

from Thales to Huxley", in 1897, was the last of his popular expositions of evolution.

Clodd was from its early days an active member of the Folk-Lore Society, of which he was president in 1895 and 1896. Besides his two presidential addresses, he made various contributions to the Society's journal. In 1885 he published "Myths and Dreams", and in 1898, "Tom Tit Tot, an Essay on Savage Philosophy in Folk-lore", which is a delightful example of one aspect of the study of folk-lore. A compact little book, "Animism the Seed of Religion", appeared in 1905, and "Magic in Names and in other Things" in 1920; this is the most elaborate of Clodd's writings on folk-belief and is as vividly written as his other books.

In 1892, Clodd published a memoir of H. W. Bates in "The Naturalist on the River Amazons", in 1900 one on "Grant Allen", and in 1902 another on "Thomas Henry Huxley". In 1916 he delighted his numerous friends with the publication of "Memories", and those who desire to know what Clodd was to his friends should read this book and incidentally they will discover what manner of man he himself was.

The above list of some of his books, and his very numerous contributions to journals of all kinds, indicate that Clodd was a sower of the seed of intellectual freedom and a populariser of evolution, more particularly as regards man. This is not the place to refer to his many literary associations, but no mention of Clodd would be complete without allusion to the stimulating quality of his conversa-

tion and to the notable gatherings at his home, where men of varied experience, activities, and research interchanged serious talk enlivened by jest. Clodd was a perfect host, and not least so when as skipper he took his party for cruises in the *Lotus*. We have lost a great friend, and we offer our heartfelt sympathy to his devoted wife, who made his declining years so happy.

A. C. HADDON.

WE regret to announce the following deaths:

Prof. J. O. Arnold, emeritus professor and lately dean of the Faculty of Metallurgy in the University of Sheffield, on Mar. 24, aged seventy-two years.

Dr. Wilhelm Biedermann, formerly professor of physiology in the University of Jena, on Nov. 27, aged seventy-five years.

Sir Edward Brabrook, C.B., a past president of the Royal Anthropological Institute and of Section H (Anthropology) and also of Section F (Economic Science and Statistics) of the British Association, on Mar. 20, aged ninety years.

Dr. Hermann von Ihering, honorary professor of palæontology at Göttingen, for many years director of the Museu Paulista at São Paulo, Brazil, who was well known for his studies in zoo-geography, the palæontology and fauna of Brazil, and the morphology and classification of the Mollusca, on Feb. 24, aged seventy-nine years.

Sir William McCormick, G.B.E., F.R.S., chairman of the University Grants Committee and of the Advisory Council on Scientific and Industrial Research, on Mar. 22, aged seventy years.

Prof. Wilfred Robinson, professor of botany at the University College of Wales, Aberystwyth, on Mar. 7.

News and Views.

CONGRATULATIONS from a wide circle of friends will be extended to Prof. George Forbes, one of our veteran electrical engineers, who celebrates his eighty-first birthday on April 5, having been born in 1849. He is the son of Principal David James Forbes, and graduating in the first instance at the University of St. Andrews, he went on later to Cambridge. Respecting his youthful adventures, our readers will doubtless recall a recent article in the *Times* by him recounting work as a war correspondent, and impressions, whilst in the service of Delane, the editor of that journal. Forsaking journalism, Forbes embraced a scientific career, becoming in the first instance professor of natural philosophy at Anderson's College, Glasgow, afterwards devoting himself to notable electrical projects. He was electrical engineer for the initial series of installations at Niagara Falls, 1891-95, besides being associated with numerous other undertakings which attest the foresight and skill of the electrical engineers of a pioneer period. In 1887, Prof. Forbes was elected into the fellowship of the Royal Society. He is a Chevalier of the Legion of Honour of France and honorary LL.D. of St. Andrews.

CELEBRATIONS in connexion with the eightieth birthday of Dr. William Henry Welch will take place in Washington, U.S.A., on April 8. A broadcast of the ceremonies will be relayed from the London Regional Station at 5 P.M. Dr. Welch's name is a

household word to doctors all over the world. In 1884, when the bequest of a rich American, Johns Hopkins, led to the foundation of a new university in Baltimore, Dr. Welch was chosen first professor of pathology. A few years later he was joined by the late Sir William Osler as professor of medicine. Mainly through the genius and enthusiasm of Welch, Osler, and the late Prof. Halsted—the famous surgeon—the new school rapidly rose to the first rank, and for more than a generation Johns Hopkins has been the goal of advanced students and research workers from all parts of the world. Dr. Welch, who has since been Director of the School of Hygiene of the Johns Hopkins University, and is at present professor of medical history there, has lived to see the educational ideals for which he fought universally adopted, and to be admitted into the class of the great masters of medicine, the class of Lister, Koch, Pasteur, and Manson. In connexion with these ceremonies in America, an address, with lantern illustrations, will be given at the London School of Hygiene and Tropical Medicine, at Keppel Street (Gower Street), W.C., by the director, Sir Andrew Balfour, on Dr. Welch's life and work, on the same day at 4 P.M.

As has already been announced, the Council of the Physical Society has awarded the Duddell Medal for 1929 to Prof. A. A. Michelson, of the University of Chicago, and at the annual general meeting on Mar. 28

the medal was handed to Mr. David Mc. K. Key, Third Secretary of the Embassy of the United States of America, on behalf of Prof. Michelson. The interferometers invented by Prof. Michelson, of which the first was used for carrying out in 1887 the famous Michelson and Morley experiment, have been applied by him, always with complete adequacy of design, to other important and difficult problems, most of them of audacious novelty. These problems included the measurement in 1892 and 1893 of the metre in wave-lengths of light; the measurement of the diameters of stars, the re-measurement of the earth tides, and the testing of the effect of the earth's rotation on the velocity of light. These measurements have had far-reaching consequences for physical science.

THE difficulties of reconciling the result of the Michelson-Morley experiment with the then prevailing physical conception of the nature of the universe were the direct cause of the inquiry of Albert Einstein, which resulted in the theory of relativity. The measurement of the metre in wave-lengths of light resulted in establishing a standard of length free from the uncertainty concerning possible variation which attaches to all material standards. The interferometer for the measurement of the diameter of stars, suggested by Michelson in 1890 and first applied by him to Betelgeuse, has not only confirmed the correctness of the almost incredible dimensions yielded by indirect means of calculation, but also has detected fresh stellar phenomena in the variable diameter of Mira Ceti, and the separation of double stars too close for resolution by the unassisted telescope. The invention by Prof. Michelson of the echelon diffraction grating provided physicists with a potent tool for the investigation of the fine structure of spectral lines, knowledge concerning which has become of such great importance in modern physics. Prof. Michelson has also designed a ruling-engine with which very large gratings have been ruled. As a final example of his work on scientific instruments for the advancement of knowledge, mention may be made of the completion by him in 1926, with apparatus designed by himself, of a redetermination of the velocity of light. The elaborate precautions taken to secure freedom from error included means whereby the distance of eighty-two miles traversed by the light was measured to a higher degree of accuracy than had ever been reached in triangulation.

Two honours highly prized by chemists were conferred at the annual general meeting of the Chemical Society on Mar. 27. Presenting the Longstaff Medal to Dr. W. H. Mills, the president, Prof. J. F. Thorpe, said that this gold medal is awarded triennially to the fellow of the Society who, in the opinion of the Council, has done the most to promote chemical science by research. He mentioned Dr. Mills's investigations of the cyanine dyes and their uses as photographic sensitizers, and referred to his researches on the occurrence of optically active forms of those substances which possess molecular dissymmetry, such as the ketodilactone of benzophenone-2-4-2'-4'-tetracarboxylic acid and the pyridylhydrazone of cyclohexylene dithiocarbonate. Dr. Mills has thereby established

the fact that the cause of the absence of optical activity among aromatic derivatives due to the uniplanar character of the benzenoid structure is no longer effective when two rings are joined in such a manner as to make them lie in different planes, and he has emphasised this conclusion by resolving benzenesulphonyl- δ -nitro-1-naphthylglycine, thus showing that the inhibition of free rotation about a single bond leads to molecular dissymmetry. The Harrison Memorial Plaque and Prize was awarded to Dr. R. P. Linstead for meritorious original contributions to chemical science. Prof. Thorpe said that it is seldom that a research worker within the age limits demanded by the trust deed strikes out a line for himself and does not merely elaborate and extend the research problems on which he has been trained. Dr. Linstead has devised and established on a sure basis a means by which it is now possible to determine the relative proportions of the constituents present in equilibrium mixtures formed by the interchange of the $\alpha\beta$ and $\beta\gamma$ structures of substances exhibiting three-carbon tautomerism, whereby the close and quantitative study of this fundamental phenomenon can be effected.

THE discussion on beam radio telephony in the House of Commons on Mar. 27 was naturally more political than scientific. Points were scored by the various speakers, but we do not think that these much affect the main issue. We referred to the subject in a note in our issue of Mar. 8, p. 386. World inter-communication cannot be considered with regard to the interests of one centre alone. When H. W. Nicholls read a paper on trans-oceanic radio telephony to the Institution of Electrical Engineers in London on Feb. 22, 1923, he described some of the results obtained by the American Telephone and Telegraph Company and the Radio Corporation, which now allow us to engineer the Atlantic radio link. In particular, he described a method of suppressing one of the side bands, a discussion on the existence of which has recently taken place in our pages. When we first heard perfect speech being reproduced across the Atlantic, we recognised what a debt we owed to the Americans. Now Sir E. Hilton Young says that if the Post Office does not co-operate with Imperial and International Communications, Ltd., it must co-operate with some one else. In particular, he stated that it is co-operating with the great American cable companies and not with British interests. We think that he takes too narrow a view. The Post Office is not jealous of the Imperial and International Communications, Ltd., and on many occasions it has proved that it is not autocratic. It is true that the Standard Company has some American capital, but there are many other large engineering firms in Great Britain which have also American support. It is a British factory employing British workers and doing a large amount of work for foreigners. We see no reason why the Post Office should not establish communication with Buenos Aires through foreign capitals if it is commercially convenient. The development of radio communication has been so rapid of recent years that it is inadvisable to hamper the Post Office in any way.

DR. JOHN RADCLIFFE, the outspoken physician who told Queen Anne that she was only suffering from the "vapours", and William III. that "he wouldn't have William's two legs for his three Kingdoms", was a liberal benefactor to his own College and to the University of Oxford. About sixty years after his death, the trustees under his will built the Observatory which bears his name. This was done at the request of the University; and there is no doubt that the trustees from the beginning always considered that they were under special obligations to the University and City of Oxford. The Observatory having lately come into the possession of £100,000 by the sale of its site, the trustees have before them a proposal to move the Observatory and its belongings to South Africa, on the ground that so large a sum could not be usefully spent on astronomy in Oxford. The trust is not a department of the University; but, as has been pointed out by Lord Birkenhead as High Steward, it is at least doubtful whether the trustees are so far independent as to be legally entitled to alienate from the University property with which it has been intimately connected for many years. It may be noted that both the Board of Faculty of Natural Science and the Hebdomadal Council have expressed disapproval of the plan now before the trustees.

PROF. G. VON HEVESY, who delivered the Hugo Müller lecture before the Chemical Society on Mar. 26, chose as his subject the chemistry and geochemistry of the titanium group of elements. Speaking in English, without the aid of a manuscript, Prof. von Hevesy first discussed the distribution and geochemical relationships of this group of elements, of one of which, hafnium, he is the discoverer. When the earth cooled, members of the titanium group became concentrated in the earth's crust; the average titanium content of the material of the whole earth is about 1 in 600. From considerations of loss of heat by the earth, thorium has been considered to be strongly concentrated in the earth's crust, and it is significant that geochemical considerations lead to the same result. Of this group, only titanium, zirconium, and thorium are found as the major constituents of minerals. Discussing the comparison of the chemical properties of the elements, Prof. von Hevesy mentioned that, failing an accurate comparison of ionisation potentials, the relative ionic sizes are of value. There is little or no difference in molecular volume between the dioxides of zirconium and hafnium, whilst the atomic volume of hafnium is in fact slightly less than that of zirconium; the ionic radii of the two elements are equal. Separation of zirconium and hafnium is rendered difficult by the very small differences in the solubilities of corresponding compounds, although advantage may be taken of such differences in double fluorides, and of the differing solubilities of the phosphates or oxychlorides in hydrochloric acid. Prof. von Hevesy next discussed the position of hafnium in the periodic classification of the elements with reference to its basicity, and then referred to the analytical chemistry of the group. Success has attended the application of methods employing radioactive indicators to minerals contain-

ing very small quantities of hafnium, and X-ray spectroscopy has also proved a valuable analytical instrument.

FOR his Friday evening discourse delivered at the Royal Institution on Mar. 28, Sir Ernest Rutherford took as his subject "The Transmutation of Matter". The idea that one metal could be transmuted into another first arose among the Greeks in Alexandria in the first few centuries A.D., and spread through Europe in the Middle Ages. With the discovery of the periodic relationship in the properties of the elements the belief in transmutation revived, and Faraday remarked, "To decompose the metals, to reform them and to realise the once absurd notion of transmutation—these are the problems given to the chemist for solution". In 1919, Rutherford showed that some of the nuclei of the atoms of nitrogen could be transformed by bombardment with the swift α -particles emitted by radium. Afterwards, Rutherford and Chadwick found that a number of the lighter elements showed a similar effect, and in all cases a swift proton was found to be emitted in consequence of a violent collision between an α -particle and the atomic nucleus. Our evidence indicates that in the case of nitrogen, the α -particle is captured during this process and the mass of the resulting atom is greater than before. In general, only about one α -particle in 100,000 comes close enough to a nucleus to effect its disruption. Transformation of an atom would occur also if an electron could be forced into a nucleus. In recent years, numerous experiments have been made to change mercury into gold and lead into mercury by means of intense electrical discharges, but there is no certain evidence that any transmutation occurs by this method. Apart from the radioactive bodies, it now seems clear that a large amount of energy must be applied to produce a disruption of the nuclei of the ordinary elements. The old idea that a new source of energy could be tapped by transformation of the ordinary elements now seems untenable. There remains, however, one interesting possibility. If hydrogen nuclei—protons—could be made to combine to form a nucleus of helium, an enormous amount of energy should be emitted during this process. Unfortunately, there is as yet no evidence that such a combination could be produced under conditions available in our laboratories.

IN the past few years there has been an unprecedented activity in the development of apparatus for all aspects of kinematography, and the number of applications for patents has been particularly large. There has been much discussion as to the validity of many of these apparently new inventions. These facts give an interest, over and above the purely historical, to the Will Day historical collection of kinematography and moving picture equipment, which is about to be offered for sale. This collection is unique and exceptionally comprehensive. There is no important stage in the development of moving pictures, with the exception of sound kinematography, which is not represented in Mr. Day's collection. The majority of the items are well known to the public, as they have been on exhibition at the Science Museum, South

Kensington, for a number of years. At the Museum they have been so adequately displayed and tended that it is to be regretted that it appears probable that the Museum will be deprived of every item of the collection after the sale. It is, perhaps, unfortunate, that the collection is to be sold as a whole. We should naturally like to know that the objects representing the pioneer work of W. Friese-Green, R. W. Paul, Birt Acres, and other Englishmen had a chance of remaining in England. France would doubtless welcome an opportunity to acquire the apparatus of the brothers Lumière, without having to purchase the entire collection.

THE Will Day collection comprises some five hundred items, including not only apparatus for recording and reproducing apparent motion, but many unique specimens of early films, and a collection of books, papers, prints, playbills, and early documents relating to the subject of moving pictures and their public presentation. The illustrated catalogue of the collection, sold at five shillings by the auctioneers, Messrs. Harris and Gillow, 80-82 Wardour Street, W.1, is one of the most valuable contributions to the history of cinematography yet published. A detailed description of each of the separate items is preceded by a foreword on the historical development of moving pictures by Mr. Will Day. Tenders for the collection in its entirety have to be made to the auctioneers before noon on May 3. It is difficult to see how it will be possible to assess the value of such a collection. Is it too much to hope that it will fall into the hands of a public-spirited purchaser, who will see to it that each country eventually has the opportunity of acquiring that portion in which it has a national interest?

THE introduction of foreign species of animals to any country is always a matter of difficulty and generally of controversy, owing to the clashing of interests which take very different points of view. The sportsman and the animal exploiter seldom see eye to eye with the purist who would reserve a country for the country's own produce. The position of the sportsman is easily appreciated. He is in sympathy with the preservation of the native fauna—he has indeed done much to keep it in being—but if the supply of game is to be maintained or increased where sport becomes more popular and more democratic, then he must turn to foreign birds. Then he must choose amongst the species which will thrive in his own country, and from these must select those which, while affording good sport, respond most profitably to the known methods of game propagation. The position is particularly interesting at the moment in the United States of America. The love of sport, or at any rate the desire to shoot something within the law, is increasing there enormously, and with it the demand that there should be plenty of sporting-gun fodder. Where native birds are big enough and abundant enough, the only danger is that they may not be able to last out the succession of annual pushes, but where native species are not sufficient, then recourse must be made to introductions of foreign blood.

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THE situation in the United States is put quite clearly by W. L. McAtee, the biologist in charge of food habits research in the Biological Survey of the U.S. Department of Agriculture. "Let the native game birds enjoy the protection of game sanctuaries as numerous and extensive as can be afforded, but on those parts of our domain where public shooting is practical and its continuance is desired, the practical necessities of the situation require the use of species of game birds that will produce the best results, regardless of their origin." As a consequence an inquiry has been made as to the "Game Birds suitable for naturalising in the United States," and a pamphlet under that title has been issued by the U.S. Department of Agriculture (Circular No. 96). The dangers of introducing possible pests or foreign bird diseases, or of depleting the food supply of native birds, have been foreseen, and in selecting suitable areas for introductions consideration has been given to latitude, temperature, and precipitation compared with those of the original habitat. The bulk of the species regarded as the most promising importations are various kinds of pheasants and partridges, but guinea fowls, Mexican quails, bustards, and sand grouse are also recommended. The natural vegetation of the United States is regarded as unfavourable to the sustenance of red grouse or black grouse, and capercaillie, snow cock, and wood-pigeons are looked upon as undesirable, in the last case on account of the damage they are likely to do and in the former because of the unpalatable quality of their flesh.

By the courtesy of the Trustees of the British Museum, the British Association is enabled to supplement its recent researches on ancient sites in Southern Rhodesia by a loan exhibition of all the more important antiquities from Zimbabwe and elsewhere, which were scattered among the museums of South Africa. Especial thanks are due to the South African Museum at Cape Town, the Rhodesian Museum at Bulawayo, and the Queen Victoria Memorial at Salisbury, for allowing their treasures to travel so far; and also to the Government of Southern Rhodesia for permitting the exhibition of the finds from Miss Gertrude Caton-Thompson's excavations last year at Zimbabwe, and Mr. A. L. Armstrong's exploration of the Bambata Cave in the Matoppo Hills. It is believed that other objects from earlier explorations at Zimbabwe are in private collections in Great Britain; and it is hoped that if their possessors are willing to allow any of these to be exhibited, they will send them without delay addressed to the Zimbabwe Loan Exhibition, care of the Director of the British Museum, W.C.1. The Exhibition, which enjoys the patronage of Their Excellencies the Governor-General of the Union of South Africa and the Governor of Southern Rhodesia, will be opened free to the public on Monday, April 7, in the Assyrian Basement of the British Museum; and will remain open until the middle of May.

ACCORDING to a message from the Riga (Latvia) correspondent of the *Morning Post*, published on Mar. 24, a communist of the name Volgin has been

appointed as the new permanent secretary of the Academy of Sciences of Leningrad, after the dismissal of the former permanent secretary, Prof. S. Oldenburg (see NATURE, Nov. 16, 1929, p. 767). In an interview with representatives of the Press, the newly appointed secretary stated that a new statute of the Academy has been drafted which requires all the academicians not only to show scientific attainments, but also to pay strict obedience to political orders and to help in the Socialistic reconstruction of U.S.S.R. It appears likely that should the present policy be continued, all the older members of the Academy will soon be displaced by others, whose achievements in adhering strictly to the Soviet Government's political principles are likely to be greater than their attainments in science. The recent dismissal of A. A. Birula from the post of Director of the Zoological Museum of the Academy is a further demonstration of the Soviet Government's attitude towards the older scientific workers in Russia. During the same interview, M. Volgin stated that even foreign honorary members of the Academy will be required to show themselves friendly to the revolutionary movement of the proletariat.

IN the presence of members of the Council of the Research Association of British Paint, Colour and Varnish Manufacturers, Mr. S. K. Thornley, the president, on Mar. 21, laid the foundation stone of a large extension of the premises of the Research Station at Waldegrave Road, Teddington. Before laying the stone, Mr. Thornley said that already we have had sufficient experience of the working of the research association idea on the utilisation of existing knowledge and the discovery of new knowledge to know that it is well worth while. It damages no one and is to the advantage of all. Co-operative research is a valuable if not the only convenient means for most people to participate in the inevitable scientific advance. The foundation stone bears the inscription: "Scientia socia industriae" (science the ally of industry). This stone was laid by Samuel Kerr Thornley, President, Research Association of British Paint, Colour, and Varnish Manufacturers, 21st March 1930.

DR. L. COCKAYNE, who was awarded the Darwin Medal for 1928 by the Royal Society for his contributions to ecological botany, has been appointed honorary botanist to the Wellington City Council, New Zealand.

A CONSIDERABLE earthquake was recorded at Kew Observatory on Mar. 26. The first impulse reached the Observatory at 7 hr. 32 min. 12 sec. The records indicate that the epicentre was situated in the south-west of China.

AT the annual general meeting of the Television Society the following were elected officers for the current year: *President*, Sir Ambrose Fleming; *Hon. Treasurer*, Mr. W. C. Keay; *Hon. Secretaries*, Mr. J. J. Denton and Mr. W. G. W. Mitchell. Mr. J. L. Baird was elected an honorary fellow of the Society.

DR. A. T. DOODSON, associate director of the Liverpool Observatory and Tidal Institute, has been awarded a prize of £150 offered by the Royal Society

of Arts in 1929, under the Thomas Gray Memorial Trust, for an improvement in the science or practice of navigation, for his work on the analysis and prediction of tidal currents.

AT the annual election of office-bearers of the Royal Philosophical Society of Glasgow, to fill vacancies, the following were elected: *Vice-President*, Mr. David Begg; *Members of Council*, Mr. G. D. Buchanan, Dr. G. H. Edington, Mr. W. Gillies, Prof. G. W. O. Howe; *Hon. Secretary*, Prof. C. R. Gibson; *Hon. Treasurer*, Sir John Mann; *Hon. Librarian*, Dr. J. Knight; *Hon. Auditors*, Mr. J. T. Tulloch, Mr. J. J. D. Hourston; *Acting Secretary*, Dr. J. M. Macaulay.

It would appear that in our review of "The World's Grasses" by Prof. J. W. Bews in our issue of Jan. 25, p. 119, we failed to view the entire field. We are now informed by Mr. A. S. Hitchcock, of the U.S. Department of Agriculture, that *Bromus secalinus* is cultivated in the valley of the Columbia River. *Bromus arvensis* is also cultivated as a crop in some European countries, so that this fact should have been referred to as an addition to, rather than as a correction of, Prof. Bews's statement.

AT the annual meeting of the Ray Society, held on Mar. 21, Prof. W. C. McIntosh was re-elected president, Sir Sidney F. Harmer treasurer, and Dr. W. T. Calman, secretary. Sir David Prain was elected a vice-president and Canon Bullock-Webster and Mr. C. H. Oakden new members of the Council. The Council's report announced that the issue for 1930 would consist of a volume on "The Aquatic (Naiad) stages of British Dragonflies", by Mr. W. J. Lucas; it will be illustrated with coloured plates which are now in course of reproduction from the author's own drawings. A work on "British Freshwater Copepoda", by Dr. R. Gurney, has been accepted for publication and its preparation is well advanced.

A GENERAL discussion on "Optical Rotatory Power" will be held by the Faraday Society on Friday and Saturday, April 25 and 26, in the rooms of the Chemical Society, Burlington House, Piccadilly, London. The meeting will open with an introductory paper by Prof. T. M. Lowry, and the proceedings will be in four groups dealing respectively with: (1) The physical basis of optical rotatory power; (2) apparatus and methods; (3) rotatory power of solutions; and (4) chemical aspects of optical rotatory power. The programme is noteworthy for the number of foreign scientific workers who have furnished papers. Members of allied societies, research students, and others interested, whether members of the Faraday Society or not, are invited to be present at the meeting.

Two Chadwick Public Lectures, delivered by Mr. Arthur J. Martin, on "Sewage and Sewage Disposal", have been published (Macdonald and Evans, 8 John Street, W.C.1. Price 2s. 6d. net). The booklet gives an interesting and instructive survey of the advances that have been made in recent years in the treatment of sewage, and concludes with a description of the activated sludge process, various modifications of which are now regarded as being the best means for the treatment of sewage.

THE latest catalogue (No. 523) of Francis Edwards, Ltd., 83 High Street, Marylebone, deals with second-hand works, 371 in number, relating to West Africa.

MR. J. H. KNOWLES, 92 Solon Road, S.W.2, has just circulated a catalogue (No. 11) of upwards of five hundred second-hand books on botany, herbals, phanerogams, floras and cryptogams, zoology and geology.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A principal of the Castleford, Normanton, and District Mining and Technical Institute, Whitwood—M. G. Swaine, Education Offices, Castleford, Yorks (April 7). A head of the Department of Commerce of the Leicester College of Technology—The Registrar, College of Technology, Leicester (April 7). A junior assistant in the Wood Chemistry section of the Forest Products Research Laboratory, Princes Risborough, Bucks—The Secretary, Department of Scientific and Industrial Research, 16 Old Queen Street, S.W.1 (April 8). A designing draughtsman in the Naval Ordnance Department of the Admiralty—The Secretary of the Admiralty (C.E. Branch), Whitehall, S.W.1 (April 12). A lecturer in pharmacy at the Witwatersrand Technical Institute—Chalmers and Guthrie, Ltd., 9 Idol Lane, E.C.3 (April 12). A permanent assistant to the adviser in agricultural economics in the Department of Agriculture and Horticulture of the University of Bristol—The Secretary, University, Bristol (April 12). A public analyst for the Metropolitan Borough of Camberwell—The Town Clerk, Town Hall, Camber-

well, S.E.5 (April 14). A pathologist at the Preston and County of Lancaster Royal Infirmary—The Superintendent and Secretary, Royal Infirmary, Preston (April 17). A research worker at the National Institute for Research in Dairying, for the investigation of problems concerning accessory food factors—The Secretary, National Institute for Research in Dairying, Shinfield, near Reading (April 19). Civilian education officers in the Royal Air Force Educational Service—The Secretary, Air Ministry, Gwydyr House, Whitehall, S.W.1 (April 22). A professorship of education in the University College of Hull—The Secretary, University College, Hull (April 23). A lecturer in historical geography at King's College, London—The Secretary, King's College, Strand, W.C.2 (April 25). A professor of bacteriology at University College Hospital Medical School—The Academic Registrar, University of London, South Kensington, S.W.7 (May 15). Probationers in the Indian Forest Service—The Secretary, Services and General Department, India Office, S.W.1 (July 1). A sanitary inspector in the Sudan Medical Service—The Controller, Sudan Government London Office, Wellington House, Buckingham Gate, S.W.1. A physics lecturer at the Newfoundland Memorial College—S. T. Harrington, Woodfield, Malvern Wells. A lecturer in mathematics and physics in the Dudley Training College for Teachers—The Secretary to the Dudley College Council, Education Offices, Dudley. A full-time teacher of building and civil engineering in the Barnsley Mining and Technical College—The Principal, Harvey Institute, Barnsley.

Our Astronomical Column.

The New Comet Wilk 1930 c.—Mr. J. P. Moller has computed the following orbit of this comet:

T 1930 March 28.794 U.T.
 ω 46° 47' }
 Ω 90 4 } 1930.0
 i 67 40 }
 $\log q$ 9.6841

EPHEMERIS FOR 0^h.

	R.A.			N. Decl.
April	2.	1 ^h 0 ^m 24 ^s		32° 31'
	6.	0 43 16		36 37
	10.	0 24 8		39 32
	14.	0 3 52		41 41
	18.	23 43 0		43 14

The comet is visible both in the evening and the morning, but the morning is rather more favourable. It attained the fourth magnitude at the end of March, and was visible in twilight. The orbit bears some resemblance to that of De Vico's comet, 1846 iv., which has been sought for ten years; but the differences are greater than perturbations are likely to have caused. It should, however, be observed as long as possible, to test for any deviation from parabolic motion.

Distribution of Matter in Interstellar Space.—Dr. J. S. Plaskett and Mr. J. A. Pearce contribute an important paper on this subject to *Mon. Not. Roy. Ast. Soc.* for January. Some months ago Dr. O. Struve suggested that the intensity of the *H* and *K* lines of calcium in the spectra of early-type stars might be used as a measure of the distance of these stars, since the lines had been shown to arise from

matter external to the stars. The chief uncertainty was as to whether it was safe to assume that the density of the interstellar gas was uniform throughout space. The present paper gives a definite affirmative answer to this question. The spectrograms of 261 stars taken at the Victoria Observatory were examined, and the radial velocities both of the stars themselves and of the interstellar gas were analysed by the formulæ derived by Dr. Oort for radial motion arising from galactic rotation. It is found that the interstellar lines indicate a rotational term of 7.9 km./sec., indicating a mean distance of 465 parsecs, and give galactic longitude 332° (referred to the intersection of the galaxy with the equator of 1900), a value agreeing closely with that found in other ways. The distances of the stars, found in a similar manner, are in the mean twice those of the gas, thus giving strong confirmation of the uniformity with which the interstellar matter is distributed, and showing that it shares in the galactic rotation.

The Trans-Neptunian Planet.—The telegram announcing Dr. G. Struve's observation of the new planet, to which reference was made in *NATURE* of Mar. 29, p. 507, was received at the Royal Observatory, Greenwich, by telephone; through an error, the word 'planet' was taken down as 'comet'. The writer of the note in *NATURE* learnt of the mistake and immediately communicated with the Editor, requesting the deletion of the words "who called the body a comet". Instructions were telegraphed to the printers, but the message was misunderstood, and the words appeared. Apologies are due to Dr. Struve for the misrepresentation.