

R. W. Cahn—Historian

J. H. WESTBROOK

Brookline Technologies, 5 Brookline Road, Ballston Spa, NY 12020, USA

In a long and distinguished career, Robert Cahn has been many things: professor, researcher, editor, columnist, book reviewer, and historian of materials science. It is the last of these roles that is reviewed here. Examination of his bibliography reveals that more than 10% of his publications are in this field. Such a count excludes conventional review articles and the many short columns he wrote for various journals (*Materials Today*, *Nature*, and *Advanced Materials*), although several of his columns also touch on historical aspects.

What were Cahn's motives for his historical pursuits? One certainly was his role as a teacher: exploring 'how did we get here from there?' is always a powerful educational tool. Another motive was curiosity, a trait almost every scientist has to an unusual degree. Cahn clearly has a fascination with novel results reported by others, especially when these are not well understood. Finally, it appears that giving proper recognition to key individuals and seminal events, often overlooked or forgotten, also stimulated his library research and writing.

Cahn's ventures into the history of materials science can be divided (see below) into three groups: biographical, topical, and philosophical (his views of the emergence of materials science and engineering as a recognized discipline). In the biographical category, he has published articles on Agricola, Rosenhain, and C.S. Smith. More than half the articles in the topical category are devoted to various aspects of the history of intermetallic compounds, their research, development, and application, a field in which he first published his own research in 1960. Other themes in the topical category are histories of innovation, single crystals, alloy design, and plasticity. The articles in the third and largest category, covering a variety of subjects relating to the development of materials science and engineering as a discipline and presenting an impressionistic map of the current state of the field, eventually were expanded by Cahn into an excellent book, *The Coming of Materials Science*, recently reviewed by the writer (*MRS Bull.* **26** (9)(2001) 727).

One of the factors strengthening Cahn's treatments of the history of materials science and endearing him to his readers is his skill as a word-smith. His writing is at once erudite, witty, and insightful. Apart from clarity of exposition, it is also enriched by allusions to classic literature and by introduction of apposite phrases from Latin, Greek, French, and German. When Cahn cannot find any appropriate term for a concept, he simply introduces a neologism, e.g., *parepisteme* for a subsidiary domain of a science. His writings are also enhanced by his knowledge of the foreign literature in the

materials field, augmented by his personal contacts and travels.

While Cahn undoubtedly engaged in these historical pursuits only for his personal edification and for the beneficial effects on his own research and teaching, we could all wish that he had had more time to spend in this area.

Biographies

R. W. Cahn, "Georgius Agricola," *Encyclopedia Britannica*, 15th ed. (1974).

R. W. Cahn, "Walter Rosenhain," *Dictionary of Scientific Biography* (1975) Vol. 11.

R. W. Cahn, "Cyril Stanley Smith," *New Dictionary of National Biography*, edited by Colin Matthews (2004).

Topical articles

R. W. Cahn, "Intermetallic Compounds: History and Prospects," *Metals, Mater. Proc. (India)* **1** (1989) 1.

R. W. Cahn, "Load-Bearing Ordered Intermetallic Compounds—A Historical View," *MRS Bull.* **16**(5) (1991) 18.

R. W. Cahn, Ordered Intermetallic Compounds, 1916–1990, in "Frontiers of Materials Research," edited by M. Kong and L. Huang (North Holland, Amsterdam, 1991) Vol. 1, p. 57.

R. W. Cahn, "The Uses of Intermetallics in Engineering Design," *Revista de la Real Academia de Ciencias, Exactas, Fisicas y Naturales (Madrid)* **90**(2) (1996) 3.

R. W. Cahn, Historical Perspective on the Development of Aluminides, in "Intl. Symp. on Nickel and Iron Aluminides: Processing, Properties, and Applications," edited by S. C. Deevi *et al.* (ASM Intl., 1997) p. 3.

R. W. Cahn, "Intermetallics: New Physics," *Contemp. Phys.* **42**(6) (2001) 365.

R. W. Cahn, "Case-Histories of Innovations," *Nature* **225** (1970) 693.

R. W. Cahn, "Alloy Design: A Historical Perspective," in *Proc. Indian Acad. Sci.* (1980) p. 225.

R. W. Cahn, "The Use of Metallic Single Crystals in Metals Research: A Concise History," *Z. Metallkunde* **90** (1999) 860.

R. W. Cahn, Historical Overview, in "Multi-scale Phenomena in Plasticity: from Experiment to Phenomenology, Modelling and Materials Engineering," edited by J. Lépinous *et al.* (NATO ASI Series, Kluwer, Dordrecht, 2000) p. 7.

SPECIAL SECTION IN HONOR OF ROBERT W. CAHN

Philosophical views of the materials science and engineering discipline

R. W. Cahn, "What is Materials Science?" *Discovery* (July, 1965).

R. W. Cahn, "What Use is Metallurgical Research?" *J. Royal Soc. Arts (London)* **123** (1975) 365.

R. W. Cahn, "The Historical Development of Physical Metallurgy," supplement to R.F. Mehl's article of the same title, in "Physical Metallurgy," 3rd ed., edited by R.W. Cahn and P. Haasen (North-Holland Publishing Co. Amsterdam, 1983) p. 27.

R. W. Cahn, Solid State Physics and Metallurgy, in "Solid State Science: Past, Present, and Predicted," edited by D. Weaire and C. G. Windsor (Adam Hilger, Bristol, 1987) p. 79.

R. W. Cahn, "Political Science," *MRS Bull.* **16**(1) (1991) 72.

R. W. Cahn, "Trends in Physical Metallurgy," in "Advances in Physical Metallurgy," edited by S. Banerjee and R. V. Ramanujan (Gordon and Breach, New York, 1996) p. 1.

R. W. Cahn, "Challenge, Response, and Serendipity in the Design of Materials," *Bull. Mater. Sci. India* **17** (1994) 1369.

R. W. Cahn, "Materials Science: The Big Picture," *Science and Public Affairs* (Summer, 1996) p. 52.

R. W. Cahn, "The History of Physical Metallurgy and of Materials Science," *Acta Metall. Sinica* **33** (1997) 157.

R. W. Cahn, "Materials Science: Parepistememes Rampant," *MRS Bull.* **24**(9) (1999) 3.

R. W. Cahn, "The Science of Things: Unanswered Scientific Questions and Unquestioned Scientific Answers in Materials Research and Development," *MRS Bull.* **25**(9) (2000) 59.

M. F. Flemings and R. W. Cahn, "Organization and Trends in MSE Education in the U.S. and Europe," *Acta Materialia* **48** (2000) 371.

R. W. Cahn, "The Coming of Materials Science" (Pergamon/Elsevier, Oxford, 2001) p. 568.

R. W. Cahn, Transition from Metallurgy to Materials Science, in "Materials Science and Engineering: Its Nucleation and Growth," edited by M. McLean (Inst. of Materials, London, 2002) p. 73.

R. W. Cahn, Freedom and Fashion in Materials Science and Engineering, in "Frontiers of Materials Science and Engineering" (SADHANA, India, 2003) (in press).

R. W. Cahn, "Metallurgists and Materials Scientists: Scope for Scepticism?" *MRS Bull.* **28** (2003) (in press).