# EDITORIAL

## HISTORICAL SCIENCE

In the acrimonious controversy between creationists and evolutionists, some scientists have stated that the general theory of evolution is as much a fact as other well-established principles of science such as gravity. As expected, such statements evoke varied reactions. Some feel comfortable with these because both gravity and evolution are naturalistic phenomena which are within the current concepts of science. On the other hand, others see a significant difference in the degrees of validation possible for these two concepts.

Most of us became acquainted with the realities of science by performing experiments in the laboratory and arriving at the expected results. This gave us great confidence in the scientific method. The outcome of experiments could be predicted. Of course, occasionally the results did not come out as expected, and the malfunction was usually explained in terms of faulty procedure, inaccurate measurement, contamination, etc., but not as indicating possible alternative interpretations of science. These basic experiments helped establish in our minds the idea that science is an absolute and that if things go amok the fault is due to anything except science.

There is ample evidence to support the predictability of simple laboratory experiments. It is regrettable that the contrast between these well-tried experiments and the unknowns of more investigative scientific endeavors are seldom appreciated by the general public or even by some trained scientists. Science is envisioned as a simple, sure procedure. We have all met that young visionary scientist who is enthusiastic about his new-found discipline and its potential for advancing human knowledge, but he has not yet acquired the caution that comes from experience. He does not yet appreciate that what we glibly call the "advancing frontiers of knowledge" also represents the "edge of ignorance."

Some scientists have attempted to alleviate the contrast between degrees of confidence in science by isolating some of the less sure areas of science under the designation of historical science. As with other broad concepts, historical science cannot be simply defined. It is not to be confused with the historian's use of the same term to describe a methodological concept. As used by scientists, historical science refers especially to those aspects of science which are not as easily testable and predictable because they are more unique at least within the limits of practicality. They often represent concepts about the past, hence the historical connotation in the designation. Physics and chemistry are usually considered less historical; geology, biology and paleontology more so. This difference is due in part to the complexity of the factors under consideration — physics and chemistry being the simplest and most predictable, while biology and paleontology which deal with a vast complex of

interacting factors present more uncertainties. Nevertheless, it is mainly around the problems of testing past unique events that the concept of historical science has developed. Unique events are difficult to analyze scientifically; unique past events are even more difficult. In the historical sciences, opportunity for speculation is greater and caution more appropriate. The warning in the statement that "God cannot alter the past, but historians can" is likewise applicable to historical science.

A significant number of the great controversies in science have centered around historical science issues. Given the difficulty in testability, this is expected. Some of the major battles include: 1) Concepts of the age of the earth changing from the 17th-century ideas of a few thousand years to Kelvin's estimates of less than 100,000,000 years to contemporary concepts of several billion years, 2) The change from the Neptunist's ideas that the crust of the earth was formed mainly by the action of water to ideas involving plutonic and volcanic concepts, 3) Ideas in the 17th century that life arose spontaneously, to the work of Louis Pasteur last century denying it and then back to spontaneous generation again in modern studies of abiogenesis, 4) Denial to acceptance of the ice ages, 5) Acceptance of catastrophism for the past history of the earth followed by total rejection for over a century, then again acceptance of a modified catastrophism, 6) Replacement of belief in the fixity of the continents by the present concepts of continental drift and plate tectonics, 7) Current contentions in anthropology regarding the purported evolutionary ancestral pattern for man, 8) The evolution versus creation controversy. Thus it appears that the uncertainty of historical science has provided its share of controversy.

One of the lessons to be learned is that we should not confuse the success of what we can call immediate science with the tentativeness of historical science. Our science is not as good when dealing with the past because of unknown changes that occur with time. The further one goes back, the more difficult it can become to relate the present to what may have happened long ago. Caution warrants that immediate and historical science each be kept in its proper sphere of evaluation. Evolution, classical uniformitarianism, catastrophism, or creation, etc., may be considered to be on a par with immediate science by some, but more appropriately these are historical sciences.

The success of immediate science should not be used as an excuse to bolster the inadequacies of historical science by ignoring the difference between the two. Science can provide information related to these "historical" concepts, but the difference in the degree of scientific validation between immediate and historical science should be recognized. Because of this, one should not say that the general theory of evolution is as much a fact as gravity.

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