Coulson, Charles Alfred

(1910–1974)

- https://doi.org/10.1093/ref:odnb/30973
- Published in print: 23 September 2004
- Published online: 23 September 2004

Charles Alfred Coulson (1910–1974)

by Walter Bird

Coulson, Charles Alfred (1910–1974), theoretical chemist, was born at Dudley on 13 December 1910, one of twin sons (there were no other children) of Alfred Coulson, who became principal of Dudley Technical College and later HM inspector of technical colleges in south-west England, and his wife, Annie Sincere, headmistress and daughter of the inventor Charles Lamb Hancock. Alfred Coulson acted as superintendent of the local Methodist Sunday school, and both Charles and his brother were brought up as staunch Methodists. Indeed, Charles Coulson's whole outlook was coloured by his immensely strong Christian faith; he became an accredited lay preacher in 1929 and subsequently vice-president of the Methodist conference (1959–60). His brother, John Metcalfe Coulson, became professor of chemical engineering at the University of Newcastle upon Tyne.

Coulson was educated at two local schools in Dudley and, following the family's move to Bristol in 1920, at the XIV Preparatory School in that city. In 1923 he was awarded a scholarship to Clifton College, and in 1928 gained an entrance scholarship in mathematics to Trinity College, Cambridge. During these years he was a good cricketer and an excellent chess player. He was elected to a college senior scholarship. In the mathematical tripos he obtained a first class in part one (1929) and was a wrangler in part two (1931). He then took part two of the natural sciences tripos, in which he also obtained a first (1932). He was later elected to a research scholarship, initially under R. H. Fowler and subsequently under J. E. Lennard-Jones, who directed him into the field which played such a dominant role in his subsequent researches—molecular orbital theory.

At Cambridge, Coulson became a leader of a group of Methodists within the university. They included Eileen Florence Burrett, a trainee teacher, and she and Coulson were married in 1938, just before he left Cambridge. She was the daughter of William Alfred Burrett, house furnisher in Leeds. They later had two sons and two daughters.

In 1934 Coulson was elected to a prize fellowship at Trinity for four years, and he obtained his PhD two years later. In 1938 he became senior lecturer in mathematics at University College, Dundee. During the Second World War he was a conscientious objector, and was the sole remaining lecturer in applied mathematics at Dundee. In 1945 he moved to the Physical Chemistry Laboratory in Oxford on an ICI fellowship, and was appointed a lecturer in mathematics at University College. He was then awarded the newly established chair of theoretical physics at King's College, London, which he took up in October 1947. In 1952 he returned to Oxford to take up the Rouse Ball chair of mathematics and a professorial fellowship at Wadham College. He spent much energy organizing the new Mathematical Institute at Oxford, which was completed in 1963. In 1972 he became Oxford's first professor of theoretical chemistry, although he was already beginning to suffer the effects of his final illness. He founded a summer school of theoretical chemistry which was outstandingly successful.

Coulson was very productive in his research. The Royal Society, of which he was elected a fellow in 1950, recorded in his obituary more than four hundred publications in scientific journals. His early book, *Waves* (1941), went into several editions. The work which he did with W. E. Duncanson, on electronic structure of molecules in momentum space, was pioneering, and their papers continued to have great influence for many years. Coulson himself thought his most important work was that on the relationship between bond-order and bond-length. He also carried out significant research on hydrogen bonding, and was influential in promoting the description of solids as the limiting case of large molecules—a theory which later gave rise to the field of low-dimensional solids. In his foreword to the book *Orbital Theories of Molecules and Solids* (ed. N. H. March, 1974), dedicated to Coulson by his friends and colleagues, H. C. Longuet-Higgins describes the personal consequences of their association: 'Above all I was impressed by the simplicity of Coulson's thinking and by his determination to make things so clear that even a novice could grasp the essential ideas'. The professional consequences were a series of brilliantly influential papers by Coulson and Longuet-Higgins in the *Proceedings of the Royal Society*. The clarity and simplicity of Coulson's thinking is nowhere better exemplified than in his best-selling book, *Valence* (1952).

Coulson was an outstanding scientist and expositor and also a man of unusually wide interests. In 1962–8 he was a member of the central committee of the World Council of Churches and in 1965–71 he was chairman of Oxfam. His religious publications and television appearances made him well known to the public. He enjoyed a happy family life, and he and his wife opened their home to his students on many occasions. He was tall and imposing, and occasionally unconventional in his attire.

He had twelve honorary degrees, including a Cambridge ScD (1971), and was an honorary fellow or member of several British and foreign learned societies. His many medals included the Royal Society Davy medal (1970) and the Faraday (1968) and Tilden (1969) medals of the Chemical Society. Coulson enjoyed robust health until 1970, when he was operated on for cancer of the prostate. He recovered, but in July 1973 a routine hernia operation revealed regrowth of the tumour. He continued to work until five days before his death, which took place at home in Oxford on 7 January 1974. His wife survived him.

Sources

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- private information (1986)

Archives

- Bodl. Oxf., personal, religious, and scientific corresp. and papers

- U. Leeds, Brotherton L., lecture notes, notebooks, etc.

- Bodl. Oxf., corresp. with Dorothy Hodgkin
- Bodl. Oxf., corresp. with W. Hume-Rothery

Likenesses

- W. Stoneman, photograph, 1952, RS
- photograph, 1974, RS
- W. Bird, photograph, RS [see illus.]