Memorial to Norman David Watkins 1934–1977

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On November 2, 1977, Norman David Watkins, professor of oceanography at the University of Rhode Island, died in his home at Jamestown, Rhode Island, after an illness of a few months, leaving a large void in the geological landscape and much promise for rich contributions to our science unfulfilled. He had been a professor at the Graduate School of Oceanography of URI and, earlier that same year, had begun a tour of duty at the National Science Foundation as head of the Division of Earth Sciences. There, his short stay notwithstanding, he had already begun to exert an important and novel influence on the organization and thrust of the Foundation's funding programs in the Earth and ocean sciences, but the onset of a sudden illness in the summer forced him to leave the work unfinished.

Watkins was born in Sunbury-on-Thames, England, on February 15, 1934. He received his early geological education at the University of Birmingham in 1958–1959. Subsequently, he went to work for Shell Oil of Canada, Ltd., where his activities ranged from geological mapping in British Columbia and the Yukon to seismic surveys in arctic Canada, and also involved seismological instrumentation and instruction. The years of the early 1960s Norm spent as a research associate and instructor at Stanford University where, with Alan Cox as his advisor, he became involved in paleomagnetic studies of Miocene lavas in southern Oregon. He also taught physics at Menlo College where his teaching was very highly regarded and is still remembered. His Oregon research led to a Ph.D. in geophysics from the University of London in 1964. At Stanford he also began to teach geophysics and marine geology, an activity that took an increasing amount of his time, talent, and dedication in subsequent years, first as an associate professor in the Department of Geology at Florida State University, then, since 1970, as a professor at the University of Rhode Island where he taught geophysics to graduate students. Over the years, some 250 undergraduate and 20 graduate students annually received a good part of their introduction in the Earth sciences and their advanced education from him. Nearly a dozen master's theses and half that many Ph.D. dissertations were completed under his direction in those short years. The large amount of time and energy demanded by this educational activity and by his efforts on behalf of the administration of the university did not prevent him from carrying on a research program that was astonishing not only for its productivity but also for its enormous range in subject matter and geographic extent. In the twenty years of his professional career Norm published nearly 120 scientific papers, often co-authored with a wide range of specialists from micropaleontologists to geochemists, and nearly 200 abstracts, reports, and other publications outside the usual refereed scientific media. He did field work on land and at sea in Canada, Texas, the Pacific Northwest, New Mexico, and

many remote and romantic places, including Mexico, New Zealand, Jamaica, and numerous distant and often inaccessible oceanic islands. He also took part in six major oceanographic cruises.

As if this were not enough, Norm also found time to become a major influence in the development of the marine geosciences in the Graduate School of Oceanography at URI, which, largely as a result of his dedication and fine sense of excellence, became an important member of the small cluster of marine geology and geochemistry programs in the country. His loss will be particularly sharply felt because—big money, big science, and big politics notwithstanding—the vitality and success of such programs are mainly a function of the drive, leadership, and insight of a comparative few. It was this accomplishment at URI as much as anything else that led to his selection as leader of the Earth science program of the National Science Foundation, and many of us were hopeful that he would introduce a fresh and innovative spirit in this important activity.

This is the record, thus, of a successful and influential man, and a record of high visibility. And yet, it is one of those ironies of life that a person's dimensions tend to be much more clearly perceived from the emptiness he leaves behind than from observation of his activities while he is still with us.

Not that Norm was, by anyone's standards, an unobtrusive, invisible type. One of my earliest memories of him is that of a large and vigorous man, berating some unfortunate lecturer in a very audible voice and over the top of a large crowd, pointing out that the beauty of the plate tectonics model should not be an excuse for careless measurements or sloppy reasoning.

Norm belonged to the circle of geologists and geophysicists who were fortunate to be close witnesses at the birth of the new geology in the mid-1960s. There were those who created or, at least, clearly phrased the fundamental ideas. Then there was the larger group whose data and interpretations served as the bricks from which the building was constructed. There were those who translated the techniques and concepts, largely derived from the somewhat unfamiliar field of geophysics, in terms which the rest of us could understand. And finally, there were those—and they were not numerous at first—who stood up for integrity with the data and for merciless critique when the current of events tended to flow faster than the accumulated evidence warranted. Norm loomed large among all three of the last categories. Not infrequently, his highly audible statements regarding the virtues of rigorous criticism and against selectivity in evidence made him more enemies than friends on the speeding band wagon that was plate tectonics in its early days. The courage required to play this essential role should not be underestimated.

Norm was, above all, a forthright, outspoken, and sometimes blunt individual and an idealist in his approach to science. Honesty in scholarship meant to him much more than just a tradition; it was the spirit itself of science, and his provocative, articulate statements, often in the role of devil's advocate, have caused many an enthusiast to reexamine his premises. Because of the same personal qualities, he was also a strong catalyst for his co-workers in whom his challenges, in addition to occasional irritation, no doubt, frequently brought out the best they had to give. He was, at heart, a team worker; most of his research was done in collaboration with one or more colleagues. In such a setting, the genesis of ideas is difficult to trace, but it is certain that even where Norm did not directly generate the interpretations, his stimulus was essential to their birth.

His interest in all matters of the Earth was catholic. The range of his investigations and publications is enormous: the circum-Antarctic Quaternary, deep-sea erosion,

the petrology and geochemistry of ocean islands, geomagnetic polarity reversal stratigraphy and its methodology, the Earth's dipole and non-dipole fields, global volcanism and volcanic ash deposits; the list can be continued for some time. At one time or another all of these and many other subjects engaged his attention and yielded one or more of the papers in his vast list of publications, longer and more diversified for a scholar of his age than any I have seen. Not all of this diversity was entirely by choice. As a skilled and productive rock paleomagnetist by trade, his collaboration was eagerly sought by many who needed his data to solve their problems, and Norm seldom refused his assistance. Invariably, he became captivated with the questions to which his tools were applied, and his cooperation was never limited to just a supply of data. First of all he was a geologist to whom all of the Earth and its history was fascinating and worthy of his time and effort.

It is undoubtedly true that a broad range of interests and the rapid migration from problem to problem can often exist only at the expense of depth and of the persistent tracking of an elusive but important truth. There are right ways and wrong ways about choosing and solving problems, and the right way seldom appears easily and quickly. Persistence and the perception of the key nature of certain problems are critical ingredients of fundamental research, and neither comes easily or frequently in a life of wide-ranging curiosity motivated by a burning desire to take advantage of all opportunities for all possible kinds of learning. However, there are compensations for the loss of penetrative power: Norman experienced the freshness of new horizons, the stimulus of contact with ever different modes of thinking, the cumulative effect of a broadening grasp of the whole Earth, and—something which greatly appealed to Norm—the chance to see all of the world's remote places. Such places are becoming hard to find when tourist groups can be seen in the upper reaches of Amazon country or in Afghanistan, but Norm found them on a remarkable collection of distant islands. Amsterdam Island, St. Paul, Crozet Island, Fernando de Noronha—these were real places to him, not remote dreams of storm-tossed or palm-fringed outposts. Thus, to the other benefits is added the purely personal one of having seen so much of the world.

One other benefit, that of having touched at least once upon a great many aspects of geology, no matter how fleetingly sometimes, is personally at least equally satisfying. It also sometimes deepens into great geologic wisdom and insight. The time for that was not given him in adequate measure.

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Printed in U.S.A. 5/79