Can Recolonization Explain the Rock Record?

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Abstract

The recolonization model is a recently proposed diluvial solution to many enigmas of the rock record. Working within the framework of the global stratigraphic succession developed by uniformitarian geologists over the past two centuries, it seeks to reconcile it with Biblical history by moving the Flood event to the very base of the stratigraphic record. Thus the Flood is represented by that section that extends from the oldest crustal rocks (Hadean) up into the Carboniferous. The post-Carboniferous record reflects a sequential terrestrial recolonization by Flood survivors, preserved as a series of historical snapshots by post-Flood catastrophes. Although appealing in its attempt to merge the geologic column with Genesis, the model's positive arguments are unconvincing. An evaluation of Biblical, axiomatic, logical, and geological issues reveals significant weaknesses. Two of its greatest flaws lie in its two key assumptions: 1) the veracity of the geologic timescale's relative chronology, and 2) the validity of uniformitarian depositional models.

Introduction

During the eighteenth century, Enlightenment intellectuals used the stratigraphic record as an excuse to reject the Biblical Flood as the primary geological agent that shaped Earth's crust (Rudwick, 2005). Their goal was the larger rejection of Biblical authority, and the use of geology as a weapon against Christianity continues to this day. Christians have derived a number of novel ideas to address this problem—some ridiculous, some intriguing. Though the philosophical context is becoming clearer, the stratigraphic issues remain unresolved, as illustrated by the variety of opinions in the 2006 symposium, *The Geologic Column: Perspectives within Diluvial Geology*, published by the Creation Research Society.

Since Steno (1638–1686), Christian naturalists have attempted to correlate the Flood event with a particular division of strata, while secular thinkers have sought to deny any link. Early in the Enlightenment, there was a tendency to minimize the Flood by moving it ever higher in the stratigraphic record. Although geologists gave lip service to the Flood up into the early 1800s, they diminished its relevance by relegating it to the uppermost sediments, which were called "diluvium." When Louis Agassiz presented his theory of glaciation, uniformitarians welcomed the opportunity to exorcise the Flood from the rock record altogether instead

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of revisiting their earlier (incorrect) interpretations.

Whitcomb and Morris (1961) resisted the secular tide by attributing most of the sedimentary rock record to the Flood—a position still held by many creationists. In recent years, the Flood has been migrating stratigraphically once more; only this time it is moving *lower* in the section (Hunter, 2000; Tyler, 2006). Perhaps the most comprehensive example of this trend is the "recolonization model"—a theory that presents several novel ideas.

Proponents of these ideas are Christians and creationists, and we see the discussion as being "within the family," rather than evidence of compromise or apostasy. Thus, their models deserve the same respect (and scrutiny) as other creation models and should be assessed in similar fashion for their (1) Biblical fidelity, (2) presuppositional and logical consistency, and (3) empirical correspondence to the phenomena to be explained—in that order of priority.

Although "recolonizers" reject the billions of years of deep time, they also reject the possibility that the bulk of the sedimentary rock record formed during the year of the Flood and so are forced to conclude that much of it is a product of post-Flood catastrophism. Dr. David Tyler's (2006) synopsis describes extensive fossilization and sedimentation after the Flood, which he posits as ending with the Carboniferous strata.

In his model, the hyper-catastrophic onset of the Flood obliterated most antediluvian organisms, and so most fossils in the sedimentary record are descendents of marine survivors of the deluge and terrestrial animals aboard the ark. This logically demands the rapid and fecund repopulation of marine and terrestrial habitats during and soon after the Flood. For that reason it is called the "recolonization model." Our critique will focus on Tyler's (2006) presentation, though other articles (pro and con) are present in the literature and are included at the end of our reference section.

What Is the Recolonization Model?

We cannot understand the recolonization model unless we understand the driving force behind it. What assumptions and data drive the model? We see two significant factors. The first is the desire to accommodate the global geological chronostratigraphic timescale (Gradstein et al., 2004), absent its geochronologic component of billions of years of prehistory. The key to understanding this conceptual construct—often called the geologic column—is the assumption that the rock record is best interpreted via globally correlative sequential time periods, whether their length is measured in days or millions of years (Reed, 2008b). In other words, strata can be best classified by their time of deposition or emplacement and then correlated globally on the basis of that time, since time's progression is a global constant. For example, the recolonization model rejects the timing of the "Cretaceous Period" as being 145.5 million years ago (Ma) to 65.5 Ma, but it accepts the "Cretaceous" as a real interval of Earth's history by which otherwise disparate rocks can be correlated worldwide. It also accepts the relative position of the "Cretaceous Period" to other time periods of the timescale (Figure 1).

A second factor driving the recolonization model is the perceived need to accommodate various uniformitarian depositional theories. These explanations tend to default to slow, low-energy environments, similar to those observed today. The recolonization model recognizes that many processes are quantitatively more rapid than the rates proposed by secular researchers but does not require qualitatively different processes, such as would be expected to accommodate the one-year time frame of the Flood. Dinosaur trackways and nests are commonly cited examples of features requiring time in excess of the Biblical chronology. According to Tyler (2006) and others, these features

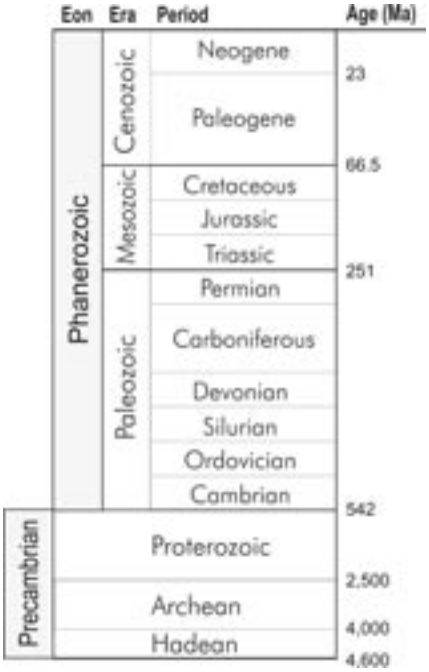

Figure 1. The geologic timescale showing both the relative chronostratigraphic arrangement that is assumed to be the same all over the globe (absent erosion and non-deposition), and the geochronologic ages currently accepted by uniformitarian geologists.

contradict continuous catastrophic deposition and thus cannot be integrated with the Flood.

Based on these premises, the model follows. In order to maintain a significant presence for the Flood in the rock record, and yet still attribute much of the sedimentary record to post-Flood time, Tyler moves the onset of that catastrophe to the oldest remnants of igneous and metamorphic crust on Earth. He notes that the beginning of the Flood was so intensely violent that it destroyed the original crust, stripping it down to the lower lithosphere (Figure 2). Tyler's view is similar to, but less radical than, Hunter's (1996; 2000) model, which places the pre-Flood boundary at the 660 km discontinuity in the mantle.

Thus the Flood began with the complete destruction of the crust on

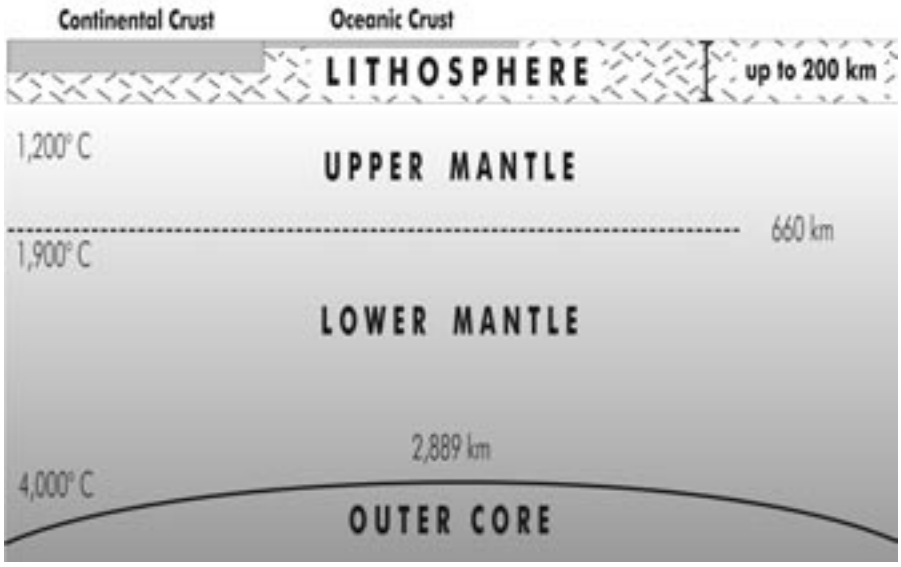

Figure 2. Earth's lithosphere, which includes the crust and part of the upper mantle, occupies the outermost skin of the planet, averaging 100 km and reaching thicknesses of 200 km. In contrast, the average thickness of the continental crust rarely exceeds 50 km and the average oceanic crust, 10 km.

the first day, and the reconstruction of its crystalline components by the end of the first forty days. To emphasize this special period of destruction, Tyler (2006) applies the Hebrew term *măbbûl* to the first forty days of the Flood as a distinct, especially destructive period that accomplished the majority of geologic work—not primarily sedimentary, as commonly thought by most diluvialists, but igneous and tectonic. He believes that this period of the Flood was so violent that practically all living land creatures died on the very first day or soon after.

> Did any survive outside of the Ark after the first day? The bursting forth of all the springs is an indication that the entire earth was awash with surging water on the very first day. If anything did survive, it could not have been much longer than a day since the inundation was so overwhelming. The parallel Jesus drew with Sodom and with His own return indicates that the destruction of life was over quickly (2006, p. 74).

It follows that terrestrial life was annihilated on the first day, leaving little to no fossil traces. Even potential fossils were destroyed.

> All the sediments coming from the antediluvian world would be mingled with the products of igneous activity, accompanied by extensive metamorphism, and this had the effect of obliterating anything that might potentially have become a fossil. In other words, the world that then was, was destroyed (II Peter 3:6) (Tyler, 2006, p. 76).

During this initial intense destruction, small populations of marine life were preserved in quiescent deepwater areas that Tyler calls "refugia." As a consequence, the complete fossil record is not a record of the Flood's destruction; every fossilized organism was either a survivor on the ark or of these marine sanctuaries.

The initial crustal destruction (Day 1) and the *mabbul* (through Day 40) are equated with the "Hadean" and/or the lowest part of the Archean, depending on which iteration of the geologic timescale one accepts ("Hadean" is a new term used by the International Commission on Stratigraphy that denotes the time of earliest crustal formation). After Day 40, the springs of the great deep closed and the floodgates of heaven stopped, and the majority of the destruction ended.

What followed was the more conventional sedimentary work of the Flood, accompanied by a rapid recolonization of the globe by marine life that had survived in the "refugia" and which quickly began refilling empty habitats over the flooded shallow water continents. In this less catastrophic period of the Flood, life was fossilized in the order of its *re*appearance: simple forms initially, followed by more complex invertebrates (Figure 3). The blue-green algae and bacteria were the first "refugians" to be fossilized and appear in late Archean and Proterozoic sediments. Then, as more suitable habitats became available, the first multicellular life—the Ediacaran fauna—became established and preserved in late Proterozoic (Vendian in Figure 3) sediments as pioneers in environments too harsh for other organisms. As the Flood progressed, other environments became survivable and were filled, as documented by the "Cambrian explosion." Late in the Flood, "Devonian" fish filled new habitats and began to be fossilized in great numbers.

As the Flood receded, exposing new terrestrial environments, plants took root, having survived the *mabbul* in the form of floating log and vegetation mats. Since all air-breathing, land-dwelling animals perished in the Flood, the only animals available to recolonize the terrestrial environments were those on the ark and their descendents. Tyler (2006) proposes that these animals began to fill the terrestrial environments and be preserved as fossils in the order found in the geologic timescale: on a gross scale of amphibians-reptiles-mammals; and on a finer scale with various small (attributed to evolutionary successions by secular naturalists), time-related

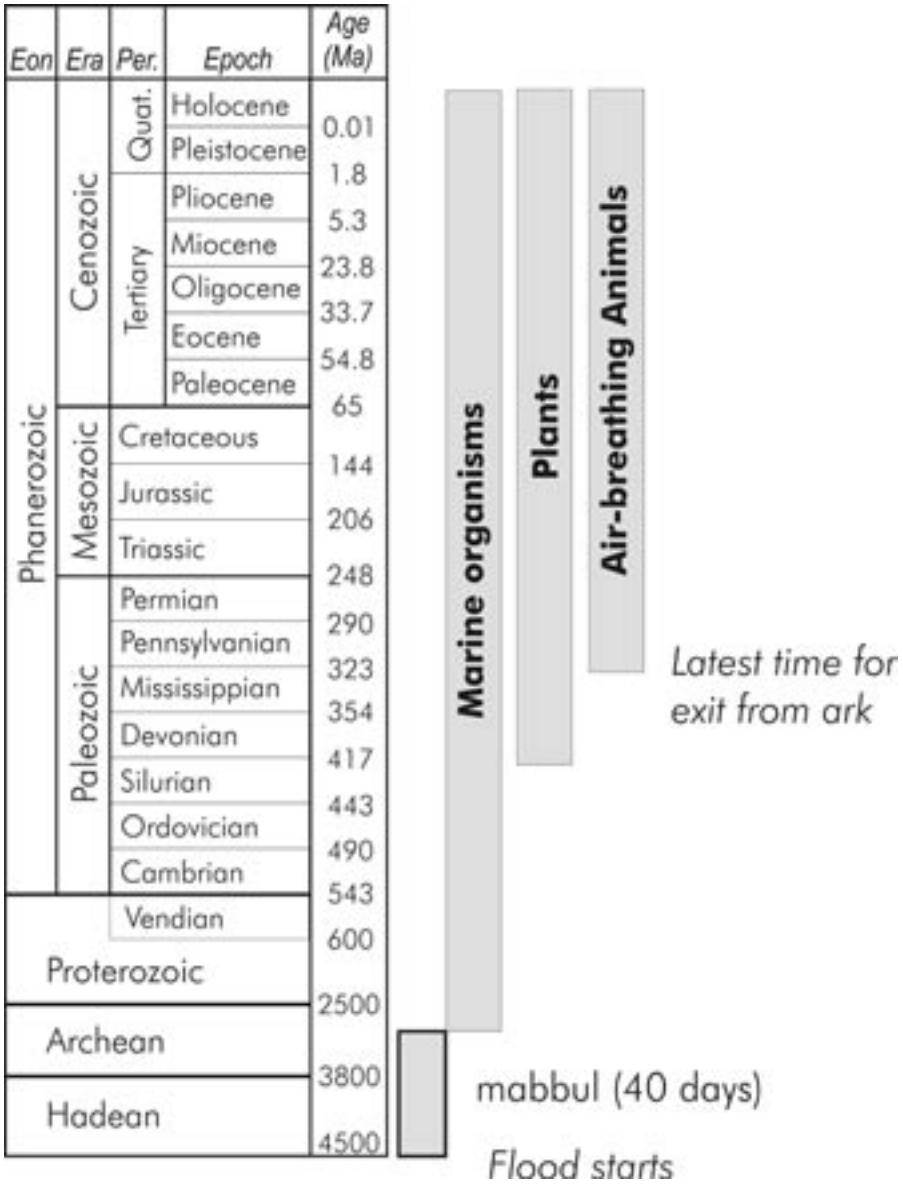

Figure 3. The stages of recolonization during and after the Flood are arranged relative to the geologic column, with the gray boxes representing the approximate extents of recolonization for marine creatures, plants, and air-breathing terrestrial creatures from the ark. The recolonization model does not accept the absolute timescale of the column. Modified from Tyler (2006).

changes (e.g., ammonite species, horses, microfossils). Thus, all air-breathing fossils, such as dinosaurs, were descendents of the ark's survivors, lived after the Flood, and were buried and fossilized by post-Flood catastrophes in a global sequential fashion congruent with a time-stratigraphic approach.

Stratigraphically, that leaves the post-Flood boundary—measured by the time the animals exited the ark—as sometime during the Carboniferous (Mississippian-Pennsylvanian on Figure 3), which corresponds to the first "appearance" of land animals in the uniformitarian column. Other European creationists had once placed the boundary in the late Paleozoic (Garner, 1996a; 1996b; Garton, 1996; Robinson, 1996; Scheven, 1996; Tyler, 1996). There have been a few significant revisions in recent years. Robinson has moved the boundary from just below the Permian into the Precambrian (Garner and Peet, 1999), based on environmental indicators such as hardgrounds. On the other hand, Paul Garner (personal communication, Oard) has set it at the Cretaceous/Tertiary boundary.

So the recolonization model presents several distinctive propositions. These include:

- The Flood event is represented by the stratigraphic interval from the earliest crust up into the Carboniferous Period.
- The fossil record includes survivors of the Flood and their descendents, rather than antediluvian creatures.
- Large-scale, global post-Flood catastrophism occurred.
- The geological work of the Flood was primarily tectonic and igneous, not sedimentary.

Discussion

As with any other model of natural history, we can and should evaluate it by an evidential hierarchy congenial to Biblical Christianity. This would include: (1) Biblical and theological evidence, (2) presuppositional consistency, (3) logical consistency and coherence, and (4) empirical (mostly geological) evidence. This discussion will follow that hierarchy in its proper order from the most significant to the least weighty. Thus, though the geological issues may be the most intriguing, they carry the least evidential import in the Christian worldview.

Biblical Issues

As with any model of earth history, the primary evidence for or against the recolonization proposal is the infallible history contained in the Bible. Thus,

accuracy in interpretation and hermeneutical approach is the single greatest hurdle for the recolonization model. And the scriptural support elicited by the model (Tyler, 2006) is weak in at least four areas.

Interpretive Methodology

Tyler (2006) draws various conclusions in regard to the Genesis Flood narrative by appealing to New Testament references that cite the Flood as a means of judgment (Matt 24:37ff; Luke 17:26ff). Tyler justifies his approach by asserting that Scripture is best interpreted by other Scripture. Although this view is common among evangelicals in general, and young-earth creationists in particular, it is somewhat naïve and simplistic. In fact, the whole approach is either circular or intractable. If Scripture A and Scripture B refer to the same or similar thing, which one interprets which? Does A interpret B, or does B interpret A? Even if we assume the later Scripture (B) interprets the earlier one (A), then what interprets the later one? If it is another later Scripture (C), then what interprets this Scripture? We end up with an intractable Wittgensteinian problem of definition, where Scriptures are interpreted by other Scriptures, which are interpreted by other Scriptures, which are interpreted by yet other Scriptures, *ad nauseum*.

Evangelicals with a high view of Scripture are obliged to read Biblical passages from a grammatical-historical perspective: Biblical words and phrases must be interpreted in light of their grammatical, literary, and historical context. Although New Testament references and allusions may assist in determining and clarifying the literary and historical context, they do not override the intrinsic grammatical relationships and the original literary and historical context.

New Testament References

In the case of the Flood narrative, Tyler errs in allowing secondary allusions to contradict the clear testimony of the primary historical narrative in Genesis 6–8. He cites Matthew 24:38–41 and Luke 17:26–35 as evidence that the Flood involved an overwhelming, immediate destruction. In Matthew 24:37–41, Jesus proclaimed:

> As it was in the days of Noah, so it will be at the coming of the Son of Man. For in the days before the flood, people were eating and drinking, marrying and giving in marriage, up to the day Noah entered the ark; and they knew nothing about what would happen until the flood came and took them all away. That is how it will be at the coming of the Son of Man. Two men will be in the field; one will be taken and the other left. Two women will be grinding with a hand mill; one will be taken and the other left. (NIV)

According to Tyler, "Jesus refers to the Flood beginning suddenly. He drew this analogy between the judgments in the days of Noah, on Sodom, and His future return. Each judgment [Noahic flood, destruction of Sodom, and Christ's second coming] is presented as sudden" (Tyler, 2006, p. 74). He adds:

> Did any survive outside of the Ark after the first day? The bursting forth of all the springs is an indication that the entire Earth was awash with surging water on the very first day. If anything did survive, it could not have been much longer than a day since the inundation was so overwhelming. The parallel Jesus drew with Sodom and with His own return indicates that the destruction of life was over quickly (Tyler, 2006, p. 74).

Thus, Tyler concludes that these New Testament references imply a sudden, comprehensive, and rapid destruction.

> In Noah's day, the waters did not rise gradually. The mabbul came unexpectedly and overwhelmingly. Along with the destruction of Sodom, Christ used these historical parallels because they were illustrations of how *unexpected*, how *rapid*, and how *comprehensive* will be the events in the hour when He returns" (Tyler, 2006, p. 85).

However, a careful reading of the cited texts shows us that Jesus' purpose in referring to these events was to highlight their sudden and unexpected nature, not their duration. This is confirmed by Matthew 24:42: "Therefore keep watch, because you do not know on what day your Lord will come" (NIV).

Regarding the Flood, Jesus did indeed indicate that it was both completely unexpected and comprehensive in that it killed every living being except those in the ark. However, the text provides no warrant in itself to conclude that the total destruction took not much more than a single day. The duration of the destruction is simply not in focus here. This is confirmed by the use of Greek aorist tense for "came" *(ēlthen)* and "took away" *(ēren)*. The aorist tense with the indicative mood is routinely employed to refer to a historical action as a whole without saying anything about the kind of action or its duration (Wallace, 1996, p. 554).

Again, it is possible to gain insight into the Flood account from other passages, but they cannot legitimately be used to twist the original narrative. To assert that brief and passing New Testament references provide a better source of information than the Genesis account itself demeans the integrity of Scripture. This is especially true when one considers that the original readers of the Flood narrative did not have access to either the New Testament or the teachings of Jesus. Does Tyler believe that these original readers were likely to have misunderstood the narrative because they did not have access to the New Testament?

A proper evangelical hermeneutic must take the Genesis Flood narrative as the primary source of information in regard to the Flood event. New Testament

references must be interpreted in light of their own specific literary and historical context and may or may not offer some insight into how the original readers understood the Flood narrative.

The Meaning of *măbbûl*

Tyler proposes a new interpretation of the Hebrew word *măbbûl*. He suggests that it refers only to the first forty days of the Flood, rather than the entire episode.

> In Genesis, the word "mabbul" is used of the destruction. It applies to the first 40 days of the time when Noah was on the Ark. The mabbul is the "cataclysm." It was overwhelming. After these 40 days, the springs of the great deep closed, the floodgates of heaven stopped, and the torrential rain ceased, signifying a cessation of destruction (Tyler, 2006, p. 75).

In other words, Tyler contends that *măbbûl* refers only to the period of destruction when the floodgates of the heavens were opened and the waters broke out from the springs of the deep. This period lasted for forty days (Gen. 7:17).

However, there are absolutely no etymological or philological grounds to ascribe such a meaning to *măbbûl*. It is not enough to simply assert such a unique interpretation. Tyler must demonstrate this meaning from its historical usage in general and its particular usage in the Flood narrative. The burden of proof lies with him alone, and he has not provided anything more than mere assertions.

The best way to resolve a word's meaning is to examine it in context in order to determine how it is being used. The word *măbbûl* occurs 13 times in the Old Testament—12 times in Genesis and once in Psalm 29:10—and all refer to the Flood described in Genesis 6–8. Michael A. Grisanti (1997) notes that "the presence of the article on all but two instances (Gen. 9:11, 15) in the Flood account (Gen. 6–11) may indicate that this … was a well-known event." In other words, *măbbûl* had become a special, technical term that was uniquely used to refer to the Noahic Flood. Moreover, all instances that refer to the Flood's coming or describe its impact are juxtaposed with the Hebrew word *măyĭm* ("waters") resulting in the translation "floodwaters." Furthermore, all the post-Flood instances refer to the Flood as a whole, not just to the first forty days (e.g., Gen. 9:28; 10:1; 11:10; Ps. 29:10). Therefore, the Old Testament usage of *măbbûl* suggests that it refers not to just the first forty days of flooding but to the presence of the floodwaters throughout the entire period the earth was flooded.

Textual Indicators of an Extended Destruction

Genesis 7:12 states that the rain fell *upon the earth* for forty days. Although *ĕrĕs* can refer to the earth as a whole, it more commonly is used as a general reference to "land" or "ground." This is confirmed by the instance in Genesis 7:17: "For forty days the flood kept coming on the *earth*, and as the waters increased they lifted the ark high above the *earth*" (NIV). The second, parallel, occurrence of "earth" in this verse is clearly a general reference to the ground.

In addition, Genesis 7:17–21 indicates that as the rain fell, the waters continued to rise. These verses provide markers of progress; the ark floated, the mountains were covered, and the depth was sufficient for the draft of the ark to never touch ground. In this passage, which covers weeks of time, the water "kept coming on the earth" (7:17, NIV) until all the mountains were covered "to a depth of more than twenty feet" (7:20 NIV).

In Genesis 6:13b, God proclaims that He will "destroy both [humanity] and the earth" (NIV). Thus, the object of God's wrath is not just human (and animal) life but the earth itself. Given that it took at least 40 and as many as 150 days for the floodwaters to cover the entire earth completely, it is not possible that the entire surface of the earth was destroyed on the first day of flooding.

Note also that the account does not indicate that every living thing on the earth was destroyed until *after* the entire earth was covered in water. In other words, it was not until the end of the period of rising waters, when the earth became completely covered in water, that all living creatures were finally destroyed. This should not be surprising given that a substantial number of creatures would have been occupying high ground at the time when the flooding began. Furthermore, birds would have been able to escape the floodwaters more easily than land dwelling creatures and could have flown to high ground.

It also must be asked how the rain could fall upon the "earth" if the crust was destroyed beforehand? How could there be mountains to be covered if the crust was destroyed? At a minimum, the water was rising for forty days before all land, including the mountains, was completely covered, and the waters prevailed for up to a total of 150 days before the ark came to rest on the mountains of Ararat (Gen. 8:4). In short, the text indicates the waters from the heavens and the springs of the deep steadily rose upon the earth for at least a forty-day period. There is no doubt that this inundation was catastrophic and—relatively speaking—extremely rapid. Nevertheless, the account does not support a complete inundation and crustal destruction resulting in the immediate death of all living creatures on the day the flooding began.

Axiomatic Issues

Uniformitarian Chronostratigraphy

It is clear that Tyler (in his 2006 article and many others) perceives the uniformitarian chronostratigraphic timescale or column to be an indisputable empirical description of the rock record. This starting point leads inevitably to conflict with the Biblical account of the Flood,

because the column is *not* empirical—it is a conceptual representation of the rock record resting on various presuppositions that are diametrically opposed to Biblical history (Reed, 2008a; 2008b; 2008c; 2008e; 2008f; Reed and Froede, 2003).

These presuppositions appeared during the Enlightenment, specifically among the mid-to-late-eighteenth-century continental intellectuals; they were not original to James Hutton (Reed, 2008d) or Charles Lyell (Rudwick, 2005; 2008). They included: (1) a lengthy prehistory—contrary to the Genesis phrase "in the beginning"—(2) the absence of God's active participation (or even presence) on history's stage, (3) the superiority of rocks to the Bible as reliable history, (4) uniformity of process through history, and (5) the material development of earth and life.

In other words, the uniformitarian timescale—even in its unquantified chronostratigraphy—springs from the worldview of Enlightenment secularism, or naturalism. Mortenson (2006) discussed the anti-Christian philosophy of the men who formed the timescale, and these commitments are confirmed by secular historians (Rudwick, 2005; 2008; Stark, 2003). Lyell's anti-Christian bias was nothing new; it was the culmination of nearly a century of Enlightenment "geology" being used as a club against Biblical history—Buffon having published his *Histoire naturelle* in 1749.

There is more to the timescale than just anti-Biblical history. It rests on a questionable methodological cornerstone—the assumption that rocks can be globally correlated by their time of emplacement (Reed, 2008b). That assumption, quite unsurprisingly, rests on the philosophical axioms of extended prehistory and uniformity of rate, both contrary to the Bible. Long ages of geological stasis commend a time-stratigraphic approach (correlating by time periods); Biblical catastrophism does not. Early naturalists embraced the time-stratigraphic method because it was evident that direct physical correlation was not possible on the ambitious global scale they desired. That method stands today; correlation is still done by *time*. "Cretaceous" is a time period; it refers only to an empirical rock body by the imputation of "Cretaceous" time to the rocks—an assignment that is not empirical.

Since there was no extended prehistory (Gen. 1:1) and since uniformity of rate cannot possibly apply to either the Flood or the Creation events, the derivative cornerstone of the time-stratigraphic approach—global correlation by time—cannot possibly be true. If the assumptions that prop up even the relative chronostratigraphy of the timescale are untrue, then it follows that the chronostratigraphy is flawed. Furthermore, a global catastrophic flood would deposit rocks based on local conditions of energy, sediment source, topography, and chemistry. These conditions might vary from one region to another, even for rocks deposited at the same time. Therefore, it is unlikely that Flood deposits could be globally correlated by the methods and assumptions of the uniformitarian column.

Uniformitarian Speculation Uncritically Accepted

Like a number of other diluvialists, Tyler seems to uncritically accept uniformitarian interpretations of many aspects of the rock record. For instance, he says,

> the abrupt appearance of so many phyla in low-energy environments (many Cambrian formations carry the marks of non-catastrophic deposition) makes little sense as an early (or the earliest) stage of the Flood (2006, p. 80).

Accepting rather than questioning this type of interpretation (i.e., "low-energy environment") leads to difficulties. If so, then obviously the "environment" required much more time than the one-year Flood. Rather than contort ourselves around the erroneous assumptions of secular prehistory, it might be more profitable to reexamine the possibility of deposition in a high-energy environment or the historical reality that a diversity of small "environments" would have been possible, given wildly varying local conditions even in a globally catastrophic flood. It is an error to assume that the Flood was wildly catastrophic everywhere on Earth at every moment over its duration. This parody is popular in anti-creationist literature (e.g., Young and Stearley, 2008) but needs to be avoided by creationists. Since uniformitarians are predisposed by their worldview to see slow processes of deposition over millions of years whenever they look at the rocks, we need to beware the pervasive power of their bias. Numerous instances could be cited of changes in interpretation from typical uniformitarian deposition to catastrophic deposition over recent decades (Ager, 1993; Oard and Reed, 2009). It is not unreasonable to believe that the continued advancement of diluvial geology will lead to more of these reinterpretations by both diluvialists and secular geologists.

As an example, shale and mudstone make up about 80% of all sedimentary rocks. Geologists have historically interpreted shale and mudstone as the products of low-energy environments, arguing from the physics of particle settling through a column of water that it would take vast periods of time for the fine particles to be deposited. They then have used those "necessary" millions of years to argue against the Flood. The problem is complicated by the fact that most fossils are found in shale or mudstone. Thus, they say, the Flood could not possibly have produced the fossil record.

But recent work by uniformitarian researchers has shown that mud can be deposited in significant quantities in fast-flowing water (Macquaker and Bohacs, 2007; Schieber et al., 2007).

This supports rapid deposition required by the Flood (Walker, 2008), and by a mechanism not recognized prior to these publications. How many other unknown mechanisms await discovery? Present ignorance of aspects of Flood processes is not a reason to default to uniformitarian interpretations of geological phenomena.

Furthermore, the relative scale of processes for the recolonization model is much closer to the Flood timing (weeks vs. centuries) than to the standard uniformitarian scenarios (millions of years). Given the necessary extent of relatively rapid deposition during posited post-Flood catastrophes, the recolonization model appears to demand an innovative examination of standard models of geology, just as other young-earth models do. The secular history encapsulated in the geological timescale cannot be made to fit with the recolonization model.

Finally, the problem is deeper than a simple disagreement over isolated geological phenomena. The real issue is whether or not uniformitarian speculation rests on philosophical assumptions antithetical to Scripture. It seems obvious, both from a historical perspective (Mortenson, 2006) and from a logical perspective (Reed, 2001), that they do. If worldviews are really at war, the scope of the fight must be acknowledged and integrated into historical models. Accepting uniformitarian interpretation with the full knowledge that the presuppositional foundations of that position are false is a dangerous way to approach truth. Areas of ignorance in diluvial geology do not justify defaulting to solutions derived from an erroneous framework. Having an "answer" is not worth sacrificing truth.

Logical Problems

Circularity of Historical Models and Historical Evidence

Because of the epistemological differences between science and history, historical models face hurdles not commonly associated with scientific theories. The reservoir of evidence is usually much smaller, the models are attempting to explain unique events rather than general principles, and in these models, the necessity of speculation is much higher (because history deals with the unobservable and unrepeatable past). Given those constraints, it is not surprising that many historical models become somewhat circular—interpreting data within the framework of the model and then falling into the common trap of thinking that the ability to conceive of a *possible* interpretation within those boundaries somehow means that the interpretation must be true.

The recolonization model trips over this obstacle. There is no clear collection of data presented that *demands* the recolonization approach. Instead, the framework is erected to resolve perceived problems with the rock record, and then the model goes in search of supporting evidence. It purports to find that evidence in the Bible and in the rock record, but none of that information is unique to the model. For example, as shown above, Genesis 6–8 allows a variety of historical solutions in terms of geologic detail and favors a more traditional Flood model. At best, the recolonization option is only one of many potential scenarios.

Likewise, the physical evidence cited in support of the model does not constrain us to the recolonization solution. Data that are presented as "evidence" of the model can easily be re-interpreted within a variety of other models in a consistent fashion. Tyler (2006) discusses various time-rock units such as the "Hadean" and "Archean," but nowhere does he demonstrate the necessity of his interpretation vis-à-vis those units. He cites dinosaur eggs, tracks, and nests as indicators of post-Flood deposition, but viable Flood explanations exist (Oard, 2009).

Unfortunately, an extra layer of difficulty is added, because the "data" often imported into the recolonization model are not data at all but mixtures of data and interpretation. Finally, the problem is made more acute by the blurring of boundaries between history and science. We are accustomed to secular models of earth history that are granted the certainty of experimental science simply because those proposing them are "scientists." Conflating history as science is expected in the worldview of naturalism but should be avoided by Christians (Reed, 2001). The conquest of history by science is an Enlightenment error and clearly related to an anti-Biblical bias. It is thus an error that creationists must strive to correct.

History cannot meet the same standards of certainty and explanatory power as science because the epistemological differences between the two disciplines are significant, especially in a Christian worldview. Thus the recolonization model should be viewed as a potential historical interpretation—nothing more, nothing less.

Refugia Are Special Pleading

An illustration of this circularity is found in the proposed "refugia" of the recolonization model. First, the proposal itself is somewhat unexpected, given the implied repaving of Earth's crust during the first day of the Flood. Instead of the expected total destruction of the surface, we learn that *not quite* everything was destroyed; bubbles of life survived in isolated marine settings. What happened to the crust beneath these settings? If it was destroyed, then how did the "refugia" survive; and if not, then does the model predict areas of distinctive oceanic crust that might identify these locations?

The model states that these areas functioned as nature's arks, preserving marine life that would repopulate the oceans during the Flood. While we do not disagree that marine life survived the onset of the Flood, we believe that these pockets of life are inconsistent with the

extent of destruction proposed by the recolonization model.

The existence of these refuges is not demanded by evidence; it is demanded by the model. If the fossil record is primarily a record of recolonization rather than the destruction of the Flood, then the creatures that recolonized must have survived somewhere: ergo, "refugia." Their existence is reminiscent of the cartoon of the lengthy chemical equation that contains the key term "then a miracle happens."

Thus we must pose several questions about these biospheres. First, what positive data demand these oases? Second, how were these zones preserved in the face of the catastrophic and complete crustal overturn demanded by the recolonization model? How did a sufficient variety of life in sufficient numbers find their way into these deepwater environments, given the rapid and abrupt onset of the Flood? How did they survive without eating each other? How did they know when and where to migrate? How could they have traversed the distances to resettle globally and produce the abundant life found in the fossil record in the time allowed? In the case of those fossilized in the Flood, we are talking of a matter of weeks. Finally, if refugia were in deep water, how did shallow water bottom dwellers survive?

Timeline of Recolonization Does Not Fit the Bible

This leads to another issue—that of timing. Tyler's model would be clarified by a time line that illustrates the sequence of the Flood as compared to the geological column as compared to the migration of life to the refugia, their dispersion across the flooded earth, and their subsequent fecund reproduction into the vast populations preserved in the fossil record—all within less than 331 days for the pre-Permian record and within a few centuries for the post-Permian record. This time line should incorporate the latest knowledge of both their relative (to explain the fossil order) and absolute speed of travel for various fauna, as well as their reproductive cycles. We suspect that such an exercise would demonstrate the inability of the refugia solution to overcome the problems inherent in the recolonization model, because time constraints would not allow sufficient time of travel to and from refugia, nor would they allow sufficient time for reproduction, dispersal, and fossilization either during or after the Flood. For example, the "Cambrian Explosion" marks the preservation of vast numbers of creatures that would have had to migrate from their isolated refugia into shallow marine environments preserved in many places across the planet. Once there, they would have to reproduce in sufficient numbers within a matter of days to fill the fossil record for that time period—all in the midst of a tremendous catastrophe. And, of course, these same shallow marine environments would be expected to be subject to violent disruptions as rapidly rising Floodwater transgressed pre-Flood continents.

Geological Issues

Given the Biblical and logical weaknesses of the recolonization model, we now turn to the area of its greatest strength—its coherence with geological data. However, closer examination reveals problems similar to those found in other areas. Rather than strongly supporting the model, the geological data raise additional questions.

Antediluvian Origin of Much of the Crust

If the crust was destroyed and replaced during the earliest phase of the Flood, then the "Hadean," Archean, and Proterozoic igneous and metamorphic rocks must have been emplaced during the first forty days of the Flood. That seems unlikely for several reasons. First, the lithosphere protects the hydrosphere and atmosphere from the mantle. The simultaneous global destruction of the crust deep into the lithosphere would expose the surface to thermal and chemical hazards that would threaten the survival of marine life and life aboard the ark.

Second, large regions of the continental crust are granitic masses that appear by virtue of their extent, mineralogy, and position to be relicts of the Creation week, rather than the Flood. For example, the granitic crust in the midcontinent region of North America is cut by numerous late Precambrian to early Paleozoic rifts, which are readily seen as early Flood features. Reed (2000) interpreted the North American Midcontinent Rift System as marking the beginning of the Flood; and that feature crosscuts preexisting granitic crust, as well as other lithological terranes. Since the sediments infilling the rift basins appear to be nonmarine and covered by marine Paleozoic sediments, it appears that the rifting would have taken place between the onset of the Flood and the marine transgression of North America.

Models that propose the destruction of the crust must address the complications that arise from the global-scale volcanism that would surely follow. Furthermore, there is no Biblical or logical warrant for such a dramatic event. If nothing else, Occam's razor should constrain such speculation. Why create the necessity to explain the catastrophic re-formation of all of Earth's crust? The Biblical texts can all be satisfied without this extreme measure. It seems quite enough to have to explain the sedimentary record and the associated intrusive, extrusive, and erosional events.

Rapid Erosion of Continents?

The recolonization model proposes the removal of rock cover, sediment, and soil from continental interiors within a very short timeframe.

> Following Robinson (1996), the recolonization model advocates subterranean water bursting from below the continents, immediately

> scouring everything *from* the land *into* the sea (Tyler, 2006, p. 76).

The movement of water over land would follow well-known hydraulic principles. Topography would exert a profound effect on water flow: increasing or decreasing the hydraulic gradient would speed up or slow down flow, barriers would halt or divert flow, and the orientation of the landscape could create conflicting current paths. Rising base level also would affect the gradient, and even friction of the water moving over the land surface would change flow rates. Uncertainties abound, but it seems unlikely, from a hydraulic point of view, that water could overflow the full extent of the continents in one day. Think of the time required for modern flood peaks to travel downstream in a river. Also consider that in North America, floodwater would have to flow a thousand miles or more. Water moving 1,000 miles in one day would have to flow at an *average* current velocity of approximately 42 mph or 19 m/s for the entire distance. Water flowing greater distances would require proportionally greater average flow velocities.

Also, if the earliest crust is that which was emplaced during the Flood, then it stands to reason that all of the pre-Flood crust was destroyed. If so, how then could the water have run across the crust-that-was-no-longer-there? Water in contact with the lower lithosphere would not flow; it would flash into steam.

Heat Problem

Tyler (2006) notes that the first phase of the Flood was the destruction and re-creation of Earth's crust. "In summary, the Hadean/Archean was a time of 'meltdown' for the Earth" (Tyler, 2006, p. 77).

However, this extensive tectonic and igneous episode would, like catastrophic plate tectonics, create a hyper-catastrophic thermal event that probably would have destroyed the ark. The heat flow from the upper mantle (ranging in temperature from 1,200° to 3,600° C) would transfer vast quantities of thermal energy into the hydrosphere and atmosphere, perhaps enough to destroy them. Thus, the feasibility of the recolonization model depends on the demonstration that the release of thermal energy would not prove fatal to life in the refugia and aboard the ark.

Returning to the Biblical texts, there is no textual support requiring the equating of the "destruction" of the Flood to crustal melting. In fact, in 2 Peter 3, a contrast is drawn between the judgment of the Flood and that of the Second Coming; the first is a destruction by water, which is *contrasted* to the latter's destruction by heat.

Time Constraints on Recolonization

As noted above, Tyler's model requires the rapid migration, reproduction, and preservation of vast numbers of organisms during and immediately after the Flood. Even as a "thought experiment," it seems highly unlikely that "refugians" would cover the earth and reproduce in sufficient numbers to populate the fossil record in the time allowed by Biblical history.

> After the destruction of the mabbul, the first continental environments to be recolonized were marine, as the surface of what was to become land was still covered with water. Only later, as the land emerged above the sea, could there be terrestrial recolonization (Tyler, 2006, p. 77).

Repopulating large continental areas with all manner of marine creatures within a matter of weeks requires giant refugia located immediately adjacent to the continents with favorable currents to carry the creatures to their ultimate resting places. Yet this seems contrary to his depiction of refugia as small, isolated, deepwater survival zones.

The order of the fossil record seems wrong, too. Why would the fossil record not show a systematic order based on the speed of the organisms combined with their fecundity? And what creatures are fecund enough to provide that many fossils in a matter of days or weeks? Trilobites litter the lower Paleozoic. How fast could they move and reproduce? They would have to move from refugia to resting places all over the world in vast numbers within days. Other examples could be multiplied. We suggest that advocates of recolonization assemble these data on at least the major fossil groups buried by the Flood and demonstrate that their hypothesis is at least theoretically possible.

Origin of "Post-Flood" Rocks

The recolonization model terminates the Flood during the Carboniferous. Thus, the volumetric majority of the sedimentary rock record would then have been deposited *after* the Flood (e.g., Froede, 2007a; 2007b; vs. Tyler, 2007). This seems difficult to reconcile with the Biblical description of the Flood as a uniquely catastrophic global phenomenon. It also seems difficult to reconcile with God's promise in Genesis 9 to never again repeat the Flood, given the global presence of widespread marine strata younger than the Carboniferous. What specific non-Flood, but geographically extensive, catastrophes would have been required to deposit these sediments all over the world?

This problem is exacerbated by the Bible's restrictive timescale, even after the Flood. There is not much time between the Flood and the time when we would reasonably expect written historical records, and such records should then contain tales of monstrous catastrophes. That time frame also must accommodate the dispersal of terrestrial life from the ark and their repopulation in sufficient numbers to provide the quantity of terrestrial fossils observed in the rock record. Furthermore, geologists are confident that the existing rock and fossil records are only a fraction of the total *deposited* record, and so the num-

ber of fossilized creatures was probably much greater than that observed today. Once again, the premise of the timescale presents an additional roadblock for the recolonization model.

Rocks and fossils are not the only problem with the time line. What about landforms that overlie these supposedly post-Flood sediments? Many require large-scale erosion and orogeny, processes more consistent with late-Flood tectonism and receding floodwaters than modern low-energy events (Oard, 2008). If the most "recent" features of the geologic record were formed by the Flood, then it stands to reason that all underlying rocks were too.

How Did Post-Flood Civilization Survive the Mesozoic?

A spin-off of this problem comes from the establishment of human civilization and the rock record of the Middle East (Holt, 1996). Vast thicknesses of the rock record in Mesopotamia are Mesozoic and Cenozoic rocks deposited by marine processes in formations that cover large regions. According to the recolonization model, these sediments would be the result of post-Flood catastrophes and thus concurrent with early human civilization that spread rapidly throughout the Middle East (Genesis 10). How could the descendents of Noah have survived in a region undergoing these kinds of large-scale catastrophic events that were repeatedly occurring and burying the flora and fauna living with man? A simple comparison of the Table of Nations to the stratigraphy of the Middle East strongly suggests that the recolonization model cannot easily explain this discrepancy.

Furthermore, in the recolonization model, the Zagros Mountains in western Iran could not have risen until well after the Flood and probably after Genesis 10. This is true of many mountain chains, yet the Zagros Mountains (uplifted in the Pliocene) impinge upon the areas first settled by men after the Flood. In that case, we would expect such an event to be recorded in ancient literature.

Conclusion

Having examined the recolonization model in the light of the Bible, the logic of its assumptions and conclusions, and the geologic data, it appears that the model raises more questions than it answers. We hope that Dr. Tyler and his fellow recolonizers will continue their efforts to understand the rock record in light of the Biblical record, but we suggest that they reexamine the recolonization concept as a means to harmonize special and general revelation.

If not, then it appears that they must rethink the model, especially in light of the worldview clash that sets the axioms of Enlightenment naturalism against Biblical Christianity in the arena of natural history. Given that conflict and given the clear and unambiguous linkage between the geologic timescale (even in its relative chronostratigraphy) and that secular worldview, the lines of investigation need to run much deeper than they do at present. We hope that this work and that of other diluvialists will begin to unlock the remaining secrets of the rock record and bring that facet of human knowledge into conformity with God's kingdom.

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Appendix

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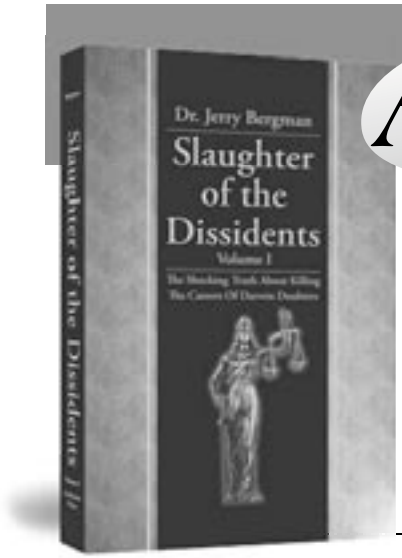

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Book Review

Slaughter of the Dissidents: The Shocking Truth about Killing the Careers of Darwin Doubters

by Jerry Bergman

Leafcutter Press, Southworth, WA, 2008, 493 pages, $24.00.

Coupled with its provocative title, this book is sufficient to shake a reader from head to foot. As the first of five proposed volumes, this issue truly is an experience. My attention was riveted and my emotions ranged from delight to disgust, mostly the latter. We are served by Bergman (and lesser authors including Kevin H. Wirth, D. James Kennedy, and John Eidsmoe) a smorgasbord of true stories. Most of the victims unjustifiably suffered seriously, being denied educational advancement, status, positions, compensation, etc. However, there is near the end of the book a redeeming "survivors" chapter presenting accounts of those including Wernher Von Braun who came through persecution with relative success.

This significant compilation authenticates the harassment of various Darwin doubters, creationists, and intelligent-design advocates. In carefully compiling these case studies, Bergman says his "plea is that readers and supporters will work to move the pendulum toward more tolerance and accommodation of Darwin skeptics in line with the principles of a free and just society" (p. 15). Bergman affirms that during his data compilation he "made every effort to contact both the victims and their critics" (p.12).

The book has convenient footnotes containing authors, dates, and pages for cited material. For complete references, readers can go to the 68-page bibliography. Also, there is a helpful 22-page index. I anticipate that the volume will have a serious impact; it deserves wide distribution.

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