A Possible Meteorite Impact Initiation of the Cambrian

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I propose that a huge meteorite impact in central Australia 545 million years ago initiated the Cambrian explosion of life by a layer of dust on snow ball Earth.

1. Discussion

Daniel Connelly discovered evidence of a huge crater about 310 miles in diameter centered southwest of Alice Springs, Australia, at the Ayers Rock [1], at 26 21 south, 131 02 east. There is a ring of disruption 430 miles in diameter around that and another ring of disruption 1300 miles in diameter. The antipode for that is east of Haiti at 26 21 north, 49 west. It is possible that the lava under the Bahamas Islands is the antipode site, especially since the seismic waves travel a little slower under the Pacific Ocean. That lava goes back to the Cambrian, which makes it possible from the Australian meteorite, because it is almost certain that crust disrupts from seismic wave convergence at the antipode of large meteorite impacts [2]. Geologists will object that the Bahamas could not still be at the antipode because of continental drift. However, it is virtually impossible for the continents to have drifted in the last billion years. There is no trench off of North America to take the ocean crust, there are continental rocks in the Rio Grande Rise in the Atlantic ocean, there are no transform faults at the ends of the Americas to account for their motion [3], the trenches themselves are impossible because there is low heat transfer and gravity at their bottoms unlike either side, which is impossible in a 60 km thick diving slab, there are volcanoes on the landward side, which is impossible arising from a cold diving slab, there are no trenches to take the Indian and Arctic ocean ridge plate formations, and earthquakes are shallow even in the longest ridge-ridge transform faults [4,5,6].

Evidence for the crater includes large arcing deposits of pseudotachylite found only at impact sites, an extensive web of ground faults radiating out from the impact site, worldwide deposits of feldspar and zircon dated 545 million years ago that share the exact age (1.21 billion years) of the zircon found at the crater's center, deposits of osmiridium that is a rare natural alloy of osmium and iridium in eastern Australia, New Zealand and New Caledonia and found there at the Cambrian/Pre Cambrian boundary, and a pair of impact craters of the same age located to the northeast of the main crater that could be meteorites that broke off from the main meteorite.

The impact was so massive that there was a 1300 mile wide disruption around the crater. There is some lava near the periphery of the meteorite disruption. This exception to lack of lava at meteorite impacts elsewhere may be related to the enormous area of the disruption, much larger than anywhere else. This could have been possible because the periphery disruption was far from the area of lighter crust caused by impact removal plus melting of the crust, which undoubtedly tends to usually prevent upwelling of lava.

2. Conclusion

This impact could have been the cause of the initiation of the Cambrian period by warming up of the snowball Earth by a worldwide deposit of dust on iced areas. Dust on ice is a very important cause of ice melting [7]. Once the ice on the ocean melted, the increased sunlight absorption there could have permitted large release of carbon dioxide from organic matter that could then decompose and methane from methane ice. Thus there would be a positive feedback from a greenhouse effect in addition to the heating of bare soil. Also this vast amount of dust was probably an important source of increased fertility for the oceans by direct deposition and erosion on land, which oceans were the primary location for life at that time and thus spark the Cambrian explosion of life.

References

[1] MAPCIS Research, http://www.mapcis.net/mapcis_research.html (Nov 2007).
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[3] C. E. Weber, "The Cause of Mid Ocean Ridges", *Speculations in Science and Technology* **4**: 151-155 (1981).
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[5] http://charles_w.tripod.com/ridge.html.
[6] http://charles_w.tripod.com/trenches.html.
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