## News and Views.

IN a supplement to this issue we publish an article by Prof. de Sitter in which a comparison is made of the time as determined by the rotation of the earth, the revolution of the moon round the earth, and of the inner planets round the sun. The application of the theory of gravitation and the laws of motion to the various bodies shows that equal intervals of time determined by one body are not exactly equal according to the others. The application of the laws of dynamics is complicated by the fact that the earth is not a rigid body and that tidal friction is slowly decreasing the rate of the earth's rotation and at the same time that of the moon's revolution. It is not possible to compute the numerical coefficient exactly, but work by Jeffreys on the tidal friction in narrow seas gives a coefficient of the right order of magnitude. Prof. de Sitter finds that the observations are best explained if the coefficient for the three intervals, before 1745, 1745–1870, after 1870, are approximately in the ratio 2 : 1 : 3. It is, however, difficult to explain why the coefficient should have altered to this extent. Tidal friction can only slow down the earth's rotation, while observations of the moon and planets indicate that at times this rotation is accelerated. This can only be done by reduction of the earth's moment of inertia. Prof. de Sitter finds that the reduction of the whole mountain range of Central Asia to sea-level would have produced only one-quarter of the change in the length of the day which observations of the moon indicate took place in the year 1918, but that an alteration of the earth's radius by five inches would suffice. Both explanations almost appear to call for observable effects on the earth itself.

EXPRESSED in time, observations of the moon indicate that the earth's period of rotation altered by 0·00339 sec. either suddenly or in the course of a few months in the year 1918. This means that the earth's rate of rotation altered by approximately 1 part in 25 millions. Prof. de Sitter raises the question whether this is sufficiently large to be tested by an actual clock. The free pendulum clock, Shortt 3, installed at Greenwich, has shown a great advance on all previous clocks; for example, its daily rate has remained constant for more than six months to the order of 0·001 sec., except for a secular term which altered the daily rate by 0·032 sec. in 100 days. This coefficient, as well as the rate, has to be determined from astronomical observations. It corresponds to a slow lengthening of the invar rod and is probably decreasing with time. The clock has, however, a rather large temperature coefficient, namely, about 0·007 sec. daily per 1° C. The cause of this is unknown, but it may be due to the impulse varying with the temperature and consequently changing the arc of vibration. To produce a change of 0·007 sec. in the daily rate the semi-arc, at present about 55′, has to alter only 10″, a quantity too small to be observed accurately with the Greenwich clocks, but possible with later ones.

THE election of Prof. D'Arcy W. Thompson as president of the Classical Association for this year calls for the congratulations of his scientific friends. Not all men of science are devoid of some tincture of letters, as the pages of NATURE testify, but it is sometimes hinted that it is not hard to pass for a scholar in their company. Prof. Thompson's election shows, however, that he is esteemed as a scholar by literary men. He is, indeed, peculiarly fitted to link the older with the newer humanities. His contributions to the history of Greek science—his "Glossary of Greek Birds," his translation of Aristotle's "Historia Animalium," and his Herbert Spencer Lecture on "Aristotle as a Biologist," to name only a few—are well known and valued. On the other hand, he brings to his scientific work not only a polished style but also a sense of the historic background of knowledge which illuminates even the pages of reports on fishery statistics. His "Growth and Form" showed that he could handle and correlate, as few men can, the results of research in the most diverse branches of modern science. Prof. Thompson's love for the classic literatures is inherited, and those who have read the "Daydreams of a Schoolmaster" will know how it would have gratified the author could he have seen his son in the position to which he has just been elected.

AN article from the *Times* correspondent at Delhi, in the issue of Jan. 12, conveys the welcome news that a great new meteorological observatory at Poona is to be brought into use this summer, thus carrying into effect a scheme proposed in 1924 for transferring the headquarters of the Indian weather department thither from Simla. The difficulties that have led to the transfer are not limited to the tropics. On one hand, it is vital that the routine work of daily forecasting and of administration shall be well carried on, for it is on performance of these tasks that revenue depends, and with that the chance of scientific progress. Further, there is a material gain of efficiency if the staff can be collected into the same station, facilitating co-operation as well as access to laboratories and libraries. There is, therefore, a tendency for the ablest men to gravitate to headquarters. But Simla cannot employ kites because winds are too light, or instrument-carrying balloons because of the wild mountain regions in which they would be lost: so experimental examination of the physical processes of weather can scarcely be effected there, and bringing up an officer from a provincial observatory very seriously reduces his chance of advancing knowledge and of keeping in living contact with science. The remedy adopted by the department in India has been to give up the advantage of being at the seat of government and to transfer its headquarters to Poona, where upper air work is possible and monsoon conditions, unlike those of the western Himalayas, are representative of India. Poona has the further advantages of a good climate and of proximity to Bombay, so that closer relationships can be maintained with shipping and commercial interests.

THE *Times* correspondent says, however, that the object of the new observatory is "special research

work with a view to elaborate and accurate forecasting of the south-west monsoon." Also "The Meteorological Department . . . is now able regularly to forecast in mid-October the quantity of rainfall in Northern India in the next five months. The indications are given to within a fraction of an inch, and during twelve years wherever the system has been followed it has never proved fallacious." On reading this surprising account, it is natural to inquire into the recent success of the method, and we find Mr. Field in his forecast of Jan. 6 last, after rightly deprecating undue confidence, saying that the high-level winds were "about normal in character." The total actual precipitation, as described on June 27, was, however, not normal but "in moderate defect." Again, in the previous year the high-level winds were "stronger than usual"; and the total actual precipitation was not in excess as it should have been, but "in slight defect." In spite of this lack of perfection, we are convinced that upper-air data promise to be of great value for seasonal forecasting after twenty or thirty years of data have been accumulated; but friends of the department should lay stress on the value of the upper-air work done at Poona for aerial navigation and daily forecasting, rather than arouse expectations of an early revolution in methods of seasonal prediction. Confidence in long-range forecasts can only be built up slowly, and is more easily lost than won.

THE award of the Progress Medal of the Royal Photographic Society to Dr. S. E. Sheppard in recognition of his researches and publications, which have resulted in important advances in the science of photography, will be generally welcomed. Dr. Sheppard is still, in the modern sense, a young man, whose name first came into prominence in connexion with the extended series of researches in photographic subjects, carried out in conjunction with Dr. Mees. The results were published in the *Photographic Journal*, in the *Proceedings of the Royal Society*, and in the *Journal of the Chemical Society*, and were then collected, together with additional work, and published in 1907 as a book entitled "Investigations on the Theory of the Photographic Process." Dr. Sheppard is also the author of the volume on "Photochemistry" in the series of text-books on physical chemistry edited by Sir William Ramsay. Dr. Sheppard was elected to an 1851 Exhibition research scholarship and proceeded to Germany for further study. Shortly after returning to England he was offered a position in the Research Laboratories of the Eastman Kodak Company, Rochester, N.Y.

SINCE taking up his duties at Rochester, where he is assistant director of research, Dr. Sheppard has been responsible for researches covering many phases of the photographic process, which culminated comparatively recently in his important discovery of the rôle played by sulphur compounds contained in gelatin in conferring sensitivity on the silver halide grain. In addition to the books already mentioned, Dr. Sheppard has been responsible for two others, namely, "The Silver Bromide Grain of Photographic Emulsions," and "Gelatin in Photography," vol. 1, published by the Eastman Kodak Company, and has done valuable work in connexion with the electro-deposition of rubber. Previous recipients of the Progress Medal have included Sir William Abney, Dr. J. M. Eder, Prof. Gabriel Lippmann, Ferdinand Hurter and Vero C. Driffield (jointly), Mr. Alfred Watkins, A. Lumière et ses fils, Dr. C. E. K. Mees, Mr. William B. Ferguson, and the present president of the Royal Photographic Society, Mr. F. F. Renwick.

ON Tuesday, Mar. 20, H.M. the King will open the eastern block of the new buildings of the Science Museum at South Kensington. First formed in 1856, the collections have occupied various buildings, but now for the first time they are shown in one designed for this purpose, though about a quarter of the collections still remain in buildings which were originally constructed for the exhibition of 1862. In 1898 Parliament voted £800,000 for completing the Science and Art Buildings at South Kensington, and in 1908 the Victoria and Albert Museum was opened by H.M. King Edward VII. As nothing had so far been done for the science collections, a number of men eminent in science and in technical industry strongly urged the need for action in the matter. Sir Henry Roscoe headed a deputation fully representative of science and its applications, which was sympathetically received by the President of the Board of Education, and in the following year the President appointed a committee, of which Sir Hugh Bell was chairman, to inquire into the Science Museum and to report upon its needs. This Committee recommended that new buildings should be erected on the existing site, which should ultimately extend from Exhibition Road to Queen's Gate.

IT is the eastern block, the first instalment of this scheme recommended by the Committee, which is to be opened in March, doubling the exhibition area of the Museum. Though the space available is still considerably less than that which the Committee laid down as being immediately needed, it has made it possible to develop the collections extensively, and to improve very greatly the setting out and exhibition of them. The result of this is reflected in the greatly increased numbers of visitors, of whom more than 709,000 visited the Museum during 1927 as compared with 450,000 in 1925. The new galleries are exceptionally well lighted, and the provision of compressed air and electricity in each gallery makes it possible to show objects in motion or specially illuminated at any point in the Museum.

IN February 1927 the Government of Queensland appointed a Land Settlement Advisory Board of three members, with the powers of a Royal Commission, to inquire into and report upon various questions in connexion with the administration of land leased for grazing sheep in Central and Western Queensland, and "generally what action should be taken by the Government to further develop the wool industry in Queensland." In the Board's report, which has been presented by the Premier to the Queensland Parliament, it is stated that the total number of sheep in

Queensland remained almost the same (20 millions) between 1891 and 1925, in spite of the fact that in the same period the population of the State increased by 109 per cent. and the railway mileage by 165 per cent. Owing to the severe drought that has prevailed over much of the sheep country since 1925, it is estimated that the number of sheep is now only 14 millions. Since, during the last five years, wool constituted 60 per cent. of the State's exports, it is obvious that the prosperity of the industry is of vital importance to Queensland.

THOUGH none of the members of the Board were scientific men, it is gratifying to find that a section of the report is devoted to the advocacy of scientific research. It is stated that "the valuable results obtainable from the practical application of science to industry have already been demonstrated sufficiently in Queensland to urge all authorities to further efforts. The banana bunchy-top investigations and the chemical and biological agencies for prickly pear destruction are instances of scientific endeavour of first-rate importance to this State. In each of these investigations the scientists of the University of Queensland played their part. Another field of endeavour is now presented to scientists in stemming the annual wastage in the wool industry." Among the problems which are mentioned as requiring scientific investigation are the provision of suitable stock licks for different types of country, the effect of artificial feeding on wool production, the effect of different grasses on the quality of the wool, the varying mineral and protein contents of pastures on the different geological types of country, the effect of overstocking on natural grasses, particularly as regards their re-growth, and the prevention of losses due to blow-fly, worms, and other parasites and diseases. It is stated that the Premier of Queensland has offered to the Commonwealth Council for Scientific and Industrial Research an area of about 25,000 acres of land in Central Queensland, free of rent for any term desired, to be held in trust as a central scientific station for investigations on the above and kindred subjects, and the hope is expressed that the offer will be accepted either in whole or in part.

WITHIN a fortnight from the date of his first dispatch on the season's work at Ur, Mr. Woolley is able to chronicle in the *Times* of Jan. 12 a further discovery of almost sensational interest which throws an entirely new light upon the customs and religious beliefs of the Sumerians. Although the body of the king has not been found in the Royal Tomb now being excavated, as probably it was plundered at an early date, a large number of objects interred at the time of the burial for his use have been unearthed. Among these are a harp, largely composed of wood, the form of which has been recovered by the use of plaster to fill up the cavities left by the decay of the wood; a chariot, on the rein ring of the pole of which was a wonderfully realistically executed donkey in silver; a gaming board; a clothes' chest; and piles of copper bowls and tumblers. The remarkable feature of the burial, however, is that, scattered among these relics are the remains of the king's attendants, evidently lying as they fell when sacrificed for his service in the next world. The harper is crouched near his harp, two asses lie at the chariot pole, and with them their three grooms; and by the clothes' chest is an officer of rank, as shown by his ornaments, possibly the Keeper of the Royal Robes, and other attendants. In a trench lie thirteen bodies, of which two are those of children, the rest women, no doubt the members of the Royal Harem. Mr. Woolley is of the opinion that this form of burial, accompanied by the sacrifice of the Court attendants, must be regarded as a survival, as there are no evidences of similar sacrifices to be found in the graves of common people.

ON Feb. 14 the Royal College of Surgeons of England celebrates the bicentenary of John Hunter, who may be described as the patron saint of the College. Hunter left one of the most remarkable collections of anatomical preparations and natural history specimens ever assembled by one man. In 1800, seven years after his death, this collection was purchased by Government and handed over to the College of Surgeons in trust. The Hunterian Collection forms the basis of the great museum now housed by the College in the south side of Lincoln's Inn Fields, but the additions made under a long line of conservators, which includes Owen, Quekett, and Flower, now overshadow the original collection. There is a doubt as to the exact date of Hunter's birth, but as he celebrated it on Feb. 14 the Hunterian oration given in his memory every alternate year has always been given in the theatre of the College on this date. On the present occasion the oration is to be delivered by Sir Holburt Waring, surgeon to St. Bartholomew's Hospital, and a former Vice-Chancellor of the University of London. A lecture on the "London Homes of the Hunters" will be given by Mr. G. C. Peachey. A special exhibition of specimens will illustrate John Hunter's chief discoveries. Visitors will also have an opportunity of examining his portraits, busts, published works, manuscripts, and personal relics.

IN a letter to the Editor, Prof. Henry J. Spooner discusses our comment in the issue of Dec. 24, p. 928, on his paper in the *Society of Industrial Engineers' Bulletin* (vol. 9, No. 9), in which he stated that the economic loss through the effects of noise is estimated at £50,000,000. We asked how this figure was obtained. Prof. Spooner states that men of affairs "have their capacity for clear thinking without a doubt perceptibly weakened by the incessant if unconscious strain upon the nervous system" caused by noise, and he says he has had countless letters from mental workers explaining how their health and work suffer through working in a noise. Such remarks, though true as personal expressions of opinion, do not, however, constitute scientific proof. The one piece of research quoted, that of Dr. Laird, would seem to be suggestive rather than conclusive. The control group is always necessary. If one has a personal interview with all the workers in and near a noisy room and inquires about noise among other

conditions of work, one does not get a uniform reaction; some dislike it, some are indifferent, some prefer it. There are heads of departments, creative workers of all kinds, as well as the actual noise producers, who are frankly surprised at the idea of their work being affected by noise. To say it must be unconsciously affected is again opinion, not evidence. In the interests of those who either are, or think they are, detrimentally affected, let us minimise noise, but the proof of its effect is not easy.

GAS undertakings deserve more publicity than is usually accorded them concerning the extent and intricacy of the organisations necessary to maintain an unfailing service of their chief products, and to provide an important supply of the great number of other materials in everyday industrial demand. The consumer's end of the pipe-line is so easily manipulated, day or night, in war and peace, strike or lock-out, with the same anticipated result, that it is not surprising that public attention should be focussed more frequently on cost than on supply. For use on the occasion of the visit of the Science Masters' Association to the Chief Offices, the Central Store, and the Fulham Works of the Gas Light and Coke Company on Jan. 6, the Company prepared an illustrated brochure giving a short account of its activities, and briefly describing the sections visited.

THE Gas Light and Coke Company received its charter so long ago as 1812; its authorised capital is now more than £40,000,000, its employment roll about 20,000, and its area of supply to 1,250,000 consumers is 265 square miles, extending from Windsor Great Park to some miles east of Epping Forest. Every year some $2\frac{1}{2}$ million tons of coal—mostly borne direct by the Company's own fleet—are required. Of the thirteen works, those at Beckton are responsible for the output of about 40 per cent. of the gas produced, whilst those at Fulham, which are probably the oldest in London, are now representative of the most modern practice in gas-works construction, having a capacity (shortly to be largely increased) of $17\frac{1}{2}$ million cubic feet of 500 B.Th.U. quality (*i.e.* 87,500 therms) a day, and treating 900 tons of coal daily on an area of 30 acres. Usually 40,000 tons of coal is held in stock at Fulham; the coal gas, maintained at a constant quality with water-gas of variable composition, is conveyed by means of more than 100 miles of high-pressure mains (at pressures of the order of 3 lb. per sq. in.) to convenient storage centres, and thence in 3700 miles of supply mains at pressures of about 4 in. water gauge. The brochure gives an account also of the housing of the experimental plant and the various research laboratories; it describes the training and welfare work, and refers to the measures which have been taken to give effect to a spirit of copartnership which exists between the Company and its employees.

DR. J. STEPHENSON, lecturer in natural history in the University of Edinburgh, has been appointed editor of the "Fauna of British India" series in succession to the late Sir Arthur Shipley.

DR. EDWARD RAY WEIDLEIN, Director of the Mellon Institute of Industrial Research, University of Pittsburgh, has been re-elected president of the American Institute of Chemical Engineers and will therefore serve in this office during 1928.

DR. MAX WOLF, Director of Heidelberg Observatory, distinguished especially for his originality and activity in observational astronomy, has been elected an honorary member of the American Astronomical Society. The constitution of the Society permits the election of one honorary member at each annual meeting, but no election has been made since 1924.

AT a meeting of the Quekett Microscopical Club, held on Jan. 10, Mr. E. M. Nelson, Dr. A. Mann, and Dr. Karl Viets were elected honorary members. Mr. Nelson was president of the Quekett Club from 1893 until 1895, and also president of the Royal Microscopical Society from 1897 until 1899. He is the author of numerous papers dealing chiefly with the practical optics of the microscope and microscopical technique, which have appeared in the *Journal of the Royal Microscopical Society*, the *Journal of the Quekett Club*, and in the *English Mechanic*. Dr. Mann, of Washington, D.C., is well known as an authority on Diatoms; and Dr. Viets, of Bremen, has done a large amount of original work on the Hydracarina and Halacaridæ.

THE British Empire Cancer Campaign announces an international convention on cancer research to be held under its auspices in London next July. Of the value of such international meetings, especially on the personal side, there can be little doubt, though there seem to have been rather many lately on this particular topic, and the amount of time which those who are actively engaged in cancer research can profitably spend in travelling to meetings across the world obviously has its limits. In this case we are glad to note that none of the considerable expense of the convention will fall on the funds of the Campaign, owing to a generous donation from Sir Richard Garton.

THE Gold Medal of the Royal Astronomical Society has been awarded to Prof. R. A. Sampson, Astronomer Royal for Scotland, for his theory of the four great satellites of Jupiter. This extensive work is contained in three separate memoirs in the *Harvard Annals* and the *Memoirs of the Royal Astronomical Society*. With the tables to which the theory is reduced, it completes a self-consistent revision of the whole problem of the four great satellites. A bronze (Jackson-Gwilt) Medal has been awarded (1) to Dr. W. H. Steavenson, for his work on faint variable stars and on the Herschel instruments; and (2) to Mr. W. Reid, of Cape Town, for his discovery of six new comets.

THE seventh International Congress of Photography will be held in London on July 9–14, under the auspices of the Royal Photographic Society. There will be three sections: (1) scientific and technical, (2) pictorial photography, (3) bibliography and record work; the scientific and technical section will

be further subdivided into groups dealing with theoretical aspects, photographic practice, scientific applications of photography, and industrial and special applications. Papers for the Congress, accompanied by abstracts, both in duplicate and typewritten, must be submitted to the honorary secretary to the organising committee, Dr. W. Clark, The Science Museum, South Kensington, London, S.W.7, before June 1.

AN exhibition indicating the possible utilisation of Overseas Empire timbers in industry will be held at the Exhibition Pavilion of the Imperial Institute, South Kensington, on Feb. 3–April 30. This exhibition is the second of a series arranged to direct attention to specific resources of the Empire, with the object of increasing the usage of Empire raw materials in Great Britain. Samples of selected timbers from some of the Dominions and Colonies will be shown in conjunction with the articles which can be made from them. An important feature will consist of exhibits illustrating the work carried out at the Imperial Forestry Institute, University of Oxford; the Forest Products Research Laboratory (Department of Scientific and Industrial Research) at Princes Risborough; and at the Imperial Institute.

THE council of the Geological Society has this year made the following awards: Wollaston Medal to Dr. D. H. Scott, lately honorary keeper of the Jodrell Laboratory, Royal Botanic Gardens, Kew, in recognition of the value of his researches in fossil botany; Murchison Medal to Dr. J. J. Sederholm, Director of the Geological Commission of Finland, in recognition of his researches in petrology, especially of the granites and gneisses of the pre-Cambrian complex of Fennoscandia; a Lyell Medal to Prof. S. H. Reynolds, C. Wills professor of geology in the University of Bristol, in recognition of the value of his researches in the stratigraphy of the Palæozoic rocks, and in vertebrate palæontology; a second Lyell Medal to Dr. W. D. Lang, keeper of the Department of Geology in the British Museum, for his researches in stratigraphy and palæontology, especially with reference to the Bryozoa; the Wollaston Donation Fund to Mr. James Wright, for his researches on the Crinoidea of the Carboniferous Limestone of Scotland; the Murchison Geological Fund to Dr. George Slater, in recognition of the value of his researches in glaciology; and the Lyell Geological Fund to Mr. Ben Lightfoot, for his researches on the economic geology of Southern Rhodesia.

THE natives of Teheran (Persia) have discovered a new, if rather primitive, method of making ice in the winter months and storing it for summer use, according to a writer in *La Nature* for Jan. 1. Long ponds, running east and west, are dug in the earth and filled with water. Due to the slight night frost, a very thin coating of ice forms. The next night this ice is watered, and the layer of ice increases, until it gradually attains a thickness of about 16 inches. The ponds are protected on the south side by high earth walls to prevent the sun getting to the ponds even at its maximum elevation. The ice thus formed is broken up and stored in blocks in large galleries dug in the earth and separated into compartments, broken ice being placed between each block. When the summer comes, the ice blocks are broken up and retailed in small portions. The insulation provided by the storage galleries is stated to be sufficient to keep the ice without appreciable loss for two years.

FROM the *Report* for 1926 of the Museums of the Brooklyn Institute (N.Y.), we learn that the Children's Museum has obtained the full-time services of a scout instructor. He gave one day each week to the instruction of the Boy Scouts in their summer camp. More than 6000 Boy and Girl Scouts prepared in the Museum for their tests in nature study. Scout captains use the exhibits for demonstrations. This is only one of many lines along which this little Museum does admirable work in promoting a love of Nature among young people of all classes.

THE January issue of the *Journal of the Institution of Electrical Engineers* contains three "Progress Reviews," namely, "Electricity in Mines," by J. A. B. Horsley; "Co-operative Research in 1927," by E. B. Wedmore; and "Electrical Standardization, 1927," by P. Good. These reviews can be obtained in pamphlet form (1*s*. each) from the Secretary of the Institution.

MESSRS. Baird and Tatlock (London) Ltd., of 14-15 Cross Street, Hatton Garden, London, E.C.1, have issued a new edition of vol. 1 (Chemistry) of their Standard Catalogue of Scientific Apparatus. This work—it is a work of no small merit scientifically, commercially, and artistically—is intended to be used in conjunction with the other volumes of the Standard Catalogue, namely, vol. 2, Physiology; vol. 3, Biological Sciences; and vol. 4, Physics. The volume just issued is subdivided into nine separate sections, covering respectively laboratory fittings, general equipment, general chemical apparatus, physical chemistry, industrial chemistry (two sections), meteorology, books, and chemicals. The preface is dated October 1927, so that although such a catalogue of between eleven and twelve hundred large pages must of necessity take months to prepare, the prices which are quoted have yet had but little time in which to undergo their inevitable fluctuations. The illustrations are particularly good, and this fact, together with the comprehensiveness with which the whole publication has been conceived, makes the catalogue a noteworthy addition to the library of any educational institution or industrial laboratory in which experimental chemistry and the allied sciences are pursued. Descriptive paragraphs concerning the operation of the more complex and less well-known pieces of apparatus are a welcome feature. These paragraphs sometimes attain almost monographic proportions; the article on the theory and use of the polariscope, for example, consists of two closely printed pages, with diagrams, and even a reference to a paper in the *Berichte*, whilst that on the determination of hydrogen ion concentration covers three pages. Many new pieces of apparatus not hitherto catalogued are included; even more recent additions to the

chemist's armoury will be dealt with from time to time in separate leaflets. The whole publication is adequately indexed, with cross-references to the companion volumes.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A gas engineer and general manager under the Rotherham Corporation—The Town Clerk, Rotherham (Jan. 25). An inspector under the Ministry of Agriculture and Fisheries for the purposes of the Diseases of Animals Acts, 1894–1925—The Secretary, Ministry of Agriculture and Fisheries, 10 Whitehall Place, S.W.1 (Jan. 30). Assistant Veterinary Inspectors under the Surrey County Council to carry out duties under the several Acts and Orders relating to (1) Milk and Dairies; (2) Diseases of Animals; and (3) such other veterinary duties as the Council may require—The Clerk of the County Council, County Hall, Kingston-on-Thames (Jan. 30). A junior scientific officer under the directorate of scientific research of the Air Ministry primarily for work in the engine research department of the Royal Aircraft Establishment, South Farnborough—The Chief Superintendent, Royal Aircraft Establishment, South Farnborough, Hants (Feb. 11, quoting A.256). A lecturer in mycology at the Imperial College of Tropical Agriculture, St. Augustine, Trinidad—The Secretary, Imperial College of Tropical Agriculture, 14 Trinity Square, E.C.3 (April 1). A senior lecturer in physical and inorganic chemistry in the University of Melbourne—The Registrar, The University, Melbourne, Victoria (April 23). A principal of the Australian School of Forestry, Federal Capital Territory, Canberra—The Secretary, Department of Home and Territories, Canberra, Australia (April 30). An additional lecturer in zoology at the Ceylon University College, Colombo—The Private Secretary (Appointments), Colonial Office, 2 Richmond Terrace, Whitehall, S.W.1. An assistant bacteriologist at the Wellcome Bureau of Scientific Research—The Secretary, Wellcome Bureau of Scientific Research, 26 Endsleigh Gardens, W.C.1. A technical laboratory assistant at the Millport Marine Station of the Scottish Marine Biological Association—The Secretary, S.M.B.A., 88 Bath Street, Glasgow. Teachers of Siamese and of Tibetan at the School of Oriental Studies—The Secretary, School of Oriental Studies, Finsbury Circus, E.C.2.

ERRATUM.—A correspondent points out that the late Mr. W. H. Dines was at Corpus Christi College, Cambridge, and not at Christ's College, as was stated in our issue of Jan. 14, p. 65.

## Our Astronomical Column.

LARGE METEOR ON JAN. 9, 11h P.M.—Mr. W. F. Denning writes: "This very large meteor was seen by an observer when motoring about 6 miles east of Birmingham. The terminal portion of its flight was from near the star Sirius vertically to the horizon. The object was much brighter than Venus at its best, and the nucleus threw off a dense train of sparks at the end. The same meteor was noticed from Ilford, Essex, where the path was recorded as moving from just below Rigel and $\kappa$ Orionis in a direction towards the western horizon. It was very brilliant, and gave an outburst of sparkling material.

"Further observations will probably come to hand, but it appears that the fireball must have radiated from near the bright star Sirius and that its height was about 63 to 20 miles over a line directed from south to north over the English Channel to its finishing stage over Hampshire. Further data are, however, desirable, particularly from observers near the south coast of England."

THE RECENT GREAT COMET.—Many reports are coming to hand from America and elsewhere, that show what an extremely fine comet this must have been. Its magnitude rose at least to −6; some estimates make it −10. Its tail was at least 8° long: it would doubtless have been more if it could have been seen on a dark sky.

Dr. Slipher reports in a *Daily Science News Bulletin*, issued by Science Service, Washington, that its spectrum was continuous, with no bright lines, indicating that the light was mostly reflected sunlight; but an appreciable amount of lower temperature radiation was present. The nucleus was small, and varied from a circular to an elongated shape. Jets and envelopes were present on the sunward side of the nucleus.

The spectroscope indicated a motion of recession from the earth of 60 miles a second (exact time of observation not stated). The actual rate of recession between Dec. 20 and 21 was 54½ miles a second, which is a good agreement.

The following orbit by Dr. A. C. D. Crommelin is from a combination of observations ranging from Dec. 3 to 20:

| | | |
|---|---|---|
| T | 1927 Dec. 18·008 U.T. | |
| $\omega$ | 46° 9·7′ | 1927·0 |
| $\Omega$ | 76 25·2 | |
| $i$ | 85 27·2 | |
| log $q$ | 9·2365 | |

The earliest known observation of this comet (a day before that of Mr. Skjellerup) was obtained by Mrs. K. Botes at Fraserburg, Cape Province, on the morning of Dec. 2. She slept on a verandah facing south-east and observed the comet from her bed. It was low in the south-east about dawn. Other independent discoverers were Mr. Ross Fitchet at Grahamstown, Dec. 5; Mr. Maristany at La Plata, Dec. 6; Mr. Chidambara Iyer, Kodaikanal, Dec. 15.

Dr. A. C. D. Crommelin has deduced the following elliptical orbit of comet Schwassmann-Wachmann from Bergedorf observations on Nov. 15, Dec. 4 and 28.

| | | | |
|---|---|---|---|
| T | 1925 May 10·9230 U.T. | | |
| $\omega$ | 359° 56′ 13·7″ | | log $a$ 0·8090646 |
| $\Omega$ | 322 35 2·2 | 1927·0 | log $q$ 0·7403755 |
| $i$ | 9 25 37·0 | | log $n$ 2·3364097 |
| $\phi$ | 8 24 43·0 | | Period 16·35298 years. |

The orbit lies wholly between those of Jupiter and Saturn; the comet has the largest perihelion distance and the smallest eccentricity of any known comet. In consequence of the small eccentricity, the date of perihelion is difficult to determine and is still very uncertain.