

# SCIENCE NEWS®

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**COVER:** The instruments of modern particle physics are big enough to be seen easily from space, as this Skylab view of the Chicago area from 240 miles up shows. The four-mile-circumference ring of Fermilab's particle accelerator is clearly visible near upper left corner of photo. Fermilab's scientists and engineers have a variety of plans underway to improve the giant accelerator's capabilities, including a proposal to use the energy doubler and the main ring to provide colliding beams at around 1 trillion volts energy. See p. 282. (Photo: NASA; reproduction from EROS data center, U.S. Geological Survey)

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APRIL 30, 1977

# LETTERS

## Science and creationism: Two different philosophies

*Letters on the creationist/evolution debate continue to come in. Some are in the same vein described in my previous editor's note to readers. Many others, however, are quite thoughtful efforts to deal with the philosophical distinctions between such diverse points of view in a way that recognizes and maintains both the special qualities of the scientific process and the dignity of individuals' personal convictions. An excellent such example is reprinted below. We will probably go on to other subjects in future letters columns, but all correspondence is welcome and will continue to be read with interest.—K.F.*

The article "Scientists Answer the Creationists" (SN: 2/5/77, p. 85), the comment by Kendrick Frazier (SN: 3/12/77, p. 163), and the subsequent letters (SN: 4/2/77, p. 211) have aroused me from my apathy to add another letter to the flood you have no doubt already received.

The emotion that seems to be an inherent part of the evolutionist/creationist debate has obscured some basic facts which, if understood, render the debate meaningless. I wish initially to clarify two points about science that are fundamental to the discussion.

First, science is a philosophical system that, under its own stringent rules, can deal with only a limited realm of human experience. In particular, it can only be applied to phenomena that are in some sense reproducible, and it can only admit hypotheses that inherently have the potential to be disproven. For example, science cannot deal with phenomena such as miracles and cannot treat questions concerning the human spirit or God. In this very fundamental sense, science and religion do not bear directly on each other at all.

Second, science does *not* reveal absolute Truth, notwithstanding the popular misconception. Because the possible applications of a theory are infinite in number, that theory can never be proven for all situations. Thus a theory is scientifically "true" only until a violation of the theory is demonstrated. Even the most time honored theories are not sacrosanct.

With this in mind, the evolutionist and creationist propositions can be seen to be two equally viable approaches to the same problem taken in the context of two fundamentally different philosophical systems.

Within a religious philosophy any situation can be explained as the result of God's will. This philosophy can admit both the creationist and the evolutionist propositions as equally viable alternatives.

Within a scientific philosophy, however, the creationist proposition is an untestable hypothesis because any outcome of any test can always be explained as the result of God's will. A violation of the proposition is inherently impossible to demonstrate because God's will is inscrutable to man. This does not imply that the proposition is correct or incorrect. It does mean that science simply cannot deal with such a proposition. It is, by definition, not science. Whether evolution is "correct" or "incorrect" is immaterial to this basic fact: Creationism is not and cannot be a part of science. Evolution, on the other hand, is a testable hypothesis, and it has successfully passed many tests. There are always more tests to be done and some that cannot be done at present. But, for the time being, evolution is scientifically the most viable proposition.

The two philosophical systems are completely different both in their basic assumptions and in their rules of proof, and there is, therefore, no common ground on which a rational debate can possibly stand. Thus, of necessity, the debate becomes emotional and thereby meaningless.

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## New potentials of X-rays

X-ray microscopy and lithography using ultra-high resolution resists (SN: 3/12/77, p. 171) is an important advance in microscopic techniques; however, your readers may be interested in knowing that X-ray microscopy itself was first performed in 1896, within a few months of Roentgen's discovery of the mysterious rays. These early microscopists (e.g., G. J. Burch and F. Ranwez), like the IBM scientists, made X-ray "contact prints," though on ordinary photographic film, which were then viewed by ordinary optical microscopy.

The subsequent history of X-ray microscopy is nicely summarized in Cosslett and Nixon's book, *X-Ray Microscopy* (Cambridge Press, 1960). Incidentally, the first use of *synchrotron radiation* for X-ray microscopy was reported in 1972 by Horowitz and Howell in "A Scanning X-Ray Microscope Using Synchrotron Radiation," SCIENCE 178:608.

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