I was greatly pleased to learn that the Honours Geology Class of 1983 at the University of Edinburgh read my editorial in the September 1982 issue of the Journal of Sedimentary Petrology (Shea, 1982a) and found it sufficiently provocative that they designated one of their number to write a response to it. What could be more appropriate than students at Edinburgh discussing and defending the ideas of James Hutton, the sage of Edinburgh and the founder of modern scientific geology?

In response to their comments I offer the following observations.

1) Uniformitarianism has meant different things to different scientists at different times and different places. Hutton was not the first to conceive a kind of uniformitarianism, nor was he the last. In fact, the concept of uniformitarianism has evolved and what was accepted by Herodotus, Buffon, Prevost, Lyell, Playfair, or Hutton is not what has been established by the best recent analyses of uniformitarianism (see particularly Gould, 1965, and Goodman, 1967). It is certainly no denigration of Hutton's contributions to acknowledge this.

2) I make no claim that the majority of contemporary scientists or geologists accept my particular concept of uniformitarianism. Quite the contrary, as I pointed out in my editorial and elsewhere (Shea 1982b), most of what has been written about uniformitarianism in recent years is simply wrong. Fortunately, scientific validity or usefulness is not determined by majority vote. Furthermore, a number of thoughtful modern analyses of uniformitarianism have been written and I have no doubt that most geologists will eventually acknowledge that 'definitive modern uniformitarianism' is the rule of simplicity.

3) Philosophers of science have recognized for some time now that the concept of natural laws that control or govern nature is based on a failure to recognize that the word law in this instance is a metaphor, that is, a term applied to something to which it is not literally applicable. There is no known way that our laws could control nature, and if we find that they do not describe nature, we change the law rather than chastise nature for its disobedience. The reason we assume that the laws that describe nature's behavior today also described it in the past and will describe it in the future is that it is the simplest assumption to make. However, if we find that a given law does not describe nature sufficiently well at any given time or place, we don't throw up our hands in despair. We can rewrite the law to make it more general, or acknowledge that it only applies under certain conditions or at certain times, or abandon that law. What the rule of uniformitarianism (that is, simplicity) tells us to do is to choose the course that leads to the greatest simplicity or elegance in overall theory. In short, modern uniformitarianism doesn't tell nature how to behave, and it doesn't require that we make any particular assumption about how nature behaved in the past or will behave in the future; it tells us how to behave if we wish to be scientific.

REFERENCES


SHEA, J. H., 1982b, Twelve fallacies of uniformitarianism: Geology, v. 10, p. 455-460 (see also discussions and reply in v. 11).