Pauling: Three Views of a Many-Faceted Life

Linus Pauling: A Life in Science and Politics

Ted Goertzel and Ben Goertzel
BasicBooks (HarperCollins), New York, 1995. 304 pp. $27.50 hc
ISBN 0-465-00672-8

Force of Nature: The Life of Linus Pauling

Thomas Hager
Simon & Schuster, New York, 1995. 721 pp. $35.00 hc
ISBN 0-684-80909-5

Linus Pauling in His Own Words: Selected Writings, Speeches, and Interviews

Edited by Barbara Marinacci
Touchstone Books (Simon & Schuster), New York, 1995. 320 pp. $14.00 pb
ISBN 0-684-81387-4

Reviewed by Derek A. Davenport

LINUS PAULING, April 1962, in one of many simultaneous incarnations. (Courtesy National Archives and Records Administration.)

Linus Pauling was born in 1901 and died in 1994. Active to the end, his life embraced much of the scientific, political and social turmoil of this century. As the chief exponent of modern structural chemistry and as one of the founding fathers of molecular biology, he has a secure place in the history of 20th-century science. As a leader of worldwide opposition to atmospheric nuclear testing, his once-controversial role in the history of political activism is controversial no longer. The jury is still out on his advocacy of multivitamin and other dietary therapies, but he may yet find a place—albeit that of devil's advocate—in the history of medicine.

A life so long, so distinguished and so controversial is bound to attract chroniclers and these three books are among the first; others are in progress or planned. The first full-length biography—or rather pathography—to appear (See PHYSICS TODAY, May 1990, page 81) was Anthony Serafini's *Linus Pauling: A Man and His Science* (Paragon House, 1989). The present books are, in their very different ways, much worthier.

Linus Pauling: A Life in Science and Politics is a three-generational family affair. Five Goertzels, including Ted Goertzel, the principal author, are listed on the title page and a sixth in the acknowledgements. The book was begun in the early 1960s by the principal author's parents, who were interested in the childhoods of eminent people. They greatly admired Pauling for his leadership of the peace movement, although disenchantment later set in because of the Arthur Robinson affair. (Robinson's summary dismissal from the Linus Pauling Institute of Science and Medicine in 1978, which became the subject of protracted legal action, was clearly an unhappy and complicated episode.)

Not surprisingly then, this is a psychoanalytical biography, occasionally insightful and at times critical. An appendix gives Pauling's responses to a series of Rorschach tests administered in 1953 and 1962; Pauling's astute and beautifully worded responses are solemnly analyzed by several specialists in the protocol. Only one suggests that Pauling was largely showing off: "My own feeling is that the person is using an overly intellectualized, overly self-referenced approach to these blots." It was of course this same showmanship that contributed to making Pauling an incomparable lecturer.

To treat Pauling's scientific accomplishments, Ted Goertzel, a professor of sociology at Rutgers University, enlisted the help of his son Ben, a cognitive scientist in Australia. Unfortunately, this collaboration leads to the least satisfactory part of the book. Chapters 3 and 4 are given over to a pedestrian summary of early 20th-century physics, followed by an inadequate resumé of Pauling's contributions to structural and theoretical chemistry. While this failure to do justice to the seminal science is not uncommon in biographies of modern scientists, it is a major impediment to placing the person's life in proper perspective. After all, Pauling devoted the first 50 years of his life almost entirely to experimental and theoretical chemistry.

The authors acknowledge "numerous interviews with Arthur Robinson" and their sympathy for Robinson colors their assessment of Pauling's character. The Goertzels' account of the matter is much more critical of Pauling than is Thomas Hager's in *Force of Nature: The Life of Linus Pauling*. And

As a recently ennobled Professor of Chemistry Emeritus, DEREK DAVENPORT, *of Purdue University, continues to write sparingly and to lecture unsparingly on chemical education, history of chemistry and various idiosyncratic mixtures of the two.*

in *Linus Pauling in His Own Words*, Barbara Marinacci, almost a member of the Pauling family, essentially brushes the matter aside. Whatever the truth may be, it seems unfair for the Goertzels to interpret a particular action of Pauling's later years as being symptomatic of a severely flawed character.

The Goertzels' study has value, particularly in the social and political area, but it is ploddingly written and poorly proofread. On page 84 we find Charles D. Coryell transmogrified to "Hugo Thorell" and on page 89 to "Charles Theorell." "Grigory Mendeleev", "J. LaBel", "J. E. Bernal" and "M. E. Datkins" certainly gain the reader's attention but not his confidence.

Hager's *Force of Nature* is a much longer, scientifically more authoritative and very well-written account of Pauling's life. It is a more empathetic book than is the Goertzels'. "I began this portrait as a Pauling enthusiast, and remain one, although my enthusiasm is now qualified," Hager writes. He fell under Pauling's spell in 1984 when, as a correspondent for the *Journal of the American Medical Association*, he attended a lecture given by Pauling on megadoses of vitamin C. Pauling's mesmerizing skill as a lecturer survived into his mid-eighties and, like legions before him, Hager was by turns enthralled, impressed and charmed.

Although he is not Pauling's official or authorized biographer (that daunting honor belongs to Robert J. Paradowski), Hager had frequent access to his subject and the cooperation of some members of the Pauling family. As a veteran of the medical beat, he handles the molecular biology and dietetics with understandable (in two senses) authority. He is equally persuasive in the chapters devoted to physical science and to political activism. In spite of the overlapping time frames of the various strands of Pauling's complicated life, the narrative flow is well maintained, the ample documentation being in the form of a 50-page appendix. While Hager's book is admiring of Pauling, it is by no means a hagiography, and it sets a standard that the various works-in-progress will be hard pressed to equal.

Pauling was a virtuoso of both the written and spoken word and his own best advocate. As Pauling's great contemporary Robert S. Mulliken ruefully admitted, "He was a master showman [who] persuaded chemists all over the world to think of molecular structures in terms of the valence bond method." His masterpiece was *The Nature of the Chemical Bond* (Cornell U. P., 1939), almost certainly the most influential chemistry text of the 20th century. It was typical of Pauling's stubbornness that in 1960, when the theoretical tide had already turned from the valence bond method towards molecular orbital theory, he issued a new third edition carrying ferrocene (with its 560 resonance forms) emblazoned on its cover.

In 1986 I wrote to Pauling, as no doubt had many others, suggesting that it was perhaps time he write his autobiography. He replied, "I am planning to do so when the time comes." That time never came, and as he says in his introduction to Barbara Marinacci's anthology, "this book will take me as close to writing my memoirs or autobiography as I shall ever get." Few of Pauling's technical writings find their way into *Linus Pauling in His Own Words*. Instead we are offered a generous selection from his speeches, interviews and nontechnical and political writings, some of them previously unpublished.

Pauling was a popularizer and propagandist of genius. At times he could be blunt: "Rifle bullets kill men, atomic bombs kill cities." Sometimes he was avuncular:

> When an old and distinguished person speaks to you, listen to him carefully and with respect—but do not believe him. Never put your trust in anything but your own intellect. Your elder, no matter whether he has gray hair or has lost his hair, no matter whether he is a Nobel laureate, may be wrong. The world progresses, year by year, century by century, as the members of the younger generation find out what was wrong among the things that their elders said. So you must always be skeptical—always think for yourself. There are, of course, exceptional circumstances: when you are taking an examination, it is smart to answer the questions not by saying what you think is right, but rather what you think the professor thinks is right.

At times he could even be rhapsodic:

> I like everything about the world. I like the mesons and the hadrons, and the electrons and the protons and the neutrons; and the atoms, the molecules, the self-replicating molecules; the microorganisms, the plants and animals; the minerals; the zunyite and cuprite, and pyrite and marcasite and andalusite, and all of the other minerals; the oceans and the mountains, and the forests; the stars and the nebulae and the black holes out there; the Big Bang 18 billion years ago. I like all of it!

But whatever the context and whatever the audience, he was clear, he was committed, he was compassionate and, far more often than most, he was right—or if not, at least on the side of the angels.

Gender Differences in Science Careers: The Project Access Study

Gerhard Sonnert and Gerald Holton
Rutgers U. P., New Brunswick, N.J., 1995. 187 pp. $50.00 hc
ISBN 0-8135-2174-2

Who Succeeds in Science? The Gender Dimension

Gerhard Sonnert and Gerald Holton
Rutgers U. P., New Brunswick, N.J., 1995. 215 pp. $16.95 pb
ISBN 0-8135-2220-X

These well-written and insightful books present the results of a most interesting study of a large, well-defined sample of scientists and present excellent discussions of previous work on gender differences in scientific success. *Gender Differences in Science Careers*, which describes the Project Access study in statistical detail, is not only a major contribution to the sociological literature in this area but is also clear, complete and cogent, a pleasure to read. *Who Succeeds in Science?* is written for a more general audience, including young people contemplating science careers, as well as teachers, science administrators and policy makers, and includes thought-provoking chapters of biographical material about scientists in the study sample as well as advice for would-be scientists and an array of policy recommendations.

Although there are differences in emphasis and amount of detail, both books discuss the results of the study and the conclusions that may be drawn from it and previous work. Understandably there is a great deal of overlap.

Project Access consisted of three components, two of which are exhaustively described in *Gender Differences in Science Careers*. The first was a statistical study of the 699 responses to a questionnaire sent to a sample of men and women who had held either National Science Foundation or National Research Council postdoctoral fellowships. The sample of respondents is shown to be representative of