

great interest at the Institute and in the industry in the question of instrumentation, and particularly the possibility of forecasting the spinning properties of cotton from physical measurements. Members could see a range of such instruments, including some of foreign manufacture and some made at the Institute. The problem is not an easy one, and indeed may not be completely soluble; but advance has been made, and broad differences in the spinning properties of cotton can now be detected rapidly with the aid of purely physical tests.

OBITUARIES

Prof. H. H. Dixon, F.R.S.

THE death of Prof. Henry H. Dixon on December 20 severs a link with a past generation of botanists and with a classic advance in botany. He was born on May 19, 1869. He was one of a family of seven brothers and two sisters; two of his brothers, and previously his father's brother, were university professors. He had a distinguished career as a student in Trinity College, Dublin, being a classical scholar of some note; he then added to his laurels by obtaining a natural science 'moderation', taking first-class honours, and continued his studies under Strasburger in Bonn, under whom he commenced research in the two major fields to which he contributed so much in later life.

Bonn was a centre of cytological work and, though it is often forgotten now, Dixon was a contributor of some note in the Strasburger school to the work then being done on meiosis. A later paper communicated to the Royal Irish Academy in 1895 was probably the first expression of the view that the appearance of bivalents is due to the approach together of chromosomes, rather than to the splitting of some pre-existent structure, thus giving the first indication of a 'reduction division'. His observation of "waves of nuclear division" passing across endosperm suggested a mitotic hormone, an observation which has yet to be investigated more fully.

Dixon's interest in cytology and his contributions to it were, however, completely overshadowed by the importance of his work on movements of water and on the status of water, or water relations, in the plant.

His life-long friendship with Prof. J. Joly had, as one of its fruits, the close collaboration between himself, a botanist, and a physicist, and from this emerged the classic theory, spoken of as the 'cohesion theory', to explain the rise of water (sap) in trees and other plants. This hypothesis was developed in the 1890's and extended by notable contributions on the cohesion of water and of sap and by a series of papers on the osmotic relations of plant tissues.

Dixon's originality of mind showed itself in many suggestions which were not followed up in the rather small School of Botany of Trinity College, Dublin. As early as 1892 he had shown how to grow seedlings in sterile culture, and foreshadowed, had the method been developed more fully, the tissue- and root-culture techniques so much used at the present time. He suggested the differential manometer for estimation of respiration-rates in 1902, though he did not develop it as a research instrument. Prof. Dixon also suggested (in a letter in *Nature*) the mutagenic effects to be expected of cosmic radiation, before Müller and the genetical world had come to accept or even consider this view.

In later years his work on transport of solutes and on permeability caused him to suggest hypotheses which, while not accepted later by himself or others, proved to be an effective stimulus both to his own student, Mason, and many other workers elsewhere.

Recognition of Prof. Dixon's qualities came relatively early; he succeeded to the chair of botany in Trinity College in 1904 and was elected to fellowship of the Royal Society in 1908. He was awarded the Boyle Medal of the Royal Dublin Society in 1917 and gave the Croonian Lecture before the Royal Society in 1937. He had been president of the International Botanical Congress and of the Royal Dublin Society, and also of Section K (Botany) of the British Association. He was an honorary fellow of Trinity College, Dublin, an honorary member of the American Society of Plant Physiologists, a Commissioner of Irish Lights and played an active part in many other national and international organizations.

The importance of the School of Botany in Trinity College, Dublin, under his guidance causes one to forget that the staff of this School during sixty years has been only two—the professor and his assistant. No memoir, however short, would be adequate if it referred merely to Prof. Dixon's academic distinction without mention of his very genial personality and of the atmosphere of the School of Botany in Trinity College, Dublin, which he created and which, unfortunately, owing to its small size, so comparatively few of the younger generation of botanists have been able to enjoy.

T. A. BENNET-CLARK

HENRY DIXON began his university course in natural science under two good men, E. P. Wright, Sir Almoth's uncle, and H. W. Mackintosh, a wonderful lecturer, who looked down his microscope and saw the marvellous works of his Creator. He knew and taught that life begins with a single cell and develops in an orderly manner.

Wright, systematist and traveller, enriched both the Herbarium, which housed Harvey's type specimens of algae, and the lovely Botanic Gardens. Dixon, soon his successor, opened his own professional sessions with an introduction to the microscope and went on to unicellular organisms. He illustrated the great ideas of evolution and heredity by precise studies in cytology and morphology. No one could escape a knowledge of bacterial and fungal infection, or of elementary ideas in general physiology.

It was my good fortune to begin under Wright and Mackintosh, and to be in Prof. Dixon's first class. I accordingly witnessed the development of his fine course, published as "Practical Plant Biology" (1922 and 1943). Years afterwards a distinguished surgeon told me that it was the first thing that had really made him think. For the practical classes, which might run to 150, about a dozen demonstrators were taken on.

The successes of later years stemmed from Dixon's careful planning of the School of Botany, opened in 1907, which replaced the few residential rooms in the Front Square. The new Herbarium was added in 1912. The moving of collections and elimination of insects was heavy work. Into the eight-acre Botanic Gardens, moved to Balls Bridge in 1806, Dixon had up to some twenty years ago introduced more than seven thousand species, including Arthur Kerr's notable collection of Siamese orchids which Sidney Wild, the head gardener, tended so sedulously.

No mention of the T.C.D. School would be complete without reference to the red-headed lad, Joe Murray, who appeared in 1905-6 and remained there until his death on January 24 of this year. With the professor, "Joe", Wild and Polly, head of the College groundsmen, I spent many happy years.

The delightful atmosphere of our chief's laboratory could be traced back to the home with his mother and sisters—enlivened by frequent visits from his brothers and their families. It was the same in his own home with his wife, who cared for him with such devotion. I recall his happiness when telling me that their three sons (all of whom have had distinguished careers) had never caused him one moment's anxiety.

W. R. G. ATKINS

Mr. R. S. Whipple

It was with a deep sense of loss that his large circle of friends heard of the death of Robert Stewart Whipple, which occurred at his home in Highgate Village on Sunday, December 13. His father, G. M. Whipple, was superintendent of the Kew Observatory, and was himself very interested in scientific instruments. Thus Whipple grew up with scientific instruments and acquired a love for them which coloured his whole life.

Whipple was educated at King's College School, Strand, and on leaving went in 1888 directly into the Kew Observatory, staying on for three years after his father's death in 1893 with his successor, Dr. Charles Chree. In 1896 for two years he was assistant manager to L. P. Casella, and then he joined the Cambridge Instrument Company, which Horace Darwin in partnership with A. G. Dew-Smith had founded in 1881. In 1909 Whipple and C. C. Mason became joint managing directors. Under their management the firm developed and acquired a high reputation for the quality of its products. Of these, mention may be made of the 'rocking-microtome', a piece of beautiful design by Sir Horace Darwin, and a range of temperature-measuring instruments. Whipple was responsible for the introduction of the Féry radiation recorder, of which the firm bought the rights for Great Britain. He himself designed an instrument for reading temperatures direct on the gas-scale; this is used largely to-day in industry as a sub-standard.

He retired from active management in 1935, but remained a director, and in 1939 was elected chairman of the Board; from this he retired in 1949 for reasons of health, but continued to take a keen interest in the firm. During all this time he took a great personal interest in the employees of the company, which they fully reciprocated, feeling that in him they had a sincere friend.

Whipple was a valued member of the societies connected with physics and a constant attendant at their meetings. He was a member of the Council of the Physical Society during 1909-14 and again during 1925-36, a vice-president from 1914 until 1916 and treasurer from 1925 until 1935. He was president of the Optical Society in 1920-22. He was a founder member of the Institute of Physics in 1920, and served on its Board for a total of twenty-one years between 1920 and 1945, and on its Finance Committee from 1945 onwards. His services in the cause of physics received their highest recognition in his election to the presidency of Section A (Mathematics and Physics) for the Dundee meeting of the British Association in 1939, which, however, was

abandoned due to the outbreak of war—one of the few cases in which that honour has fallen to an industrialist.

Whipple was always interested in the history of science and was a collector of early scientific instruments; of these he built up a wonderful collection which he most generously presented to the University of Cambridge in 1944; but it was not until 1951 that a small building was provided for their display, and the Whipple Museum was opened by the Vice-Chancellor on May 5. Now that "History and Philosophy of Science" has (partly perhaps due to the inspiration of this Museum) been included as a half-subject in the Natural Sciences Tripos, candidates will find the study of the actual instruments, that this Museum affords, of very real help. When the plans for the new Science Laboratories at Cambridge are further advanced, it is to be hoped that a larger building will be found, in which, with the Whipple instruments as a nucleus, the great number of instruments that Dr. R. T. Gunther proved to exist in Cambridge by the collection he was able to get together in June 1936 will again be assembled to grow to a collection worthy of the University.

In addition to the instruments, Whipple gave his library of scientific books, which included many of the rare early ones. He hoped that these might eventually be housed near the instruments, so that an instrument and its description can be studied together.

He also handed to trustees a fund of £3,300—later increased to £8,300—to be used for the purchase of instruments and books.

Whipple was a man of wide interests and engaged in many activities, serving on many committees; these will miss his wise guidance and support—often of a substantial kind. He will long remain in the hearts of those who served with him.

In 1939 he was elected president of the Highgate Literary and Scientific Institution, into which he put new life by his energy and help, and it is now a strong society. Only a little more than a week before his death, he gave the sum of £5,000 to trustees to be used for the benefit of Highgate Village.

Whipple was a fine example of an English gentleman, upright and honourable, full of kindness and sympathy, ready to help in any good cause and a man of wise counsel and sound common sense. He had great charm of manner which endeared him to all with whom he came into contact. He married Helen Muir, daughter of a Glasgow engineer and sister of James Muir, professor of natural philosophy in Glasgow; they celebrated their golden wedding in June 1953. Their son, George, is chairman and managing director of Messrs. Hilger and Watts, makers of optical scientific instruments, and a daughter, Ruth, is the wife of Prof. J. F. Young, professor of pathology in the University of Aberdeen.

R. S. CLAY

WE regret to announce the following deaths:

Mr. P. S. Ridsdale, director of the Charles Lathrop Pack Forestry Foundation, formerly editor of the *American Forestry Magazine* (1912-22) and of *Nature Magazine* (1923-37), on December 23, aged eighty-one.

Mr. H. W. J. Stone, honorary secretary and treasurer during 1933-45 of the Parliamentary Science Committee and editor of its publication *Science in Parliament*, on January 17, aged seventy-six.