

its periods of revolution around its own axis, the earth, and the central fire (all three of which would presumably be of about the same length) in the system of Philolaus. This is very speculative, however, and others may wish to consider revolutions around various objects in more modern systems.

¹⁴One must note (with caution) the Hermetic tradition of the Renaissance and earlier which purported to reach back to Hermes Trismegistus in Egypt at about the time of Moses. See Lawrence S. Lerner and Edward A. Gosselin, "Giordano Bruno," *Scientific American*, 228, No. 4 (April, 1973), especially p. 91; and also Frances A. Yates, *Giordano Bruno and the Hermetic Tradition* (Chicago: The University of Chicago Press, 1964), especially Chapters I and XXI. Note also Isaac Newton, *Mathematical Principles of Natural Philosophy and His System of the World*, Translated by Andrew Motte, translation revised by Florian Cajori, (Berkeley and Los Angeles: University of California Press, 1934, 1962, 1966), Vol. II, *The System of the World*, pp. 549-550.

Geological Specimen Rejuvenates an Old Controversy

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Under the title "Puzzling Fossils Unearthed," the *Deseret News* of 13 June, 1968 reported the discovery of "a fossilized footprint" which was said to pose a "dilemma for geologists." The discovery was made in the Antelope Springs area of the House Range, Millard County, Utah. A photograph accompanying the article shows two pieces of fine-grained stone, obviously halves of a larger block, split apart along a natural plane of weakness. On one half is a shallow foot-shaped or shoe bottom-shaped depression about 10 inches long, $3\frac{5}{8}$ inches wide at the widest and 3 inches wide near the "heel." The other block shows a raised area that fits into the corresponding depression. The entire edge of the front part of the impression is rounded and not squared off so that the specimen is referred to by the finders as a "sandal print" rather than a "shoe print." The imprint of the "heel" is separated from the "sole" by a ledge which is said to indicate that a separate piece of material had been shaped and affixed as a low heel. Finally, embedded in the "heel" area is the remains of a small fossil trilobite, an extinct arthropod of the Cambrian Period.

The discovery was reported in many newspapers throughout the country and I and my colleagues in the Department of Geological and Geophysical Sciences at the University of Utah received letters from as far away as Hawaii and Florida either asking for more information or condemning us as atheists for not accepting the find as proof of the Genesis account of creation. The most thorough discussion appeared in the *Creation Society Research Quarterly* for December 1968 which contains illustrations and three articles on the specimens. Incidentally, the Creation Research Society is an organization of research scientists committed to full belief in the Biblical record of creation and early history. In the first article, Dr.

Melvin A. Cook, then Professor of Metallurgy at the University of Utah, describes the find as a "most remarkable specimen of a fossil human footprint." He concludes that it raises "a serious contradiction of conventional geology." In this same issue the finder, William J. Meister, Sr., then Drafting Supervisor, Bacchus Works, Utah Hercules Incorporated, describes the circumstances of discovery in detail and refers to his specimen without any doubt or qualifications as a human footprint. He describes also the finding of other footprints at the same locality including one of a "barefoot child." From what is reported by Meister a large number of prints must have been taken out but to my knowledge none but the original has been illustrated. Mr. Meister affirms that the Bible alone explains how evidences of human beings can be found with trilobites. He hints that Noah's Flood enters the picture but doesn't explain how.

A final contribution is that of Leland J. Davis, then a consulting geologist, who describes the geology of the area in detail so as to leave no doubt as to the authenticity of the Cambrian age of the Wheeler Shale at the site of discovery. He also lists by name the fossils that are found in the formation but omits any reference to the "footprint."

I am not at all surprised that many persons unacquainted with fossils or the reactions of rocks in the field should accept this as a genuine human footprint. Neither am I surprised that the whole affair should immediately take on emotionally religious overtones. I am surprised, however, by certain published statements of the discoverer. According to Mr. Meister, Dr. Cook recommended that the specimen be shown to geologists at the University of Utah but he (Meister) was "not able to find one who would take time to examine it." I cannot reconcile this statement with the fact that I spent most of an afternoon with Mr. Meister and two of his colleagues who brought their specimen to my office after I had willingly agreed to examine it.

After seeing the specimen I explained to Mr. Meister why I could not accept it as a footprint and why geologists in general would not accept it. At the very least, we would expect a true footprint to be one of a sequence showing right and left prints somewhat evenly spaced, of the same size and progressing regularly in one direction. A true footprint should also show displacement or squeezing aside of the soft material into which the foot was pressed. Footprints must obviously be pressed downward into the original soft material, anything with the depression oriented the opposite way; that is, upward, cannot be a footprint. From my examination of this specimen I can say that there is no evidence of squeezing or pushing aside of the matrix. As to the up and down orientation of the impression I cannot say and it would be difficult to determine now that it has been removed from the strata. It is most significant that no other matching prints were obtained. I know of no instance where a solitary one-of-a-kind impression has been accepted and reported in a scientific journal as a genuine footprint no matter how well-preserved it might be.

I unhesitatingly assert that this is not a footprint. I have observed and collected a number of types of footprints that meet all the critical requirements and I have had no qualms about describing these in print even though some were totally new. The Meister specimen is the result of a natural break which happens to resemble a footprint. This type of fracture is called spalling and the part which breaks out or is detached is called a spall. Spalling commonly takes place in homo-

geneous fine-grained rocks as they are brought near the surface of the earth through erosion. Heating and cooling by changes of temperature seem to favor the process. Most spalls literally pop out of the confining rocks; they have flattened lens-like shapes and leave shallow depressions in the parent material. If anything interrupts the uniformity of the rock so as to create a spot or plane of weakness within it, the break will tend to pass into or through these areas. This explains why a trilobite fossil should be seen in the Meister specimen. I have observed this type of breakage numerous times in the process of collecting fossils. The material of the fossil-bearing Wheeler Shale is particularly susceptible to spalling and the creation of oddly-shaped fragments. We have a number of these in our collections at the University of Utah, even some that look like footprints. But no two are alike and we regard them as mere curiosities in the same class as Meister's specimen.

The acceptance of the House Range specimen as a genuine footprint leads to all manner of anti-geological conclusions. If man and trilobite coexisted, either man is much older or trilobites are much younger than geologists suppose. This alone demolishes the traditional time scale of the geologists which places the Age of Trilobites millions of years before the Age of Man. Another possible conclusion is that it is the trilobite which is young enough to be associated with man and neither of them is necessarily very old. This is much more in line with some versions of scripture-based theology. The statement from the Pearl of Great Price that Adam was "the first flesh on earth" comes immediately to mind (Moses 5:7). If man came first and all other animals later on we would have a perfectly good reason for finding their evidences together. This order of things denies not only the whole scheme of Darwinian evolution but the geologists' time scale as well. The conclusion that man and trilobites were alive together less than 6,000 years ago also clearly substantiates the so-called "no death before the Fall" doctrine. According to this peculiar Latter-day Saint interpretation there was no dying, hence no possibility of fossils being formed, before the expulsion from the Garden of Eden 6,000 years or so ago.

I do not doubt the sincerity of most of those who believe Mr. Meister's specimen to be a genuine human footprint. The specimen was in no sense faked and I am sure it was found exactly as reported. But I, along with my geologist friends, am equally sincere in my belief that it is an accidental natural product and not a footprint. One might think a difference of opinion such as this could be solved by appeal to impartial judges or by a more thorough investigation of the field of evidence. But from the time of discovery the specimen has taken on a religious significance that makes a friendly solution almost impossible.

I hope my apprehensions are without foundation but I fear that readers of the newspapers and the *Creation Research Society Quarterly* will get the impression that we geologists deny the genuineness of such specimens because to accept them would be to admit that the basis of geology is a delusion and a fraud. They could well imagine that in our secret selves we tremble at the prospect of being unmasked as liars and hypocrites. Even worse, fellow members of the Church must believe that since my interpretation of relevant scripture differs from theirs and from that of some Church leaders I am probably an atheist and an enemy of the Church.

Speaking in defense of my views, I am inclined to criticize advocates of false

or erroneous arguments for erecting barriers which will have to be removed at a later date, perhaps at a cost of considerable embarrassment to themselves and to the Church. They should, in my opinion, at least leave open the possibility that they might be mistaken and that other explanations exist. In the present case all opposing arguments, together with my admonition not to publish, went unheeded. It is puzzling why those who have had the most experience with fossil footprints were totally ignored. And even though no reference is made in published accounts to the religious affiliations of anyone connected with the Utah footprints I am sure that, locally at least, there is no doubt that Latter-day Saint interpretations have encouraged the footprint believers to publish their find as widely as possible and to press their case among all who will listen.

Conflicts between science-oriented and non science-oriented Church members has been going on for at least a century and no obvious grounds for reconciliation are in sight. With more and more young people attending college and being exposed to the facts and theories of science the forecast might well be increased tension and division. If we must have differences of opinion the least that antagonists can do is to be honest and open-minded in their thinking and reporting. There is bound to be loss of confidence in those who are trying to make valid points by doubtful arguments, no matter how sincere they may be.

Shades of Dr. Johann Jacob Scheuchzer. He was a physician and naturalist who lived in Zurich in the late seventeenth and early eighteenth centuries. As a firm believer in the then popular theory that fossils originated chiefly through the agency of Noah's Flood he took an intense interest in anything dug out of the earth. When fossil bones of approximately human dimensions were discovered at Oeningen in 1725 they were sent to him for an opinion. He saw in these remains something he had been looking for and described them in a short tract in Latin titled *Homo Diluvii Testis* (Man Who Witnessed the Flood). Scheuchzer also discovered two petrified vertebrae near Altdorf, Franconia, Germany which he considered to be those of a man drowned in the Flood.

It is an irony of history that Scheuchzer's name has become forever linked with *Homo Diluvii Testis*. His feelings about the specimen are revealed in a couplet (translated from the German) which accompanies his commentary:

Afflicted skeleton of old, doomed to damnation
Soften, thou stone, the hearts of this wicked generation.

Nearly one hundred years later the famous French paleontologist Cuvier proved conclusively that the Oeningen specimen is that of a large salamander. It rests securely in the catalog of extinct beings under the name of *Megalobatrachus scheuchzeri*. The two vertebrae from Altdorf are known to pertain to the marine reptile we call the ichthyosaur.

Truly the more things change the more they remain the same.