Part V

Tectonic Evidence

After showing sedimentary and fossil evidence, we now move on to tectonic evidence. One of the greatest challenges to the K/T Boundary Model, and much worse for the Precambrian and Late Paleozoic Boundary Models, is the tens of thousands of feet of differential vertical tectonics that took place all over the world during the Cenozoic. How could this happened after the Flood, especially when Psalm 104:8 says that the mountains rose and the valleys sank down to drain the Floodwater.

Then there is the problem that the place moved over a thousand miles during the Cenozoic, according to the plate tectonics paradigm. How would this occur when catastrophic plate tectonics ended with the Flood? Other spectacular tectonics took place during the Cenozoic, which also make such event impossible or nearly so after the Flood. These include the emplacement of ophiolites, the development of metamorphic core complexes, and the formation of ultrahigh-pressure minerals in which rock is forced down to around 125 miles (200 km) and back up quickly.

Chapter 18

Huge Cenozoic Vertical Tectonics

The Cenozoic is characterized by huge vertical tectonics, again assuming the geological column for sake of discussion. A number of examples will be briefly discussed, followed by their implications for the location of the Flood/post-Flood boundary.

The Rocky Mountains Uplifted about 40,000 Feet during the Cenozoic

Many of the mountain ranges that compose the 100 or so that make up the Rocky Mountains in the western U.S. have uplifted tens of thousands of feet relative to the same rock in the adjacent valleys or basins. It is likely the valleys and basins sank at the same time the mountains uplifted. During sinking, the valleys and basins filled with sediments up to thousands and in a few cases tens of thousands of feet thick (see Chapter 5) with the top subsequently eroding hundreds to thousands of feet (see Chapter 21).

In the state of Wyoming, at one time the granite upper crust was generally level (Figure 18.1).[1] This can be inferred from the spread of quartzite rocks several mountain ranges from their source in the western Rocky Mountains (see Chapter 24). The mountains must not have been a barrier at the beginning of the quartzite transport. In addition, the same sedimentary rocks that are found as erosional remnants on the tops of the mountains match the tilted sedimentary rocks at the edges of the adjacent basins. The tilted sedimentary rocks continue under the flat sedimentary rocks that lie in the middle of the basins. The fact that sediments are generally laid horizontally, indicates there was once a vast, generally flat upper crust composed of granite or gneiss.

So, if we compare the height of the granite and gneiss upper crust in the mountains versus the granite crust in the adjacent valleys or basins, we can determine the amount of uplift of the mountains relative to the valleys and basins.[2] Based on the altitude of granite and gneiss upper crust, it can be determined that the Beartooth Mountains rose 23,000 feet (7,000 m),[3] the Teton Mountains rose about 30,000 feet (9,150 m),[4] the Wind River Mountains were pushed up 46,000 feet (14,000 m) to the west on an overthrust,[5] and the Rawlins uplift rose 37,000 feet (11,300 m) with respect to the Hanna Basin.[6] So, the differential vertical tectonics in Wyoming is up to around 46,000 feet (14,000 m).[7]

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[1] Glass, G.B. and Blackstone, D.L., 1994. *Geology of Wyoming*. Information Pamphlet No. 2, The Geological Survey of Wyoming, Laramie, WY.

[2] http://michael.oards.net/Genesisfloodrunoff.htm.

[3] Wise, D.U., 2000. Laramide structures in basement and cover of the Beartooth uplift near Red Lodge, Montana. *AAPG Bulletin* 84 (3):360–375.

[4] Love, J.D., J.C. Reed, Jr., and K. L. Pierce, 2007. *Creation of the Teton Landscape: Geological Chronicle of Jackson Hole & the Teton Range* Grand Teton Association, Moose, WY.

[5] Steidtmann, J.R., L.T. Middleton, and M.W. Shuster. 1989. Post-Laramide (Oligocene) uplift in the Wind River Range, Wyoming. *Geology* 17:38–41.

[6] Otteman, A.S. and S.W. Snoke, 2005. Structural analysis of a Laramide, basement-involved, foreland fault zone, Rawlins uplift, south-central Wyoming. *Rocky Mountain Geology* 40(1):65–89.

[7] Love, J.D., 1960. Cenozoic sedimentation and crustal movement in Wyoming. *American Journal of Science* 258-A:204–214.

The Uinta Mountains of northeast Utah rose up about 40,000 feet (12,000 m).[8] Wallace Hansen summarizes:

> The upbuckling that produced the mountains was accompanied by comparable downbuckling under the basins. *As the mountains rose, the basins subsided*, so that deposits once near sea level throughout the region are now 12,000-13,000 feet high in the mountains but are as much as 30,000 feet below sea level beneath the Green River and Uinta Basins (emphasis mine).[9]

Hansen essentially quoted Psalm 104:8, very likely without realizing it. Figure 18.2 is a schematic summarizing the 40,000 feet (12,000 m) of differential vertical tectonics between the Uinta Range and the adjacent basins.

The majority of the Rocky Mountain uplift took place during the Cenozoic. The Teton Mountains are thought to have mostly risen in the past 5 million years. This would be near the beginning of the very late Cenozoic.[10]

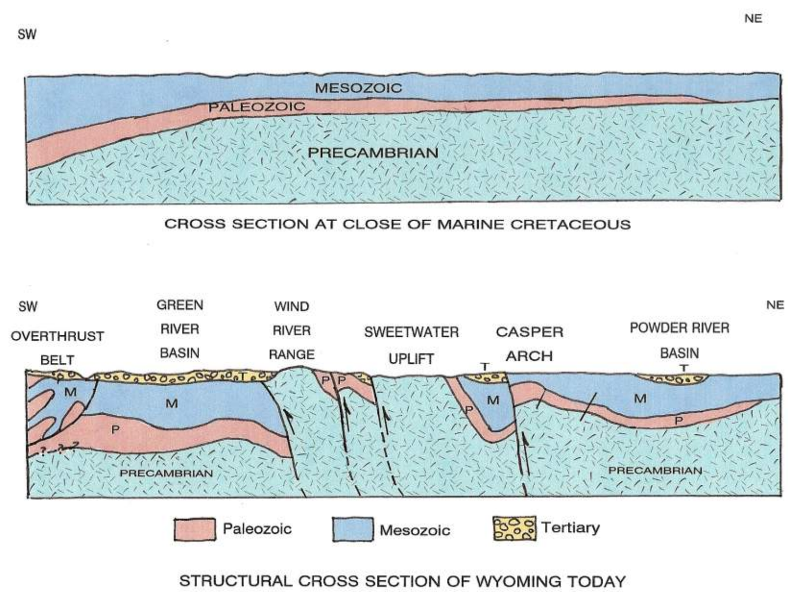

Figure 18.1. The uniformitarian view of the Precambrian granite and sedimentary rocks below Paleozoic and Mesozoic sedimentary rocks in Wyoming at the end of the Mesozoic and at present (redrawn by Mrs. Melanie Richard from Glass and Blackstone, 1994, p. 3).

Colorado Plateau Deformation Cenozoic

At first sight, the Colorado Plateau appears to be fairly flat, but in reality there is a fair amount of deformation that took place, especially in the Grand Canyon area. The deformation is similar to the Rocky Mountains but not as dramatic.[11] At the western edge of Grand Canyon, the Grand Wash Fault and the Colorado Plateau rose 10,000 feet (3,000 m) relative to the Basin and

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[8] Oard, M.J., 2012. The Uinta Mountains and the Flood Part I. Geology. *Creation Research Society Quarterly* 49(2):109–121.

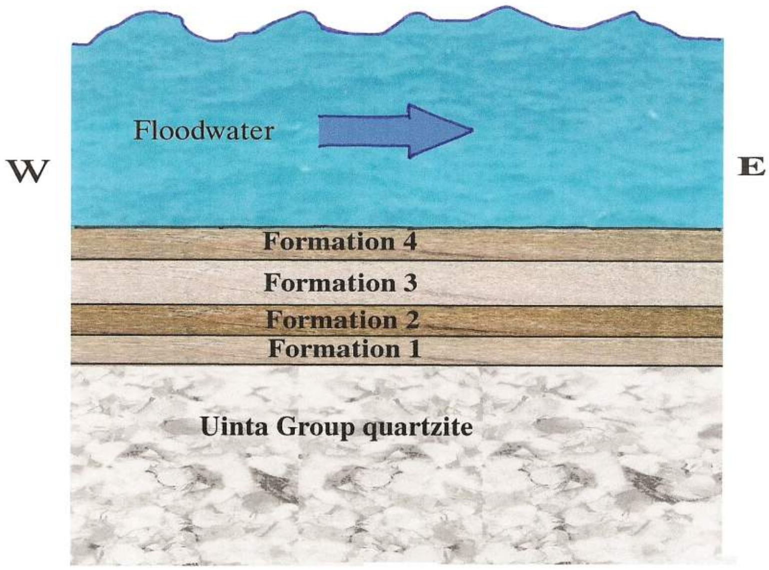
[9] Hansen, W., 2005. *The Geologic Story of the Uinta Mountains*, Falcon guide, Guilford, CN, p. 104.

[10] Love *et al.*, Ref. 4, p. 1.

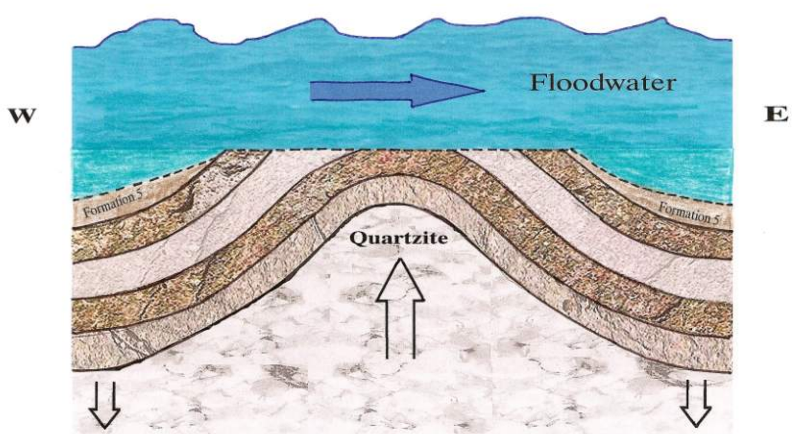
[11] Karlstorm, K.E. and J.M. Timmons, 2012. Faulting and uplift in the Grand Canyon region; in: Timmons, J.M. and K.E. Karlstrom (Eds.), *Grand Canyon Geology: Two Billion Years of Earth's History*, GSA Special Paper 489, Geological Society of America, Boulder, CO, pp. 93–107.

Range province to the west. The other faults in the Grand Canyon area resulted in up to 2,950 feet (900 m) of differential vertical tectonics in the late Cenozoic. Needless to say, this faulting would be accompanied by strong earthquakes.

(a)



(b)



(d)

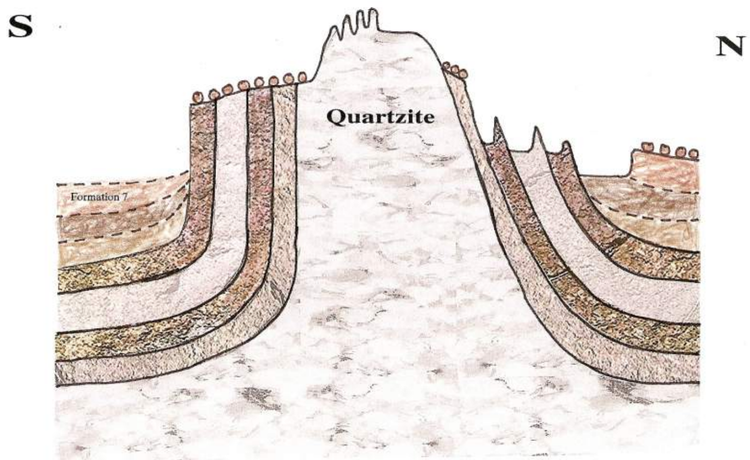


Figure 18.2. Schematic of differential vertical tectonics during the Flood for the Uinta Mountains and the adjacent basins (drawn by Mrs. Melanie Richard).

It can be shown that uplift similar to what happened in the Rocky Mountains of the U.S. was also happening globally during the Cenozoic. Several examples will be presented with a summary from Cliff Ollier and Colin Pain's book *The Origin of Mountains*.[12]

The Atlas Mountains of northwest Africa rise to a height of 13,671 feet (4,167 m) while some of the basins within and surrounding the Atlas Mountains have sunk by at least this same amount[13] in the late Cenozoic.[14]

The Mediterranean Sea basins, including the Pannonian basin of Romania and Hungary, developed mostly in the Cenozoic.[15,16] At the same time, the surrounding mountains uplifted, many of which were overthrusted away from the basins accompanied by much metamorphism.

The mountains of south-central Asia, including the Himalayas, the Tian Shan, and the Zagros Mountains, as well as the Tibetan Plateau, rose up tens of thousands of feet while surrounding basins sank tens of thousands of feet. During this time, severe erosion of the mountains deposited coarse gravel thousands of feet thick, and up to around ten thousand feet thick in spots. The deposits extend from the edge of the mountains and thin toward the center of the basins.[17] The

[12] Ollier C. and C. Pain, 2000. *The Origin of Mountains*, Routledge, London, U. K.

[13] Sébrier, M., L. Siame, E. M. Zouine, T. Winter, Y. Misserard, and P. Leturmy, 2006. Active tectonics in the Moroccan high Atlas. *C.R. Geoscience* 338:65–79.

[14] Babault, J., A. Teixell, M.L. Arboley, and M. Charroud, 2008. A Late Cenozoic age for long-wavelength surface uplift of the Atlas Mountains of Morocco. *Terra Nova* 20:102–107.

[15] Agostini, S., C. Doglioni, F. Innocenit, P. Manetti, and S. Tonarini, 2010. On the geodynamics of the Aegean rift. *Tectonophysics* 488:7–21.

[16] Faccenna, C., C. Piromallo, A. Crespo-Blanc, and L. Jolivet, 2004. Lateral slab deformation and the origin of the western Mediterranean arcs. *Tectonics* 23, TC1012, doi:10.1029/2002TC001488.

[17] Oard, M.J., 2011. Retreating Stage formation of gravel sheets in south-central Asia. *Journal of Creation* 25(3):68–73.

coarse gravel is generally rounded by water, and is sometimes composed of boulders larger than 6.5 feet (2 m) long. Gravel layers parallel to the mountains are sheet-like and hundreds of miles long. Figure 18.3 shows the sheet like gravels in the Sichuan Basin east of the Tibetan Plateau. The differential tectonics and the filling of the basins are dated as late Cenozoic.[18]

Figure 18.3. Thick gravel western Sichuan Basin, China, which is just east of the Tibetan Plateau (courtesy of Vern Bissell).

In southeast Asia, the Greater Caucasus Mountains have risen up to 18,510 feet (5,642 m) while the South Caspian Basin has subsided around 88,500 feet (27,000 m).[19,20] The Alborz Mountains in Iran wrap around the southern part of the basin and are believed to have uplifted a significant amount at the same time as the South Caspian Basin subsided.[21] Differential vertical tectonics of around 107,000 feet (32,600 m) took place in the Cenozoic: "The South Caspian

[18] Donnelly, T.W., 1982. Worldwide continental denudation and climatic deterioration during the late Tertiary: evidence from deep-sea sediments. *Geology* 10:451–454.
[19] Knapp, C.C., J.H. Knapp, and J.A. Connor, 2004. Crustal-scale structure of the South Caspian Basin revealed by deep seismic reflection profiling. *Marine and Petroleum Geology* 21:1,073–1,081.
[20] Nadirov, R.S., E. Bagirov, M. Tagiyev, I. and Lerche, I., 1997. Flexural plate subsidence, sedimentation rates, and structural development of the super-deep South Caspian Basin. *Marine and Petroleum Geology* 14:383–400.
[21] Axen, G.J., P.S. Lam, M. Grove, and D.F. Stockli, 2001. Exhumation of the west-central Alborz Mountains, Iran, Caspian subsidence, and collision-related tectonics. *Geology* 29:559–562.

basin evolved adjacent to the rapidly uplifting Greater Caucasus Mountains since the Paleogene [early Cenozoic]…”[22]

Ollier and Pain stated that the major uplift of nearly *all* the mountains of the world happened in the last several million years, the late Cenozoic.[12] The basins and valleys sank at the same time.

How Can Such Stupendous Vertical Tectonics Occur Worldwide after the Flood?

Creationists who believe the Cenozoic or even late Cenozoic is post-Flood place dramatic, unique, worldwide tectonic activity and powerful water erosion of the mountains and deposition in the adjacent valleys and basins *after* the Flood. The Cenozoic was a very violent time. How would the people and animals that left the Ark survive, let alone multiply and repopulate the earth?

[22] Knapp *et al.*, Ref. 19, p. 1,073.