13. Humphreys, D.R., Accelerated nuclear decay: a viable hypothesis?; in: Vardiman, L., Snelling, A.A. and Chaffin, E. (Eds), *Radioisotopes and the Age of the Earth,* Institute for Creation Research and Creation Research Society, Chapter 7, pp. 333–379, 2000. See pp. 370–371 for discussion of energy loss from red-shifted photons.

14. I am assuming that the 'premises' to which AK objects are those which all relativistic cosmologies have in common. It is unlikely he meant the premises unique to my cosmology, because it would not make sense for him to consider building his own cosmology on premises he could easily replace with others more to his taste.

## Was Mount Ararat a submarine stratovolcano?

I refer to Bill Crouse's reply[1] to my Letter to the Editor, *Cudi Dagh not high enough?*,[2] in which he suggests that my arguments about altitudes and water levels are of no avail in supporting my case that the Ark rested on Mount Ararat, unless there is supporting geological evidence.

Crouse is correct in suggesting that if Mount Ararat was formed under the Flood waters then there should be some supporting geological evidence, somewhere on the mountain, of a submarine origin. He suggests that if Mount Ararat was thus formed then there would be some remaining 'diluvium', and notes that there are no recorded sedimentary rocks or fossils resulting from water action on Mount Ararat. He goes on to imply that he agrees with John Baumgardner's opinion[1] that Mount Ararat rose after the Flood.

Now, some secular writers have concluded that Mount Ararat is a stratovolcano,[3,4] and this would seem to be confirmed by 'outward' dipping (? volcanic) stratification in the western wall of the Ahora Gorge, on the northern side of the mountain, as shown in Crouse's photograph on the front cover of *TJ* **15**(3), 2001. (The stratification is also visible in the photo included here with this letter.) Crouse also notes that volcanic stratification occurs in a canyon on the southern side of the mountain.

If Mount Ararat was erected as a submarine stratovolcano then it would be highly unlikely that conditions on the sloping sides of the active volcano would have been conducive to the preservation of 'diluvium'[1] ('coarse superficial accumulations … glacial and fluvio-glacial deposits of the Ice age'[5]) or fossils. It is more likely that the required geological evidence of a submarine origin for the mountain would comprise volcanic textures and lithologies indicative of a sub-aqueous origin for the volcanic lavas,[6–8] interbedded volcaniclastics,[9] pyroclastics[10] and possible (minor) sedimentary strata[11] of which the whole mountain is comprised. Such textural and lithological evidence may only be obvious to an expert in this field.

The Geological Map of Turkey (Van 1:500,000)[12] shows that the whole of the Mount Ararat area is, as Crouse has noted, composed of ('igneous') volcanic rocks, comprising dominantly basalts, with subordinate spilites, porphyrites and dolerites. Numerous small volcanic cones occur in the area, all of which probably formed during historically recorded post-Flood seismic and volcanic activity.[3] Interestingly, what looks very much like one of these small volcanic cones can be seen in Crouse's photograph on the front cover of *TJ* **15**(3), 2001, just to the left of the horse rider's left elbow. The photo with this letter shows the cone more clearly.

Submarine volcanic lavas, volcaniclastics and pyroclastics are common throughout the geological record,[6,13,14] and basaltic lavas, the most common lithology in the Ararat area, commonly occur in sub-aqueous environments, from the Archean to the present day ocean floor.[15–19] Dolerites commonly occur in these subaqueous environments as syn-volcanic sheeted dykes.[20]

Spilites,[21] which occur in the Mount Ararat area,[12] are soda enriched ophiolites,[22,23] which are; 'albite basalt lavas of subalcalic affinity … **generally of submarine eruption**, showing "pillow" and allied structures'.[24]

'Porphyrites', which also occur in the Mount Ararat area,[12] are felsic lavas such as trachytes, dacites and andesites, which can also occur as sub-aqueous flows.[25,26]

McPhie *et al.*[6] (quotes in quotation marks below, emphases added), and others, document the volcanic textures which characterise sub-aqueous volcanics. Very briefly, these textures include, but are not restricted to 'pillow' lavas[27,28] which '… are diagnostic of the **subaqueous** emplacement of lavas, especially those of basaltic composition'; hyaloclastite/quench fragmentation[29] i.e. '… clastic fragments formed by non-explosive fracturing and disintegration of quenched lavas … occurs on modern ocean floors … ;' and '… is a valuable indicator of the emplacement of lava into **subaqueous** settings … ; and peperite[30]

> '… a rock generated by mixing of coherent lava … with unconsolidated wet sediment … occurs … along basal contacts of lava flows that override or burrow into unconsolidated sediments … an important component of mixed sedimentary-volcanic sequences, especially those in **subaqueous** settings.'

A literature search should be undertaken to determine whether the detailed geology of Mount Ararat has been documented (? by Turkish workers) and if so, whether lithologies and textures indicative of a submarine origin of the volcanic rocks are present, and whether the mountain is interpreted as a submarine stratovolcano.

If the geology has not been so documented, then the volcanic strata of the mountain should be examined in detail, and the mountain should not be discounted as a submarine volcanic construct, formed beneath the waters of the Genesis Flood, unless it can be proven that none of those volcanic textures that are indicative of a sub-aqueous origin of lavas, volcaniclastics and pyroclastics, or interstratified sediments, exist.

Crouse[1] regards evidence based on water volumes and altitudes as 'slippery' suggesting; 'we cannot use present day altitudes to calculate water depth'. I would just like to make two brief points regarding this issue.

Firstly, the fact that the altitude of Cudi Dagh is 1,782 m above present mean sea level,[31] and the fact that the present volume of 'free' water at the Earth's surface would cover the Earth to a depth of at least about 3,000 m above present mean sea level,[32] are demonstrable geographic facts. Those who advocate post Flood vertical movements to explain this discrepancy should present the evidence for such movements.

Secondly, there are no large faults mapped in the Mount Ararat region that are suggestive of any large vertical movements occurring since the Flood,[41] unlike the Himalayas, where relatively large post Flood vertical movements can be shown to be due to even larger horizontal movements (e.g. Mount Everest).

Confirmation of a submarine volcanic origin for Mount Ararat would significantly corroborate the Scriptural and geographic evidence suggesting that it is the mountain on which Noah's Ark came to rest.

Max Hunter
Charters Towers, Queensland
AUSTRALIA

## References


1. Crouse, B., Bill Crouse replies, *TJ* **16**(2): 60–61, 2002.
2. Hunter, M.J., Cudi Dagh not high enough? *TJ* **16**(2):59–60, 2002. Please note an erratum in Reference No. 5 in that letter, regarding the sentence which reads in part; *'The water depth estimate in this reference (11,710 m) assumes ... '.* 11,710 m should read 2,710 m.
3. Navarra, F., *Noah's Ark: I Touched It,* Logos International, Plainfield, NJ, 1974.
4. <//www.volcano.und.nodak.edu/vwdocs/volc_images/img_ararat.html>.
5. *Dictionary of Geological Terms,* American Geological Institute, Dolphin Books, Doubleday & Co. Inc., New York.
6. McPhie, J., Doyle, M. and Allen, R., *Volcanic Textures: A Guide to the Interpretation of Textures in Volcanic Rocks,* Centre for Ore Deposit and Exploration Studies, University of Tasmania, 1993.
7. Cas, R.A.F. and Wright, J.V., *Volcanic Successions: Modern and Ancient,* Allen and Unwin, London. 1987.
8. McPhie, J. and Allen, R.L., Facies architecture of mineralised submarine volcanic sequences: Cambrian Mount Read Volcanics, western Tasmania, *Econ. Geol*. **87**:587–596, 1992.
9. Fisher, R.V., Submarine volcaniclastic rocks; in: Kokelaar, B.P. and Howells, M.F. (Eds), Marginal Basin Geology, *Geol. Soc. Spec. Pub*. **16**:5–28, 1984.
10. Dimroth, E. and Yamagishi, H., Criteria for the recognition of ancient subaqueous pyroclastic rocks, *Geol. Surv. Hokkaido Rep*. **58**:55–88, 1987.
11. Volcanogenic Sedimentation in Ancient Terrains, *Field Guide II, IAVCEI / IAS Field Workshop,* L1–L2, 1990.
12. *Geological Map of Turkey (Van 1:500,000),* The Institute of Mineral Research and Exploration/Turkish Geodetical Survey, Ankara, Turkey, 1961.
13. Yamagishi, H., Classification and features of subaqueous volcaniclastic rocks of Neogene age in southwest Hokkaido, *Geol. Surv. Hokkaido Rep*. **51**:1–20, 1979.
14. Yamada, E., Subaqueous pyroclastic flows: their development and their deposits; in: Kokleaar, B.P. and Howells, M.F. (Eds), Marginal Basin Geology, *Geol. Soc. Spec. Pub*. **16**: 29–36, 1984.
15. Dimroth, E., Cousineau, P., Leduc, M. and Sanschagrin, Y., Structure and organization of Archean basalt flows, Rouyn-Noranda area, Quebec, Canada, *Can. Jour. Earth Sci*. **15**:902–918, 1978.
16. Dolozi, M.B. and Ayres, L.D., Early Proterozoic, basaltic andesite tuff breccia: downslope, subaqueous mass transport of phreomagmatically-generated tephra. *Bull. Volcanol*. **53**: 477–495, 1991.
17. Bergh, S.G. and Sigvaldason, G.E., Pleistocene mass—flow deposits of basaltic hyaloclastite on a shallow submarine shelf, South Iceland. *Bull. Volcanol*. **53**:597–611, 1991.
18. Applegate, B. and Embley, R.W., Submarine tumuli and inflated tube-fed lava flows on Axial Volcano, Juan de Fuca Ridge, *Bull. Volcanol.* **54**:447–458, 1992.
19. Bryan, W.B., Systematics of modal phenocryst assemblages in submarine basalts: petrologic implications, *Contrib. Mineral. Petrol*. **83**: 62–74, 1983.
20. Fox, P.J. and Stroud, J.B.; in: Emiliani, C. (Ed.), *The Sea,* Wiley & Sons, New York, pp. 119–218, 1981.
21. Cann, J.R., Spilites from the Carlsberg Ridge, Indian Ocean, *Jour. Petrol*. **10**:1–19, 1969.
22. Cameron, W.E., Nisbet, E.G. and Dietrich, V.J., Boninites, komatiites and ophiolitic basalts, *Nature*, **280**:550–553, 1979.
23. Coleman, R.G., *Ophiolites,* Springer Verlag, Berlin, 1977.
24. Barth, T.F.W., *Theoretical Petrology,* John Wiley and Sons Inc., 1962.
25. Cas. R.A.F., Allen, R.L., Bull, S.W., Clifford, B.A. and Wright, J.V., Subaqueous, rhyolitic dome-top cones: a model based on the Devonian Bunga Beds, southeastern Australia and a modern analogue, *Bull. Volcanol*. **52**:159–174, 1990.
26. De Rosen-Spence, A.F., Provost, G., Dimroth, E., Gochnauer, K. and Owen, V., Archean subaqueous felsic flows, Rouyn-Noranda, Quebec, Canada, and their Quaternary equivalents, *Precambrian Res*. **12**: 43–77, 1980.
27. Moore, J.G., Mechanisms of formation of pillow lava, *Amer. Jour. Sci.*, **63**:269–277, 1975.
28. Jones, J.G., Pillow lavas as depth indicators. *Amer. Jour. Sci*. **267**:181–195, 1969.
29. Bergh, S.G. and Sigvaldason, G.E., Pleistocene mass-flow deposits of basaltic hyaloclastite on a shallow submarine shelf, South Iceland, *Bull. Volcanol*. **53**:597–611, 1991.
30. Hanson, R.E. and Wilson, T.J., Large-scale rhyolite peperites (Jurassic, southern Chile), *Jour. Volcanol. Geotherm. Res*. **54**:247–264, 1993.
31. *Road Map of Turkey, 1:100,000,* Kummerly & Frey, Bern Edition, 1989.
32. Hunter, M.J., Is the pre-Flood / Flood boundary in the Earth's mantle? *CEN Tech. J*. **10**(3): 344-357, 1996.


Photo by Bill Crouse

*The north slope of Mount Ararat looking toward Ahora Gorge. Note the 'outward' dipping (? volcanic) stratification in the western wall (right side of photo) of the gorge. A small volcanic cone can be seen in the middle of the photo, probably related to the numerous small volcanic cones in the area. These probably formed during historically recorded post-Flood seismic and volcanic activity.*