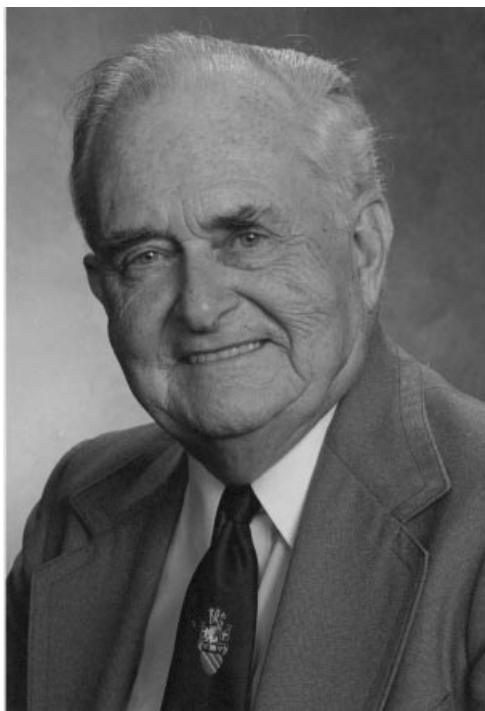


Obituary: Professor Donald Cardwell (4 August 1919–8 May 1998)



Donald Cardwell (1919–1998)

Before the Second World War, few scholars knew how to incorporate science, technology and medicine into social, political or economic history. Nowadays many historians know the methods: university courses, books and (some) museums manifest their skills. For the ‘greats’ of science, and for many lesser figures and groups, we are able to relate scientific ‘works’ to ‘lives’, contexts and audiences, with an analytical sophistication matching the best of current intellectual and cultural history. This progress in historiography owes much to the intellectual and institutional bases built in the 1950s and 1960s, not least in the universities of northern England. Among the pioneers, Donald Cardwell was a perspicacious and persistent innovator, especially in Manchester, where he helped develop both a school of historians and a marvellous museum of science and industry.

From 1963, Donald made his academic home at the University of Manchester Institute for Science and Technology (UMIST). He was at his best in the History of Science common room, holding forth on science, technology and the industrial revolution, mixing acute analysis with whimsical excursions which also revealed his deep sense of period and place. He adopted Manchester, though he was the son of a civil servant from Croydon, born in Gibraltar, and educated at Plymouth College and King’s College, London, where he gained a first in physics in 1940.

From 1941 he was a Temporary Experimental Officer in the Admiralty Signals (and Radar) Establishment, serving in the UK, and from 1943 in Sierra Leone and Egypt. Back at King’s from 1946, he applied his knowledge of radar in a Ph.D. on lightning detection – ‘Some observations on the wave-form of atmospherics recorded under daytime conditions of propagation’ (1949). The experience was not encouraging. As part of the King’s department, especially John Randall and Maurice Wilkins, was moving from wartime concerns to biophysics, Donald moved further – into historical and social studies.

Supporting himself as an industrial physicist, he attended history of science courses at UCL and Morris Ginsberg's sociology seminars at the LSE, where he met his future wife, Olive. From 1951 to 1954 he held a Nuffield Foundation grant for the historical research that became his first book – *The Organisation of Science in England* (1957). For two years, from 1954 until 1956, he worked at Keele on a project for the Science and Industry Committee, instituted in 1952 by the British Association to investigate the factors governing the application of scientific knowledge in British industry. The results were published in C. F. Carter and B. R. Williams's *Industry and Technical Progress* (Oxford: Oxford University Press, 1957). Thereafter, he took a research post in London from which he resigned at the end of 1957 when the project 'was altered into a purely economic study'.

After the publication of *Organisation* and almost a decade of short-term employment, he was rescued by the philosopher Stephen Toulmin, who invited him to join the History and Philosophy of Science group at the University of Leeds, where he held a Leverhulme Fellowship from 1958 until 1960, and then a lectureship. There he met Jerry Ravetz, who shared his interest in the relationship between science and technology, and began the work on the history of 'energy' that he would continue with Arnold Pacey at UMIST. In 1962 he was invited to UMIST by the Principal, Vivian Bowden. From 1 January 1963 he was appointed Reader and head of a new Department of History of Science and Technology. The technological universities were expanding and in Manchester, as at Imperial College, London, history of science was to provide a 'liberal' element in the education of engineers. Bowden also wanted a museum.

At UMIST Donald surrounded himself with other scientists who had turned to history – Pacey and the chemist Wilfred Farrar were already on the staff of the Institute. Like Donald, they were unassuming but learned and original; they liked to joke about fashions in historiography, but they already understood the principles that dominate the profession now – that history of science must be concerned with practice as well as theory, that local studies are enormously useful in exploring the interplay of content and context, and that we do well not to divide the histories of science, technology and medicine from each other, or from economic and social history. These were key themes in the Northern seminar which from the late 1960s linked UMIST with Leeds, Lancaster and Bradford and also included Charles Webster, Charles Schmitt, Piyo Rattansi, Ted McGuire, Maurice Crosland, Jack Morrell and Robert Fox. The lessons spread – not through manifestos, but by example and through a tradition of warm encouragement to younger scholars.

Donald was shy of conferences, and in later years he rarely lectured outside Manchester. He maintained friendships with several historians of technology, notably Edwin Layton, but his international influence came mainly through his books. *Steam Power in the Industrial Revolution* (1963) was based on his work at Leeds. The edited volume on *John Dalton and the Progress of Science* (1968) was based on a Manchester conference for Dalton's bicentenary. *Watt to Clausius* (1973, reprinted 1989) was the major statement of a thesis which has become commonplace but which then rather shocked the historians of ideas – that much of nineteenth-century physics, especially energy physics, derived from reflections on industry, and especially from the attempts of engineers to assess the efficiency of steam engines. Donald argued strongly against the then dominant view that science, essentially, was created in the scientific revolution. His broader ruminations on the

relationships of science and technology are to be found in his *Technology, Science and History* (1972), which he later rewrote and expanded as the *Fontana History of Technology* (1994).

In 1974, for the 150th anniversary of UMIST's ancestor, the Manchester Mechanics Institute, Donald edited a collection of essays entitled *Artisan to Graduate*. He was given a chair that year, and he continued to head the department until his retirement in 1984. In 1989 he published his long-awaited biography of James Joule, in which his expertise in the history of energy combined with his attachment to the history of Manchester. His books were used by the Open University and did much to advance the history of science in Britain, but his literary achievements were perhaps best recognized in the USA, where history of technology had become a professional discipline. The society for the History of Technology awarded him the Dexter Prize in 1973 and the Leonardo Medal in 1981.

The department at UMIST grew steadily over two decades. Maureen Farrell and Kathleen Farrar gained lectureships, Joe Marsh succeeded Arnold Pacey in history of physics, and John Pickstone gained a lectureship in 1977 after the untimely death of Wilfred Farrar. Richard Hills, Richard Lorch, Alan Williams, Jim O'Hara and Roger Cooter were among the notable research fellows. But the early 1980s proved very difficult. The Thatcher government was forcing cuts in the university system; Donald, Kathleen and Maureen were approaching retirement; and the Principal of UMIST, Robert Haszeldine, proposed to close the Department. That UMIST rejected the proposal said much for the respect which Donald commanded in the Institute, but there was no agreement about the future of the subject in Manchester. After years of inconclusive debate, Pickstone, Cooter and a new lecturer, David Edgerton, moved up the road to the University of Manchester to establish the Centre for the History of Science, Technology and Medicine and the Wellcome Unit, retaining the Manchester emphasis on the practical and the local.

For most of his retirement, Donald continued to work and to publish. He and Olive moved at one stage to their summer cottage in West Wales, where Donald practised DIY, but they soon returned to Manchester – to be near their two children and to Donald's intellectual niche. At UMIST he worked with Richard Hills and Joe Marsh and with Raj Williamson on her history of UMIST. He continued to support the Manchester Literary and Philosophical Society and the North-West branch of the Newcomen Society. With Terry Wyke he launched the 'Axon project' to extend the chronicle of Manchester history.

But his chief civic legacy is the Museum of Science and Industry, for which he laid the groundwork soon after his arrival in Manchester. He recruited Richard Hills, initially as a research student, and with the support of Lord Bowden and Sir Maurice Pariser they put together a very fine collection of industrial machinery and scientific instruments. In 1969 they opened a museum in the former Oddfellows Hall on Grosvenor Street, directed by Richard Hills, and initially funded by UMIST, Manchester University and Manchester City Council. Donald also helped establish the national fund for the preservation of industrial and scientific heritage (PRISM).

In the early 1980s, around the time of Donald's retirement from UMIST, the Manchester collections moved to Castlefield, the site of the world's first railway station. There the museum's growth has been so spectacular, and its brief is now so large, that it is rarely thought of as a 'University' foundation. Donald remained a Trustee to his death, and the

museum is a fitting memorial – a contribution to Manchester from a lively and engaging scholar who taught us to see in the microcosm of the industrial city the creative interweavings of scientific, technical and civic concerns.

A Donald Cardwell Memorial Fund has been set up with the object of establishing a series of lectures, creating an exhibition for the Museum of Science and Industry in Manchester and funding postgraduate study and research in the history of science, technology and medicine. Further details are available from Professor J. V. Pickstone, CHSTM, Maths Tower, The University of Manchester, Oxford Road, Manchester M13 9PL.

JOHN PICKSTONE