

## OBITUARY

## Robert Wolfgang Cahn (1924–2007)

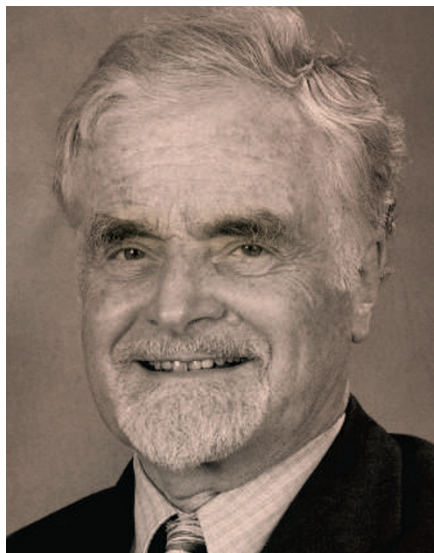
Doyen of materials science.

In Robert Cahn, who died on 9 April 2007, materials science has lost one of its creators, a formidable contributor to its development, and its foremost chronicler. Robert Cahn's energetically international outlook on science, and his eagerness to promote new ideas from younger minds, endeared him to many across the world.

As narrated in Cahn's autobiography *The Art of Belonging*, the flight of his family from Nazi Germany and then from the Spanish Civil War, via France, Switzerland and Italy, led eventually to England. With this troubled background it required some force of will on Cahn's own part to acquire a good education, but he did so, and entered Trinity College, Cambridge, in 1942. In September 1945 he started his PhD work under Egon Orowan at the Cavendish Laboratory, and thus began more than half a century devoted to research on the structure and deformation of metals and alloys.

While at Cambridge, Cahn met Pat, his future wife, and this led to a key scientific breakthrough. Pat's father was Daniel Hanson, head of the Physical Metallurgy department at Birmingham, and he put Cahn in touch with Alan Cottrell, then a lecturer in his department, to help with interpreting some of Cahn's early observations. Cahn had found that metallic single crystals, after plastic deformation and annealing, reformed into a series of strain-free crystallites. With Cottrell, he showed that this could only reasonably be explained by dislocation rearrangement into walls. This 'polygonization' was the first unambiguous experimental evidence for dislocations, first hypothesised by Orowan (and independently by Polanyi and Taylor) in 1934.

After two years, Cahn left Cambridge to complete his PhD at the Atomic Energy Research Establishment, Harwell, where under Bruce Chalmers he performed important early work on the plastic flow of uranium, elucidating the mechanism of deformation twinning. In 1951, he moved to the Physical Metallurgy department at Birmingham University and thereafter remained in universities, subsequently at Bangor, Sussex, Paris and Cambridge, with visiting positions at laboratories around the world. At Sussex, Cahn was the first professor of Materials Science in the UK, and he designed the first courses in the



subject. He was involved in setting up the still-thriving Science Policy Research Unit, and later became Dean of Engineering.

After Harwell, Cahn's research ranged widely, with highlights in recrystallization, ordering in alloys and intermetallics and its effects on creep, rapid solidification of alloys, and metallic glasses. His work on atomic diffusion in metallic glasses (mostly at Sussex) is particularly highly cited, as is his more recent work on the order-disorder transition and its links with ductility in Ni<sub>3</sub>Al-Fe that he performed at the General Electric central research laboratory in Schenectady, when in nominal retirement.

Although Cahn's own research, with a few minor excursions, focused on metals, his interest in materials ranged much more widely. In 1967, John Maddox, editor of *Nature*, appointed him as materials science correspondent (initially anonymous) for the journal. Cahn wrote many commentaries, and his News & Views articles in particular were notable contributions, sometimes making him a source of reference in fields well outside his own specialization. Many of his *Nature* pieces, together with other articles, have been collected in book form in *Artifice and Artefacts*. His crisp, clear style, spiced with quotations, sometimes cynical, is widely appreciated in his many papers, book chapters and other pieces, and new writing, for example his column in

*Materials Today*, continued to appear long after most would have been happy to retire.

Widely respected as Robert Cahn's writings are, perhaps even more materials scientists know him for his editorial work. He was founder and editor of a number of journals. Amongst these, he himself considered his role as the first editor of *Journal of Materials Science* to be the most important. Furthermore, Cahn had a particularly warm association with the Materials Research Society, for which amongst other things he served as an inaugural principal editor of the *Journal of Materials Research*.

A prolific book editor, Cahn was particularly proud of the multi-author textbook *Physical Metallurgy*, which has now seen four editions, the last two edited jointly with Peter Haasen. Cahn edited three major book series including *Cambridge Solid State Science*. He also served as editor or co-editor of the *Encyclopedia of Materials Science and Engineering*, and the *Encyclopedia of Advanced Materials*.

A fellow of the Royal Society, he was elected to many national academies, and held international honours. He had a particularly close attachment to the scientific community working on rapidly quenched and metastable materials. In August 2005, at their triennial conference, this community elected three inaugural Distinguished Fellows, Robert Cahn, Tsuyoshi Masumoto and David Turnbull. Turnbull died in the same month as Cahn; it is devastating that physical metallurgy has lost two of its greats in such quick succession.

Robert Cahn had many interests outside science: mountains, music, art, literature, photography, and above all his family. Robert is survived by Pat, their four children and twelve grandchildren. In his autobiography, Cahn suggests his own epitaph "driven by fate to wander far and wide", a reference to his family history and scientific travels; he leaves many scientists around the world who were not only colleagues, but more importantly friends.

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