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## SIR WILLIAM HENRY BRAGG, O.M., F.R.S.

BRITISH Science loses one of its most distinguished leaders in the death of Sir W. H. Bragg "full of years and of honours" on the 12th of March 1942. Born in Great Britain and educated in the Isle of Man and at the Cambridge University, he went to Australia as Professor at the University of Adelaide in 1885 and by his work there won his election to the Fellowship of the Royal Society in 1906. He returned to Great Britain in 1909 as Professor at the Leeds University, moving to the University College, London as Quain Professor in 1915. He resigned this chair in 1923 to take up the Directorship at the Royal Institution, a position which he continued to hold till his death at the age of nearly 80 years.

There are many interesting references to Sir William Bragg and extracts from the correspondence which passed between him and Lord Rutherford in Eve's biography of

the latter. These throw a vivid light on the scientific interests of both men and their influence on each other. The earliest reference dates to the year 1895 when Rutherford visited Bragg at Adelaide while on his way from New Zealand to Cambridge to join as a research student under J. J. Thomson! Thus, in a sentence, are linked the names of a trio who symbolised British physics in the first three decades of the twentieth century, just as the trio Kelvin, Stokes and Rayleigh symbolised it in the last three decades of the nineteenth century. One has only to recall the names of these men and their achievements to realise the tremendously rapid development of physics during this epoch and to appreciate their share in creating the objective or experimental basis on which the structure of physics rests at the present time.

The enormous interest excited by the discovery of radio-activity and by the early

investigations of the Curies and of Rutherford appears to have been responsible for galvanising the Adelaide Professor into a career of research activity. Indeed, till 1912, the scientific interests of Bragg appear to have centred largely on radioactivity and the ionising radiations produced by it. The earliest published paper by Bragg to which I have been able to find a reference appeared in the *Philosophical Magazine* for December 1904 and deals with this subject. Both success and recognition came to him very quickly. His principal discovery was the recognition that alpha particles from radium and its subsequent products had definite but different ranges in air. A little later, he also made the discovery that when gamma rays from radium struck a thin plate of metal, the radiation forwards were greater than the back radiations. This surprising observation led him to put forward the view that both gamma rays and X-rays were corpuscular in nature. In fact, Bragg became a strong advocate of the idea that X-rays were neutral doublets made up of both kinds of electricity. This opinion was contested by J. J. Thomson and by C. G. Barkla who put forward evidence supporting the view that X-rays were in the nature of electrical waves.

The epoch-making discovery of the diffraction of X-rays in crystals made in 1912 by Laue had the effect, not only of convincing Bragg of the error of his views regarding the nature of X-rays, but also of setting his feet on the path of research which earned for him the award of the Nobel Prize for Physics in 1915 jointly with his son W. L. Bragg. In the special number of *Current Science* entitled "Laue Diagrams" published in 1937, the story of Laue's great discovery and of its subsequent develop-

ments has been told in full by the leading authorities on the subject. It is therefore unnecessary here to recapitulate this well-known chapter of modern scientific history. The recognition of the importance of the work of the Braggs in this field was to no small extent aided by the publication of their joint work entitled "X-rays and Crystal Structure" which appeared in 1915 and went through several editions. A smaller book entitled "An Introduction to Crystal Analysis" by W. H. Bragg published in 1928 was also a useful treatise of a more popular kind.

The high position that Sir William Bragg occupied both in the esteem of scientific men and in the public eye was, I believe, to no small extent based on an appreciation of his remarkable gifts for popular exposition of scientific topics, derived no doubt from his long experience as a teacher. The Royal Institution offered him a splendid forum for the exercise of these gifts. The subsequent publication of these lectures in a series of charmingly produced and illustrated volumes made them accessible to a world-wide audience. "The World of Sound", "Concerning the Nature of Things", "Old Trades and New Knowledge" and "The Universe of Light", are a series of books which will continue to delight both young and old for many years.

My first personal contact with Sir William Bragg was in the summer of 1921 when I visited him at his laboratory at the University College in London. He showed me a model of the naphthalene crystal on which he was then at work and which he made the subject of his Presidential Address to the Physical Society later in the same year. I next saw him when I was in London in the summer of 1924 prior

to the visit of the British Association to Canada in that year. Bragg was then at the Royal Institution, still greatly interested in his organic crystals. He had Muller, Shearer and others with him hard at work preparing the long-chain aliphatic compounds and studying their structure. Bragg seemed to be much happier in the atmosphere of the Royal Institution than at the University College. Possibly he had had enough of University teaching and examinations after doing them for nearly forty years! Bragg presided at my lecture on the Scattering of Light to the British Association at Toronto. We were in the same train together travelling across Canada to Victoria and back. My contacts with Bragg on my subsequent visits to London in 1929 and 1930 were very brief.

Sir William's laboratory at the Royal Institution has been for many years a place of pilgrimage to X-ray workers from all the

world over. My own personal impression derived from such contacts as I had was that Sir William was a very unselfish and loveable personality, anxious to help others forward in their work. He had, of course, his limitations, one of which was, I think, an insufficient appreciation of the newer viewpoints in theoretical physics. But this was not surprising, seeing that he belonged quite as much to the nineteenth century as to the twentieth.

Like "J.J." and Rutherford, he lived to achieve the highest honours which a British man of science could hope to achieve in his own country, namely the Copley Medal, the Presidentship of the Royal Society and the Order of Merit. Curiously enough, his Knighthood was, I believe, given not for his work on X-rays, but for his studies on sound-ranging in the last war!

C. V. RAMAN.

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## THE NUTRITION SOCIETY

A NEW scientific society, the Nutrition Society, has been inaugurated in England by Professor F. G. Hopkins, with Cambridge as its Headquarters. Sir John Orr, who is one of the few to realize the importance of Nutrition in relation of national efficiency, is the first Chairman of the Society.

Work on Nutrition is, in fact, being carried on from different angles by medical practitioners, biochemists and physiologists, agriculturists and veterinarians, dietitians and sociologists, economists, statisticians, food technologists and administrators. The new Society will provide a common meeting-ground for the discussion of all aspects of Nutrition, formerly partitioned by barriers of specialisation.

In this country, problems of nutrition are being studied principally at Coonoor under the direction of Dr. W. R. Aykroyd. There are also a few centres of research, where work of a basic character is being

done. Several of the Provincial and State Governments have carried out dietary and economic surveys in their respective provinces. For now more than a decade, Rao Bahadur B. Viswanath, since his discovery that farm-yard manure raises crops with richer content of vitamins, has been advocating a closer collaboration between the science of agriculture and the science of nutrition. The Indian Research Fund Association and the Lady Tata Trust, among others, have encouraged research in the field of Nutrition in this country, by financing schemes of research in this subject.

So far as we are aware there does not appear to be any Central Organisation, which could correlate and organise these research activities and utilise the results in building up a healthy and virile nation. Does not the present afford an opportune moment to organise a society on lines similar to those adopted by the Nutrition Society of England?