

CPT emphatically includes the Paleozoic

Upon reading Carl Froede's brief article entitled 'The Wilson Cycle: a serious problem for Catastrophic Plate Tectonics' (*TJ* 16(3), 2002), I found myself asking how he possibly could have acquired such a flawed concept of CPT. In particular, I noticed the sentence 'Baumgardner stated that the "Paleozoic" pre-Flood oceanic floor was subducted with the onset of the Flood, pulling apart the formerly unified landmass'. His reference for this assertion was my first article in the recent CPT forum, *TJ* 16(1), 2002. So I pulled up this article on my computer and did a search on the word 'Paleozoic'. Nowhere do I say or imply Paleozoic is pre-Flood as Froede claims. In fact, let me quote a portion on page 59 in the section entitled 'Logical imperatives':

'First, I am convinced the biblical text requires the beginning of the metazoan fossil record to coincide with the beginning of the Genesis Flood and most of the subsequent fossil record to be a product of that year long event. The observational data of the previous section then implies a staggering amount of tectonic change must have accompanied the Flood cataclysm. In attempting to put the pieces of this geological/tectonic puzzle together, I consider the piece with the greatest importance to be the set of observations that constrain the present ocean basement to be no older than the Mesozoic portion of the continental fossil record. This requires, from a logical standpoint, all the pre-Flood ocean floor, as well as any generated when the Paleozoic fossils were being deposited, to have vanished from the Earth's surface.'

This quote makes it clear that my concept of CPT places the onset of the cataclysm *before* the Paleozoic part of the record, at the place where meta-

zoan fossils abruptly appear. I have made this point plainly in every major paper I have published on CPT, as any interested reader may verify.¹⁻⁶ The fundamental thesis of Froede's article that the pre-Flood seafloor in the CPT framework is Paleozoic in age—and that the Paleozoic portion of geological history is prior to the Flood—is simply incorrect and contrary to all I have ever written on the topic. The major kinematic inconsistencies Froede claims to exist between the catastrophic and uniformitarian versions of plate tectonics arise solely as a consequence of his mistaken interpretation of my work.

Iapetus Ocean issues

Nevertheless, Froede's article raises the important issue of the tectonic changes that unfolded within the interval early in the Flood during which sediments containing Paleozoic fossils were being deposited in continental environments. In particular, he inquires about the opening and closing of the Iapetus Ocean between what is now North America and Europe. To me the evidence is compelling that such dramatic tectonic activity indeed did occur during this stage of the Flood. Observations from the geological record of both North America and Europe argue strongly that, as organisms classified as Paleozoic were being swept away by Flood waters and buried, continental rifting followed by seafloor spreading and formation of an ocean basin between North America and Europe was simultaneously taking place. This new seafloor was then subducted as the so-called Iapetus Ocean subsequently slammed shut. How long did all this take? My estimate is about two weeks. Based on the geological observation currently available, this sort of scenario is a logical necessity if the Flood as described in Genesis is responsible for all the metazoan fossil record up until the latest Cenozoic, as I believe it must.

Froede also questions whether the steam jets I mention in the recent *TJ* forum on CPT could cool the Iapetus seafloor sufficiently to subduct into the

mantle. Let me provide a few numbers that are preliminary, since analysis of these jets is work still in progress. The kinetic portion of the specific energy of steam with a velocity of 1.4×10^4 m/s is 1×10^8 J/kg. Removing 10^8 J of heat cools 100 kg of mantle rock, assuming a specific heat of 1000 J/kg-K, by 1000 K. Since the rock density is about 3.3 times that of water, a column of water 1 km deep, escaping to space in this manner, is sufficient to cool a column of rock 30 km deep by 1000 K. Dramatic, yes; implausible, maybe not.

Need for initial conditions

In the context of Froede's article let me explain once again why the 3D computer models I have published do not include the Paleozoic portion of the Flood catastrophe. The reason is that such models *unequivocally* require initial conditions. These conditions include the initial distribution of ocean and continent, initial locations of plate boundaries, as well as the initial density distribution inside the mantle. This latter information is crucial because it is the density variation, mainly in the form of cold slabs from the surface, which drives the motion.

The physical features of today's seafloor allow us to go backward in time to reconstruct prior locations of plate boundaries, including where ocean plates plunged into the mantle providing sources of negative buoyancy. However, today's seafloor goes back in its history only to early Mesozoic. There is no seafloor of the Paleozoic portion of the record remaining at the Earth's surface. The sparse clues that do exist concerning the changing Paleozoic plate configuration therefore reside mainly in today's continental rocks. As a result, the fidelity of the plate reconstruction process deteriorates rapidly as one seeks to reconstruct the Paleozoic history. Therefore, it is profoundly more difficult to guess an accurate initial state for an early Cambrian Earth than it is for an early Mesozoic Earth. However, without an accurate initial state, a computer model that reproduces even the basic

tectonic features of Earth history is impossible.

In other words, a good guess for the initial conditions is a non-negotiable necessity if the resulting computer model is to yield any resemblance to today's world. Therefore, instead of a suite of generic models that yield final states bearing scant similarity to today's Earth, I have opted for more restricted models initialized from early Mesozoic states that at least represent some measure of fidelity. However, this choice in the computer-modeling side of things in no way implies CPT does not or cannot include Paleozoic tectonics. Indeed, the success of the more restricted models should serve as encouragement that folding in the Paleozoic portion of the cataclysm is a reasonable next step as more accurate plate reconstructions and better simultaneous estimates for the mantle's internal state can be obtained.

Observational data primary

Finally, let me emphasize that, as a model for the Genesis Flood, catastrophic plate tectonics is primarily anchored in a wealth of *observational data* concerning our Earth, not primarily in computer modeling. It is the immense store of interlocking geological, geophysical, and geochemical data about our planet that represents the chief body of evidence that the earth has undergone a major tectonic catastrophe in the not so distant past and that none of the ocean lithosphere in existence prior to this cataclysm currently survives at the planet surface. In my view, the observational support for these conclusions is compelling beyond any serious doubt.

The chief contribution of computer modeling, by contrast, has been the simpler 2D work that illustrates that the experimentally determined properties of silicate minerals, when incorporated into a model for a planet like the earth, can result in dramatic instability and catastrophic mantle overturn. In other words, the main value of computer modeling thus far has been to shed light on a mechanism that can account for

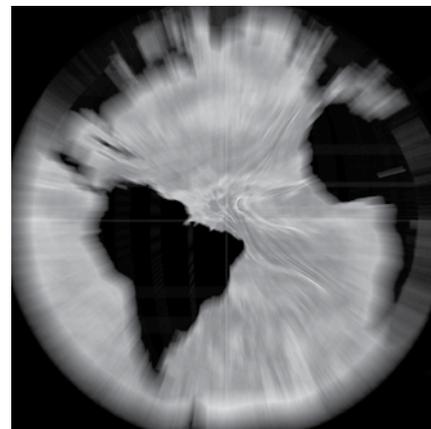
the short time scale and catastrophic character of the tectonic processes revealed so clearly in the observational data. The 3D modeling has merely served to illustrate that the patterns of flow observed in 2D models also work in three dimensions and that when realistic initial conditions are applied a somewhat realistic pattern of plate motions at the earth's surface emerges. However, from a computational mechanics viewpoint, the latter result is not that surprising or remarkable. To reiterate, the primary support underpinning CPT is the vast and diverse body of geological, geophysical, and geochemical observational data we now have for our planet.

In conclusion let me remark that Froede's criticism of CPT might be understandable if he had an alternative model that provided at least a few superior explanations of, say, observations supporting the appearance and disappearance of the Iapetus Ocean. However, he has no such alternative. I believe it is time for creationists to begin pulling together in a coherent and constructive team effort to build a comprehensive model of Earth history that makes the uniformitarian attempt at this enterprise crude and obsolete by comparison. God has already given us the essential elements we require.

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Courtesy of NASA

Carl Froede Jr replies:

I appreciate the letter of clarification provided by Dr Baumgardner regarding the role of accelerated Wilson cycles in his model, the position of the Paleozoic section within Catastrophic Plate Tectonics (CPT), and the limited extent of his modeling. However, moving the onset of the Genesis Flood to, or before, the Precambrian/Cambrian stratigraphic boundary only produces further confusion. For the first time in print, Baumgardner states that CPT can accommodate the Plate Tectonic (PT) concept of Wilson cycles (Wilson cycles as a uniformitarian concept document the hypothetical opening

and closing of oceanic basins over extended periods of geologic time). He stated that jets of water emanating from the sea-floor spreading ridges enable Wilson cycles by cooling the newly created oceanic basaltic crust, allowing for repeated subduction. Finally, contrary to public perception, he states that his confidence in CPT is not based in extensive computer modeling; rather it is 'anchored in a wealth of observational data concerning the Earth'.¹

Timing of continental breakup(s)

One of the confusing aspects of CPT is the timing of the breakup of the pre-Flood Earth. It is said to have begun with 'the beginning of the metazoan fossil record'.² This sounds straightforward, but implies that all oceanic crust should be Paleozoic in age.³ CPT theory follows its parent model (i.e. PT theory) and advocates a Mesozoic age for the world's oceanic basins. Where is the Paleozoic oceanic crust? How could the breaking up of the continents (at the onset of the Flood) have begun at the start of the Paleozoic and not leave any observational data of this age? If all oceanic crust is Mesozoic, is CPT only able to offer a partial model of the Flood?

Proposing that the beginning of the Flood occurred at or before the Precambrian/Cambrian boundary does not explain uniformitarian datasets that reflect a number of *earlier* supercontinents, ice ages, large igneous provinces, and orogenies.⁴ How can CPT ignore these PT datasets that indicate continental plate movement has occurred almost as early as the Earth's origin 4.5 billion years ago? How can young-earth creationists know how to differentiate between uniformitarian and catastrophic plate tectonic models?

A CPT mechanism for Wilson cycles?

Earlier publications suggested that runaway subduction occurred only once in association with the Flood

and that it involved the breakup of old, thick, pre-Flood oceanic crust that was subducted into the Earth.^{2,5} Plate motion was limited to the distance that the old oceanic crust plunged into the Earth. However, Baumgardner's letter indicates otherwise. CPT invokes supersonic jets of water that transfer heat, from the newly formed oceanic crust and exposed mantle at spreading centers, into outer space. New oceanic crust apparently cooled rapidly enough to form a thick crustal layer which itself was able to subduct and create the necessary plate motions to accomplish one or more Wilson cycles. It is difficult to envision the physical basis for this hypothesis.⁶

Data versus interpretation

The concept that CPT is 'anchored in a wealth of observational data concerning the Earth'¹ is based on the unchallenged interpretation of a history told by uniformitarians. I believe there is a distinction between uniformitarian data and its interpretation. Must not young-earth creationists reject the uniformitarian constructs such as the evolution-based uniformitarian stratigraphic column? This question has been asked and never answered.⁷ CPT claims the PT dataset has all the support necessary to make it a viable model of Earth history. Why does CPT ignore the PT observational evidence of earlier plate motions and multiple supercontinents? How does CPT explain today's plate motions as defined by PT theory? Where do young-earth creationists draw the line in relation to accepting a uniformitarian-based version of Earth history?

Conclusions

Megamodels like PT and evolution appear to be able to explain a broad spectrum of historical unobservable events and yet they are unable to produce conclusive evidence. In this context, does CPT definitively provide evidence of the Genesis Flood? If so, we would hope to see interpretations of data within the CPT framework. One

specific area requiring clarification is the water jet-heat transfer-repeated subduction aspect of the model. I appreciate Dr Baumgardner's willingness to discuss and provide further clarification about CPT.

Acknowledgments

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