

knack. He read widely and always maintained a keen interest in fresh developments of biology. He took a large part in the investigation of the inheritance of sinistrality in *Limnaea peregra* with Boycott, Diver, and Garstang, recently published in the *Phil. Trans.*, and incidentally made a number of valuable measurements of the factors which influence the rate of growth of water snails. 'Semper's law' particularly attracted him, and he succeeded in showing fairly conclusively that the larger size of individuals reared in larger volumes of water is due to the greater supply of food. He also made a number of original observations on the kinds of algæ actually eaten by snails, and of their preferences and dislikes for different species. Some of his results are published in the *Naturalist* (p. 231; 1926) and the *Essex Naturalist* (p. 48; 1927), but many of his problems were waiting for the further

experiments which he had planned to make when he retired this next summer.

WE regret to announce the following deaths:

Mr. J. D. H. Dickson, senior fellow of Peterhouse and author of numerous papers on thermodynamics and thermoelectricity, on Feb. 6, aged eighty-one years.

Mr. D. T. Jones, C.B.E., chairman of the Fishery Board for Scotland, on Feb. 4, aged sixty-five years.

Dr. C. Krumwiede, professor of hygiene and bacteriology at New York University, assistant director of the research laboratory of the Health Department of New York and past president of the Society of American Bacteriologists, on Dec. 28, aged fifty-one years.

Dr. Albert Schammelhout, secretary of the International Pharmaceutical Federation and an honorary member of the Pharmaceutical Society of Great Britain, on Jan. 20, aged sixty years.

### News and Views.

EARLY this year we had the pleasure of offering congratulations on behalf of scientific workers generally to Sir Ernest Rutherford on the barony conferred on him by H.M. the King, announced in the New Year's Honours List (*NATURE*, Jan. 10, p. 65). A further proof of the world-wide recognition of his brilliant achievements is the award, which we are glad to announce, of the Echegaray Medal of the Royal Academy of Sciences of Madrid. This medal was founded by the Academy in honour of Señor D. José Echegaray, its president from 1901 until 1916, and is awarded triennially to any person, Spaniard or foreigner, who shall, in the opinion of the Academy, have distinguished himself to an eminent degree in one or other of the branches of science for the promotion of which the Academy exists. Previous recipients of the medal are: Señor José Echegaray (1907), Señor Eduardo Saavedra (1910), Prince Albert I. of Monaco (1913), Señor Leonardo Torres Quevedo (1916), Prof. Svante Arrhenius (1919), Prof. Santiago Ramón y Cajal (1922).

ON Feb. 15 occurs the centenary of the death of the famous mechanician and engineer, Henry Maudslay, who was not only the founder of one of the most historic engineering firms of London but also was the originator of important advances in machine tools and engine construction. He was the first to construct screw cutting lathes in which the slide rest is moved along the bed by means of a leading screw driven by change wheels; and it was from his interchangeable system of screw threads that Whitworth afterwards developed the well-known Whitworth system. Born in Woolwich in 1771, the son of a soldier who had become a carpenter in Woolwich Arsenal, Maudslay began work in the Arsenal at twelve years of age and by eighteen had acquired such extraordinary mechanical skill that Bramah employed him on the construction of his locks. Later on, at the age of twenty-six, Maudslay set up in business for himself in Wells Street, and in 1810 founded the works in the Westminster Bridge Road where, for nearly a century, marine engines were constructed for the Navy. He was the

maker of the famous block-making machinery devised by Brunel for Portsmouth Dockyard. And among his workmen were Clements, who afterwards constructed Babbage's calculating machine, Nasmyth, the inventor of the steam hammer, and Whitworth. Into all his work, Maudslay introduced mathematical accuracy, while his constructions were all known for their beauty of proportion. The business he founded was carried on until 1905. On his death, Maudslay, at his own desire, was buried in Woolwich churchyard, where a monument recalls his merits as an engineer and a man.

THE Royal Commission on Transport, in its final report on the co-ordination and development of transport in Great Britain (see also p. 225), considers that of the two main causes of the present difficulties of railways, the long-continued depression in trade, especially in the 'heavy' industries, is the more important, though road competition will be a more permanent adverse factor. To meet such competition, a thorough overhauling of railway schedules, with speeding up of services and improved conveniences, including the removal of irritating conditions, revision of fares, and increased seating accommodation on main line trains, are recommended. In regard to grouping under the Railways Act, the report recommends that each company should confine its attention to the needs of its particular area; that joint lines should be merged and the traffic pooled at points served by two or more railways. Electrification of all suburban services where there is intensive passenger traffic, the closing of little-used and unremunerative branch lines, and progress in the use of larger waggons and of containers are other recommendations. In regard to road transport, expenditure on by-pass roads but not on new arterial roads is recommended; and the activities of the Ministry of Transport should be concentrated on the complete reconstruction of many existing roads, the widening of roads, improvement of road junctions and lines of sight, strengthening of weak bridges, freeing of toll roads and bridges, and the progressive reconstruction of built-up areas.

THE members of the Royal Commission on Transport are satisfied that users of motor vehicles are in general fairly taxed, but that the ratepayers' burden in respect of roads is too great; they recommend that no proceeds of taxation from motor vehicles should be diverted from the Road Fund, but that the present proportion between ratepayers and motorist should be reversed. The diversion of heavy goods traffic from the railways to the roads should be discouraged, steel tyres abolished, and pneumatic tyres used on all motor vehicles. The report recommends that no additional tramways should be constructed, and, without laying down a definite time limit, that they should gradually be replaced by other forms of transport. Certain canals are considered as still possessing real value as a means of transport, but they require rationalisation and development, although there is no territory where the construction of a new canal would be regarded as a serious proposition. A number of the smaller ports have been allowed to fall into a state of decay, and the first step to be taken towards assisting coastwise shipping is the improvement of the ports used by coasting vessels. In future road construction programmes, the requirements of harbour areas should receive a prominent place. The Commissioners are of the opinion that, in principle, it is undesirable that one form of transport should own docks and harbours to which access by other means of transport is required. A public trust is considered the best kind of authority to own docks and harbours, although transfer of the majority of railway-owned docks and harbours is not recommended. In regard to co-ordination, the appointment of a small permanent advisory council on transport, to study transport problems both generally and in particular areas, and to advise the Ministry on action which might be usefully taken to promote the co-ordination, improvement, and development of transport generally, is the only recommendation made, although the future of co-ordination is discussed.

THE debate on the second reading in the House of Commons of the Representation of the People (No. 2) Bill took place on Feb. 3. Several points in connexion with university representation in parliament were discussed during the debate. Statistics were quoted by Sir J. Withers, who stated that of the 12,000 university voters (*NATURE*, Jan. 31, p. 183), 10 per cent are living abroad, not, as has been suggested, as pleasure-seekers, but as tea-planters, consuls, Civil servants, and men of business. He considered their votes of great value, especially where foreign policy is concerned. He protested strongly against the proposed abolition of the university vote, on the grounds that the proposal was the result of a cynical bargain for party advantages, to get rid of Conservative members of the House, rather than a consideration of the public interest. Miss Rathbone pointed out the value of such representation, in that special channels were thus supplied through which mental training could express its views. Sir Graham Little stated that the reason for the removal of the twelve members had been quite frankly shown by

Mr. Clynes, when he said that those members were mainly Conservatives.

IN defence of the Bill, especially the question of the abolition of university votes, Mr. Ramsay Macdonald said that, at the present time, university representation is simply plural voting. If any institution in the country requires special representation, it certainly is not the universities. The universities pervade the whole atmosphere of the House, they are represented in every party and on every bench, because of the culture and enlightenment which the universities have spread among all classes of society. On Feb. 2, during the motion for the second reading, Mr. Clynes said that whatever else university members may have exhibited, they have shown in the quality of their work in the House of Commons a lack of knowledge of public needs. Mr. Shaw, during the debate, expressed the view that university graduates should be content with the influence which their university training can give them in the community, without asking for a separate parliamentary vote. At the division, 295 voted for the second reading and 230 against, giving a Government majority of 65.

THE general secretary, Prof. C. Marie, of the committee for the publication of the "Annual Tables of Constants and Numerical Data (Chemical, Physical, Biological and Technological)", informs us that Dr. M. Volmer, professor of physical chemistry and electrochemistry at the Technische Hochschule in Berlin, has been elected a member of the permanent committee, and Prof. M. Bodenstein as honorary member of this same committee. Prof. W. A. Roth, editor of "Landolt Börnstein Tables", has agreed to participate in the editing of the thermo-chemistry sections of the forthcoming volumes. These nominations of German representatives are greeted with particular satisfaction, as they put an end to a situation for which events alone were responsible, but which were no less regrettable from a scientific point of view.

ACCORDING to the tenth annual report of the British Electrical and Allied Industries' Association (E.R.A.), being presented at the annual general meeting on Feb. 13, the Association's income seems to be assured, and will, it is hoped, soon reach £50,000 a year. The work has recently been reorganised so as to secure that research is undertaken for the benefit of the industry as a whole and not merely for particular sections of it. Provision has now been made to wind up all 'confidential researches' at the end of the year, the rights of interested sections in certain confidential work being safeguarded. Some of the work done is mainly of technical interest, but some of the reports disclose phenomena which are of a more general interest. At first sight a report of the effect of storage in a warm atmosphere on the properties of adhesive electrical insulating tapes seems purely technical; but it may well give rise to research of interest to physicists. The research on the heating of cables buried deeply in the earth has led to important conclusions. The experiments show that the thermal resistivity of the soil diminishes with the depth, and

hence cables carrying heavy currents can get rid of more of their heat than had been anticipated. This tends to compensate for the greater distance from the earth's surface, and so the carrying power of deeply buried cables is not necessarily worse—and is indeed sometimes better—than that of cables buried only two or three feet below the surface. This is generally due to the fact that the soil is more compressed at the greater depths. The experiments show the necessity of studying closely the difficult problem of the movements of the moisture in the soil, under the influence of the thermal gradients due to the heating of the cables. Methods have also been devised of improving the thermal conductivity in the neighbourhood of the buried cables.

The Hurter Memorial Lecture delivered by Prof. G. T. Morgan before the Liverpool Section of the Society of Chemical Industry, on Jan. 16, gave a survey of recent developments in organic syntheses through the use of pressure. The original impetus in this field came in the production of intermediates for dyestuffs, and the experience thus gained by the great German firms was of fundamental importance in the development of the ammonia synthesis, and afterwards, following the study of the reactions between carbon monoxide and hydrogen at high temperatures and pressures in presence of catalysts, in the manufacture of methyl alcohol. Prof. Morgan is still hopeful that the synthesis of ethyl alcohol and higher alcohols is possible, without a simultaneous loss of carbon monoxide, by complete reduction to methane. Dealing with oxidation under pressure, the production of *aa'*-dipyrryl, with a bispyrpyridine, which gives a remarkably stable ferrous co-ordination compound with iron, from pyridine and anhydrous ferric chloride at 350° and about 50 atmospheres, was cited. Reference was also made to studies on the Kolbe-Schmidt reaction and on the action of carbon dioxide on phenols and on amines in the presence of anhydrous metallic chlorides, which are still yielding results of importance in the dyestuffs field. Prof. Morgan believes that a systematic study of high pressure reactions will lead to discoveries whereby the use of pressure may be partly or entirely avoided, and points out that, as the discovery of more effective catalysts lowers reaction temperature, high pressure synthesis should approximate more closely to the elaboration of complex carbon compounds, associated in Nature with the vital activities of plants and animals.

AN interesting legislative experiment is apparently to be made in the United States. Science Service reports that Congress has unanimously passed a law which gives to the man who produces new plants "the same encouragement and protection that the inventor of new mechanical or electrical apparatus has received for more than a century". New plants can be patented, and for seventeen years the breeder of a new plant will have a monopoly on its production. It is added that, as yet, full procedure for handling plant patents has not been worked out. When this has been done, possibly the authorities may discover some difficulties in the way of this new legislative

project. Plants propagated from seeds and from tubers are apparently excluded from its operation, but fruit trees, ornamental shrubs, etc., which can be vegetatively propagated come under its operation: it is not clear on what principle the tuber, a vegetative mode of propagation, should be excluded when other vegetatively propagated plants are included; but its exclusion may considerably reduce legal actions contesting patents under the new act. It will be interesting to see how the breeder establishes his claim to a new plant under the law. If he states that his new plant is the result of hybridisation between two named parents, how will this affect the operation of other breeders who desire to make the same cross? Will the same effect be ruled to follow, in law, if the same parents are used in the same manner upon another occasion?

AT Daytona Beach, on Feb. 5, Capt. Malcolm Campbell beat the world's land speed record, which was set up by the late Sir Henry Segrave at the same place on Mar. 11, 1929. Major Segrave's average speed over the measured mile was worked out as 231.36226 miles per hour, and the new record achieved by Capt. Campbell works out as 246.154 miles per hour. Exceptional credit is due to Capt. Campbell for his feat, since conditions were far from good. Visibility left much to be desired and the course was found to be uneven in places, especially at the northern end. These drawbacks did not deter him, however, and he set out, taking a flying start of 5.5 miles, which is 1.5 more than usual. His car, the Napier-Campbell *Blue Bird*, was fitted with a supercharged Napier aero engine, similar to those of the Supermarine seaplanes used in the Schneider Trophy contest in 1929. The engine develops more than 1400 horse power. The speeds returned for Capt. Campbell were: southward run, 246.575 miles per hour; northward run, 245.733 miles per hour—or an average of 246.154 miles per hour.

COTTON that has been grown entirely in England will be displayed in the Empire Marketing Board's stand at the British Cotton Textiles Exhibition which opens at the White City, London, on Feb. 16. Less than 30 miles from London there are 'cotton-fields' complete with plants which have flowered, fruited, and flourished for three generations. Specimens of various types of cotton grown in glass-houses at the Rothamsted Experimental Station will be shown alongside cotton from seven Empire countries. The plants have been grown for the purpose of scientific study of 'black-arm' disease, which attacks cotton in the Sudan, Nigeria, and Uganda. It is due to a bacterium which causes the young plants to wilt and die, and in another form, 'angular leaf spot', attacks the leaves and prevents the plant from producing lint. A grant has been made by the Empire Marketing Board for a study of the causes and spread of infection, and how 'black-arm' may be checked. Six tanks have been erected in which the temperature of the soil and the atmosphere, the humidity, and the amount of light can be controlled by those in charge. The workings of these tanks—the only apparatus of its

kind in the country—are to be shown by means of an exhibit of photographs, and cultures of the disease will also be exhibited.

IN continuation of the series of special exhibitions to illustrate the resources of raw materials of the British Empire which have been given at the Imperial Institute, a special exhibition of the mineral resources of the Empire will be opened by Mr. Amery on Feb. 17. This exhibition, besides bringing out some facts which are little realised by the general public—for example, the vast wealth of minerals produced within the Empire as compared with the rest of the world—will also show the utilisation of some of the lesser-known minerals, which are nevertheless of great importance. Again, it is not generally realised that 90 per cent of the world's nickel output, 90 per cent of the asbestos, and 72.5 per cent of the world's gold output were produced within the Empire in 1928. Sir Robert Horne will give an address on the mineral resources of the Empire in the cinema at the Imperial Institute at 5.30 P.M. on Thursday, Feb. 19. The seating accommodation is limited, and those desirous of attending should communicate early with the Secretary, Imperial Institute, London, S.W.7. There will also be a special series of mining films shown in the cinema throughout the exhibition. Entrance will be free. In connexion with the exhibition, the Institute is publishing a handbook on the mineral resources of the British Empire.

It is announced that a course of lectures on "The Application of Anthropology to Practical Affairs in Africa" will be given by the Rev. Edwin Smith at the London School of Economics on Mar. 9, 10 and 11 at 5 P.M. The manner in which the lecturer will deal with his subject, as outlined in the announcement, suggests a thoroughly practical handling of the question both in the interests of the future administrator and others concerned with native affairs and from the point of view of the scientific investigator. Rapidly changing conditions among backward peoples must, sooner or later, bring the anthropologist face to face with the question of the best way to deal with his problems in the field. Is his aim to be directed towards the elucidation of native institutions, in so far as it is possible to ascertain their original form, or is he to record them as they now are and register their function in changing conditions? If anthropology is to serve as an applied science, it may not appear that the matter is open to question. This is, no doubt, one of the points which Mr. Smith will discuss, and upon which his knowledge of African conditions entitles him to respectful hearing. In his first lecture, he will consider if we are on the right lines, in view of the Government's declaration with reference to the value of anthropology. In his second lecture, African family life and the regulation of the sex impulse will be considered as a type problem calling for sound knowledge as a basis of any action; and in the third, he will deal with the changing African, and consider whether what the African is becoming, rather than what the African was, is a necessary study if anthropology is to help in the solution of African problems.

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IN an age when iron is produced in enormous quantities and when scrap iron is scarcely worth picking up, it is difficult to realise the conditions in the fourteenth century, when, as stated by Rogers, on a farm "the most formidable item of expenditure on the supply of necessary dead stock was the annual cost of iron". The value of iron then was probably well over £100 a ton in our money, and even in the latter half of the seventeenth century wrought iron was twice as dear as rolled lead. Such are some of the statements given in the authoritative paper by Mr. J. W. Hall on "The Making and Rolling of Iron" contained in the recently published vol. 8 of the *Transactions* of the Newcomen Society. Originally produced direct from ore in quantities of 7 lb. at a time, 'manufactured iron' even 250 years ago was made in a finery not much bigger than a smith's fire. One great difficulty was the limited supply of charcoal, and between 1720 and 1750 the make of bar iron in the whole of Great Britain was only 250 to 350 tons a week. The principal steps in the history of iron-making include the use of coke in the blast furnace, Cort's invention in 1784 of 'dry' puddling on a sand bottom in a reverberatory furnace, and Joseph Hall's improvement in 1839 when he lined his puddling furnace with a partially fusible oxide of iron, an improvement which completely established the reputation of South Staffordshire bar. Brown's first chain cables for the Navy, costing 6d. a lb., were made of this bar, and it is the chain cable trade which to-day provides the chief outlet for the same material. In the working up of the iron, the trip hammer was used with great skill, and such hammers were used for iron long after rolling had been adopted for other metals. Slitting mills were in use in England in 1590. Rolls for iron were first used merely for finishing to size, but Cort's patent of 1783 laid the foundation of the existing methods of rolling sections.

A THIRD international conference on bituminous coal will be held at the Carnegie Institute of Technology in Pittsburgh, Pa., in November next, again organised by Dr. Thomas S. Baker, president of the Institute of Technology. Prominent fuel technologists from all parts of the world will be invited to attend the conference. In connexion with the organisation of the meeting, Dr. Baker has visited Europe to invite prominent scientific workers to speak at the congress. The purpose of the conference will again be to present for discussion the results of recent studies in coal, and particularly the economics of the new methods and processes that are being evolved. The programme will include papers on carbonisation, liquefaction, and gasification of coal; by-products of coal; the mechanism of combustion; cleaning of coal and its preparation for the market; pulverised fuels; power plants, and domestic heating. The advisory board supporting Dr. Baker includes J. A. Farrell, president of the United States Steel Corporation; J. H. Hammond, mining engineer; F. B. Jewett, president of the Bell Telephone Laboratories; A. W. Mellon, Secretary of the United States Treasury; F. A. Merrick, president of the

Westinghouse Electric and Manufacturing Company ; A. G. Pratt, president of the Babcock and Wilcox Company ; H. B. Rust, president of the Koppers Company ; M. S. Sloan, president of the New York Edison Company ; G. Swope, president of the General Electric Company ; and W. C. Teagle, president of the Standard Oil Company of New Jersey. It is hoped that the conference will assist in discovering new processes and help the recovery of the coal industry.

THE council of the Institution of Electrical Engineers has made the tenth award of the Faraday Medal to Mr. Charles H. Merz, a well-known electric power and traction engineer. The Faraday Medal is awarded by the council of the Institution, not more frequently than once a year, either for notable scientific or industrial achievement in electrical engineering or for conspicuous service rendered to the advancement of electrical science, without restriction as regards nationality, country of residence, or membership of the Institution.

THE following appointments to the Colonial Agricultural Service have recently been made by the Secretary of State for the Colonies: Mr. H. Wolfe, deputy director of agriculture, Tanganyika Territory, to be deputy director of agriculture (plant industry), Kenya; Mr. N. D. Simpson, to be systematic botanist, Ceylon.

THE Empire Marketing Board has approved a grant, for two years, for an investigation into the technique of milk examination by the London School of Hygiene and Tropical Medicine. The present standards for the bacteriological grading of milk were established in 1923. It has since become clear that they are not sufficiently complete, and, in view of their great importance in securing a thoroughly reliable 'clean milk' supply, it has been decided to work out a new technique to be accepted as the official standard in all cases of litigation.

WE regret that an error was made in our reference to the new catalogue of lantern slides issued by Messrs. Flatters and Garnett (*NATURE*, Feb. 7, p. 211). Chief credit for this production was given to Mr. Flatters. We understand that Mr. Flatters has not been in the business for many years, and that the compilation of the catalogue (especially the botanical section) was due mainly to Mr. Henry Garnett.

THE Wellcome Foundation, Ltd., is to erect a new medical and chemical research building at the corner of Gordon Street and Euston Road, London, W.C.1, on the site, 225 feet by 135 feet, now partly occupied by its Bureau of Scientific Research. For many years the Foundation has maintained medical and chemical research laboratories; but recent developments have made it necessary to co-ordinate and extend these activities. The new building will furnish the additional accommodation required, and be provided with the most modern research equipment. The architect is Mr. Septimus Warwick.

THE 1932 meeting of the Iron and Steel Institute will be held in the United States of America, under

the presidency of Colonel Sir Charles Wright, Bart. Joint arrangements, with reference to ocean and inland travel, are being made with the Institute of Metals, which is also holding a meeting in the United States in 1932. The inclusive dates for the meetings and excursions are Sept. 12–Sept. 29. The cost of the trip will be approximately £125 for the round journey; the major portion of this may be paid in advance, on an instalment plan, which began this month. Plans are under consideration for participation in some form by the Canadian Institute of Mining and Metallurgy, either at Toronto or Montreal, or both.

THE thirty-sixth general meeting of the Deutsche Bunsen Gesellschaft für angewandte physikalische Chemie, the leading association of research workers, scientific workers, and technologists in Germany in the field of applied physical chemistry, will be held on May 25–27 in Vienna. The subject of the symposium will be: "Recent Progress in the Science of Metallurgy with particular reference to Light Metals". The arrangements have been undertaken by Prof. Specketer, director of the I.G. Farbenindustrie A.-G., managing director of the Griesheim Elektron works.

THE Faraday Society has arranged a general discussion on "Photochemical Processes" to be held in the chemistry department of the University of Liverpool on April 17 and 18. Several distinguished chemists and physicists from the United States and the Continent have been invited to attend the conference and to send contributions. There will be four sessions, each with an introductory paper, which, like all the contributions, will be distributed previously, and taken as read. The four subjects are: "Molecular Spectra in Relation to Photochemical Change", "Photochemical Kinetics in Gaseous Systems", "Photochemical Change in Liquid and Solid Solutions", and "Photosynthesis". The introductory papers respectively are by Prof. R. Mecke, Prof. M. Bodenstern, Prof. Berthoud, and Prof. E. C. C. Baly.

FROM a recent article in *De Visscherij Courant* it appears that the slipper limpet is multiplying in the waters of Zealand in Holland. Frequent warnings by the coastal fishery authorities at Amsterdam have been issued, pointing out the necessity of exterminating these parasites in their early stages. As the food of the slipper limpet is the same as that of the oyster, it is feared that a great multiplication of the pest would have a serious effect upon the quality of the Zealand oyster. The Ministry of Agriculture and Fisheries desires to impress upon all persons who import Dutch or other foreign oysters, for the purpose of relaying, the importance of taking every precaution to avoid laying down oysters with slipper limpets attached to them. Every oyster should be examined for slipper limpet spat before it is laid down, for once the slipper limpet has become established on an oyster ground, it is practically impossible to eradicate it.

AMONG the many hazards of mining, one of the most difficult to avoid is the production of sparks by impact of rock, or of steel pick and rock. It has been

shown that the picks of mechanical coal-cutters can strike sparks which will ignite firedamp. In a recent report (No. 62) issued by the Safety in Mines Research Board, M. J. Burgess and R. V. Wheeler report experiments which show that sometimes the impact of a hand-pick on suitable hard stone will ignite firedamp. It was not easy and the work suggests that the production of suitable conditions is a rare occurrence in practice.

MESSRS. Francis Edwards, Ltd., 83 High Street, Marylebone, W.1, have just issued a useful little list of some 350 second-hand works dealing with the arctic and antarctic regions.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned: An assistant aeronautical engineer in the Army Air Corps of the Irish Free State—The Secretary, Civil Service Commission, 45 Upper O'Connell Street, Dublin, C.8 (Feb. 24). An adviser in greenkeeping at the St. Ives Greenkeeping Research Station—R. B. Dawson, St. Ives Research Station, Bingley, Yorks (Feb. 28). An assistant woman demonstrator

in physics at Royal Holloway College—The Principal, Royal Holloway College, Englefield Green, Surrey (Mar. 4). A professor of mechanical engineering in the University of Birmingham—The Registrar, The University, Edgbaston, Birmingham (Mar. 9). A director of the Institute of Plant Industry, Indore, and agricultural adviser to States in Central India and Rajputana—The High Commissioner for India, India House, Aldwych, W.C.2 (Mar. 14). A head of Biological Department of Epsom College—The Headmaster, Epsom College, Surrey (Mar. 31). A professor of philosophy at King's College, London—The Academic Registrar, University of London, South Kensington, S.W.7 (May 7). A part-time assistant master, qualified to teach biology, at the Technical Institute, Gillingham—C. Colles, Medway Technical College, Gillingham, Kent. A resident engineer at the Rotherhithe Works of the South Metropolitan Gas Company—The Secretary, South Metropolitan Gas Company, 709 Old Kent Road, S.E.15. A science master for physics at the Newport, Isle of Wight, Secondary School—The Director of Education, County Hall, Newport, Isle of Wight.

### Our Astronomical Column.

**Jupiter without its Satellites.**—Mr. W. F. Denning writes: "The planet Jupiter will be observed apparently without visible satellites on Feb. 14. On that evening at 8.51 P.M. the first satellite will commence its transit across the disc of its primary. The fourth satellite will have previously begun its transit; while the second satellite will be hidden behind the planet, and the third will be suffering eclipse. The temporary obscuration of the satellites will continue for more than 2 hours and 15 minutes, for at 9.6 P.M. the first satellite will complete its transit. Jupiter has nine satellites; all but five are so faint that small telescopes cannot reveal them. To view the planet devoid of all visible satellites is a somewhat rare spectacle. The writer was privileged to witness it on Aug. 21, 1867, with a 4½-in. refractor, and a delineation of the appearance presented was afterwards given in the *Astronomical Register*. Repetitions of the phenomenon will occur in 1932, and one of these which occurs in November may possibly be seen at Greenwich."

**Pluto.**—A recent *Daily Science News Bulletin* issued by Science Service, Washington, D.C., reports that Dr. S. B. Nicholson and N. U. Mayall, of Mount Wilson, have been studying the mass and orbit of Pluto. They first obtained corrections to Pluto's orbit by applying perturbations by the large planets; the period appears to be very close to 248 years. With the orbit thus obtained they investigated the mass that was indicated by the observations of Neptune. The two planets were in conjunction in longitude in 1891, and at their least distance apart, 19 units, in 1895. They made use of the data given by Dr. J. Jackson in his paper on Neptune's orbit (*Mon. Not. Roy. Ast. Soc.*, June 1930). Two different methods of treatment, one including, the other excluding, Lalande's observations of 1795, gave for Pluto's mass 1.08 and 0.72 in terms of the earth's mass.

Even the smaller of these masses would require the diameter of Pluto to be at least 7000 miles, assuming that the density is unlikely to exceed that of the earth. Such a diameter is not impossible. With an

albedo the same as that of the planet Mercury, it would make the visual magnitude in opposition about 14. The visual magnitude was stated to be brighter than the photographic one, and some of the estimates made it as bright as 14. M. Baldet, using the 33-inch Meudon refractor, estimated the diameter as 0.2", or about 4000 miles. But the limbs would be so feebly illuminated that the real diameter may be greater than his estimate.

**Solar Physics Observatory, Cambridge.**—The eighteenth annual report of the director of the Solar Physics Observatory, Cambridge, covering the period Aug. 1, 1929–July 31, 1930, shows satisfactory progress, although much of the routine work has been hampered by somewhat extensive instrumental alterations, which, however, should greatly assist the work in future. In particular may be mentioned the installation of an electric Gerrish drive for the 36-inch Common reflector in place of the old clock drive, and the re-designing of the spectroheliograph. The loss which the observatory has sustained through the sudden death of the first senior observer, Mr. F. E. Baxandall, in October last, is referred to in appropriate terms. Mr. Baxandall's chief unfinished investigation, on the spectrum of  $\beta$  Lyrae, has been edited by the director, with the collaboration of Dr. F. Hogg, director of the Amherst Observatory, and published as vol. 2, part 1, of the *Annals of the Solar Physics Observatory*. An important addition to the instrumental equipment is a registering microphotometer, specially designed by the Cambridge Scientific Instrument Co., in close collaboration with the assistant director, Dr. Carroll, the purchase of which was facilitated by a generous donation from Mr. J. H. Reynolds, honorary treasurer of the Royal Astronomical Society. A full description of the instrument has recently appeared in the *Monthly Notices of the Royal Astronomical Society*. On the meteorological side, the results of a study, during the last five years, of the discharge of electricity from an elevated metal point during periods of disturbed weather conditions have been discussed in a paper presented to the Royal Society. An extension of this work is now in progress.