

how his first year almost daunted him with his realisation of the insufficiency of present knowledge. It was clear he was passing through his transition period, blending what he knew of three sciences into one harmonious whole. It was at this time he published his work on the bladders of *Utricularia*, which as a boy he had independently discovered as capturing their prey by active movement in response to stimuli. His thought henceforth was of his plant first, and this is well seen in his research on the sugar-cane froghopper blight in Trinidad. Here he was dealing with a pest not introduced but belonging to the forests of the island, only secondarily attacking the canes. Having studied his insects and his plant together as one entity, his advice to the planter is to attend with the greatest care to his cultivation, in particular to see that his canes have plenty of water physiologically available for their growth. "Canes do not necessarily show serious blight when froghoppers have been abundant, nor is an abundance of the insect a necessary condition for serious blight." Other research in Trinidad resulted in the discovery of a bollworm, *Sacadodes pyralis*, a moth, the life history of which was worked out, and much time was spent in studying and rearing successive generations of cotton stainers, *Dysdercus*, bugs which prefer cotton to their natural Malvaceous plants and stain and rot the cotton lint by the bacteria and fungoid spores they introduce.

Dr. Withycombe only came to Cambridge in August last, and he at once set to work on his material of froghoppers and *Dysdercus*. He had to prepare a course of advanced lectures, and he had a sub-department to get into order. As a lecturer he was almost conversational, as he had seen everything of which he spoke, and his class loved him. As a colleague we admired and loved him too, for he had a most lovable personality, quite extraordinary vision, and absolute devotion to research.

J. S. G.

MR. CHARLES HARDING, formerly an assistant in the Meteorological Office, died at Eastbourne on Sunday, Jan. 9, in his eighty-first year. Mr.

Harding entered the Meteorological Department of the Board of Trade in 1861, and was among those who transferred to the service of the Meteorological Committee when the Office was reconstructed in 1867 after the death of Admiral Fitzroy. He thus had experience of the Office under all the different forms of administration through which it had passed, with the exception of the most recent one of all under the Air Ministry. For some thirty years Mr. Harding was Principal Assistant in the Marine Division, and served under three Marine Superintendents, Captain Toynbee, Lieutenant Baillie, and Captain M. W. Campbell Hepworth. He retired in 1911, but returned during the War for part-time duty, and did not finally sever his connexion with the Office until 1920. His active career in the Office, therefore, extended over nearly sixty years. Mr. Harding became a fellow of the Royal Meteorological Society in 1874, and served on its council and as vice-president for many years. He was the author of a number of meteorological papers, dealing mainly with climatology or marine meteorology, published in the *Proceedings of the Royal Meteorological Society* and elsewhere. For some forty years he was a valued and regular contributor of notes and articles on meteorological subjects to the columns of NATURE.

WE regret to announce the following deaths :

Dr. Daniel Carhart, professor emeritus of civil engineering since 1908 at the University of Pittsburgh, on Dec. 8, aged eighty-seven years.

Dr. Forris Jewett Moore, until a year ago professor of organic chemistry at the Massachusetts Institute of Technology, on Nov. 20, aged fifty-nine years.

Sir Isambard Owen, from 1909 until 1921 Vice-Chancellor of the University of Bristol, who took a leading part in the establishment of the University of Wales (1891-93) and in the reconstruction of the University of Durham (1907-9), on Jan. 14, aged seventy-six years.

Mr. F. J. Stoakley, for some fifty years chief assistant to the professor of chemistry at Cambridge, and well known to many generations of men who have worked in the Chemical Laboratory there, on Jan. 16, aged sixty-two years.

News and Views.

IN connexion with the reprint elsewhere in this issue (p. 125) of Clerk Maxwell's own abstract of his great memoir on the electrodynamic field, our attention has been directed by Sir Joseph Larmor to the valuable group of Maxwell letters that were discovered in 1903 among Stokes's private papers. They have been made public in the "Memoir and Scientific Correspondence of Sir George Stokes," vol. 2 (1907), pp. 1-45, published by the Cambridge University Press. They are an intimate account, reporting progress in a personal way from time to time in most of his scientific activity throughout his life. These and like collections of letters, from many of the most prominent workers of the time, all preserved by Stokes, make the two volumes an almost indispensable

prolegomena to the history of discovery in physical science during the latter half of last century. A very interesting account of Maxwell's early years is contained in an obituary notice written by Tait for the Royal Society of Edinburgh, and printed in NATURE, vol. 21.

PROF. G. ELLIOT SMITH has announced in the *Times* of Jan. 14 an interesting discovery which he says "should settle once for all the century-old controversy regarding the identification of certain elephant-like creatures represented . . . in Mexico, Central America, and elsewhere in the New World." Mr. J. Eric Thompson has just discovered in the Ayer Collection of the Newberry Library in Chicago unpublished

water-colour sketches made more than ninety years ago by M. Frédéric de Waldeck, a French artist, of four bas-reliefs in stucco found by himself on the floor of a subterranean room in the palace at Palenque, and also a drawing of a part of the wall in the same room. The drawings on the first of the stucco slabs show two elephant's heads drawn in a floral design which is said to be suggestive of motives of the Chinese T'ang period; the second shows anthropomorphised heads "of characteristic Maya style"; the third, a conventionalised tapir; and the fourth, an egg and *Halotis* shell. The design on the sculptured wall represents an elephant's head, front face with open mouth, on a serpent's body, with a conventionalised macaw and tapir heraldically grouped on each side. Prof. Elliot Smith also publishes a photograph of a crudely modelled elephant from San Salvador and two views of a painted vase discovered in 1916 at Yalloch, Guatemala, the design on which is considered by Dr. Gann, the discoverer, to represent the long-nosed god B (the feathered serpent Cuculcan, the Aztec god Quetzalcoatl), but which Prof. Elliot Smith holds to represent the elephant in the conventionalised style of Java and Eastern Asia.

As readers of NATURE are aware, Prof. Elliot Smith, reasoning as a zoologist, has argued ably that certain Maya sculptures represent the Indian elephant; but is it possible in so highly conventionalised an art as that of the Maya to make any attribution at all with that certainty? The varied interpretations—tortoise, tapir, macaw, and the like—which provoke Prof. Elliot Smith's amusement, are evidence of the ambiguity of the design rather than of the perversity of the attempts at interpretation. The Waldeck drawings would place the matter beyond question if they could be accepted as accurate. Prof. Elliot Smith quotes vindications of Waldeck's trustworthiness, which had been impugned; but the drawings themselves show the influence of the pseudo-classical Empire style of the French art of Waldeck's day rather than the true spirit of Maya art. It is admitted that Waldeck had a penchant for restoration. In the circumstances, it is perhaps not too much to say that a stylised reproduction of a subject already highly conventionalised needs careful verification by experts before it can be accepted as evidence beyond question.

THE Gold Medal of the Royal Astronomical Society has been awarded to Prof. Frank Schlesinger, of Yale University Observatory, for his work on stellar parallax and astronomical photography. Prof. Schlesinger has done excellent observational work in spectroscopy and the variation of latitude. Specially notable is his work on stellar parallax, in which he showed how a higher standard of accuracy was attainable and took a leading part in the organisation of a number of observatories in this work. He has recently established an observatory at Johannesburg for parallax observations in the southern hemisphere. He has also initiated the use of wide angle doublet lenses for determination of position. The great accuracy which he has attained has stimulated

German astronomers to re-observe the *Astronomische Gesellschaft* Catalogue on these lines.

At its last meeting, the Council of the Royal Photographic Society awarded the Progress Medal to George Eastman "in recognition of his inventions, researches, publications, and other work," moved partly to this step by the broad vision displayed in his founding and supporting, alike with rich endowments and active co-operation, the Eastman Research Laboratories. From this organisation, staffed by some of the most notable scientific workers that photography can claim, reports concerned with almost every aspect of the subject, from theories of light action to the commonplaces of dark-room practice, are circulated freely without other tangible reward than the gratitude of practical workers. Mr. Eastman's labours in his chosen field stretch so far back as to be barely realised by the photographer of to-day. Fifty years ago, while still a youth, he worked out from scanty data gleaned in journals of the period a method of producing dry plates (then a novelty wholly imported from Europe) and courageously started their manufacture. The same qualities led him later to devote large sums and his great practical experience to perfecting the roll-holder, and its natural sequel the daylight-loading film camera of to-day. The zest with which he interested himself in the new product celluloid, and the whole-hearted support afforded Edison in his early work in cinematography, are mainly responsible for the rapid progress made by the latter towards mechanical precision. Had Friese Greene and Le Prince, working in England, enjoyed like access to this invaluable help in their hours of difficulty, few of the film problems now puzzling British Government departments need have arisen.

THE friends and admirers of the late Dr. T. S. P. Strangeways are forming a memorial fund, of which the primary object will be the provision of scholarships for his five sons. The committee includes the Master of Christ's College, the Master of Gonville and Caius College, the Master of St. John's College, the Master of Trinity Hall, the Regius professor of physic, the professor of pathology, the professor of anatomy, Sir Otto Beit, Sir Walter Morley Fletcher, Sir Charles Walston, Lady Woodhead, Dr. Cassidy, and many other well-known names. Cheques should be crossed "c.a. Strangeways Memorial Fund," and may be sent to either of the hon. treasurers: Mr. G. F. C. Gill, Lloyds Bank, Cambridge, or Prof. Sir Humphry D. Rolleston, Bart., Southfield, Trumpington Road, Cambridge; or to Dr. L. E. Shore, Dr. Louis Cobbett, or Dr. G. P. Bidder. It is obvious that a large sum will be required; and towards this £1895 has been subscribed by the Committee and a few friends.

AMONG the men of science of the seventeenth century—a period made memorable by the work of Gilbert, Napier, Galileo, Wallis, Hooke, and Newton—the Hon. Robert Boyle will always occupy a prominent place. Born three hundred years ago, on Jan. 25, 1627, he might be called the Cavendish of his time.

Of noble birth, Boyle was left with ample means by a father who was one of the ablest of public men. The portrait of Boyle, however, is that of a thinker and not of a man of action. He was delicate and studious as a boy and owed much to his tutor, with whom he spent some years on the continent, while in after life he was influenced by his sister, just as Pascal was by his. It was in 1654 that Boyle, then twenty-eight years of age, went into residence at Oxford, and with Wilkins and others began those meetings which led to the foundation of the Royal Society. Six folio volumes tell of his industry, and contain the results of his experiments in chemistry and physics. Following in the footsteps of Torricelli and Otto von Guericke, he improved both barometer and air-pump, and it was in his "Defence of the Doctrine touching the Spring and Weight of Air," published in 1662, that he gave us the important law known by his name. He never held any appointment, though he might have been Provost of Eton and president of the Royal Society. His death took place on Dec. 30, 1691, just a week after that of his sister. They had long lived together in Pall Mall and were buried side by side "at the upper end of the south side of the chancel" of St. Martin-in-the-Fields; but thirty years later the church was rebuilt, and to-day no one can point to his grave and no monument recalls to the stranger that Boyle was buried there.

IN the *Sunday Times* of Jan. 2, Prof. H. J. Spooner directs attention to some of the notable centenaries which occur this year. Among the names of men of science which he mentions are those of Newton, Laplace, Fresnel, Volta, and Lister. The bi-centenary of the death of Newton will be celebrated at Grantham in March, while the centenary of the death of Volta is being recognised by the holding of an electrical exhibition at Como. The custom of commemorating such events should find general acceptance, for, as Fairbairn once remarked, "the smallest honour we can do the great benefactors of mankind is occasionally to bring them to our recollection." To the names mentioned many others might be added. Next in interest to mathematicians and astronomers, after Newton and Laplace, comes that of Robert Woodhouse (1773-1827), successively Lucasian professor and Plumian professor, to whom belongs the credit of introducing the calculus at Cambridge and who found earnest disciples in Babbage, Herschel, and Peacock. Another astronomer who died the same year was Calandrelli (1749-1827), once director of the Vatican Observatory, while going back four hundred years we have the birth of Stadius (1527-1579), a predecessor of Kepler as mathematician to the Emperor of Germany. A contemporary of Stadius who should not be overlooked was the famous Dr. John Dee, alchemist and astrologer, who was born in 1527 and died in 1608.

To chemists and physicists the tercentenary of the birth of Boyle (1627-1691) and the centenary of the death of Augustin Jean Fresnel (1788-1827) will afford the greatest interest. Though Fresnel sank

into an early grave he was one of the foremost students of optics, and it was only eight days before his death that Arago placed in his hands the Rumford medal of the Royal Society. Another physicist of note who died in the same year was Chladni (1756-1827), whose works on sound were translated into French through Napoleon. Henry Beaufoy (1764-1827) was both physicist and astronomer but is still better known for his experiments in naval architecture. The year 1827 saw the publication by Ohm of "The Galvanic Circuit worked out mathematically". Although no great chemist died in 1827, in that year were born Sir Frederick Abel (1827-1902), John H. Gladstone (1827-1902), Edward Nicholson (1827-1890), and, most distinguished of all, Marcellin Berthelot (1827-1907). In the same year the death occurred of Samuel Crompton (1753-1827), whose work as the inventor of the spinning mule will be the occasion of a gathering at Bolton, and also of George Medhurst (1759-1827), one of the inventors of the atmospheric railway. Among the great pioneers of last century was Sandford Fleming (born 1827), who was Engineer-in-Chief of the Canadian Pacific Railway from 1871 until 1880.

SOME considerable stir in the United States was caused in July 1925 by the trial of Mr. John T. Scopes, a science teacher of a Tennessee high school, for having taught the truth of evolution in defiance of the State law. The matter aroused widespread interest, and in our issues of July 11 and later, we published the views of a number of leading men of science and theologians on the desirability or otherwise of the control of university and school curricula by the State. It will be recalled that Mr. Scopes was found guilty, after a long trial, of breaking the State laws and was fined 100 dollars. The defence at once announced its intention to appeal against the decision of the judge and to raise the question as to whether a State law prohibiting the teaching of evolution was consistent with the constitution of the United States. The case came before the Supreme Court of Tennessee, and on Jan. 15 the verdict was given that the 'anti-evolution' law is constitutional, but that the lower court erred in fining Mr. Scopes 100 dollars. Mr. Scopes was guilty of a misdemeanour, for which the maximum penalty in Tennessee, it would appear, is 50 dollars unless the case is tried by a jury.

ON Dec. 4 of last year, the twenty-fifth anniversary of the establishment of the Bureau of Standards was celebrated at Washington. The Hon. Herbert Hoover, Secretary of Commerce, and "the only Engineer in the Cabinet," delivered the first address, in the course of which he remarked, "The Bureau to-day represents the greatest of all the world's physical laboratories. . . . I know of no laboratory, no effort of any Government that represents so liberal and so generous a support to science as is exemplified in the Bureau of Standards. To-day its appropriations approximate two and a quarter million dollars a year, a larger income than most of our universities." Referring to the Bureau and the maintenance of a

high standard of living, he said, "It is only through the support of agencies of this character, and hundreds of other institutions engaged in scientific research, that we may expect with confidence that as our population grows we can still add this increment of comfort and luxury which we have enjoyed in the last century." Addresses were also given by Dr. F. A. Wolf, who referred to the time when the quarters of the Bureau consisted of two basements in the Coast Survey building on Capitol Hill; by Dr. Stratton, a former Director of the Bureau, and by Mr. Cortelyou, a former Secretary of Commerce, who spoke of the hundreds of men of high scholarship found in the Bureau, and recalled a story of Edison who, being asked by an interviewer to name the four most useful men he knew, replied, "Oh, you wouldn't recognise them. They're working around in laboratories."

THE expedition to New Guinea of the Smithsonian Institution and the Scientific Research Society of the Dutch East Indies, which has penetrated 250 miles into the interior of Dutch New Guinea under the leadership of Prof. Stirling, has reached Singapore on its way back to the United States. According to a dispatch from the Singapore correspondent of the *Times* in the issue of Jan. 14, 8000 ethnographical specimens, a large botanical collection, and much information concerning the pygmy races has been obtained. It will be remembered that in the reports on the progress of this expedition which have been issued by the Smithsonian Institution from time to time, special stress has been laid on the value of the work in mapping and exploration which has been made possible by the use of the aeroplane. The mountain barrier was crossed and the entire upper reaches of the Bouffier River, hitherto unknown, were mapped. The original intention of visiting Lake Habbema, at an estimated altitude of 12,000 ft., by flying was abandoned; but the expedition reached a height of 9000 ft. where three months were spent among the pygmies. These proved to be most hospitable and friendly, in contrast to the Papuans of the coastal area, who attacked the camps, the canoes, and the transport, when several of the natives were killed. The expedition would appear to have been more fortunate than travellers in other parts of New Guinea in their relations with the pygmies, as it has usually been found difficult to establish contact with them.

AN appeal for contributions to a Maya Exploration Fund has been issued by Sir Frederic Kenyon, Director of the British Museum. As a result of the excavations carried out last year on the site at Lubaantun, an invitation has been tendered to the trustees of the British Museum by the Government of British Honduras to undertake the supervision of the archaeological exploration of the Colony. The trustees are prepared to accept the responsibility if funds allow; but as the resources at their disposal are limited, they ask for the financial support of the British public in this undertaking, which promises results of exceptional importance. A capital sum of £40,000 to £50,000 is required to meet an annual cost of £2000 for exploration from year to year.

British Honduras, though a small territory, contains remains of every phase of Maya civilisation. As explorations of the last two or three years have shown, it is impossible to place any limit to the extent and character of the material which may be forthcoming from this area to help in elucidating the fascinating problems which bear upon the origin and development of the prehistoric culture of Central America. At Lubaantun itself, in the course of two seasons' work, features unique in Maya art and architecture have been brought to light. That the continuous and systematic archaeological exploration of the country should be undertaken at the request of the Colonial Government is in itself a gratifying mark of the recognition of the importance of these priceless monuments of antiquity, which hitherto have not only been utterly neglected by the authorities, but have not even been protected from the vandalism of any chance comer.

A BOOKLET entitled "The National Institute for Research in Dairying: Its Work and Needs," compiled by the staff, deals with the inception, development, and aims of the National Institute for Research in Dairying, which is now located (under the University of Reading) at Shinfield, near Reading. During the time that the Institute has been established—some fourteen years—it has overcome many of its initial difficulties and has tackled some of the pressing problems of dairying with vision and enthusiasm. In face of what has been accomplished, it is to be hoped that the question of finance, which still hinders the work, will receive attention. It is not only those directly connected with dairying who are indebted to the Institute, but also the general public for the benefits which arise from the Institute's campaign for clean milk. The work of the Institute is classed under the headings of (a) management and feeding of dairy stock, (b) the chemical constitution and other properties of milk and milk products, (c) the methods of handling and distribution of milk. In each of these sections, not only has attention been given to the practical aspect of the various questions, but also the underlying scientific problems have been thoroughly studied. This has necessitated a very large amount of chemical, physical, and bacteriological investigation.

FROM the beginning, the National Institute for Research in Dairying has placed the production of clean milk in the forefront of its programme, and it has succeeded in stimulating a very keen interest in this subject throughout England. At the present time there is a steady increase in the number of clean-milk competitions, which are mainly organised by the county authorities. In 1925 the number of these competitions totalled 35, and there is every reason to expect an increase in the future. Demonstrations of methods to be employed in producing clean milk on the farm are now a feature of many county and local agricultural shows, and the visits of the county dairy instructors or instructresses to the farms in their respective areas are spreading the knowledge which is so vital to success. Most of these dairy teachers have been to a special course of instruction at the National

Institute, so that, in addition to research, the Institute plays a very important part in training and stimulating those who are able to influence the farmer in this important question of clean, safe milk.

THE inaugural meeting of the Institution of Fuel Technology was held in London on Dec. 7 and 8 last. Sir Alfred Mond, in his presidential address, discussed the problem of fuel generally in an interesting and stimulating manner. He pleaded for more co-operative effort in the scientific development of fuel, and more optimism in industry as a whole. T. Hardie read a paper on modern practice in gas manufacture, based on the experience of the Gas Light and Coke Co. The thermal efficiency of carbonisation in modern vertical retorts has reached 85 per cent., and of carburetted water-gas manufacture nearly 70 per cent. Prof. R. T. Haslam, Massachusetts Institute of Technology, contributed a theoretical discussion on the combustion of carbon, and Sir Richard Redmayne a paper on the German brown coal industry, giving a very comprehensive account of the fuel itself and of the various processes to which it is now put; it emphasised the potential value of such a low-grade fuel when suitably exploited. A paper was contributed by W. E. Groume-Grijmaïlo, of Petrograd, on his theory, based on hydraulic analogy, of the flow of furnace and heating gases, and its application to furnace construction. S. McEwen discussed the economies of low-temperature carbonisation, with special reference to the supply of pulverised fuel and its use. Dr. J. S. Owens gave an account of modern views on smoke and public health. The *Fuel Economist* for December contains a full account of the papers and discussions, which are of considerable interest and value.

WE learn from the report for the past year of the British Photographic Research Association, which was presented to the Council by the Director of Research on Nov. 23, that the Association has now entered on the last year of its second period of grant from the Department of Scientific and Industrial Research, and is therefore obliged to consider the question of the future. The Association is supported financially by the subscriptions of its members, supplemented by a grant from the Department, and in this manner has been enabled to make a really good start and thoroughly to justify its existence during the last nine years. We wish we could add that it was thoroughly well established, but the obviously uncertain nature of its income must be a source of anxiety to every member of the staff, and now and then leads to the loss of valued assistants, who naturally are ready to pass to appointments of a more apparently secure character.

At the last annual general meeting of the Association, a resolution was passed that "it is of great importance to the industry that the British Photographic Research Association should be continued, and that every effort should be made to secure its continuation on a sound financial basis." We sincerely hope that these efforts will be made, and

that they will be crowned with a success that will enable the Association not only to feel that it is well established but also that it may look forward to a healthy growth. The last year has added eight to the total of its scientific communications published, and two others are in the press. In addition, four summaries of literature have been circulated, frequent meetings of the staff with members of the scientific staffs of manufacturing firms have been held, and three lectures have been given in response to "requests from outside circles." Assistance or advice given confidentially to the members of the Association is one of the other activities of the research staff, but its main work is to supplement and not to replace the research departments of the various manufacturing firms, by attacking fundamental problems rather than those immediately concerned with factory work. It is pleasing to note that a certain feeling of distrust that existed at first on the part of some manufacturers has now been replaced by one of confidence in the research staff of the Association and its Director.

THE Society for Experimental Biology met at Bedford College, London, on Jan. 10 and 11. At the first session Prof. A. E. Boycott described experiments to determine the cause of the local distribution of *Planorbis* and *Bithinia* in a group of ponds, Mr. R. E. Chapman showed the effect of bicarbonates on photosynthesis in water plants, Dr. W. K. Slater discussed the effect of anaerobic conditions on the metabolism of the cockroach, and Dr. J. Needham communicated a paper on the carbohydrate metabolism of the developing egg. A number of demonstrations of plant and animal experiments were also made. The second session, which was devoted to a symposium on the relative growth of parts, in which Prof. J. S. Huxley, Miss M. Shaw, and Messrs. M. Perkins, John Hammond, J. T. Cunningham, and others took part, was characterised by lively discussion. In the third session Dr. C. M. Yonge described intracellular digestion in Metazoa and Mr. G. F. Marrian explained the inter-relationships of respiratory pigments. Mr. G. P. Wells summarised experiments on the action of cations on invertebrate muscle, and Mr. V. J. Clancy described recent work on the biochemistry of sclero-proteins which go to form skeletal and protective structures in animals and plants. At the annual meeting twenty-two new members were elected, and on the evening of Jan. 10 a dinner at the Florence Restaurant was attended by about fifty members and guests.

At the fourth annual meeting of British zoologists in the rooms of the Zoological Society on Jan. 8, it was proposed by Prof. Stanley Gardiner, and carried unanimously, "That this meeting represents to the Trustees of the British Museum the desirability of equipping zoological expeditions for the purpose of obtaining as full a record as possible of the past and present fauna."

THE Research Association of British Paint, Colour and Varnish Manufacturers has made arrangements

to purchase a property at Teddington near to the National Physical Laboratory, to be used as its research station and laboratories. It is hoped that the premises will be ready for occupation by the end of March. A Technical Advisory Committee has been appointed to consider and draw up the preliminary programme of research, and a second member of the technical staff has been appointed, namely, Dr. J. O. Cutter.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—An assistant master to teach engineering science in the day junior Technical and Evening Technical Schools, Truro—The Principal, Technical Schools, Truro (Jan. 28). A secretary to the Royal Asiatic Society—The

Secretary, Royal Asiatic Society, 74 Grosvenor Street, W.1 (Jan. 29). A lecturer in machine drawing and design in the department of engineering, University College, Nottingham—The Registrar (Jan. 31). An assistant editor of British Chemical Abstracts—B (Applied Chemistry)—The Secretary, Bureau of Chemical Abstracts, 46 Finsbury Square, E.C.2 (Feb. 4). A principal of the Teachers' Training College and professor of education in the University of Western Australia—The Agent-General for Western Australia, Savoy House, Strand, W.C.2 (Feb. 10). A test assistant at the Royal Aircraft Establishment for general assistance to the scientific staff of the wind tunnel section of the Aerodynamic Department—The Chief Superintendent, R.A.E., South Farnborough, Hants. (Reference No. A. 142).

Our Astronomical Column.

COMETS.—Mr. Blathwayt, who discovered his first comet a year ago, has now found a second one, which is of the ninth magnitude, being the brightest comet that has been in sight for several months. The place of discovery is Braamfontein, near Johannesburg, and the position on Jan. 13 at 1^h 28^m 0^s is given as R.A. 15^h 44^m 0^s, S. Decl. 29° 46', daily motion + 12^s, S. 50'. The comet is too far south for observation in England, but may come northward later.

Prof. J. Comas Sola, of Fabra Observatory, Barcelona, has discovered an object of doubtful character (comet or minor planet). Its place on Jan. 10 at 0^h 30^m 0^s U.T. was 8^h 19^m 20^s, N. Decl. 2° 22', daily motion - 1^m 28^s, S. 18', magnitude 12.4. If it is a minor planet, it must have a fairly small mean distance and a high inclination, so that it is an object of interest in any case.

Dr. A. C. D. Crommelin has deduced the following orbit of comet 1926 f. (Comas Sola) from photographic observations by G. Merton and F. J. Hargreaves on Nov. 10, Dec. 3, Dec. 24:

$$\left. \begin{aligned} T &= 1927 \text{ Mar. } 22 \cdot 1992 \text{ U.T.} \\ \omega &= 38^\circ 27' 30'' \cdot 8 \\ \Omega &= 65 \ 36 \ 29 \cdot 2 \\ i &= 13 \ 45 \ 40 \cdot 0 \\ \phi &= 35 \ 5 \ 39 \cdot 5 \\ \log q &= 0 \cdot 248639 \\ \text{Period} &= 8 \cdot 51645 \text{ years.} \end{aligned} \right\} 1926 \cdot 0$$

These elements indicate a close approach to Jupiter in May 1912, and are therefore compatible with the suggestion of identity with Spitaler's comet 1890 VII. Very large perturbations are required to make this possible, the aphelion distance having increased from 5.08 to 6.568, which latter is 1½ units beyond the orbit of Jupiter.

EPHEMERIS FOR 0^h.

	R.A.	N. Decl.	log Δ.
Jan. 24	2 ^h 39 ^m 46 ^s	18° 40'	0.148
Feb. 1	2 49 52	20 26	0.166
„ 9.	3 2 10	22 14	0.183

The comet should be readily observable until May, which would be six months after discovery. It remains within a few degrees of Mars for some time.

THE MINOR PLANETS.—Prof. H. N. Russell gives in the *Scientific American* for January an interesting summary of our present knowledge on this subject. Keen visual scrutiny revealed 300 planets between 1847 and 1891; then the photographic method was introduced and led to a great increase in the rate of discovery, more than 1800 discoveries having been

announced between 1891 and 1926. At present, 1046 planets have been well observed and have received permanent numbers; about 1000 more are known to exist, but their orbits are only roughly determined.

The search cannot be pronounced a waste of time, if only for the fact that it led to the discovery of Eros, which gives such an excellent means of determining the solar parallax. Albert, Alinda, and Ganymede resemble Eros in travelling partly within the orbit of Mars. The group of six Trojan planets, which make equilateral triangles with Jupiter and the sun, give an example in the heavens of a solution of the 3-body problem which Laplace had announced from theory more than a century earlier. Dr. Baade's remarkable asteroid Hidalgo, the orbit of which extends from Mars to Saturn and is more eccentric than many cometary orbits, also presents interesting features, and raises some puzzling questions in cosmogony.

It is satisfactory that international co-operation in observing the minor planets, which broke down during the War, is being established afresh. Prof. M. Wolf's first photographically discovered planet was lost for some thirty years, and was then recovered in America, though it needed a long series of observations to establish the identity.

SATELLITES OF MARS.—These satellites offer some interesting problems, owing to their close proximity to Mars, with resulting shift to their orbit planes, due to the planet's oblateness. There is also the possibility of some alteration of the mean motion of Phobos as a reaction of tidal friction. Hence the series of measures made in 1924 with the 26-in. equatorial at the United States Naval Observatory, Washington, by A. Hall, E. C. Bower, and Miss E. A. Lamson (*Astr. Jour.*, No. 873) is of interest. The corrections to the mean daily motions are:

	Deimos.	Phobos.
Hall . . .	- 0.000060°	+ 0.000099°
Bower . . .	- 0.000107°	+ 0.000097°

The deduced values of the reciprocal of the mass of Mars are:

	Deimos.	Phobos.
Hall . . .	3,108,500	3,157,100
Bower . . .	3,127,200	3,212,100

Giving Deimos double weight, owing to the larger arc subtended by its orbit, the weighted mean is 3,140,100. Thus the observed value of the mass is nearly 2 per cent. smaller than the accepted value, rather a large difference.