THE YOUNG EARTH†

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It is shown that the claims for a great age of the Earth, seen so often in uniformitarian literature, are obtained by selecting arbitrarily certain processes by which to attempt to judge the age of the Earth, and ignoring others which have, a priori, as great a likelihood of being reliable. As a matter of fact, most of the possible ways of estimating the age of the Earth give results much less than those demanded by uniformitarian theorists. Of 74 possible ways of determining the age of the Earth considered here, about one-third give results of no more than 10,000 years. Even these results, in many cases, are upper limits; moreover the nature of the process involved is often such that the results are inherently likely to give too great an age.

Introduction

There are only two possible basic models of origins, evolution and special creation. Proponents of the evolution model postulate that the origin and development of all things are attributable to natural laws and processes which are still in operation. According to the creation model, all the basic systems and categories of the natural world were brought into existence by special processes of creation which are not in operation today.

Since presently-operating processes of biologic change proceed so slowly, if at all, that evolution (in the sense of the development of more complex organisms from less complex) is non-observable, it is obvious that an immense amount of time is required for the evolution model. It is necessary, therefore, that geochronometric methods be developed which yield great spans of time, if the evolution model is to be retained.

On the other hand, long ages are not required for the creation model. Although the basic non-Biblical scientific creation model does not necessarily preclude long ages, great spans of time are not required as is the case with the evolution model. Therefore, geochronometric methods which yield young ages do not have to be rejected by proponents of the creation model.

Since there exists an almost infinite number of processes in the world, and since each of them involves changes with time, each of them might potentially be used to measure time. It is significant that, in the standard literature, only those processes are discussed which involve such slow changes as to yield long ages. Processes which operate more rapidly, and therefore yield younger ages, are normally either ignored or explained away.

Actually there are only a few processes which provide time enough to satisfy evolutionists. There are many more processes which will indicate a young earth and which, therefore, can be acceptable only in the framework of the creation model. Some of these are discussed in this paper.

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Requirements for a Geochronometric Process

It should be emphasized that it is impossible to determine with certainty any date prior to the beginning of historical records—except, of course, by divine revelation. Science, in the proper sense, is based on observation, and the only records of observations are found in historical records. Natural processes can be used to **estimate** prehistoric dates, but **not to determine** such dates. The accuracy of the estimates will depend on the validity of the assumptions applied to the use of the process in making such calculations.

Assume, in the general case, a simple process in which there are two main components, one "parent" and one "daughter" component—call them A and B, respectively. The initial magnitude of these components at zero time (that is, the time when the particular system came into existence) are A_0 and B_0. After an additional time T these magnitudes have changed to A_T and B_T. The average time-rate at which A changes into B during the time T is R_T. The instantaneous rate may either be constant or may change in some fashion with time, in which case it may be expressed in functional form as

$$r_t = f(A_o, B_o, t) \qquad (1)$$

since it may possibly depend on the process components as well as on time.

If the process is not a closed system, then there may be changes in A and B which result from extraneous influences, other than those expressed in the normal rate function. Let such changes be represented by the quantities Δa and Δb, where Δa may be either positive or negative and represents the modification in A brought about during the time T by such external influences. A similar definition applies to Δb.

When all these quantities are put together, the following equations express the effect of these changes in A and B.

$$A_o \pm \Delta a - (R_T)T = A_T \qquad (2)$$

$$B_o \pm \Delta b + (R_T)T = B_T \qquad (3)$$

Subtract Equation 3 from Equation 2

$$(A_o - B_o) \pm (\Delta a \mp \Delta b) - 2R_T T = (A_T - B_T) \qquad (4)$$

then the time T is calculated as follows:

$$T = [(B_T - B_o) + (A_o - A_T) \pm (\Delta a \mp \Delta b)][1/2R_T] \qquad (5)$$

This equation is relatively simple, involving only two components in the chronometric system. Many processes would involve more than this. Some, of course, might involve a change in only one component.

To solve Equation 5 and find the duration T, it is obvious that all the terms on the right-hand side would have to be known. The problem, however, is that only A_T, B_T, and r_T (the present magnitudes and rates) can actually be measured.

There is no way in which the average rate R_T can be determined unless the functional relationship expressed in Equation 1 is known. Mathematically this average rate could be expressed as follows:

$$R_T = (1/T)\int_0^T r_t\,dt \qquad (6)$$

As was just remarked, this cannot be calculated, however, unless the equation for r_T is known. It is customary simply to **assume** that $R_T = (r_T)$ as it is measured at present. In other words, it is arbitrarily assumed that the process rate has been *constant* throughout the period T. This is an unrealistic assumption since, in the real world, there is no such thing as a process rate which cannot be changed.

Furthermore, there is no way in which Δa and Δb can be determined, since there is no way of knowing what extraneous influences may have affected the system in the prehistoric past. The common assumption is that the system has always been a closed one and thus both Δa and Δb are zero; but this assumption is likewise unrealistic since, in the real world, all systems are open systems.

Similarly, there is no way of knowing the initial amounts, A_0 and B_0, of the parent and daughter components, since no scientific observers were present to measure them at the appropriate time. Again, however, it is commonly assumed that there was no daughter component present initially, so that B_0 is zero; and that the initial parent component has been modified only by the amount corresponding to the present daughter component, so that $A_0 = B_T + A_T$.

If all these assumptions are made, Equation 5 becomes:

$$T = [(B_T - 0) + (B_T + A_T - A_T) + (0 + 0)][1/2R_T] = B_T/R_T \qquad (7)$$

Since both B_T and R_T can be measured, it is thus easily possible to calculate T. However, the resulting date is obviously only as accurate as the assumptions.

To recapitulate, any geochronometric calculation is based on at least the following assumptions:

(1) Constant process rate (or known functional variation of process rate).

(2) Closed process system (or known external effects on the open system).

(3) Initial process components known.

It is significant that not one of these three vital assumptions is provable, or testable, or reasonable, or even possible! Therefore, no geochronometric calculation can possibly be certain; and most of them are bound to be vastly in error.

Estimates of the Earth's Age

Since the magnitude of the error in the assumptions obviously will vary quite widely from process to process, one would expect to get a wide range of "apparent ages" from different processes. This turns out to be the case.

Some few systems, such as certain uranium-lead minerals, have yielded a time of over three billion years for the age of certain ancient rocks. Other systems, such as the earth's decaying magnetic field, give an apparent age of about 10 thousand years for the earth as a whole. All sorts of ages for the earth are implied by different processes.

In every case the same three assumptions are made —namely, the assumptions of a constant rate, a closed system, and zero initial daughter component. As stressed above, these assumptions are quite likely wrong. The evolutionist may reject the young age indicated by the decay of the magnetic field on this basis; but so may the creationist reject the old ages given by uranium decay, on the same basis. The same assumptions have to be made in every case.

To illustrate the extreme variability of such processes, a list of dates obtained from different processes is given in Table 1.

In addition to the typical uniformitarian assumptions noted above, it is also assumed that each process may be applied essentially to the earth as a whole. That is, it is assumed that all major components of the earth—the ocean, the atmosphere, the magnetic field, the crust, etc., were formed at essentially the same time. Some processes deal with the ages of extraterrestrial components of the universe, none of which could be significantly younger than the earth.

Space does not permit discussion of all of these in this paper, but references are given in the table to allow the reader to examine more detailed discussions of each. One should note also that these calculations are based on the actual measured data, and are in no way related to the imaginary "geologic ages" of evolutionary thinking.

In Table 1, then, are listed 74 different processes for calculating the age of various integral parts of the earth, and thus, presumably, of the whole earth. All processes yield an age of much less than a billion years, whereas the present standard evolutionary estimate is approximately five billion years.

The geochronometric methods in favor at the present (that is, those which give long ages, such as uranium-lead, rubidium-strontium, and potassium-argon) have not been included in the tabulation, nor are they discussed in this paper. However, it has been shown elsewhere[1, 5, 6, 7] that these, too, can easily be reconciled with a young earth.

The most obvious characteristic of the values listed in the table is that of extreme variability—all the way from 100 years to 500,000,000 years. This variability, of course, simply reflects the errors in the fundamental uniformitarian assumptions. The processes have all been affected in various ways and to varying degrees: (1) by influences extraneous to the respective systems; (2) by changes in the process rates; and (3) by the unknown initial values.

Some of the estimates are obviously far too large. The half-billion years for the earth's crust determined by present lava flows, for example, is based on the assumption that all the earth's crust was formed in this way, whereas everyone would agree that actually very

Table 1
Uniformitarian Estimates—Age of the Earth

(Unless otherwise noted, based on standard assumptions of closed systems, constant rates, and no initial daughter components.)

	Process	Indicated Age of Earth	Reference
1.	Efflux of Helium—4 into the atmosphere	1,750-175,000 years	1
2.	Influx of meteoritic dust from space	too small to calculate	1
3.	Influx of radiocarbon to the earth system	5,000-10,000 years	1
4.	Development of total human population	less than 4,000 years	1
5.	Influx of uranium to the ocean via rivers	10,000-100,000 years	1
6.	Influx of sodium to the ocean via rivers	260,000,000 years	1
7.	Influx of nickel to the ocean via rivers	9,000 years	1
8.	Influx of magnesium to the ocean via rivers	45,000,000 years	1
9.	Influx of silicon to the ocean via rivers	8,000 years	1
10.	Influx of potassium to the ocean via rivers	11,000,000 years	1
11.	Influx of copper to the ocean via rivers	50,000 years	1
12.	Influx of gold to the ocean via rivers	560,000 years	1
13.	Influx of silver to the ocean via rivers	2,100,000 years	1
14.	Influx of mercury to the ocean via rivers	42,000 years	1
15.	Influx of lead to the ocean via rivers	2,000 years	1
16.	Influx of tin to the ocean via rivers	100,000 years	1
17.	Influx of aluminum to the ocean via rivers	100 years	1
18.	Influx of carbonate to the ocean via rivers	100,000 years	2
19.	Influx of sulphate to the ocean via rivers	10,000,000 years	2
20.	Influx of chlorine to the ocean via rivers	164,000,000 years	2
21.	Influx of calcium to the ocean via rivers	1,000,000 years	2
22.	Leaching of sodium from continents	32,000,000 years	2
23.	Leaching of chlorine from continents	1,000,000 years	2
24.	Leaching of calcium from continents	12,000,000 years	2
25.	Influx of sediment to the ocean via rivers	30,000,000 years	3
26.	Erosion of sediment from continents	14,000,000 years	3
27.	Decay of earth's magnetic field	10,000 years	4
28.	Efflux of oil from traps by fluid pressure	10,000-100,000 years	5
29.	Formation of radiogenic lead by neutron capture	too small to measure	5
30.	Formation of radiogenic strontium by neutron capture	too small to measure	5
31.	Decay of natural remanent paleomagnetism	100,000 years	5
32.	Decay of C-14 in pre-Cambrian wood	4,000 years	5
33.	Decay of uranium with initial lead	too small to measure	6
34.	Decay of potassium with entrapped argon	too small to measure	6
35.	Influx of juvenile water to oceans	340,000,000 years	7
36.	Influx of magma from mantle to form crust	500,000,000 years	7
37.	Growth of active coral reefs	10,000 years	7
38.	Growth of oldest living part of biosphere	5,000 years	7
39.	Origin of human civilizations	5,000 years	7
40.	Formation of river deltas	5,000 years	8
41.	Submarine oil seepage into oceans	50,000,000 years	9
42.	Decay of natural plutonium	80,000,000 years	10
43.	Decay of lines of galaxies	10,000,000 years	11
44.	Expanding interstellar gas	60,000,000 years	12
45.	Formation of Carbon 14 on meteorites	100,000 years	13
46.	Decay of short-period comets	10,000 years	14
47.	Decay of long-period comets	1,000,000 years	15
48.	Influx of small particles to the sun	83,000 years	15
49.	Maximum life of meteor showers	5,000,000 years	15
50.	Accumulation of dust on the moon	200,000 years	15
51.	Deceleration of earth by tidal friction	500,000,000 years	16
52.	Cooling of earth by heat efflux	24,000,000 years	16
53.	Accumulation of calcareous ooze on sea floor	5,000,000 years	17
54.	Influx of lithium into ocean via rivers	20,000,000 years	18
55.	Influx of titanium into ocean via rivers	160 years	18
56.	Influx of chromium into ocean via rivers	350 years	18
57.	Influx of manganese into ocean via rivers	1,400 years	18
58.	Influx of iron into ocean via rivers	140 years	18
59.	Influx of cobalt into ocean via rivers	18,000 years	18
60.	Influx of zinc into ocean via rivers	180,000 years	18
61.	Influx of rubidium into ocean via rivers	270,000 years	18
62.	Influx of strontium into ocean via rivers	19,000,000 years	18
63.	Influx of bismuth into ocean via rivers	45,000 years	18
64.	Influx of thorium into ocean via rivers	350 years	18
65.	Influx of antimony into ocean via rivers	350,000 years	18
66.	Influx of tungsten into ocean via rivers	1,000 years	18
67.	Influx of barium into ocean via rivers	84,000 years	18
68.	Influx of molybdenum into ocean via rivers	500,000 years	18
69.	Influx of bicarbonate into ocean via rivers	700,000 years	19
70.	Escape of high-velocity stars from globular clusters	40,000 years	20
71.	Rotation of spiral galaxies	200,000,000 years	20
72.	Accumulation of peat in peat bogs	8,000 years	21
73.	Accumulation of sediments for sedimentary rocks	20,000 years	21
74.	Lithification of sediments to form sedimentary rocks	20,000 years	21

little of it was formed thus. Similarly, the quarter-billion year age for the ocean determined by sodium influx neglects the certain fact (from both geological and paleontological evidence) that the ocean has been composed of salt water from the beginning. Most of the other figures in the table are also clearly much too large.

On the other hand, some of the figures are clearly too small. The age of the ocean as based on the influx of lead and aluminum is considerably less than man's own recorded history of the ocean. It must be that the rates of influx of those metals were much lower in the past, or else that they are continually being removed from solution in some way.

Conclusions

Nevertheless, all things considered, it seems that the lower ages are likely, on the whole, to be more accurate than the higher ones. This conclusion follows from the obvious facts that: (1) they are less likely to have been affected by initial concentrations or positions other than "zero"; (2) the assumption that the system was a "closed system" is more likely to be valid for a short time than for a long time; and (3) the assumption that the process rate was constant is also more likely to be valid for a short time than for a long time.

Thus, it is concluded that the weight of all the scientific evidence favors the view that the earth is quite young, far too young for life and man to have arisen by any evolutionary process. The origin of all things by special creation—already necessitated by many other scientific considerations—is therefore also indicated by chronometric data.

Finally, the reader should note that these conclusions were reached with no reference at all to the testimony of the Bible relative to chronology. It is, therefore, all the more significant that these results correspond closely to the brief chronology of terrestrial and human history given long ago by divine revelation in the Holy Scriptures.

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CREATION CONVENTION, AUGUST 17-19, 1975

"Space and Astronomy" will be the main topic of the Creation Convention scheduled for Seattle Pacific College, Seattle, Washington, August 17-19, 1975, under joint sponsorship of the Bible-Science Association (Seattle Branch) and Campus Crusade for Christ, International. Featured speaker at the final session, the Tuesday night banquet, will be Col. James Irwin, astronaut, who will tell the story of the scientific voyage of Apollo 15 to the moon, his own Christian experience, and how science and belief in God are compatible.

Speaker for the opening session on Sunday evening will be Harold Slusher, M.S., staff member at the Institute for Creation Research and Chairman of the Curriculum in Planetary Science at Christian Heritage College in San Diego. In his presentation he will show why a young earth is scientifically feasible.

Donald Chittick, Ph.D., Professor of Chemistry at George Fox College in Newberg, Oregon, will show how the creation model for the origin of space is the better model.

The relation of the earth to the sun is the topic of an essay by James Hanson, who is Professor of Computer and Information Science at Cleveland State University, specializing in space science.

George Mulfinger, M.S., physicist and astronomer, will demonstrate that there is little evidence for the various theories proposed for the origin of the universe, except for the record in Scripture. Prof. Mulfinger is on the faculty of Bob Jones University in Greenville, S.C., and is co-author of the just-published *Physical Science Textbook* for junior high school students.

John Read, who is an aerospace engineer with Hughes Aircraft, will discuss the question of whether or not there is life in space. He will also discuss UFOs.

Robert Whitelaw, M.S., who is Professor of Mechanical and Nuclear Engineering at Virginia Polytechnic Institute and State University, will stop at the convention on his way home after spending a year teaching at the Chung Yuan Christian College of Science and Engineering in Taiwan. His presentation will deal with harmony and discord in the solar system, and he will also discuss the spacing of orbits.

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