Geological granddaddy

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James Hutton and the History of Geology. By Dennis R. Dean. Cornell University Press: 1992. Pp. 303. \$38.50.

SCIENTISTS often crave a founding father-figure for their science; their motives would make an instructive study in the anthropology of science. The choice of patriarch is often chauvinistic, revealing modern science to be as internationalist as the Olympics. For geologists, the British (indeed English-speaking) favourite has been James Hutton (1727–97), the Scottish author of a massive *Theory of the Earth* (1795) that is far more often revered than read. A quarter of a century ago, E. B. Bailey, a former director for the British Geological Survey, expressed the claim baldly with his book *James Hutton: The Founder of Modern Geology* (1967). The title of Dennis Dean's new book is more ambivalent, but he ends his text by endorsing Bailey's phrase. Meanwhile, most historians of science have grown reluctant to identify either founders or forerunners, judging that both epithets obfuscate more than they reveal.

Hutton is a difficult subject for biography, because few manuscript records by or about him are now extant, and virtually all his scientific work was published in the last few years of his life. Nonetheless, Dean has done a fine job of piecing together what he and other historians have managed to ferret out about Hutton's career. It was a remarkably uneventful one in outward terms. Hutton was a typical figure of the European Enlightenment, and a prominent one in its Scottish manifestation — a friend of David Hume and Adam Smith. After a standard medical education, much of it on the Continent, he was for some years actively involved in agricultural improvement, until a sleeping partnership in a successful chemical firm gave him the financial freedom to settle in Edinburgh as a somewhat eccentric bachelor and a leisured 'natural philosopher'. That contemporary term, rather than the anachronistic word 'scientist', defines his intellectual endeavour: he would have regarded his three-volume *Principles of Knowledge* (1794) as just as important as his geological *Theory*.

The most valuable aspect of Dean's book is that it systematically summarizes all Hutton's writings about the Earth; his prolix texts are expounded with clarity and insight. This gives readers a reliable summary of what Hutton claimed, and on what kinds of empirical and concep-

tual foundations; it should act as a helpful guide in reading the texts themselves. The same expository treatment is extended to the immediate reception in Britain and Ireland of Hutton's great paper to the Royal Society of Edinburgh (1785) and to that of the two-volume *Theory* that set out his argument in detail a decade later (a third volume remained unpublished at his death, and indeed until 1899). The exposition also covers the work of Hutton's younger champion, the Edinburgh mathematician John Playfair, whose *Illustrations of the Huttonian Theory of the Earth* (1802) was the more readable, but significantly

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modified, medium by which the majority of nineteenth-century geologists imbibed their Hutton. Although Dean focuses on Hutton's texts and those of his British and Irish contemporaries, he also reproduces a good selection of the drawings with which they illustrated their arguments, and he is sensitive to the significance of their concrete first-hand experience in the field.

The book would have been more coherent and even more valuable, however, if it had been restricted to Hutton's lifetime and the first decade or two after his death. As it is, Dean pursues an increasingly diluted stream of 'Huttonian' geology, which he concedes was largely mediated through Playfair, all the way to Charles Lyell's avowedly neo-Huttonian *Principles of Geology* (1830–33), and even through to the end of the century. This later part of the book is increasingly sketchy, and becomes largely derivative of the work of other historians. It ends with a

rapid survey of "Hutton and the historians"; but this turns out rather curiously to mean various scientist-historians of the nineteenth century, and the survey stops around 1900 with the venerable Geikie and Zittel. What is therefore missing from Dean's concluding assessment of Hutton's place in the history of geology is a thorough engagement with the research of modern historians such as Roy Porter (*The Making of Geology*, Cambridge University Press, 1977) and Rachel Laudan (*From Mineralogy to Geology*, University of Chicago Press, 1987), both of whom see Hutton as a figure somewhat apart from the mainstream of European or even of British geology, and for whom the controversies between Huttonians and their critics were by no means a matter of black and white. Such an assessment does not make Hutton any less important, of course, but it does demand at least a reconsideration of the traditional interpretation of Hutton as the, or at least a, 'founder' of geology.

Dean's book would also have been more useful if it had provided a richer context for Hutton's work. Dean claims, in my opinion correctly, that Hutton's famous conclusion, that in the Earth "we find no vestige of a beginning, no prospect of an end", should be read primarily as a statement about the limitations of human knowledge, rather than as a claim about the vast timescale or even the eternity of the world. But that interpretation needs to be related to Hutton's own epistemology; Dean has missed the chance to present Hutton's intellectual enterprise as a unified whole. Furthermore, even Hutton's 'geology' needs to be understood in his own fully international context. Like other Enlightenment philosophers, Hutton was well aware of what was going on in countries other than his own; he thought nothing of including in his book lengthy untranslated quotations (mainly from the great Genevan naturalist Horace-Bénédict de Saussure) in the then international language of science. Unfortunately Dean gives only the most cursory attention to Hutton's Continental sources, or to the way Hutton's theory was received beyond the English Channel. Above all, he does not show how Hutton's work fitted into a well established and pan-European tradition of 'theories of the Earth', nor does he analyse adequately how Hutton's book and others in the same genre differed from the self-consciously new science of geology that replaced them in the decades after Hutton's death. □

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