

## News and Views.

THE important announcement has just been made that in the near future there will be established in the vicinity of Toronto an astronomical observatory which will rank with the world's greatest institutions of this kind. It will be erected by Mrs. D. A. Dunlap and her son, D. Moffat Dunlap, as a memorial to the late David A. Dunlap, who died on Oct. 29, 1924, and will be known as the David Dunlap Observatory. Astronomy and geology were both favourite studies of Mr. Dunlap, but the former had a peculiar attraction for him. He was a keen student of the heavens, and always liked to share his knowledge with others. This project has been under consideration for the last five years and will now be brought to completion. In working out the plans, Mrs. Dunlap has had the assistance of Prof. C. A. Chant, head of the Department of Astronomy of the University of Toronto.

THE outstanding feature of the David Dunlap Observatory will be a large reflecting telescope seventy-four inches in diameter. There is only one of greater aperture in the world, namely, that on Mount Wilson in California. The instrument was ordered some time ago from the firm of Sir Howard Grubb, Parsons and Co., of Newcastle-on-Tyne. It will be housed in a circular metal building, such construction being best for this purpose. The observatory building will be a beautiful structure in the classic style. It will be erected on a suitable site near Toronto, in the midst of a large acreage which will be converted into a park, to be known as the David Dunlap Park. When the observatory is completed, it will be under the Department of Astronomy of the University of Toronto, while the park will be developed in a scientific way by the Faculty of Forestry. The new institution will bring distinction to the University, the city, the province, and indeed the whole Dominion. It will be an enduring memorial to a worthy citizen.

IN a recent leading article (see *NATURE*, Nov. 22, 1930, p. 797) we pointed out the urgent need for increased attention to the systematic study of the Indian peoples and cultures in view of the probable political conditions of the future. Bearing on this, it may be mentioned that Lord Winterton, in the *Empire Review* for January, closes an article discussing the problems of form and organisation in the government of India, with which the Round Table Conference has been concerned, by very pertinent illustration of the extraordinary range of variation in the peoples whose destiny is being decided. Discussion since the Conference opened has served to bring out even more clearly the fundamental importance, beneath the purely political problem, of questions of race, of religion, and of culture. At the same time, letters to the Press, such as that from Mr. Codrington which appeared in *NATURE* of Dec. 13, 1930, p. 919, and the correspondence in the *Observer* and elsewhere, while directing attention to such facilities as exist in England for Indian studies which are essential to the understanding of these questions, have emphasised their inadequacy.

STRONG support for the views on the question of anthropological studies in India itself, which we ourselves expressed, may be drawn from the presidential address delivered in the Anthropological Section at the seventeenth Indian Science Congress held last year at Allahabad and now available in the recently published congressional proceedings (Calcutta: Asiatic Society of Bengal, 1930. 15 rupees). The president, the Rev. P. O. Bodding, most urgently impressed upon his hearers the necessity for a record of the facts relating to custom, even the commonest facts of everyday life. Admitting the attraction of theory, he pointed out that an unbiased and uncoloured record of the facts is an essential preliminary to study, and alone affords any certainty of permanent value. Mr. Bodding is primarily and indeed solely interested in the scientific aspect of the matter: but he made use of a cogent argument in support of his plea, the force of which is equally, if not more, applicable in relation to the bearing of anthropological study upon the problems of administration. In India to-day, he urged, change in custom is taking place continuously and everywhere. He quoted from his own long experience among the Santals, where, for example, their attitude of mind in marriage customs appears to have changed entirely, passing, it would seem, from an attitude of potential hostility to one of union with the 'parties of the other part'; while in religion, it is now customary to find that at the celebration of a Hindu festival the greater number of the participants, and those who make the most noise, are Santals, officially classified as 'animists'. It is obvious that if from the scientific point of view it is important that a record of the facts should be preserved at the earliest possible as well as at the later stages of development, it is no less important that the administrator should have an exact knowledge of the changes that are taking place and of their direction.

A CURIOUS feature of the industrial situation is the pronounced shortage of administrators competent to direct and organise industry on the scale which the magnitude of modern industrial combines and their international relationships require. Men of the requisite ability are not automatically produced by the present system. On the contrary, authorities such as M. Henri Fayol have pointed out that under the specialisation involved in rationalisation the departmental manager or executive rarely has the opportunity of gaining the wider experience which is essential in higher administrative duties. It has been authoritatively estimated, moreover, that in the case of the managing director even of a highly technical organisation, the amount of technical ability essential is only 10 per cent as compared with 50 per cent of administrative ability, and even in the head of a technical department 35 per cent of administrative as compared with 30 per cent of technical ability is required. Such factors accordingly present serious obstacles in the promotion or training of staff for promotion to the higher administrative positions. Valuable work to remedy this state of affairs is being

done in Europe by the International Management Institute founded in 1927 by the XXth Century Fund, the International Labour Office, and the International Committee for Scientific Management. This Institute has already made a number of important studies on the application of scientific management in special factories, in banking, and in railway undertakings, and is fast becoming a clearing-house of world information and a focus of activity on all questions covered by the resolutions of the World Economic Conference.

IN Great Britain the Institute of Industrial Administration is carrying out similar work, and claims to have united in a comprehensive view the principles underlying the various aspects of industrial administration. It aims, further, at establishing industrial administration among the recognised professions; and with the further objects of education and the maintenance of high standards of skill and responsibility among its members, has modelled itself to some extent on the lines of established professional institutions. In opening a public discussion on Dec. 12, Mr. A. S. Comyns Carr, president of the Institute, pointed out that modern competition calls for a higher standard of administration, to eliminate waste and reduce costs of production, as well as in the introduction of new methods, and this is true of all sizes of business undertakings and of marketing as well as of production. Mr. Comyns Carr believes that the foundations of the knowledge required can be laid by suitable reading and instruction, and that examination can test these foundations and the capacity for initiative and common sense. Primarily, in its educational work, the Institute is an examining and not a teaching body. Arrangements are now being made by educational authorities to provide instruction by lectures in some or all of the subjects of the Diploma of the Institute, and this work is supplemented by the formation of a Students' Society to provide reading courses at very moderate fees.

ONE of the present Government's measures for assisting agriculture has been the Land Drainage Act of 1930. It would appear to be a popular subject with politicians, and recent governments, when asked what they have done for agriculture, have generally been able to give good accounts of what they have done to encourage the drainage of agricultural land. The cynic asks why this zeal for draining, when the land that is already drained cannot produce crops at a profit. There has, however, been a definite need for the present Act, and Mr. A. T. A. Dobson has explained this and the provisions of the Act very clearly and concisely in a paper read recently at the Surveyors' Institution. Rationalisation is a universally-acclaimed palliative for our economic troubles to-day. Agriculture cannot expect to escape, nor does it deserve to. This Act rationalises one thing in agriculture, the law of land drainage; it is intended to produce order out of something approaching chaos. Previously there was a large number of drainage districts under the jurisdiction of authorities of different types, and there was too much clashing of responsibilities and

interests. Large rivers were rarely dealt with satisfactorily. The War years caused drainage works to fall badly into arrears. In 1926 trouble arose in the Great Ouse district in the form of passive resistance to the payment of drainage rates. A special Commission was set up in consequence, followed by a Royal Commission to investigate the whole question of the law of land drainage.

THE present Land Drainage Act follows closely the recommendations of the Royal Commission, and most of Mr. Dobson's paper is devoted to an explanation of its provisions. The general effect is that there will be two classes of drainage authority: the catchment board, responsible for all works on its main river, with supervisory jurisdiction over a wide area, and with considerable powers of raising revenue; and the ordinary drainage board, called within a catchment area an internal drainage board, responsible for the drainage of limited areas. Mr. Dobson then describes the methods of financing the drainage operations of these two types of authority, explains other points in the Act, and concludes by claiming that "the Act provides the necessary machinery for securing that, in future, all the waterways and drainage channels in England and Wales can be kept in a proper state of efficiency, including main rivers". If this proves to be the case, a very useful and necessary Act has been passed.

REPRESENTATIVE exhibitions of British chemical plant are of infrequent occurrence. Though the last one, held in 1926 in conjunction with the London meeting of the Society of Chemical Industry, was very successful, a favourable opportunity for repeating this venture has so far not occurred. A unique opportunity for remedying this state of affairs and for bringing British chemical plant to the notice of the chemical and allied industries throughout the world will occur next July on the occasion of the jubilee celebrations of the Society of Chemical Industry. The British Chemical Plant Manufacturers' Association has decided, in co-operation with the Chemical Engineering Group of the Society, to stage an exhibition which will be open during the whole week of the celebrations, July 13-18 inclusive, at the Central Hall, Westminster. The exhibiting area will be twice as great as in 1926. The exhibition will cover all types of plant, apparatus, instruments, constructional materials, and general equipment required by the chemical industry and the numerous other branches of industrial activity associated with it. Only makers of British plant will be eligible to exhibit. There will be a section devoted to the work of the various research associations and to the Department of Scientific and Industrial Research; this will be organised on non-trade lines by the Chemical Engineering Group of the Society of Chemical Industry, and its object will be to demonstrate the important part which science plays in the development of British industry and in the control of the products. Admission to the exhibition will be free, and invitations will be widely distributed to those who are interested in British chemical plant. The public will also be admitted free on the Friday

afternoon and the Saturday. Special steps will be taken to ensure the production of a fully classified catalogue, which will be supplied free either on admission or on application to the British Chemical Plant Manufacturers' Association. Further information regarding the exhibition can be obtained from the office of the British Chemical Plant Manufacturers' Association, 166 Piccadilly, London, W.1.

THE Newcastle-upon-Tyne Electric Supply Co. and its associated companies supply an area exceeding 4000 square miles, extending from Scarborough to Alnwick and including York. The power supplied is used for domestic purposes, mining, shipbuilding, engineering, and general manufacturing. The system of supply is three-phase alternating, at voltages ranging up to 20,000. Naturally, the accurate metering of all this energy was a problem of great difficulty. A full description of the difficulties and the methods by which they have been overcome is given in a paper read to the Institution of Electrical Engineers on Jan. 2 by E. Fawssett and G. E. Moore. The records show that good meters need not be examined oftener than once a year. Small meters are only examined once in every two years and very small meters once in every four years. The meter readers use motor cars which carry the testing equipment, including check meters. Each car carries two testers, each of whom must be able to drive the car and perform all the routine tests. About forty cars are always at work, and the performances of the meters under a variety of conditions are tested, the larger meters being subjected to more thorough tests. It is found that the lower bearing of the meter disc, which revolves on a vertical spindle, is the most unsatisfactory part of the whole meter. Oil is used to prevent rust, and the pivot and the jewel are immersed in it. Considering that electric meters are running sometimes for years at a stretch with a maximum inaccuracy of sometimes less than one per cent, it will be seen to what a pitch of perfection manufacturers have developed them. It is satisfactory to learn that the cost of the elaborate arrangements made to safeguard the revenue of the Newcastle company by accurate metering is less than the thousandth part of the revenue.

IN 1914 the developments in the design of thermionic relays enabled a telephone cable to be laid across the United States from ocean to ocean. Each relay has a filament from which electrons are liberated when it is heated by current from a battery. The most desirable filament at present in use is that used in the circuits of the Bell Telephone System. It consists of a platinum alloy the surface of which is coated with a mixture of barium oxide and strontium oxide. A minute trace of barium in each filament permits the use of a much smaller amount of power for heating. We learn from the *Bell Laboratories Record* for October that a quarter of a million telephone repeaters are in everyday use. The amount of barium used for each filament is only about one-sixth of a microgram. For all the tubes in use the total amount of the barium effective in the emission of electrons is not more than

the twentieth of a gram. A clean tungsten filament required 35 watts for heating as compared with only 2.2 watts required for a filament coated with barium. Multiplying the quarter of a million tubes in use by the cost of the current taken from storage batteries, we see how the minute quantity of barium utilised in accordance with the methods found by fundamental research effects a great saving in the commercial working of the system. Experiments are quoted that prove the remarkable fact that the electron current which is possible at any heating temperature from a single layer of barium atoms on a platinum wire is enormously greater than the current which could be obtained from a filament of either substance alone.

SINCE 1926 there has been issued at Woods Hole a paper devoted to the work and workers at the Marine Biological Laboratory and the Bureau of Fisheries Laboratory. With the increasing number of workers at Woods Hole the need for some such organ is apparent. The *Collecting Net*, as it is called, is issued weekly during the summer months, and contains, besides items of local interest to workers, short summaries of some of the research carried out at the laboratories, each accompanied by a critical review. A glance at last year's issues, together with the directory of investigators, emphasises how Woods Hole becomes during the summer months a great meeting ground for biological workers, who form a unique community some hundreds strong. But this centre of biology is to be even further enriched by the addition of the largest oceanographic institution in the world. The issue of the *Collecting Net* for Aug. 30 of last year contains plans and details of the proposed Woods Hole Oceanographic Institution, the construction of which has already begun. The Institution has been endowed by the Rockefeller Foundation with grants of 1,000,000 dollars to finance the buildings and equipment, and 1,000,000 dollars as a permanent endowment fund. An additional working grant of 50,000 dollars a year has been promised for a period of ten years. The Institution is under the directorship of Dr. Henry B. Bigelow, and is to be a four-storied building with about fifty rooms and three or four large laboratories for student investigators. From here an ocean-going research vessel will operate in the Atlantic. The ship, 105 feet long at the water-line and with a displacement of about 380 tons, will be a two-master with ketch rigging, fitted with an auxiliary Diesel engine. Work has already started on this vessel, which is being built at Copenhagen. The Institution will possess a resident staff of eight or ten workers, who will remain at Woods Hole all the year round. It is hoped that building will be completed so that the laboratory will be able to open its doors next summer.

ON Jan. 6 a film on "The Sirex Woodwasp and its Parasites" was shown privately at the London Pavilion. This film is the first attempt at applying the talking-film to biological research. The woodwasp is responsible for serious havoc to timber, especially in New Zealand. This film is to form the first of a series dealing with the habits of the more important Empire forest insects. It is to be in-

incorporated also in the new "Secrets of Nature" series of films, which will be produced this year. Many excellent silent films of scientific subjects, especially relating to natural history, are already available, and the use of the sound-film for like purposes is therefore to be welcomed. Educational films are shown in various theatres throughout the country, comprising biology, chemistry, other branches of science, history, and so forth. They are, in some cases, used to make up a complete programme. These, however, are of the popular or very elementary type and, where they form a complete programme, are meant for school children. On the other hand, the illustration of a biological or any other scientific subject, which one supposes will be of a specialised nature, by means of the sound film, is a different problem. It is too much to expect many members of the general public to pay for performances made up of films of such a nature, so, at the most, the films could only be used for filling up a programme of entertainment. The value of the film would thus be seriously diminished. The best use that could be made of such films, the production of which should be encouraged, is for presentation before societies and academic and research institutions. However, much was suggested in this direction with regard to the silent film; but little has yet been done, probably for financial reasons. Nevertheless, the project has a possible future; and its development does not rest so much with production and photography as in securing a sufficient demand to justify producers undertaking the costs involved in making films of this nature.

ON the afternoon of Dec. 18, at the Lister Institute of Preventive Medicine, a large company, consisting of the staff and other research workers, past and present, met in the library of the Institute to offer parting gifts to Sir Charles Martin and Prof. Arthur Harden on the eve of their retirement. Prof. J. C. G. Ledingham, who is succeeding Sir Charles Martin as director, presided, and referred to the fact that only a few years ago a very similar gathering assembled to celebrate the conferment of knighthood on Sir Charles Martin by presenting him with his portrait. Sir Charles had directed the activities of the Institute for twenty-seven years. His highly successful administration might justly be attributed, in the first instance, to the great charm of his personality, and secondly, to his tact, his business ability, and the surprising catholicity of his scientific interests. Prof. Harden had served the Institute for thirty-three years and, as biochemist-in-chief, during that period made his department an important centre of biochemical research. Only a year ago he was awarded a Nobel prize in chemistry for his work on fermentation. While the departure of Sir Charles Martin and Prof. Harden would mean a severe loss to the Institute's forces, the traditions they had set would long remain a potent source of inspiration to their successors. On behalf of the many subscribers at home and abroad, Miss Harriette Chick presented to Sir Charles and Lady Martin a silver coffee service, designed and executed by Mr. Philip Alexander of Walberswick, Suffolk; while Miss Muriel Robertson unveiled and

presented to Prof. Harden his portrait in oils by Mr. Neville Lewis. Sir Charles and Lady Martin sailed on Jan. 2 for Cape Town, en route to Australia, where Sir Charles will take charge of the Division of Animal Nutrition of the Commonwealth Council for Scientific and Industrial Research for at least two years.

IN a paper reprinted from the *Transactions* of the Indian Philosophical Congress (1927), Mr. J. Walker Tomb declares that 'time' is used in two senses, metaphysical and mathematical. The former is the duration or continuance of personality, depending upon consciousness and memory. The latter, in his opinion, is the duration of matter, and he considers that the definitions of Aristotle, Newton, Einstein, and Eddington are quite wrong. Moreover, "the relativists . . . have built upon this misconception a bewildering philosophy which dethrones reason". To support this view, passages are quoted concerning bodies travelling with the velocity of light. (This, of course, is a case in which the equations cease to hold. As Einstein says, "Lumen is a fraud".) It is interesting to compare these views with Sir Arthur Eddington's opinions. In an interview reported by Mr. J. W. N. Sullivan (*Observer*, Dec. 21, 1930), he said: "We must remember that the notion of time, as it occurs in science, is a mere abstraction. The notion of time is, I believe, an abstraction from the dynamic nature of consciousness. Consciousness is essentially dynamic, and the 'time' of science is a most imperfect representation of this quality." The drawing together of science and philosophy is much hindered by the tendency of each side to misunderstand the other.

FOURTEEN of the leading French publishing firms which specialise in the production of technological literature have combined to produce a "Bibliographie des livres français d'Industrie et de Technologie". The lines of the "Catalogue of British Scientific and Technical Books" of the British Science Guild have been closely followed, with the following difference, namely, that books published in 1929-30 precede the General Catalogue for 1919-30, which forms the bulk of the work. Entries in Part 1 are annotated; those in Part 2 are not. The name and subject indexes include both sections. Hence there is some danger of confusion, and the writer of the prefatory note wisely counsels the user of the Bibliography to consult both sections "en cas de recherche". An annual supplement to the bibliography is promised with a consolidated edition every third year. The classification and indexing of the entries have been carried out in a workmanlike manner, and we have no doubt that the bibliography will prove a useful guide in the selection of French technological books in all parts of the world.

THE north-east of Scotland has many points of contact for the archaeologist, the historian, and the naturalist, and each of these, as well as the general reader, will find articles of interest in the latest issue of the *Deeside Field*. Selecting from a wide variety of topics, we mention only the Rev. Dr. Walker's

account of "Some Memorable Naturalists of the North-East". He recalls the accomplishments of William MacGillivray, naturalist and ornithologist; George Dickie, botanist; James Nicol, the geologist, who first saw a glimmer of light in the upheavals of the North-west Highlands; of George Sim, taxidermist and naturalist; and Thomas Edward, of Banff, who spent his boyhood in Aberdeen. But there are others, for no account could be complete which omitted the name of the Army surgeon, Dr. A. Leith Adams, who, in addition to writing popular accounts of his natural history observations in India and Egypt, became an authority on fossil elephants.

PROF. WILLIAM KING GREGORY has been elected president of the Galton Society for the Study of the Origin and Evolution of Man, New York, and Mr. Frederick Osborn has been elected secretary-treasurer.

A MEETING to inaugurate a British Society of Motion Picture Engineers will be held at the rooms of the Royal Photographic Society, 35 Russell Square, on Monday, Jan. 19, at 7 P.M. A draft constitution has been drawn up by the provisional committee, the secretary of which is Mr. Leslie Eveleigh, Gaisford House, Gaisford Street, Kentish Town.

THE following advisory committee has been appointed for the purpose of advising the Minister of Health on the practical application of modern advances in the knowledge of nutrition: Prof. Major Greenwood (chairman), Prof. E. P. Cathcart, Sir F. Gowland Hopkins, Miss Jessie Lindsay, Prof. E. Mellanby, and Prof. V. H. Mottram. The members will hold office until Dec. 31, 1933, and will be eligible for reappointment. The secretary to the committee will be Mr. F. R. Hudson, of the Ministry of Health.

THE Council of the Royal Astronomical Society has awarded the gold medal to Prof. W. de Sitter, director of the Observatory of Leyden, for his theoretical investigations on the orbits of the satellites of Jupiter and his contributions to the theory of relativity. Prof. de Sitter has also been invited to deliver this year's George Darwin Lecture. The Council has awarded a Jackson-Gwilt medal and gift to Mr. Clyde W. Tombaugh, of Lowell Observatory, Flagstaff, Arizona, in recognition of his discovery of the extra-Neptunian planet, Pluto.

ON Tuesday next, Jan. 20, at 5.15, Mr. J. W. T. Walsh will deliver the first of a course of three lectures at the Royal Institution on the art of illumination; on Thursday, Jan. 22, at the same hour, Prof. H. Dingle begins a course of three lectures on the nature of physical science. The opening Friday evening discourse of the year will be given by Sir William Bragg, on "The Scattering of Light", on Jan. 23; Mr. J. M. Keynes will deliver the Friday evening discourse on Feb. 6, on the mechanics of the trade slump.

THE Council of the Royal College of Surgeons of England has appointed Mr. J. H. Thompson, lecturer in physiology at King's College, London, to the research scholarship endowed by the late Lord Melchett. The subject to which Mr. Thompson proposes to

devote himself is the influence of the parathyroid bodies on growth. His research will be carried out in the new laboratories of the Royal College of Surgeons and also in the physiological department of King's College. Mr. Wilfred Trotter has been appointed Hunterian Orator of the Royal College of Surgeons for 1932.

At the meeting of the Grand Council of the British Empire Cancer Campaign, held on Jan. 12, arrangements were approved in connexion with the Garton Prize of £500 and Gold Medal, which is to be awarded to the person or persons submitting the best original dissertation on "The Early Diagnosis of Cancer" by December 1931. It was also announced that the subject, "The Biological Effects and Mode of Action of Radiations upon Malignant and other Cells", had been chosen for the second Garton Prize and Medal, the dissertations for which must be received by December 1933.

THE following appointments have recently been made by the Secretary of State for the Colonies in the colonial agricultural and forestry services: Mr. G. H. Gethin-Jones, to be soil chemist, Kenya; Mr. H. Evans, to be physiological botanist, Mauritius; Mr. M. H. French, to be biological chemist, animal nutrition research, Tanganyika Territory; Mr. R. J. A. W. Lever, to be entomologist, British Solomon Islands; Mr. C. O. Flemmich, to be assistant conservator of forests, Federated Malay States; Mr. T. E. D. Vigne, to be assistant conservator of forests, Nigeria; Mr. C. E. Duff, to be assistant conservator of forests, Northern Rhodesia; Mr. C. H. Holmes, to be assistant conservator of forests, Ceylon.

At the annual meeting of the Association of British Zoologists, held on Saturday, Jan. 10, in the rooms of the Zoological Society of London, with Prof. E. B. Poulton in the chair, the morning session was devoted to discussions as to whether zoologists should accept fees for lectures and expert advice, and on the future of zoological collecting. In the afternoon it was moved "that training for applied zoology must be based upon a broad general zoological foundation", the three principal speakers being Dr. W. T. Calman, who dealt with museum work; Dr. E. S. Russell, with fisheries work; and Prof. J. W. Munro, with entomological work. The Association has only recently been formed and this was its first meeting, although, for seven years previously, there has been an annual meeting of British zoologists to discuss matters affecting the interests of the science.

DR. FRANK CONRAD, of the Westinghouse Electric and Manufacturing Co., Pittsburgh, has been awarded the Edison Medal, the highest award of the electrical engineers in the United States, for pioneering work in radio-telephone transmission before the days of broadcasting. In addition to his developments in radio communication, Dr. Conrad has made important contributions to alternating current work and arc lamp design; he has been in the employ of the Westinghouse Co. since 1890, and is now assistant chief engineer. The Edison Medal was founded by associates and friends of Thomas A. Edison and is

given annually for "meritorious achievement in electrical science, electrical engineering, or the electrical arts", by a committee of the American Institute of Electrical Engineers.

MESSRS. W. and G. Foyle, Ltd., 119 Charing Cross Road, W.C.2, have just circulated a catalogue of their No. 7 department, containing the titles of books, both second-hand and new, relating to most branches of technology and applied science. Being carefully classified the catalogue should be of service to many readers. The list is obtainable upon application.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—

A research scholar in mental diseases under the Joint Board of Research for Mental Diseases of the University of Birmingham and the City Mental Hospital Committee—E. Eyles, Hon. Secretary, Council House, Birmingham (Jan. 24). An advisory research entomologist at the Seale-Hayne Agricultural College, for the South-West Province—The Principal, Seale-Hayne Agricultural College, Newton Abbot, Devon (Feb. 8). A physicist or engineer to carry out researches and standardisation in wireless telegraphy and telephony, and a physicist to carry out researches in optics, each under the National Research Council of Canada—The Secretary-Treasurer, National Research Council, Ottawa, Canada.

### Our Astronomical Column.

**The Near Approach of Eros.**—Prof. H. N. Russell gives, in the *Scientific American* for January, a clear account of the methods being employed for using the present approach of Eros for obtaining improved values of the solar parallax and the mass of the moon. He estimates that fully ten years will be needed for a full discussion of the measures: but there is one source of delay that he has not considered. Several observatories have been co-operating during the past six or seven years in obtaining accurate places of selected stars near the planet's track. But the track diverges appreciably from the predicted one, to the extent of 1 minute of time in R.A. at the nearest approach. This makes some of the selected stars unsuitable, as being too far from the planet. It will be necessary to select others on the opposite side of the planet to take their place, and these will need to be carefully observed. One precaution that was not considered in 1901 is now being taken. The spectra of the stars have been examined, and those that differ markedly in type from Eros (the spectral type of which resembles that of the sun) will be rejected, owing to the different amount of their refraction by the earth's atmosphere. The article notes that the opposition of 1938, though inferior to the present one, will be much better than that of 1901, which was the best since the planet was discovered in 1898. 1968 will be about equal to 1938, and the next really favourable oppositions will be in 1975 and 2012.

**Axial Rotation of Stars.**—In the *Astrophysical Journal*, vol. 72, p. 1, Dr. O. Struve discusses the spectroscopic evidence for the existence of rapidly rotating stars. The occurrence of rapid rotations is assumed in many astronomical theories, such as the fission theory of binaries, but so far there has been no direct evidence that they are anything but rare exceptions. Dr. Struve shows that broad, shallow absorption lines are caused by axial rotation. The broadening exhibits the proportionality to wavelength required by the Doppler effect, and the line contours agree with the theoretical shapes for rapidly rotating stars. There is also a correlation of line width with period and amplitude in spectroscopic binaries. Two stars ( $\alpha$  Virginis and  $\eta$  Ursæ majoris) are treated in detail, and the evidence suggests the existence of an evolutionary transition between close spectroscopic binaries and rapidly rotating single stars, though the direction of such transition is not established by the observations.

**Old Eclipses of Jupiter's Satellites.**—Some of the secular variations of the elements of Jupiter's satellites are so slow that they cannot be satisfactorily

determined from recent observations alone. All the calculators of tables of the satellites have made some investigations of this kind; that which Prof. W. de Sitter has lately published in *Annals of Leiden Observatory*, vol. 16, part 4, is one of the most complete. The earliest observations used are those of Wargentin, beginning in 1668; the extensive list prepared by Delambre in preparation for the construction of his tables has also been used. The systematic errors of the observations have been investigated; they are very considerable, but in spite of these a very marked improvement in the secular variations of the elements of satellite III has been obtained in this discussion. The improvement is less noticeable in the cases of satellites I and II, as their changes are more rapid and can be determined from the modern observations.

Prof. de Sitter is much interested in the question of the changes of the earth's rate of rotation, and includes a discussion of the evidence afforded by Jupiter's satellites; the old observations do not add much weight to the determination. He considers that the amount of uncertainty of his curve derived from all sources is not more than 5 seconds at the date 1670; the uncertainty from the satellites at the date 1750 is fully 10 seconds.

**A New Catalogue of the Naked-eye Stars.**—The Yale University Observatory has published a useful catalogue of 9110 stars, edited by Prof. F. Schlesinger. It contains practically all the stars down to mag. 6.5 and a few fainter ones. The reference numbers in Boss P.G.C. and in the northern and southern Durchmusterungs are given. The positions are given only to the nearest time second in R.A. and the nearest minute of declination. The Proper Motions have been revised and, where possible, are given to the third decimal of a second of arc; those in R.A. are expressed in great circle. The spectral type, parallax, and radial velocity are given, where they are known. There is also a column of remarks, which includes notes of companions, of variation of light, or of radial velocity. There is also a table for reduction to galactic co-ordinates, and one giving the new constellation boundaries as fixed by a committee appointed by the I.A.U. The following systematic corrections have been applied to the proper motions of the P.G.C.:

$$\begin{aligned} \text{In R.A.} &+ 0.00021'' - 0.00015'' \sin \text{R.A. tan Decl.} \\ \text{In Decl.} &- 0.0023'' \cos \text{R.A.} \end{aligned}$$

A bad misprint on page 4 of the introduction should be corrected. The R.A. of the galactic pole is given as  $18^{\text{h}} 40^{\text{m}}$ ; it should be  $12^{\text{h}} 40^{\text{m}}$ .