

support for the necessary endowment may be forthcoming, and that the labours of those who will work here may be blessed with every success, that I now declare the Ross Institute and Hospital open."

After the Bishop of Southwark offered a dedicatory prayer, a vote of thanks to the Prince was proposed by the Duchess of Portland, and seconded by Sir

Ronald Ross, who expressed his grateful thanks to the Prince for the kind manner in which His Royal Highness had referred to his work. He also thanked all the contributors for the honour they had done him in naming the Institute after him. The Prince replied to the vote of thanks, and after his departure the Institute was opened to the inspection of the guests.

### News and Views.

ON July 14, in the House of Lords, the Duke of Northumberland directed attention to the alteration in the status of the engineer officers of the Royal Navy brought about by the Admiralty Fleet Order 3241/25 issued last November. This matter has already been referred to in these columns on several occasions. In his remarks the Duke of Northumberland said that the Order abolished the last vestige of the improved status of the engineer officer under the 1902 scheme for the amalgamation of the engineering branch with the deck officers. Not only did it relegate the engineer officer to the non-executive branch of the Navy, but it also emphasised the distinction between the deck officer and the engineer officer by re-imposing the wearing of the purple stripe. The Duke of Northumberland was supported by Viscount Chelmsford and the Earl of Selborne, the latter remarking that the point of view of the engineer officers had been recapitulated by Engineer Rear-Admiral Sheen in a letter in the *Times* of June 1, and to that he had seen no answer. Moreover, the Order might do great harm and could do no possible good. Viscount Chelmsford said that the question had arisen when he was First Lord and he had left a personal note for his successor, Mr. Bridgeman, to the effect that there had been no acute demand for the change, and that the system as it then stood was working well. The Duke of Montrose also spoke. He seemed to think that because purple had been worn by emperors, engineers should not object to it. The answer to that is, of course, that it is the way it has been imposed and what it signifies that renders it so distasteful. With his suggestions that engineer officers should have executive command of certain establishments ashore and that an engineer officer should be appointed a Sea Lord of the Admiralty a good many will agree.

THE reply for the Admiralty was made by Earl Stanhope, who repeated Mr. Bridgeman's assurance that the Order did not affect the ranks, titles, and powers of engineer officers. That, however, is not correct, for the Order does undoubtedly take away the power of engineer officers to rise to certain high appointments which they could have reached as executive officers. Earl Stanhope said that the Order was designed to sweep away an anomalous position, and divided all officers into categories according to their duties. He did not say, however, why there should be three categories of engineer officers—one for the main machinery, one for the gun machinery, and one for the electrical machinery, while navigating, gunnery, and torpedo officers all remained in one category. Such a reply will give no satisfaction in

engineering circles, and does nothing towards removing that sense of injustice from which engineer officers are suffering. In view of the apparent determination of the Admiralty to stand by this Order and to impose the purple stripe, we think the Joint Committee of the Engineering Institutions, of which Sir William Ellis is chairman, would do well to issue a short plain statement of the matter as it now stands. The excellent memorandum issued some months back was too long for general distribution, and in the highest interests of Great Britain this is a matter for the widest publicity.

ON July 22 the centenary occurred of the death of Guiseppe Piazzi, the discoverer of the first of the minor planets. Piazzi was born in the north of Italy in 1746, and came under some of the most distinguished teachers of his day. He then entered the monastic order of the Theatines. A professor first at Genoa and then in Malta, in 1780 he was appointed to a chair of mathematics at Palermo. His efforts to found an observatory there were seconded by the Viceroy of Sicily, Prince Caramanico, and the observatory was opened in 1791. Piazzi meanwhile had studied Lalande's methods in Paris and Maskelyne's at Greenwich, and when he returned to Palermo in 1789 he had among his instruments a 5 ft. vertical circle by Ramsden. He devoted himself to the preparation of star catalogues, and it was while pursuing this work that in January 1, 1801, he discovered Ceres, named thus in allusion to the titular goddess of Sicily. He communicated his discovery in the first place to Oriani, who calculated the elements of its orbit, and then to Bode. Piazzi's star catalogues were published in 1803, 1807 and 1814, the latter containing 7646 stars. He served for some time as president of the Academy of Sciences of Naples, and was elected a foreign member of the Royal Society of London. By his will he bequeathed his library and instruments to the observatory at Palermo, and left an annuity for educating students in astronomical science.

THE news of the impending retirement of Prof. J. A. Fleming from the chair of electrical engineering at University College, London, a position which he has occupied since its foundation in 1885, will be received with regret by the large number of friends and students who have come under his influence. His tenure of office has been practically co-extensive with the growth of modern electrical engineering, a development in which he has taken a great part. So early as 1879 he was the scientific adviser of the original Edison Telephone Company of London, and in 1882 he was appointed to a similar position with

the Edison Electric Light Company of London, taking part in the establishment of the first electric supply stations. In 1890 he acted in the same capacity for the London Electric Supply Corporation, formed to operate the Ferranti system of high voltage electric supply, using single-phase alternating current. In 1899 he was retained by Marconi's Wireless Telegraph Company to advise on the engineering work in connexion with the establishment at Poldhu of the first high power radio station in the world. Prof. Fleming has thus been in intimate touch with the early development in Great Britain of the three important electrical inventions: the telephone, the electric incandescent lamp and radio communication. During the forty-one years of his teaching work at University College, about 2000 students have passed through his department, many of whom have since achieved great distinction, there being among them three who have become presidents of the Institution of Electrical Engineers. His interest in general education has shown itself in the prominent part which he took in the work which led to the foundation of the Morley Memorial College.

PROF. FLEMING'S original contributions to knowledge are comprised in rather more than a hundred papers published in the transactions of various learned societies and covering such matters as the direct reading potentiometer, the investigation in conjunction with the late Sir James Dewar of the electric and magnetic properties of matter at low temperatures, a paper read before the Institution of Electrical Engineers in 1885 on the necessity for a National Electrical Standardising Laboratory, which gave the first impulse to the movement that resulted in the establishment of the National Physical Laboratory, and the invention of the thermionic valve, which in its modernised form is the essential element in radio communication. He is the author of a large number of very widely known text-books on electrical subjects. He was elected a fellow of the Royal Society in 1892 and received the Hughes Medal of the Society in 1910. The Royal Society of Arts awarded him its Albert Medal in 1922, especially for his invention of the thermionic valve. The Institution of Electrical Engineers has awarded him its Institution premium on two occasions, and made him an honorary member in 1923. His membership of other societies includes that of the Society of Engineers of London, the Glasgow Philosophical Society and honorary membership of the Royal Engineers' Institute, Chatham. Prof. Fleming's great gift of clear exposition and successful experimenting has created for him a special place as a public lecturer, as the audiences whose attention he has held on very many occasions at the Royal Institution have testified. He carries with him into his retirement the sincere good wishes of a large circle of friends, colleagues and students.

In his address to the tenth annual meeting of the Association of British Chemical Manufacturers, held on July 8, Mr. D. Milne Watson, the chairman, dealt with recent activities of the Association and certain

topical events, such as the coal strike, from the point of view of the chemical manufacturer. The British chemical industry may be comparatively small, yet it is advancing: during the decade 1911-21 the number of persons engaged in it increased from 0.81 to 1.15 per cent. of the total number of occupied persons in the country. Although rather jaded with fairs and exhibitions, the Association has supported the revived British Industries Fair; the view is held that chemical firms should not, as a rule, exhibit individually or indiscriminately, but unitedly as an industry at selected exhibitions. Whatever views may be held on the policy of protection, there is no doubt that the careful survey of an industry prior to legislating, such as was recently carried out in connexion with the extension of the Safeguarding Act to the fine-chemical industry for a further period of ten years, is very stimulating to the industry; on the other hand, care is needed to prevent a protected industry from becoming lethargic.

REFERENCE was also made in Mr. Watson's address to the harm done in recent years by viewing the dyestuffs industry through magnifying glasses. This industry suffers from fierce competition abroad, and from an excess of plant left over from the War. The contention that it has a secure home market is only a half-truth, for security is only given when a dyestuff is equal in quality to a competing foreign one, and when it is sold at a price which does not place the user in an unduly disadvantageous competitive position. Consolidation of interests, such as has been effected between Scottish Dyes, Ltd. and the British Dyestuffs Corporation, and between British Synthetics, Ltd. and the British Alizarine Co., is advisable and should be extended; and the lines upon which industrial development is proceeding in other countries must be studied with the view of introducing changes in the organisation of British chemical industry. The council of the Association does not see how it can take any effective or direct part in negotiating a settlement of the coal strike, but it is co-operating to that end with other industries under the aegis of the Federation of British Industries. So far, chemical manufacturers have been able to maintain stocks and to meet all demands. The fact that during the general strike only a very few employees in the chemical industry left their work is ascribed to the cordial relations which have always subsisted between masters and men, and to the circumstance that the men are for the most part really interested in their work.

IN the discussion on the chairman's address, Dr. E. F. Armstrong emphasised the need of more effective co-operation among home-producers, and also the undesirability of building up sections of the industry "which are strong because they are members of international groups, in which the British voice varies in loudness." All indications point to foreign competition becoming more fierce. The Right Hon. J. W. Wilson referred to the magnitude of the German Interessengemeinschaft and to the even greater combination in the iron and steel industry; although

the United States will probably follow suit, this line of development is not in accordance with the British temperament. Dr. G. C. Clayton, M.P., has noted the increased attention paid by the House of Commons to chemical matters, while the Government is showing considerable interest in the Department of Scientific and Industrial Research. He regards recent results obtained in the Fuel Department as hopeful, and thinks that before long an economic process for recovering the valuable products from coal and for producing smokeless fuel will see the light of day. The Germans claim that they have overcome most of the difficulties in producing liquid fuel direct from coal; we in Great Britain are not very far behind them, if, indeed, we are not actually in front.

THE annual meeting of the Society of Chemical Industry and Congress of Chemists, in which a number of societies with related interests are co-operating, opened on Monday, July 19, and in the afternoon the Messel Memorial Medal was presented to Lord Balfour by the Duke of York. After the presentation, Lord Balfour delivered the Messel Memorial Lecture, taking as his subject the relation of the State to science and industry. In tracing the association between science and industry, Lord Balfour referred first of all to the men of genius, moved solely by the desire to add to the store of human knowledge, to whom falls the glory of making fundamental discoveries. This work can be stimulated only by education. The next stage is accomplished by men of constructive ability who can see how the achievements of the scientific worker are to be applied. Then comes the time for testing the results on a scale larger than that of the laboratory experiment, and finally there is the full scale trial which, if satisfactory, means that another piece of laboratory work has been applied to the purposes of industry, and the organisation of production and marketing can proceed. A Government department can do little to further fundamental discovery and should not interfere with the last stages of development, namely, production and marketing. Its assistance should be given, Lord Balfour stated, in the middle region, where industry as a whole rather than one special branch is concerned. There has been no falling-off in the achievements of British men of science or in the business capacity of the leaders of industry, but more co-operation is needed between them, coupled with the broad and imaginative outlook which has been the basis of the great industries in other countries of the world.

IN the course of an address delivered by Sir Robert Hadfield on the occasion of the opening of new metallurgical and engineering research laboratories during the twenty-first anniversary celebrations of the University of Sheffield, the speaker reviewed the history of the University and its predecessors, the Firth College and the Technical School, and of the efforts made to establish educational facilities in connexion with the industries of the city. Although Sheffield had been for many centuries an important centre for the manufacture of steel by the old methods, it

was not until the invention of crucible steel by Huntsman in 1740 that it began to assume the leading position which it has occupied ever since. It is remarkable how, the manufacture of steels of specially high quality having once been established, the existence of a skilled body of workers, and of manufacturers accustomed to the trade, favoured the introduction of new processes, so that a large number of important inventions, especially concerning alloy steels, have originated in that city. It is also appropriate that the study of metallography, which may be said to have furnished the scientific basis for all modern metallurgy, should owe its origin to a Sheffield scientific man, H. C. Sorby, a pioneer in so many branches of science. The new laboratories are equipped for the investigation of metals, and particularly of steel, by modern physical methods, in view of the remarkable results which have been attained by the application of exact physical measurement and by the study of physical properties in the improvement of metallurgical operations.

SIR ROBERT HADFIELD'S address contains statistics concerning the work of Sheffield firms during the War, when the great armament plants were largely increased and enormous quantities of munitions were produced. Statistics as to present employment show the number of employed persons to be about 184,000, of whom, roughly, 42,000 are engaged in the iron and steel industry and 21,000 in cutlery, to name the two occupations most usually associated with the city. The importance of education and training for these industries is therefore obvious, and the University has set itself to meet the needs of the local population, whilst at the same time becoming a centre of post-graduate study and research. In view of the situation on the South Yorkshire coalfield, the study of coal also assumes great importance, and the Fuel Department of the University has been specially equipped for research on the utilisation of coal. One of the urgent needs of the industry is the greater application of electrical power, and interesting facts bearing on this subject are quoted by the author. Even with the existing comparatively high cost of electric power, its use in the steel industry has assumed vast dimensions.

THE fifth Hurter and Driffield Memorial Lecture was delivered by Prof. Charles Fabry before the Royal Photographic Society on April 20 last, and is published, with illustrations, in the July issue of the Society's journal. Prof. Fabry took as his subject "The Photographic Plate as an Instrument for the Measurement of Visible and Invisible Radiations," and passed in review probably all the useful methods of photographic photometry, indicating their respective advantages, difficulties, and limitations. The use of polarisers for varying the intensity of the incident beam is excellent when the light is not partially polarised, but the layer of Canada balsam present in most polarisers is absolutely opaque to ultra-violet radiations of wave-length less than 3400 Å.U. Beyond this the balsam may be replaced by air, but this gives a small angular field. Prof. Fabry adds, "I have, however, used Glan prisms with success." When

working in the ultra-violet region in conjunction with M. Buisson, it was found that the stripped gelatine film (glass being inadmissible because of its absorption) of a developed plate gave a sudden diminution of its absorptive power, transmitting about twelve times as much light at 3150 Å.U. as at a little distance on either side of this point, due to the transparency of metallic silver for radiations of about this wavelength. This difficulty was overcome by intensifying the plate with mercuric chloride and ammonia before stripping. Schumann plates are not suitable for photometric purposes because of the irregularities following from the difficulties of their manufacture, but the 'oiled plate' introduced by Duclaux et Jeantet is spoken of as perfectly suitable. A thin layer of mineral oil put upon the plate fluoresces in the ultra-violet and the fluorescent light affects the plate. An illustration shows the effect with and without the oil for wave-lengths from about 2816 to 1854 Å.U. Prof. Fabry urges the desirability of founding one's photometry on the energy (or heating power) of radiations, as this is "the only real measure of the intensity of a radiation." "Two rays which appear equal with a certain exposure may seem to be absolutely different if a longer exposure is given."

A SERIES of postcards depicting objects of scientific interest preserved in or connected with the Old Ashmolean Museum has recently been issued by the Oxford University Press. The collection comprises a set of designs representing the Old Ashmolean at different dates, including a reproduction in colour of a print by Rowlandson (1809). Another set, devoted to the Dodo, begins with an excellent coloured copy by Mrs. Gunther of the well-known picture in the Sloane Collection, and is continued by De Bry's representation of the landing at Mauritius in 1598, by the drawings of Clusius and Savery, and by photographs of the head still preserved at Oxford. An interesting series of portraits starts with Richard Wallingford, Merton College (1292-1336), the first describer in detail of the making of scientific instruments, and ends with John Evelyn, Balliol College (1620-1706). Other notable portraits are those of Robert Recorde, All Soul's College (1510-1548), the inventor of the mathematical signs of multiplication and equality, Robert Boyle, Elias Ashmole, Christopher Wren, and John Wilkins, the last two of Wadham College. In a set representing the history of medicine occurs a drawing by Christopher Wren of the base of the brain, which for exactness of detail could scarcely be bettered at the present day.

SINCE the quantum theory of spectrum emission was started on its career by Bohr in 1913, the stream of contributions by workers in all parts of the world has been almost unparalleled in its volume and variety of character. The, as yet, semi-empirical character of the whole conception gives the widest possible scope to speculation and the formation of arbitrary practical rules, and such rules have for some time been put forward at too rapid a rate for the controlling factor of experiment to separate the false from the true. The subject has consequently

become so intricate and so charged with ideas, many of which are incompatible with one another, that the experimenter who has wished to obtain a clear idea of what is being proposed has had no time left for his experiments. In particular, the notations and numerical values assigned to the various 'quantum numbers' now recognised are almost as numerous as the writers on the subject, and the resulting confusion, which is largely unnecessary, has been a serious hindrance to the acquiring of definite ascertained knowledge. The appearance of a new *Bulletin* of the National Research Council of the National Academy of Sciences, Washington, on "Quantum Principles and Line Spectra," by J. H. Van Vleck, assistant professor of physics in the University of Minnesota (Washington, D.C., National Academy of Sciences, 1926, 3 dollars), in which the many-sided activities of theoretical workers are ably summarised and compared with one another, is therefore an event of great importance. Duplication of Sommerfeld's "Atombau und Spektrallinien" has been avoided so far as possible, and particular prominence is given to the methods of approaching the subject which are suggested by Bohr's correspondence principle. The volume has been brought up-to-date during passage through the press by the insertion of numerous footnotes, and may really be said to be invaluable to the large body of workers in spectroscopy. The author is to be commended on the clearness of his exposition. Each sentence has usually only one possible meaning—a characteristic which is far too rare in many of the original papers on the subject.

ROTHAMSTED Experiment Station appears to have made a new departure in the issue, in very attractive form and under the general title of "Rothamsted Conferences, I.," of an account of a recent discussion at Rothamsted upon the growing of lucerne. This little memoir is extremely effective. The case for a further cultivation of lucerne in Great Britain is first presented by Sir John Russell and members of his staff. Experience with lucerne is then given by members of staff from various experiment stations, by private growers, by big seedsmen, etc. Lord Bledisloe, Parliamentary Secretary to the Ministry of Agriculture and Fisheries, and Lord Clinton, chairman of the Lawes Agricultural Trust Committee, contribute, as also Mr. Dampier Whetham of the Royal Agricultural Society Research Committee. This committee has helped financially Mr. H. G. Thornton's experiments upon inoculation by *Bacillus radicicola*. A summary of points collected at the conference follows upon the discussion and makes a very clear presentation of the main case for lucerne growing. It appears that lucerne has often been a failure because British soils are not infested with the strain of the nodule nitrogen-fixing organisms necessary for its healthy growth. Mr. Thornton's field trials suggest that the difficulties in the way of successful inoculation often met with in the past are now overcome and lucerne then deserves a more extended trial. It will not grow on ill-drained or shallow soil, and probably requires a fair supply of lime; it must be sown on clear land and the weeds

kept down by suitable cultivation. Given these conditions, it is apparently one of the most valuable of arable crops, and adds to the fertility of the soil, permitting a more intense farming. It gives each year after the first year usually two good hay cuts and a green aftermath for cutting or grazing.

THE Council of the Royal Meteorological Society has awarded the Howard Prize for 1926 to Cadet B. W. Harman, of H.M.S. *Worcester*, for the best essay on "The Causes and Distribution of Fog in the North Atlantic."

DR. W. H. GIBSON has been appointed Director of Research for the Linen Industry Research Association in succession to Dr. J. Vargas Eyre. Dr. Gibson was educated at University College, London, under Sir William Ramsay, and afterwards spent twelve years at the Research Department, Royal Arsenal, Woolwich; for his services in connexion with high explosives research during the War he was awarded the M.B.E. in 1918 and the O.B.E. in 1920. For the last seven years he has been in charge of the Research Department of a prominent linen firm in Belfast.

EXCAVATIONS on prehistoric sites in the Crimea are about to be commenced under the auspices of the Russian State Academy for the History of Material Culture by G. A. Boutch-Osonolovsky. The first site to be attacked is the Kik-Koba cave, where it is hoped may be discovered missing parts of an early human skeleton already found. Exploration will then be extended to the hill caves of later palæolithic age in continuation of the investigations which were begun in 1924.

IT is stated in *Science* that, at the annual meeting of the Geological Society held at Peking on May 3-5, the first presentation was made of the Grabau Medal, founded by Mr. C. Y. Wang for "accomplishment in the field of geological research in China, or for original advancement of the science throughout the world." This first award was made to Prof. Amadeus W. Grabau, who has been largely responsible for the training of an active group of young Chinese geologists and has himself contributed to our knowledge of the invertebrate fossils and palæogeography of China and Central Asia.

THE secretary of the Department of Scientific and Industrial Research announces that a licence, under Section 20 of the Companies (Consolidation) Act 1908, has been issued by the Board of Trade to the British Food Manufacturers' Research Association, which has been approved by the Department as complying with the conditions laid down in the Government scheme for the encouragement of industrial research. The secretary of this Association is Mr. R. M. Leonard, 22 Buckingham Gate, London, S.W.1. The investigations of the Association will be conducted in close co-operation with those of the British Association of Research for the Cocoa, Chocolate, Sugar, Confectionery, and Jam trades.

PROF. H. H. BARTLETT, Director of the Botanical Gardens of the University of Michigan, who has just

been appointed honorary collaborator of the Smithsonian Institution, is about to make collections of the flora of Sumatra and Formosa for the Smithsonian Institution and the University of Michigan. The flora of Sumatra, which is exceptionally rich from the scientific point of view as well as economically important, is poorly represented in the United States collections. During a year previously spent in studying the rubber-producing plants of Sumatra, Prof. Bartlett's attention was attracted to the folklore of the poorer Malays, and especially to their custom of writing beliefs, legends, and descriptions of the magical and medicinal properties of plants on the internodes of green bamboos which are afterwards dried and preserved. This folklore has received little attention hitherto. Prof. Bartlett proposes to devote some part of his time to the study of it as well as the language during his stay in the island.

REFERRING to the review entitled "Eugenic Reform" in *NATURE* of July 10, p. 39, Mrs. C. B. S. Hodson writes stating that her share in Major Leonard Darwin's book "The Need for Eugenic Reform" was confined merely to proof-reading for the detection of printer's errors.

UNDER the title "Instructions to Collectors: No. 7—Blood-sucking Flies, Ticks, etc." (1926: price 6d.), the British Museum (Natural History) has issued a fifth edition, revised and enlarged, of a useful illustrated pamphlet. The Museum requires carefully collected and properly labelled material of this kind from practically all parts of the world. Medical men and others who may be willing to help in the collection of specimens will find within its pages full directions for the collecting, mounting, and transmission to England of such material (other than mosquitoes).

MR. E. PICKWORTH FARROW'S book upon the plant life of East Anglian Heaths was recently reviewed in these columns (*NATURE*, December 19, 1925, p. 896). Based upon the experience of vegetation study recorded in this book, Mr. Farrow communicated a brief article entitled "The Study of Vegetation" to *Discovery*, which is intended to stimulate and, to some extent, to guide the beginner in this fascinating field of inquiry. In an enlarged form this article has now been reprinted as a pamphlet which is published by Messrs. Blackie and Son, Ltd., on behalf of the Coastal Research Laboratory and Bird Sanctuary at Blakeney Point, Norfolk (price 2s.). The price of the pamphlet may seem a little high, but all proceeds from its sale go towards the maintenance of this well-known centre of ecological research, now under the National Trust.

THE Fuel Research Board of the Department of Scientific and Industrial Research has just issued a further pamphlet in the series of the Physical and Chemical Survey of the National Coal Resources. This pamphlet, No. 6, is the fourth dealing in detail with one of the seams of the Lancashire Coalfield, the present one being devoted to the King Seam; sections of the coal in various parts of the coalfield are given as it happens to vary a good deal both in thickness and in quality, the latter point being brought out by analyses of the coal from a number of points in the

coalfield. This pamphlet is on precisely similar lines to those previously published, and gives a mass of valuable information concerning the coal seam under discussion.

MESSRS. J. J. Griffin and Sons and Baird and Tatlock have issued a joint catalogue, No. 50, of scientific apparatus mainly for physics. It is well printed and bound and has 735 pages, 14 of which are devoted to the index. In the section on light, an X-ray spectrograph, neon lamps, and a number of new optical benches are described. Under electricity, several new forms of galvanometers, resistance boxes, selenium cells, and electric furnaces are to be found.

THE latest catalogue (New Series, No. 19) of Messrs. Wheldon and Wesley, Ltd., 2 Arthur Street, W.C.2, deals with upwards of 3000 works relating to astronomy, classified as follows: History, biography, bibliography; origin and development of astronomy from Aristarchus to Sir W. Herschel; periodicals, publications of societies and observatories; elementary works, treatises, dictionaries; spherical and theoretical astronomy; celestial mechanics; practical astronomy; spectroscopy, solar and stellar spectra, photometry, photography; astrophysics, cosmogony; the sun, transits, sunspots; eclipses; Mercury, Venus, minor planets; the earth; the

moon; Mars; Jupiter; Saturn, Uranus, Neptune; comets and meteors; stellar astronomy; double and multiple stars; variable stars, red stars and nebulae, clusters, Milky Way.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—Demonstrators in civil and mechanical engineering in the University of Leeds—The Registrar (July 28). An assistant lecturer in philosophy at the University College of Wales, Aberystwyth—The Secretary (August 3). An assistant in the department of physics of University College, London—The Secretary, University College, Gower Street, W.C.1 (August 7). A lecturer in biology and chemistry at the Municipal Technical College, Swansea—The Director of Education, Education Office, Dynevor Place, Swansea (August 9). A chemical pathologist and lecturer on chemical pathology (jointly) at St. Bartholomew's Hospital Medical College—The Dean of the College, E.C.1 (August 16). A professor of music at the University College of Wales, Aberystwyth—The Secretary (August 25). A lecturer in moral philosophy in the Queen's University, Belfast—The Secretary (August 31). An assistant master at the Kingston-upon-Thames Technical Institute, to teach engineering workshop practice—The Principal.

**Our Astronomical Column.**

KOPFF'S PERIODIC COMET.—This short-period comet was discovered by Kopff in 1906, and was detected again after two revolutions in 1919. It passed perihelion last January, when ephemerides were published in the *B.A.A. Handbook* and elsewhere. However, the comet was then badly placed for observation, being nearly behind the sun; it escaped observation for six months after perihelion. Prof. M. Wolf succeeded in photographing it on July 13 at 1<sup>h</sup> 5.2<sup>m</sup> U.T. in R.A. 1<sup>h</sup> 17<sup>m</sup> 12<sup>s</sup>, N. Decl. 18° 14', the magnitude being 16. The observation indicates Jan. 27.15 as the date of perihelion. The other elements are taken from the *Handbook*:

$\omega$	19° 43' 29"	$\log q$	0.232113
$\Omega$	263 55 10	$e$	0.51422
$i$	8 41 30	Period	6.5842y

The comet is probably only observable with large reflectors; the following ephemeris is for 0<sup>h</sup> U.T.:

	R.A.	N. Decl.	$\log r$ .	$\log \Delta$ .
July 26.	1 <sup>h</sup> 27 <sup>m</sup> 48 <sup>s</sup>	19° 55'	0.3680	0.3060
Aug. 3.	1 32 24	20 47	0.3761	0.2949
11.	1 35 33	21 31	0.3839	0.2828
19.	1 36 48	22 3	0.3917	0.2715

THE CONSTITUTION OF THE INTERIOR OF THE EARTH.—Dr. H. Jeffreys read a paper on this subject at the June meeting of the Royal Astronomical Society which is printed in vol. 1, No. 7, of the Geophysical Supplement of the *Monthly Notices, R.A.S.* It has hitherto been supposed that the rigidity near the earth's centre is very great, but since it was discovered that secondary seismic waves are (apparently) not transmitted through this region, Dr. Jeffreys reinvestigated the data for rigidity in the interior, including that based on the tides, and finds that they are quite consistent with the interior being composed of liquid iron, possibly with an admixture of nickel. The depth of the outer boundary of this liquid core is given as 2900 km. or 0.455 of the radius, this being the surface of discontinuity of seismic waves found by Gutenberg. Though mainly

geophysical, the paper has also an astronomical bearing.

LARGE SOLAR PROMINENCE.—The recent appearance of a very large prominence has been reported by Mr. Newbegin observing with his solar spectroscope at Sutton. On July 16 at 10<sup>h</sup> 25<sup>m</sup>, it extended 40° around the sun's west limb—from position angle 276° to 316°—and its height was then 85 seconds of arc. Probably it is the largest prominence observed as yet during the present cycle. Its character was of 'massive' formation and quiescent in type. An amount of fine detail is indicated by Mr. Newbegin's sketch, the prominence appearing to be composed of a number of tree-like structures rising at more or less equal distances from the chromosphere and connected together by branching filaments.

As a class, the large massive prominences last for some time—frequently for several weeks—and although usually found within the sunspot zones they are rarely, if ever, seen above a spot. In the present instance there was no spot in the vicinity, but there were faint patches of faculae which were the remains of the extensive area connected with the great spot of December and January last. Indeed, the position of the prominence, at least for a portion of it, is almost identical with that of this spot. The mean position of the spot during its two transits in December and January was longitude 32°, latitude 22° N. Allowing for the average polar retardation at latitude 22°, the longitude of the place originally occupied by the spot was 0° on July 16, while the longitude of the sun's western limb on the same day at the time of Mr. Newbegin's observation was 2°.

Spectroheliograms showing disc markings and limb phenomena have doubtless been secured at several observatories equipped with spectroheliographs and should give additional information of great value as to the life-history of this large prominence, which is evidence of a recrudescence of activity in the chromosphere above an extinct sunspot. It may be added that no unusual magnetic disturbance has recently been recorded in this connexion.