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Creationism and Catastrophic Plate Tectonics

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At the 1994 International Conference on Creationism, six prominent creationists introduced a Flood model called Catastrophic Plate Tectonics (Austin et al., 1994). They based it on two major arguments: (1) evidence for uniformitarian plate tectonics, and (2) computer modeling of rapid plate motions. Refinements to the modeling have since provided fascinating graphical depictions of this crustal breakup, and the theory's popularity is evidenced by its wide promotion by major creationist organizations. Indeed, the popular creation press could easily convince Christians that this particular model is integral to the defense of biblical truth. Many creation scientists accept catastrophic plate tectonics (CPT); others remain skeptical, though their views have not been so widely disseminated.

Christians should stop and think before they leap on board this bandwagon. Some caution is warranted by the theory's logical

and technical problems, but the greatest problem lies in the potential perceived overlap between a human model and biblical truth. The spread of the Christian worldview in the earth sciences is just beginning, and few realize how massive an effort is required. It has proven both daunting and exciting. Individuals working in their specialties are producing a patchwork of exciting new research, though much energy is expended debunking uniformitarian fables. But people desire the confidence that comes from grand explanatory models, and CPT and "Hydroplate" (Brown, 2001) are the only ones in the public eye. This gives them a stature that has led to exaggerated claims:

The wealth of new data...that precipitated the acceptance of plate tectonics during the 1960's simultaneously also opened the door for the first time in more than 200 years to a technically credible defense of the Genesis Flood (Baumgardner, 2003, p. 113).

Creationist efforts towards grand theories

should be balanced by the more mundane work of sifting and reinterpreting the mass of data accumulated by uniformitarians. Broad models require a firm foundation. Should CPT's acceptance rest on its scope of explanation or on its ability to correctly explain all relevant data?

What is CPT?

Since the introduction of CPT, its literature has consisted of technical articles about computer modeling (e.g., Baumgardner, 1990; 1994a; 1994b; 2003), a forum between Baumgardner and Oard in 2002 in the *Journal of Creation* (formerly *TJ*), and a variety of popular books (e.g., Wise, 2002), video presentations, and articles (e.g., Snelling, 2007). The technical literature remains surprisingly sparse, given its popularity.

In short, CPT posits a pre-Flood crust consisting of a large supercontinent (Rodinia) and a world ocean underlain by a dense crust and lithosphere. Density con-

... continued on p. 6

Contents

Creationism and Catastrophic Plate Tectonics	1
Has Earth Contaminated the Solar System with Microbes?	1
A Time to Discard Creationist 'Shibboleths' — A Response to Carl Froede	3
A Question of Being Reasonable and the Use of the Uniformitarian Geologic Column — A Reply to David Tyler	4
How CRS Scientists Can Help The Next Generation	5
Speaking of Science	
Seeds Muscle Their Way into the Soil	9
Details of Photosynthesis Coming to Light	9
Fossil Forest Found in Coal	10
Swifts Don't Just Dream of Flying	10
Scientists Track Homing Pigeons with GPS	10
Dino Feathers or Horsefeathers?	11
All by Design: Not by Bread Alone	12

Has Earth Contaminated the Solar System with Microbes?

by Carl R. Froede, Jr., B.S., P.G.

It seems that just about every news item coming from NASA over the past decade has been an attempt to sell the public on the idea that life (intelligent or not) has evolved elsewhere in the universe. Selling evolution is big business even for some government agencies. Most readers will recall the stir created a few years ago when several evolutionary scientists claimed to have found evidence of organic life on the Martian meteorite ALH 84001 collected in Antarctica (Figure 1; McKay

et al., 1996). This matter has been previously discussed in *Creation Matters* (Wood, 1996; Tyler, 1996; and Humphreys, 1996).

In their article, McKay et al. (1996) suggested that they found evidence of fossil bacteria along with associated chemical traces. While most scientists were skeptical, the article provided a powerful headline and proved to be a big story for the secular press. Of course, NASA astrobiologists used the

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Solar System Contamination

...continued from page 1

occasion to push for funding to continue their search for extraterrestrial life living on other planets or planetary satellites possibly as extremophiles. An article in the January 2007 issue of *Sky and Telescope* presents a radically different perspective on this argument.

Author Selby Cull (2007) explores the possibility that microbial life from Earth has “contaminated” our solar system and beyond in association with the ejecta of extreme impact events. This article conveys the size of the impact event necessary to eject Earth materials into space, the escape velocity necessary to move materials and organic life into space, the types of microbes that could possibly survive such a blast, and the time and length of travel to seemingly hospitable locations, such as Mars, Jupiter’s moon Europa, and Saturn’s moon Titan.

She also mentioned two impact events in uniformitarian history that could have provided the energy to accomplish the task: 1) the end of the Late Heavy Bombardment (3.8 billion years ago), and 2) the Chicxulub Mexico impact (65 million years ago) that purportedly wiped out the Dinosauria and gave rise to mammals (Figure 2). There are other impact events that could possibly meet her criteria, with the biggest such impact occurring in association with the Permian/Triassic extinction (250 million years ago). In any case, Cull (2007, p. 36) noted that the ejecta derived from the impact would have “...carried those microbes on their journey through the solar system, possibly delivering life to other worlds.” At the end of her article, Cull (2007, p. 40) reaches the obvious conclusion:

If one day we find fossil bacteria on another world, will genetic testing be able to distinguish a citizen of Titan from an expatriate of Earth? Depending on what we find, we may never be able to tell whether they are truly aliens or just exiled earthlings...

So, while uniformitarians assert that microbial life could have been transferred to other terrestrial objects within our solar

system and beyond over the course of billions of years, what are we as young-Earth creationists to make of this idea? Could this bizarre hypothesis occur within the biblical

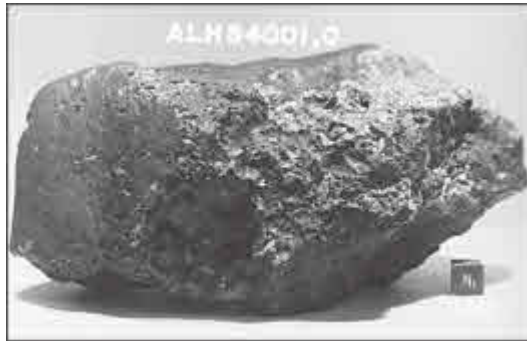


Figure 1. Martian meteorite ALH 84001 at Johnson Space Center, after being returned from Antarctica. For scale, the black cube is 0.4 inches (1.0 cm) on a side. The outer surface of ALH 84001 is partially coated with a black fusion crust. The interior rock color is a uniform greenish gray. Photograph courtesy of the NASA Johnson Space Center.



Figure 2. The Chicxulub impact crater (Mexico) is buried under approximately 4200 ft of marine deposits. Uniformitarians age date this impact event to 65 million years ago and claim a link to the death of the Dinosauria. Young-Earth creationists would counter that the timing of the impact and subsequent cover by marine deposits reflect an event that occurred during the global Flood of Genesis (see Froede and DeYoung, 1996). The outer rim of the impact crater is approximately 112 miles (180 km) in diameter suggesting an object ranging in size between six (asteroid) and 10 miles (comet) [9.7 and 16 km]. This impact event is believed to have provided the energy necessary to eject Earth materials out into space (Cull, 2007). There are other craters of varying sizes across the planet that would have experienced the same if not greater energy suggesting that Earth has sent considerable material into space some of which may turn up on the terrestrial planets and associated satellites within our solar system in the future.

framework? The surprising answer is “yes.” Extraterrestrial impacts have been postulated as beginning with the onset of the Flood and continuing across the submerged planet in an ever-decreasing rate (Froede and DeYoung, 1996). If the ejecta contained microbial life, and it landed on other terrestrial

objects, could they survive and thrive? The answer is a conditional “yes” based on: 1) the time spent in space, 2) the impact force upon landing, and 3) landing in a suitable habitat. Even without survival, microbial life might become fossilized and preserved for later discovery.

The exploration of our solar system could eventually reveal evidence of microbial life outside of Earth. The question we must ask is: “Was this life derived from Earth and how can we know?” As young-Earth creationists we know that the Bible has the answer to this question. It clearly states that Earth is a unique place where **all** life was created. Finding living or even fossilized microbial matter on other worlds does not destroy the truth conveyed in the Bible; rather it demonstrates the powerful impact events that must have occurred on Earth in association with the global Flood of Genesis.

Acknowledgments

I am grateful for the review assistance provided to me by Jerry Akridge, John Reed, and Emmett Williams. I thank my wife Susan for allowing me the time to investigate this interesting and bizarre subject. Any mistakes are my own. Glory to God in the highest (Proverbs 3:5-6).

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A Time to Discard Creationist 'Shibboleths' – A Response to Carl Froede

by David J. Tyler

When Jephthah and his men wanted to check the tribal affiliation of someone trying to ford the Jordan River, they asked him to say "Shibboleth." Ephraimites attempting to do this said "Sibboleth," which proved to be their downfall. The story of this sad infighting between two tribes of Israel is recounted in Judges 12:1-6.

There appear to be some shibboleth tests within creationism. Whilst there is nothing wrong with the principle of testing ideas, we must ensure that we are testing for truth and not making tradition our standard. The way forward is to examine all things by the Word of God. Biblical revelation is our standard of truth.

Carl Froede's recent contribution on "Norway's newest dinosaur and the Flood/post-Flood boundary" (Froede, 2007) appears to me to illustrate the problem of setting the wrong standard. In writing this response, I want to emphasise that there are no personal issues or agendas here. My interest is in creating a climate where we can debate these issues without being pigeon-holed because we take specific positions on some issues.

In his article, Carl presents two arguments against those who locate the Flood/post-Flood boundary prior to the fossilised dinosaur remains. The first is that it "does not seem reasonable" to have great thicknesses of sediment deposited above the dinosaur fossils (and in the case of the Norwegian find, the thickness today is 1.4 miles). The second argument is concerned with throwing out the "uniformitarian geologic timescale" — by which he means the Geologic Column. (His Figure 2 is stated to be the uniformitarian geologic timescale, but the illustration reveals nothing about time at all! The figure relates to the Geologic Column.)

Let us first address the argument about reasonableness. As someone who thinks it is both reasonable and scriptural to locate the dinosaur remains in the post-Flood period, I believe the argument needs unpacking before it can even begin to make sense. Why is this position considered unreasonable? It seems eminently reasonable to infer that the Flood was not replaced by quiescence once the Ark was grounded. It is

perfectly reasonable to think that global catastrophism was replaced initially by continental catastrophism and then by more regional catastrophism.

It is also reasonable to think that these catastrophes did significant geological work: eroding and depositing sediments, erupting lavas and disturbing the environments of the earth. If it is argued that these sediments minimise the Flood, consider whether the person making this objection has gained a realistic understanding of the judgment of God. Biblically, the Flood was a devastating global destruction that far exceeded any of the post-Flood catastrophes. This is certainly what the recolonisation approach to Earth history maintains. If several miles of sediment are understood to be produced by post-Flood processes, this only serves to underline how much greater was the Flood destruction.

Those of us who have concluded that the dinosaur fossils are post-Flood are seeking to ground our thinking on Scripture. In particular, we point out that dinosaur fossils occur with trackways. The same sediments that buried the bones also covered the tracks of living animals. Below the dinosaurs, tracks and trails are few and mainly of marine organisms. Above the dinosaurs are tracks of other air-breathing animals. There is no general horizon above the dinosaurs that is barren of traces of living organisms. These data need to be related to biblical teaching about the Earth being covered with water during the first 40 days of the Flood and the destruction of all air-breathing land animals outside the ark (Genesis 7:17-24).

It is our view that the post-Flood interpretation of the dinosaur remains provides a reasonable framework for understanding the data from geology and from Scripture. The barren sediments below the dinosaurs represent the time between their destruction and the recolonisation of the Earth after the Flood. The dinosaurs were pioneer air-breathers in recolonising the new Earth, followed by birds and then mammals.

The post-Flood interpretation of the dinosaur remains provides a reasonable framework for understanding the data from Scripture and geology. So Carl's reference to burial in the flood being "more reasonable" begs the question. We need to explore

these issues rationally, not set up a shibboleth based on the claim to be more reasonable.

The second of Carl's arguments is concerned with the Geologic Column. However, acceptance of the Column as an empirical construct is hardly a minority position among Young-Earth geologists. Those who recognise the essential validity of the Column do not link it to a timescale, but rather to the geometrical ordering of strata. We recognise that advocates of uniformitarianism have sought to interpret the Column in terms of modern-day processes and long timescales, but that does not make the Column concept inherently uniformitarian. Thus, the phrase "uniformitarian geologic timescale" should be regarded as an inappropriate shibboleth that does not engage with the real issues.

So, let us debate these issues properly. I applaud CRS for publishing the book *The Geologic Column* (Reed and Oard, 2006). This provides a variety of perspectives for consideration, including those presented in this short response.

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A Question of Being Reasonable and the Use of the Uniformitarian Geologic Column – A Reply to David Tyler

by Carl R. Froede Jr.

I thank Dr. Tyler (2007) for his response questioning some of the ideas that I proposed regarding Norway's first and only (at least to date) dinosaur fossil find (Froede, 2007). I agree with him that we, as brothers in Christ, should not attack one another personally for ideas that we express — even if we oppose the interpretation being offered. Apart from the record of Scripture, we can only offer our opinion, ideas, and interpretation. I hope that we can always question each other's concepts and ideas, because this is how creation science will grow — as we challenge and refine the thoughts and ideas we put forth.

Tyler (2007) identifies two topics in my article where he expresses disagreement: 1) my position that the great thickness of the sediment deposited above the dinosaur bone is Flood-derived material, and 2) my rejection of the use of the uniformitarian-based geologic column/timescale in Flood-based studies. I will address these issues in reverse order.

Geologic timescale / Geologic column

Tyler (2007) is incorrect in believing that there is a difference between the uniformitarian geologic timescale and the geologic column (Figure 1). Notice their interlocking relationship. Some young-Earth creationists assert that by excluding the timescale aspect of this construct, it can be readily adopted for Flood-based geological studies. Perhaps the greatest problem (of which there are many) in adopting the uniformitarian geologic column occurs when attempting to apply a single Flood/post-Flood boundary to a specific location in the geologic column at any particular site on Earth (see Froede and Reed, 1999; Reed and Froede, 2000).

In accepting the geologic column and rejecting the timescale, Tyler and others hope to retain the existing uniformitarian geologic framework sans time. This new geologic column would retain the existing divisions in the same sequence, remaining both linearly and sequentially consistent with the uniformitarian perspective. For example, you would neither have the Cambrian after the Permian, nor would you allow a jump from the Cambrian to the Miocene

without passing through the appropriate intervening Eon/Era/Period/Epoch divisions. Gaps between divisions (e.g., Miocene strata overlying Cambrian strata) would correlate to either missing time and/or sediment. This approach provides easy accommodation to existing uniformitarian timescale/column data sets.

However, the principle problem encountered when following this approach occurs when it is applied to the Genesis record of Earth history. The obvious disconnect in attempting to join these contrasting philosophies was demonstrated in an article that discussed applying the uniformitarian geologic column Era boundaries to possible Flood/post-Flood boundaries for the strata infilling the Gulf of Mexico basin (Froede and Reed, 1999). Although this work was protested (Tyler and Garner, 2000), it has remained unchallenged by those who support the use of the geologic column (see Reed and Froede, 2000). If the uniformitarian geologic column is so easy to defend within Flood-based stratigraphy, then why has no one taken on our challenge for this location?

Post-Flood deposition — global, continental, or regional?

I would agree that Noah and his family did not disembark from the Ark to present-day geological conditions. However, I disagree that Noah and family stepped off the Ark into the Triassic, with the remaining balance of the geologic column yet to be deposited around the globe.

Stop and think what this *requires*. Setting the Flood/post-Flood boundary at the Triassic would subject most of the existing Western European Continent (in places) to burial by thousands of feet of post-Flood sediment. In this post-Flood setting, thousands of feet of marine sediment would be deposited on top of the Alps before this area would be uplifted in the Cenozoic. The Paris Basin would be one very large depocenter, filling with post-Triassic marine sediments derived from the surrounding continent and the dry North Sea area. This would require regional uplift and erosion, followed by

down-warping and deposition occurring multiple times after the Flood. This would be an amazing place to be if all of this activity occurred in a post-Flood setting.

A different approach to defining earth history

Rather than following the uniformitarian geologic column, I think it is more reasonable to define the rock record in a manner consistent with the biblical narrative. While I believe that we can have different ideas about the nature and effects of the global Flood, I do not believe that diluvialists can reasonably defend the column's post-Triassic geologic activity across the globe outside of the Flood. Of course, this is my perspective, and I encourage Tyler and others who hold to the geologic column to demonstrate their conceptual framework by presenting their views regarding the history of the Gulf of Mexico Basin, the North Sea Basin, or the Paris Basin in a manner that remains consistent with Scripture and the uniformitarian geologic column. I still contend that this cannot be done in a reasonable manner.

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GEOLOGICAL TIMESCALE				
Eon	Era	Period	Epoch	Age (Ma)
Phanerozoic	Cenozoic	Quaternary	Holocene	1.8
			Pleistocene	
		Neogene	Miocene	
			Paleogene	
		Tertiary	Oligocene	
			Eocene	
	Mesozoic	Cretaceous	Palaeocene	65.0
			145.6	
			208.0	
	Paleozoic	Permian	245.0	
			290.0	
		Carboniferous	362.5	
			408.5	
		Cambrian	439.0	
510.0				
570.0				
Proterozoic	Precambrian		2500	
Archean				

Figure 1. The uniformitarian geologic column and timescale.

How CRS Scientists Can Help The Next Generation

by Lane Lester, Ph.D.

If you're a member of the CRS, what does that mean to you? You belong to the oldest association of scientists who consider creation the best explanation of origins. Each quarter you receive the *CRSQ*, the top peer-reviewed creation journal. You also receive *Creation Matters*, discounts on books, and the opportunity to exchange information and opinions on CRSnet and CRSforum.

However, the CRS needs members who give as well as receive. If you publish articles in the *CRSQ* or *CM*, then you are making a significant contribution to the advancement of science and science education. Now you have a new opportunity to make an impact on the next generation of scientists and the science that they will produce.

As a judge for the Georgia State Science and Engineering Fair, I've observed that some of the best projects involve a working scientist serving as a resource person for the student. We'd like to see Christian school and home-schooled students benefit from this same kind of help, and if you're a voting member of the CRS, you're invited to be a part of this program.

The level of involvement can vary over a wide range, and you make the choice. A few possibilities include:

- Email communication of ideas and information
- Providing references and reprints
- Providing experimental material
- Reviewing the student's work and making suggestions

If you'd like to be part of this pilot project involving a limited number of students, please send the following information to me at llester@creationresearch.org.

- Your name
- Your degree(s) and discipline
- A brief description of the type of projects with which you could help

A list of the above information will be made available to students who will initiate contact.

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trasts between the oceanic lithosphere and the mantle made their relative positions inherently unstable.

The Flood began as the oceanic lithosphere separated from the continents and then plunged into linear trenches like a giant conveyor belt. This subduction led to increasing instability, which accelerated the process until the whole oceanic lithosphere had quickly descended to the base of the mantle.

Subsequent convection currents in the mantle began to break Rodinia apart. Meanwhile, molten rock forming at new mid-ocean ridges created giant linear jets of steam that condensed and fell back to Earth as the rain of Genesis 7. Thermal expansion of the ocean floor and the downward pull of the new continents by mantle currents allowed the sea to cover them, depositing marine sediments over the continental interiors. The continents moved rapidly apart. Snelling (2007) describes how they reformed as “Pangea,” which also fragmented. The present continents rapidly moved to their current positions, creating the modern Atlantic Ocean.

What is the Evidence?

Two lines of evidence are put forward: computer modeling and data supporting gradualist plate tectonics. The computer model is the cornerstone of CPT, and is described in Baumgardner’s publications. Other data from gradualist plate tectonics are used to support CPT, including the apparent fit of coastlines across the Atlantic Ocean, faunal and lithological similarities across the Atlantic, and magnetic “stripes” parallel to the mid-ocean ridges. But the most important uniformitarian support for CPT is the younger age of the oceanic crust compared to continental crust. This age discrepancy supports the destruction of the pre-Flood oceanic crust and the repaving of the current oceans during the Flood.

Before Christians are carried away by computer models or matching coastlines, they should remember that their worldview demands a different hierarchy of evidence

(Figure 1) than does secular science. When CPT is examined in this light, we see a different story. It becomes less compelling because it: (1) is not affirmed by the Bible, (2) is not consistent with the biblical worldview because of its unfiltered use of uniformitarian conclusions, and (3) contains logical inconsistencies that raise questions of formal validity. Thus, its case seems to rest only on empirical data, and even if that case were powerful, its evidentiary value would remain less than that popularly perceived.

What’s Wrong with CPT?

It is good that CPT has attempted to bridge the gap between modern earth science and creationism. Whether or not it represents the actual events of the Flood, its biggest problem is the grave potential misperception stemming from its aggressive promotion by creationist organizations. That emphasis

such models should be prefaced by “We do not know exactly what happened during the Flood, but...” Creationists must constantly fight against the secular attitude that science can infallibly describe unobserved past events. The only ultimate and certain truth about any historical scenario not found in Scripture is “I don’t know, and you don’t either!”, and the greater the scope of the theory, the louder that motto should be uttered.

Furthermore, CPT is not the sound empirical model shown to the public. A number of problems with the theory remain unanswered. A primary frustration (and a caution to anyone ready to jump on the bandwagon) is the paucity of published information. Aside from the original 1994 ICC paper, the sparse technical publications about CPT have mostly been refinements of the original computer model. If CPT is the first “technically credible defense” of

the Flood in 200 years, then where is the deluge of geological discussions of sedimentation, tectonics, and landforms to flesh out that computer skeleton? The early years of uniformitarian plate tectonics saw an explosion of such articles. We must not allow virtual reality to replace observational reality in diluvial studies.

CPT faces a logical flaw in the timing of the subduction episode relative to the age of the sea floor, especially since:

...the issue on which the ultimate validity of the plate tectonics paradigm rests is the age of the ocean floor...relative to the sediment record of the continents (Baumgardner, 2002b, p. 69).

If the relative ages of the oceanic and continental crusts constitute an important evidence for CPT, they also constitute its biggest problem (Figure 2). The oceanic crust is “Mesozoic” and younger, implying that plate divergence happened just prior to that time. But the runaway subduction episode was initially said to mark the beginning of the Flood:

The Flood was initiated as slabs of oceanic floor broke loose and subducted along thousands of kilometers of pre-Flood continental margins (Austin et al., 1994, p. 609).

Evidentiary Approach to CPT		
Hierarchy of Evidence	Decreasing Certainty ↓	Evidentiary value of CPT
Affirmed or denied by Bible		No
Consistent with biblical worldview		Unclear; unfiltered use of uniformitarian conclusions
Formally valid		Unclear; ocean crust age vs. onset of Flood
Empirically compelling		Scope of supporting data not equal to theory

Figure 1. The truth of any proposition or construct is evaluated within the Christian worldview by a hierarchy of evidentiary categories. The most important is consistency with the Scripture; the least important is empirical data.

may lead Christians and non-Christians alike to think that CPT is integral to a correct biblical understanding of the Flood. Since creationists deal with a spectrum of biblical, historical, and scientific concepts, care must be taken to distinguish between the certain truth of God’s word and uncertain human constructs. The truth of Genesis stands alone as God’s revelation. CPT is informed speculation about details not provided by Scripture. Though advocates do not equate it to biblical truth, its relentless popular presentation gives that impression. Geophysical and geological Flood models should never be confused with biblical truth.

It is said that most creationists believe CPT. Even if true, that does not guarantee its validity. In a culture conditioned to accept scientific pronouncements as truth, all

This presented CPT proponents with a logical dilemma with three possible solutions. First, the vast continental “Precambrian” and “Paleozoic” deposits are pre-Flood, something that CPT advocates reject. Second, CPT may have occurred later in the Flood, negating its claim as the cause of the Flood. Third, there could have been multiple episodes of runaway subduction.

Once these logical flaws were noted, CPT advocates (e.g., Baumgardner, 2003; Snelling, 2007), began to lean towards the third option, but the unique nature of the runaway subduction presents problems: i.e., were there two periods of rain from the “windows of heaven”? Also, since the “trigger” for CPT is so vague, the necessity of multiple cycles multiplied the theory’s uncertainty. Finally, because the evidential emphasis rests on the demonstrated “age” of the sea floor, it becomes an argument from a lack of evidence, the earlier ocean floor having been subducted.

There also remain many questions about the subduction event and the subsequent replacement of the world’s ocean floor. If plates moved at meters per second, the mantle would have been rapidly exposed beneath the entire ocean. What would be the effect of placing seawater in contact with mantle materials (basalt lava $\geq 1,200^{\circ}\text{C}$) over nearly three-quarters of Earth’s surface? CPT’s linear steam jets at the mid-ocean ridges presuppose solid crust covering the rest of the sea floor; this requires the instantaneous repaving of the sea floor along the trailing edge of the subducted slab (Figure 3). But is that thermally realistic? If steam jets existed, would they not have covered vast areas of the sea floor? Realistic heat transfer models are needed to evaluate: (1) whether the

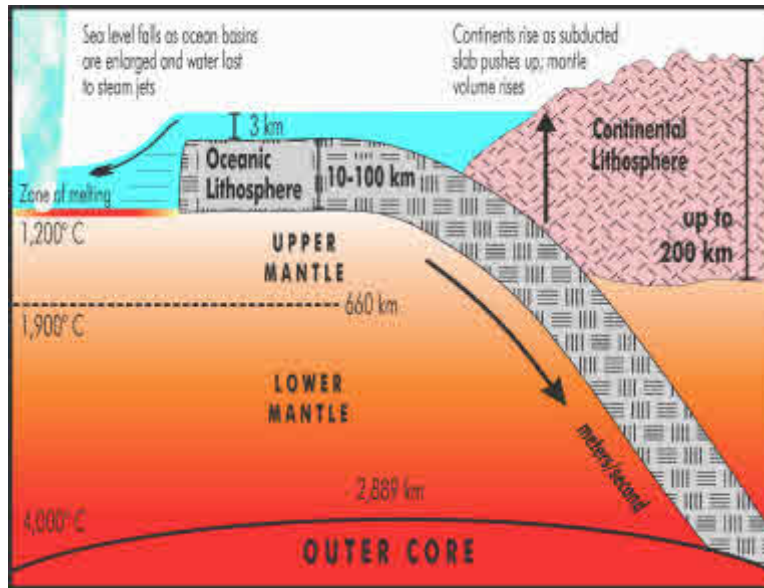


Figure 3. Cartoon of problems in CPT hypothesis. Flooding of continents must overcome drop in sea level caused by the removal of at least 10 km of oceanic lithosphere, the large-scale removal of seawater by “steam jets,” and the increased volume of the mantle beneath the continents. Also, rapid exposure of mantle would generate a thermal pulse potentially vaporizing the hydrosphere.

exposed mantle would have solidified that rapidly, and (2) the extent of thermal transfer into the water column. Would the oceans have been heated enough to extinguish life? To evaporate? Additional heat from the dramatic decompression of the upper mantle and friction from moving crustal plates cannot be ignored.

Other questions arise from the idea that the continents were flooded because the sea floor rose by thermal expansion and mantle convection pulled the continents down. That may be possible, but it would have been offset by other factors (Figure 3). If the

entire oceanic lithosphere were pushed beneath the continents, would not the sudden increase in mantle volume beneath the continents have pushed them up, especially at the subduction zones? And if the entire thickness of the oceanic lithosphere was suddenly removed, would not the elevation of the oceans have fallen in response to the sudden dramatic increase in ocean basin volume? And would not the conversion of vast volumes of ocean water into steam have also depressed sea level?

Furthermore, many of the conventional evidences for plate tectonics, such as continental fit, subduction zones, faunal matches, and mountain building, have been challenged by both uniformitarians and creationists (e.g., Molén, 1994; Oard, 2002a; 2002b; 2002c; Reed, 2000; Robinson, 1996). These objections remain largely unanswered or unacknowledged. For example, it is interesting that a second supercontinent, “Rodinia,” was added (cf., Austin et al., 1994) after creationist critics pointed out that the uniformitarian evidence supporting CPT calls for multiple supercontinents (Reed and Froede, 2002, Figure 3).

Where Next? The acceptance or rejection of CPT must depend on the application of distinctively Christian evidentiary criteria. Most importantly, creationist proponents must be careful to publicly present it as a speculative historical reconstruction, devoid of the scientific certainty claimed by secularists. They must note that biblical truth is not constrained by the theory, even though the theory attempts to conform to biblical truth. The historical reality of the Flood does not stand or fall by any forensic model. We cannot use secular standards to evaluate our the-

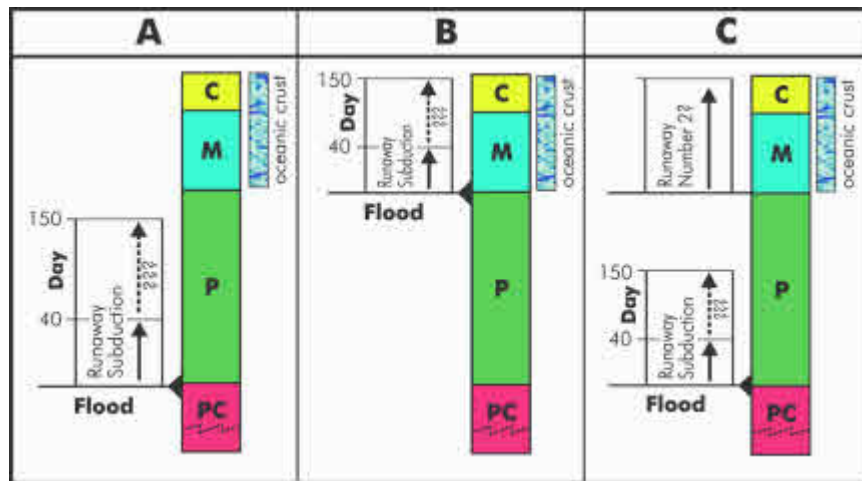


Figure 2. Possible solutions to the problem caused by the emphasis on “Mesozoic” and younger ages for the oceanic crust. (A) The pre-Flood boundary and runaway subduction are both low in the rock record, negating sea floor age evidence. (B) The oldest oceanic crust marks the Flood’s beginning; thus all pre-Mesozoic rocks are pre-Flood. (C) Multiple episodes of CPT occurred during the Flood. PC = Precambrian, P = Paleozoic, M = Mesozoic, and C = Cenozoic.

ories about the past, but need to use the criteria of the biblical worldview.

The development of Flood models, like CPT and Hydroplate, is a valid part of creationist research. But proponents of any model must openly engage in critical dialogue with their peers. If a theory survives that appraisal, it becomes stronger. If not, it should be replaced with a better hypothesis. Since comprehensive models require a very high standard of evidence, they need a firm foundation of reinterpreted data from all relevant disciplines. Better yet, multiple hypotheses stretch our minds and keep us moving forward.

Finally, CPT's weaknesses must be addressed. These include the disparity between its broad explanatory scope and narrow technical foundation, the numerous unaddressed consequences of the proposed events, the selective use of uniformitarian data, and the logical inconsistencies in the timing of the events relative to the critical evidence of the "young" oceanic crust. We have long criticized evolutionists for promoting technical fairy tales about Earth's history, and for their presumption that science is the true path to historical truth. Let us exercise that same rigor with our own

ideas. CPT may prove a viable explanation of events during the Flood, but it is not there yet.

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Speaking of Science

Commentaries on recent news from science

Editor's note: All S.O.S. (Speaking of Science) items in this issue are kindly provided by David Coppedge. Opinions expressed herein are his own. Additional commentaries and reviews of news items by David, complete with hyperlinks to cited references, can be seen at: www.creationsafaris.com/crevnews.htm. Unless otherwise noted, bold emphasis in quotations is added.

Seeds Muscle Their Way into the Soil

A biological motor has been found, of all places, on the seeds of wild wheat. A team of German and Israeli scientists watched wheat seeds and found they could dig themselves into the ground.¹ How can a dry seed, with no muscles, nerves, or circulatory system, accomplish such a feat? It all becomes clear when you look under the awning.



You've probably seen the long strands attached to the seeds of grasses like wheat and oats. These are called awns. They're not just decorative; they are actively involved in seed dispersal. Once the seed drops to the ground, with awns still attached, a remarkable mechanism goes into action. As the humidity rises and falls throughout the day and night, the awns respond by bending or twisting.

How does the bending take place? The seed, awns and all, falls to the ground. In real time, it might look like nothing is happening. The seed, after all, is dead; its tissues are removed from any source of nourishment or internal energy.

A time lapse movie, however, shows the seed appearing to spring back to life. This time, it's a robotic life exacting its energy from the air. The alternate bending and unbending of the awns gives a kind of "muscle" to the seed, propelling it along the ground — and even into the soil! **"This suggests that the dead tissue is analogous to a motor,"** the scientists said. **"Fueled by the daily humidity cycle, the awns induce the motility required for seed dispersal."**

A passive muscle driven by moisture in the air — amazing. It was nice of the authors to spare us any evolutionary just-so stories about how this all came together by chance. Their only use of the "E" word was in reference to human history: "The short evolutionary time since domestication (about 10,000 years), probably allowed the complete loss of awns in several domesticated wheat lines, but not the alteration of the awn structure." If so, this is a case of devolution, not evolution. They actually used the word *design* twice. Anyone believing evolution could design this mechanism needs to eat more whole wheat to provide better nourishment to the brain.

¹ Elbaum, Zaltzman, Burgert and Fratzl, "The Role of Wheat Awns in the Seed Dispersal Unit," *Science* 316(5826), 884–886 (11 May 2007). doi: 10.1126/science.1144097

Details of Photosynthesis Coming to Light

New tools of science are unveiling the secrets of what was long a "black box" in biology: photosynthesis. A paper in *Nature* last week¹ described the structure of the plant PhotoSystem I complex (PSI) in near-atomic resolution. Next day, a paper in *Science*² described some of the protein interactions that occur when plants turn light into energy for work. Both papers praised the exceptional efficiency of **"the most efficient nano-photochemical machine in nature."**



As is common in the scientific literature, the paper in *Nature* used engineering language when discussing photosynthesis. It referred to the "reaction centre" as a "light-harvesting complex," and to certain parts as "antennas." The authors used the root *efficient* eight times in the paper; for example (two instances in the same sentence), **"This highly efficient nano-photoelectric machine is expected to interact with other proteins in a regulated and efficient manner."** The paper ended:

The complexity of PSI belies its efficiency: almost every photon absorbed by the PSI complex is used to drive electron transport. It is remarkable that PSI exhibits a quantum yield of nearly 1 (refs 47, 48), and every captured photon is eventually trapped and results in electron translocation. The structural information on the proteins, the cofactors and their interactions that is described in this work provides a step towards understanding how **the unprecedented high quantum-yield of PSI in light capturing and electron transfer** is achieved.

The authors only referred to evolution once: "The two principal subunits of the reaction centre, PsaA and PsaB, share similarities in their amino acid sequences and constitute a pseudosymmetric structure **that evolved** from an ancient homodimeric assembly." Yet this was stated dogmatically without any explanation of how that could have occurred. Rather than quote their jargon about biomechanics and biomolecular dynamics, let's attempt an analogy that suggested itself from one of the illustrations: it's like catching eggs dropping out of the sky into a soft, gentle net, where they can be safely transported to the kitchen. Those who prefer the original jargon can see the footnote.³

Those who studied high school biology decades ago can revel in these facts about photosynthesis that are now coming to light (pardon the pun). At the time, our teachers and professors saw light going in, and sugars coming out, but were nearly clueless about what magic was going on inside. The black box is now opening, and we're finding out that highly efficient molecular machines were there all along. So *that's* how it's done!

¹ Amuntz, Drory, and Nelson, "The structure of a plant photosystem I supercomplex at 3.4-angstrom resolution," *Nature* 447, 58–63 (3 May 2007).

² Skourtis and Beratan, "Photosynthesis from the Protein's Perspective," *Science*, 316(5825), 703–704 (4 May 2007). doi: 10.1126/science.1142330

³ Wang *et al.* suggest that the slow protein dynamics discussed above may help to overcome reaction barriers produced by membrane potentials or by environmental factors that perturb the photosynthetic reaction center and potentially slow down the electron-transfer rate. Thus, protein motion could overcome reaction barriers produced by cellular factors that might otherwise perturb the electron-transfer kinetics."

Fossil Forest Found in Coal

A Carboniferous forest extending some 40 square miles has been found in the ceiling of a coal mine, reported *ScienceDaily*,¹



*LiveScience*² and *News@Nature*.³ About 50 species have been identified, including ferns and horsetails over 10 times taller than those alive today. *News@Nature* remarked that the forest contained some mangrove-like plants. The article quoted a surprised researcher who said, "It was always assumed that mangrove plants had evolved fairly recently."

The fossil forest was found in 2005, but was only recently announced in the journal *Geology*.⁴ The area is now 100 meters underground. The research team believes an ancient earthquake some 300 million years ago caused a sudden lowering of the area, resulting in the inundation and fossilization of the forest. Another surprise was that the ancient forest was so diverse for such an early period. "This discovery also shows that the fundamental processes that guide the complexity and evolution of forests has been around for hundreds of millions of years," *News@Nature* said.

Is this a "mangrove-like" plant or a true mangrove? If the latter, it sounds like a big out-of-order problem for evolution, because mangroves were not supposed to appear till the late Cretaceous,⁵ and these forests are Carboniferous, over 200 million years earlier. That would be a bigger problem than finding a living dinosaur. A quick check of the original paper in *Geology* does not reveal any mention of family Rhizophoraceae or any of the other mangroves, but that doesn't mean they were not found.

We'll have to see if more of the details come to light. In any case, gymnosperms were not thought to live in "mangrove-like" habitats. This story also illustrates, as seen so often before, that wherever evolutionists look, they find more complexity farther back in time than they expect.

¹ Anonymous, "Earth's first rainforest unearthed," *ScienceDaily* (23 April 2007). www.sciencedaily.com/releases/2007/04/070423080506.htm

² Bryner, J., "Ancient rainforest revealed in coal mine," *LiveScience* (23 April 2007). www.livescience.com/strangenews/070423_fossil_forest.html

³ Sanderson, K., "Ancient fossil forest found by accident," *News@Nature* (23 Apr 2007). www.nature.com/news/2007/070423/full/070423-1.html (subscription required for access)

⁴ DiMichele, W.A., H.J. Falcon-Lang, W.J. Nelson, S.D. Elrick, and P.R. Ames, "Ecological gradients within a Pennsylvanian mire forest," *Geology* 35(5), 415–418 (May 2007). doi: 10.1130/G23472A.1

⁵ Ellison, A.M., E.J. Farnsworth, and R.E. Merkt, "Origins of mangrove ecosystems and the mangrove biodiversity anomaly," *Global Ecology and Biogeography* 8(2), 95–115 (March 1999). doi: 10.1046/j.1466-822X.1999.00126.x

Swifts Don't Just Dream of Flying...

Swifts don't just dream of flying ... they fly while dreaming. Did you know that swifts, the aerial acrobats, sleep on the wing? That's not all — they adapt their wing shape to turn on a dime. *ScienceDaily*¹ summarized the cover story of *Nature* this week (April 26) that examined "wing morphing" in swifts — their ability to change wing shape in flight. Dutch and Swedish scientists conducted tests in wind tunnels to measure the lift and drag for different wing shapes. Extended wings are more efficient for gliding, but swept wings are good for tight turns and speed. Swept wings also protect against breakage. Swifts gain a 3-fold advantage in flight efficiency by continually adjusting the shape of their wings.



Wing morphing is the "latest trend in aviation," the article says. NASA is experimenting with micro-aircraft that can vary wing shape in flight for use in surveillance. Students in the Netherlands are also imitating the flight of the swift with their model aircraft. But then, even the Wright brothers observed birds for ideas on how to construct wings for the first airplane.

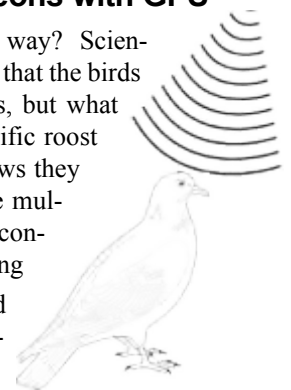
The article also says that swifts even mate in the air. They only land on their cliff-hanging nests to lay eggs. Otherwise, it's in the air all the time — up to 1.5 km high at night while roosting in mid-air. European swifts migrate to South Africa and back each year. In a lifetime, a swift will fly 4.5 million kilometers — equivalent to 100 trips around the Earth. Swifts also eat up to 20,000 insects a night.

Fortunately, no evolution fables polluted this story. No one tried to say that a *T. rex* morphed into a swift over millions of years. That wouldn't fly on a wing or a prayer. Who taught swifts the kind of aerodynamics NASA admires? Who gave them both the hardware and software to live on the wing almost all the time? Who programmed the autopilot that allows them to roost without a roost?

¹ Anonymous. "Wing morphing of the swift could inspire new aircraft designs," *ScienceDaily* (29 April 2007). www.sciencedaily.com/releases/2007/04/070427113243.htm

Scientists Track Homing Pigeons with GPS

How do homing pigeons find their way? Scientists are still not sure. They know that the birds use a sun compass and magnetic fields, but what other cues guide them back to the specific roost they know as home? A new study shows they are smarter than we thought. They use multiple cues and weigh the reliability of conflicting ones. Oxford scientists reporting in *PNAS*¹ tracked the birds with GPS and found some surprises — and more questions.



The team outfitted 32 birds with 28-gram GPS loggers on their backs, attached to clipped feathers

with glue and velcro. As a control, they made them do training flights with dummy weights. Some birds were very familiar with the route; others were novices. This allowed the researchers to contrast the influence of landmarks (piloting) with compass-guided flight. They tracked the flight paths on courses up to 10.6 km.

Once the birds learned the way, the experimenters played tricks on them with sun-shifted release times. They kept the pigeons in light-tight chambers for a week where the sunrise and sunset times were shifted by 4 hours, corresponding to a 90° shift in sun position. They found that even when these jet-lagged birds started off perpendicular to the correct orientation, they quickly found parallel routes to the targets. The scientists concluded that multiple cues are weighed by the birds when they encounter unexpected conflicting information:

Either way, **our results clearly indicate that birds combining multiple sources of onward guidance information during the local homing task.** Both the **origin** of this **compass** information and the **function** of its **integration** with landmark guidance **remain to be elucidated.**

Homing pigeons have fascinated humans for thousands of years. How do they do it? Here we are in 2007, still trying to figure it out. The birds are not just robots with a compass. They have the ability somehow to choose what cues to follow when they are in conflict. There's more going on in a bird brain than we can fathom. The "origin of this compass information" doesn't really need to be elucidated (if by that they think a Darwinian answer is in the wings). They know where it came from. In plain English, design reveals a Designer. Make sense e'en to Pidgin speakah.

¹ Biro, D., R. Freeman, J. Meade, S. Roberts, and T. Guilford, "Pigeons combine compass and landmark guidance in familiar route navigation," *Proceedings of the National Academy of Sciences USA* (published online before print 23 April 2007), doi: 10.1073/pnas.0701575104

Dino Feathers or Horsefeathers?

The much-touted feathers on certain dinosaurs may be nothing more than collagen fibers. An article on *ABC Science Online*¹ says "Dinosaur 'feathers' are no such thing." Instead, it's just decayed dermal collagen, like that found on sharks and reptiles. A South African team came to this conclusion after analyzing the alleged feathers on *Sinosauropteryx*.



If their analysis is correct, this casts doubt on the birds-from-dinosaurs theory. The team leader called the idea a "reckless leap" from the evidence, and said, "There is not a single close-up representation of the integumental structure alleged to be a proto-feather." He called for more scientific rigor in the analysis of these fossils.

*News@Nature*² also reported on this find, saying "Bald dino casts doubt on feather theory." It says, "If *Sinosauropteryx* was indeed featherless, then it may be that feathers arrived on the evolutionary scene later than palaeontologists had thought."

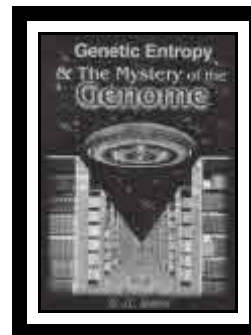
But *Nature* downplayed the implications. David Unwin, paleontologist at the University of Leicester, said, "there's no need to panic" about the implications of this find. He claimed, "This doesn't in any way challenge the idea that dinosaurs had feathers

and that dinosaurs gave rise to birds." It just "throws into doubt the first step in feather evolution." But Unwin echoed a common theme in evolutionary theories: "Things may be more complex than we thought."

Although we don't want to make a conclusion based on one team's analysis of one fossil, we agree that more scientific rigor is called for. Notice how *Nature* was quick to hedge about the meaning of this disillusionment. The rest of the media that love to display artists' reconstructions of feathered dinosaurs are strangely silent so far. We ought to be asking seriously, in the meantime, have we been sold a bill of goods (again) about feathered dinosaurs? We have often seen the propensity of the Darwinists to take flights of fancy based on lightweight evidence.

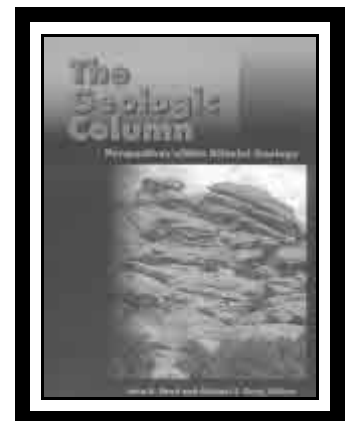
¹ Agence France-Presse, "Dinosaur 'feathers' are no such thing," *ABC Science Online* (23 May 2007).
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² Sanderson, K., "Bald dino casts doubt on feather theory," *News@Nature* (21 May 2007).
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All by Design

by Jonathan C. O'Quinn, D.P.M., M.S.

Not by Bread Alone

Evolutionary teaching holds that more highly “evolved” animals are more advanced, more specialized, with primates at the pinnacle of evolution. With an open mind, however, we see that biological specialization has nothing to do with an evolutionary ladder.

Fluctuations in the availability of food in nature can impose periods of fasting, which animals must overcome in order to survive. The Western diamondback rattlesnake possesses remarkable skills in handling these lean times. The rattlesnakes can quite easily survive up to six months or more without any food.

These snakes are able to spare protein yet metabolize fat stores for energy, despite the fact that lipids account for less than 10% of their body mass. For comparison, most “higher” animals that survive starvation by metabolizing fat stores, e.g. bears, seals, and penguins, have lipid stores comprising over



Photo of Western diamondback rattlesnake courtesy of U.S. Fish and Wildlife Service.

50% of their body mass. Western diamondbacks are even able to spare essential fatty acids such as linoleic acid and arachidonic acid during this process.

Prolonged fat metabolism produces high levels of ketones. To prevent dangerous ketosis during starvation, these rattlesnakes possess an enzyme known as

β -hydroxybutyrate dehydrogenase, which is also found in many “higher” vertebrates to help them during periods of starvation.

A well-nourished human can barely survive a month without food. This shows that biological complexity has nothing to do with evolution and everything to do with an all-knowing Creator, Who has designed each kind of animal with exactly what it needs to survive.

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