and his next task, that of determining the relative abundance of isotopes, interested him partly because of its connexion with the atomic weights of chemistry. His method was a photographic one, in which exposures were adjusted to make the blackening caused by two isotopes the same or nearly so. His last apparatus, the third mass spectrograph, aimed at an accuracy of 1 in 100,000, and though it did not have quite the resolving power he had hoped for, it achieved valuable results in fixing the mass defects of a number of important isotopes.

Though in the later years, work of equal quality was being done in the field of mass spectrography by Dempster, Bainbridge, Neier and others in the United States, there are few instances in modern science in which the first discoverer of a major field of research has had it so much his own way for such a long time. This is evidence of the technical difficulties involved, not only, or even perhaps mostly, on the measurement side, but also in the production of beams of ions of all sorts of elements with measurable intensity. For this, Aston's training in chemistry and in the peculiarities of the gaseous discharge were of the greatest value. But to this training he added that combination of patience and intuition which marks the great experimenter. There is scarcely a research in nuclear physics which does not use his work, directly or indirectly, and usually many times over. The use of isotopes as tracer elements both in chemistry and in biology is only in its early stage, but even now the results are highly important and it is difficult to put a limit of the possibilities of this field. It is true that most of the isotopes used for this purpose are either radioactive or were discovered by the analysis of band spectra, but the method would scarcely be possible without the knowledge of the isotopic structure of ordinary elements which we owe to Aston. Nor is it likely that the rare isotopes of the light elements, such as heavy hydrogen, which his method is not well fitted to discover, would have been found without his work.

Outside his work Aston's interests were most strongly held by sport, by travel and by music, though any sort of mechanical or scientific device attracted him. In sport he was an ardent skier and made almost yearly visits both to Switzerland and to Norway. He preferred expeditions, often long ones, to trick turns, though he had jumped a little. He liked to do his own climbing and to be independent of funiculars. It was perhaps the greatest grief of his life that a strained heart produced by skiing in the winter of 1934–35 put a stop to winter sports. But skiing was only one of many sports. As a young man he once cycled two hundred miles in twenty-two hours; he was a good lawn tennis player of tournament class, a good swimmer and used to say that the surf-riding he learnt at Honolulu was in many ways the finest sport in the world. He was a golfer well above the average, and the Sunday four with Rutherford, Fowler and Taylor was an institution. During the First World War he took up rock climbing. On several occasions he led courses classed as of 'exceptional severity'. Among his miscellaneous activities were photography, bridge and the special Trinity game of vingt, and the collection of Chinese porcelain. He played the piano and violin, but gave most attention to the 'cello.

His love of travel was intense, especially sea travel, and he contrived to combine it with science by going on eclipse expeditions and on British Association visits, though these were by no means his only journeys.

Aston was a man in whom a great zest for life was combined with a simplicity of character almost approaching naïvety. He was interested in people, especially his numerous friends, and probably more interested in things and places. This gift of interest in the outside world made him an ideal holiday companion. The pleasure he clearly took communicated itself to the rest of the party. He was precise in his habits, though it would be unfair to call him old-maidish, for he enjoyed changing from one routine of life to a totally different one. Though a good occasional lecturer, he had no gift for teaching and a few early attempts were not persisted in. He enjoyed scientific meetings, but was essentially an individualist and never attempted to form a school. I think he realized that much of his skill was incommunicable, and that in any event he needed quiet to work his best. His attitude to physics was essentially that of the experimenter and visualizer. He preferred the model to the equation; the concrete to the abstract. The philosophical aspect did not appeal to him. He was a Conservative in politics as in life, and though he would admit that a change might be good, he preferred it to happen as gradually as possible. I last saw him when he received the Duddell Medal of the Physical Society. In a characteristic speech he remarked with some feeling that his researches would never have been passed by any competent planning committee.

In addition to many papers in the *Proceedings of the Royal Society* and *Philosophical Magazine*, Aston's principal published work was his book on "Isotopes", of which the first edition came out in 1922, the second in 1924. In 1933 the name was changed to "Mass Spectra and Isotopes", though much of the material was the same; in 1941 it appeared in final form. He was twice on the Council of the Royal Society, was awarded a Royal Medal and gave the Bakerian Lecture in 1927. He was an honorary member of the Russian Academy of Sciences, and of the Accademia dei Lincei. He received an Hon. LL.D. from the University of Birmingham, and an Hon. D.Sc. from Dublin. He took a prominent part in the work of the International Atomic Weights Committee.

G. P. Thomson.

Prof. F. Záviška

František Záviška, whose death due to neglect and dysentery occurred on April 17, 1945, a few days after his liberation from the concentration camp at Osterode, was an eminent Czechoslovak theoretical physicist.

Záviška was born on November 18, 1879, in Velké Meziříčí, Moravia, and studied at the Charles University, Prague. After a brilliant career there, he was appointed assistant at the Technical High School in Brno. In 1903 he returned to Prague, where he obtained his doctorate.

Záviška's first important researches were on Fresnel's laws of birefringence and on the polarization of boundary lines of total reflexion. In 1906 he became a *docent* of theoretical physics and obtained a grant which enabled him to proceed to Cambridge, where he worked in Sir J. J. Thomson's laboratory on the influence of X-rays on condensation of water vapour. He returned to Prague, where he successfully worked on the theory of the Hall effect. In 1914 he became a temporary professor, and in 1919 a permanent professor of theoretical physics in the Charles University in Prague.

Záviška's subsequent work was chiefly concerned

with the theory of wave guides and the propagation of electromagnetic waves through tubes. He was popular alike with students and colleagues, and enjoyed the reputation of being a first-class teacher. He worked also on the theory of relativity and published many valuable text-books in Czech for his students. He was admired for the clearness of his lectures and unswerving character.

After the German occupation of Czechoslovakia, he was arrested in 1944, and after being in several concentration camps, he was finally transferred to Osterode. In April 1945 the Germans evacuated the camp, fearing capture by the Allies, and Záviška was in a group of about six hundred who were travelling on foot. The group, however, rapidly diminished owing to continuous shooting of stragglers by the S.S. men; but Záviška was able to escape into a nearby wood. Very ill, he managed to reach some Americans; he was taken into the hospital of Gifhorn, but died there two days later.

VLADIMIR VAND.

WE regret to announce the following deaths:

Dr. J. Brittain, director of research on explosive projectiles, Royal Arsenal, Woolwich, on February 13.

Prof. J. Stanley Gardiner, F.R.S., emeritus professor of zoology in the University of Cambridge, on February 28, aged seventy-four.

Mr. C. M. Lloyd, for more than twenty years head of the Department of Social Science, London School of Economics, on February 20, aged sixty-seven.

NEWS and VIEWS

Sir John Townsend, F.R.S.

SIR JOHN TOWNSEND's retirement from the Wykeham chair of physics in the University of Oxford after more than forty years of service is an occasion for remarking on his influence on electrical investigations. His best-known researches are, of course, those on the ionization produced by electrons drifting through gases in an electric field, but these represent only one group of many investigations which he and his students have made on the kinetics of charged particles. The experiments and analysis which established the dependence on speed of the mean free paths of slow electrons, which were summarized in a centenary address to the Franklin Institute in 1924, may perhaps be singled out as being particularly brilliant and fundamental. To Sir John also belongs the credit for having shown, at an early stage in the development of the theory of ionization, that the production of electric sparks can be accounted for in terms of other properties of the conducting gas, and for having insisted that the breakdown voltage may be lowered by volume electrification. Many of the most interesting extensions of his work have been made in the United States, and include K. T. Compton's theory of the cathode dark space, I. Langmuir's theory of the effect of a magnetic field on a discharge plasma, and Loeb's critique of the whole range of phenomena related to sparking. A great deal of the work initiated or inspired by Sir John, such as Kirkby's, on the combustion of hydrogen in a discharge, and MacCallum's, on the helium molecule, still remains, however, to be worked out in detail. Physicists the world over will join in extending their best wishes to Sir John Townsend, and in expressing the hope that retirement will not involve a cessation of his active interest in the field which he has so largely made his own.

Prehistoric Archæology in the University of London: Prof. V. Gordon Childe

THE announcement that Prof. Gordon Childe has been appointed to a newly created chair of prehistoric European archæology at the University of London was not unexpected and will be welcomed. Prof. Childe is one of the leading British archæologists, and his influence will be still more largely felt when he gets into the saddle in London. Born in Australia, he took his degree at Oxford, and then, after a period in Australia, returned to Britain and acted as librarian to the Royal Anthropological Institute. Later he went to Edinburgh on becoming the first Abercromby professor of archæology there. While in London he had already made his name through his books, "The Dawn of European Civilisation" and "The Danube in Prehistory". From Edinburgh there followed "New Light on the Most Ancient East", a work which has enabled prehistorians readily to absorb the latest ideas on Near Eastern archæology. Scotland, too, has not been forgotten, as the publication of his own excavations at Skara Brae bears testimony. More recently, Prof. Childe has tended to concentrate on making his great knowledge available for the ordinary intelligent reader, and a number of small works, including one in the Pelican Series, have issued from his pen. Prof. Childe has not merely worked in his study. He has travelled extensively and undertaken excavations in the field. His influence on British archæology has been considerable and archæologists will be glad to have him once more in London.

Financing Research in Industry

WHEN Lord Barnby withdrew his bill to enable the Board of Trade to impose a statutory levy to finance research in industry last autumn, it was stated that the Government would take the earliest opportunity to see whether other proposals of the same kind could be tried. The matter was raised in the House of Commons in the committee stage on the Emergency Laws (Transitional Provisions) on January 23, when Sir Stafford Cripps moved an amendment to include a regulation, Defence (Services for Industry) Regulations, 1945, to enable the Board of Trade, should it be so desired, after consultation with any particular industry or branch of industry, to make arrangements for securing co-operative provision within that industry for certain facilities including research and experiments in matters relating to manufacture, consumption, collection and publication of statistics and other services conducing to increased efficiency in production and marketing of products. In explaining the purpose of the regulation, Sir Stafford Cripps stated that its inclusion would give the Government eighteen months or more to find out whether industries desired this method of levy for co-operative service, so that there would be time to draft a more permanent form of legislation which might be required. The proposed collective action is limited to research, market research, the collection of statistics and such matters,