

## News and Views.

WE referred last week, p. 138, to the meeting of the Royal Society on Jan. 17, at which Prof. Eddington described some speculations on a new development of quantum mechanics, published in the January issue of the *Proceedings* of the Society. So much prominence has been given to the paper in the public press that some further remarks upon it in these columns may be worth while. The speculations put forward are of a very interesting type, for they attempt to assimilate what we now call interchange of electrons to a transformation in a new co-ordinate or co-ordinates, similar to a Lorentz transformation in space-time co-ordinates in that it can never be observed. The starting point of these speculations is the observation that we now describe the interaction of electrons by two principles, Coulomb's electrostatic forces and Pauli's exclusion principle, and that every principle of scientific æsthetics requires us somehow to weld them into one. This observation is perhaps the most promising and interesting part of the paper. The main part of the paper is concerned with speculations as to how perhaps this might be done, and the description of the interchange of electrons already alluded to is Prof. Eddington's attempt at a weld.

PROF. EDDINGTON'S whole speculation is extremely tentative, even for a new step in quantum mechanics, and very properly so propounded. If his main idea is correct, that the principles of Coulomb and of Pauli are two aspects of the same feature of our world, there must necessarily be a theoretical connexion between the two constants,  $e^2$  and  $hc/2\pi$ , which they respectively introduce. Prof. Eddington's tentative speculations suggest a value of 136 for this ratio; all the existing experimental evidence, provided that our main theoretical formulæ are trustworthy, are in favour of a value very near to 137, a value which of course is not necessarily integral. It is quite possible that Prof. Eddington's theoretical result of 136 may be right, even if every word which he or any one else can as yet say about his theory is a totally wrong interpretation of it, like so much else which we still say of the easier aspects of quantum mechanics. It is far too soon to be confident either way. But if the ratio is really 136, it is already clear that the new theory when complete must involve small but far-reaching changes in the relations between the primary physical constants and, for example, Rydberg's constant. It will be a matter of the highest interest if it ultimately turns out that the formula for Rydberg's constant, the corner-stone of modern physical theory, was slightly wrong after all! At present it is proper to confess that we do not in any sense understand the new theory, still less know if it is right. Its further study will no doubt be prosecuted with interest and vigour.

IN order to introduce into the Leningrad Academy of Sciences, which three years ago celebrated its 200 years of independent scientific life, it was decided last year to enlarge the Academy by adding to it forty

new members. A list of candidates has been approved by the authorities, and amongst the new academicians several active supporters of the government have been duly elected. Three of the candidates put forward by communistic organisations failed, however, according to the *Times* of Jan. 28, to obtain the two-thirds majority of votes necessary to secure election, probably because of their insufficient qualifications. The Soviet authorities insist now that the Academy must waive its statutory regulations and take a fresh ballot on the three rejected candidates. A meeting of the Academy summoned to consider this extraordinary proposal decided that, although it was contrary to the statutes, it has to be accepted. Nine academicians, however, voted against acceptance, and their names have been published by the Soviet press as follows: Pavlov (physiologist), Levinson-Lessing (geologist), Borodin (botanist), Liapunov (mathematician), Karsky (ethnologist), Lavrov, Petrushevsky, Vladimirtseff, and Sakulin; every one of these nine names is well known—indeed, some are famous amongst the leading men of science of the whole world. Various startling projects of reconstructing the Academy so as to make it support actively the government policy are discussed by the official Soviet press, but apparently no definite decision has been arrived at so far.

THE neon tubes which are now so familiar to the public in various script sign advertisements have found a useful application in replacing white lights for lighthouses serving air routes. In a new light at Lympne, sixteen tubes twenty feet long are employed in the form of a vertical truncated cone. The light is said to have a candle power of 6000 and to be visible in clear weather for 45 miles. The neon spectrum gives a number of lines lying for the most part towards the red end of the spectrum, the yellow line 5853 Å. being specially prominent. Thus the normal colour of the tube is red orange, unless much argon or mercury vapour are also present. It is therefore possible to obtain a radiation which is comparatively little subject to atmospheric scattering (the intensity of scattering is inversely proportional to the fourth power of the wave-length) while yet remaining of high visibility. The characteristic colour of the light is a strong recommendation; it would be made somewhat more red owing to scattering when seen through fog, but the change would be small in comparison with that experienced in connexion with any white light. Experiments have shown that even when the neon light failed completely to penetrate a layer of fog it made a "large red luminous patch on the top of the fog." Such a light has now been installed at the Lympne aerodrome on the London-Paris air route.

FOR some time it has been rumoured that Prof. Einstein has been about to publish the results of a protracted investigation into the possibility of generalising the theory of relativity so as to include the phenomena of electromagnetism. It is now announced

that he has submitted to the Prussian Academy of Sciences a short paper in which the laws of gravitation and of electromagnetism are expressed in a single statement. The *Daily Chronicle* of Jan. 26 reports an interview with Prof. Einstein in which he explains in outline the scope of his new achievement. "For years," he is reported to have said, "it has been my greatest ambition to resolve the duality of natural laws into unity. This duality lies in the fact that physicists have hitherto been compelled to postulate two sets of laws—those which control gravitation and those which control the phenomena of electricity and of magnetism. . . . Many physicists have suspected that two sets of laws must be based upon one general law, but neither experiment nor theory has, until now, succeeded in formulating this law. I believe now that I have found a proper form. I have thought out a special construction which is differentiated from that of my relativity theory, and from other theories of four-dimensional space, through certain conditions. These conditions bring under the same mathematical equations the laws which govern the electromagnetic field and those which govern the field of gravitation. The relativity theory reduced to one formula all laws which govern space, time, and gravitation, and thus it corresponded to the demand for simplification of our physical concepts. The purpose of my work is to further this simplification, and particularly to reduce to one formula the explanation of the field of gravity and of the field of electromagnetism. For this reason I call it a contribution to 'a unified field theory.' . . . Now, but only now, we know that the force which moves electrons in their ellipses about the nuclei of atoms is the same force which moves our earth in its annual course about the sun, and is the same force which brings to us the rays of light and heat which make life possible upon this planet."

PROF. EINSTEIN gives no indication of the line of thought he has followed or of the precise character of the new law. His paper, it is stated, will be published in a few days. As an illustration of the remark that many physicists have suspected the existence of a general field law, we may quote the following passage from Prof. Eddington's recent book, "The Nature of the Physical World." After an account of the relativity interpretation of non-empty space, he writes, "It should be added, however, that this is a summary description and not a full account of the non-emptiness, because we have other exploring apparatus—magnets, electroscopes, etc.—which provide further details. It is usually considered that when we use these we are exploring not space, but a field in space. The distinction thus created is a rather artificial one which is unlikely to be accepted permanently. It would seem that the results of exploring the world with a measuring scale and a magnetic compass respectively ought to be welded together into a unified description, just as we have welded together results of exploration with a scale and a clock." Apparently Einstein's new work has accomplished such a welding, but details cannot be gathered until the paper becomes available.

OF all British men of science, none commands our admiration and respect more than Michael Faraday, who by the simplicity and nobility of his character endeared himself to all those around him and by the variety and importance of his discoveries made possible many of the extraordinary advances of modern science. His life's work was done in the laboratory of the Royal Institution, and it was there, on Aug. 29, 1831, he made his first successful experiment on electromagnetic induction; an experiment which, following in the wake of those of Oersted, Arago, Sturgeon, and Ampère, marks the first of a series of discoveries to which we owe our command of electricity to-day. Recognising the epoch-making character of that experiment, the Royal Institution proposes to take steps to celebrate its centenary, and accordingly has issued an invitation to those interested to be present at a meeting of the Royal Institution on Feb. 5 at 4.30 P.M., when the proposal will be considered. In the invitation the Royal Institution points out that the centenary of the British Association also falls in 1931, and that certain important conferences on electricity will be held in London that year, and in directing attention to this matter says: "It seems probable also that the event may provide a unique and most favourable opportunity for a review of the great contributions which British workers have made to the scientific and industrial advances of the past century. It is certain that such a review might be made a source of inspiration and encouragement to the nation." At a dinner of the American Institute of Electrical Engineers in 1901, the toasts were: "The Land of Ampère," "The Country of Faraday," "The Successors of Ohm," "The Heirs of Volta," and "The Legatees of Franklin." That was a happy demonstration of the freemasonry of science, and it would be a fortunate thing if the efforts of the Royal Institution lead to an international gathering to commemorate the work of one of whom Tyndall said that "he prized the honour of being Faraday's successor less than the happiness of having been his friend."

THE centenaries of scientific interest which occur in 1929 will recall some of the most remarkable men in the history of scientific discovery; men of various nationalities; pioneers in many branches of science, and men differing greatly in character. England, Germany, Holland, France, the United States, and Norway, will all have their celebrations, some of which will no doubt attract world-wide attention. Perhaps the most notable name to be recalled is that of Huygens, who was born at The Hague on April 14, 1629, and died there on June 8, 1695. As a connecting link of the age of Galileo and that of Newton, Huygens is one of the leading figures in seventeenth-century science. Among Englishmen we note the approaching centenary of the death of Davy, who passed away on May 29, 1829, and that of Young, who died on May 10. We have already referred to these famous men in these columns, and it is to be hoped the commemorations will be worthy of the occasions. No less a notable figure is that of Lamarek, who died on Dec. 18, 1829, and whose statue stands at the entrance to the Jardin des Plantes, for which he did so much. On April 6

occurs the centenary of the death of the brilliant but short-lived Norwegian mathematician Niels Henrik Abel, while later in the year come the centenaries of the births of the German chemists Kekulé and Griess, of the French chemist Schützenberger, the Austrian geologist Hochstetter, the American geologist Hayden; while another notable American man of science born in 1829 was Asaph Hall, the discoverer of the satellites of Mars. The United States and England alike will no doubt in some way pay tribute to the memory of James Smithson, through whose bequest arose the great Smithsonian Institution at Washington. Smithson died at Genoa in June 1829.

BESIDES these anniversaries we may direct attention to the bi-centenary of Thomas Newcomen, who may properly be called the father of power engineering. The steam- or fire-engine had been the subject of experiments by Papin, Worcester, Savery, and others, but the introduction of the atmospheric beam engine for pumping purposes was mainly the work of Newcomen, the Dartmouth blacksmith. Newcomen's engines provided the first solution of the problem of pumping from deep mines, and the form he introduced continued to be constructed right throughout the eighteenth century, and one or two examples were at work within quite recent times. Moreover, it was the model of a Newcomen engine, still preserved in the University of Glasgow, which led Watt to his epoch-making inventions. But Newcomen engines were in use forty years before Watt began his experiments, and when at the Watt centenary of 1919 a small group of engineers founded a society for furthering the study of the history of engineering and technology, they most appropriately called it the Newcomen Society. Though not a large body, the Newcomen Society has by its activities and its excellent *Transactions* admirably fulfilled its purpose, and this coming summer it is holding a joint meeting with the Devonshire Association in order to pay due homage to the memory of Newcomen. Born at Dartmouth in 1663, Newcomen died in London on Aug. 5, 1729, and lies in an unknown vault in Bunhill Fields Burial Ground. Another centenary of interest to engineers is that of the famous locomotive trials at Rainhill in October 1829, when the great competition took place between Hackworth's *Sans Pareil*, Ericsson's *Novelty*, and Stephenson's *Rocket*, the latter the best-known locomotive in the world. To this event the Newcomen Society also rightly proposes to direct attention.

THE second report of the National Fuel and Power Committee to the President of the Board of Trade (Cmd. 3252, London: H.M. Stationery Office, 9d. net) recommends that legislation be promoted without delay to provide alternative procedure under section 10 of the Gas Regulation Act, whereby the Board of Trade, by Departmental Order, may grant to gas undertakings, power to raise additional capital and borrow money on mortgage to the extent of the undertakers' paid-up share capital; power to offer new capital for subscription to existing holders, consumers, and employees; power to effect joint working arrangements with other undertakings, and to institute a two-part tariff system of charge for gas. The therm

system of charge is considered a fair one, and the Report recommends that, from an appointed day, existing statutory gas undertakers, except very small ones, supplying less than, say, 20 million cub. ft. of gas per annum, should be required to supply gas on a thermal basis and become subject to the purity, pressure, and testing requirements of the Gas Regulation Act. All gas undertakers should fulfil the requirements of the Act as regards purity and pressure of gas, it being understood that, in the case of a non-statutory undertaking, no penalty would be incurred when a deficiency in respect of these requirements was due to circumstances not within its control. The growing practice of supplying artificially dried towns' gas necessitates the amendment of the section of the Act defining the calorific value in terms of unit volume of gas saturated with water vapour. No quarterly average value of calorific value should be assessed unless at least six tests of the gas have been made during the quarter. At present, gas undertakers are customarily permitted to work up residuals purchased from other undertakers or elsewhere to the extent of only one-third of the like residuals obtained from their own manufacture of gas. It is recommended that this restriction as to quantity, where it exists, be removed.

ACCORDING to a recent announcement, by Prof. James H. Breasted, the organisation on an extended scale of the Institute of Oriental Research of the University of Chicago is now made possible by an endowment of 9,500,000 dollars, of which the greater part is already assured. Among the objects to which this sum is to be devoted are the provision of a new building on the campus of the University, an annual grant towards carrying out projected researches over a period of the next ten years, and an endowment for teaching which will enable the Institute to avail itself of the services of the leading Orientalists and historians of the world. The plan of work, now in process of being framed, will include a series of expeditions sent out from the central organisation, which will work side by side and in close co-operation along the whole of what is termed the 'archæological front' of the Near East, including Babylonia and Assyria as well as Persia and its neighbours.

THE marvels of Ur multiply. Within ten days of his first report of the season, Mr. Woolley has further sensational discoveries to record. His account of the opening up of another pit shaft, in the *Times* of Jan. 22, leaves the reader in amazement no less at the light they throw on Sumerian burial practices than at the surprising wealth of objects of Sumerian art and their character. Now we learn of the sacrifice of a groom and of asses found with traces of a chariot and the remains of the ornament of the harness, on a sacrificial floor composed of a mat roof covering another sacrificial chamber with its array of victims. This in turn leads to a death pit with forty-five victims, of whom no less than thirty-nine are women, and six are indeterminate. Of headdresses of gold and precious stones similar to those of the nine court ladies found last year, thirty-four have been found, and the other contents of the pit, so far as cleared, are no less remarkable in quantity and character

both of workmanship and conception. Two statues are unique—rampant rams with heads and legs of gold, horns and shoulder hair of lapis, the fleece of white shell, each tuft carved separately, and the belly of silver.

CAPT. PUREFOY, on behalf of the Committee for the Protection of British Butterflies, appointed by the Entomological Society of London, has presented to the Department of Entomology of the British Museum (Natural History) a set of specimens of the first brood of the imported Dutch form of the large copper butterfly, reared in Wood Walton Fen, near Huntingdon. The British form of this butterfly, formerly moderately common in the fen country, where its caterpillar fed upon the giant water-dock, has been extinct since 1848. About ten years ago a form was discovered in Holland, whence was derived the stock with which it is hoped to repopulate some part at least of the area formerly occupied by the insect. The specimens presented to the Museum are intended to form the commencement of an annual record of the broods, so that any variational tendencies in the colony may be more easily recognised. Capt. Purefoy has also presented a set of specimens from the Irish colony established by him a number of years ago, which has been well maintained ever since. From Dr. J. Schwetz the Department has also received specimens of a new species of tsetse-fly, taken by him in the region of the Lower Lomami River, Belgian Congo. Since the new specimen belongs to the same group as *Glossina palpalis*, the tsetse chiefly responsible for the spread of human sleeping sickness, its discovery may be of medical importance. The skeleton of the large *Ichthyosaurus* extracted at the end of November last from the Lower Lias in the quarry of the Red Triangle Cement Works at Harbury, Warwickshire, has been presented by the Portland Cement Selling and Distributing Co. to the Department of Geology of the Museum. The skeleton is deeply imbedded in nodules of limestone.

PROF. A. C. SEWARD'S Friday evening discourse, delivered on Jan. 25 at the Royal Institution, was entitled "Greenland: As it is and as it was." He gave a brief description of the geological structure of the country, the present inhabitants, the ice-sheet and icebergs, and of the Arctic flora. The only representatives of trees are stunted willows and the prostrate dwarf birch. Many of the flowering plants have a circumpolar distribution; some of them being also members of the alpine flora of Scotland and Switzerland, while others are unknown in Europe and occur in North America. The present conditions in Greenland are much more favourable than in corresponding regions in the far south on the borders of the Antarctic continent. Prof. Seward then discussed the value of fossil plants as evidence of climatic conditions of the past. In rocks of Cretaceous age on Disko Island and at localities on the mainland about halfway up the western coast of Greenland there are fossil ferns closely related to species of *Gleichenia*, now widely spread in the southern tropics, and other ferns related to a species now confined to Malaya;

there are conifers now unknown in Europe, and abundance of trees with leaves scarcely distinguishable from those of the maidenhair tree (*Ginkgo biloba*). Special attention was directed to the presence, in the Cretaceous flora, of plane trees, of trees closely related to existing Magnolias and trees akin to the tropical bread-fruit tree, and representatives of other families now characteristic of subtropical or tropical regions.

THE paper dealing with "Colour and its Applications," read by Dr. L. C. Martin before the Illuminating Engineering Society on Jan. 22, contained an interesting survey of colour measurement, in the course of which an ingenious new colorimeter developed at the Imperial College of Science by Mr. W. D. Wright was described. The lecture was aided by some effective demonstrations, by Mr. C. F. Smith, of colour-mixtures and harmonies, for which his 'mutochrome' apparatus proved well adapted. Dr. Martin also discussed the relation between colour and acuteness of vision, and presented a series of curves illustrating the relation between colour and visual speed. Much of the discussion was concerned with 'artificial daylight,' and the need for a practical standard of white light was emphasised. The arbitrary standard, based on the use of an electric incandescent lamp, run at a prescribed pressure and equipped with a standard blue filter, is stated to furnish radiation equivalent to that of a black body maintained at about 2900° K., and has evidently possibilities. It was interesting to learn that a standard specification for artificial daylight is now likely to prove a practical project.

THE current issue of the *Journal of the Marine Biological Association* contains a description of the Laboratory at Plymouth and a list of publications recording the results of researches carried out there or under the auspices of the Association on the North Sea coast from 1886 to 1927. This bibliography of nearly a thousand papers, ranging over morphology, biology, and various branches of economic marine zoology—on fishes, oysters, cockles and scallops, the shipworm, crabs, lobsters, and sponges—serves to emphasise the close correlation between pure and applied science, and shows that the wise policy of the founders of the Association—to aid science and industry—has been consistently followed. The Laboratory provides facilities for all kinds of biological work and appreciative reference should be made also to the successful courses for advanced students, held during the Easter and summer vacations. The major parts of the organisation of the Plymouth Laboratory has been built up during the thirty-three years' directorship of Dr. E. J. Allen, to whom and to his staff are due congratulations, not only for their many contributions to the advancement of our knowledge of the sea, but also for the fine spirit of helpfulness which prevails in the Laboratory.

THE gradual disappearance of the European bison, which reached its most serious stage during the War, has been watched with much concern, and an association was formed a few years ago with the object of endeavouring to prolong the existence of this interesting species. This good cause has received a severe

blow in the news brought back by Prof. J. Pujanov, of Semferopol, who has just completed a survey of the Caucasus reserve. In 1911 the herd in the Caucasus region numbered 1000, and in 1924, when 25 animals were still known to be alive, the Soviet Government set aside an area of 1100 square miles as a permanent bison reserve. Last year a group of zoologists who had had special experience explored this region thoroughly, searching every valley. Not a single living bison was seen. Bones in plenty were discovered of animals apparently only a year or two dead, and some bore bullet-marks. The bison seem to have been shot by poachers, the patrol of the reserve having been insufficient to stop illegal shooting. It is stated that one or two animals may still possibly lurk in remote fastnesses in the area, but for all practical purposes the Caucasus herd may be regarded as extinct.

AN able summary, over the initials 'I.D.S.,' appears in the October issue of *Psyche*, against the suggestion of some psychiatrists that those patients whose mental disorder is difficult to specify, or does not constitute them a danger to themselves or others, should be detainable by some informal compulsion warranted by their relatives and by medical opinions. The advantages claimed are, that the earlier treatment thus enforced would be more effective than if delayed until the patient should be certified, and that the informal nature of the proceedings would avoid the stigma of insanity. The writer claims in opposition that only a small proportion of mild cases ever reach the asylum, that institutional life does not have a good effect on the individual, that the district asylums have not the staff for the necessary treatment, and the average medical officer is ill-instructed in psychiatry and mental treatment. He also quotes with approval Dr. Millais Culpin's views expressed in a letter to the *Times* last autumn as to the probability of the stigma very quickly being affixed to this compulsory detention. He suggests that the provision of outdoor treatment is the better course to follow, and points out that if there is any treatment worth having, people will gladly avail themselves of it.

WITH the financial help of the firm of Zeiss of Jena, the *Zeitschrift für Instrumentenkunde* has been able to carry out its project of issuing occasional supplements dealing with the history of the progress of optics. The first part appeared in December under the title *Forschungen zur Geschichte der Optik*. It consists of 40 pages of the same size as those of the *Zeitschrift*. Five pages are occupied by an article by Dr. M. v. Rohr, the editor, devoted to an extract from Sir J. F. Herschel's *Journal*, giving an account of his visit to Fraunhofer at Munich in September 1824, and to other evidence of the rapid spreading of a knowledge of Fraunhofer's work amongst English physicists in the next few years. The remainder of the issue is devoted to an article by Dr. H. Boegehold giving the history of the achromatism of prisms and lenses from the discovery of the effect for glass and water by Newton in 1704, its use by Dollond in 1757, and its general recognition as an optical method by about 1775.

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PROF. EJNAR HERTZSPRUNG, of Leyden Observatory, has been appointed George Darwin lecturer of the Royal Astronomical Society for 1929. The lecture will be delivered at the May meeting of the Society.

AN earthquake of moderate intensity was recorded at Kew Observatory at 20 hr. 48 min. 50 secs. G.M.T. on Jan. 24. The epicentre is estimated to have been 5580 miles away, probably in Central America.

SIR ERNEST RUTHERFORD will open a discussion at the Royal Society on Feb. 7 on "The Structure of Atomic Nuclei." Dr. F. W. Aston, Dr. J. Chadwick, Dr. C. D. Ellis, R. H. Fowler, and Prof. O. W. Richardson will take part in the discussion.

THE Pharmaceutical Society of Great Britain will hold a conversazione at the Society's house at 17 Bloomsbury Square, London, W.C.1, on Tuesday, Feb. 12, when the museums, school, and research and pharmacological laboratories will be open to inspection.

THE Progress Medal of the Royal Photographic Society of Great Britain has been awarded by the Council to Mr. Olaf Bloch, in recognition of his various inventions, researches, and publications, which have resulted in important advances in the development of photography.

THE Council of the Institution of Naval Architects has awarded a premium for the year 1928 to Lieut.-Colonel V. C. Richmond for his paper on "Some Modern Developments in Rigid Airship Construction," and a joint premium to Mr. E. Leslie Champness and Mr. Frank McAlister for their paper, "Further Notes on the Relative Strength of Fine and Full Cargo Vessels." The premiums will be presented on Mar. 20 at the opening of the annual general meetings, which will be held at the Royal Society of Arts, John Street, W.C.2.

THE Institute of Physics announces additional privileges for student members. Registered student members pay a fee of five shillings per annum, which is credited against the entrance fee on election to corporate membership. In future, in addition to existing privileges, students will receive the published lectures given before the Institute free of charge, and will be allowed to subscribe to the *Journal of Scientific Instruments* at the privileged rate of ten shillings and sixpence per annum.

THE Council of the Institution of Electrical Engineers has made the eighth award of the Faraday Medal to Signor Guido Semenza, of Milan. This 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. Signor Semenza has for many years taken a leading part in the development of the applications of electricity.

THE non-magnetic yacht *Carnegie* has reported her arrival at Callao, Peru, on Jan. 14. Because of a storm and loss of an anchor at Easter Island, the vessel left there on Dec. 12, two days before the time originally set. Unfavourable winds drove her south from her course as planned to 40° south latitude in

longitude about 95° west. Captain Ault reports continued excellent observational results for the full programme since leaving Easter Island. Twenty-three bottom samples were obtained on the trip from Balboa to Easter Island to Callao; those from Easter Island to longitude 95° west were red clay with volcanic mud. It is expected that the *Carnegie* will sail on Feb. 3 from Callao for Papeete, Tahiti.

THE claim by Leone Caetani, author of the "Annali del' Islam," that the great Moslem migration into North Africa was due to the increasing desiccation of Arabia at that period, has been discussed by Prof. Alois Musil in an Appendix, No. 10, to his work on Northern Negd in the fifth volume of his "Explorations in Arabia," in process of publication by the American Geographical Society. Prof. Musil insists that this claim is quite invalid, and that there is no evidence of any material climatic change in Arabia during historic times. Prof. Musil's detailed discussion of this question is useful, as the view that the Arab emigration was due to increasing desiccation has been adopted recently by Sir Thomas Arnold (1924), and by Prof. MacMillan Brown, "Problems of the Pacific," 1927.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A junior assistant (engineer) at the Fuel Research Station, East Greenwich—The Secretary, Department of Scientific and Industrial Research, 16 Old Queen Street, S.W.1 (Feb. 14). An assistant for work on virus diseases of the potato, and an assistant for field work in connexion with the development of potato culture, each under the Department of Agriculture for Scotland—The Establishment Officer, Department of Agriculture for Scotland, Queen Street, Edinburgh (Feb. 16). A reader in mathematics at Birkbeck College—The Academic Registrar, University of London, South Kensington, S.W.7 (Feb. 18). A lecturer in agriculture in the University of Leeds—The Registrar, The University, Leeds (Feb. 18). A professor of electrical engineering at the College of Engineering, Guindy, Madras—The Secretary to the High Commissioner for India, General Department, 42 Grosvenor Gardens, S.W.1 (Feb. 23). An evening lecturer in magnetism and electricity at the Wimbledon Technical Institute—The Principal, Technical Institute, Wimbledon, S.W.19. A Secretary to the Technical Institute, Wandsworth—The Principal, Technical Institute, Wandsworth, S.W.18.

Our Astronomical Column.

COMET SCHWASSMANN-WACHMANN (2).—The new comet 1929a proves to be one of short period, like the first one discovered by the same observers. Images of the comet were found on plates taken on Jan. 4 and 12 (the latter at Uccle Observatory). From these positions, combined with photographic observations on Jan. 20, Prof. G. van Biesbroeck and Mr. Y. C. Chang have computed the following orbit (*I.A.U. Circ.*, No. 218):

T	1929 April 1-36 U.T.
$\omega$	2° 15'
$\Omega$	126 36
$i$	3 39
log $q$	0.3075
Period	6.825 years.

EPHEMERIS FOR 0<sup>h</sup>.

	R.A.	N. Decl.	log $r$ .	log $\Delta$ .
Jan. 28.	5 <sup>h</sup> 39 <sup>m</sup> 16 <sup>s</sup>	20° 59'	0.3201	0.0988
Feb. 5.	5 39 1	21 23	0.3174	0.1161
13.	5 41 57	21 47	0.3149	0.1348
21.	5 47 25	22 10	0.3126	0.1546

The distance from the sun is diminishing, but that from the earth increasing; the brightness should not diminish rapidly. The comet should be observable until May at least. If these elements are accurate, there was a near approach to Jupiter (about one-third of a unit) in November 1926.

FORBES'S COMET.—The following are the latest observations to hand of Forbes's Comet:

U.T.	R.A. 1928.0.	S. Decl. 1928.0.	Observer.
Dec. 8-47988	12 <sup>h</sup> 54 <sup>m</sup> 21.15 <sup>s</sup>	31° 55' 9.4"	G. van Biesbroeck, Yerkes.
9-48678	12 56 50.03	32 22 2.7	" "
10-48032	12 59 15.77	32 47 48.7	" "
8-06210	12 53 19.23	31 43 36.1	H. E. Wood, Johannesburg.

*Astr. Nach.*, 5608, reports an observation of this comet: Oct. 27-81 U.T., R.A. 11<sup>h</sup> 1<sup>m</sup> 24<sup>s</sup>, N. Decl. 8° 32.2'. There is little doubt that the comet was seen, but the position given is very rough.

A POSSIBLE COMPANION TO SIRIUS B.—A letter from Dr. R. T. A. Innes in the *Observatory* for January states that a faint star has been suspected near Sirius B on several nights ranging from Feb. 4, 1926, to Mar. 20, 1928. Its distance from B varies from 1" to 2" and the period is estimated to be from 18 months to two years. It is estimated as of magnitude 12. On some evenings several observers saw it. Various eyepieces were tried, and every precaution was taken to guard against illusion, but the object is so difficult that its existence is not absolutely guaranteed. Dr. van den Bos recalls that Prof. Fox suspected the duplicity of B with the 18½-inch Clark refractor. He gave P.A. 231°, distance 0.8", date 1920.110.

Dr. van den Bos also gives some measures of the companion of Procyon, though this was so difficult that he does not guarantee its objective existence:

	P.A.	Dist.
Feb. 8, 1927	198.6°	3.06"
Oct. 27, 1928	230.7	2.07

He had purposely consulted no ephemeris on either occasion, but afterwards found that the first position was in fair accord with Dr. Spencer Jones's ephemeris.

It may be worth while to point out that the distance and period as estimated by Dr. Innes are not compatible with each other. From the meridian observations of the bright star, the mass of Sirius B has been deduced as 0.96 of the sun's mass. If Sirius B is double, this would be the joint mass of its two components. The parallax 0.38" is very well determined. Taking the mass as equal to that of the sun, a semi-major axis of 1.52" would give a period of 8 years. One of 1.00", the smallest value suggested by Dr. Innes, would give a period of 4.27 years. Thus, either the distances given by him are considerably overestimated or the period is underestimated. The distance given by Prof. Fox, 0.8", would give a period of 3 years, if assumed to be the unforeshortened length of the semi-major axis. The distances were estimated, not measured, at Johannesburg, the suspected star being too faint to set a wire upon.