

this much-needed volume span two centuries (late eighteenth to late twentieth), three continents (Europe, Australia, North America), and innumerable subdisciplines of geology (invertebrate and vertebrate paleontology, paleobotany, igneous and metamorphic petrology, structural geology, and Quaternary science.) For the reader motivated to understand not only the role of women in the history of science in general, but their role in nineteenth- and early twentieth-century geology in particular, *The Role of Women in the History of Geology* is most welcome.

Cynthia Burek, a professor of geoconservation and Deputy Director of the Centre for Science Communication at the University of Chester, U.K., and Bettie Higgs, a lecturer in the Department of Geology at University College Cork, Ireland, wrote or cowrote six of the twenty-two papers here. This fact, along with their deft editorial hand, gives the volume narrative cohesiveness. Nearly every paper contains information that connects familiar men of geology with heretofore unrecognized women of geology. For example, Anne Phillips, the niece of William “Strata” Smith and the sister of John Phillips, professor of geology in King’s College, London, worked in the field with both these relatives and independently recognized the crucial piece of evidence, a conglomerate, that disproved Murchison’s theories about the intrusive origin of England’s Malvern Hills. Similarly, Annie Greenly worked with her husband Edward in the Scottish Highlands and on the Island of Anglesey for over two decades. Her caution to him regarding geologic mapping—“Let [C. T.] Clough be your model in precision, but do not follow him in style. Found your style on nature’s curves. Watch these wherever you can and where you cannot see them, feel them. To be true, a map must be beautiful” (p. 320)—anticipates future arguments made by contemporary feminist philosophers of science about epistemological standpoint.

Two especially fascinating chapters focus not on individual women but on the societal contexts in which they worked. “The Historical Problems of Travel for Women Undertaking Geological Fieldwork” details the difficulties, whether sociological, political, or logistical, that women geologists encountered when traveling to or working in the field. The insights offered in this chapter bear on the leaky pipeline of women in field sciences today. In “The Role of British and German Women in Early Nineteenth-Century Geology: A Comparative Assessment,” Martina Kölbl-Ebert, a geologist and curator at the Geological Collection of the State of Bavaria, Germany, explains how the early profes-

sionalization of geology and rigid gender roles, which idealized female household duties and motherhood in a climate that was hostile to intellectual women, precluded women’s collaboration in German geoscience. She contrasts this with the situation in Britain, which saw a local window of opportunity between 1795 and 1840, in the gap between the early beginning of industrialization and the late professionalization of geology. The former freed women of higher social standing from household responsibilities, while the latter created a need for an informal workforce to help the gentleman scientists. According to Kölbl-Ebert’s fascinating account, these circumstances—in combination with less rigid gender roles that did not delineate between private and public spheres for women and men, respectively, as well as simple fashions in women’s clothing—facilitated informal geological education for women in Britain, even though universities did not admit them until the 1870s.

For the visual learners among scholars, the volume’s illustrations alone convey the ever-present, albeit shadowy, presence of women in geology during the period under examination. The photographs of women in the field, at conferences, and in classrooms, along with their field notes and illustrations, are enthralling. They add visual heft to the words of the volume. My only gripe with the volume is the fact that authors’ first names are absent, as are brief biographies of each contributor. Why hide this information?

One would be hard pressed to write a full-length biography of most of the women profiled in this volume. Like Shakespeare’s sister, they were encumbered and their contributions remained obscure. However, this collection of their stories makes the point with gusto: women had substantial roles in the development of the science of geology. In *A Room of One’s Own*, Virginia Woolf wrote, “What one wants, I thought—and why does not some brilliant student at Newnham or Girton supply it?—is a mass of information” (Woolf, p. 45). Burek and Higgs have answered Woolf’s call admirably.

JILL SCHNEIDERMAN

Leo Corry. *Modern Algebra and the Rise of Mathematical Structures.* viii + 431 pp., index. Second revised edition. Basel/Boston/Berlin: Birkhäuser Verlag, 2004. €69.55 (paper).

“Structure” has been a pet word for scientists and intellectuals in the twentieth century, enjoying an aura of depth that one is tempted to qualify as mythological. We have seen waves of structuralism from linguistics to philosophy,

from anthropology to literary theory, from mathematics to psychology, naturally followed by counterwaves of poststructuralism or anti-structuralism. (An interesting, if old, analysis can be found in Jean Piaget, *Structuralism* [1968; Routledge & Kegan Paul, 1971]; a more recent attempt to put the case of mathematics in context is David Aubin, "The Withering Immortality of Nicolas Bourbaki," *Science in Context*, 1997, 10:297–343.)

Within this broader picture, the case of mathematics has very peculiar and interesting characteristics. Mathematical structuralism is still alive and well, among both mathematicians and philosophers of mathematics; and there is little doubt that the "rise of mathematical structures" from the late nineteenth century has contributed more than anything else to the intellectual vogue of structuralism.

Leo Corry's book is the first attempt to produce a general history of this phenomenon in the development of mathematical thought. His work has two parts: the first is concerned with the emergence of a conscious interest in the analysis of algebraic structures; the second deals with attempts, from the 1930s to about 1950, to thematize the very concept of structure and give it pride of place in mathematical work, including that of Bourbaki and the early development of category theory. Though not the only possible choice, the focus on *Moderne Algebra* (the title of B. L. van der Waerden's famous book of 1930) is obviously adequate, and it is supported by the perception of influential insiders such as the members of Bourbaki. Corry's analysis in Part I concentrates on the particular example of the development of ideal theory (the theory of "ideals," i.e., certain set-theoretical structures, in rings), from the pioneering contributions of Richard Dedekind beginning in 1871, which dealt with the crucial but particular case of rings of algebraic integers, to those of Emmy Noether in 1926, which generalized to abstract rings.

Among the many possible ways of dealing with this matter, historiographically speaking, Corry's approach has a marked conceptual and epistemological bent. The approach is quite critical, too, as shown by the sharp comments that color his analysis of Bourbaki's legendary theory of structures and their general images thereof. A seemingly simple, but in practice very useful, framework for this approach is laid out in the introduction. Mathematicians and scientists not only deal with a *body* of knowledge (problems, techniques, established results) but also entertain certain *images* of that same knowledge and of their discipline, images that guide their research. Corry sets himself the task

of following the rise of structures both in the images (Pt. 1) and in the body of mathematics (Pt. 2). This effort is particularly intriguing because twentieth-century images of mathematics have emphasized a certain kind of reflexivity, tending to view the discipline as self-contained and even self-founded, however deceptive these ideas have proved to be.

I would particularly recommend Chapter 1, "Structures in Algebra: Changing Images," for those who want to gain a deeper grasp of the history of modern mathematics. The remaining chapters offer a sound and interesting introduction to the topics discussed. Many questions of detail and interpretation deserve to be further developed, but this only underscores the interest and suggestiveness of the book. Among them, I would like to mention the need to complement Corry's study of Bourbaki's theory with parallel analyses of contemporary and even earlier contributions to an understanding of structures as set-theoretical constructs.

It is to be hoped that in the coming years we shall see new studies of the rise of mathematical structures in all possible directions—further analysis of detailed history, discussion of the general interpretive framework, assessments of conclusions, and attempts to deal with the broader question of how contextual, institutional, intellectual, and social ingredients have affected this story. In the process, Corry's book will remain indispensable as a reference.

In closing, I cannot refrain from a remark about the production of the book. This new paperback edition comes with the sheets simply pasted and not seamed, despite the fact that its price would be regarded by most publishing houses as sufficient for a hardcover edition.

JOSÉ FERREIRÓS

Dennis R. Dean. *Romantic Landscapes: Geology and Its Cultural Influence in Britain, 1765–1835.* (History of Earth Sciences, 5.) 426 pp., illus., bibl., apps., index. Ann Arbor, Mich.: Scholars' Facsimiles and Reprints, 2007. \$200 (cloth).

Dennis Dean's doctoral thesis of 1968, "Geology and English Literature: Crosscurrents, 1770–1830," was one of the most important studies of geology and literature in that decade. The range of sources discussed, unfettered by traditional concepts of the literary canon, ensured that it remains useful four decades later. Dean now offers a substantially revised, expanded version of his thesis, aimed at literary historians, historians of ideas, and earth scientists. It is Volume 5 in the "History of Earth

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