AN ADVENTIST APPROACH TO EARTH ORIGINS

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IMPORTANCE OF ORIGINS ISSUES

Why are science and religion issues important? They have to do with ultimate realities, with whether to "worship" the Creator or the creature (creation), with whether a supreme being is above the creation and can supernaturally intervene (with miracles, an Incarnation, a resurrection, a new birth, an Advent). *As Christians*, evolution/creation questions affect an understanding of: (1) the relation of faith and reason and the nature of inspiration, (2) God's character and how He relates to evil, competition, and death, (3) relationships to other humans and to the environment, and (4) self-worth and need of a Savior. *As Seventh-day Adventists* the issues are important because of belief in the Sabbath as a memorial of a 7-day creation and belief in a short future for the earth. *As evangelists*, one must understand the science/religion interface to work in a technological society and to share beliefs with scientists.

EVIDENCE FOR: MORE THAN NATURALISTIC SCIENCE

An associated paper ("Christianity and Science: An Adventist Perspective") noted that science developed in a civilization with a Christian world view, many of the founding fathers of science were devout Christians, and many scientists today are also believers. Evidence from developments in physics during this century suggests that a totally naturalistic world view is insufficient to explain all the observations. However, this evidence may lead to various metaphysical philosophies such as the New Age, pantheism, and eastern mysticism. Next, evidence for a personal designer/creator is discussed.

EVIDENCE FOR: A DESIGNER/CREATOR

The design argument and its strengths

The complexity of a simple living cell suggests that life was designed. Scientists have made numerous statements about the improbability of life arising from non-life, with the following as several representative quotations (Bradley):

> The current scenario of the origin of life is about as likely as a tornado passing through a junkyard beside Boeing airplane company accidentally producing a 747 airplane. - Sir Fred Hoyle, in *The Intelligent Universe*
>
> The origin of life appears to be almost a miracle, so many are the conditions which would have had to be satisfied to get it going. - Sir Francis Crick in *Scientific American* (February 1991)
>
> The simplest bacterium is so ____ complicated from the point of view of a chemist that it is almost impossible to imagine how it happened. - Harold Klein, chair of National Academy of Sciences committee, in *Scientific American* (February 1991)

Improbability arguments easily catch one's attention. The immense number of different ways to assemble a simple protein is easily calculated. Selecting from 20 varieties of amino acids, a sequence of 100 units can be assembled in 20^{100} different ways, or about 10^{130} which is 1 with 130 zeroes after it. If the handedness and the conditions for

forming a peptide bond are included, the chances of randomly forming the requisite sequence are astronomically small. Closely related arguments can be made from information theory. Hubert Yockey's article, entitled "A Calculation of the Probability of Spontaneous Biogenesis by Information Theory", says: "One must conclude that, contrary to the established and current wisdom, a scenario describing the genesis of life on earth by chance and natural causes which can be accepted on the basis of fact and not faith has not yet been written."

The irreducibly complex structures of higher organisms lack a step-wise evolutionary explanation; and the corresponding, structurally intermediate fossils are rare. The irreducible complexity argument, or argument from perfection, emphasizes that nothing works until everything works. It describes a system that is composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning. A book published last year by Michael Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution*, describes examples of irreducible complexity from biochemistry, an area that Darwin and his colleagues knew nothing about. Independent of any evidence from the fossil record, this book gives evidence for design:

> [B]iochemistry offers a Lilliputian challenge to Darwin. Anatomy is, quite simply, irrelevant to the question of whether evolution could take place on the molecular level. So is the fossil record. It no longer matters whether there are huge gaps in the fossil record or whether the record is as continuous as that of U.S. presidents. And if there are gaps, it does not matter whether they can be explained plausibly. The fossil record has nothing to tell us about whether the interactions of 11-cis-retinal with rhodopsin, transducin, and phosphodiesterase could have developed step-by-step. Neither do the patterns of biogeography matter, nor those of population biology, nor the traditional explanations of evolutionary theory for rudimentary organs or species abundance. (p.22)

The author states that *no* papers are available offering a testable, Darwinian scenario for the evolution of these complex systems.

Of course, it should be noted that just because some feature of the universe *can* be accounted for with scientific explanations doesn't mean that it *wasn't* designed.

Possible weaknesses of the design argument

A god-of-the-gaps argument. Design can easily appear to be a god-of-the-gaps argument to be refuted as further evidence is discovered. This has happened often enough in the past, and some biochemists see hints of evolutionary explanations for hemoglobin, cilia, and vision. It is easy to ride the bandwagon when science presents evidence for fine-tuning and design, but without care it can set one up for disillusionment. Premature appeal to special divine activity to explain nature damages the Christian apologetic. In referring to the gap between life and non-life, Andrew Ellington, an Indiana University professor, warns that "to trumpet the barrier today is to eat your words when it falls tomorrow. If you make a proof of Jesus (or Buddha or any supernaturalism) on the back of abiogenesis, be prepared for the disproof as well. Such a disproof is unfair, and not necessarily logically linked, but it will be so perceived." However, perhaps irreducible complexity is different than other god-of-the-gaps arguments because additional information widens the gap instead of narrowing it.

Other. A *scientific definition* of design needs yet to be carefully articulated. A *higher probability* for forming a 100-amino-acid protein may be possible, if only a few of the 100 amino acids are critical and if a functional molecule can be formed in a myriad of ways. *Flaws in design*, such as the panda's thumb and the arrangement of rods and cones in the eye, have been urged as evidence against an intelligent Designer. Hen's teeth, pseudogenes, vestigial organs, and other examples provide *evidence of evolution*. The ichneumonid wasp laying its eggs in a caterpillar provides evidence only of an *evil designer* unlike the biblical God. Some of these arguments can be answered by including the results of sin as a destructive agent, or assuming that we really don't know how God works; however, these are only partial answers and on-going study needs to be done.

Naturalistic explanations for apparent design

Self-organization. This explanation is probably the most popular current alternative to a Designer. In complex systems far from thermodynamic equilibrium order and new properties can arise spontaneously. Self-organization results. These complex systems can be explained by simple laws: the complexity of the Mandelbrot set can be derived from a simple equation; the infinite variety of snowflakes can be explained from some simple laws of chemistry and geometry.

However, complexity theory may work better at explaining design on computers than in real life. At a summer 1993 conference at the Santa Fe Institute in New Mexico where these topics were being studied,

> Participants in the discussions constantly returned to the necessity to calibrate models and their parameters against observation of the real-world systems they purport to simulate. Questions were raised and left largely unresolved about the potential usefulness and hidden dangers of models as "flight simulators" ... The agenda included a number of examples of applications of models and of the behavior of real systems. Here is where the greatest divergences in views of complexity and the need for "reality checks" emerged most visibly. The discussion involving these contributions can best be summarized in terms of its emphasis on increasing, wherever and however possible, the amount of "hard" data that can be used to test the validity of models. (Cowan and Pines)

The anthropic principle. This alternative to a Designer states that: we wouldn't be here if it weren't that the conditions were right for us to exist. This explanation is rather lacking in appeal and not the one most generally espoused by the scientific community. It is like explaining why you can see an elephant in your living room by saying that you wouldn't see it there if it wasn't there.

Other. *Infinite time and space* have been suggested as possible explanations for the coincidences. Infinite time could be provided by multiple universes in series, and infinite space by having multiple universes in parallel. Unfortunately these can't be tested scientifically, but only discussed philosophically.

Perhaps design in nature is only a *construct of the human mind.* Nature appears ordered because the human mind is a product of nature and sees some of itself there.

Perhaps the *designer is just the environment.* The apparent design of the environment for the organism may in fact be the design of the organism for the environment by natural selection and survival of the fittest. The explanation easily works for many adaptations seen in nature.

Darwinian evolution—useful scientific principles taken to an unwarranted excess

Mechanistic laws govern nature. Mechanistic laws (invoking no supernatural intervention) have worked well in the physical sciences, and it was hoped that they would work in all areas of the biological sciences as well. The attempt was made to leave God out as an explanation, to use natural law as all-sufficient with no place for the supernatural or miracles, to treat life as governed by chance with no purpose, and to reject teleology. For some this has led to meaninglessness, disillusionment, pessimism, and despair. Bertrand Russell from *A Free Man's Worship* wrote:

> That Man is the product of causes which had no prevision of the end they were achieving; that his origin, his growth, his hopes and fears, his loves and his beliefs, are but the outcome of accidental collocations of atoms; that no fire, no heroism, no intensity of thought and feeling, can preserve an individual life beyond the grave; that all the labor of the ages, all the devotion, all the inspiration, all the noonday brightness of human genius, are destined to extinction in the vast death of the solar system, and that the whole temple of Man's achievement must inevitably be buried beneath the debris of a universe in ruins—all these things, if not quite beyond dispute, are yet so nearly certain, that no philosophy which rejects them can hope to stand. Only within the scaffolding of these truths, only on the firm foundation of unyielding despair, can the soul's habitation henceforth be safely built.

However, mechanistic laws are not sufficient to explain everything, even in the physical sciences.

Nature changes. In the last century, society exhibited evidence of change, growth in knowledge, and progress. Charles Darwin rejected fixity of species and proposed that change and progress occurred in the biological realm as well. His theory of evolution was an extrapolation of the ubiquitous variation he saw in tropical animals. However, biological variation and change has its limits; it is not necessarily progress; and direct evidence for development of new types of organisms is lacking.

Man as a part of nature. The Copernican revolution removed the earth as the center of the universe. A logical next step assumed that man is not so special either. After all, physical and chemical laws and biological processes are the same for man as for the rest of nature. However, in fact, man is unique; conscious mind and moral instincts cannot be reduced to these laws of nature.

Struggle and natural selection in nature. Alfred Lord Tennyson in his poem, *In Memoriam*, gave form to the concept of struggle and natural selection:

> - Are God and Nature then at strife,
> That Nature lends such evil dreams?
> So careful of the type she seems,
> So careless of the single life, ...
> - 'So careful of the type?' but no.
> From scarped cliff and quarried stone
> She cries, 'A thousand types are gone;
> I care for nothing, all shall go. ...
> - Who trusted God was love indeed
> And love Creation's final law—
> Tho' Nature, red in tooth and claw
> With ravin, shriek'd against his creed—

In Darwin's autobiography, he acknowledged his debt to Thomas Malthus' book, *Essay on Population*, in the often-quoted passage:

> In October 1838, that is fifteen months after I had begun my systematic inquiry, I happened to read for amusement "Malthus on Population," and being well prepared to appreciate the struggle for existence which everywhere goes on from long-continued observation of the habits of animals and plants, it at once struck me that under these circumstances favorable variations would tend to be preserved, and unfavourable ones to be destroyed. The result of this would be the formation of new species. Here then I had at last got a theory by which to work.

However, the observance of struggle does not necessarily make it right or applicable to humans, especially the excesses that have at times been seen in social Darwinism.

Conclusions on design

There are two types of design arguments: (1) the conditions for life were fine-tuned, and (2) life itself was designed. The second argument is valid in any kind of creation theory. The first argument, however, is not compatible with all creation theories. It assumes a Designer, but one who works through evolutionary processes at least in the physical realm.

The argument from design is a strong argument. It is faith-affirming for the *believer* when facts in the natural world provide empirical evidence consistent with belief in a Designer and the supernatural God of Scripture. It provides evidence for the *unbeliever* to suggest that a totally naturalistic world view is not sufficient.

The argument is strongest when it is carefully presented and doesn't claim more than it can deliver. Exaggerated negative predictions of the past only made the Christian appear a fool when they happened: "man will never synthesize any organic molecules" or "man will never set foot on the moon". Scientists like to have incontrovertible facts, but the design argument doesn't go that far. The existence of God cannot be proved. Blaise Pascal in his *Pensées* observed that "We have an incapacity for proving anything which no amount of dogmatism can overcome. We have an idea of truth which no amount of skepticism can overcome."

The evidence for design—the difficulty in arriving at a spontaneous origin for life and the gaps in the fossil record—suggest that a Designer/Creator may be a better explanation of the data than what naturalistic science offers. However, this evidence is also consistent with some kind of progressive creation. The issue of time—how long life has existed on earth—is next addressed.

EVIDENCE FOR: A SHORT TIME SCALE AND A UNIVERSAL FLOOD

My personal philosophy

To me, the issue of a short time scale is a much more difficult topic than the issues of naturalism/supernaturalism and design for life, so I will start with my personal philosophy.

Although I myself prefer a (short-age) recent, world-wide, catastrophic flood model to a (long-age) evolutionary model, I do not believe a short-age model is best supported scientifically: much data does not easily fit, no comprehensive model is available, and a supernatural component must be included. I am not overly concerned with this situation, because I am not basing my belief in short ages on science. So, what do I do?

Empirical evidence should be necessary for any belief system, and I do find evidence (as discussed above) that a totally naturalistic world view is insufficient. This leads to some kind of a religious approach to life, which in my case is Bible-based Christianity.

With a Christian world view as a basis, it is difficult to picture the biblical God of love as using competition, survival of the fittest, the rule of tooth and claw, and death as His preferred method for the development of life; however, we find evidence for this kind of activity throughout the geologic record. In order to harmonize this evidence with a biblical world view, it is easiest to assume that this destructive activity was the result of man's sin (and thus happened after the creation of man) and was buried in a world-wide flood. This suggests (although doesn't require) a short time period since God created the various life forms, man fell, and sin resulted in the destruction of the world.

It is from that philosophical framework that I try to find at least some empirical evidence that preferentially supports short ages and more that is at least consistent with it; however, I don't expect overwhelmingly good scientific evidence, nor to be able to prove my viewpoint, because a supernatural component must be included.

Some of this evidence is presented in the next several sections; however, this and similar evidence should not be used as good scientific reason to believe in short ages, because it can easily leave one with an incomplete picture, and thus a philosophical misunderstanding: (1) If one believes that the limited data consistent with a short-age model makes it a defensible scientific model, he can easily be unprepared for facing the much greater weight of data that has been fit into the long-age theory. The weight of scientific evidence is on the side of long ages. (2) If one believes it is safe to accept the Bible because science supports it, it is tantamount to putting science above the Bible and reason and sense perception above revelation. Belief in a short chronology (and perhaps the Bible as well) can then easily be discarded when the scientific evidence is found to be lacking.

The sample evidence below and other evidence similar to it can be useful in suggesting that some scientific data is consistent with a short-age model, as long as it is recognized that: (1) The arguments are in a very simplified format, but are more complicated and equivocal when all factors are taken into account. (2) At least part of the evidence for rapid, wide-spread activity fits easily into a long-age model as well. (3) Any comprehensive geologic model doesn't fit all the data, so that problems with a long-age model do not necessarily mean that a short-age model is correct. (4) Significant data exists that has no good explanation in a short-age model. (5) No comprehensive, short-age model is even available. (6) Ultimately, a biblical short-age model would be expected to include some supernatural activity, immediately making it unacceptable as a scientific model at all.

Some scientific data preferentially supports a short chronology

Paraconformities. How long did it take to lay down the rock layers, for example those so readily seen in the Grand Canyon? The standard interpretation requires millions of years; however, flat contacts representing the passage of tens of millions of years (as dated by fossils) between layers can be found rather frequently. Major

erosion would be expected at these contacts, if left exposed for long periods of time. The lack of significant erosion suggests that the successive layers were deposited much more rapidly. (Roth, 1988)

Paleocurrents. Is geologic activity local or wide-spread? A massive collection of data is available suggesting that ancient water currents were uni-directional over wide areas. The standard geological paradigm would expect water to flow into a depositional basin from many directions; whereas, a flood model would more likely propose flood waters sweeping across large areas in a single direction, as is observed.

Ancient DNA. Biological molecules have been found in rocks dated as millions of years old. The molecules would normally be expected to decompose in much less time, suggesting that the rocks are much younger. (Brown, 1991; Cano and Borucki)

Some (reinterpreted) scientific data will now fit either paradigm

Catastrophism. In the last 20 or 30 years, more and more geologic evidence has been interpreted in terms of catastrophism. Examples include: turbidites, the channeled scablands of Washington state, and meteor impacts (such as a possible one defining the Cretaceous/Tertiary boundary). Fossilization processes and mass burials also suggest catastrophic activity. Mount St. Helens is a modern day example of this kind of catastrophic activity, where sediments hardened rapidly and deep canyons were quickly eroded. (Roth, 1986; Brand)

Yellowstone fossil forests. In some places, Yellowstone National Park has more than 70 volcanic layers, each of which contains upright trees. If each layer represents a forest requiring 1000 years to mature, the total time required would be more than 70,000 years. Much research has gone into studying these layers. Results suggest that instead of being buried forests, the trees may have been destroyed, transported (with some oriented vertically), and buried rapidly by successive volcanic eruptions. (Coffin)

Coconino footprints. Some rocks layers in the middle of the geologic column have been interpreted as being deposited under desert conditions. That would be difficult, if most of the rocks in the geologic column were deposited during a world-wide flood. The Coconino sandstone in the Grand Canyon area is one such example. However, recent studies suggest that trackways in this formation more closely resemble modern trackways made under water. (Brand and Tang)

Some scientific data is difficult to fit into a short chronology

Order in the fossil record. The geologic column is based on the order of fossils in the (sedimentary) rocks. The following table gives a general idea of the types of life found at different levels in the column.

The standard column with times listed in millions of years.

	Phanerozoic		
	Cenozoic		
2	Quaternary	ice ages, man	
65	Tertiary	mammals	— flood ends ?
	Mesozoic	mass extinctions	
135	Cretaceous	flowering plants	
200	Jurassic	dinosaurs	
230	Triassic		
	Paleozoic	mass extinctions	
300	Permian		
350	Carboniferous	coal	
405	Devonian	fish	
435	Silurian	land vegetation; air breathing arthropods	
500	Ordovician	trilobite	
575	Cambrian	explosion of life forms	— flood starts ?
	Precambrian	few fossils, single celled	
4600	(earth formed)		
15000	(Big Bang)		

The Colorado plateau is one area where the sequence can be observed, but the order is worldwide, so that index fossils from this sequence do well at correlating from one area of the earth to another. A long-age evolutionary model easily explains the order by gradual development over long periods of time. Sudden appearances in the record, such as the Cambrian explosion and the appearance of angiosperms, are difficult but not impossible to explain. A short-age flood model explains the order by ecological zonation, flotation, and motility; however, some specific features are not particularly easy to explain: biogeography, the detailed small-scale order, the lack of mixing (no humans with dinosaurs, no angiosperm pollen with trilobites), and the observation that fossils (even of animal types assumed to be on Noah's ark) become more and more similar to modern forms as one moves up the geologic column.

Radiometric dating. Evidence that the matter of the universe, the solar system, and the earth are old comes from such areas as: element and isotope abundances, the naturally occurring radioactive isotopes, the Oklo phenomena, the concordance between various radiometric dating methods, and the constancy of radiometric decay rates. The life associated with these old rocks is assumed to have a corresponding old age. This evidence presents a significant problem for a short-age model. Following are some attempted approaches to the problem, but no coherent short-age explanation is available.

Radiometric dating is not a perfect science, so its problems can easily be emphasized. Discordance between different radiometric dates is not uncommon (although often understood) due to argon retention (only pertinent for K/Ar dating), to metamorphic resetting, and to different source areas for sedimentary rock. Coals, expected to be millions of years old, have been dated with carbon-14 at 40 thousand years. Perhaps the only dates published are those that agree with expectations. Other questionable evidence has also been suggested such as: pleochroic halos for polonium, lack of helium in the earth's atmosphere, and the small depth of meteor dust on the moon.

Perhaps one can accept that the rocks are really old, but the associated life is young independent of the radiometric dates. If old matter, but young life is accepted, some suggestions from geochemistry may help with the sequence of dates: fractionation/zonation in the magma chamber, crustal material incorporated in the magma as it moves, isochrons instead being mixing lines, and argon escape in submarine volcanic rock being dependent on hydrostatic pressure.

Several other features should be kept in mind when discussing the age of the universe and the earth: (1) Extrapolation back in time is reasonable, but requires caution. (2) Unexpected scientific discoveries in the past have

changed age estimates by several orders of magnitude. (3) Evidence from special and general relativity suggest that our perception of time is relative, rather than absolute. (4) Perhaps time is just the god-of-the-gaps for evolution. Given enough time can anything happen, so that the impossible becomes possible and the possible probable? (5) God's supernatural intervention can at times provide appearance of age, such as for the water-to-wine miracle.

Geological evidence. Although not totally impossible to fit into a short-age model, the following evidence is easier to explain in a long-age model: cooling of batholiths and tectonic plates, the rate for plate tectonic movement, coral reef growth rates, "annual" sedimentary layers that in places may number in the millions, ice core data, length of time for geomagnetic reversals, chemically precipitated sediments, reworked sediments, and evidence of significant animal activity.

Theological and scientific implications of different time models

Entire universe young. This view is held by many young-earth creationists. YES This model is the simplest to defend theologically, due to almost complete lack of contrary evidence in Scripture. Quite possibly this was the understanding of the ancient Israelites. NO It fits very poorly with the scientific evidence.

Solar system and earth young -BUT- universe old. There were other previously created worlds, and the devil sinned before this earth was created (Job 1:6; 38:7; Ps. 33:6; Col. 1:16; DA 834; PP 41,42; GC 497; SR 19). This may be the most common understanding held by Seventh-day Adventists. YES It helps scientifically in explaining astrophysical phenomena, such as light from stars that appear to be millions of light-years away. NO If the Sabbath commandment of the immutable Decalogue is for the entire universe, it would suggest that the entire universe was created during a 7-day creation week. An old universe model would probably accept long ages for stellar evolution, instead of a fiat creation of the stars.

Life on earth young (6000 years) -BUT- materials of earth and solar system old (billions of years). The soft (or passive) gap theory suggests that the heavens in Genesis 1 include only the atmosphere and the earth includes only the dry land. The Adventist Review has suggested this view on various occasions (1860, 1887, 1964, 1993). YES This view may assist in explaining the old radiometric dates as actual ages for the rocks, without necessarily assuming that the constituent fossils are also old. NO This model is not inherently obvious in the creation account, and is only suggested by science; however, even the science has problems. The rocks with little life (Precambrian) and those with much life (Phanerozoic) are geologically similar in many ways, so that arguing for an old Precambrian and a young Phanerozoic may not be very consistent. In addition, if the sun and moon were not actually created on the fourth day but only appeared to an observer, perhaps the plants and animals were not really created during creation week but only appeared on their respective days as well.

Life on earth young (approximately 10 thousand years) -BUT- not exactly 6000 years. Using the genealogies of the patriarchs between Adam and Abraham, the various Old Testament manuscripts provide a range of ages since creation. YES This view more easily harmonizes some archaeology (carbon-14 dates) with Scripture. NO Ellen White makes numerous statements about the age of the earth being about 6000 years, so this view accepts that inspired documents are not necessarily accurate in all scientific details.

Recent creation and world-wide flood -BUT- somewhat extended time (20 thousand - 1 million years). YES This view removes problems with archeology and carbon-14 ages and many questions about the ice ages. NO No suggestion of these extended times is found in the biblical chronologies, and Ellen White suggested that ages should not be measured in tens of thousands of years.

Recent creation, local flood -BUT- previous life, no world-wide flood. This view is sometimes called the hard (or active) gap theory. The fossil record is due to an old creation that was destroyed before the creation of Genesis 1 occurred. YES Although death in the fossil record would be before Adam's sin, it could still be placed after the devil's sin and be the result of his experimentation. This model agrees with the uniformitarian geologic column and long ages. NO It may be difficult to explain why the animals from an ancient creation are so similar to those of a recent creation. The Bible suggests that creature death is the result of Adam's sin. The Bible assumes a world-wide flood (1Pe 3:20; 2Pe 2:5;3:6; Lk 17:27; Mt 24:39): migration would have been easier than an ark to save life from a local flood; God promised not to destroy the earth again with a flood (Ge 8:21;9:11) and many local floods have occurred since then.

One literal 7-day creation week -BUT- occurring millions of years ago. This view has been suggested, but not amplified significantly. YES The Sabbath as a memorial of a 7-day creation is retained. The suggested long ages

of science are accepted. NO An ancient creation associated with an ancient fall and death would result in a mixed burial of many kinds of organisms, unlike the observed paleontological sequence.

God as Creator -BUT- working over long time periods. Progressive creation and theistic evolution are accepted by many evangelical Christians who are scientists. YES It accepts the standard scientific interpretation of long ages for the geologic data, but still holds God as Creator and Designer. NO It removes the literalness of Genesis 1-11 attested by other Bible authors (creation: Heb 11:3; 2Pet. 3:5 / Adam and Eve: Mt. 19:4-6; 1Tim. 2:14-16 / origin of sin: Rom. 5:12 / flood: Heb. 11:7; and see #6 above). It allows for death before sin and calls into question the goodness of God's character.

Conclusions on time

Science. There does appear to be good scientific evidence for long ages (even for life on earth). The standard techniques are reasonably good with no obvious major problems. A fairly comprehensive long-age model with supporting evidence exists, whereas no good comprehensive short-age naturalistic model exists. However, science is not perfect, so one is not irrational for not accepting all of it. Radiometric dating has problems, and some scientific evidence exists for short ages.

Inspiration. Short ages for life on earth (and even for the matter of the universe) may be best theologically. Origins questions are intended to be answered by the Bible, whereas science is not best equipped to answer them. Outside evidence can be used to check a biblical interpretation, but the interpretation shouldn't be changed if it would destroy the Bible's internal consistency. However, scripture misinterpretations have occurred in the past (a geocentric universe, fixity of species, ...), so it is important not to require more than the Bible requires. Care must be taken not to repeat dogmatic mistakes of the past, and the Bible should not be used as a science textbook.

Conflict. Conflict between science and revelation on time issues is very apparent and no clear final answer is currently available. For comparison, other examples of necessary conflict due to our finite comprehension are available: the divine/human nature of Christ, the dual wave/particle nature of light. Some scientific data fits a short chronology best, more fits a long chronology best, and much can fit both.

Therefore. Various resolutions to the conflict should be considered, weighing the pros and cons of each. One can be more objective when considering several options, rather than just one. I prefer to work with a combination of models (although uncomfortable with the extremes listed). With the chance of erring in developing an earth history model, I prefer caution—biblical certainty and scientific uncertainty, over scientific certainty and biblical uncertainty. Some corroboration for belief from the physical world should be expected, but it is unlikely to be overwhelming, considering the difficulty of analyzing God's activity scientifically.

Any of the models have significant problems. There is a lot we don't know about time that will never be known until heaven. There is a need for continued study and the willingness to change one's opinion as necessary. However, for me there is one non-negotiable point: any origins model that misrepresents God's character is totally unacceptable.

CONCLUSION

Several quotations have helped me in dealing with the evidence. First, Job's response to God after God had asked him so many difficult questions:

> Behold, I am vile; what shall I answer thee? I will lay mine hand upon my mouth. Once have I spoken; but I will not answer: yea, twice; but I will proceed no further. — Job 40:4,5
>
> I know that thou canst do every thing, and that no thought can be withholden from thee. Who is he that hideth counsel without knowledge? therefore Have I uttered that I understood not; things too wonderful for me, which I knew not. — Job 42:2,3

The chapter in *Steps to Christ* on "What to Do With Doubt" is very helpful, with the following quotation being of particular interest:

> God never asks us to believe, without giving sufficient evidence upon which to base our faith. His existence, His character, the truthfulness of His word, are all established by testimony that appeals to our reason; and this testimony is abundant. Yet God has never removed the possibility of doubt. Our faith must rest upon evidence, not demonstration. Those who wish to doubt will have opportunity; while those who really desire to know the truth will find plenty of evidence on which to rest their faith. (SC 105)

And we find that Jesus dealt tenderly with doubting Thomas:

> ... Many who, like Thomas, wait for all cause of doubt to be removed, will never realize their desire. They gradually become confirmed in unbelief. Those who educate themselves to look on the dark side, and murmur and complain, know not what they do. They are sowing the seeds of doubt, and they will have a harvest of doubt to reap. At a time when faith and confidence are most essential, many will thus find themselves powerless to hope and believe.
>
> In His treatment of Thomas, Jesus gave a lesson for His followers. His example shows how we should treat those whose faith is weak, and who make their doubts prominent. Jesus did not overwhelm Thomas with reproach, nor did He enter into controversy with him. He revealed Himself to the doubting one. Thomas had been most unreasonable in dictating the conditions of his faith, but Jesus, by His generous love and consideration, broke down all the barriers. Unbelief is seldom overcome by controversy. It is rather put upon self-defense, and finds new support and excuse. But let Jesus, in His love and mercy, be revealed as the crucified Saviour, and from many once unwilling lips will be heard the acknowledgement of Thomas, "My Lord and my God." (DA 808)

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