# OBITUARY

## W. R. G. Atkins, C.B.E., O.B.E.(Mil.), Sc.D., F.R.I.C., F.Inst.P., F.R.S. 1884–1959

William Ringrose Gelston Atkins was appointed Head of the Department of General Physiology at the Plymouth Laboratory in February 1921 at the age of 36 having already at Trinity College, Dublin, applied widely the methods of physics and chemistry to the problems of biology, particularly botany. He was very well equipped to study the physics and chemistry of sea water as an environment for marine life. He served with great distinction at Plymouth, apart from the years of the Second World War, until he retired from the staff in March 1955 and enjoyed only four years of leisure before his death on 4 April 1959.

Atkins may be said to have borne the same relationship to chemical oceanography that V. M. Goldschmidt did to geochemistry. Each saw the problems of the waters or of the rocks broadly, drew on all the apparatus of research available in their day and founded each a new branch of science. They became close friends, mainly by correspondence and cross-fertilized each other. They differed in temperament, whereas Goldschmidt founded schools, Atkins preferred to work with his own hands or with those of his trusted assistants, Mr F. J. Warren and Miss Pamela Jenkins (Mrs L. Hummerstone). The greater part of his sea work was done on the 'Salpa', described when she arrived a few months after Atkins himself, as a powerful sea-boat and much more capable of facing rough weather than her predecessor. Powerful for her time she may have been but uncomfortable she certainly was, to an extent which those who work on our present vessels may find it hard to understand. It was on this ship that so much of Atkins's work, which became classical, was carried out. Her master, Captain Vivian Lord, was an individualist like Atkins himself. Each held the highest regard for the other for their personal integrity and competence at their respective jobs.

The chemical study of the sea as a biological environment started in Germany but the analytical methods of the day were not equal to the task. Matthews at Plymouth had introduced methods of improved accuracy but too slow for the considerable surveys which were necessary. Atkins's great gift was to realize the value of new techniques and then with great energy and care to apply them to problems which he was the first to define clearly. The credit for the first effective application of colorimetric, or as we prefer to say to-day, absorptiometric chemical analysis to oceanography is his.

He formulated clearly the problems of the biological productivity of temperate seas and started, following Benjamin Moore, by studying the carbon

cycle, using measurement of pH as his tool. His results were clear-cut but he quickly realized that the answers he sought could be more surely obtained by studying phosphate. This he achieved by applying Denigès's colorimetric method to sea water. His technique was simple but effective and could be used on ocean-going research ships. During the years that followed he devised methods for a number of other constituents of sea water of biological importance, and applied them extensively.

Atkins quickly saw that production in the sea depended in equal measure upon the availability of nutrients and upon a sufficiency of light. As early as 1924 he entered upon a famous partnership with Dr H. H. Poole of the Royal Dublin Society which combined two acute minds with different gifts and opportunities to attack the intractable problem of the manner, the extent and the consequences of the penetration of light in the sea. As joint authors they wrote over forty papers, many of which have become classics. They found that though the photo-electric cell was much the best tool for the job, the early models could be treacherous. Much meticulous work was carried out to track down sources of error, many still with us, so that young men entering this field of research would be well advised to read for themselves how these sources of error were recognized and overcome.

One result of this intimate knowledge of photo-electric cells and their failings was that in his other main field of study, absorptiometric analysis, he remained to the end of his days an advocate of visual methods and rejected photo-electric methods. Possessed himself of exceptional powers of colour discrimination and memory he found it hard to realize that few shared his gifts or that the fatigue and failings of a modern photo-electric cell might be less serious than those of most human eyes. He was ever ready to give from his wide experience and one consequence was the application of his work in terrestrial environments, as in soils and woods all over the world.

For many years he continued work on the preservation of nets and ropes which developed from his earlier work in Egypt on fabrics. This was typical of the way in which he applied his discoveries in one branch of science to the problems of another.

An account of the many honours he received and of his work at Dublin and elsewhere during the two world wars will be found in the Obituary Notices of the Royal Society and in *Nature* (2 May 1959).

Atkins was a man of strong and forthright character, often stern in his support of causes which he felt to be just. He expected high standards of experimental competence and scientific integrity from his staff and from workers visiting the Laboratory. He was a very kindly man with a strong social conscience. Much of the good work that he did was known only to those who were very near to him. In his private life he was devoted to home and garden. To Mrs Atkins and their married son, all who knew them—and they were many—will extend deep sympathy.

L. H. N. COOPER