

At this point it is pertinent to ask, "How do we know that a particular set of postulates, say those of elementary algebra, will never lead to a contradiction?" The answer to this disposes once for all of the hoary myth of "absolute truth" for the conclusions of pure mathematics. **We do not know, except in comparatively trivial instances, that a particular set of postulates is self-consistent and that it will never lead to contradiction.** This may seem strong, but the reader will be in a position to judge for himself if he reads the succeeding chapters, particularly the last of all

So much for the "absolute truths, which existed in the Divine Mind before the morning stars sang together" — so far as these were mathematical truths — and so much also for the Great Architect of the Universe as a pure mathematician. If He can do no better than some of the postulate systems that pure mathematicians have constructed in the past for their successors to riddle with inconsistencies, the universe is in a sorry state indeed. The less said about the postulate systems for the universe constructed by scientists, philosophers, and theologians, the better.²

I was aghast that modern mathematicians have such a different view of mathematics from me. I'm with E. Everett; and I was appalled by the ridicule levelled at theologians and others of like mind, by this and many similar writings. Hence my parallel effort was to try to find what has gone wrong with modern mathematics — why has it gone off the rails, and to try to determine how it can be brought back to the **correct** position it had until the late 19th century.

Ferguson's paper is also unhelpful. Obviously he doesn't approve of my attempt at a solution to this problem of the **devaluation** of mathematics, but he offers no suggestions of his own.

He seems not to see it as a problem. He has nothing whatsoever to contribute to how or why the factions arose, after some 3,000 years of successful united mathematical work.

He has made a number of errors of fact, accusing me of things I didn't write :-

- (1) I divided Platonism into Logician and Set theoretic approaches (p. 108) — when I hadn't heard of Platonism. As far as I can see these are not related.
- (2) I rejected Platonism for its treatment of infinity (p. 108) — this is again incorrect.
- (3) I wonder 'whether perhaps mathematics might not be universally true, but merely true for mankind' (p. 113) — is wrong and damaging. But if Ferguson had ended this sentence with 'merely true in this creation', I would have no objection.

Some parts of Ferguson's paper are worrying, as they use technical words of dubious or ill-defined meaning:-

- (1) What are transfinite sets? We understand infinite sets as being non-finite, but has anybody explained what Cantor means by transfinite?
- (2) What does he mean by *foundations without foundationalism*? (p. 110). Can there be any such thing? Does it have an analogy in 'the living dead'?

With respect to the difficulty with the trinity, Ferguson states that 'it **does** contradict our mathematical practices'. Thus he has no answer for the sceptic's attack. But Formalists and quasi-Formalists wouldn't have any sort of answer because their mathematics does not have any meaning anyway, as demonstrated in the quote from Bell above.

In his conclusion, Ferguson has got it exactly wrong. He writes:

'Malcolm has argued for a rejection of the traditional positions in the philosophy of mathematics.'

I believe I was upholding the traditional position, and only questioning the modern deviations

from the traditional position which started towards the end of the 19th century. And in his introductory section he says: 'I am inclined to agree with Malcolm' that mathematics should cohere with Biblical revelation. I would like to know in what sense he believes his present paper is advocating any Biblical principles as related to mathematics.

Finally, from reading Ferguson's paper, I am not convinced that Formalism has anything to recommend it, nor has my position changed as to the positive aspects of Intuitionism. Further, I gave numerous quotations to back up my position, which were all carefully referenced. Ferguson gives no such references.

I am working on a more rigorous paper addressing the philosophy of mathematics, and any further defence and clarification of my position on the above matters will have to wait until the research for that is completed.

David Malcolm,
Maryland, New South Wales,
AUSTRALIA.

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THE POST-FLOOD BOUNDARY

Dear Editor,

The discussion in **CEN Tech. J.**, **10(1)**, 1996 concerning the global stratigraphic record is very helpful. However, my present conclusion is this: The definite succession of the fossils, the chalk formations, the coal seams, the fossil tracks, the dinosaur nests, the continental flood basalts, etc. are best explained by Robinson *et al.* As an example we recognise that Froede's model is not able to explain why we do not find any fossils of land

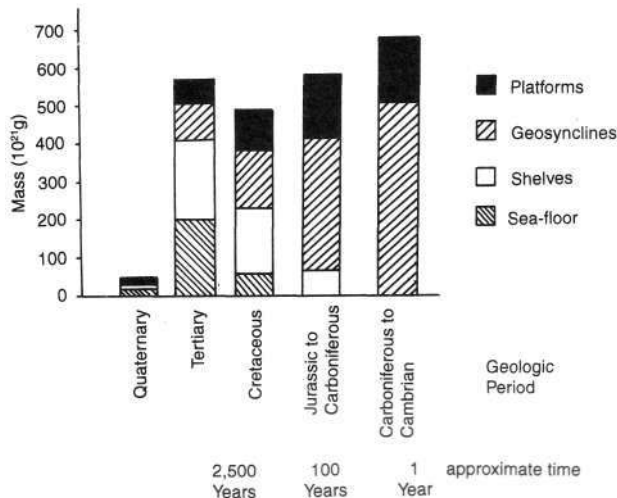


Figure 1. Global distribution of Phanerozoic sediments.

animals and plants from Cambrian to the Devonian.

In particular, I refer now to Roy Holt's paper, 'Evidence for a late Cainozoic Flood/post-Flood boundary'.

Holt shows in Figure 2 (p. 131) the global distribution of Phanerozoic sediments. He indicates that the amount of sediment in the Tertiary is the largest of any sub-era or period. However, we should take into account how much real time could be assigned to each period. I have redrawn that figure in the following manner: If I assume that the end of the Flood is in the middle of the Carboniferous, then I add the masses from the Cambrian to half the Carboniferous, I get a larger mass during the year of the Flood than in the Tertiary (see Figure 1). I further added the masses from half the Carboniferous to the Jurassic. Assigning the year of the Flood from the Cambrian up to half of the Carboniferous, the following 100 years from half of the Carboniferous up to the Jurassic, then 2,500 years to the Cretaceous and Tertiary, I get a fairly reasonable distribution of sediments. The maximum was deposited during the Flood. In the first 100 years after the Flood, the deposition on the shelves was started. The next 2,500 years show the largest deposition on the sea floor and the shelves, whereas on the platforms and the geosynclines we note reduced deposition. This interpretation supports the notion that

the Mesozoic was laid down after the Flood.

Concerning Holt's Figure 5 (p. 140) one comes to different interpretations than his. Again I have redrawn that figure similarly and taken real time into account. From Cambrian to Carboniferous there is very little subaerial volcanics (see Figure 2). Water covered at that time most of the Earth. The more the water receded, the more subaerial volcanics are observed. If real time is compared to the volcanic activity, the end of the Flood somewhere in the Carboniferous seems to be much more reasonable than later in the geologic column.

Holt and others want to tie the Flood/post-Flood boundary directly to the Scriptural account. But why do they ignore the Scriptures, where some post-Flood catastrophes are mentioned? For example, Psalm 104:5-9, 'Who laid the foundations of the earth, that it should not be removed for ever. Thou coveredst it with the deep as with a garment: the waters stood above the mountains. At thy rebuke they fled; at the voice of thy thunder they hasted away. They go up by the mountains; they go down by the valleys unto the place which thou hast founded for them. Thou hast set a bound that may not pass over; that they turn not again to cover the earth.' It says here that at least part of the mountain-building has been observed after the Flood. If one imagines the uplifting of the Alps and the Himalayas, it is impossible to recognise a comparable catas-

trophe during the last 1,000 years.

Other Scriptures indicate large catastrophic events. The authors must have witnessed and recorded them. For example, Amos 9:5, 'And the Lord GOD of hosts is he that toucheth the land, and it shall melt, and all that dwell therein shall mourn: and it shall rise up wholly like a flood; and it shall be drowned, as by the flood of Egypt'. The sediments were saturated with water after the Flood. It took hundreds of years to press out the water. This led to very large local floods and further sedimentation in post-Flood time.

Micah 1:4, '... And the mountains shall be molten [!] under him, and the valleys shall be cleft, as wax before the fire, and as the waters that are poured down a steep place'. Nahum 1:3-6, '... the LORD hath his way in the whirlwind and in the storm, and the clouds are the dust of his feet. He rebuketh the sea, and maketh it dry, and drieth up all the rivers; Bashan languisheth, and the Carmel, and the flower of Lebanon languisheth. The mountains quake at him, and the hills melt, and the earth is burned at his presence, yea, the world, and all that dwell therein. Who can stand before his indignation? And who can abide

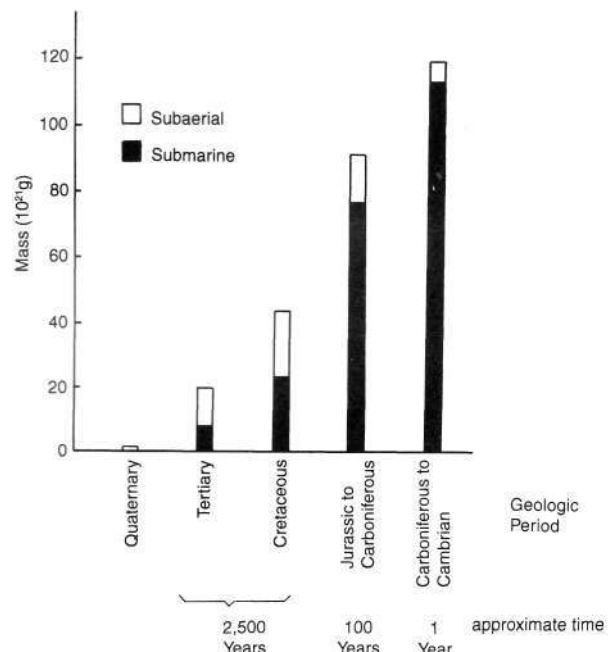


Figure 2. Distribution of Phanerozoic continental volcanics.

in the fierceness of his anger? His fury is poured out like fire, and the rocks are thrown down by him'. Habakkuk 3:6-10, 'He stood, and measured the earth; he beheld, and drove asunder the nations; and the everlasting mountains were scattered, the perpetual hills bow; his ways are everlasting . . . Thou didst cleave the earth with rivers. The mountains saw thee, and they trembled: the overflowing of the water passed by: the deep uttered his voice, and lifted up his hands on high'.

Job 38:29-30, 'Out of whose womb came the ice? And the hoary frost of heaven, who hath gendered it? The waters are hid as with a stone, and the face of the deep is frozen.' There was still water in the deep! Job must have witnessed the ice age.

Tectonic activity, volcanic eruptions, mountain-building, erosion and sedimentation have shaped the Earth, also in the time after the Flood. The Scriptures assure us that it happened with great catastrophes.

People have witnessed them and recorded their observations. The lithostratigraphic column and the biostratigraphic column as indicated in the statement on p. 333 (CEN Tech. J., 10(3), 1996) have to be interpreted not only according to Genesis, but according to the whole Scriptures. And on this road, I appreciate the works of Robinson *et al.* very much. .

Finally, I refer to CEN Tech. J., 11(1), 1997, p. 47: Archaeoastronomy theory — is it the pits? During a 12-year-study, the German scientist Dr Werner Papke (1994) decoded the Gilgamesh Epic. He found that Noah, Ham, Cush and Nimrod were historical persons by comparing the Gilgamesh Epic with the list of the Sumeric kings and Genesis. He was also able to show that the Gilgamesh Epic is intimately tied to the zodiac and is an interpretation of the constellations of the planets, the Moon, the Sun, and the stars. He even found that it is highly possible the Babylonians at 2340 BC had a

heliocentric world-view, which got lost later on. He shows also that the Biblical Flood story is the basis of the Flood story contained in the Gilgamesh Epic and not vice versa. Papke wrote a book in 1994 with the title **Die geheime Botschaft des Gilgamesch** (unfortunately in German), published by the Weltbild Verlag GmbH in Augsburg, Germany (400 pages).

H. Stutz,
Dietlikon,
SWITZERLAND.

The Author replies . . .

I thank Mr Stutz for considering my paper on the Flood/post-Flood boundary.¹ I am pleased that he neither identified one mathematical error nor corrected one quantitative value I used in my paper.

However, I am puzzled that Mr Stutz seems to avoid all the Biblical references, historical data, detailed

GEOLOGIC SETTING (grouping after Stutz)	ESTIMATED DURATION* (after Stutz)	SEA SEDIMENT MASS (10 ²¹ g)	LAND SEDIMENT MASS (10 ²¹ g)	MINIMUM** EROSION RATE REQUIRED FOR STUTZ'S MODEL (multiple of present annual erosion rate***)	
				Sea	Land and Sea
<i>post-Flood</i>					
Quaternary	~1,743 years	30.3	12.4	869	1,230
Tertiary and Cretaceous	2,500 years	636.4	406.5	12,700	20,900
Mid-Carboniferous to Jurassic	100 years	48.1	519.1	24,100	284,000
	<i>post-Flood Totals</i>	<i>714.8</i>	<i>938.0</i>		
<i>Flood</i>					
Cambrian to mid-Carboniferous	1 year (Flood)	0	663.9		

Notes:

I take the Genesis genealogy straightforwardly and do not assume there are gaps in the genealogy. As a result the Earth is estimated to be 6,000 years old and the Flood occurred about 1,656 years after Creation Week.

I state minimum because it is likely that some sediments were reworked within Mr Stutz's model. Including the reworking of sediment in the table would increase the required erosion rate. No doubt in the model Mr Stutz advocates a significant amount of sediment was technically subducted after the Flood. Including an estimate of this subducted sediment would further increase the erosion rates required by Mr Stutz's model.

*** The present annual erosion rate is 2.0 x 10¹⁶ g/yr as cited in Ref. 1.

Table 1. The distribution of global sediment in 'real time' according to Mr Stutz.

analysis, and modelling I presented by not really addressing the issues. He does not address the quantitative upper limits on post-Flood erosion and volcanism I provided. He seems to ignore the interrelationship of erosion and volcanism with

- (1) post-Flood sediment distribution,
- (2) post-Flood climate and the Biblical account,
- (3) post-Flood primary productivity and fossil fuel growth, transportation, burial, and formation,
- (4) post-Flood primary productivity and organic carbon content in the geologic record,
- (5) the elevation of the Plain of Shinar, eustatic curves and sea-level constraints imposed by God's promise about not sending another Flood (Genesis 8:21-22; 9:11-16, Isaiah 54:9, Psalm 104:6-9, and

Jeremiah 5:22),

- (6) the Biblical and geological timing constraints imposed by the formation of the mountains of Ararat (Genesis 8:4-22; 9:1-21), and
- (7) the Biblical and geological timing constraints imposed by the geology of the Plain of Shinar (Genesis 11:2-6).

Mr Stutz states that many features of the geologic column 'are best explained by Robinson et al.'. However, 'best explanations' often fail when placed under the scrutiny of quantitative analysis. This should challenge us to review our assumptions and question our conclusions. For the benefit of Mr Stutz and the reader, I will provide a quantitative assessment of the model he proposed. This will be compared with the upper limits that

can be found in my paper and were elaborated upon in my recent Letter to the Editor of this journal.²

For reasons that are not stated, Mr Stutz proposes a slightly different model than that of Robinson *et al.* and places the Flood/post-Flood boundary in the mid-Carboniferous rather than at the end of the Carboniferous. Mr Stutz addresses only the distribution of sediment and volcanics with time and a few Scriptures. I addressed these issues in detail in my original paper and recent letter, so in this letter I will only briefly address the quantitative issues Mr Stutz raises. Readers who want more detail and analysis should read my original article and my recent letter on the same subject.

I do agree with Mr Stutz's interpretation of Job 38:29-30, but the rest of his claims about Scripture seem

GEOLOGIC SETTING (grouping after Stutz)	ESTIMATED DURATION* (after Stutz)	SUBAERIAL VOLCANICS MASS (10 ²¹ g)	SUBMARINE VOLCANICS MASS (10 ²¹ g)	MINIMUM** VOLCANICS PRODUCTION RATE REQUIRED FOR STUTZ'S MODEL (x 10 ¹⁸ g/yr)	
				Subaerial	Subaerial and Submarine
<i>post-Flood</i>					
Quaternary	~1,743 years	0	1.3	0.0	0.7
Tertiary and Cretaceous	2,500 years	31.1	32.2	12.4	25.3
Mid-Carboniferous to Jurassic	100 years	68.2	14.6	682	828
<i>post-Flood Totals</i>		<i>99.3</i>	<i>48.1</i>		
<i>Volcanic production rate that reduces light on the Earth's surface to the limit of photosynthesis</i>				4.0	
<i>Probable upper limit on post-Flood volcanic production rate for survival of Noah, his descendants and animal life</i>				<0.4	
<i>Flood</i>					
Cambrian to mid-Carboniferous	1 year (Flood)	117.5	8.14	118	8.14

Notes:

I take the Genesis genealogy straightforwardly and do not assume there are gaps in the genealogy. As a result the Earth is estimated to be 6,000 years old and the Flood occurred about 1,656 years after Creation Week. I state minimum because it is likely that many volcanics have been reworked and are no longer recognised as volcanics. Including the reworked volcanics would increase the required production rate. No doubt in the model Mr Stutz advocates a significant amount of sediment including volcanics were technically subducted after the Flood. Including an estimate of this subducted volcanic mass would further increase the volcanic production rates required by Mr Stutz's model.

Table 2. The distribution of global volcanics in 'real time' according to Mr Stutz.

unfounded. It appears that he confuses descriptions of the Genesis Flood, Creation Week, or specific judgments (or perhaps prophetic events) with post-Flood history. Scripture does not talk about thousands of years of incredible levels of erosion and volcanism as Mr Stutz's model requires (as will be shown). The reader can check the Scriptures he cites as well as the many Scriptures I cited in my paper and draw their own conclusions.

Post-Flood Erosion and Sediment Distribution

Mr Stutz has redrawn the sedimentary data I provided and assigned estimated 'real time' limits according to his model. The distribution of sediment according to Mr Stutz's 'real time' is shown in Table 1. Also shown are the minimum erosion rates required to move the indicated amounts of sediment.

I demonstrated in my paper that the maximum amount of sediment that could realistically be carried to the sea in the 4,300 years since the Flood was 1.1×10^{21} g. This assumed maximum catastrophism, precipitation and erosion plausible during the post-Flood ice age and a model that quantitatively and accurately describes the sediment load of all rivers on the Earth. This analysis was discussed with great detail in my paper (pp. 132—139).³ This amount of sediment is about one-twentieth of the non-carbonate Quaternary marine sediments, and therefore places the Flood/post-Flood boundary firmly in the late Cainozoic and most likely in the late Pleistocene.

Without identification of a mechanism or analysis of the erosion rates, Mr Stutz proposes that 620 times this maximum plausible amount of sediment was carried to the sea in only 2,600 years. In his model an average annual erosion rate to the sea, for the first 100 years, would have to be a staggering 24,100 times the present level of 2.0×10^{16} g/yr, and decreases only to 12,700 times the present rate for the following 2,500 years, that is, until AD 255. The average annual

erosion rate since AD 255 (that is, for the last 1,743 years) would have to be 869 times the present value in Mr Stutz's model. I would like to think that Mr Stutz would not advocate a distribution of sediment in 'real time' that requires these incredible erosion rates if he had quantitatively analysed the implications of his own model.

When we include the amount of continental sediment that is being eroded and redeposited, the required erosion rate increases to a phenomenal 284,000 times the present erosion rate for the first 100 years after the Flood, and 20,900 times the present rate for the following 2,500 years. For the last 1,743 years, since AD 255, the erosion rate would have to have been at over 1,200 times the present value.

There is a severe collision between written history and the values required by Mr Stutz's model. Where in all the Biblical record and secular history do we find accounts of rain without end that is necessary to wash so much land and soil away? We don't. We read about local floods and occasional wet times as well as droughts. We find nothing that compares with the erosion, and by necessity the excessive rain, that Mr Stutz's model requires.

I am disappointed that Mr Stutz did not examine the implications of his own model. In my paper and in my recent letter I pointed out the incredible levels of erosion that would be required for a Flood/post-Flood boundary at the end of the Palaeozoic (near Mr Stutz's placement at the mid-Carboniferous). He should have taken note of the analysis. He should also be aware that, as pointed out in my paper, inserting a few more thousand years in the genealogy in Genesis does not solve the challenge. The results of my analysis were emphasised repeatedly in the paper, but this seems to have escaped Mr Stutz's attention.

If Mr Stutz still wishes to advocate a mid-Carboniferous placement for the Flood/post-Flood boundary, he should explain to us, using quantitative values, how these levels of erosion can be achieved and sustained during the nearly 4,400 years since the Flood.

And in doing so, he should go on to quantitatively explain how much precipitation there was and what the sediment load of the rivers was, how plants could take root and grow with this much erosion, how Noah could have grown and harvested grapes for wine, how animals could survive and refill the Earth, how fossil fuels could be grown, transported, buried and formed, how the Plain of Shinar was a plain, not a swamp or part of the ocean, when Noah's descendants arrived, and how all this can be reconciled with the Biblical and secular history. There are numerous other details that he would also need to explain.

Post-Flood Volcanism and Climate Impact

Mr Stutz has redrawn the volcanic data I provided and assigned estimated 'real time' limits according to his model. The distribution of volcanics according to Mr Stutz's 'real time' is shown in Table 2. Also shown are the minimum production rates required to produce the indicated amounts of volcanics.

The Biblical account of seeing a rainbow, the need for sunlight to grow food, and the ice core records all point to a severely limited amount of post-Flood volcanism. The details in my paper demonstrate that the probable amount of post-Flood volcanics is less than 8×10^{19} g, with a lethal level at 2.8×10^{21} g.⁴ This upper limit on subaerial volcanics indicates the Flood/post-Flood boundary is in the late Cainozoic and most likely in the mid to late Pleistocene.

I also indicated in my paper that the surface of the Earth would be at the limit of photosynthesis at a volcanic production rate of 4×10^{18} g/yr, corresponding to a lethal level of volcanism. The upper limit on the production rate of volcanics required to support a food chain for a meagre survival of terrestrial animals would likely be less than one-tenth of the lethal level. The upper limit on the production rate of volcanics required for Noah to see a rainbow and grow grapes, and for animals to refill the

Earth, would likely be even lower.

In stark contrast, the rate of volcanism required in Mr Stutz's model would, via volcanic dust and aerosols, block out all light from the Sun for the first 2,600 years after the Flood. See Table 2 where the subaerial volcanic production rate in Mr Stutz's model varies from 3-170 times the lethal level after the Flood. These are not the conditions described by Noah and his descendants, nor are they the conditions described by ancient historians. No one would ever see a rainbow and grapes would never grow or ripen. This is not the volcanic record found in the ice core records in Greenland and Antarctica, as pointed out in detail in my paper.

I am disappointed that Mr Stutz did not examine the implications of his own model and seems to have ignored the content of my paper. He should be aware that, as I pointed out, inserting a few more thousand years in the genealogy in Genesis does not solve the challenge. I pointed out at length in my paper the incredible levels of volcanism that would be required to place the Flood/post-Flood boundary at the end of the Palaeozoic, near Mr Stutz's placement. This issue was emphasised repeatedly but seems to have escaped Mr Stutz's attention.

Conclusion

The above analysis is just an example of the type of detailed analysis and modelling results that can be found in my paper and recent letter, and need not be repeated here. At the close of my paper I stated, *'the thoughts of readers with insight into alternate interpretations with quantitative reassessments of the evidences are invited'*. Unfortunately, Mr Stutz's pictorial rearrangement of the sedimentary data provides no quantitative assessment. If Mr Stutz would have examined my paper and tested his model he might have realised the staggering challenges his model creates for the post-Flood climate — challenges that make survival in post-Flood times just as incredible and perhaps more miraculous than Noah

and his family surviving the Genesis Flood.

The geologic and Biblical evidence for a late Cainozoic Flood/post-Flood boundary is powerful and compelling. In contrast, when the mid-Carboniferous model of Mr Stutz is tested it is found to be unable to account for the geophysical record and is incompatible with the Biblical account. If Mr Stutz and other advocates for a late Palaeozoic boundary for the Flood can **quantitatively** account for their postulated tremendous levels of post-Flood erosion and volcanism while remaining compatible with the Biblical account and geophysical record, they should do so.

Until a quantitative and detailed critique of my analysis showing a multiplicity of errors orders of magnitude in size and in many of the independent evidences is provided, I am compelled by the data to believe the Flood/post-Flood boundary is very late in the geologic column. I hope those who advocate the mid-Carboniferous or pre-Permian boundary will be able to look beyond their paradigm and see the data set before them. The thoughts of readers with insight into alternate interpretations **with quantitative assessments of the evidences,** rather than conjecture and untested 'explanations', are still invited.

Roy D. Holt,
Cedar Crest, New Mexico,
UNITED STATES OF AMERICA.

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2. Holt, R. D., 1997. Letter to the Editor: The Flood/post-Flood boundary. *CEN Tech. J.*, **11(3)**:308-314.
3. Holt, R. D., 1997. Errata. *CEN Tech. J.*, **11(3)**:298.
4. This estimate of volcanics assumes a 700-year period of maximum volcanism (that is, at the limit of photosynthesis) that is not recorded in the ice cores. This period may have been 200 years or less, and the upper limit on total volcanics would be correspondingly less. See Ref. 1 for details.

GOLD PLACERS IN EARTH HISTORY

Dear Editor,

I found the paper by Alexander Lalomov and Serguei Tabolitch on gold placers¹ most interesting. Especially interesting is Table 4, showing that placer gold generation has occurred on Earth during only two periods according to the uniformitarian timescale: 86 per cent in the middle Archaean and 13 per cent in the Cainozoic. (I am confused on the middle Archaean distribution in Table 4, because the text says the placer gold is distributed within both the Archaean and Proterozoic.²) The placer gold distribution seems like quite a uniformitarian anomaly to me, and points more toward a Flood origin. I agree with the authors that gold placers can help define the pre-Flood/Flood and Flood/post-Flood boundaries.

Peter Klevberg and I have been studying surficial erosion surfaces in Montana and surrounding areas. Often these erosion surfaces are capped by a veneer of coarse gravel or conglomerate that occasionally has been transported many hundreds of kilometres from their nearest sources. Sometimes, placer gold is found in these coarse gravels. For instance, about 1,500 km³ of gold-bearing quartzite conglomerate was deposited in northwest Wyoming, which probably was transported about 400 km by high energy currents.^{3,5}

One of the most interesting placer gold deposits is on the ridges of the Wallowa Mountains of northeast Oregon.⁶ The Wallowa Mountains consist of granodiorite intrusive rocks with a smaller amount of volcanic and sedimentary rocks. The coarse gravel is found on erosion surfaces mostly upon ridges and peaks in eight areas, protected from erosion by a basalt cap of the Columbia River Basalts during uplift and erosion of the Wallowa Mountains. The coarse gravel includes well-rounded quartzite boulders up to 1 m in diameter! The gravel is exotic and distributed over an area of about