

were other and large benefactions, which, however, are outside the scope of this notice. The first prize was given in 1825. A commission had formulated regulations, and amongst the members were Cuvier, Fourier, and Berthollet. The terms of the award are of wide application, whilst the prizes are open

to persons of all nationalities. In the first section are three yearly gifts of 2500 francs, and three *mentions honorables* of 1500 francs. In the second section (in effect, chemistry) there is a prize of 2500 francs, with a second of 1500 francs for meritorious entry. T. E. JAMES.

News and Views.

For several years Dr. Wilhelm Freudenberg has collected fossils from the sand-pits in the Pleistocene river deposits near Heidelberg, from which the lower jaw of *Homo heidelbergensis* was obtained. We now learn, from a communication which he has made to Sir Arthur Smith Woodward, that among the mammalian remains which he has discovered there are no less than eighteen fragments of fossil man and apes. The tibia ascribed to Heidelberg man is short and very stout, with an inward twist, and in many ways like that of a big gorilla. A fragment of a femur is also very gorilla-like. The second metatarsal is curved as in a chimpanzee, and the first metacarpal is twice as large as that of a modern man. These remains are associated with *Elephas antiquus*. Other fragments found not with this elephant, but with *E. trogontherii*, belong to a Primate about as large as an orang. There is a sagittal crest on the parietal bone, and a piece of lower jaw resembles that of *Sivapithecus* rather than *Dryopithecus*. The pelvis shows several features of that of a chimpanzee, and the femur and tibia are slender. Other fragments of the same age belong to two smaller Primates related to the gibbons. They seem to have had comparatively small canine teeth. In association with them, one long and remarkably human femur, an apparently human pubis, and a human navicular bone, are considered by Dr. Freudenberg to belong to a forerunner of Neanderthal man. In the upper beds, with *Rhinoceros etruscus*, were also found implements of quartzite, charcoal, and burnt fragments of bone.

PALÆONTOLOGISTS and anthropologists will await with great interest Dr. Freudenberg's detailed description of his finds. Remains of monkeys of Pleistocene age are known from Norfolk, the Thames valley, France, and Germany, but no trace of the man-like apes has hitherto been discovered in Europe of later date than the Lower Pliocene. If Dr. Freudenberg's results are confirmed, the search for the earliest ancestors of man in Europe is not so hopeless as it is commonly supposed to be.

THE retirement is announced in the *Lancet* of Dr. A. B. Macallum, professor of biochemistry in McGill University, Montreal, and formerly administrative chairman of the Honorary Advisory Council for Scientific and Industrial Research, Canada. Prof. Macallum, who was successively lecturer and professor in physiology and later professor of biochemistry in the University of Toronto, introduced a full experimental course in physiology at Toronto so long ago as 1886; at that time, no similar course for students was anywhere in existence. His research work at first

was devoted particularly to the origin of hæmoglobin from the chromatin of hæmatoblasts. This led to a demonstration that chromatin is an iron-holding compound and that hæmoglobin is, as it were, a degeneration product of chromatin. Later, Prof. Macallum investigated the absorption of iron compounds in the intestines, the composition of the blood plasma of invertebrates and vertebrates, and the microchemical detection of potassium, chlorine, phosphorus, calcium, iron, and copper. His latest work has dealt with the effects of surface tension on the distribution of salts in living matter. Prof. Macallum was elected a fellow of the Royal Society in 1906; in 1920 he left Toronto to take the chair of biochemistry at McGill University. He will be succeeded by Prof. J. B. Collip, whose name will be remembered in connexion with the discovery of insulin.

THE honorary secretary of the Institution of Professional Civil Servants writes to inform us that the leading article on "The Technical Expert in the Civil Service," published in our issue of Dec. 10, has been welcomed by the professional group of civil servants. He directs attention also to the fact that, since its foundation in January 1919, the Institution has worked energetically for "a thorough reform in matters affecting the status of the technical expert," and has met with some success over a limited area in bringing conditions of employment of similar professional staffs in different departments to a uniform basis. Further, by recourse to the arbitration machinery set up for the Civil Service in 1925, it has succeeded over a rather wide area, but in many cases, in obtaining piecemeal improvements in salary scales. He also points out that the reform of the non-technical branches of the Civil Service was only carried through after a series of Royal Commissions, and states that, although the Council of the Institution has loyally worked the system of Whitley Councils recently created, it is convinced that the reforms which are urgently required in the technical branches will not be achieved without an authoritative public inquiry. We entirely concur in this view, and, indeed, in the leading article on "The Expert in the Civil Service" published in *NATURE* of Aug. 27 last, urged that a Royal Commission should be appointed to examine into and report on the present position of professional workers in the State service. We are of opinion that the need for modifications of the present Civil Service system is of pressing importance, and that in the interest of both efficiency and economy no time should be lost in providing for a comprehensive inquiry of the nature indicated.

SPEAKING at Sexey's School, Bruton, Somerset, on Speech Day, Prof. John Read, professor of chemistry at the University of St. Andrews, directed the attention of the boys of his old school to some of the qualities which scientific training educated: honesty, perseverance, precision, the co-ordination of hand, eye, and brain, the development of logical methods, and the recognition of the importance of small things. Whilst confessing his enthusiasm for literary pursuits, he urged them not to be misled by references to the 'dry bones' of science, or to imagine that the man of science is less human or humane than his brethren; there is need to emphasise this in an age when no man can claim to be truly educated unless he possesses a knowledge of the general principles of physical science and comprehends how a plant grows and how an animal lives. Discussing the ever-expanding part which science is playing in the industrial and economic development of the British Empire, Prof. Read referred to the activities of Imperial Chemical Industries, Ltd., and particularly to its progress in rendering Great Britain less dependent on imported liquid fuels and fixed nitrogen, and to its assistance in the development of agriculture. Prof. Read also addressed the school literary and debating society on the contribution of organic chemistry to the progress of civilisation, the title of his lecture being "An Organic Chemist looks at the World"; he referred on this occasion to the non-permanence of coal and oil as sources of energy and to their possible replacement by alcohol, which can be produced in unlimited quantity so long as the sun shines and plants grow. Mention was also made of the low-temperature distillation of coal, and of the value of brown coal as a source of energy.

At a meeting held at the Imperial College of Science in February last, it was agreed to form a society for the purpose of studying bibliographical methods and securing unity of bibliographical procedure and classification. The first meeting of the Society was held at the Science Library, South Kensington, on Dec. 13, thirteen members being present. The objects of the Society were defined as follows: "To promote the study of bibliographical methods and of the classification of information, to secure international unity of bibliographical procedure and classification, and to foster the formation of comprehensive and specialist bibliographies of recorded information." The name adopted for the Society was "The British Society for International Bibliography." As the Society has been adopted as the British Section of the Institut International de Bibliographie, it is proposed to use the sub-title "British Section of the I.I.B." if necessary. Prof. Alan Pollard, of the Imperial College, was appointed president, with Dr. S. C. Bradford, of the Science Library, as vice-president, and Dr. Walter Clark, also of the Science Library, as honorary secretary. The other members of the council are Miss Snelus, Messrs. P. K. Turner, A. Esdaile, and T. Smith. At the VI^e Conférence Bibliographique Internationale, held in Brussels in July last, it was agreed to confer the presidency of the Institut International de Biblio-

graphie upon Great Britain for the year 1927-28, and the British Society for International Bibliography was invited to nominate the president. It has proposed the name of Prof. Pollard. The Society is prepared to receive all criticisms and suggestions for the development of the Classification Décimale of the Institut International de Bibliographie, and to transmit recommendations to the Institute. All particulars concerning the Society, the Institut International de Bibliographie, and the Classification Décimale may be obtained from Dr. Clark, hon. secretary of the Society.

A MACHINE which is capable of turning out one million pint bottles a week, and requires only one man to attend its operation, is surely a remarkable achievement. Such is the machine recently constructed by the Metropolitan-Vickers Electrical Co., Ltd. at its works in Manchester (Fig. 1). The glass is melted in pots or in a tank furnace and the machine is run on rails to the mouth of the furnace. A small 15-h.p. electric motor is started and bottles are automatically turned out in dual moulds at the above rate. The machine consists of fifteen identical

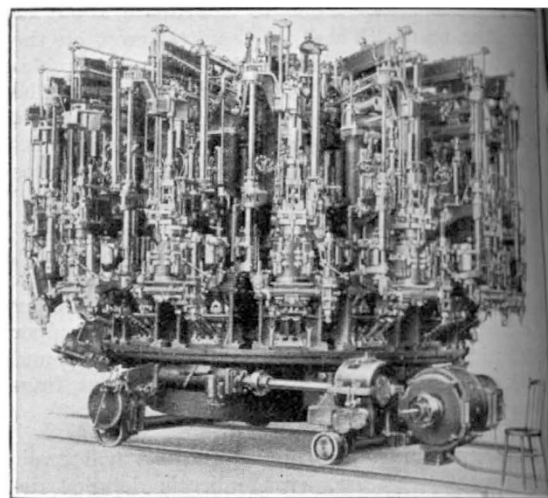


FIG. 1.

units which rotate around a central pillar. In the event of a breakdown of any one unit, it can be replaced in less than thirty minutes. As each unit passes the mouth of the furnace, huge arms are lowered into the molten glass, a quantity of which is picked up in a mould by means of suction. A small quantity of compressed air is then admitted to form a cavity in the neck of the bottle. Further rotation of the machine, which has a speed of six revolutions per minute, enables the glass blank thus formed to be transferred to a second mould, the interior of which is of the shape of the finished bottle. A further supply of compressed air blows the bottle to the shape of the mould. The machine moves on to the next stage, when the moulds are lowered and the bottles are automatically discharged on to a conveyor. In addition to the manufacture of bottles, this machine is equally useful for the manufacture of electric lamps

or other articles of a similar nature and is entirely a British production. It is a great improvement over previous machines, most of which are of foreign manufacture. For a complete illustrated description of the machine, reference should be made to the *Engineer* of July 1 and 8, 1927.

MR. L. J. KETTLE, the electrical engineer to the Dublin Corporation, gave an interesting address to the Irish local Centre of the Institution of Electrical Engineers on Oct. 13. He pointed out that the Electricity (Supply) Act, 1927, of the Irish Free State gives practically unlimited power to the Irish Electricity Supply Board. One of its duties is to investigate the natural power resources of the Free State. Towards the end of the War, some work in this direction was done by the British Government. Mr. Kettle regards peat as the greatest potential power asset. Six million tons of air-dried peat are at present dug out and used per annum in Ireland. The fuel equivalent of this peat is equal to that of the whole of the coal imported per annum into the Free State. With a little State assistance and encouragement the output could be materially increased. Even if the increase were only ten per cent., it would be equivalent to all the power to be obtained initially from the River Shannon. Mr. Kettle is strongly of opinion that a comprehensive water-power survey of Ireland should be made as soon as possible. It is quite conceivable that the by-products of a peat power station would more than cover all the costs of production, and thus the electric power generated would cost nothing. He urged that the Electricity Board should completely equip the model farm near Dublin with all manner of electric labour-saving devices. It would be a valuable demonstration and training centre for the propagandists who are anxious to see the whole country electrified. He pointed out that the actual production costs are now of secondary importance, owing to the large number of middlemen interposed between the manufacturer and the consumer. His cure for this state of affairs is to return to the old village industry system. He considers that a return to this system may be feasible in Ireland.

MR. C. C. PATERSON, Director of the Research Laboratories of the General Electric Co., Ltd., gave an interesting address to the London Section of the Institution of Metals on Nov. 10. He pointed out that the cost of conducting materials is one of the heaviest items of expenditure in the electrical industry. For long-distance power transmission it is nearly half the total cost. In addition, it is now becoming common practice to use tubular conductors in order to prevent the formation of the corona. This adds to the expense. It is not beyond the bounds of possibility that metallurgical research will yield a high conductivity alloy which will replace copper. The possibilities of the lighter metals like beryllium and aluminium when alloyed have not yet been fully investigated. So far as the magnetic qualities of metals are concerned, it looks as if the manufacturing departments lag behind laboratory research, at least

so far as heat treatment and new methods are concerned. Practical men now recognise the great importance of the presence of gases in metals like nickel and tungsten which are used in the manufacture of electric lamps. Commercially pure metals from the factory are quite unsuitable for lamp manufacture. A two-hour treatment in 'a vacuum' is necessary until the pressure falls to 0.004 mm. of mercury. It would be a great boon to the electrical industry if the metallurgist could produce an alloy in the form of wire which would keep its homogeneous nature, and retain its qualities however long it was subjected to the action of heat. In other words, it must remain stable and not develop local hot spots when heated by an electric current. It is of great importance to devise tests on the effects of heating on various alloys so as to enable the purchaser to get the most economical material. At the Research Laboratories of the General Electric Co., Ltd., at Wembley, experiments are being carried out on various test methods.

IT is announced that Sir Ernest Rutherford has been elected a foreign associate of the Paris Academy of Sciences. The foreign associates of the Academy are limited in number to twelve, and include Sir Ray Lankester, elected in 1910, and Sir J. J. Thomson, elected in 1919.

THE Catherine Wolfe Bruce gold medal of the Astronomical Society of the Pacific, given annually for "distinguished services to astronomy" upon the nominations made by six of the world's great observatories, has been awarded for 1928 to Dr. W. S. Adams, Director of the Mount Wilson Observatory. The formal presentation will be made in the early part of next year. Previous recipients have included Prof. E. W. Brown, M. Henri A. Deslandres, Sir Frank W. Dyson, M. E. B. Baillaud, Prof. A. S. Eddington, and Prof. H. H. Turner.

AT a special general meeting of the Institute of Physics, held on Dec. 16, and on the recommendation of the Board, the Royal Meteorological Society was admitted a participating society of the Institute. The Royal Meteorological Society is the sixth society to co-operate in the scheme of participation, and an important step is thus taken towards the realisation of one of the principal objects of the Institute, as expressed at its foundation, namely, to co-ordinate the work of all existing societies concerned with the science of physics and its applications.

COL. CHARLES LINDBERGH has been awarded the Langley Medal for Aerodromics of the Smithsonian Institution of Washington, "in recognition of his daring non-stop flight from New York to Paris on May 20 and 21, 1927." Established in 1909 in honour of Samuel Pierpont Langley, third secretary of the Smithsonian Institution, who was the first man in the world to make a large model heavier-than-air machine fly successfully under its own power, the medal has been awarded hitherto to four men: Wilbur and Orville Wright, Glenn H. Curtiss, and

Gustave Eiffel. Col. Lindbergh stated that it has been decided to offer his machine, *Spirit of St. Louis*, to the Smithsonian Institution to be added to the collection of aeroplanes of historic interest that it possesses.

THE annual report of the Rockefeller Foundation for 1926 has recently been issued. During that year the Foundation expended 9,741,474 dollars on medical research and the prevention of disease in all parts of the world. The activities of the Foundation are reviewed by the president, Dr. George E. Vincent, in this report, which is illustrated with relevant maps, charts, and photographs.

IN connection with the work of the Colorimetry Section of the U.S. Bureau of Standards and the report of the Colorimetry Committee of the Optical Society of America, Mr. Irwin G. Priest is desirous of compiling a bibliography of papers and books having a direct bearing on colorimetry, spectrophotometry, and colour specifications. It is expected that this bibliography will ultimately be published in the *Journal of the Optical Society*. He will be glad if authors who have contributed to this subject will send him check lists of their papers, giving titles and complete journal references. Reprints will also be of service and will be gratefully received. Mr. Priest's address is Bureau of Standards, Washington, D.C.

Our Astronomical Column.

THE SPECTRUM OF THE COMET PONS-WINNECKE.—Two papers on this subject have recently appeared. Dr. G. Shaju (*Astron. Not. Roy. Ast. Soc.*, Supp.) gives diagrams showing the changes in the relative strength of different bands. At the end of May the band at $\lambda 468$ was the brightest, those at $\lambda 405$ and $\lambda 469$ being in order of lessening brightness. The first band remained stationary for a week and then got decidedly fainter; while the other two brightened, that at $\lambda 469$ being the brightest at the end of June. The continuous spectrum was not visible at the end of May, but gradually grew in strength after this. There was more increase of light visually than photographically, implying a change of colour from blue to yellow.

Lowell Obs. Bull. No. 86 contains a discussion by V. M. Slipher of spectrograms obtained on June 20 and 23. The continuous spectrum was then strong and showed the solar absorption lines, indicating that the nucleus was shining by reflected sunlight. The Swan spectrum was weak; there were strong cyanogen bands at $\lambda 3883$ and $\lambda 4216$, but the strongest bands were an unidentified series between $\lambda 3993$ and $\lambda 4075$. The spray of light towards the sun was the most emissive region.

This paper, like that of M. Baldet recently noticed in this column, directs attention to the remarkably small size of the stellar nucleus. The estimate at the Lowell Observatory gave a linear diameter of two or three miles, that of M. Baldet being less than a mile.

MEASURES OF DOUBLE STARS.—Prof. G. van Biesbroeck, in addition to his cometary work, undertakes a large amount of double-star observation with the 40-inch refractor at Yerkes Observatory. Vol. 5, part 1, of its *Publications* contains his measures of some 3000 stars, the majority of which are stars the duplicity of which was discovered by Prof. Hussey

MESSRS. Gurney and Jackson will publish shortly "A Popular Handbook of Indian Birds," by H. Whistler, illustrated by many coloured and black-and-white plates and text figures by H. Grönvold.

THE latest catalogue (No. 503) of Messrs. Francis Edwards Ltd., 83 High Street, Marylebone, W.1, although mainly of a general character, contains sections devoted to geography and travel, botany and gardening, entomology, folklore, and natural history. It should therefore be of interest to readers of NATURE.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—An assistant lecturer in agricultural chemistry at the East Anglian Institute of Agriculture, Chelmsford—The Clerk of the Essex County Council, Shire Hall, Chelmsford (Jan. 9). A science master for physics and chemistry at the Longton High School—The Director of Education, Town Hall, Hanley, Stoke-on-Trent (Jan. 21). A reader in chemistry at Bedford College for Women—The Academic Registrar, University of London, South Kensington, S.W.7 (Feb. 17). A rubber technologist to take charge of the rubber section of a government laboratory—The Commandant, Experimental Station, Porton, Wilts. A lecturer in biology at the Saffron Walden Training College for Women Teachers—The Principal, Training College for Women Teachers, Saffron Walden.

about the beginning of the century. The old and new measures are compared, and wherever sensible change appears an estimate is made of the hypothetical parallax, both on the assumption of a uniform mass double that of the sun, and also from the Eddington curve connecting mass with absolute magnitude. He also discusses the errors of published orbits and deduces many new ones.

One of the stars is the long-period variable X Ophiuchi, which has an unchanging 8.9 mag. companion at a distance of $\frac{1}{4}$ ". Its hypothetical parallax is 0".007, in good agreement with Adams's spectroscopic value 0".005 from the unchanging component, the type of which is K0. It is noted that the trigonometrical measures published by van Maanen and Gringrich are probably affected by the apparent shift of the combined star-image due to the change in light. There is a new orbit given for λ Ophiuchi, rejecting the W. Herschel observations, which appear to be affected by some error. The period comes out as 150 years. The same period is suggested for 37 Pegasi, the orbit of which is turned edgewise to us. There are numerous observations of 70 Ophiuchi; Prof. van Biesbroeck thinks that the evidence for an unseen companion is not convincing.

THE SCHWASSMANN-WACHMANN NOVA.—The Harvard storehouse of plates has once again proved of great service in tracing the behaviour of this Nova before its discovery. Miss Cannon publishes the following details in *Harvard Announcement Card*, No. 37. It was invisible (less than mag. 15) in plates of previous years; it first appears on Sept. 11 last, mag. 11.7; it rose to a maximum of 6.0 on Sept. 30; it had fallen to 7.4 on Oct. 16, to 8.4 on Oct. 29, to 9.4 on Nov. 19. Its spectrum was photographed with the 24-inch reflector on Nov. 20; the hydrogen lines were bright, the line at 4640 being five times as bright as H β .