Chapter 10

The Puzzle of Large Natural Bridges and Arches

Delicate natural bridges and rock arches are a type of erosional remnant that provides further evidence for rapid Flood erosion, but on a much smaller scale than those described in Chapter 9.[1] A natural bridge is an arch-like rock formation caused by erosion, especially by running water, and spans a watercourse, which now may be dry. Natural bridges are relatively rare, but there are probably more than 200 in North America alone.[2]

Natural Bridges

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. The natural bridges are associated with White and Armstrong Canyons. Their names have changed with the political wind. Sipapu Natural Bridge is 220 feet (67 m) high and 268 feet (82 m) wide (Figure 10.1). It is second in size only to Rainbow Bridge, near Lake Powell in northern Arizona.[3]

Figure 10.1. Sipapu Natural Bridge from the trail down to the bridge in Natural Bridge National Monument, Utah.

One of the most famous natural bridges is Natural Bridge, Virginia, about two miles east of Interstate 81 (Figure 10.2). The opening under the bridge is about 200 feet (60 m) above Cedar Creek.[4] U.S. Highway11 is built on this natural bridge.

Cleland classified many types of natural bridges on their presumed origin.[5] One of the most commonly proposed is undercutting the neck of a meander bend. The natural bridges in Natural Bridges National

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[1] Oard, M.J., 2009. Many arches and natural bridges likely from the Flood. *Journal of Creation* 23(1):115–118.

[2] Cleland, H.F., 1910. North American natural bridges, with a discussion on their origin. *GSA Bulletin* 21:314.

[3] Huntoon, J.E., J.D. Stanesco, R.F. Dubiel, and J. Dougan, 2003. Geology of Natural Bridges National Monument, Utah. In, Sprinkel, D.A., T.C. Chidsey, Jr., and P.B. Anderson (editors), *Geology of Utah's Parks and Monuments*, Utah Geological Association Publication 28, second edition, Salt Lake City, UT, pp. 232–249.

[4] Williams, E.L., 2002. Natural Bridge, Virginia: origins speculations. *Creation Research Society Quarterly* 39(2):101–105.

[5] Cleland, H.F., 1910. North American natural bridges, with a discussion on their origin. *GSA Bulletin* 21:313–338.

Monument most likely were 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 most common type of natural bridge is when a limestone formation is dissolved and eroded by water below the top. A natural bridge on the Boulder River, south of Big Timber, Montana, was formed by limestone dissolution.[7]

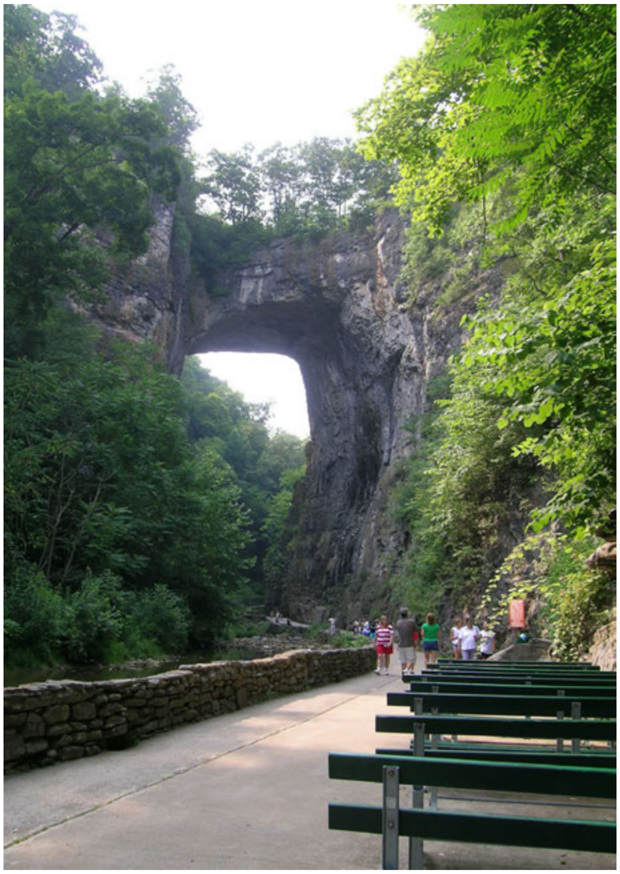

Figure 10.2. Natural Bridge, Virginia.

Rock Arches

A rock arch is believed to have formed by physical and chemical weathering over a long period of time 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 found *on ridges or the sides of a ridges or mountains*. Arches National Park, southeast Utah, has the greatest density of arches in the world—more than 700 of them, all different (Figure 10.3).[8,9] Canyonlands National Park, just to the southwest of Arches National Park, has 25 arches.[10] Some arches are just big enough to walk through while others could contain the dome of the capitol in Washington D.C. Arches National Park also exhibits a number of balanced rocks (Figure 10.4). Nearly all the arches in southeast Utah are found in only two specific sandstone formations in the area.[11] The arches in Arches National Park are preserved on an anticline—a ridge pushed up by a rising salt dome.

Rock arches are believed to form slowly over long periods of time by: (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

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6 Barnett, V.H., 1912. Some small natural bridges in eastern Wyoming. *Journal of Geology* 20:438–441.

7 Wentworth, C.K., 1933. Natural bridges and glaciation. *American Journal of Science* 26 (156):577-584.

8 Harris, A.G., E. Tuttle, and S.D. Tuttle, 1990. *Geology of National Parks*, fifth edition, Kendall/Hunt Publishing Co, Dubuque, IA, pp. 80–91.

9 Cruikshank, K.M. and A. Aydin, 1994. Role of fracture localization in arch formation, Arches National Park, UT. *GSA Bulletin* 106:879–891.

10 Harris, A.G., E. Tuttle, and S.D. Tuttle, 1990. *Geology of National Parks*, fifth edition, Kendall/Hunt Publishing Co, Dubuque, IA, p. 75.

11 Blair, Jr., R.W., 1986. Development of natural sandstone arches in south-eastern Utah. In, Gardiner, V. (editor), *International Geomorphology* 1986, Proceedings of the 1st International Conference on Geomorphology, Part II, p. 598.

breached from below; and (4) continued weathering that enlarges the holes that eventually cause the arch to collapse.[12] There is one major problem with this hypothesis and that is the *erosion and enlargement of the hole under the arch has never been observed*. In other words it is only hypothetic that arches are forming today.

Figure 10.3. Double Arch, Arches National Park, southeast Utah.

Figure 10.4. Balance Rock, Arches National Park, southeast Utah.

It is assumed that it takes a long time to form an arch. Geologists estimate that it would have taken 70,000 years for water, frost, and wind action operating in a dry climate to form the isolated Delicate Arch in Arches National Park (Figure 10.5).[12]

Assumed Uniformitarian Origin Not Observed

The origin of arches and the larger natural bridges is mysterious. The explanations in the literature assume slow processes of erosion over tens of thousands of years. The problem with that much time is that the bridge or arch should have *weathered and collapsed*

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[12] Harris, A.G., E. Tuttle, and S.D. Tuttle, 1990. *Geology of National Parks*, fifth edition, Kendall/Hunt Publishing Co, Dubuque, IA, p. 83.

Figure 10.5. Delicate Arch, Arches National Park, southeast Utah at sunset (from Wikipedia). One would not expect this arch to form over 70,000 years without the collapse of the top.

long before the material around it eroded, except for some small natural bridges (see below). C.H. Crickmay noted that natural bridges are easier to explain than arches:

> What is remarkable about its [natural bridge] history is that, in all the time required for the stream currents to corrode downward and laterally through a vertical depth of from 10 to 12 or 60 m [33 to 39 feet or 197 feet] in resistant rock, the progress made by 'denudation' toward destroying the fragile-looking bridge appears to have been *virtually nil*—a discrepancy in rates of action that may exceed 100,000 to 1 (brackets and emphasis mine). [13]

Such a discrepancy in erosion makes little sense and implies they were formed rapidly instead of over a long period of time.

Some geologists suggest that the erosion of a less resistant rock beneath a more resistant rock cut the arches, but this can account for only a few arches, at best.[9] The arches in Arches National Park are made of homogenous sandstone. Other hypothesized mechanisms are no more likely. Cruikshank and Aydin 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.[14]

They hypothesized that the majority of arches are caused by "local enhancement of erosion by fracture concentration," which they believe they have found in many arches. Such an "obvious mechanism" was somehow missed by previous investigators. Unfortunately, no one has *seen* an arch form by this mechanism. 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 pure speculation:

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[13] Crickmay, C.H., 1972. Discovering a meaning in scenery. *Geological Magazine* 109:172.

[14] Cruikshank and Aydin, Ref. 9, p. 891.

[15] Harris, A.G., E. Tuttle, and S.D. Tuttle, 1990. *Geology of National Parks*, fifth edition, Kendall/Hunt Publishing Co, Dubuque, IA, pp. 81–83.

Figure 10.6. Location (arrows) of former natural bridge across the Boulder River, south of Big Timber, Montana, that collapsed in 1989.

> 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]

We *do* observe natural bridges and arches being actively destroyed. A portion of Landscape Arch in Arches National Park collapsed in the 1940s. The natural bridge across the Boulder River in Montana collapsed in 1989 (Figure 10.6). This was one of those natural bridges that formed by the dissolution of limestone. In 1990, London Arch along the coast of Point Campbell National Park, western Victoria, Australia, collapsed.[17] Figure 10.7 shows the remnants of this collapsed sea arch. One of the most photographed freestanding arches in Arches National Park was Wall Arch, the 12th largest arch of the estimated 2,000 in the park (Figure 10.8). However, it collapsed during the night of August 4th and 5th, 2008 (Figure 10.9).

We observe the destruction of large freestanding arches and natural bridges, but not their formation. The origin of these features happened in the unobserved past, like so

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16 Cruikshank and Aydin, Ref. 9, p. 879.

17 Twidale, C.R., 1997a. Some recently developed landforms: climatic implications. *Geomorphology* 19:349–365.

Figure 10.7. The remnants of the collapse of London Bridge, a sea arch along the coast of Port Campbell National Park, western Victoria, Australia.

Figure 10.8. Wall Arch, Arches National Park, Utah, before it collapsed (from Wikipedia).

Figure 10.9. Wall Arch after it collapsed (from Wikipedia).

Figure 10.10. Windows in a "fin," from Red Canyon just west of Bryce Canyon National Park.

many aspects of geomorphology.18 Large freestanding arches and natural bridges are more likely formed by quick erosion in the past.

Small Natural Bridges Can Form after the Flood

Most of the *small* natural bridges could have formed *after* the Flood through erosion, especially when some of the small natural bridges are found in glaciated areas.[2,7] They could not have survived glaciation so they must have formed after the post-Flood Ice Age. Small arches, called windows, in Bryce Canyon National Park (Figure 10.10), are obviously a result of post-Flood weathering and erosion of soft rock. The suggested mechanisms for the formation of small natural bridges and arches are reasonable expectations of post-Flood erosion.

A Late Flood Mechanism for Large Natural Bridges and Arches

The large natural bridges and arches, on the other hand, require too much time to form during the short post-Flood period of about 4,500 years. Uniformitarian scientists postulate they would take tens of thousands of years to form. But weathering and erosion would work against the formation of these features, since this postulated long period of time would result in the collapse of large natural bridges and arches, if they could form. Furthermore, large natural bridges and arches are *not* forming today. So, the best way to explain these features is by rapid erosion not that long ago.

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[18] Oard, M.J., 2008. *Flood by Design: Receding Water Shapes the Earth's Surface*, Green Forest, AR.

Figure 10.11. Kolob Arch, northwest Zion National Park, Utah (from Wikipedia)

Figure 10.12. An alcove from Zion National Park.

The runoff of the Floodwater would provide a likely mechanism for the formation of large natural bridges and arches. Large natural bridges imply more rapid erosion in channels which would have occurred during the Channelized Flow Phase of the Flood. Arches could have formed by Flood erosion that first formed a small erosional remnant with subsequent greater erosion at the base of the remnant.

Kolob Arch in northwest Zion National Park (Figure 10.11) is probably an exception in that it likely formed after the Flood.[19,20] It is the second largest arch in the world, spanning 287 feet (87 m). Landscape Arch in Arches National Park is probably the largest arch at 290 feet (88m). Kolob Arch is different than other large arches in that it is eroded

[19] Manning, A., 2009. Arches and natural bridges. *Journal of Creation* 23(2):67–68.
[20] Oard, M.J., 2009. Arches and natural bridges: Michael Oard replies. *Journal of Creation* 23(2):68.

Figure 10.13. Crawford Arch, Zion National Park, as seen across the valley from the human history museum (courtesy of Tom Vail).

from an alcove (Figure 10.12) on a cliff face and is now separated from the cliff by only 44 feet (13 m). It is *not* freestanding like Delicate Arch. Kolob Arch could have formed late in the Flood, but it is more likely it was eroded after the Flood by sapping, the seeping of water through and out a crack, widening the crack with time. Most other large arches are now thin slices of rock that are freestanding, such as Crawford Arch (also called Bridge Mountain Arch) in southeast Zion National Park (Figure 10.13).

There is another mechanism to form natural bridges in limestone during the Flood. Caves in limestone would form rapidly late in the Flood,[21,22,23] and when the cave is close to the surface, the roof can collapse. Creation scientists, Dr. Emmett Williams, attributed Natural Bridge, Virginia, to erosion during Flood runoff.[24] Since, Natural Bridge is in an area that has an abundant amount of limestone caves, he concluded that the arch represents a remnant of a collapsed cave with the debris from the collapse completely washed out of the area by channelized Flood flow. Natural Tunnel in extreme southwest Virginia also provides evidence for Flood excavation in limestone, but in this case a larger section of the tunnel roof remained in place.[25]

[21] Oard, M.J., 1998. Rapid cave formation by sulfuric acid dissolution. *Journal of Creation* 12(3):279–280.

[22] Silvestru, E., 2001. The riddle of paleokarst solved. *Journal of Creation* 15(3):105–114

[23] Silvestru, E., 2003. A hydrothermal model of rapid post-Flood karsting. In, Ivey, Jr., R.L. (editor), *Proceedings of the Fifth International Conference on Creationism,* technical symposium sessions, Creation Science Fellowship, Pittsburgh, PA, pp. 233–241.

[24] Williams, E.L., 2002. Natural Bridge, Virginia: origins speculations. *Creation Research Society Quarterly* 39(2):101–105.

[25] Williams, E.L., 2003. Natural Tunnel, Virginia: origin Speculations. *Creation Research Society Quarterly* 39(4):220–224.