

## BOOK NOTES

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*American Chemists and Chemical Engineers, Vol. 2.* W. D. Miles and R. F. Gould. Gould Books, Guilford, CT, 1994. X + 297 pp. \$20.

This inexpensive volume of short biographies of American chemists continues where the first volume (published in 1976 by the American Chemical Society) left off. Included in this volume are 258 chemists and chemical engineers, 252 being men and 9 women, representing both industry and academia. There are also some biographies of people who were not chemists or chemical engineers but made contributions in science or industry. Those who have died since the appearance of Volume 1, such as Vincent du Vigneaud, Louis Fieser, R. B. Woodward, Kasimir Fajans, and Ralph Oesper, make their appearance here. A short perusal through some of the biographies reveals many interesting facts. For example, Louis Fieser (1899-1977) served on the Surgeon General's 1964 committee on the health effects of smoking. Murray Raney (1885-1966) was a nonchemist who developed the "Raney" nickel catalyst in 1924 to hydrogenate cottonseed oil. Francis Garvan

(1875-1937) was the lawyer who engineered the US takeover of the German patents on dyes after World War I and enabled the US chemical industry to become independent. Samuel Fisk Green (1822-1894) completed a vocabulary of chemical and physical terms in Tamil, the language of Sri Lanka (then Ceylon), and completed a translation of chemical texts into that language. All the biographies are written in simple, direct prose that describes the life and accomplishments of each chemist clearly and succinctly. The book itself is well bound with a detailed index, and each entry has a list of additional biographical references. In perusing the volume, I found only one minor fault. The criteria for inclusion listed in the preface are somewhat confusing, as if there were typographical errors that were not noticed. But this is a minor fault, since a simple overview of the biographies gives an indication of the criteria. Overall Gould and Miles have put together an excellent and extremely useful reference work in the history of chemistry and chemical engineering. *Peter J. Ramberg, Dept. Chem., Ohio University, Athens, OH 45701*

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*Thinking About Matter: Studies in the History of Chemical Philosophy,* John Hedley Brooke. Variorum Ashgate Pub. Co., Brookfield, VT, 1995.

The "Collected Studies Series" of the Variorum Press has already made available several collections of the papers of noted historians of chemistry. The volumes of Maurice Crosland, Trevor H. Levere, and Allen G. Debus are now joined by one containing ten papers of John Hedley Brooke, who has a high reputation for his studies of 219<sup>th</sup>-century chemistry, especially in relation to religious and philosophical issues.

The papers reprinted in the Variorum volumes are reproduced exactly as they first appeared, without revision or even correction of misprints. All retain their original pagination to which the volume index is keyed. Since revision is not permitted, the author faces the challenge of selecting, arranging, and introducing a series of samples of his work that form a coherent sequence

and give a rounded picture of the themes of his research. Brooke has achieved this quite successfully, though inevitably the collection remains less coherent than a monograph would be.

A short preface, written specifically for the volume is appropriately followed by "Chemists and their contexts: some recent trends in historiography" (originally published in 1991), which doubles as an introduction to the remainder of the articles. Brooke makes the case for his own approach to the history of chemistry as an alternative to the traditional emphasis on celebrating the precursors of recent achievements. He has been concerned instead to relate chemical research to the philosophical issues that have often arisen in connection with it, though his exposition is not specifically philosophical in idiom and he criticizes attempts to make history fit into a philosophical model of how science should be done. He is interested in discussions of such general issues as the nature of matter, the composition of mol-

ecules, and the differences between organic and inorganic substances. These are the central themes of the studies included here.

The second article in the collection is the only one not devoted to a 19<sup>th</sup>-century topic. "the sower went forth": Joseph Priestley and the ministry of reform" (originally published in 1984 and revised in 1990) is an elegant discussion of Priestley's theological outlook as a framework for his scientific research. This is followed by "Davy's chemical outlook: the acid test" (1980), which subtly analyzes Humphry Davy's complex and varying views about acidity, arguing that he was not a consistent advocate of the theory that ascribed acidity to the presence of hydrogen. A similarly subtle analysis, alert to the ironies of a complex issue, is presented in "The superiority of nature's art? Vitalism, natural theology and the rise of organic chemistry" (1989). In this article, Brooke argues that vitalism and mechanism can in fact be rather difficult to discriminate, and that ambiguous theological implications can be drawn from each position.

In the following papers, on organic chemistry in the early 19<sup>th</sup> century, Brooke enters a series of further caveats against historical interpretations that he considers too simplistic. In "Wohler's urea and its vital force?—a verdict from the chemists" (1968), he persuasively debunks the mythology that has surrounded the artificial synthesis of urea in 1828. Brooke argues that, at the time, Wohler's synthesis was more noted for its implications for the problem of isomerism than for breaching the supposed barrier between inorganic and organic substances. "Berzelius, the dualistic hypothesis, and the rise of organic chemistry" (1992) is a comprehensive study of the role of analogies between the inorganic and organic realms in Berzelius's chemistry, especially focusing upon the theory of electrochemical dualism. Brooke proposes that this was a approach, albeit one that was soon superseded. "Laurent, Gerhardt,

and the philosophy of chemistry" (1975) deals with controversies as to how much could be deduced about molecular structure from the reactions of organic substances. "Organic synthesis and the unification of chemistry—a reappraisal" (1971) closes the circle of these studies by proposing that analogical arguments between organic and inorganic realms were more important in creating a common conceptual framework for the two branches of chemistry than were the achievements of organic synthesis.

The final two papers continue the theme of redressing naive expectations of episodes in the history of chemistry. "Avogadro's hypothesis and its fate: a case-study in the failure of case-studies" (1981) argues against the supposition that Avogadro's hypothesis was unreasonably neglected by chemists for fifty years after it was advanced. Brooke argues that the meaning of the hypothesis was not exactly clear, and its potential utility for chemists at the time very limited. Finally, "Doing down the Frenchies: how much credit should Kekule have given?" (1993) takes issue with John Wotiz's claim that Kekule suppressed his degree of indebtedness to Laurent for the idea of the ring structure of benzene. Brooke shows that the structure was not given the same meaning by Laurent and by Kekule, and that the ethics of acknowledging priority cannot be decided unambiguously.

Each of these papers is fully worthy of reprinting, and study of the collection will richly reward anyone interested in the history of chemical theory in the early 19<sup>th</sup> century. Brooke argues his points with an elegant style and resourceful use of an extensive knowledge of the primary literature. Although the studies are independently conceived and remain quite distinct from one another, taken together they display a remarkably subtle and discriminating historical intelligence. *Jan Golinski, Department of History, University of New Hampshire, Durham, NH 03824.*