Van Ingen Snyder, "An American officer and his friends accord the Japanese officials little respect," as reproduced in A. W. Habersham, *The North Pacific Surveying and Exploring Expedition, or My Last Cruise*. [From *New Lands, New Men*]

sweat made possible the "quantum leap" (p. 269) that science took in the 19th century.

Long since having established his scholarly credentials as the interpreter of American scientific exploration, Goetzmann in this final volume of his trilogy on the subject provides a popular account of "the good old days of the explorer-adventurer among the winds and currents of storm-tossed seas at the very ends of the earth" (p. 362). In its majestic sweep and narrative power, the book stands as a tribute to a motley crowd of fur traders, Indian portraitists, landscape artists, surveyors, and simple collectors and as a reminder that science derives from intimate engagement with untamed nature.

WILLIAM STANTON
Department of History, University of Pittsburgh, Pittsburgh, PA 15260

Further Letters of Darwin

The Correspondence of Charles Darwin. Vol. 2, 1837–1843. FREDERICK BURKHART and SYDNEY SMITH, Eds. Janet Browne, David Kohn, and William Montgomery, associate editors. Stephen V. Pocock, managing editor. Cambridge University Press, New York, 1986. xl, 603 pp., illus., + plates. $37.50.

With remarkable promptness, the editors of Darwin's correspondence invite us to a second treat. Less than two years after the much-hailed publication of volume 1 and the *Calendar* of the correspondence (see *Science* **228**, 838 [1985]), volume 2 brings the project to the year 1843. There is no need to comment on the thoroughness, exemplary scholarship, and great utility of this edition of Darwin's correspondence, that task having already been performed by reviewers of the previous volume.

The present volume contains 405 letters, covering the period 1837–1843. These were indeed momentous years for the young naturalist. In July 1837, as Darwin tells us in one of the most famous lines of his diary, he

> opened first note Book on "transmutation of species".—Had been greatly struck from about month of previous March—on character of S. American fossils—& species on Galapagos Archipelago.—These facts origin (especially latter) of all my views" [p. 431].

It is clear that readers interested in following the development of Darwin's views on the modification of species through the agency of natural selection should address themselves to the available editions of the notebooks and of the manuscript works of the years 1842 and 1844, which represented Darwin's earliest attempt to formulate his theories in a systematic way. Yet the letters here reproduced contain interesting insights into Darwin's system of work. His growing self-confidence as geologist and naturalist, as well as his formulation of "theories to work by" on the question of species, turned Darwin into a sophisticated detective, capable of extorting important information from colleagues and friends who often would never suspect the importance of what they knew for his great project.

The letters here reproduced show Darwin intent on recruiting the army of naturalists, animal and plant breeders, travelers and surveyors, colonial bureaucrats, and amateur virtuosi to whom over the years he addressed thousands of questions on hundreds of subjects. Darwin soon divulged the secret of his work on species to such friends as Charles Lyell and his cousin William Darwin Fox; to others he simply wrote that variation of forms was a topic he was curious about, and he kept the great majority of correspondents in the dark as to the true purpose of the elaborate questionnaires and requests for information they received.

In September 1843, Joseph Dalton Hooker returned from his voyage of exploration on board H.M.S. *Erebus* and immediately took a leading position in Darwin's army of correspondents. The two had much in common, though the slightly older Darwin must for the first time have felt the senior partner in the exchange of letters and information. The four letters to and from Hooker printed in this volume were in fact the beginning of one of the most interesting scientific correspondences of the century, and it could be argued that Hooker was probably the single most important influence on the development of Darwin's thought after the early encounter with Lyell.

In retrospect, however, Darwin might not have looked on the start of his work on species as the most important event of the years 1837–1843. Indeed, marriage to his cousin Emma Wedgwood and the birth of their first three children were undoubtedly the major events of his life during these years, and not surprisingly they constitute the focus of many of the letters here published. The interest of the family side of the correspondence is more than merely biographical, rich as it is in glimpses of early Victorian upper-class households. Though the relationship between Emma and Charles was based on reciprocal veneration and respect, it was good Victorian Charles who kept the only key to the drawers containing all the keys to cupboards and other locked repositories, and it was with reluctance that

he once sent it to Emma when away, warning her to be careful with it.

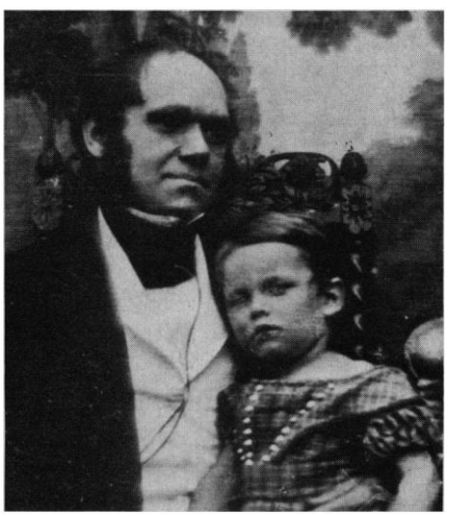
Of great interest and high emotional value are the letters relating to Charles's religious doubts and to Emma's sincere sorrow, and at times despair, over her fiancé's lack of belief in revelation. Emma was consoled to know that Charles held his strong moral principles to be perfectly compatible with traditional Christian ethics. Yet, in a letter she wrote him shortly after their marriage (a further evidence of the frequency with which the couple discussed religious topics), her confidence that Charles's ethics was a sufficient condition for salvation appeared shaken:

> Don't think that it is not my affair & that it does not much signify to me. Every thing that concerns you concerns me, & I should be most unhappy if I thought we did not belong to each other forever [p. 172].

The emotional significance of this letter lasted throughout Darwin's life and helps explain his reluctance to discuss religious views publicly, for fear of causing pain to Emma. He treasured the letter and wrote a short, moving comment on it:

> When I am dead, know that many times, I have kissed & cryed over this.

As reviewers have remarked when commenting on the first volume, this edition of the correspondence of Charles Darwin represents a considerable step forward toward understanding the birth of contemporary evolutionary biology, as well as toward appreciating the social and general cultural dimensions of Victorian science. The work under review could be looked at as the termination of almost two decades of philologically impeccable and intellectually innovative scholarship on Charles Darwin. Yet it could also be argued that this admirably accurate edition of Darwin's letters will provide a new and powerful incentive to studies in the history of evolutionary biology and in British and European cultural history in general.



Charles Darwin and his eldest child, William Erasmus Darwin; from an 1842 daguerreotype. [From *The Correspondence of Charles Darwin*, vol. 2; courtesy of the Darwin Museum, Down House]

The interpretation of this treasure of documents will eventually make us feel even more dramatically the lack of authoritative modern assessments of figures such as Lyell, Hooker, Richard Owen, or William Benjamin Carpenter. In other words, the next task on the agenda of the historian of evolutionary biology is to place Darwin within the context of his time, without anachronistic preconceptions or hagiographical intentions. These letters, or the notebooks, will not help us understand the diffusion of various brands of evolutionary thought in the 1830s or to appreciate the dimensions—in England as well as in Europe and in the United States—of the impact of Robert Chambers's *Vestiges of the Natural History of Creation* or of Herbert Spencer's mid-1850s support of cosmic evolution. There is no question that Darwin carefully and originally formulated his solutions, and his explanatory strategies, within a context of lively debates. These debates, which were religious and philosophical as well as properly scientific, centered on the question of species and the problem of explaining the succession of life on the strata and the surface of the earth. The merit of stimulating new lines of research and providing as many new questions as solutions will undoubtedly add to the debt scholars will gladly acknowledge to the editors of this edition of Charles Darwin's correspondence.

PIETRO CORSI
Department of the History of Science, Harvard University, Cambridge, MA 02138

Lives of Science

Women in Science. Antiquity through the Nineteenth Century. A Biographical Dictionary with Annotated Bibliography. MARILYN BAILEY OGILVIE. MIT Press, Cambridge, MA, 1986. xiv, 254 pp. $25.

With the rising interest in women's studies the last decade has seen serious investigations and publication of a number of useful and provocative works on the influence of gender in various scholarly disciplines, particularly science. In the past year three reference books—Caroline Herzenberg's *Women Scientists from Antiquity to the Present: An Index*, Margaret Alic's *Hypatia's Heritage: A History of Women in Science from Antiquity through the Nineteenth Century*, and now Marilyn Ogilvie's *Women in Science*—have appeared, updating our previous standard biographical dictionaries, Rebière's 1897 *Les Femmes dans la Science* and Mozans's 1913 *Women in Science*, and adding new perspectives.

Ogilvie, a historian of science at Oklahoma Baptist University, presents biographical sketches of 186 Western women active in science over the centuries from antiquity until well into the 20th. Although not so extensive as Alic's or Herzenberg's, her compilation is helpful, giving reliable information in a convenient form. The emphasis is on American women scientists—80 are listed—but representatives from nine European countries and from the Greek, Alexandrian, and Roman periods are also included.

Ogilvie lists her subjects in alphabetical order and, when possible and as appropriate, gives for each her birth and death dates, nationality, branch of science, birthplace, parents' names, her education, professional positions, husband's name, number and names of children, place of death, major or representative works, a summary of her career and references to writings about her. The entries vary in length from a few lines (as in the case of Elsa Neumann, German physicist) to more than eight pages (Marie Curie), depending on the woman's importance and the availability of printed information about her. "Scientist" is broadly interpreted to encompass women who were physicians, inventors, collectors, writers, popularizers, translators, illustrators, and patronesses of science and of scientists. The author makes no claim of comprehensiveness for her roster—and indeed it omits numbers of able 19th-century women scientists (including Maria Emma Gray and Sarah W. B. Lee)—but she has noted some often-neglected figures such as the English chemist Elizabeth Fulhame. Seven well-arranged bibliographical sections list source materials; the entries here are often accompanied by brief summaries and pertinent comments. These units, along with a catalogue of the subjects (with period, field, and nationality of each), add to the usefulness of this attractively printed book. The index, regrettably, does not include the reference material.

Noteworthy is Ogilvie's introductory essay, "Science and women: a historical view," in which she examines chronologically Western science and the relation of women to it. Changing views of the physical universe and of human society (especially women) are deftly interwoven in this brief survey. All in all, readers should find much in the volume to claim their attention.

ELIZABETH C. PATTERSON
Albertus Magnus College, New Haven, CT 06511