

After his return from South America, von Ihering was honorary professor of palæontology in the University of Giessen. Many of his views were rejected when first advanced, but are now receiving wider recognition and acceptance.

PRINCIPAL J. YULE MACKAY.

JOHN YULE MACKAY, whose death on Mar. 30 we regret to record, was a distinguished student of the University of Glasgow. After graduation in medicine in 1882, he became Cleland's senior demonstrator and lecturer on embryology.

Mackay was successful as a teacher, and, in addition, he produced original work of permanent value. He devoted his attention mainly to the vascular system, and wrote a monograph on the morphology of the arterial arches in birds which was published in 1888 in the *Transactions of the Royal Society*. He was with Cleland the originator of the "Memoirs and Memoranda in Anatomy" which was issued from the Glasgow School, and its first volume, published in 1889, contained an interesting paper by him on "The Arterial System of Vertebrates Morphologically Considered", in which from his comparative observations, he constructed a scheme of the classification of the branches of the aorta, the correctness of which has been confirmed by subsequent embryological observations. His ability and energy were shown also in the volume on "Human Anatomy: General and Descriptive", which he produced in association with Cleland.

Shortly after Mackay's appointment to the chair

of anatomy in University College, Dundee, he was selected to be the principal of that College, and he held the dual posts until a few years ago, when he resigned the chair but retained the principalship. He was for many years the University representative of the University of St. Andrews on the General Medical Council, and until recently was the chairman of the Education Committee of the Council.
D. W.

WE regret to announce the following deaths:

Dr. J. H. Appleton, emeritus professor of chemistry at Brown University, known for his work in industrial chemistry, on Feb. 18, aged eighty-six years.

Dr. Asaph Hall, of the U.S. Naval Observatory, vice-president in 1900 of Section A of the American Association for the Advancement of Science, who was known for his work on the orbits of planetary satellites, on Jan. 12, aged seventy years.

Prof. Conrad Keller, professor of special zoology in the Technical Highschool, Zurich, author of works on the origin of domestic animals, aged eighty-two years.

Dr. W. A. Orton, director of the Tropical Plant Research Foundation, formerly plant pathologist in the U.S. Department of Agriculture, and president in 1921 of the American Phytopathological Society, on Jan. 7, aged fifty-two years.

Dr. R. F. Ruttan, emeritus dean of the faculty of graduate studies and research at McGill University, past president of the Royal Society of Canada and of the Society of Chemical Industry, on Feb. 19, aged seventy-three years.

Prof. L. Vialleton, honorary doyen of the faculty of medicine of the University of Montpellier, author of works on histology, evolution, and other zoological topics, aged sixty-nine years.

News and Views.

ON May 10 occurs the centenary of the birth of the distinguished French chemist, François Marie Raoult. The son of a customs officer, he was educated at Laon and Paris, became a teacher, held various appointments at Rheims and elsewhere, and in 1870, at the age of forty, succeeded to the chair of chemistry at Grenoble, where the remainder of his life was passed. His earliest researches were largely connected with the phenomena of the voltaic cell, but his name is best known for his work on solutions, which occupied the last two decades of his life. His first paper on the depression of the freezing points of liquids by the presence of substances dissolved in them was published in 1878. Continued experiments with various solvents led him to the discovery of a simple relation between the molecular weights of substances and the freezing-point of the solvent which he expressed in the "loi générale de la congélation". He also studied the diminution of the vapour pressure of a solvent caused by dissolving a substance in it, and his important work in these directions was afterwards used by such eminent investigators as van 't Hoff and Ostwald in support of the hypothesis of electrolytic dissociation in solutions. An account of his work was given in a memorial lecture in 1902 by van 't Hoff before the Chemical Society, of which Raoult had been elected a foreign member in 1898. A modest, retiring, and dignified man, he lived

mainly for his work, the value of which was recognised by the award of prizes by the Paris Academy of Sciences and of the Davy Medal of the Royal Society. His death took place on April 1, 1901.

FOR the public Kew is a delightful pleasure, for the gardener a demonstration of achievement and a suggestion of possibilities, and for the botanist a storehouse of information and a centre for research. The recently issued number of the *Bulletin of Miscellaneous Information* (Appendix I., 1930), comprises under this familiar but somewhat unattractive title, a review of the work of the various departments of the Royal Gardens during 1929. In 1925 work was begun on the formation of a National Pinetum at Bedgebury, in Kent, as the nearness of London is not conducive to the growth of conifers; and in spite of the long cold winter and abnormally dry summer of 1929, good progress is reported. The abolition of the penny charge for admission to the gardens from August Bank Holiday onwards is reflected in an increase in the number of visitors of nearly 220,000 between August and December, as compared with the corresponding period in 1928. The hard winter of 1928-29 and the boisterous gales of the last two months of the year caused severe losses among shrubs and large trees, but the long hot summer gave an unusual brilliance of colour to the abundant crops of fruits and berries on

many of the trees, and the later incessant and heavy rains effectively cleansed trees and shrubs from soot and dirt.

THE more strictly botanical activities of the Royal Botanic Gardens, Kew, have benefited by generous grants from the Empire Marketing Board, which have rendered possible visits by the scientific staff and various collectors to different parts of the Empire overseas and elsewhere, resulting in valuable accessions to the gardens and herbarium, and the gain of invaluable experience to individual members of the staff. Mr. Hutchinson's botanical tour in South Africa produced a harvest of more than 3000 species, including a large number of living succulent plants. Work of botanical exploration has also been carried out in British Guiana, Persia, Somaliland, and the Solomon Islands. Considerable additions have been made to the herbarium, mainly by the incorporation of stored material. An important feature of the work is the international co-operation in research rendered possible by an extension of the system of reciprocal loans between important botanical institutions; during the year more than 9000 specimens were borrowed and nearly 6000 sent out on loan. Botanical work in South Africa will be greatly facilitated by an arrangement to present to the National Herbarium at Pretoria duplicates of authentic specimens in the Kew Herbarium. The report of the museums records an increasing interest taken in the economic products of plants, involving much correspondence and discussion of home and colonial products with visitors. The difficulty in answering questions as to possibilities of new crops for home or the colonies is often enhanced by the lack of discretion on the part of optimistic journalists. An interesting acquisition is a new sundial constructed and presented by Prof. C. V. Boys, which was described in NATURE of Dec. 21, 1929.

WE have received a letter from Prof. G. E. Gates, of Judson College, Rangoon, in which he directs attention to the loose way in which authors of zoological papers still frequently refer to species of earthworms, even when these actually supply the material of their investigation. Thus a recent writer speaks of "the common Australian (European) earthworm"; the question is, What is meant? Presumably, says Prof. Gates, one of the peregrine Lumbricidæ that have been imported into Australia and have become acclimatised in settled areas around the cities. But "at least six species of Lumbricids have been recorded from Australia: *Eiseniella tetraedra*, *Eisenia fatida*, *Allolobophora caliginosa*, *Bimastus constrictus*, and *Octolasion lacteum*. These worms when found elsewhere are usually present in considerable numbers, so that to each one of them the adjective 'common' might be applied. Thus an investigator who procures his earthworms from manure piles might regard *E. fatida* as the common species, while another investigator who gets his material from the very same locality but at a distance of a very few feet from the manure piles would probably find another species to be the common form. Similarly a thick grove or river bank only a short distance from both the preceding places might

have still other common species. The phrase 'the common earthworm' in such a region must therefore be nearly as meaningless as 'the common bird' or 'the common fish' would be." Even though one of these species should happen to preponderate so largely in one particular place as to deserve the name, locally, of 'the common earthworm', outsiders cannot be expected to know which is meant. The importance of the matter, as Prof. Gates points out, lies in the fact that in such cases corroboration of the results obtained is impossible, and their value, therefore, very considerably diminished, because of the anonymity in which the animal concerned is shrouded. It is not only the Oligochæta which are thus cavalierly treated by authors; in the same paper which calls forth these remarks, the monocystid parasites with which the writer is concerned are also left specifically undetermined.

THE issue of the *Times* for April 26 contains a letter from Sir John Rose Bradford, president of the Royal College of Physicians, in his capacity of Chairman of the Harvey Church Memorial Fund, appealing for funds for the restoration of the tower of Hempstead Church, Essex, the resting-place of William Harvey, which collapsed in 1882. An appeal was made in the *Times* last January not only to individual practitioners of medicine, but also to medical corporations, institutions, societies, and schools, with the result that some £1500 of the £5700 required has been raised. The present appeal is primarily directed to members of the medical profession, by whom Harvey is generally regarded as second only to Hippocrates, but it is hoped that it will provoke a generous response from laymen as well, particularly those who can appreciate Harvey's exhortation to the fellows of the Royal College of Physicians "to search and study out the secrets of nature by way of experiments". The present dilapidated condition of Hempstead Church has not infrequently created an unfavourable impression upon the foreign medical men who have made a pilgrimage to Harvey's tomb. A new importance is now assumed by the erection of a worthy memorial to Harvey at a time when, as we noted in our issue of April 19, a special effort is being made to establish a post-graduate school of medicine in London and to attract foreign students to Great Britain. Donations should be made payable to the Harvey Memorial Fund, and may be sent to the honorary treasurer, Mr. A. W. Ruggles-Brise, Spain's Hall, Braintree; or to Dr. Arnold Stott, 58 Harley Street, W.1, who is joint honorary secretary with the Vicar of Hempstead.

AN interesting tradition has long been current that Comenius (Jan Amos Komensky) the famous seventeenth-century pedagogue, was invited to accept the presidency of Harvard College, founded in 1636. The evidence that such an offer was made by the younger John Winthrop (1606-76), Governor of Connecticut, rests upon the authority of two references to it by Cotton Mather, of Boston, in works published in 1702 and 1726. Recently, Mr. R. FitzGibbon Young has re-examined the evidence

("Comenius and the Indians of New England", pp. 28. University of London School of Slavonic Studies. Price 3s. net) and, by taking into consideration the circumstances of time and place, has concluded that whilst there is definite evidence that Comenius was invited to New England, the presidency of Harvard was not vacant when Winthrop could have seen him. Nevertheless, his pan-sophic educational schemes received the careful consideration of contemporary American educationists. Mr. Young has also traced Comenius's connexions with Robert Boyle, Dr. Wilkins, Sir Kenelm Digby, and other members of the "invisible college" which was later to become the Royal Society. It would seem that the intention of certain savants, both in England and America, was that Comenius's methods of instruction should be applied to the unsuccessful attempt then set on foot for educating the American Red Indians upon the most advanced western European lines. Nothing came of the project, but Comenius's views can still be regarded as of some historical interest.

FOLLOWING the decisions at Düsseldorf in 1910, the sixth session of the International Congress of Mining, Metallurgy, and Applied Geology will be held at Liège on June 22-28 next during the International Exhibition of 1930. These meetings will be under the gracious patronage of His Majesty King Albert and of the Belgian Government. The Congress has been organised by the Liège Association of Engineers and the Geological Society of Belgium at Liège, in consultation with the societies which took part in the Conference at Düsseldorf. The work of the Congress will be divided into three sections: (A.) Mining Section, which will include reconnaissance and preliminary work, modern methods of working coal mines, metalliferous deposits and quarries, generation and utilisation of energy, extraction, ventilation (gas and dust), and mechanical treatment of ores and coal; (B.) Metallurgy Section, which will deal with blast-furnace practice, steel and ferrous alloys, foundry work, non-ferrous alloys and fuels; (C.) Applied Geology Section, covering metals, fuels, hydrology, and geophysical prospecting. Further information can be obtained from the general secretary of the Organising Committee, 16 Quai des États-Unis, Liège.

EVER since its formation in 1884, the North-East Coast Institution of Engineers and Shipbuilders has paid attention to engineering education, and in 1903 and 1907 it published reports on the training of apprentices. After the reading of a paper in October 1926 by Sir T. Morison entitled "How should an Engineer be trained?", the Education Committee of the Institution was requested to consider the training of candidates for official positions in the engineering and shipbuilding industries, and, in a short but valuable report entitled "Engineering Training for Officer's Rank", the results of its inquiries have just been published. 'Officer's rank' is considered to denote that a person possessing it has a reasonably broad acquaintance with the application of scientific principles to engineering, a certain amount of scholarship,

and some practical knowledge of all the trades or professions which are employed in engineering works; while the report refers mainly to the training of marine and mechanical engineers, shipbuilders, and naval architects.

THE Education Committee of the North-East Coast Institution of Engineers and Shipbuilders regards the obtaining of a university degree in applied science as assuring a satisfactory standard of scholarship and as the normal road to officer's rank in the engineering profession, but one of the points stressed in the report is the desirability of a preliminary training in the works before the student enters upon his university course. "It is extremely desirable, as a preliminary to entering the university, that some experience of handling and fashioning actual materials, and of seeing what engines and ships and their parts look like in different stages of their construction, should be acquired." This view was supported by 94 per cent of the firms to which a questionnaire was sent. Appended to the report are outline schemes of training for both the shipyard and the engineering workshop. The carefully considered views of the Committee will be read with interest by those teaching in technical schools and colleges, and the report should also be of value to parents of boys desirous of becoming engineers.

THE opening of direct electrical communication between Madrid and Buenos Aires on Oct. 12, 1929, marked the completion of a wonderful engineering feat for which the International Telephone and Telegraph Corporation deserves great credit. The radio link installed is capable of connecting any telephone in the principal cities of Europe to any telephone in the principal cities of Argentina, Chile, and Uruguay. The length of this link (6400 miles) is twice as great as that connecting Britain with the United States. The radio path cuts the meridian at the equator at an angle of about thirty-four degrees. It passes through zones notorious for atmospheric disturbances and through the equatorial region where radio transmission is particularly subject to fading. Devices have been installed to counteract the effects of fading and, in addition, echo suppressor circuits which prevent the speech being reflected at the distant ends have been permanently installed. In order to give a trustworthy service over the entire day, three wave-lengths are used at each transmitter. A wave-length of 15 metres (20,000 kilocycles) is employed in the daytime, 20 metres for sunset and sunrise conditions, and 30-metre waves (10,000 kc.) are used at night. In order to reach Montevideo in Uruguay and some of the important cities in Argentina, it was necessary to place a telephone cable under a very broad portion of the River Plate and to cross some very high mountains where snow prevents train traffic at certain periods of the year. Serious trouble has been experienced in Argentina, where enormous cobwebs are blown by high winds into the circuits and effectively short-circuit them. In *Electrical Communication* for February many details are given of the system. Extensions have been made to Chile, which will add

many cities in that country to the Buenos Aires-Madrid link. In two years' time the toll plant to Bogota will add Colombia to the system.

THE transmission systems for railway electrification which are used in the Swedish State railways are novel and deserve special study by railway engineers. We therefore welcome a paper by I. Ofverhohm, the chief electrical engineer of the State railways, which is published in the *ASEA-Journal* (Allmanna Svenska Elektriska) for December. At the end of the year 1928, nearly six hundred miles of the State railways had been electrified and the electrified portion carried nearly a quarter of the whole traffic (in train-miles) of the railway system. Owing to special reasons, alternating current was used. The power required for the Kiruna—Riksgransen line, the so-called Ore railway, is produced by separate generators at the Porjus power plant, which is then stepped up to 80,000 volts for the transmission lines which extend for 250 miles along the railway, the average distance between the substations being about 20 miles. The southern part of the State railway from Stockholm to Göteborg, which is called the western trunk line, is supplied with electrical power from the national high voltage three-phase transmission lines. The voltage between the trolley wires and the earth in the Ore railway is 16,000 volts, and the frequency is only 15. The important difference between the two sections of the State railway is that for the Ore railway special transmission lines and transformer substations had to be constructed in addition to the trolley lines. In the latter case it was only necessary to construct motor generator stations in addition to the necessary trolley wires. One objection that has been often urged against the use of alternating current is that it would produce interference with telegraph and other communication circuits. The Swedish engineers seem to have overcome very easily by various methods described in the paper any troubles arising from this cause.

A REPORT on "Rational Organisation and Industrial Relations", which consists of a symposium of views by members drawn from the spheres of management, labour, and science, has recently been published (The Hague: International Industrial Relations Association, 1930. 3.50 fl., 6s.; to Members of the Association, 2.50 fl., 4s.). In a paper on "Rational Organisation", Mr. L. Urwick, director of the International Management Institute, Geneva, defines a rational or scientifically organised industry as a group of enterprises engaged in supplying similar or allied requirements to the community by methods involving the minimum waste of either effort or material. Rationalisation, he holds, is both an attitude and a process. As an attitude, it records the belief that a more rational control of world economic life through the application of scientific method is possible and desirable. As a process, it implies the application of scientific intellectual technique to all problems arising in the organisation and conduct of production, distribution, and consumption. An important lesson which recent experiments in scientific

management have to teach is that the art of management and of organising large bodies of men must be based on a searching intellectual study of the underlying sciences bearing on it, coupled with that power of synthesised expression which is the distinguishing hall mark of real ability. Scientifically managed industry of the future will necessarily involve a substantial degree of workers' control, but the mechanisms and forms of that control would accord rather with the findings of comparative administration than with any political preconceptions. "Personnel Policy and Procedure" is discussed by Dr. C. H. Northcott, labour manager of Messrs. Rowntree and Co., Ltd., who holds that management should not wait for the workers to make a proposal. Even in such matters as wages, it is unfair to the workers that a grievance known to the management should remain uncorrected until complaints are made.

In the *Engineer* for April 11 is an illustrated article on the s.s. *Seapro*, a fish-treating vessel which has just sailed for the south-west coast of Africa. Fish of many kinds are caught in the waters in that area, some of which are only fit for conversion into food for cattle, pigs, and poultry; some of which are valuable for their oil content; others the livers of which provide medicinal oil, and shellfish that furnish a table delicacy when tinned. Finally, there are other fish which are worth putting into cold storage for sale at any convenient market. To deal with these various classes of fish, the *Seapro* has been fitted up as a factory with hacking machines for tearing the fish into small pieces; drying machines for expelling the water; sterilising machines in which the albumen is coagulated and bacteria killed by being subjected to high temperature; a complete tin-making plant for making tins, and others for boiling and canning crayfish and for boiling the oil out of fish livers. The machinery, which is driven by electric motors, has been constructed by Rose, Downs, and Thompson, Ltd., of Hull, who specialise in the construction of fish meat plant. The actual fishing will be done by a fleet of motor-boats the crews of which will be recruited locally but who will live on board the *Seapro*, in which extensive native quarters have been provided. The *Seapro* is a vessel of 5305 deadweight tonnage, and before being altered for her present purpose was, under another name, engaged in the pilgrim traffic in the East.

THE cost of books to the reader, relative to the publications of different countries and to succeeding years, is not easy to assess with strict accuracy, and on this account the statistics collected by John R. Miner must not be pushed too far (*Quart. Rev. Biol.*, p. 598; 1929). They refer to the cost of the biological books received for review in 1929 by the journal mentioned. If these may be taken as fair samples of national production, of the great nations Germany heads the list as the most expensive retailer (1.65 cents a page), followed by England (probably meaning Great Britain—1.29 cents), United States (1.14), and France (0.47). The cheapest of all biological books are those published by the United States Government,

and next to them appear to come those of the British Government, but this statement is founded on a single example only. It is very striking, however, that during the four years of this annual survey, France has continued to produce the cheapest commercially published scientific books, costing on the average less than half as much as those of any other country. In all countries 1929 was marked by rising prices, varying from an increase of 18.3 per cent in British books to 4.4 per cent in French; United States commercial books show no difference, but their Government publications have risen 9.5 per cent. The longer view shows that while British and American books stand now practically at the price level of 1926, French books in the same time have increased in price 34.3 per cent and German books 51.4 per cent.

DR. A. NODON has contributed an article to *Savoir* (Mar. 15) which again raises the problem of the nature and origin of the cosmic rays. It seems to be undecided at present whether they are electromagnetic waves or corpuscles. Prof. Millikan's interpretation of the accurate absorption curves obtained by him and by his collaborators is not everywhere accepted, but, on the other hand, the evidence that the rays are corpuscular is as yet not completely satisfactory. Their place of origin, again, cannot be regarded as settled in the absence of more complete statistical analysis of the type made by A. Corlin, the accumulation of data for which is necessarily a lengthy procedure. Dr. Nodon has directed attention to the work on the cosmic rays which has been done in France at various times since the discovery that there was a real residual ionisation in electroscopes. The feature of the French work is that it tends to show that the penetrating radiation comes in part directly from the sun, and in part indirectly from the upper atmosphere, but not from the sun. The present position is most unsatisfactory and it does not seem possible to pronounce any certain judgment on the questions at issue.

THE anthropological surveys carried out and planned by the Bernice P. Bishop Museum at Honolulu promise to add much to the knowledge of the people of Polynesia. The Museum was founded in 1889 as a memorial to the Princess Panahi, last of one of the branches of the chiefs of Hawaii, with the stated object of the advancement of knowledge of "Polynesian and kindred antiquities, ethnology, and natural history". It was recognised that the problems of anthropology should be given a preferred position owing to the rapidity with which, on the death of the older people and in the absence of written records, reliable sources of information regarding native language, music, myths, social organisation, industries, and history, disappear. In carrying out the surveys, the investigators have, as it were, kept an eye on the clock, realising that vanishing data must be gathered at all costs, and that less urgent studies may well be excluded from the programme of immediate work. For the purposes of the survey, Polynesia has been divided into twenty-six areas, and eighteen surveys have been completed or organised. In addition to its ethnographical work, the

Museum has done much to elucidate the flora and fauna of the Hawaiian area.

THE Zoological Survey of India was a fine conception which took shape under the enthusiastic guidance of the late Dr. Nelson Annandale, and the report for the years 1926-29 shows how solid is the foundation being laid for a knowledge of the fauna of India. Concerned equally with the field work on which advance of knowledge must be based, with the preservation and storage of the materials collected, and with the identification of specimens, the Survey finds its labours hampered in several directions. The director, Col. R. B. Seymour Sewell, suggested, therefore, that besides additional staff, there was need for a fire-proof building to house the collections, the library and laboratories, and of a marine biological station at Karachi. Force of circumstances has prevented the completion of these projects, but the appointment of an anthropologist should be of great service from the point of view both of the public galleries and of the scientific collection of data. Field work has been carried on in various areas, and now that the Chilka Lake survey has been completed, attention has been turned particularly to the fauna of the Nerbudda River. Appendices, occupying 44 pages, give lists of collections sent out and received, of an impressive series of type specimens added, of papers published, and so forth; but in these days of expensive printing, full lists of specimens added to the exhibited collections, of odds and ends received for identification, or of workers who used the library or laboratories, might be omitted without serious loss.

THE Zoological Society of London has had another most successful year. According to the Report for 1929, the number of visitors shows a decline from that of the previous year and the realised profit has fallen. But the former still exceeds two millions, and the latter, at £12,059, is in reality an improvement on the previous year, since there has already been debited against profit a non-recurrent loss of £2742 due to the centenary celebrations. The number of animals in the collections remains much the same as before—4095, excluding fishes and invertebrates—and this in spite of an abnormally high mortality amongst small mammals and birds which took place during the exceptionally severe and prolonged frost in January and February of last year. Otherwise the collections show a wonderful freedom from disease, for we can reckon out of count the deaths of thirteen penguins imported from the Falkland Islands in an infected condition. The gratifying decrease of tuberculosis, to which we have referred before, continues, the records showing ten cases fewer in mammals and eleven in birds, with only two cases amongst the Primates, as against forty-one in 1926 amongst the inhabitants of the old ape, monkey, and lemur houses—a fine justification of the new housing policy. In view of the scare regarding psittacosis, it is reassuring to learn that no case of this disease has been detected and no outbreak of epizootic disease has occurred in the Society's aviaries during the year. To the Report are appended the addresses by His

Grace the Duke of Bedford and Sir P. Chalmers Mitchell at the centenary celebrations, as well as shorter addresses by three representative delegates.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A temporary technical assistant in farm economics under the Department of Agriculture for Scotland—The Establishment Officer, Department of Agriculture for Scotland, Queen Street, Edinburgh (May 10). Designers with experience in the design and construction of light precision mechanical or electrical machinery, for an Admiralty establishment near London—The Secretary of the Admiralty (C.E. Branch), Whitehall, S.W.1 (May 10). A physiological botanist under the Director of Agriculture, Mauritius—The Private Secretary (Appointments), Colonial Office, 2 Richmond Terrace, Whitehall, S.W.1 (May 16). A university librarian for the Queen's University, Belfast—The Secretary to the Library Committee, Queen's University, Belfast (May 16). A head of the Building Department of Leeds Technical College—The Director of Education, Education Department, Calverley Street, Leeds (May 17). A senior science master at the City of Leeds School—The Director of Education, Education Department, Calverley

Street, Leeds (May 17). A chief assistant in the Pottery Department of the North Staffordshire Technical College—The Clerk to the Governors, North Staffs Technical College, Town Hall, Hanley, Stoke-on-Trent (May 19). A junior lecturer in the department of inorganic and physical chemistry of Bedford College for Women—The Secretary, Bedford College for Women, Regent's Park, N.W.1 (May 24). An assistant horticultural adviser to the County of Southampton Education Committee—The County Education Officer, The Castle, Winchester (May 24). An assistant director of agricultural education, a senior agricultural advisory officer, and a poultry advisory officer—The Director of Agricultural Education, Agricultural Station Offices, Sprowston, Norwich (May 24). A head of the mathematics and physics department of the Birmingham Central Technical College—The Principal, Central Technical College, Suffolk Street, Birmingham (May 30). An assistant lecturer in the department of mathematics of the University College of Swansea—The Registrar, University College, Swansea (May 30). Assistant meteorologists under the India Meteorological Department—The Director-General of Observatories, India Meteorological Department, Poona 5, India (June 29).

Our Astronomical Column.

Double Star Measures at Johannesburg.—*Circular* No. 80 of the Union Observatory is wholly occupied with double star measures made by Mr. W. H. van den Bos. There are 1393 measures of 604 pairs; the 9-inch refractor is used for such pairs as are within its reach; the 26½-inch for more difficult ones. Some pairs within reach of northern observers are measured for a check on personality in measuring. One of these is Sirius; there are five measures of the principal pair *AB*, which agree closely with the ephemeris from Aitken's orbit; two measures of the suspected third companion *C*, date 1929.213, give P.A. from *B* 132.6°, distance 1.54"; the note on one night is "*C* sharp and stellar regarded as quite certain, good measure"; but a later note states that the real existence of *C* is still regarded as doubtful. A bar across the object glass was found to aid observation in this case; there were dark lanes between the diffracted patches of light; a faint object in these lanes was more easily seen; it is suggested that the device might be useful for Procyon. Three companions of Nova Pictoris were measured; position angles, 70°, 230°, 10°; distances, 0.5", 0.6", 0.3"; dates not given. An interesting new close pair is *v* Indi; magnitudes, 6.1, 6.2; P.A. 0°, distance 0.14". As this star has a parallax of 0.034" (Voute), it is likely to show orbital motion. With the circular are issued twelve more sheets of the photographic star-atlas of the southern heavens that is being made with the Franklin Adams camera; they are ruled with the lines of R.A. and Decl. for the equinox of 1875.

A New Determination of the Galactic Pole.—*Publication* No. 43 of the Groningen Laboratory, by Prof. P. J. van Rhijn, director of the Laboratory, is taken up with a careful analysis of the distribution of the faint stars, based chiefly on the photographs of the Kapteyn selected areas, but supplemented by the Franklin Adams photographs and some other sources. The stars used are very much fainter than those employed in obtaining the galactic co-ordinates that

are in common use; it is therefore not very surprising to find that the new position of the galactic pole differs considerably from accepted values. Thus, in the analysis the preliminary position of the galactic pole was that derived by Gould; R.A. 12^h 42^m 34^s, N. Decl. 27° 13'; that finally adopted is 12^h 56^m, N. 25° 30' (both are for the equinox of 1900). The publication contains tables for reducing R.A. and Decl. to this new system; the remainder of it contains extended tables of the logarithms of the star density for different magnitudes and in different regions of the sky. The important result is deduced that the ratio of increase in the number of stars on extending the table from any magnitude (between the limits 15 and 18) to a value half a magnitude fainter is independent of the galactic longitude, and is the same on both sides of the galaxy.

Melbourne Astrogaphic Catalogue, Vol. 3.—This catalogue has just been published under the direction of the present Government Astronomer, Mr. J. M. Baldwin; most of the photographs were taken and measured under his two predecessors, Messrs. Ellery and Baracchi. It covers the zones -69° and -70°, so that about half the stars in it occur twice, since each plate covers 2° in declination. There are 254 pages, and the average number of stars on each page is about 200. The diameters of the star images are given, and a table in the introduction gives the magnitude corresponding to each diameter; the faintest stars are of magnitude 12.9. The rectangular co-ordinates *x*, *y* of each star are given to the third decimal of a minute; there are tables to facilitate the reduction to Right Ascension and Declination. The stars used for the plate constants are in heavy type. The reference numbers in the Cape Photographic Durchmusterung are given for all stars contained in that work, together with their magnitudes. The Melbourne section of the catalogue extends to the south pole, but the zones near the pole are very small, so that about half the whole area has now been published.