Many arches and natural bridges likely from the Flood

Michael J. Oard

Freestanding rock arches and large natural bridges are observed to collapse today, such as Wall Arch in Arches National Park in early August 2008. The formation of large arches and natural bridges from slow weathering and erosion would take tens of thousand of years. However, the uniformitarian hypotheses for their origin are not observed. A rapid process of erosion in the past consistent with the Retreating Stage of the Flood is more likely.

One of the most photographed free standing arches in Arches National Park, Wall Arch, in southeast Utah, USA, collapsed sometime late Monday or early Tuesday of August 4th and 5th, 2008 (figure 1). No one reported seeing it collapse. The arch is located along the popular Devils Garden Trail and was more than 10 m (33 ft) tall and spanned 22 m (71 ft) across before collapse (figure 2). It was the 12th largest arch of the estimated 2,000 arches in Arches National Park. The collapse of such arches provides evidence that long free standing arches and many tall natural bridges likely formed rapidly during the Flood.

National Park Service photo

Figure 1. Location of Wall Arch after collapse.

National Park Service photo

Figure 2. Wall Arch before the collapse.

Rock arches

Arches come in all sizes. They range from Landscape Arch in Arches National Park, the longest in the world, with a span of 88 m (290 ft) to small holes. The large ones are high enough to contain the Capitol building in Washington D.C. The small holes are called windows in Bryce Canyon National Park (figure 3). Such windows could form rapidly by weathering of the soft strata.

Most free standing rock arches are believed to have formed *without stream erosion*. Although an arch is similar to a natural bridge, it differs from a natural bridge because it does not span a valley formed by erosion. Rock arches can be *on ridges or the sides of a ridge*.

Rock arches are believed to form slowly over long periods of time by physical and chemical weathering. Four

Figure 3. Windows in a 'fin', Bryce Canyon National Park from near Mossy Cave Trail.

steps are proposed: (1) uplift that causes deep vertical, parallel fractures to form; (2) weathering and erosion that enlarge fractures resulting in narrow walls or 'fins'; (3) continuing erosion with some fins breached from below; and (4) continued weathering that enlarges the holes and eventually causes the arch to collapse.[1]

It is assumed that it takes a long time to form an arch. Geologists estimate that it would have taken 70,000 years of water, frost and wind operating in a dry climate to form the isolated Delicate Arch in Arches National Park (figure 4).[1] Nearly all the arches in southeast Utah formed in only two specific sandstone formations in the area.[2]

Figure 4. Delicate Arch, Arches National Park. Uniformitarian geologists estimate that this arch took 70,000 years to form but rapid erosion by retreating floodwaters during Noah's Flood would have carved the arch quickly.

Natural bridges

Natural bridges were formed by running water and come in many sizes. Some of the largest and most impressive natural bridges in the world are located in southeast Utah. Natural Bridges National Monument boasts three of the ten largest natural bridges in the world and they are associated with White and Armstrong Canyons. Their names have changed with the political wind. Sipapu Natural Bridge is 67 m (220 ft) high and 82 m (268 ft) wide (figure 5). It is second in size only to Rainbow Bridge, located on Lake Powell in northern Arizona.[3]

One of the most famous is Natural Bridge, Virginia, about two miles east of Interstate 81 (figure 6). The opening under this natural bridge is about 60 m (200 ft) above Cedar Creek that flows underneath.[4] U.S. Highway 11 crosses the *top* of this natural bridge.

Cleland[5] classified many types of natural bridges on their presumed origin mechanism. One of the most common proposed mechanisms is the undercutting of the neck of a meander bend. Those in Natural Bridges National Monument likely formed this way. Another common mechanism is the undercutting of a weak layer beneath a resistant layer in a small eroding valley.[6] Sometimes the resistant 'layer' can be a petrified log. A third common type of natural bridge is formed by the solution and mechanical erosion of limestone. A natural bridge on the Boulder River, south of Big Timber, Montana, was formed by limestone dissolution.[7]

Assumed uniformitarian origin not observed

The origin of free standing arches (as opposed to windows) and the larger natural bridges is mysterious. The explanations in the literature assume slow processes of erosion over tens of thousands of years, according to the principle of uniformitarianism. The problem with that much time is that the bridge or arch should have *weathered and collapsed* long before the material around it was able to erode and leave behind an arch or natural bridge. Crickmay noted that natural bridges seem to defy uniformitarianism:

> 'What is remarkable about its [natural bridge] history is that, in all the time required for the stream currents to corrade downward and laterally through a vertical depth of from 10 to 12 or 60 m in resistant rock, the progress made by 'denudation' toward destroying the fragile-looking bridge appears to

Figure 5. Sipapu Natural Bridge, Natural Bridge National Monument, southeast Utah, USA.

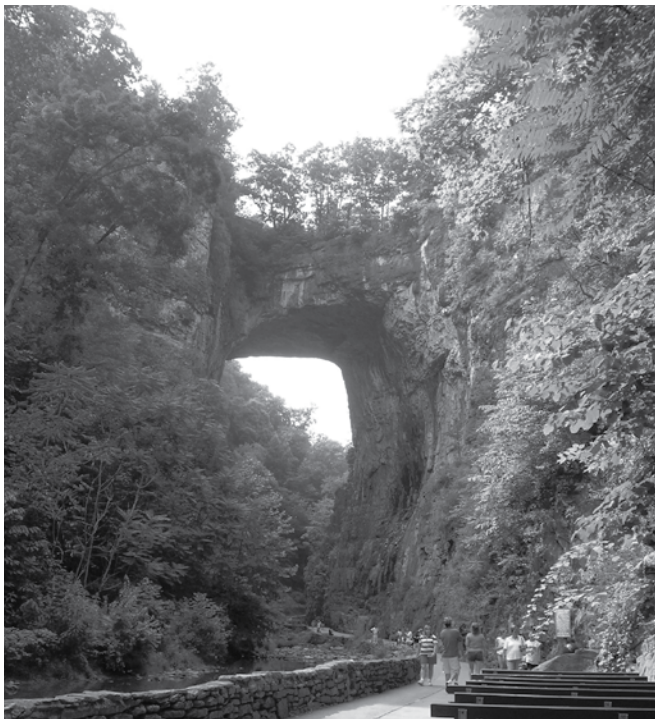

Figure 6. Natural Bridge, Virginia, USA.

> have been *virtually nil*—a discrepancy in rates of action that may exceed 100,000 to 1 [emphasis added].'[8]

Since natural bridges have streams or stream channels below them and arches do not, Crickmay's observation applies even more so to rock arches. Such a discrepancy in erosion makes little sense and implies *rapid formation* of most free standing rock arches and large natural bridges.

Some geologists suggest that the erosion of a less resistant rock underneath a more resistant rock causes the arches, but such a mechanism can account for few arches, at best.[9] Other hypothesized mechanisms are no more likely. Cruikshank and Aydin[10] summarized:

> 'There is no need to invoke reasons such as weak cement, unloading, or exfoliation to explain the presence of arches, especially when these processes act on similar rocks in nearby regions without producing the same abundance of arches.'

Cruikshank and Aydin[9] hypothesized that the majority of arches are caused by 'local enhancement of erosion by fracture concentration', which they have identified in many arches. Why was such an 'obvious mechanism' somehow missed by previous investigators? However, *no one has seen an arch form by this mechanism.*

Thus, long free-standing arches do not seem to be forming today in Arches National Park; in other words stage three and early four are not observed. And, like Wall Arch, we do observe late stage 4, their collapse. A portion of Landscape Arch in Arches National Park collapsed in the 1940s. Since 1991, three large slabs of sandstone measuring 9, 14 and 21 m long have been witnessed collapsing from the thinnest section of Landscape Arch. The longest arch in the world will likely be gone soon! The natural bridge across the Boulder River in Montana collapsed in 1989. In 1991, an arch off Point Campbell, western Victoria, Australia, collapsed.[11]

Since we observe the destruction of large freestanding arches and natural bridges, but not their formation, the origin of these features occurred in the past by processes not observed today, like so many aspects of geomorphology.[12] In other words, large freestanding arches and natural bridges are relic and likely formed by some mechanism in the past that caused quick erosion to specific locations. The Genesis Flood provides a likely mechanism for many of them.

A late-Flood mechanism

In the Flood paradigm, most of the *small* natural bridges and arches could have formed *after* the Flood by erosion. Since some of the small bridges are located in glaciated areas,[5,7] and since these natural bridges could not survive glaciation, they must have formed after the Ice Age. Furthermore, the suggested mechanisms for their formation are reasonable expectations of post-Flood weathering and erosion.

However, the *large* natural bridges and practically all the free standing arches require too much time to form in this manner during the post-Flood period. Erosion by normal weathering processes during the formation of large natural bridges and arches should have destroyed these features long before eroding down to their present levels. Large natural bridges and arches imply more rapid erosion—the type of erosion that would have occurred during the Retreating Stage of the Flood.[12,13] Arches would have formed during either the Sheet-flow or Channelized-flow Phase of the Retreating Stage, while natural bridges probably formed during the Channelized Phase.

Williams[4] attributed Natural Bridge, Virginia, to erosion during Flood runoff. Since the natural bridge is located in karst country with abundant caves, he concluded that this unusual feature represents a remnant of a collapsed cave with the debris from the collapse completely washed out of the area. Natural Tunnel in extreme southwest Virginia also provides evidence for Flood excavation in karst land, but in this case a larger section of the tunnel roof remained in place.[14]

The timing of arch and natural-bridge formation in the specialized conditions of the late-Flood period is especially compelling when we remember that large natural bridges and arches are not forming today. Arches are simply *assumed* to form by more rapid weathering at the base of a fin.[15] However, such differential erosion and arch formation is speculation:

> 'Arch formation cannot be due solely to weathering and erosion, however, because these processes are not restricted to the sites of arches in rock fins. There must be some factor that locally enhances the effects of erosion within a rather small part of a rock fin to produce an arch. How erosion is localized within a rock fin to form an arch is enigmatic.'[16]

Rivers and streams can be eliminated as potential agents of local arch formation, by definition of a rock arch. The arches in Arches National Park are preserved on an anticline—a ridge pushed up by a rising salt dome.[17]

Although the specialized conditions that might have formed arches and natural bridges were present in the late-Flood period, the process has not been observed and we must rely on inference. Rapid downcutting by floodwater during late Flood erosion, either over a high area or during the formation of an incised valley, could have undercut less resistant rock, breaking through underneath a more resistant layer. Or, possibly mechanical erosion from the floodwater was concentrated lower down on the rock surface, eventually cutting a hole. The bridges in Natural Bridges National Monument could have formed at the very end of the Flood when the last vestiges of the Flood were extremely channelized. The formation of Natural Bridge and Natural Tunnel, Virginia, by the rapid erosion of caves in limestone[18–21] followed by Flood erosion of the roof seems like a viable hypothesis. It could be that some of the uniformitarian suggestions, such as a different lithology, weaker cementing of the sand, and local fracture concentration, in combination with catastrophic flow during Flood runoff, caused the arches of Arches National Park and elsewhere.

References

1. Harris, A.G., Tuttle, E. and Tuttle, S.D., *Geology of National Parks*, 5th ed., Kendall/Hunt Publishing Co., Dubuque, IA, p. 83, 1990.
2. Blair Jr, R.W., Development of natural sandstone arches in south-eastern Utah; in: Gardiner, V. (Ed.), *International Geomorphology 1986*, Proceedings of the 1st International Conference on Geomorphology, Part II, pp. 597–604, 1986; p. 598.
3. Huntoon, J.E. *et al*., Geology of Natural Bridges National Monument, Utah; in: Sprinkel, D.A., Chidsey Jr, T.C. and Anderson, P.B. (Eds.), *Geology of Utah's Parks and Monuments*, Utah Geological Association Publication 28, 2nd ed., Salt Lake City, UT, pp. 232–249, 2003.
4. Williams, E.L., Natural Bridge, Virginia: origins speculations, *Creation Research Society Quarterly* **39**(2):101–105, 2002.
5. Cleland, H.F., North American natural bridges, with a discussion on their origin, *GSA Bulletin* **21**:313–338, 1910.
6. Barnett, V.H., Some small natural bridges in eastern Wyoming, *Journal of Geology* **20**:438–441, 1912.
7. Wentworth, C.K., Natural bridges and glaciation, *American Journal of Science* **26**(156):577–584, 1912.
8. Crickmay, C.H., Discovering a meaning in scenery, *Geological Magazine* **109**:171–177, 1972; p. 172.
9. Cruikshank, K.M. and Aydin, A., Role of fracture localization in arch formation, Arches National Park, Utah, *GSA Bulletin* **106**: 879–891, 1994.
10. Cruikshank and Aydin, ref. 9, p. 891.
11. Twidale, C.R., Some recently developed landforms: climatic implications, *Geomorphology* **19**:349–365, 1997.
12. Oard, M.J., *Flood by Design: Receding Water Shapes the Earth's Surface*, Master Books, Green Forest, AR, 2008.
13. Walker, T., 1994, A biblical geological model; in: Walsh, R.E. (Ed.), *Proceedings of the Third International Conference on Creationism*, Creation Science Fellowship, Pittsburgh, PA, pp. 581–592, 1994.
14. Williams, E.L., Natural Tunnel, Virginia: origin speculations, *Creation Research Society Quarterly* **39**(4):220–224, 2003.
15. Harris *et al.*, ref. 1, pp. 81–83.
16. Cruikshank and Aydin, ref. 9, p. 879.
17. Doelling, H.H., Geology of Arches National Park, Utah; in: Sprinkel, D.A., Chidsey Jr, T.C. and Anderson, P.B. (Eds.), *Geology of Utah's Parks and Monuments*, Utah Geological Association Publication 28, 2nd ed., Salt Lake City, UT, pp. 11–36, 2003.
18. Oard, M.J., Rapid cave formation by sulfuric acid dissolution, *Journal of Creation* (*CENTJ*) **12**(3):279–280, 1998.
19. Silvestru, E., The riddle of paleokarst solved, *Journal of Creation* (*TJ*) **15**(3):105–114, 2001; p. 109.
20. Silvestru, E., A hydrothermal model of rapid post-Flood karsting; in: Ivey Jr, R.L. (Ed.), *Proceedings of the Fifth International Conference on Creationism*, Creation Science Fellowship, Pittsburgh, PA, pp. 233–241, 2003.
21. Silvestru, E., *The Wonders of Creation: The Cave Book*, Master Books, Green Forest, AR, 2008.

Michael J. Oard has an M.S. in atmospheric science from the University of Washington and is now retired after working as a meteorologist with the US National Weather Service in Montana for 30 years. He is the author of the monographs *An Ice Age Caused by the Genesis Flood*, *Ancient Ice Ages or Gigantic Submarine Landslides?* and *Frozen in Time*. He serves on the board of the Creation Research Society.