Would asteroids from outside the solar system produce more damage closer to the sun?

My first guess is that there would be no more impacts on solar system bodies closer to the sun than farther from the sun, assuming the same size, density, etc. of the solar system bodies and a uniform distribution of impactors. I do not think the sidereal period would have much effect, but I may be wrong on this. The relationship between the sidereal period and the number of impacts should be related to the velocity of the solar system body. At a faster velocity, the rate of impacting would be faster than at a slower velocity, but after the asteroids pass, the number of impacts should be the same.

I think the situation would be like a little boy caught in a rain shower a block away from home. He would be hit by the same number of raindrops whether he walked or ran home.

Should we see left-over impactors?

I am glad Mr Bernitt sees the merit of the trillions of asteroids originating from outside the solar system, but I do not have an answer to this question. I think it would take a sophisticated calculation of the gravitational effects of the sun and other solar system bodies on such a population of asteroids.

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A new magnetic field theory and Flood model

I really appreciate your efforts to shine light on the changes to which our planet has been subjected. Thank you for your effort. However, I have some problems with some details and I look forward to your comments. I hope that my observations are wrong, but I submit the following for your consideration.

1. You calculate the original mass of an isotope given its present mass, its half-life and the duration of the decay period (the 'elapse time'). To do this you insert numbers into an equation to give, for example, ^{235}U:

$$\frac{(1.3\times10^{15}\,kg^{235}U)}{\left(1-\dfrac{1}{2^{\frac{(7.038\times10^{8}\,yrs)}{(4.5\times10^{9}\,yrs)}}}\right)}$$

$$=1.3\times10^{16}\,kg^{235}U$$

It is bad practice to simply wind numbers into an equation. It is always good to quote the equation being used, and for the benefit of those of us who are not familiar with a field, give some idea of its origin and derivation. The equation, as printed, is

$$m_o=\frac{m_c}{\left(1-\dfrac{1}{2^{\frac{t_{Half-life}}{t_{Elapse}}}}\right)}$$

m_o = Original total mass of isotope
m_c = Current total mass of isotope
t_{Elapse} = Elapse time from when original mass of isotope was present
$t_{Half-life}$ = Half-life of isotope

By my calculations the numerical value yielded by this equation is obviously wrong because it produces spurious results. I suspect the equation you have used is wrong.

2. Perhaps the equation you had intended to use was

$$m_0=\frac{m_c}{\left(1-\dfrac{1}{2^{\left(t_{Half-life}/t_{Elapse}\right)}}\right)}$$

The results I get from this equation are close to the values you get—as can be seen from the table below. However, I cannot see where this equation comes from.

3. I am not intimate with the details of radioactive decay, but I understand that

$$m_c=m_o\left(\frac{1}{2}\right)^{\left(t_{Elapse}/t_{Half-life}\right)}$$

So that

$$m_o=m_c(2)^{\left(t_{Elapse}/t_{Half-life}\right)}$$

to give

$$m_o=1.3\times10^{15}\,kg^{235}U\times(2)^{\left(\frac{4.5\times10^{9}\,yrs}{7.038\times10^{8}\,yrs}\right)}$$

$$=1.09\times10^{17}\,kg^{235}U$$

Is there any reason why the masses you want cannot be calculated from 'first principles'?

The following table shows the significant difference in the results.

	Your result	My result from your equation	Original mass from first principles
U-235	1.30×10^{16}	1.27×10^{16}	1.09×10^{17}
U-238	3.60×10^{17}	3.62×10^{17}	3.62×10^{17}
Th	7.30×10^{17}	7.34×10^{17}	8.12×10^{17}
K-40	1.10×10^{18}	1.14×10^{18}	2.43×10^{18}

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Don Stenberg replies:

Thank you for reading my paper and contacting me about it. I think you're exactly right—I did use the wrong equation in my paper to determine the original radioisotope quantities and as a result it appears as though I underestimated the amount of heat produced by radioactive decay by approximately half.

So what implications does this have for my model? Well, the reality is that there exists a fairly high degree of uncertainty regarding the composition and characteristics of the earth at any significant depth. In my paper I used a 'best guess' for many of the parameters, based on my review of current scientific publications. For instance, in my paper I took commonly assumed concentrations of radioactive materials in the crust and mantle, but we don't have direct ways to measure those concentrations, and so (particularly for the mantle) my calculations could be assuming concentrations of radioactive materials that are somewhat too high. Furthermore, it is also possible that the earth's pre-Flood internal temperature was closer to 300 K than my assumed 500 K, which would accommodate somewhat more radioactively-produced heat. If the earth's present interior temperatures were also somewhat higher than my calculations and/or if there was less energy released by mantle separation than I assumed in this paper, these could also account for more heat.

In addition, although the heating of the earth may be the primary way that heat produced by radioactive decay can be accounted for, there may also have been other mechanisms involved:

- The intense global rain of the Flood helped radiate some of that heat into space.
- High-energy steam jets carried away some of the heat.
- Some heat was stored as potential energy as work was done to 'raise' the outermost parts of the earth as the earth expanded.
- Some of the energy was absorbed by other nuclear processes such as possibly the splitting of deuterium.
- The geological chemical reactions and changes to mineral crystalline structure that no doubt accompanied the Flood were on balance, endothermic (e.g. metamorphism).

I would like to see more research done in some of these areas. Even though my mathematical error underestimated the amount of heat produced by accelerated decay based on my assumptions about the earth, I believe it is still possible that this model involving the heating of the earth can essentially solve the heat problem associated with accelerated radioactive decay.

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Could most of the earth's U, Th, and K have been in the mantle prior to the Flood?

In his two-part article entitled 'A new magnetic field theory and Flood model',[1,2] Don Stenberg proposes a scenario for earth history that seeks to provide positive solutions to a number of problems associated with catastrophic plate tectonics (CPT) as well as with the Radioisotopes and the Age of the Earth (RATE) conclusions. Specifically, he proposes (1) that essentially all the earth's major heat producing elements (U, Th, K) prior to the Flood were in the mantle, and (2) that essentially all the nuclear transmutation or decay that has occurred during the solar system's history took place during the Flood.

Major problems swept away

In this proposed framework almost all the heat released by accelerated nuclear decay is absorbed by the mantle. This seems to solve one of the major difficulties associated with the RATE conclusions by providing a sink for the vast amount of heat released by some 4.5 Ga worth of accelerated nuclear decay. It also relieves the need to have some 4 Ga worth of nuclear decay take place before plants are created on Day 3 of Creation Week. It also sweeps away the problem of a high concentration of radioactive elements in the continental crust at the time of the Flood and high radiation levels arising from these elements as a consequence of the accelerated nuclear decay during the Flood. To be sure, these are not minor issues. I commend the author for seeking so earnestly to find solutions to them.

However, there are good reasons why the RATE team and those of us who have worked on the issues associated with CPT have not entertained Stenberg's two main theses in a serious way. The foremost ('elephant in the room') reason has to do with the actual record of radioisotope-decay history written within the rocks of the continental crust.

What does the record of radioisotope decay tell us?

Zircon, $ZrSiO_4$, a uranium-bearing primary mineral that is incorporated into the structure of an igneous rock when it crystallizes, has proved to be especially well suited in recording the history of nuclear decay.[3] These durable crystals can record a rock's nuclear decay history all the way back to when the rock originally crystallized, provided there has been no subsequent metamorphic event to interfere. Many of the continental granitic rocks outside the tectonic belts appear not to have experienced any significant metamorphism in their history. A compilation of U–Pb zircon ages from such granitic regions reveals that some 75% of the earth's continental area has a uniformitarian age greater than 1.5 Ga.[4] Age determinations by the RATE team for granitic rocks in New Mexico and Wyoming agree with these findings.[5] Zircons displaying more than 4.4 Ga have been reported from crustal rocks found in Western Australia.[6] Moreover, the same distribution of zircon ages as found in the granitic rocks themselves is also found in detrital zircon grains contained in the sands at the mouths of the major rivers of the world.[7]