Struggles and Discovery

In Praise of Imperfection. My Life and Work. RITA LEVI-MONTALCINI. Basic Books, New York, 1988. xiv, 220 pp. + plates. $18.95. Alfred P. Sloan Foundation Series. Translated from the Italian by Luigi Attardi.

Rita Levi-Montalcini was born in 1909 of Jewish parents into the patriarchal society of upper-middle-class Turin; she chose—during the rise of Italian fascism in the 1930s—to study medicine and then to embark on a career in biological research. That she overcame the obstacles of gender and religion and the objections of her Victorian family to become one of the most important biologists of her era is a remarkable achievement. The original edition of her autobiography is already a best seller in Italy, where Levi-Montalcini is nationally recognized, having won (with Stanley Cohen) the 1986 Nobel Prize for Physiology or Medicine for her work on nerve growth factor.

The most engaging sections of the book recount Levi-Montalcini's upbringing and her pursuit of a medical degree at the University of Turin, where her friends and classmates included Renato Dulbecco and Salvador Luria. She describes the major episodes of her early life with delicacy and emotion: the loss to cancer of her governess, whose resigned suffering led the then languishing teenager to consider medicine, and, somewhat later, the death of her father (an enterprising engineer who had introduced factory-made ice to the Piedmont). Such poignant reminiscences are nicely balanced by lighter anecdotes. Levi-Montalcini was initiated into research by Guiseppe Levi, a distinguished histologist and the charismatic professor of anatomy at Turin. When she became an intern in his laboratory, Levi assigned her the dubious project of deciphering how and why the developing human brain becomes convoluted. Once, when she was sent to the maternity ward of the Ospedale Maggiore to obtain suitable "material," an insufficiently bribed caretaker foisted upon her a full-term stillborn instead of the early fetus she had been told to fetch. When, during the bus ride home, she spied a small foot protruding through the newspapers in which her bundle had been carelessly wrapped, she decided that Levi had to suggest a more tractable course of embryological research. After several other false starts, she became expert in staining embryonic chick neurons with silver, a simple but elegant technique which allowed her to carry on research during the war with a minimum of equipment.

Perhaps the most compelling aspect of the book is Levi-Montalcini's description of the impact of fascism on the Turinese and the near destruction of her own incipient career by Mussolini's "Manifesto per la difensa della razza" (which barred "non-Aryans" from academic careers in 1938). Her struggle to persevere in an atmosphere of increasing chaos is deeply affecting. Surviving through anonymity, cleverness, and simple luck, she and her mentor Levi (also a Jew) managed to carry out an important series of experiments on nerve cell degeneration during the early 1940s. This work, performed largely in her bedroom under the most austere conditions, came to form an important part of the foundation on which modern concepts of nerve cell death now stand.

The latter half of the book, which largely covers Levi-Montalcini's career in the United States, is less satisfying. At the invitation of Viktor Hamburger, then professor of biology at Washington Univeristy, Levi-Montalcini came to St. Louis in 1947. The plan was for her to spend only one semester, just long enough to resolve a disagreement about the interpretation of independent work each had done earlier. Instead, Levi-Montalcini and Hamburger began a series of crucial experiments that led, over the course of five years, to the discovery of nerve growth factor (NGF). After 1953, when Hamburger backed away from these investigations to pursue other research interests, Levi-Montalcini and Stanley Cohen ingeniously pursued the NGF molecule and its biological significance. Although the text certainly conveys the excitement that led to the discovery of NGF and to an understanding of its biological role, readers will not learn why the protagonists thought their experiments important or why these discoveries changed the course of modern neurobiology, as they did. Crucial insights are depicted as a series of revelations, apparently devoid of the conflict and doubt that beset most scientific progress and divorced from any broader intellectual context.

The personal side of this part of the story is also oddly inadequate. Levi-Montalcini makes no allusion to a period of disaffection during the late 1960s, when, in despair over the lack of recognition she felt was then her due, she took up work on the cockroach nervous system. "For a long time people didn't mention how NGF was discovered," she has said in a recent interview (*Omni*, March 1988, p. 70) that is far more candid than her book. "My name was entirely left out of the literature. People repeated my experiment and didn't mention my name!" In fact, Levi-Montalcini is a fierce competitor who tends to categorize her colleagues as being for her or against her. This aggressive spirit, common to many of the best scientists and hardly surprising in someone who had to struggle against seemingly insurmountable odds, is not evident here. Nor does Levi-Montalcini confront the ambivalence of her relationships with Levi and Hamburger, both of whom are given little credit for their contributions to her success. The receipt of the Nobel Prize is mentioned only obliquely ("On Christmas Eve, 1986, NGF appeared in public . . . in the presence of the royals of Sweden," p. 201), and she studiously avoids disclosing her feelings about this and other belated honors. Perhaps as a result of these omissions, the last chapters of the book are increasingly disjointed. The death of a young friend in St. Louis, the deficiencies of the Italian scientific bureaucracy, the evolution of man, the fate of human race, and other tangential matters are discussed without obvious purpose.

In the end, one is left with the sense that both the scientific and personal stories have been only partly told. Perhaps this disappointment will be turned to advantage; the deficiencies in Levi-Montalcini's own account will surely encourage biographers to complete the task of revealing a brilliant and complex scientist.

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Patterns of Sea-Level Shift

Sea-Level Changes. MICHAEL J. TOOLEY and IAN SHENNAN, Eds. Basil Blackwell, New York, 1987. x, 397 pp., illus. $75. Institute of British Geographers Special Publications Series, vol. 20.

This compilation of papers on Quaternary sea-level changes conveys the evolution in thought over the past decade from the search for the chimerical global eustatic curve to an emphasis on careful determination of local, relative sea-level curves and regional patterns that can be integrated into a global four-dimensional record. This ne-