to provide technical education, and to encourage industry and ingenuity in a community distinguished for its mechanical skill, as well as to finance any invention likely to benefit local industries, particularly mining. The short history of the Society, which is included in the annual report for 1927, shows how the meetings became a recognised centre for the exhibition and demonstration of new inventions, some of which have become of world-wide renown and usefulness, such as Were Fox's dipping needle deflector, Nobel's nitro-glycerine, and Loam's man engine. Even more generally important have been the Society's educational efforts. Evening classes in mining subjects, a science school at Falmouth, and classes in connexion with South Kensington examinations, all owe their origin to its foresight and energy. The reports of 1927 and 1928 (vol. 6, pts. 1 and 2) show that the arts and crafts are still being encouraged by extensive prize schemes in connexion with the annual exhibition and special school work. In addition to their formal records, the reports also contain notes on eminent Cornishmen, and original articles on "Ancient Mining in Cornwall," French war prisoners in Cornwall, and the "China Clay Industry," as well as an address by Lord Gainford on "The Progress of Broadcasting."

Two articles of special biological interest in the December *Scientific Monthly* are Prof. Chas. G. Rogers' "Physiological Evidences of Evolution and Animal Relationship," and Prof. Theodore Korpányi's "Transplantation of Organs." In the former is discussed the possible evolutionary significance of the osmotic pressure of body fluids, their composition, and the relationship between their hydrogen ion concentration and that of sea-water; blood coagulation

and blood reactions; chemical actions and regulations in living bodies; excretion, reproduction, and death. The discussion suggests many physiological lines along which further investigation might well lead to biological conclusions of general importance. Prof. Korpányi's article describes the wonderful success which attended his efforts to transplant organs, such as amphibian and mammal eyes, the testis and spleen of amphibians, the spleen of rats, from their original connexions to entirely novel positions. Even amongst mammalia he has found that in its own proper situation a transplanted eye may regenerate the optic nerve and regain a power of vision.

THE Ossolinski Institute at Leopol (Lwow), in Polish Galicia, has recently celebrated its centenary. The founder died in 1826, his library arrived at Leopol in 1827. The Institute has been an irreducible bastion of Polish culture and intellectual life during a tragic century. The union of Polish learned societies in Leopol now presents a *Bulletin* (in French) describing their activities during 1925 and 1926. There are some thirty associated societies grouped in unions round the six Polish universities. Intellectual life is just emerging from war-time depressions. Books in Polish are a difficulty exaggerated by high costs of printing, import taxes on paper, lack of modern printing machinery, and the discouragement of publishers who find only a restricted market. The suggestion is made that publishers might agree not to publish competitive scientific books with similar contents, also to prepare a programme of educational text-books. Co-operation with foreign countries is welcomed; scientific publications have been sent to Tokyo and received from America, but on the whole it has proved easier to exchange periodicals than personal visits. Visitors to Poland will find the 94 pages of this *Bulletin* a useful vade-mecum as a guide to persons and institutions.

THE Registrar-General has issued the provisional figures of the birth- and death-rates and infantile mortality during 1928 for England and Wales. The birth- and death-rates are respectively 16·7 and 11·7 per 1000 population, and the infantile mortality is 65 deaths under one year per 1000 live births. The birth-rate is 0·1 per 1000 above that of 1927, and the death-rate is 0·6 per 1000 below that of 1927, and only 0·1 per 1000 above the lowest recorded (1923 and 1926). The infantile mortality-rate is the lowest on record, 4 per 1000 births below that of 1923.

DR. J. A. V. BUTLER, lecturer in physical chemistry in the University of Edinburgh, has been awarded the Meldola Medal of the Institute of Chemistry for his published work on the modern theory of conducting solutions. The Meldola Medal is awarded annually to the chemist whose published chemical work shows the most promise, and is brought to the notice of the administrators during the year ending Dec. 31, prior to the award. The recipient must be a British subject of not more than thirty years of age at the time of the completion of the work.

IT is announced in *Science* that Dr. Oliver Kamm, head of the department of chemical research of Parke, Davis and Company, formerly professor of organic chemistry in the University of Illinois, has been awarded the prize of 1000 dollars of the American Association for the Advancement of Science. The prize is awarded each year for a notable contribution to science presented at the annual meeting of the association and the associated scientific societies. Dr. Kamm's paper, presented before the section of chemistry at the recent New York meeting of the Association, was entitled "Hormones from the Pituitary Glands."

ACCORDING to the *Times* of Jan. 31, Signor Mussolini has presented to Switzerland a part of the scientific manuscripts of Albrecht von Haller, which were deposited at the Brera Library in Milan, and in the University of Pavia. Haller has sometimes been called the father of modern physiology. Born at Berne on Oct. 16, 1708, as a boy he acquired knowledge with ease, and as a man displayed immense industry and unusual versatility. His medical studies were prosecuted at Tübingen and at Leyden, where he came under the influence of Boerhaave. He practised for a time in his native town, and from 1736 until 1753 was professor of anatomy and botany at Göttingen. Returning to Berne, he there compiled his "Elementa Physiologiæ" and other works, took part in public affairs, and corresponded with eminent men in all parts of the world. He died at Berne on Dec. 12, 1777.

AT the recent annual meeting of the Botanical Society of America, held in New York City, the following were elected as Corresponding Members: Prof. C. H. M. Flahault, professor of botany in the University of Montpellier; Dr. D. H. Scott, lately honorary keeper of the Jodrell Laboratory, Royal Botanic Gardens, Kew; John I. Briquet, director of the Botanic Gardens, Geneva; and Alexander Zahlbruckner, director of the botanical section of the Natural History Museum, Vienna. The following were elected officers for the Society: *President*, Dr. Margaret C. Ferguson, Wellesley College; *Vice-President*, Dr. L. W. Sharp, Cornell University.

IN our issue of Aug. 18, 1928, p. 251, reference was made to a 'record' low barometric pressure of 665·1 mm. (886·8 millibars) during a typhoon. It should have been stated that the observation was made on Aug. 18, 1927.

THE *Leicester Museum, Art Gallery, and Library Bulletin*, a quarterly leaflet of about eight pages, is a useful means of keeping touch between the public and the institutions. The January number contains a select list of recent additions to the Library, but none of them, out of about a hundred serious volumes on science, art, and philosophy, deals with biological science. The special exhibition illustrating "Sport in the Midlands," from contemporary paintings, drawings, and prints of the last two centuries, proved to be a great success.

THE Ministry of Health has issued to sanitary authorities a *Circular* (No. 955) directing attention to the rapid spread of influenza reported from the United States and Canada, and bringing to the notice of local authorities the Memorandum on Influenza issued in 1927 (Memo. 2/Med.). This memorandum reviews the 1918–19 epidemic, discusses the bacteriology of the disease and mode of infection, and describes measures of personal protection and precautions when attacked, and outlines the action to be taken by sanitary authorities to combat influenza outbreaks. According to a recent *Daily Science News Bulletin*, issued by Science Service of Washington, D.C., more than a million cases of influenza occurred in the United States before Christmas, but the epidemic is now subsiding.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned :—A county librarian under the Leicestershire County Council—The Director of Education, County Education Office, Leicester (Feb. 16). A live stock officer under the Ministry of Agriculture and Fisheries—The Secretary, Ministry of Agriculture and Fisheries, 10 Whitehall Place, S.W.1 (Feb. 18). An assistant chemist under the Northern Coke Research Committee—Prof. Briscoe, Armstrong College, Newcastle-upon-Tyne (Feb. 18). A tutor for philosophy, politics, and economics at St. Hilda's College, Oxford—The Secretary, St. Hilda's College, Oxford (Feb. 23). A lecturer in pharmaceutics at the Chelsea School of Pharmacy—The Principal, Chelsea School of Pharmacy, Chelsea Polytechnic, S.W.3 (Feb. 25). A biologist, and a chemist, with experience of physiological problems, to assist in carrying out a survey of the Estuary of the River Tees—The Director, Marine Biological Laboratory, Plymouth (Feb. 28). A junior scientific officer under the Directorate of Scientific Research of the Air Ministry, primarily for research work in the aerodynamics department of the Royal Aircraft Establishment—The Chief Superintendent, R.A.E., South Farnborough, Hants (Mar. 2, quoting A.319). A head of the engineering department of the Technical Institute, Gillingham—R. L. Wills, Elm House, 15 New Road Avenue, Chatham (Mar. 9). An associate professorship of geography in the University of Sydney—The Agent-General for New South Wales, Australia House, Strand, W.C.2 (Mar. 16). A professor of philosophy in the University of Lucknow—The Registrar, The University, Lucknow, India (Mar. 17). A professor of medicine in the University of Lucknow—The Registrar, The University, Lucknow, India (Mar. 31). An assistant lecturer and demonstrator at the Leathersellers' Technical College—The Acting Principal, Leathersellers' Technical College, 176 Tower Bridge Road, S.E.1. Assistant directorships of a social survey—The Professor of Social Science, University, Liverpool. An entomologist for original research work into the bionomics of Tacchardia Lacca —"India," care of Richardson and Co., 26 King Street, St. James's, S.W.1.

Our Astronomical Column.

A CHART OF MERCURY.—M. E. M. Antoniadi published a chart of Mercury in *Comptes rendus* of the Paris Academy of Sciences in the autumn of 1927. This is reproduced, with a few additions resulting from his 1928 observations, with the 33-inch Meudon refractor, in the *B.A.A. Journal* for January 1929. Some of the markings, in particular those in the north-east quadrant, closely resemble those in Schiaparelli's chart, reproduced in *Ast. Nach.*, 2944 ; but the south-west quadrant is practically filled with a dusky shading ; the darker regions of this coincide with narrow dark markings drawn by Schiaparelli.

M. Antoniadi looks on the 88-day rotation, first announced by Schiaparelli, as completely established. He remarks that it has long been known that Japetus always turns one face to Saturn, this being proved by its notable variation of light in different regions of its orbit ; and as its distance from Saturn is 62 Saturn-radii, it was only to be expected that the sun, the density of which is twice that of Saturn, should produce a like effect on Mercury at a distance of 82 sun-radii. He considers that the axis of rotation of Mercury is not exactly perpendicular to the orbit plane, but does not indicate the amount or the direction of the deviation.

EPHEMERIDES OF VARIABLE STARS.—At the meeting of the International Astronomical Union at Rome in 1922, the Cracow Observatory was entrusted with the calculation and publication of ephemerides of variable stars. This task has been energetically fulfilled by Prof. T. Banachiewiez, and the seventh annual volume has just appeared. The descriptive matter is given in two languages, Polish and Peano's simplified Latin. The latter is easily read by any one with an elementary knowledge of Latin or the derived languages.

There is a useful index to the ephemerides and notes on certain stars. Use is made of three different time systems ; the Greenwich civil day (U.T.), the Julian day, and the new system proposed by the author, which begins at Greenwich midnight on Jan. 0, 1801. Tables are given to reduce from any of these systems to the others. The volume contains other useful tables, of precession, obliquity of ecliptic, moon's equation, etc.

THE BRIGHTNESS OF THE NEBULÆ.—*Ast. Nach.*, 5609, contains a paper by A. Markov of Pulkovo on the brightness of the spiral nebulæ. He has used both his own observations and those of many other observers, in particular Dr. Wirtz of Strasbourg. He concludes that the brightness of the spirals is far too high to be explained by reflection from the galaxy, as was suggested by Prof. Lindemann. He finds the surface brightness of the Andromeda nebula to be abnormally high, twelve times that of the average spiral, and seventy-six times that deduced for the galaxy ; the latter, according to its surface brightness, though not according to its size, is to be ranked among the faint spirals. The star-density in the Andromeda nebula is concluded to be unusually great, and confirmation of this is drawn from the large number of novæ that have appeared in it. Its central brightness (measured from a square 1″ in the side) is given as 17 mag., falling to 21 mag. at a distance of 5′ along the minor axis. The Pulkovo results give the value + 0·68 mag. for the average colour index of the spirals.

The paper also deals with gaseous nebulæ ; the photographic brightness of some of them was found to be lower than the visual brightness. Their brightness as a whole is stated to be of the same order as that of the gas in an exhausted tube under the influence of soft cathode rays.