News and Views

The King of the Belgians and Progressive Science

A GREAT figure of the War has passed away with the death on February 17 of Albert I, King of the Belgians, at the early age of fifty-eight years. For nearly twenty-five years he guided his people faithfully, carrying them with him through the War years, urging them on and directing their progress during the not less uncertain years following the Peace of Versailles. His work in the political field has been set forth in many places. We are concerned here with his interest in science and scientific research, of which he was a convincing advocate. He played an active part in the development of scientific institutions in Belgium. The protection of flora and fauna, particularly of tropical regions, early attracted his attention, and in 1909, after a visit to the Congo, he put forward a plea for protective measures which culminated with the creation, in 1929, of the Parc National Albert, a nature reserve of nearly 1,400 square miles. So recently as 1932, King Albert visited the Kivu Park with Prof. V. Van Straelen in order to see for himself the effectiveness of the protective measures.

KING ALBERT'S name will also be associated with the "Fonds national de la recherche scientifique" in Belgium. Speaking at the one hundred and tenth anniversary of the well-known Cockerill iron and steel works at Seraing in the autumn of 1927, the King declared emphatically that pure science is indispensable to industry, and that the nation which neglects science and the savant is marked for decadence. The appeal had an immediate effect. A great gathering was held at the Palais des Académies, Brussels, which was attended by the King, Ministers of State, and representatives of industry, finance, politics, science and the universities. Again King Albert made a powerful plea for science, poor herself but the creator of riches, for security and independence for scientific workers in order that they might devote themselves entirely to their studies; then he announced the creation of the "Fonds national", to which he invited industrial and financial interests to contribute. King Albert was well known in Great Britain, and on a recent visit, his enthusiasm for scientific research led him to spend an afternoon examining the treasures of the Royal Institution, after which he enjoyed a 'laboratory' tea with Sir William Bragg and members of the staff, and watched some experiments with liquid air in illustration of the late Sir James Dewar's work.

History Made in Germany

IN another column of this issue of NATURE (see p. 298) is a translation of an official circular, issued to all education authorities in Germany by the Minister of the Interior, on the teaching of prehistory and history, which contains 'directive ideas' to be followed in historical instruction and to serve as a standard in the adoption of textbooks. The directions in the circular deal first with certain 'points of view' which "hitherto have been considered inadequately, if at all", and secondly, give an outline of the manner in which the theory of Nordic racial and cultural supremacy is to be applied in dealing with the course of events from the earliest times to the present day. The study of 'race' and 'culture' are to be made to subserve the German nationalist idea, while the heroic legends will quicken the emotional appeal of leadership in present-day 'national assertion'. From the point of view of prehistoric and historical science, the contents of this document are astonishing. It is scarcely necessary to point out that the racial and cultural unities which are to be made the basis of the modern German nationalist State are non-existent in point of fact, but rest on misstatement or misinterpretation. If, however, these 'directive ideas' appear too biased, too frankly propagandist, to call for critical examination from the point of view of ethnology, archæological science, or history, they must none the less be regarded as symptoms of a grave condition of thought. The circular suggests that Germany is prepared to abandon all standards of intellectual honesty in pursuit of a political ideal, which, it may be noted, it is hoped to impose on all 'Nordic' peoples.

Prof. Harold C. Urey

PROF. HAROLD C. UREY, of Columbia University, has been awarded the Willard Gibbs medal of the Chicago Section of the American Chemical Society for his discovery of 'heavy water'. Prof. Urey, at the age of forty-one years, is the youngest man ever to receive this honour. He was born in Walkerton, Ind., on April 29, 1893. In 1917 he was graduated from the University of Montana with the degree of bachelor of science in zoology. In 1923 he received the Ph.D. degree in chemistry from the University of California. He received an American-Scandinavian fellowship for research in 1923–24, studying under Prof. N. Bohr at Copenhagen. He was assistant in chemistry at Johns Hopkins University in 1924–29, and has been associate professor of chemistry at Columbia since 1929. The Willard Gibbs medal, founded by William A. Converse in 1911, was named after Josiah Willard Gibbs, professor of mathematical physics at Yale University from 1871 until 1903, who, although not primarily a chemist, did much to advance the science of chemistry. It is awarded annually by the Chicago Section of the American Chemical Society to a scientific worker "whose work in either pure or applied science has received worldwide recognition". The award is determined by a national jury of men of science. The first Gibbs medallist was Svante Arrhenius of Sweden.

Constitution of the Stars

THE fourth Rickman Godlee lecture was delivered at University College, London, by Sir Arthur Eddington on February 16. Lord Dawson of Penn presided, and paid a tribute to Rickman Godlee's great pioneer work in the surgery of the brain and

to his wide range of interests in scientific work and in affairs. Sir Arthur Eddington took as his subject the "Constitution of the Stars". He reminded the audience that the problem of the constitution of the stars was first set forth in a paper, with a somewhat strange and comprehensive title, published by Lane in 1869. Since then, many attempts have been made to compute the temperatures existing deep inside the huge celestial furnaces. Thus, in the case of the sun, whilst the measured temperature of the photosphere is six thousand degrees, the computed temperature at the centre is twenty million degrees. This central region is now considered to be constituted of swarms of protons and stripped atoms moving at speeds of hundreds of miles per second, of swarms of electrons moving at ten thousand miles per second, and an enormous quantity of X-radiation which is mainly responsible for the permanent shape of the sun. Because of its nature, the energy of this radiation can only leak away slowly, by a stepping-down process.

OWING to excessive ionisation, the average mass per particle in the middle of the sun is only two units, unless a considerable quantity of hydrogen is present. We have to know the average mass per particle in order to calculate the temperature at the centre. Sir Arthur said that he first made a reservation concerning the effect of hydrogen in 1927. It is now possible to measure the mass and the absolute brightness of a star and to say with some degree of certainty how much hydrogen it contains. In 1934, a further reservation is necessary because of the discovery of the neutron, for if neutrons were present to the extent of five per cent in the constitution, the material heat of the sun would be rapidly lost by conduction. However, it is felt that the properties of neutrons are not yet sufficiently established to make predictions, and, in any event, they can probably only exist inside atomic nuclei when near the centre of the sun. Sir Arthur also discussed the significance of recent experiments on artificial disintegration, which suggest a means by which the energy of the sun is replenished, namely, by the absorption of protons in atomic nuclei. This means that the temperature of the centre cannot rise much above ten million degrees so long as appreciable amounts of hydrogen are present.

REFERRING to the "gaseous mass" postulated in Lane's paper, Sir Arthur Eddington pointed our that the sun obeys laws deduced for perfect gases, because of the huge compressibility of the stripped atoms inside the furnace. Densities some thousands of times greater than that of the earth are thus possible, and, indeed, are actually found to exist, for example, in the case of the dark companion of Sirius. Moreover, an application of the Pauli exclusion principle shows that such extremely dense matter must be cold, as is the companion of Sirius. Thus, although we seem farther away than ever from a solution of the problem of the evolution of the universe, Sir Arthur suggested that, since we are now able to formulate problems which were not even suspected ten years ago, we can more adequately measure our progress by the problems we are able to present for solution rather than by those we are able to solve.

Oil from Coal in Great Britain

OIL from coal was the subject of a debate in the House of Commons on February 8, when the British Hydrocarbon Oils Production Bill was read for the second time. The Bill proposes to give a preference of 4*d*.–9*d*. a gallon on oil derived from British coal, peat and shale. The exact amount of the preference will depend on the customs duty payable on imported material, or on the difference between it and any excise duty. The duration of the preference will depend on its amount: at the minimum rate of 4*d*. a gallon it will operate for nine years, or, at 9*d*. a gallon, for four years. The Secretary for Mines (Mr. E. Brown) reported that the Government announcement of policy has already been followed by industrial developments. Imperial Chemical Industries have started the erection of a plant at Billingham for the annual production of 100,000 tons (30,000,000 gallons) of motor spirit by the hydrogenation of coal. A substantial increase is also shown in the amount of benzol obtained last year from gas works and coke ovens, as well as in the quantity of motor spirit from shale oil and low temperature carbonisation processes. More than 10,000 men have been put into employment already in connexion with the Billingham plant, and, in operation, it will absorb 1,280 men, and, in addition, some 1,200 miners for the production of 350,000 tons of coal a year. The actual cost to the Treasury of the production of 100,000 tons of oil under the new preference will, it is estimated, be about £1,000,000.

Economic Issues in Hydrogenation

THE debate on the Bill referred to above brought forward a number of criticisms of the scheme. The opinion was voiced that the enterprise should be State-owned and directed, and also that the developments should be planned so as to assist the more depressed mining areas. It was also pointed out that hydrogenation has been in progress for a number of years in Germany, where very cheap lignite is available. In spite of a similar preference granted in that country, the synthetic petrol manufactured there in 1933 was less than the amount which is to be produced in Great Britain under the new scheme. Both the technical and the economic success of the process were, in fact, questioned. The motor-car industry is also faced with developments in heavy-oil engines of the Diesel type, which may in time displace light-oil engines and lessen the demand for petrol. A strong case was put forward, however, for the founding of this new industry as a means of utilising British coal resources more efficiently, and also for the covering of the requirements of national defence.

Research on Foul Brood Diseases of Bees

BY co-operation between the bee keepers of England and the Agricultural Research Council,