

- synchronous with the first preservation of crust? In: **Archaeon Geology**, J. E. Glover and D. I. Groves (eds), Geological Society of Australia, Special Publication 7, pp. 453-456.
10. Auldane, J., 1992. Review of Hunter, Ref. 5, July 15, 1992 (unpublished).
  11. Gentry, R. V., 1986. **Creation's Tiny Mystery**, Earth Science Associates, Knoxville, Tennessee.
  12. Hunter, Ref. 2.
  13. Hunter, M. J., in preparation.
  14. Salop, Ref. 7.
  15. Condie, K. C., 1981. **Archaeon Greenstone Belts**, Elsevier Scientific Publishing Co.
  16. Goodwin, A. M., 1977. Archaeon volcanism in Superior Province, Canadian Shield. In: **Volcanic Regimes in Canada**, W.R. Baragar (ed.), Geological Association of Canada, Special Paper 16, pp. 205-241.
  17. Anhaeusser, C. R., 1973. The evolution of the early Precambrian crust of Southern Africa. **Philosophical Transactions of the Royal Society of London, Ser. A273**: 359-388.
  18. Anhaeusser, C. R., Mason, R., Viljoen, M. J. and Viljoen, R. P., 1969. A reappraisal of some aspects of Precambrian shield geology. **Bulletin of the Geological Society of America**, 80:2175-2200.
  19. Plumb, K. A., 1990. Subdivision and correlation of the Australian Precambrian. In: **Geology of the Mineral Deposits of Australia and Papua New Guinea**, F. D. Hughes (ed.), Australasian Institute of Mining and Metallurgy, Melbourne, Monograph 14, Vol. 1, pp. 27-32.
  20. Hunter, Ref. 5, Figures 3, 4, 5, 6 and 10.

## THE FLOOD/POST-FLOOD BOUNDARY

Dear Editor,

I read with great interest the special issue of your **CEN Tech. J.**, 10(1), 1996 dealing with the Flood/post-Flood boundary in the geological record. I am surprised that these fascinating papers have not generated more response from your readers. Perhaps this is because your editorial<sup>1</sup> may have given the readers the impression that the corporate witness of Robinson,<sup>2</sup> Scheven,<sup>3</sup> Garton,<sup>4</sup> Garner,<sup>5-6</sup> and Tyler<sup>7</sup> in this journal was fully overthrown by the paper by Holt.<sup>8</sup> Holt argued that the Flood/post-Flood boundary is located in the uppermost (Pliocene/Pleistocene) part of the

geological record. The other papers supported placing the boundary much lower in the geological record, in the Carboniferous strata ('pre-Permian' end of the Flood boundary) and therefore implied that there was considerable geological activity after the Flood.

Certainly Holt's rebuttal is packed with detailed analysis, persuasively expressed, yet I found his argument ultimately very unconvincing.

### Models Are Only as Good as Their Assumptions

As a Ph.D. mathematician involved with statistical analysis and mathematical modelling in a research context for much of my working life, I was especially interested in the closing sentence of Holt's paper: *'The thoughts of readers with quantitative assessments of the evidences are invited'* (his emphasis). This clearly shows that Holt wants the reader to attach special importance to quantitative analysis. He thereby invites careful scrutiny of his own models.

Certainly Holt's various modelling exercises are a *tour de force*, and the mathematics and numbers do much to make the argument appear convincing. Unfortunately, the quality of any modelling exercise is only as good as the assumptions upon which it is based. His unsatisfactory assumptions make Holt's analysis less impressive than it at first appears.

Holt's paper is long and considerations of space make it impossible to probe Holt's analysis in detail. Nor is it necessary. I will show that Holt's case fails because of its flawed assumptions.

When I read the paper, I was immediately struck by the **extreme uniformitarianism** of his assumptions. His assessment of the pre-Permian end of Flood boundary model broadly assumes that ever since the end of the Flood conditions have remained as they are at the present day. This may be acceptable for his own 'late-Cainozoic' end of Flood boundary model, which assumes few changes

after the end of the Flood, though even he must allow for different conditions during the Ice Age. However, proponents of the pre-Permian boundary, such as the authors of the other papers, clearly envisage post-Flood geological activity on such a large scale that makes Holt's uniformitarian assumptions **unreasonable**.

For instance, vast quantities of chalk were laid down in the Cretaceous period, as well as the fossil fuels (which Holt specifically analyses). The chalk and the fossil fuels (in so far as they formed from post-Flood biological material, which, according to the pre-Permian model, a significant proportion of Tertiary material did)<sup>9</sup> must have permanently and substantially reduced the amount of carbon in the biosphere and atmosphere. Moreover, we have no present day experience of the behaviour of vast thicknesses of recently and rapidly deposited sedimentary layers, many of which had trapped and retained great volumes of Flood water. Large quantities of hot, high pressure subterranean water, probably from these sources, were apparently released during the Mesozoic and Tertiary mountain building,<sup>10,11</sup> to cause the massive erosion which formed huge volumes of Mesozoic and Tertiary deposits. Emerging at both high pressure and temperature, some of this water could have been propelled high into the atmosphere at much the same time as the volcanoes and meteorite impacts were sending dust there, providing a mechanism for the rapid removal of dust from the atmosphere, and, perhaps, for the onset of the Ice Age. Certainly, whether this cleansing action took place or not, the very different carbon dioxide and atmospheric water concentrations must have very significantly affected the dynamics of the atmosphere. For reasons such as these, Holt's uniformitarian models concerning the growth of fossil fuel and concerning the impact of volcanism on the climate fail to be convincing.

The geological and climatic  
CEN Tech. J., vol. 11, no. 2, 1997

scenarios envisaged by the pre-Permian boundary might, in principle, be modelled. As a mathematical modeller I think this is unlikely to be very useful at this stage. With the present limited state of knowledge about the historic conditions — reflected in the fact that different creationist geologists hold such widely divergent views on when the Flood ended — mathematical modelling cannot yet play much of a role in discriminating between the competing theories. This is because the range of possible assumptions is still so broad, that models can probably be designed to suit almost any theory or observed outcome!

### Where was Mount Ararat?

Holt's arguments about the geology of the Mount Ararat region do seem persuasive, until it is realised that many places on the Earth have been named as reminders of somewhere else. Studying Birmingham, Alabama, USA tells us nothing about its namesake, Birmingham, England. The geographical names in Genesis 2: 11-14, which presumably now refer to different locations, suggest that we should be cautious. Holt admits that the historical references to Mt Ararat may be doubtful. Without greater certainty that these references really do refer to the original Mountains of Ararat where Noah beached, it would be unwise to attach great weight to his argument.

### The Relative Scale of Flood and post-Flood Deposits

Holt's suggestion that the pre-Permian boundary implies that the Flood deposits are small in scale compared with the post-Flood deposits is based on the wrong set of assumptions. Holt assumes that the Flood started with the Cambrian. Even Whitcomb and Morris<sup>12</sup> suggested that locally all the Proterozoic (that is, about half of the Precambrian) could be Flood derived. Today, an increasing number of creationists believe that the vast quantities of the massively thick, world-wide, Precambrian deposits

were largely, if not entirely deposited during the Flood. This change of assumption, on its own, completely changes the balance between the Flood and post-Flood deposits without any other considerations. Moreover, even within his own chosen framework, Holt fails to remember that a large proportion of the Mesozoic deposits are reworked Palaeozoic deposits, and that the Tertiary deposits are mainly reworked Mesozoic and Palaeozoic. Therefore Holt's analysis cannot be accepted.

It is perhaps worth noting in passing the implications of adjusting these assumptions. Firstly, the Flood becomes on a larger scale and vastly more terrifying: the Precambrian deposits are far larger in scale and geographical extent than the relatively more modest deposits of the post-Carboniferous period included by the late Cainozoic model. It may also be reasonably inferred that the powerful, world-wide flooding of the Precambrian and early Palaeozoic — leaving aside the intense early Precambrian asteroid bombardment, already termed a 'cataclysm' in geological literature — would have been sufficient to destroy every pre-Flood air-breathing land-dwelling animal **without leaving any trace whatsoever**. This, moreover, has the merit of very **literally** fulfilling the 'blotting out' of Genesis 6:7 (NASB). Secondly, the post-Carboniferous geological activity, whilst very violent by today's standards, is on a significantly smaller scale and, especially in the Tertiary, becomes more **localised** as time passes, than that during the Precambrian to the Carboniferous. In contrast to the early Palaeozoic, after the Carboniferous there are always large parts of the world which are above water and potentially inhabitable.<sup>13</sup>

### A Fixed Sea-Level Boundary or a Turbulent World?

Holt believes the Bible teaches that the Flood ended with the sea at a level which has not been subsequently exceeded, and seems to base much of

his argument in favour of a Pliocene, or later, end to the Flood upon this assumption. Without investigating the details here, his Biblical exegesis seems open to question. The implication of the King James Version may be that a limit is being set on the boundaries of the sea, but Job 26:10 is very differently translated in modern versions: 'He has inscribed a circle on the surface of the waters, At the boundary of light and darkness' (NASB). For Psalm 104:6-9, the immediate context, and the general emphasis on creation in the Psalm suggest that events in Creation Week (Genesis 1:9-10) may be in view rather than the Flood. Even if Psalm 104:9, 'Thou didst set a boundary that they may not pass over; That they may not return to cover the earth' (NASB),

does refer to the Flood, it seems to require only that some boundary should always **exist** so that the waters do not again cover the Earth. Jeremiah 5:22,

'For I have placed the sand as a boundary for the sea, An eternal decree, so it cannot cross over it, Though the waves toss, yet they cannot prevail; Though they roar, yet they cannot cross over it' (NASB),

surely, should not be interpreted as implying an absolutely literal and permanently fixed boundary for all time, otherwise there could never be inundations by the sea or changes in coastlines! Nor is it too helpful as a teaching aid, which was the Lord's purpose, if Holt's interpretation is correct and yet the sea can sometimes rise and fall significantly when below this level as Holt suggests. Holt's consequent inference that the sea was at exactly the same level at the time of David and Jeremiah as it had been at the end of the Flood therefore seems based on a series of remarkably tenuous and tendentious assumptions. We must all beware of interpreting Scripture to suit our scientific theories.

God has **only** promised not to destroy the Earth again completely by a Deluge — **the book of Revelation** (for example, Revelation 6:12-14;

8:5-13; 16:3-21) shows that very large scale, and indeed horrifically terrifying, geological, astronomical and maritime events can happen without breaching His promise.<sup>14</sup>

Some of these future events are stated to be without precedent — for example, Revelation 16:18:

'and there was a great earthquake, such as there had not been since man came to be upon the earth, so great an earthquake was it, and so mighty' (NASB).

Jesus Himself told us that before the end, men will become very afraid as a result of the geological and astronomical events, and by the activity of the sea:

'there will be great earthquakes, and in various places plagues and famines; and there will be terrors and great signs from heaven . . . And there will be signs in sun and moon and stars, and upon the earth dismay among nations, in perplexity at the roaring of the sea and the waves, men fainting from fear and the expectation of the things which are coming upon the world; for the powers of the heavens will be shaken' (Luke 21:11,25-26 NASB).

There are certainly plenty enough Scriptures to make us wary of assuming the Earth became completely and permanently stable from the day the Flood finished (see also Psalm 46; 93; 114; Isaiah 24 etc.)! Geologically too, is it remotely plausible that one year of horrific violence could be followed by complete quiescence? Some considerable time would be needed for recovery — although Holt admits this,<sup>15</sup> he confines the consequences to the Ice Age, which had few tectonic implications. If a modern earthquake is followed by days or sometimes months of aftershocks, large scale **geological** activity must have carried on for years, and more probably centuries, after the vast and totally devastating Flood. This alone makes the late Cainozoic boundary implausible.

### What Killed the pre-Flood Land Animals?

But if, for the moment, we accept Holt's argument about this Biblical sea-level limit, he faces an overriding difficulty which destroys his entire argument. His problem is this. **What killed off the last of the land-dwelling, air-breathing animals, which he takes to be pre-Flood, at the end of his Flood, if that occurs in the late Cainozoic?**

On Holt's interpretation of Scripture, the sea-level at the end of the Flood is no higher than at the time of David and Jeremiah, and hence similar to the present day. Likewise, geologically, **Holt's own sea level curves<sup>16</sup> (his figures 7 to 9) show that, long before the close of the Tertiary, when he assumes the Flood ends, large areas of the Earth are above water, and continuously remain so, just as they are today.** Taking his assumption that the Flood starts at the start of the Cambrian, the pre-Flood land animals must somehow manage to survive (presumably mainly by swimming) through the world-wide and undeniably global stages of the Flood during the early Palaeozoic, yet no land animals are recorded by the fossils as dying at that time. Such animals as are fossilised, along with their fossilised footprints, in the Palaeozoic are predominantly unequivocally aquatic — the very ones we might expect to be the best swimmers, with the best chance of surviving the violence of this stage of the Flood.

Thus Professor Van Andel<sup>17</sup> says: *'Regarding the early Palaeozoic . . . we find it a wet world, its continents inundated far more than they have ever been since then, and the rise of the sea continuing. Before this rise ended, very little land remained above water*

This definitely sounds like a global Flood, and the words quoted and his subsequent comments make clear that from the Mesozoic period onwards there are always large areas of Earth above water. Geological conditions also became much less violent and the

events less extensive than they had been earlier. Yet if the Flood did destroy all the air-breathing, land-dwelling animals, as Scripture undoubtedly requires, Holt needs a mechanism to make **every individual one** of these animals die out by the end of the Flood.

What killed them? Holt does not tell us. Geological activity during the Tertiary is at all time **localised** to particular areas, so cannot kill everything. It certainly cannot have been water that caused the destruction, which is the means which Scripture suggests, because the sea is too low. By the Mesozoic (after the earlier and totally global flooding), and at all times thereafter, some animals, at least, could indeed have found land and run uphill to save their lives, as is so often claimed. This applies, surely, even more definitely to the birds, some of which can fly thousands of miles, and which Scripture (Genesis 6:7; 7:21,23) seems particularly at pains to tell us all perished. What we find in the fossil record is that all forms of land-dwelling life, and especially the birds, are becoming more abundant, rather than dying out, in the later strata. **Indeed, after the Carboniferous, there is no gap in the fossil record, no systematic stratum entirely devoid of air-breathing, land-dwelling fossils to mark the time when all such pre-Flood animals have died out, but before the post-Flood animals have multiplied sufficiently to repopulate the Earth and appear once more as fossils.** So when did the process of extinction become complete? Scripture requires that every single air-breathing, land-dwelling animal and bird must die. At every stage after the early Palaeozoic the conditions are such that some air-breathing animal and bird must die. At every stage after the early Palaeozoic the conditions are such that some air-breathing, land-dwelling animals can survive, **and** survive easily — and we know from the animals that entered Noah's Ark that a **single pair** is all that was needed to repopulate the Earth.

Holt clearly realises that he has a

problem, since he suggests introducing the concept of the 'erodeozoic', saying that there may have been other deposits, **of which he himself admits there is 'no continental record'**<sup>9</sup> (and on the continents is indeed where we must expect it if every land animal is to die), which have subsequently been eroded.<sup>18</sup> These deposits, of which there is no trace, he supposes may have contained pre-Flood man. Not only is evidence for **any** such sediments lacking, but we must also ask where is the evidence for an erosion which could so perfectly remove these sediments, and which has also, apparently, left no evidence?

Even setting this aside, Holt's sea-level curves and his own Scriptural exegesis<sup>19</sup> make abundantly clear that the world was not totally reinundated at this stage — indeed Holt emphasises that the sea-level was by then much as it is now. **If the land animals managed to survive, and in such vast abundance, until there was land again — indeed as much land for them to live on as there is now — we must ask the naive question: why did Noah need to carry animals in the Ark?** Holt's model is simply incoherent, inconsistent with both the Scriptures and the geological evidence. Whatever the merits of Holt's criticisms of other models, his own late-Cainozoic boundary model collapses spectacularly without needing any mathematics or quantitative models to prove it.

This fundamental problem of how all the pre-Flood air-breathing, land-dwelling animals died is not confined to Holt's very late Flood boundary model. **All Flood models which regard the air-breathing, land-dwelling animal fossils as being of pre-Flood animals fail the test of credibility for exactly the same reasons.**

### Which Way Forward?

By contrast, the other authors in that edition of the journal present a case in favour of their pre-Permian model which is free of these fatal flaws, and is therefore worthy of very serious

consideration. As a mathematical modeller, I do not find any of the objections presented by Holt to have sufficient weight to overthrow the arguments of the other authors. As with all scientific models based on a new paradigm, and at an early stage of development, there are still many details to be worked out, and doubtless their model will need some adjustment in the light of further evidence and research.

But unlike models which envisage pre-Flood animals surviving for nearly a year right through the judgment until very late in the Flood, a particular merit of the pre-Permian model, from a Scriptural standpoint, is the implication that the early Flood was too terrifyingly sudden and far too violent for any to survive beyond the very earliest hours of that Day of Judgment, in just the same way as we are told it shall be in the day of the Son of Man (Luke 17: 20-37, cf. Genesis 19:1-29).

I have shown, albeit in outline, that Holt's paper is not, as your editorial seemed to suggest, a well-argued quantitative challenge or answer to these other papers. Their arguments deserve a far better response than he has provided — if that is indeed possible — from other proponents of later end-of-Flood boundaries. **Any response, however, must adequately explain by what means every single one of the pre-Flood air-breathing, land-dwelling animals died, at a time when, according to the Scripture and geological evidence, the Flood had abated and vast areas of the Earth were above water.**

Unless someone can provide a suitable explanatory mechanism to ensure their death we must definitely look for a fundamentally different model. It seems to me, on the basis of the articles in that issue of the journal, that the pre-Permian understanding of Flood geology, which regards the air-breathing, land-dwelling animal fossils as evidence of the post-Flood regeneration and repopulation of the Flood-devastated Earth, is the most reasonable Scriptural and scientific model we can embrace. Consequently,

it has the best chance of achieving scientific acceptance, and of convincing the uncommitted and the evolutionary sceptic about the awesome reality of Noah's Flood, and the inescapability of the coming Day of Judgment.

Richard H. Johnston,  
Yateley,  
ENGLAND.

### REFERENCES

1. Snelling, A. A., 1996. Where should we place the Flood/post-Flood boundary in the geological record? *CEN Tech. J.*, 10(1): 29-31.
2. Robinson, S. J., 1996. Can Flood geology explain the fossil record? *CEN Tech. J.*, 10(1):32-69.
3. Scheven, J., 1996. The Carboniferous floating forest — an extinct pre-Flood ecosystem. *CEN Tech. J.*, 10(1):70-81.
4. Garton, M., 1996. The pattern of fossil tracks in the geological record. *CEN Tech. J.*, 10(1):82-100.
5. Garner, P., 1996. Where is the Flood/post-Flood boundary? Implications of dinosaur nests in the Mesozoic. *CEN Tech. J.*, 10(1):101-106.
6. Garner, P., 1996. Continental flood basalts indicate a pre-Mesozoic Flood/post-Flood boundary. *CEN Tech. J.*, 10(1): 114-127.
7. Tyler, D., 1996. A post-Flood solution to the chalk problem. *CEN Tech. J.*, 10(1): 107-113.
8. Holt, R. D., 1996. Evidence for a Late Cainozoic Flood/post-Flood boundary. *CEN Tech. J.*, 10(1): 128-167.
9. Scheven, J., 1988. Mega-Sukzessionen und Klimax im Tertiär, Katastrophen zwischen Sintflut und Eiszeit. (Mega-successions and climax in the Tertiary, catastrophes between the Flood and the Ice Age), Hannsler, Neuhausen Stuttgart, 223p.
10. Scheven, Ref. 9.
11. Garton, M., 1997. A Spanish weekend. *Origins*, 22:11-24.
12. Whitcomb, J. C. and Morris, H. M., 1961. *The Genesis Flood*, Presbyterian and Reformed Publishing Company, Phillipsburg, New Jersey, pp. 231-232.
13. Van Andel, T. H., 1994. *New Views on an Old Planet*, Cambridge University Press, 2nd edition, pp. 178-184.
14. Tyler, Ref. 7.
15. Holt, Ref. 8, p. 152.
16. Holt, Ref. 8.
17. Van Andel, Ref. 13.
18. Holt, Ref. 8, p. 145.
19. Holt, Ref. 8, pp. 129, 150.