

## Coded Information Systems

I am thoroughly enjoying the Information Series by Royal Truman in *J. Creation* 26(3), but would like to offer a perspective that seems to be missing from the works of Werner Gitt that I have read; perhaps Truman will cover this in his Part 4. This concerns Coded Information Systems (CIS; thank you, Royal, for that term) which do not contain an apobetics layer and have no sense of intentionality. This is most easily understood in visual systems.

The CIS is comprised of subsystems linked by communication nodes. When the sun emits visible light, there is no intentionality other than in God's design—the sun itself is not attempting to intelligently communicate. The sun's rays strike a tree and are reflected, causing the information stream to be altered to include attributes of the tree. Again the tree has no intentionality outside of design, and couldn't care less whether anyone is watching or not. Nevertheless, the CIS is at play. The next node, for example, is the human eye. The eye has no intentionality in receiving or retransmitting the message, but it performs its intended function by recoding the message for transmission to the brain. So far, the three nodes have been unwitting participants, and have neither intentionality nor understanding in their participation.

It is at this point that I would offer a different definition of 'information'. What has been transmitted so far is what I would term 'data'. Information is only derived by superimposing an external referential framework called meta-data, i.e. data about data. When the message is received at the brain for processing, it needs to apply other

data not just to decode the message, but to understand it. The reflected light from the tree is interpreted as a specific colour, shape, texture, size, and distance from the eye, but the brain cannot know that this is a 'tree' without being told. At a deeper level of analysis, we should note that sight is not a closed-loop system in that there is no method of verification that what the brain perceives it has seen is the external reality.

This is still an autonomous process with no apobetics layer. If one is lazily lying in the meadow in the noonday sun, the presence of the tree can go entirely unnoticed by the unwitting observer. In this case, intentionality can only arise from within the observer.

This scenario has particular applicability to the evolution narrative, for evolution cannot explain how the sense of sight could evolve. It might also have wider application, but I will leave that for others.

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### » Royal Truman replies:

I'm pleased to note that Wayne and others are pondering information theoretic matters carefully. The example offered was challenging, since by Coded Information Systems (CIS) I envision seamlessly meshed components consisting of coded messages; signals; engineered components; and preloaded resources and not something as disconnected as the sun's rays beaming in every direction with the next component being an individual eye.

To interpret Wayne's comments, let us keep in mind my observation that the sender and/or receiver can be intelligent or inanimate. Furthermore, it is common to classify information systems as 'push' or 'pull'.

He is right that the sun is not attempting to communicate anything about the tree. His perspective is a *push* system (the sun sends out photons) and it is inanimate. However, it is not sending *coded messages*. Therefore, it is not related to Gitt's model and cannot be required to show apobetics.

Let's re-examine it now as a CIS *pull* system. The retina scans the environment, initiating, seeking, *pulling*. I agree that what lands on the retina should not be called 'information'. Sensors interact with signals like photons, and can be converted into coded messages (see Part 3, p. 117). The further processing in the brain/mind mentioned by Wayne involves what I call 'preloaded resources', which includes the ability to reason and to integrate context.

Note that this cognitive pull system can display an apobetics aspect: to clarify or verify the current interpretation, messages can be sent to other portions of the brain/mind to reflect upon its reasonableness; and commands can be sent to the eye to rescan the environment for additional signals to be integrated with the present interpreted concept.

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## Asteroid impacts

In his two articles,<sup>1,2</sup> Michael Oard suggests that asteroids have impacted other 'inner orbit' planets, but not apparently on Earth to any great extent. He proffers the idea that the earth was struck in the early days of the Genesis Flood, which destroyed most of the evidence for impacts. In particular, he makes the assumption that the moon's pattern of impact craters is so evident that it should be taken as a standard for asteroid impacts on the earth.

In regard to these two articles on the subject data, I wish to point out some anomalies, short comings and out-right errors with all due respect.

- May I suggest as a starting point that regardless of where Oard is going with his thoughts, he has failed the criteria test of *evidence*. What evidence is there that asteroids impacted the earth during the early days of Noah's Flood? In fact what evidence is there at all that an implied asteroid storm ever occurred?
- Secondly, other inner planets show impact craters, but these may have accumulated at the time of creation; or were accumulated in the last 6,000 years! Was Earth shielded by the moon or other bodies? We don't know, but those thoughts are equally valid ideas! As I understand from other creationists,<sup>3</sup> it appears that current arguments against asteroids impacting the earth are *due to shadowing* produced by Jupiter's orbit. A subject with which I am not familiar.
- Thirdly, I wish to question where Oard is taking the argument. What does he expect to *establish* or achieve if he is correct? Is God not capable of opening up the bowels of the earth with or without asteroids to assist?

### Evidence information—its necessity and form

When I read Werner Gitt's book on information,<sup>4</sup> I noted some sound principles which I have always held throughout my professional life as a Structural and Civil Engineer. My work has involved me in a number of unique bridge failure problems, and many forensic problems related to hydraulics and nuclear contamination. As you can imagine, the Law always calls for *factual evidence to back-up opinions* expressed. The form that evidence takes is not often visual, but must be in accordance with established physical,

chemical, or scientific principles. If evidence is not provided in one of these forms, no matter how obvious, respectable, plausible, or tantalizing the witness's story may be, it will be thrown out of court. Without these established *laws*, engineers cannot expect any structure to stand the tests of nature. Ballistics is also an area in which my professional career overlaps with Oard's asteroid impact possibilities. I was for three years Technical Advisor (Ballistics) to the 13<sup>th</sup> Field Artillery Regiment, Royal Australian Army.

### Asteroids—recently or earlier

When one considers the orbital paths of the four inner planets, two things attract attention. These planets are all heavy/dense/hard materials over 4,000–5,000 kg/m<sup>3</sup>, except the moon at about 3,350 kg/m<sup>3</sup> (water is 1,000 kg/m<sup>3</sup> while iron is 7,800 kg/m<sup>3</sup>). Outer planets are mostly light-weight gas giants as best we know. Between the two groups lies an *asteroid belt*. Why? Is this the result of an early asteroid invasion or storm? Or is it there to protect the inner planets, including Earth, from future asteroid storms, subsequent to creation? Where is the evidence?

The other point attracting attention is that the other planets *except for Earth* show many asteroid or other impacts as visible craters; but not, I might add, with any signs of the asteroids themselves! Could this be exactly as God would have it, in order *to protect his creation on Earth*? Aside from the beauty of these other lifeless planets, they are mostly waterless, airless deserts of no practical use to us except for their mineral content. The question, then, is why did God make them at all?

Very little else can be noticed about these planets by an observer. Earth travels along with the other planets at similar high speeds, generally. *But no significant evidence can be found*

*to compare moon craters with Earth, Mars, or Mercury craters!* Where is this evidence?

### Orbital trajectories and motions

We can look deeper into the mathematics of orbits. We could even compare orbital planet speeds (24–48 km/sec) which are much faster than asteroids travel. That is evidence! We can predict where other inner planets will be when the first asteroid hits an outer planet! This is enlightening, and it takes many days to travel between orbits at asteroid speeds. That is evidence! We can even predict the gravitational forces between planet Earth, the moon, the sun, and asteroids. This shows some interesting results also. It is also interesting to view craters in the pole areas against the equatorial regions, which don't show much difference in spite of the assumed angle of impact. *However, such ballistic studies are not evidence for impacts on the earth.*

### Asteroid paths

Oard says the pathways for asteroids would most likely be set or influenced by the sun's gravitational pull/force. This implies that asteroids would be crossing the inner planet orbits at about 90°. Immediately this poses a ballistics problem, akin to the side-show duck-shooter trying to get a hit on a fast-moving toy duck from left to right. One might postulate that the asteroids may have originated from the sun, but this seems an unlikely scenario, and where is the evidence? There is always the possibility that the moon shielded the earth at a critical time or conversely the earth shielded the moon instead. But always there is the nagging thought that all the other solid planets, Venus, Mars and Mercury, also show asteroid impact craters. Why would this be if the timing between planets is so large, e.g. 45–100 days apart? The back of the moon also shows impact

craters too! All these craters could have been made at any time, either at the one time or over many periods of time since creation! Again, where is the evidence? *I propose that there is no evidence to suggest from which direction the asteroids came!*

### Conclusion

There is no evidence for asteroid storm impacts large or small on Earth, which are, or were, related to those on the moon. Any laws about asteroid impact distribution are fruitless and lack credibility without evidence. *Assumptions are not evidence* for such a case to be made, and therefore cannot be regarded as any form of proof for this theory being put forward! Another aspect would be, what was God's purposes for using asteroid impacts anyway? There is not one word of this in any passage of Scripture I can find, suggesting to me that this has not been answered. After all, nobody heard it happen! In the end may I ask, even if asteroids were used to start or further the Flood—and this was proven with evidence supporting it—*What do we learn about this as-yet-unproven event? And where will we use that information to promote an understanding of that event in history or other aspects of God's love for his creation?*

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### References

1. Oard, M., How many impact craters should there be on the earth? *J. Creation* 23(3):61–69, 2009.
2. Oard, M., An impact flood submodel—dealing with issues, *J. Creation* 26(2):73–81, 2012.
3. Cowell, B., *Creation-Evolution Dispelling The Myths*, Creation Lectures vol. 1, Introduction to Creation, Two By Two Worship Ltd, UK, www.twobytwoworship.com.
4. Gitt, W., *In The Beginning Was Information*, Master Books, Green Forest, AR, 2007.

### » Michael Oard replies:

There will always be issues dealing with impacts, as there should be, since we are dealing with the past. We can use the clues from Scripture and what we observe to deduce reasonable scenarios.

Mr Hunt's first and main point is about evidence of impacts. I thought I presented evidence from which to make a valid forensic deduction. This evidence is the cratering record on all the solid bodies of the solar system that have not been subsequently modified, not only in the inner solar system but also the moons of the outer planets. Mr Hunt sees this evidence also: "But always there is the nagging thought that all the other solid planets Venus, Mars and Mercury also show asteroid impact craters." So, it is a reasonable deduction that the whole solar system was once bombarded by impactors, which I will also call asteroids, although we don't know whether they were asteroids, comets, or some type between comets and asteroids. Given this observational evidence of solar-system-wide bombardment within the 6,000 years of history, we can make several deductions.

First, the asteroid belt can be eliminated as a source for the asteroids, because the orbits of these asteroids are generally circular around the sun. Since so many impacts have occurred over the whole solar system, there is not nearly enough time in 6,000 years for hardly any asteroids to be perturbed out of the asteroid belt to account for the solar system cratering record, even if a planet exploded. The only other possibility for so many impacts on the solid bodies of the solar system is that the solar system ran into a swarm of asteroids.

Second, unless the earth is in a special place or God protected it, we can conclude that the earth was also bombarded sometime in its history. This is because the planets and moons are small points in interplanetary space, and so the space in between must have had a lot of impactors passing through.

Third, this means that our nearest neighbour can be used as an analogue for the number of impacts during Earth history. (The moon is much too small to shield the earth from impacts, because it is only a very tiny point source and its gravity would perturb only those asteroids that grazed it. It is also doubtful that Jupiter or any other planet would provide any shielding effect for the earth.) Extrapolating to the earth resulted in a minimum of over 36,000 craters greater than 30 km in diameter—an enormous amount of energy.

Fourth, we can then eliminate several timing possibilities, leaving the Flood for the majority of the asteroid impacts. The impacts did not hit after the Flood or between Creation Week and the Flood, because even a small fraction of the impacts would have devastated the whole earth and we would not exist. So, that leaves only during Creation Week or the Flood itself. Mr Hunt suggests that the impacts could have occurred during Creation Week. Since the moon, and probably other solar system bodies, were not created until Day 4, it would be unlikely that much impacting occurred between Day 4 and Day 6, especially on Earth because there was no death of nephesh creatures before man sinned. It seems straightforward that a large number, if not all, of the impacts occurred during the Flood. Because of the enormous energy, I lean that God modulated the impacting on Earth so that it was not as devastating as it could be, but he did not modulate the impacting on other planets where there was no life.

Mr Hunt asks where I am taking this argument. I plan to take it as far as I can. Since I have deduced that the asteroids hit during the Flood with enough energy to cause the Flood, I am now looking for the geological evidence for impacts. It is of course reasonable that the Flood would have destroyed much of this evidence, but there should be some evidence in the rocks. I believe I am finding plenty of evidence, mostly unpublished at this

point. I expect to gradually publish this evidence as time permits.

Except for rather obvious evidence of impacting (less than 200) in the rocks, I would not expect the uniformitarian scientists to see much of this evidence, since they do not expect it. After all, they reject the Genesis Flood, and cannot see the abundant evidence for the Flood in the rocks and fossils.

Mr Hunt points to the asteroid belt and wonders why it exists. Nobody really knows. It can't be the result of an asteroid swarm moving into the solar system because of their precise orbits around the sun. Mr Hunt also suggests the asteroid belt may possibly protect the inner solar system from asteroid bombardments. How could this work? I suggested that it is possible that a large asteroid could have hit a small planet to cause the asteroid belt. If it was an asteroid the size of the one that caused the 2,500-km-diameter South Pole-Aitken crater on the moon or the several craters greater than 2,000 km on Mars, such a small planet would likely shatter.

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## Energy balance in Earth models

I was very interested to read Don Stenberg's two-part article<sup>1,2</sup> proposing a model of Earth history which addresses some of the fundamental problems raised by the conclusions of the RATE (Radioisotopes And The age of the Earth) project. In particular, Stenberg's model holds promise of demonstrating a plausible global energy balance during the inferred period of accelerated nuclear decay. There was at first glance an obvious problem with Stenberg's radiogenic heating calculation,<sup>3</sup> but these have now been corrected by Reece.<sup>4</sup>

However, I believe that Stenberg's calculation also overlooks a critically

important energy sink, which, if handled correctly, can add a good measure of robustness and flexibility to his model. He notes<sup>5</sup> that potential energy would have been released by separation of the mantle as the earth heated up, and estimates that this would have produced about  $3.1 \times 10^{30}$  Joules of additional heating. A correct estimate of the energy change due to radial redistribution of material within the earth requires evaluation of the difference in gravitational potential energy between the initial and final configurations. The total gravitational potential energy  $U$  of a uniform sphere of mass  $M$  and radius  $R$  is<sup>6</sup>

$$U = \frac{-3GM^2}{5R}$$

where  $G$  is the Newtonian constant of gravitation. Hence the increase in potential energy when a uniform sphere expands from radius  $R_0$  to  $R_1$  (i.e. when material is lifted in a gravitational field, which involves doing work against gravity, and therefore represents an energy sink) is

$$U = \frac{-3GM^2}{5} \left( \frac{1}{R_0} - \frac{1}{R_1} \right).$$

Using  $G = 6.673 \times 10^{-11} \text{ m}^3\text{kg}^{-1}\text{s}^{-2}$  and  $M = 5.974 \times 10^{24} \text{ kg}$ ,<sup>7,8</sup> together with Stenberg's radius figures of  $R_0 = 6.128 \times 10^3 \text{ km}$  and  $R_1 = 6.378 \times 10^3 \text{ km}$ , we deduce  $= 9.138 \times 10^{30} \text{ J}$ .

However, since the earth models of interest have a layered or onion-like structure, a more realistic estimate of the energy change involves calculating  $U$  region-by-region for Stenberg's 'before' and 'after' configurations. We assume spherical symmetry and also that the density remains constant within any given region. The calculation proceeds by considering the incremental contribution to  $U$  of a thin shell of material of density  $\rho(r)$  and thickness  $dr$  when the mass of material within this radius is  $m(r)$ . The mass of this shell is

$$dm = 4\pi r^2 p(r) dr$$

and hence its contribution to gravitational potential energy is

$$dU = \frac{-Gm(r) dm}{r} = 4\pi Gm(r)p(r)rdr$$

If the outer radius is  $R_E$  we deduce

$$U = -4\pi G \int_0^{R_E} m(r)p(r)rdr.$$

If, counting outwards from the centre, the regions are labelled 1, 2, 3, and so on, then the gravitational potential energy for the innermost region is simply

$$U = \frac{-3GM_1^2}{5R_1}.$$

For the second region the result is

$$U_2 = \frac{-3GM_2}{2(R_2^3 - R_1^3)} \left[ M_1(R_2^2 - R_1^2) + M_2 \frac{2R_2^5 - 5R_2^2R_1^3 + 3R_1^5}{5(R_2^3 - R_1^3)} \right]$$

and similarly for subsequent regions; for regions 3 and beyond the first term inside the square brackets must include the *total* mass inside the current region, such that becomes, and so on. The total for a model involving  $n$  such regions is then simply

$$U = \sum_{i=1}^n U_i.$$

The result of this calculation (which can be done on a spreadsheet) is that in Stenberg's pre-Flood Earth,  $U_i = -2.63 \times 10^{32} \text{ J}$  and in his present-day Earth,  $U_p = -2.5 \times 10^{32} \text{ J}$ . The energy sink resulting from the expansion is therefore  $1.3 \times 10^{31} \text{ J}$ . Note that this is much larger than Stenberg's estimated potential energy change and carries the opposite sign in the global energy balance.

Assuming that we now have at least roughly correct figures for radiogenic heating ( $1.62 \times 10^{31} \text{ J}$  according to Reece,  $1.54 \times 10^{31} \text{ J}$  according to my own calculations) and for the heat required for partially melting the earth's core and heating up its mantle ( $1.1 \times 10^{31} \text{ J}$ ),<sup>5</sup> the energy sink represented by expansion is much larger than required for the energy balance. I therefore suggest