

Global tectonics—clarity, not confusion

I will briefly address several issues raised by Dr Baumgardner's article.¹ He has moved the discussion forward by calculating gravitational body forces for current plate motion. However, many assumptions and simplifications go into these calculations. For instance, in the ridge push body force, shown in his figure 4, the force depends upon the validity of the plate cooling model over *millions of years*.² Moreover, does the hot asthenosphere really rise up close to the surface of mid-ocean ridges and gradually deepen away from the MORs? In reference to the slab-pull force (his figure 2), how does the fact that rocks are weak in tension not cause the plate to break near the trench? What is the effect of the slab bending zone? Moreover, does the force extend down the whole subduction zone when the direction of compression is in the opposite direction at intermediate depths? How would the curvature of the earth affect these vector forces? How would the deep keels of continents work into the drag of the lithosphere over the asthenosphere? Researchers keep looking for new ways to move plates,^{3,4} indicating the main mechanisms of current plate tectonics have not been resolved:

“Debate over the driving mechanism of plate tectonics has continued since the early 1970s, with increasing sophistication but still no general solution.”⁵

Baumgardner states that I took Hamilton's provocative article out of context. Going back over the article, I would say that Hamilton is not on some crusade for changing the terminology of ridge push. Ridge push has been well understood as a body force for a long time.² Hamilton's article is

confusing, and he does seem to say that the ridge-push force is insignificant, as do other researchers, but does add that ridge push, which he calls ‘ridge slide’, is an additional body force for subduction. Although he does believe in subduction, he seems to be downplaying the slab-pull force and invoking a secondary or additional mechanism of ‘slab rollback’.

It is somewhat important for CPT to show that plates move today, but the real issue is whether plates have really moved hundreds to thousands of kilometres in the past. I partially addressed the issue,⁶ but I think Baumgardner needs to attempt to demonstrate such plate movement without the use of a model. I prefer to stick with the observations and not models, since models are far from accurate and subjective.

Numerous issues need to be addressed in the top-down CPT model. For instance, why should we accept the uniformitarian earth evolution models for the formation of the earth's crust? Can the details in ‘subduction zones’ and ultra-high-pressure minerals really be explained? Why should we believe the biostratigraphy of microfossils, a part of the CPT model? Why should we believe in the accuracy of relative radiometric dating? Then there is the problem of how continents crash back together again, such as in forming supercontinents Pannotia and Pangea after Rodinia split. There is a lot of geology still to explain by CPT.

In assuming CPT motions should have stopped, I have thought that the orders of magnitude higher viscosity after runaway subduction would have halted the motions.

Toward the end, Baumgardner challenges my impact submodel. He states that there would be so many impacts that there would be a magma ocean. Although new data from the moon now indicates that the number of impacts greater than 30 km is more like 58,000,⁷ I don't have to run the

numbers to know that there is a heat problem. The extrapolation to the earth seems solid to me. The question really is: How do we explain the numbers? Why should Baumgardner chide me for how I attempt to solve my heat problem⁸ when he also invokes God to solve the heat problem with CPT and accelerated radiometric decay, the latter of which is much more severe than with impacts.

Baumgardner then challenges me to come up with a mechanism for differential vertical tectonics after impacting. I have admitted that I am working on my model from the *bottom up* and am just beginning. I have dealt with the cause of differential vertical tectonics at the ‘concept level’ from the restoring forces resulting from variable depths of crust and upper mantle blasted away by impacts.⁹ I have not yet worked on the systematic differential vertical tectonics between the oceans and the continents.

Baumgardner ends with one of his *ad hominem* comments that I ‘frequently’ quote out of context. I have made mistakes, and the subject of geophysics and geology is so vast and complex, I am sure I will do it again. But to claim I quote out of context frequently is like me trying to say that because he apparently was not aware in 2002 that oceanic magnetic anomalies were very small changes in magnetic intensity and that granite is supposed to have formed in the Andes by subduction,⁵ then he knows little about geophysics.

Baumgardner's approach to challenges to his CPT model is to focus on mistakes, real or perceived, by his challengers. What we need is more positive contributions from both of us in trying to figure out the mechanism and details of the Flood, without *ad hominem* arguments.

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References

1. Baumgardner, J., Global tectonics—clarity, not confusion, *J. Creation* 27(1):99–106, 2013.
2. Turcotte, D.L. and Schubert, G., *Geodynamics*, Cambridge University Press, New York, 2002.
3. Alvarez, W., Protracted continental collisions argue for continental plates driven by basal traction, *Earth and Planetary Science Letters* 296:434–442, 2010.
4. Höink, T., Jellinek, A.M. and Lenardic, A., Viscous coupling at the lithosphere-asthenosphere boundary, *Geochemistry, Geophysics, Geosystems* 12(1):1–17, 2011.
5. Alvarez, ref. 3, p. 437.
6. Oard, M.J., Is plate tectonics really occurring today? *J. Creation* 26(3):120–127, 2012.
7. Spencer, W., Impacts and Noah's Flood—how many and other issues, *J. Creation* 27(1):85–89, 2013.
8. Bernitt, R. and Oard, M.J., How many impact craters should there be on the earth? *J. Creation* 24(1), 48–49, 2010.
9. Bardwell, J., *The Flood Science Review*, 2011, injesusnameproductions.org/pages/page.asp?page_id=50291, accessed 2 May 2014.

» John Baumgardner replies:

It is important to remind readers that the context of the previous two articles^{1,2} as well as Michael Oard's present letter is my *J. Creation* 26(1) article entitled 'Is plate tectonics occurring today?'³ I intentionally restricted my discussion to the present day, based on observations of the earth as it is currently behaving, to remove assumptions and conjectures concerning the past entirely from the table. I drew special attention to the ongoing GPS measurements by more than 2,000 GPS receiver stations in the NASA geodetic network operated by the Jet Propulsion Laboratory. I stressed that these measurements by themselves demonstrate beyond any reasonable doubt that plate tectonics is taking place today. With essentially no room for debate, they show plate convergence at ocean trenches and plate divergence along the mid-ocean ridge system. Oard's response has been to avoid discussion of these data almost entirely and to draw attention instead to other topics, many of which concern the earth's physical past. His present letter continues this pattern with not a single word concerning the GPS measurements.

In his *J. Creation* 26(3) article,¹ Oard raised the issue of whether there are currently forces capable of moving the plates. In my *J. Creation* 27(1) article,² I emphasized that the GPS measurements stand on their own as far as their interpretation is concerned. I pointed out that their interpretation does *not* depend on knowledge of the driving forces responsible for the associated plate motions. In effect, the topic of driving forces is a 'red herring' issue relative to the question I raised in my *J. Creation* 26(1) article.³ Nevertheless, because one can address the topic of driving forces in the present and because the analysis is rather simple, I devoted much of my *J. Creation* 27(1) article² to that topic. Oard, in the present letter, now wants to quibble about the analysis. Astonishingly, he makes the mistaken claim that the ridge push force "depends on the validity of plate cooling over *millions of years*." No, it depends merely on the presently existing seafloor topography. How or when the higher ridge topography came into existence plays no role in the calculation in regard to the amount of force it generates at the present moment. The other issues he raises in this context are additional 'red herrings'.

Oard again quotes the professional literature to attempt to show that slab-pull and ridge-push forces that I highlighted are not the primary mechanisms responsible for moving the tectonic plates. One reason I focused attention on these two mechanisms was Oard's taunt in his *J. Creation* 26(3) article,¹ implying that slab pull is insufficient to move the Pacific Plate. Neither of the two articles^{4,5} he quotes in his letter, however, challenges the claim that slab-pull and ridge-push forces are the main mechanisms that act to move the large oceanic plates. The Höink *et al.* paper,⁴ in fact, explicitly affirms that slab-pull is the primary mechanism for moving the Pacific Plate. The two papers deal with specialized situations of small oceanic

plates and internal deformations within continental plates. Again, Oard is using his tactic of introducing 'red herring' issues to distract attention away from the primary topic in view; namely, the reality of subduction and seafloor spreading, that is, plate tectonics, in the earth at the present moment in time.

Oard charges me again with committing the 'best in the field' logical fallacy. In the past I have ignored this accusation because I thought it so absurd. Just how in Oard's mind is the scientific process supposed to function? For the past several hundred years it has been based on the proposing and testing of hypothetical explanations as to how things in the natural world work. Some hypotheses survive this testing process; many do not. Most of those that do undergo refinement along the way. Simply because an explanation seems to be correct and enjoys wide acceptance does not logically or automatically mean that it is fallacious. How can Oard pretend to believe that it does? Consider, for example, the laws of thermodynamics. To maintain that just because the laws of thermodynamics are widely accepted as valid logically makes them fallacious is plainly irrational. Such a mindset flies in the face of how honest science is done.

Most people with some training in earth science would view the conclusion that lithospheric plates are subducting at ocean trenches and moving apart at mid-ocean ridges today as an obvious inference from the GPS observations. Why is it that Oard insists that such a conclusion represents logical fallacy? If he has identified a problem, let him spell it out and let him provide an alternative that accounts for the observations in a superior manner. Certainly he has had ample opportunity to do so in recent articles but has not. Offering explanations and testing them against observations is the way the scientific method works. That process does not entail logical fallacy. It is noteworthy that this 'fallacy'

which Oard is flaunting is consistently absent in the standard lists of logical fallacies. It is missing, for example, in Wikipedia's 'List of fallacies' which includes more than 100 entries.⁶ It is nothing more than another 'red herring' on Oard's part to distract attention from the main topic of discussion.

Finally, Oard invites me to explain how there could have been more than 58,000 impacts by objects over 30 km in diameter on the moon while earth remained relatively untouched during the Flood. My answer is simple. The work of the RATE team shows that these impacts on the moon did not occur during the year of the Flood.⁷

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References

1. Oard, M.J., Is plate tectonics really occurring today? *J. Creation* 26(3):120–127, 2012.
2. Baumgardner, J., Global tectonics—clarity, not confusion, *J. Creation* 27(1):99–106, 2013.
3. Baumgardner, J., Is plate tectonics occurring today? *J. Creation* 26(1):101–105, 2012.
4. Höink, T., Jellinek, A.M. and Lenardic, A., Viscous coupling at the lithosphere–asthenosphere boundary, *Geochemistry, Geophysics, Geosystems* 12(1):1–17, 2011.
5. Alvarez, W., Protracted continental collisions argue for continental plates driven by basal traction, *Earth and Planetary Science Letters* 296:434–442, 2010.
6. en.wikipedia.org/wiki/List_of_fallacies.
7. Baumgardner, J., Do radioisotope methods yield trustworthy relative ages for the earth's rocks? *J. Creation* 26(3):68–75, 2012.

A call for research into two areas

I believe that there are two areas of research that could bear much fruit for biblical creation ministry and Flood modelling, but which are largely outside of my area of expertise, so I am calling on our broader community to help in these areas if possible.

First, I believe that the often Grand Canyon-scale sub-oceanic canyons along most continental shelves are powerful evidence for the receding stage of the global Flood. In some instances, such as at the mouth of the Hudson River near New York and off the coast of Monterey Bay in California, there are strong indications of past large rivers coming out of these canyons and flowing at the bottom of the ocean, sometimes terminating in deltas. Surely these sometimes mile-wide river beds must have formed when the bottom of the oceans lay exposed toward the tail end of the Flood. Since the topology of the ocean is now freely available to everyone with the internet on Google maps, it has never been easier for us to follow this line of research. Not only is this evidence for the Flood, but it must be specifically explained by our Flood models, and it has an impact on our reconstructions of what was taking place during the receding phase of the Flood.

Second, I believe that more research is needed for what would happen if huge quantities of steam condensed very high in the atmosphere. It seems that if this steam was able to condense at very high altitudes where air pressure is very low, then the newly-condensed water would fall as rain at a temperature that is compatible with pre-Flood oceanic life, perhaps as cool as 80° to 90°F (27° to 32°C). Furthermore, it seems likely that massive amounts of steam would have been generated when water came into contact with the cooling newly-emplaced ocean floor, flood basalts, granites, etc. This steam could have conceivably transferred massive amounts of heat from these cooling rocks. Finally, there seem to be at least some hints in the scientific literature that condensing steam actually releases energy as electromagnetic radiation under some conditions, which could then have radiated out into space from

the top of the atmosphere and thereby removed massive amounts of heat from the surface of the earth. The criticism that the Flood would have boiled the oceans several times over loses its teeth if the steam could condense to relatively cool water at high altitudes and fall back to earth as quickly as it was generated.



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Errata

Journal of Creation 27(1)

Clarke, P., The Stele of Merneptah—assessment of the final 'Israel' strophe and its implications for chronology

An incorrect glyph was used in the last sentence of p. 60. The sentence should read:

“Consider how the Egyptians referred to themselves  and compare it to how they wrote Israel .