resulted (whether consciously or unconsciously) only from the acceptance of biblical accounts describing great catastrophes. If the Bible had not provided such descriptions, Creation would not have been seen as a basis for asserting catastrophism's having occurred or the future finding of evidence that it did. Some see an inference of catastrophism in a perceived demand by Creation for a young earth in conjunction with the earth's appearance of having a great age. However, it is Scripture that possibly demands a young earth and not the act of Creation.

Conclusion

In summary, Creation and catastrophism are independent; one does not imply the other. Even so, taken together, Scripture, other ancient literary evidence, and physical evidence establish a sequential association of events: Creation → catastrophism → variation, (limited, i.e.); recurrence of the latter two not being precluded.

In contrast, the secular catastrophist sees creation and catastrophism as two sides of the same coin: one cannot proceed without the other, seemingly making a beginning impossible—as incomprehensible as God, so to speak.

The uniformitarian sees catastrophism as an undesirable crutch, recourse to which is made to explain the otherwise inexplicable. This reflects both inconsistency and a lack of objectivity; these being only two of the many weaknesses with which this dogma is fraught.

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CREATIONIST PREDICTIONS INVOLVING C-14 DATING

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Radiocarbon dating was introduced in 1946 by W. F. Libby, who was recognized with a Nobel Chemistry Prize fourteen years later (1960). From the beginning, many variables which should be considered in using the technique were recognized, several by Libby and his co-workers:[1, 2]

1. *Cosmic ray flux through the earth's atmosphere*
2. *C-14 concentration in the ocean and atmosphere*
3. *C-14 decay half-life*
4. *Migration of carbon atoms into or out of earth materials*
5. *Local variation in carbon isotope concentrations, called fractionation*

These variables will be discussed briefly from the viewpoint of creationist contributions to the subject.

Cosmic Ray Flux

Creationists have promoted two important mechanisms for the variability of the initial item on the above list. The first mechanism involves the existence of a pre-flood water vapor canopy surrounding the early earth. The origin of this canopy model has been traced by Bernard Ramm, unfortunately in a sarcastic setting.[3] Ramm gives credit for early canopy literature to H. W. Kellogg (1936) and C. T. Schwarze (1947). This proposed canopy reduced the penetration of cosmic rays through the early earth's atmosphere by absorption. The reduced flux of cosmic rays in turn lessened the production of C-14 during pre-flood history. The result is an apparent radiocarbon age of pre-flood samples which is far greater than actual. An example is the flood-deposited coal resource which is largely free of C-14 as expected from the canopy model. The thick carbon dioxide cloud cover of Venus provides a present day example of a planetary canopy. Nevertheless, the existence of an initial earth canopy remains to be accepted by the scientific world.

The second mechanism for the quenching of incident cosmic rays, studied by Thomas Barnes, is an exponentially increasing terrestrial magnetic field as one moves *backward* through time.[4, 5] An increased deflection of cosmic rays away from the earth results from an increasing magnetic field in accordance with the Lorentz force. Current discussion, however, is usually limited to multiple short term events during magnetic field reversals, the last one presumed to have occurred 20 millennia ago.[6]

The mechanism of a single intense magnetic field having blotted out C-14 production in history is simply not accepted by secular science. In fact, the official summary of increased, (i.e., increased in former times over the present figure) magnetic field values recorded since 1839 is no longer available, a discouragement to those who wish to investigate the magnetic field decay phenomenon.[7]

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C-14 Concentration

Melvin Cook pointed out in 1956 that the formation and decay rates of C-14 in the atmosphere were not in equilibrium.[8] Today a 30 per cent difference in rates is measured; the amount of C-14 is currently increasing in the atmosphere as equilibrium is approached.[9] This gradual C-14 isotope buildup, if extrapolated from zero initial C-14 concentration, predicts that the earth's atmosphere is younger than 15 thousand years as calculated by Cook.[10] This present large-scale transient behavior of the C-14 concentration is not explainable on the basis of uniformitarian presuppositions.

Radioactive Lifetime

Perhaps Lord Kelvin (William Thompson, 1825-1907) should be credited as the first creationist to challenge radiometric dating in an indirect way, on the basis of half-life variation. Kelvin's life concluded during the rapid initial growth of radiometric studies, initiated by Becquerel's discovery of radioactivity in 1896. Kelvin stubbornly refused to concede that radioactivity was a spontaneous process, independent of all outside effects.[11] Today it is realized that the lifetime of many unstable nuclei including C-14 *are* dependent on external temperature, pressure, and chemical environment. Kelvin's biography shows that he became increasingly dissatisfied with the growing uniformitarian view of general geology during his lifetime, although he was always gracious in his arguments supporting a young earth.[12]

Migration, Fractionation

Selective movement and incorporation of carbon isotopes in nature are little understood phenomena. Many natural processes tend to concentrate particular isotopes, with the result of natural isotopic enrichment. In the case of carbon, C-14 has occasionally been found to be selectively excluded during organic incorporation of carbon dioxide, with a resultant enrichment of C-12 and C-13 isotopes.[13] Radiometric analysis of such material shows an apparent date which is older than actual due to the lack of C-14. Future studies may show the variable processes of isotope movement and incorporation to be of major significance. The recalibration necessary to account for these factors is unknown for C-14 as well as for all other radiometric dating methods.

Predictions

Looking to the future, several predictions can be made regarding the area of C-14 dating. Some of the predictions have exciting implications for creationists; others are mere projections of present uniformitarian trends.

1. In the latter category, published radiocarbon dates will continue to become more ancient. Even though the oldest (possibly) absolute dating scale is less than 10 thousand years old (Bristlecone pines), the C-14 method is regularly extrapolated back 50 thousand years. Recently, the promise was made for 100 thousand year C-14 dating, using mass spectroscopic counting of actual carbon atoms rather than the usual monitoring of the rate at which C-14 decay is taking place.[14] Thus, in spite of a lack of detailed information on the five variables listed in the first paragraph, the C-14 method is now extrapolated through 17 half-lives (100 thousand years). Eventually the method will probably be credited with million and billion year ages, as stray C-14 atoms are detected and are fallaciously credited with being the remnant of ancient carbon concentrations. This C-14 trend parallels the ever-increasing age of the earth as publicized by uniformitarian geology.
2. It may someday be possible to differentiate between cosmic-ray-manufactured C-14 and the remaining originally created variety of C-14. This proposed difference may be in terms of some inherent physical property manifesting itself as high-resolution spectral fine-structure. It is traditionally assumed that no original C-14 exists: "Obviously no carbon-14 is primordial; the half-life is too short."[15] However, just as geologists speak of "juvenile" water entering the hydrologic cycle for the first time, so there may well be "juvenile" C-14 in the environment. The detection of such primordial, juvenile C-14 would be strong evidence for a recent creation on the order of thousands of years.
3. Further experimental evidence of a large magnetic field in earth history awaits discovery. Thomas Barne's work predicts an earth magnetic field strength twenty times the present value, just 6000 years ago. The C-14 free coal deposits certainly provide an indication of cosmic ray shielding due to an intense magnetic field in the past. Another indication of intense former magnetism should be available in the record of magnetization of rocks. Does remnant magnetization indicate a much stronger earth field in history? There are indications that this is indeed the case, both for archaeological artifacts,[16] and for magnetic minerals.[17]
4. It may be predicted that new data on the earth's magnetic field since the time of Thomas Barne's 1965 summary, when available will continue to show an exponential decrease in field value.
5. Only moderate variations in the half-life of radioactive nuclei have been directly measured thus far, 5.7 per cent being the largest change (for a metastable state of U-235).[18] The change of the carbon-14 lifetime has been noticed only as a slight statistical variation. It may be predicted that *large-scale* changes will eventually be produced in the laboratory for isotope lifetimes. The critical combination of chemical, physical, and electromagnetic field environment has simply not yet been found in the laboratory. This combination may nevertheless occur frequently in nature. Robert Gentry of Oak Ridge National Laboratory has thoroughly studied pleochroic halos, or radiohalos, and has found indirect evidence for such substantial

variations in the lifetimes of several long-lived isotopes.[19, 20]

Conclusion

The many variables present in the radiocarbon dating technique rule out calibration of the method beyond the short-term possibly absolute dendrochronology of bristlecone pines. Nevertheless, the method is irrationally being pushed ever backward in time. Creationists thus have the continued challenge and responsibility of demythologizing the radiocarbon technique. Predictions concerning C-14 dating show that the future holds tremendous possibilities for evidence of a recent creation.

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RADIOCARBON CALIBRATION—REVISED

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The radiocarbon dating method has been claimed to provide considerable support for evolutionary theories of the past which conflict with the Biblical record of the Earth's early history. This paper seeks to answer the question: how can the radiocarbon activity measurements be understoon in a way that is consistent with the Biblical framework of history? The evidences for the non-equilibrium theory of radiocarbon variations are discussed and are shown to give the theory a sound theoretical foundation. The prediction that atmospheric C-14 activities have increased with time has been tested by studying the results obtained from known-age samples. Consistency between theory and observation is found for the period of the last 2600 years, but not before this. It follows that either the non-equilibrium model is wrong, or that the chronologies of Ancient Egypt and of the tree-ring sequences are in need of major revision. Evidences from Biblical archaeology which strongly suggest the need of a revision are briefly discussed. Using a revised chronological scheme, the C-14 activities of the archaeological samples have been recalculated, and it is found that the results are consistent with the non-equilibrium prediction. Consequently, the theory is self-consistent, and this promotes confidence in the general approach. The form of a creationistic calibration curve for C-14 dates is suggested, so that use may be made of the dating system when re-evaluating the facts relevant to prehistory.

1. Introduction

From the Biblical account of the early history of the earth, a number of important events or periods can be identified: 1. the relatively recent Creation in six days; 2 the Fall of man into sin followed by God's curse on the Creation; 3. the Antediluvian period with its long-lived inhabitants and advanced culture; 4. the world-wide Flood and the preservation of land creatures in the Ark; and 5. the dispersal of the descendants of Noah from Babel to the different regions of the earth. Most modern archaeologists and prehistorians regard each component of this history as mythical. Instead, they advocate a comparatively slow evolutionary development of man over hundreds of thousands of years as pre-human animals; tens of thousands of years as Palaeolithic man; and thousands of years as Neolithic man. More recently, the view that civilizations arose independently in different parts of the earth and that men did not disperse from a central region has gained wide acceptance. In the study of prehistory, the radiocarbon dating method has given considerable authority and impetus to the evolutionary views.

It is the purpose of this paper to show that the results of radiocarbon dating are dependent on the presuppositions incorporated into the theory of the method. Also,

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