

News and Views.

At a recent meeting of the Council of the University of Bristol, an announcement was received with much gratification of two munificent offers for the endowment of research in physics, one from the Rockefeller Foundation and one from Mr. W. Melville Wills. Impressed by the possibilities of the Henry Herbert Wills Physical Laboratory as a centre of research, the Rockefeller Foundation offered the sum of £50,000 to the University of Bristol for the endowment of research in experimental and theoretical physics, on condition that a further contribution of £25,000 for the same purpose was secured from other sources. Mr. Melville Wills, already a benefactor to the University, has most generously offered to give the required sum of £25,000 in memory of his late brother, the founder of the laboratory. Thanks to this further act of beneficence by a member of the Wills family, the University has been able to accept the Rockefeller Foundation's offer. The laboratory was founded by a gift of £200,000 from the late Mr. Henry Herbert Wills, and was opened in 1927 under the direction of Prof. A. M. Tyndall. A broad view of the term 'laboratory' was taken, and a professorship in theoretical physics was created so that the closest co-operation between theory and experiment might be effected in the laboratory. With the concurrence of the Rockefeller Foundation, the gift of Mr. Melville Wills will be utilised for the endowment of the chair at present held by Prof. J. E. Lennard-Jones in theoretical physics. One portion of the Rockefeller gift will be devoted to researches in the field of molecular structure and the borderland of physics and chemistry, to which the laboratory has already contributed on both the theoretical and the experimental sides. After providing for certain other immediate needs, the remainder of the gift will form a reserve to meet the growing requirements of the laboratory as a centre of research.

On Feb. 5 occurs the centenary of the death of Commander Henry Foster, who in 1827 was awarded the Copley Medal of the Royal Society for his magnetic observations made in the Arctic regions. Born in August 1796, Foster was the eldest son of a clergyman of Woodplumpton, near Preston, Lancs, and joined the Navy as a volunteer in 1812. He served in various parts, and after the Napoleonic wars became known as a surveyor. He accompanied Basil Hall to South America in 1820, served under Parry in the *Hecla* in 1824 and in 1827, and it was for his work in the *Hecla* that he was awarded the Copley Medal. Promoted to commander, he was appointed to the command of the *Chanticleer*, commissioned by the Admiralty, at the request of the Royal Society, for determining the ellipticity of the earth. Foster sailed in April 1828, visiting South America and the Cape and then Panama, where he unfortunately met his death by accidental drowning in the River Chagres. His body was recovered and a monument was erected over his grave. There is also a tablet to his memory in Woodplumpton Church. Foster's pendulum ex-

periments, carried out at fourteen different stations between 10° 38' north latitude and 62° 56' south latitude, were made with the most scrupulous regard to accuracy, and they were the most extensive series of experiments made up to that time. After his death his papers were placed in the hands of Baily, who gave an account of his work in the seventh volume of the *Memoirs* of the Royal Astronomical Society.

"BIOLOGY and Statecraft" formed the subject of a national lecture broadcast by Sir Walter Morley Fletcher on Jan. 23. Sir Walter briefly epitomised the historical developments in biology, and emphasised the sudden speeding up of this development within the memory of living man. Reasons were given for this sudden increase in speed of development, the chief two being the invention of the microscope and the use of experiment. The latter, we think, forms the most important explanation of all. Microscopy has just followed a serene type of development since its inception in the seventeenth century. On the other hand, experimental biology, such as physiology, and the chemical aspects of mycology, entomology, and so on, are of much more recent development. It was entomology, a comparatively recent science, that received Sir Walter's attention, based on his statement that insects are still our most destructive enemies and rivals. Such insects will have to fight hard with pathological bacteria in order to retain this distinction. As Sir Walter pointed out, the study of entomology should receive more recognition by the State. There are only 275 official entomologists in the British Empire, and we spend only a quarter of the amount that the United States of America spend on this science. It is difficult to ascribe this dearth of entomologists to any one factor. We must not blame completely, as Sir Walter suggests, the lacking in scientific knowledge by our statesmen and those in administrative authority, for they are now offering great facilities for the training of entomologists; but, we believe, the root of the trouble is that such opportunities for training, offered by the State, have not yet been appreciated by men students. Nevertheless, as we have often remarked, science must not become the tool of the State, but must always remain the concern of the State; and then, as Sir Walter said of biology, we shall be able to bring into our methods of statecraft the guidance of biological truth.

THE Representation of the People Bill, which has recently been issued, includes a clause providing for the total abolition of university constituencies. These constituencies were originated at the beginning of the seventeenth century by James I. with the object of enabling universities to send grave and learned representatives to parliament. As, however, men of scholarship are not now segregated and confined solely to universities, these constituencies were threatened with extinction just before the War; though, since then, as stated in a leading article in *NATURE* of Nov. 4, 1922, they have become enhanced in prestige and extended application. It is on this

latter observation that the case for the retention of university constituencies should be based. At the same time, some type of legislative reform is clearly necessary, if only to take account of modern developments of universities. In view of this progress, the present method of university representation is distinctly old-fashioned and undesirable. Plural representation of the older universities seems unnecessary, and a fuller representation of the newer universities is worthy of consideration. The list of voters in 1929, which appears in the memorandum upon university representation submitted to the electors of the older universities, the substance of which appears on p. 183, supports this view. However this may be, the proposal to abolish university constituencies altogether must raise strong protests from members of all parties.

THE university of to-day is not merely a collection of books as Carlyle suggested, neither is it just a place of advanced lectures followed by examinations and ultimately a degree. At one time, it was; but now it is the head of, the power behind, the whole of our great system of education, without putting itself as the 'be-all and end-all' of everyone who is being educated. In more ways than one it influences all primary and secondary education, and has thus become a great, comprehensive entity. Although we have a Board of Education with its specially appointed advisory councils and committees, representatives of universities—that is, representatives of our complete educational system, from five to twenty-five—are clearly desirable in Parliament, to safeguard and advertise the aims and projects of one of the most essential features of our modern constitution. It is therefore a little surprising that a measure to abolish direct academic representation should be brought forward at the present time, and especially by a government which has shown genuine concern for the development of educational work of all types.

ALTHOUGH we have as yet in the British Isles no professedly and distinctively Children's Museum on the lines of the many now existing in the United States, still the movement here is progressing. Indeed, under the curatorship of Miss Beatrice Hindshaw, the Horsfall Art Museum in Ancoats, Manchester, is already in practice, if not in theory, a museum for the boys and girls of that otherwise poor district. In the Liverpool Museum, Dr. Allan has been furnishing a Children's Corner; and the boys, if not the girls also, of London are eagerly awaiting the treat promised them by Sir Henry Lyons at the Science Museum. These are notable instances of what is being done, but the museum founded for children alone is yet unborn. It is, however, in embryo. A meeting held in London a few months ago decided "to found a Children's Museum in London, to be a national and international centre, to educate and inspire the children of all races, and to stimulate child-lovers of the British Empire and the World".

To judge from the printed statement, the promoters of the Children's Museum base their museum idea on the child's world as it appears to the child, or as it

might more happily appear, rather than on the world of the adult, to which the museum should gently introduce the child. Stress seems to be laid on such objects as toys, pictures, and models, and on such methods as marionettes, a children's orchestra, theatre, dance hall, and fairy-tale rooms. More serious subjects are not definitely excluded, but science and natural history might well bulk more largely in the programme. These schemes, however, have a habit of growing according to circumstances rather than plan. The important thing is to make a start in a house (or room) with some energetic curators (or even one only), and the gifts for which the distinguished supporters appeal will then flow in. The honorary temporary secretary is Mrs. Chas. E. Dawson, 8 Queen's Gardens, Lancaster Gate, London, W.2.

At a meeting of the Ross Institute Industrial Anti-Malarial Advisory Committee in December last, reports were received on anti-malarial work carried out in various tropical countries. Dr. G. C. Ramsay stated that in tea gardens in Assam he had been able to exclude hookworm disease and kala-azar as chief sources of sickness among the coolies. The principal cause of sickness, inefficiency, and death was malaria, and the contrast between the malarial and the non-malarial gardens was extraordinary. Mosquito control consisted, in the first place, in studying those species in a district which carried malaria, and their habits, and then taking measures directed especially against those species. In his own district, Dr. Ramsay found twenty species of anopheline mosquitoes present, but an intensive study proved that practically only one (*A. minimus*) carried infection. The value and application of larvicides, oiling, and Paris green as anti-mosquito agents were described, and examples given of immediate improvement following their use. Biological methods were also employed, such as encouraging the growth of certain swamp plants and destroying others. Sir Malcolm Watson, principal of the Malaria Department, Ross Institute, confirmed Dr. Ramsay's results. He stressed the value of quinine in the treatment of malaria, provided it was used in sufficient doses over a sufficient period. Plasmoquine might be a valuable adjunct to quinine, for it was claimed that this drug killed the sexual forms of the malaria parasite, which are those that infect the mosquito. He pointed out that investigation is required to explain why some anopheline mosquitoes carry malaria and others do not, and why a particular species may carry malaria in one country and not in another.

MR. NICOLAUS, of the Selection Trust, speaking of the Rhodesian Copper Mines, stated that since the Ross Institute expedition to Northern Rhodesia the incidence of malaria at one mine had dropped from 27 per cent of population per month to only 8 cases per month in a population of between 8000 and 9000. At another mine, with a population of between 10,000 and 11,000, since mosquito control had been inaugurated, the malaria incidence last October was nine new cases only. The Tata Iron and Steel Company have also adopted a scheme of mosquito control,

drawn up by Sir Malcolm Watson, and report that the Noamundi Mine is now entirely free from both larval and adult anophelines, and that no new cases of malaria have occurred for some time. The Burma Shell Group is to join with the Ross Institute in an investigation of the oils available in India for oiling mosquito-breeding waters, so that the oil most suitable for any place in cold or in hot weather may be selected. The Ross Institute Industrial Anti-Malarial Advisory Committee was formed in 1928 to keep industry in touch with science, to make the tropics healthy, and expand the markets of the world. It consists of representative members of industry and members of the Ross Institute. The Ross Institute and Hospital for Tropical Diseases, Putney Heath, London, S.W.15, is entirely supported by voluntary contributions.

THE annual general meeting of the Royal Meteorological Society was held on Jan. 21, when Mr. R. G. K. Lempfert was re-elected president. The Buchan Prize, which is awarded biennially for the most important original papers contributed to the Society during the previous five years, was presented to Dr. C. E. P. Brooks. Mr. R. G. K. Lempfert delivered an address on the work of the Meteorological Office at the Royal Airship Works, Cardington, of which Mr. M. A. Giblett, who lost his life in the disaster to the *R101*, was in charge. The weather charts constructed from all available material for the study of the conditions over the area between Great Britain and India were described. The greater part of the address was, however, devoted to describing the experimental investigation of atmospheric turbulence which is still in progress. Four anemometer stations have been set up at Cardington, separated from one another by distances of about 700 feet. Each station is equipped for recording the direction and velocity of the wind on a very open time scale, so that the variations of wind from second to second can be examined. Comparison of these detailed records from the four stations will furnish important information regarding the extent and intensity of the eddies which are always present in the wind. The importance of the eddy character of the air movement which we call wind is being more and more recognised in the science of meteorology. The stresses and strains to which structures are exposed during gales are due to the eddies. Fog formation equally depends on eddy motion, though on a different scale; so does the distribution of atmospheric pollution. Closely associated with the details of wind structure is the distribution of temperature in the vertical, and the arrangements made at Cardington, and also at Ismailia, for keeping this important meteorological factor under constant observation up to a level of 200 feet were described.

AN important feature of the work of the enlarged Rubber Service Laboratory of Imperial Chemical Industries, Ltd., opened at Blackley on Jan. 22, is that devoted to rubber service for users of Vulcafor products, and is intended to assist rubber manufacturers in the solution of problems which arise in connexion with the use of accelerators, anti-agers, pigments, and

other products; but research work represents one of its chief activities. Such research work includes studies on the new rubber substitutes, etc., prepared by the treatment, polymerisation, and so forth, of vegetable oils and other organic compounds, with the object of developing new products for use in the rubber industry; also investigations aiming at the discovery of vulcanisation accelerators, anti-agers or anti-oxidants, anti-scorching compounds, etc., of improved properties, intended to increase the life of rubber articles. During the last few years, for example, the mileage life of a motor tyre has been increased from the order of 5000 to nearly 20,000. Other research is concerned with the properties of various rubber compounds and the development of improved methods of physical and chemical testing. The laboratory is a normal development of the British dye-stuffs industry, with the other research laboratories of which it is in close collaboration. The enlarged laboratory is the most completely equipped of its type outside the United States of America.

IN one of his series of popular meteorological articles entitled "Why the Weather", issued by Science Service, Washington, D.C., Prof. C. F. Talman directs attention to important advances in travelling comfort introduced in recent years in the United States. On certain steamers that navigate tropical waters, and later on certain railway lines crossing very hot desert regions, arrangements for controlling the temperature and humidity of the air in saloons and restaurants have been successfully introduced. Experiments on these lines must lead to increased knowledge of the effect of various atmospheric conditions on human comfort, and it is to be hoped that they will result eventually in the carrying out of an important climatological inquiry. A vast amount of information has been accumulated about the temperature, humidity, wind, etc., in different parts of the world, but anyone confronted with statistics of this kind is apt to be misled as to the extent to which any very abnormal temperatures are likely to give rise to discomfort, through inability to make a proper allowance for the other factors. What is required is some system of reducing ordinary air temperatures to what might be called 'virtual temperatures', so that the regions of greatest physiological heat and cold could be shown on climatological maps. It is recognised that the 'wet bulb' thermometer is superior to the ordinary 'dry bulb' in this respect, but something more representative of human sensations than even the wet bulb is required. There is, for example, the difference of sensation between cloudy and clear weather, due to radiation effects, that should be taken into account. Meteorological statistics would clearly be rendered of very much greater practical value if work on these lines could be successfully carried out on a world-wide scale.

SIR WILLIAM BRAGG'S Friday evening discourse on Jan. 23, at the Royal Institution, on "The Scattering of Light", was the first to be given in the reconstructed theatre of the Royal Institution. The subject of Sir William Bragg's discourse had a historical connexion with the Institution. In its earliest form it asked

for explanations of the blue of the sky and sea. Prof. Tyndall and the late Lord Rayleigh were among the earliest and most important contributors to the solution of the problem. Rayleigh put the theory on a sound basis, and explained exactly why the blue is scattered more than the red, so that it was turned aside while the red passed on. The same explanation was applicable to the colours of the rising and setting sun. Rayleigh showed also that there was no need to postulate the presence of water vapour: the molecules of the air itself were sufficient to explain the amount of the scattering. In recent years the interest of the subject has been greatly increased by the discoveries of Sir C. V. Raman, of Calcutta. He has shown that there is a form of scattering hitherto not observed. Some of the original light is scattered with change of colour, and this change is capable of the most precise measurement. Many workers in various parts of the world have extended Raman's discovery and a new and most fascinating field of research has been opened up. The change mentioned depends on the nature of the scattering atoms and molecules, the properties of which are thereby made capable of closer observation. Moreover, the explanations of the new effects are more easily expressed in terms of the quantum or corpuscular theory of light, and in this way the highly attractive mystery of the nature of light is still further enhanced.

THE Annual Report of the Director of the U.S. Bureau of Standards (Dr. G. K. Burgess) to the Secretary of Commerce for the year ending June 30, 1930, is a pamphlet of 53 pages which gives a short account of each section of the work of the Bureau. The staff numbers 1161, the average salary is £490, and the total expenses for the year £588,000, an increase of £37,000 on last year. The largest item, £54,000, is for tests of building materials; the next, £44,000, for standardisation of the products of industry, and this work seems so much appreciated by the manufacturers that between 80 and 90 per cent of them are carrying out the recommendations of the Bureau in respect of between seventy and eighty commodities. Industrial research has cost the Bureau £41,000, but forty-one associations and manufacturers co-operate with the Bureau and maintain ninety-six research associates, eleven of whom work at the Bureau on radio and electrical problems, eight on cements, eight on petroleum and its products, seven on fuel, and seven on steam and high temperatures. The fee value of the tests carried out at the Bureau was £137,000. The present buildings are greatly overcrowded and a five-year building plan has been submitted to Congress.

SOME interesting particulars of the activities of the Bureau of American Ethnology are given in the recently issued forty-fifth Annual Report, which covers the period 1927-28. Miss Densmore has made additional studies of the music of the American Indian, both in the field and in the laboratory. Her remarkable collection of phonograph records now amounts to 1695. Study of the Columbia Basin and

Lower Snake River in Oregon by Mr. N. W. Kreiger has revealed a uniform culture, with some remarkably clearly defined localised specialisations in tools and art designs. It is expected that further investigation will show the relation between the culture of this area and the pre-agricultural south-west. In two areas in particular the work of the staff of the Bureau requires mention. In the south-western States the investigation of the Basket-maker and Pueblo cultures is producing some of the most notable results in American archaeology. In Alaska, Mr. Henry B. Collings, jun., and Mr. T. Dale Stewart, conducting investigations at Nunivak Island and along the adjacent coast, have found what is held to be the most primitive of all the Alaskan Eskimo. Among the "Accompanying Papers" two important contributions, dealing respectively with the Salishan tribes of the Western Plateaux and the Thompson Indians, are edited by Prof. Boas from the papers of Mr. James Teit, whose intimate knowledge of the Thompson Indians was based on a residence among them of many years. It is interesting to note that Dr. La Flèche's record of an Osage war ritual was written down at the request of the Indians themselves to ensure correct rendering of the ritual at the next performance. The request is significant as indicating a desire to keep up old customs, which is losing ground in a struggle against the weakening of tribal memory.

THE Department of Zoology of the British Museum (Natural History) has recently received, as a donation from His Royal Highness the Duke of Gloucester, the skin and skull of a Menelik's bushbuck (*Tragelaphus scriptus meneliki*), and from Mr. A. S. Vernay, a large collection of antelopes and other big game from Bechuanaland. Recent donations from the Trustees of the Rowland Ward Bequest include a ratel, or 'honey badger' (*Mellivora ratel*), from Kenya Colony. The ratel is found over a great part of Africa south of the desert region and in many parts of India. The forelimbs carry very large and powerful claws, which are used by the animal for burrowing. Although a comparatively common animal, it is, owing to its nocturnal habits, but rarely met with, living amongst rocks or the roots of trees. Ratels are practically omnivorous, feeding on honey, a variety of fruits, snakes, and sometimes raiding poultry farms. They can attack bees' nests with impunity, as the great thickness of the skin prevents any serious harm being done by the bees' stings. The Museum has also received a collection of more than 7000 specimens of land shells from Lord Howe Island and Norfolk Island; the land snails of these isolated islands are of importance for the study of geographical distribution. The Department of Botany has purchased the *Transactions* (in manuscript) of the Society of Amateur Botanists, in two volumes, 1863-64, from the library of Sir George Watt. The Society was formed among the old students of M. C. Cooke's evening classes in botany, for artisans, held at Trinity Schools, Lambeth, where Cooke was headmaster. Many others joined who afterwards became eminent botanists, including J. Britten, W. Thiselton Dyer, Berthold Seeman, Worthington G. Smith, and Henry Trimen. The meetings were held first at the

Metropolitan Club, Edgware Road, and then over Robert Hardwicke's shop in Piccadilly. Hardwicke's *Science Gossip* was one result; another was the formation of the Quekett Microscopical Club, which replaced the Society in 1865.

SIR WILLIAM BRAGG, Fullerian professor of chemistry in the Royal Institution, has been elected an honorary member of the Institution of Electrical Engineers.

It is announced in *Science* that Dr. David White, senior geologist of the U.S. Geological Survey and home secretary of the National Academy of Sciences, was awarded the Penrose Medal at the Toronto meeting of the Society of Economic Geologists.

THE one thousand dollar award of the American Association for the Advancement of Science for an outstanding paper presented at the recent Cleveland meeting was given to Drs. M. A. Tuve, L. R. Hafstad, and O. Dahl, of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington. Their paper entitled "Experiments with High Voltage Tubes" was presented to the American Physical Society.

THE Society for Cultural Relations with Soviet Russia is considering the possibility of organising a tour of scientific institutes in Soviet Russia during July and August 1931. It is proposed to arrange for parties of British scientific workers engaged in physical, biological, and medical research to visit and meet Russian workers engaged in similar researches. V.O.K.S., the central institution in Moscow for organising cultural relations with foreign countries, is prepared to do everything possible to help the tour, and Intourist, the Soviet organisation for tourist parties, will consider giving specially reduced travelling charges. Scientific workers desirous of joining such a tour are invited to write to the Secretary, Society for Cultural Relations with Russia, 1 Montague Street, London, W.C.1.

WHEN the late Sir Patrick Manson was addressing the Section of Tropical Diseases at the annual meeting of the British Medical Association in 1898, he said that there was not one of his hearers who did not bewail the crass ignorance in which he had lightly undertaken the care of men's lives in dangerous climates, nor one who could not pillory himself with the recollection of lives that perished owing entirely to the lack on his part of an elementary knowledge of tropical medicine. Manson's address came under the notice of Joseph Chamberlain, who took action which resulted in the establishment of the London School of Tropical Medicine. From that School, which Manson himself directed, and its successor, the London School of Hygiene and Tropical Medicine, some 4000 medical officers have gone to the far corners of the earth, trained in special post-graduate courses in tropical medicine. At the School on Feb. 3, 1931, Dr. Philip Manson-Bahr will deliver a public lecture on "The Dawn of Tropical Medicine, being an account of the Life and Work of Sir Patrick Manson". The chair will be taken by Sir Harry Goschen, Bart., and admission is free, without ticket.

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THE Ministry of Agriculture and Fisheries has recently issued two advisory leaflets, one on "Swine Erysipelas" (No. 17), another on "Blackhead of Turkeys" (No. 20). Information is given on the symptoms, recognition, treatment, and modes of prevention of these diseases.

The annual "Guide to the Spas and Marine Health Resorts of Great Britain and Ireland and New Zealand", by Dr. R. Fortescue Fox, has recently been issued (London: J. and A. Churchill, 1s. net). Information is given on the climates of coastal resorts and inland spas, with indications regarding the ailments for which they are best suited.

THE "South African Journal of Science", vol. 27, which is the report of the South African Association for the Advancement of Science, has just been published by the Association at Johannesburg, price 30s. net. The volume contains a statement of the constitution of the Association, the presidential addresses, and a complete collection of the papers read and published. An account of the meeting, including brief notes on some of the papers, appeared in *NATURE* of Nov. 29, p. 862.

A SECOND edition of the economic pamphlet No. 112, entitled "The Cockroach, its Life-history and how to deal with it", by Mr. F. Laing, has recently been issued by the British Museum (Natural History). It provides a general account of the commoner species of these insects that frequent buildings, etc., and discusses means of their eradication. This pamphlet will be found useful by anyone troubled with these pests, and is obtainable at the Museum in Cromwell Road, or through a bookseller, price 6d. (postage 1d.).

THE Departmental Committee on Maternal Mortality and Morbidity in an interim report which was published last July found that not less than one-half of maternal deaths in childbirth are preventable under suitable conditions. The Ministry of Health has now issued a memorandum (*Memo. 156/M.C.W.*) with explanatory Circular (1167) to local authorities, directing their attention to this report, and urging them to exercise their full powers for the care of maternity. Authorities are reminded that an additional amount of £5,000,000 for the development of the maternity and child welfare services was included in the general Exchequer contribution under the Local Government Act, 1929.

DR. EDWARD R. WEIDLEIN, Director of the Mellon Institute of Industrial Research, announces that the Institute has lately begun a broad investigation into possible industrial uses for raw and refined sugar. The research will be carried on by a multiple industrial fellowship sustained by the Sugar Institute, Inc., of New York, an organisation that represents the cane sugar refiners of the United States. The investigation will be supervised by Dr. George D. Beal, assistant director of Mellon Institute, and by Dr. Gerald J. Cox, Senior Industrial Fellow. Four chemists have begun the initial scientific research of the industrial fellowship, and additions will be made to this staff, as needed, from time to time.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—An assistant lecturer in phonetics at the Glasgow Training Centre of the National Committee for the Training of Teachers—The Director of Studies, Training Centre, Jordanhill, Glasgow (Feb. 2). A graduate in engineering for physics, mechanics, mathematics and machine drawing at the Southall Technical Institute—The Principal, Southall Technical College, Southall, Middlesex (Feb. 2). A junior demonstrator in physiology at the University of Durham College of Medicine—The Registrar, College of Medicine, Newcastle-upon-Tyne (Feb. 2). A laboratory assistant in the Bacteriological and Pathological Laboratory, Birkenhead—The Town Clerk, Town Hall, Birkenhead (Feb. 6). A principal of the High Wycombe Technical Institute—The Secretary for Education, Educa-

tion Department, County Offices, Aylesbury (Feb. 7). A head of the engineering department of the Leicester College of Technology—The Registrar, College of Technology, Leicester (Feb. 21). An assistant in the London Museum—The Keeper, London Museum, St. James's, S.W.1 (Mar. 14). An entomologist under the Indian Research Fund Association, able to undertake independent inquiries on malaria in the field or laboratory—The Secretary, Indian Research Fund Association, Simla, India (Mar. 31). A woman lecturer in geography at the Warrington Training College, Liverpool—The Principal, Warrington Training College, Wavertree, Liverpool. A full-time teacher of draughtsmanship (engineering), under the London County Council—The Education Officer (S.S.5), the County Hall, Westminster Bridge, S.E.1.

Our Astronomical Column.

Light-Variation of Eros.—*Beob. Zirk.*, No. 3, contains some observations of maxima and minima of Eros, made at Hamburg-Grossborstel by M. Beyer. The principal period is still $5^h 16^m 14^s$, but the light-range is notably smaller than it was at the beginning of December. Similar changes of light-range have been observed at other apparitions; they favour the theory that the planet is double, and that mutual occultations occur when the earth is near the plane of rotation, but not otherwise. Duplicity ought to be detected by the great American telescopes at this near approach, if it exists. Prof. Yamamoto notes in *U.A.I. Circ.*, No. 309, that even if the variation arises from regions of very different albedo on the planet's surface, it may cause the centre of light to be shifted some $0.1''$ from the centre of figure, which would be an appreciable amount in researches of such delicacy as are now being carried out. There was a request to observers with large instruments to try to observe the shape of the planet, but no reports have yet been received on the subject.

Locating the Sun's Corona.—In *Comptes Rendus* for Nov. 10, M. Lyot, of the Meudon Observatory, describes work conducted by him during July and August last, at the observatory of the Pic du Midi, for detecting the sun's corona without the unique conditions afforded by a total solar eclipse. M. Lyot states that from his observing station the purity of the atmosphere was such that, by the interposition, in the optical train, of a metal disc slightly larger than the image of the sun formed by a 4-cm. objective, the prominences at the sun's limbs were clearly visible without recourse to a spectroscope. Working under these conditions with a very sensitive polariscope, he explored the sky immediately surrounding the sun's disc. It was found that the proportion of polarised light (the plane of which appeared to be radial) was insensible at about $6'$ from the sun's limbs but increased inwards. M. Lyot proved to his satisfaction that the origin of the polarisation was neither atmospheric nor instrumental, and he concludes that he has observed the polarisation of the sun's inner corona. Figures for July 29 and 31 derived from the observations made at various position angles at a constant distance of $80''$ from the sun's limbs show two minima that correspond to the position of the sun's axis on those days. A further substantiation was made by observing the strength and length of two bright lines of the spectrum that were visible with a direct vision spectroscope. These lines were evidently the coronal lines $\lambda 5303$ and $\lambda 6374$, and their variation at different

position angles around the disc corresponded generally with the degree of polarisation observed. These results are of great interest, for they indicate a means of studying frequently certain attributes of the sun's corona that have hitherto been available to observation during the brief and infrequent occasions of a solar eclipse.

Rotation of the Galaxy.—Sir Arthur Eddington chose this topic as the subject for the Halley Lecture on May 30, which has been published at Oxford by the Clarendon Press. After a brief historical sketch, he gives a proof of the formula published by Dr. Oort a few years ago, which states that the radial velocities of the stars contain a term varying as twice the sine of their galactic longitude, this being measured from the centre of galactic rotation. He notes that the same formula was published by Gylden in 1871, but did not then attract much attention.

The formula gives two alternative positions for the galactic centre, diametrically opposite to each other. The one in Sagittarius is now selected, on other grounds, but Gylden chose the one in Gemini. Prof. Turner had also been led to the position in Gemini by consideration of the two stellar drifts; but that method likewise gave two opposite positions as possible. Dr. Plaskett, in the George Darwin Lecture of the Royal Astronomical Society delivered last May, showed that the radial velocities of the stars of types *O* and *B* supported Oort's position of the centre, and further indicated that the interstellar gas shares the rotation of the stars. Sir Arthur Eddington notes that, owing to the viscosity of this gas, it does not appear that its rotation could be maintained indefinitely; this tends to support the shorter time-scale that limits the duration of the stellar system to a few thousands of millions of years, whereas the long scale gives millions of millions.

Galactic rotation gives an explanation of the fact that the quick-moving stars are all moving towards one hemisphere; these are really the laggards, and the sun is moving from them, not they from the sun. Stars with high speed in the rotational direction would escape from the galaxy, the attraction of which could not control them. They have already been eliminated. Sir Arthur Eddington notes that the aspect of the spiral nebulae is far from suggesting stability. As our galaxy is believed to resemble them, this consideration also favours the shorter time-scale. The rapid recession of the spirals, if taken as real, is shown to provide an argument tending in the same direction.