Chapter 5

Mountains Rise and Valleys Sink: Geology Demonstrates Psalm 104:8

Is there any geological evidence that at the end of the Flood the mountains rose and the valleys sank draining the Floodwater? It might surprise the reader to know that the evidence for Psalm 104:8 is a sound inference from geomorphology for the whole world.

Differential Vertical Tectonics Ubiquitous on the Continents

Evolutionary geomorphologist and world traveler, Lester King writes that differential vertical tectonics is a *worldwide phenomenon*:

> So the fundamental tectonic mechanisms of global geology are vertical, up or down: and the normal and most general tectonic structures in the crust are also vertically disposed ... But one must bear in mind that every part of the globe—on the continents or in the ocean basins—provides direct geological evidence that formerly it stood at different levels, up or down, and that it is subject to in situ vertical displacements.[1]

Notice King's choice of adjectives. The uplift of mountains and the sinking of basins are *fundamental* tectonic mechanisms of *global* geology, based on observations on both the continents and ocean bottoms. These up or down tectonic deductions are *normal and most general*, and the geological evidence is *direct* all over the Earth.

One example is the Himalayan Mountains adjacent to the Ganges Plain of India. The Himalayas are uplifted mountains, while the Ganges Plain, just south of the Himalaya Mountains, represents a deep, downdropped valley, filled with sedimentary rocks. You may not realize the true depth of the crustal subsidence in a valley or basin, if that valley or basin has been filled with sediments (since hardened to sedimentary rocks). But the depth can usually be calculated by seismic methods. So, it is important to know the *depth* of the crustal rocks in a valley or basin.

King is not the only scientist to deduce that differential vertical tectonics accounts for the shape of the Earth's surface. In northeast Tibet, Fothergill and Ma noted that mountains were uplifted while valleys sank after regional erosion surfaces formed in the "late Cenozoic" in the uniformitarian timescale (see the in-depth section for information on this timescale and the geological column at the end of the chapter). The late Cenozoic is at the very young end of the uniformitarian timescale.[2] In extensive carbonate regions of China, Yaoru stated: "Structural lifting and upwarping have always been accompanied

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[1] King, L.C., 1983. *Wandering Continents and Spreading Sea Floors on an Expanding Earth*, John Wiley and Sons, New York, NY, pp. 16, 71.

[2] Fothergill, P.A. and H. Ma, 1999. Preliminary observations on the geomorphic evolution of the Guide Basin, Qinghai Province, China: implications for the uplift of the northeast margin of the Tibetan Plateau. In, Smith, B.J, W.B. Whalley, and P.A. Warke (editors), *Uplift, Erosion and Stability: Perspectives on Long-Term Landscape Development*, Geological Society Special Publication No. 162, The Geological Society of London, London, U. K., p. 197.

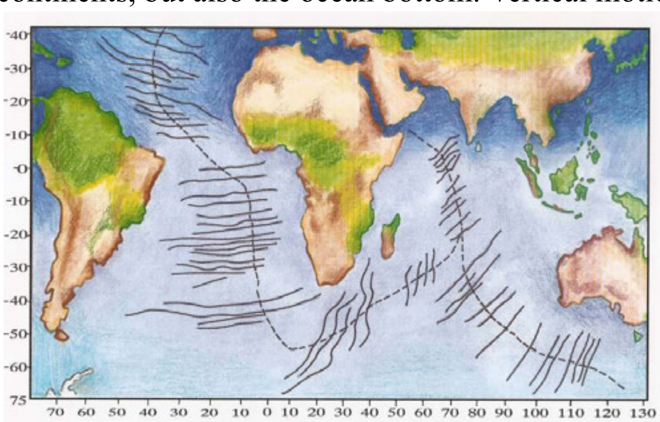
by subsidence, and the mountains or plateaux are usually therefore adjacent to basins or subsided plains."[3] The Uinta Mountains uplifted over 40,000 feet (12 km) relative to the sinking Green River Basin to the north and the Uinta Basin to the south (see Figure 4.3):

> 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).[4]

The uniformitarian author of this quote essentially quoted Psalm 104:8 to describe the differential vertical motions of the Uinta Mountains with respect to its adjacent basins. Similar differential vertical tectonics is obvious in Wyoming, as will be shown in the next chapter. It is amazing how much support there is for Psalm 104:8!

Small-Scale Tectonics on the Ocean Bottom

As King mentioned, differential vertical tectonics is a solid deduction not only for the continents, but also the ocean bottom. Vertical motions may be demonstrated by fracture zones, abyssal hills, and other features. Fracture zones, some of which are almost ocean wide, are tectonic features that are generally perpendicular to mid-ocean ridges (Figure 5.1). There are dozens of major fracture zones. They are usually marked by downdropped valleys and uplifted cliffs, called escarpments, that show differential vertical tectonics of thousands of feet [5]



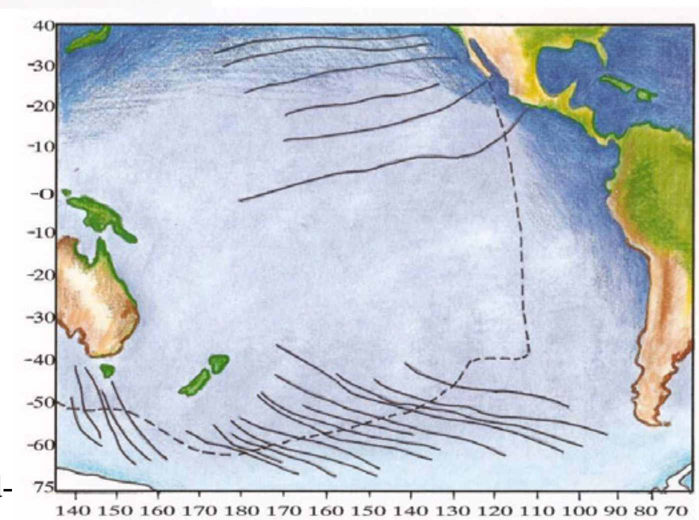


Figure 5.1. Fracture zones (solid lines) and mid-ocean ridges (dashed lines) in a) the Pacific Ocean and in b) the Atlantic and Indian Oceans (drawn by Mrs. Melanie Richard).

Most people see maps of the deep ocean basins and the bottom is generally flat. But the deep ocean bottom is covered by sediments, mostly originating from the continents. Sediments have mostly covered up the evidence for differential vertical tectonics. But below the sed-

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[3] Yaoru, L., 1986. Karst geomorphological mechanisms and types in China. In, Gradiner, V. (editor), *International Geomorphology*, part II, John Wiley & Sons, New York, NY, p. 1,079.

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

[5] Kennett, J., 1982. *Marine Geology*, Prentice-Hall, Englewood Cliffs, New Jersey, p. 36.

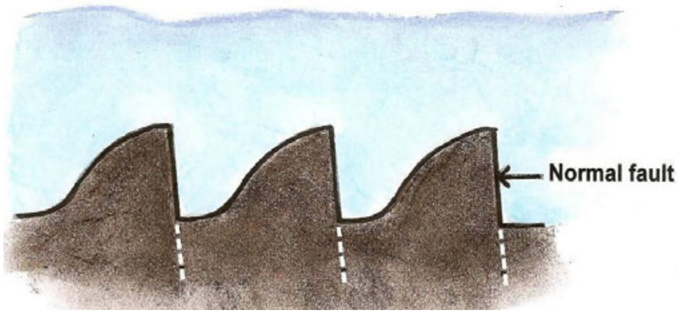

Figure 5.2. The most likely explanation for the formation of abyssal hills by normal faulting (from Macdonald et al., 1996, p. 125 and redrawn by Mrs. Melanie Richard).

iments of the deep ocean basins and on the flanks of the mid-ocean ridges, abyssal hills covered with generally thin sediments, are very common. Abyssal hills are long, narrow ridges typically 6 to 12 miles (10 to 20 km) long, 1 to 3 miles (2 to 5 km) wide, and 150 to 1,000 feet (50 to 300 m) or more high (Figure 5.2).[6] Some abyssal hills can be much longer and higher.[7] These hills are orientated approximately parallel to the mid-ocean ridges and most importantly for this discussion are *fault-bounded uplifts adjacent to downdropped troughs*, similar to the example of the Beartooth Mountains and the adjacent Bighorn Basin described in the next chapter, but the differential vertical tectonics is on a smaller scale (see Figure 6.7). Abyssal hills cover practically all the ocean floor.[8,9] Macdonald and colleagues state, "…abyssal hills are nevertheless the most abundant geomorphic structures on Earth."[10]

The Timing of Differential Vertical Tectonics

Although uniformitarian geologists claim that there have been many uplifts and a wearing down of mountains over geological time, they contend most of the current mountains rose *recently*. Cliff Ollier and Colin Pain stated in their book *The Origin of Mountains* that the major uplift of nearly *all* the mountains of the world occurred in the last several million years of geological time, the late Cenozoic (see the geological column and timescale below).[11] This is comparable to the last 5 hours, if the uniformitarian timescale represented a year. Translated into the Flood paradigm, mountain uplift was clearly among the *last* major geological events when the floodwater drained off of the continents.

Although such differential vertical tectonics is a ubiquitous feature of the Retreating Stage of the Flood, it is not expected that all tectonics occurred only after Day 150. Huge vertical tectonics would also have occurred before Day 150, which in some locations would also be accompanied by sinking areas. The fountains of the great deep bursting open and meteorite or comet impacts must have occurred at the same time early in the Flood to cause tremendous tectonics.

Geological Column and Timescale (in-depth section)

Secular scientists since the Enlightenment have marked "history" as a regular linear progression without reference to the Bible. They named this the geological column or geological timescale (Figure 5.3).

[6] Macdonald, K.C., P.J. Fox, R.T. Alexander, R. Pockalny, and P. Gente, 1996. Volcanic growth faults and the origin of Pacific abyssal hills. *Nature* 380:125–129.

[7] Menard, H.W. and J. Mammerickx, 1967. Abyssal hills, magnetic anomalies and the East Pacific Rise. *Earth and Planetary Science Letters* 2:465–472.

[8] Goff, J.A., W.H.F. Smith, and K.M. Marks, 2004. The contributions of Abyssal Hill morphology and noise to altimetric gravity fabric. *Oceanography* 17(1):24–37.

[9] Kennett, Ref. 5, p. 38.

[10] Macdonald *et al*., Ref. 6, p. 125.

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

geological timescale (Figure 5.3)

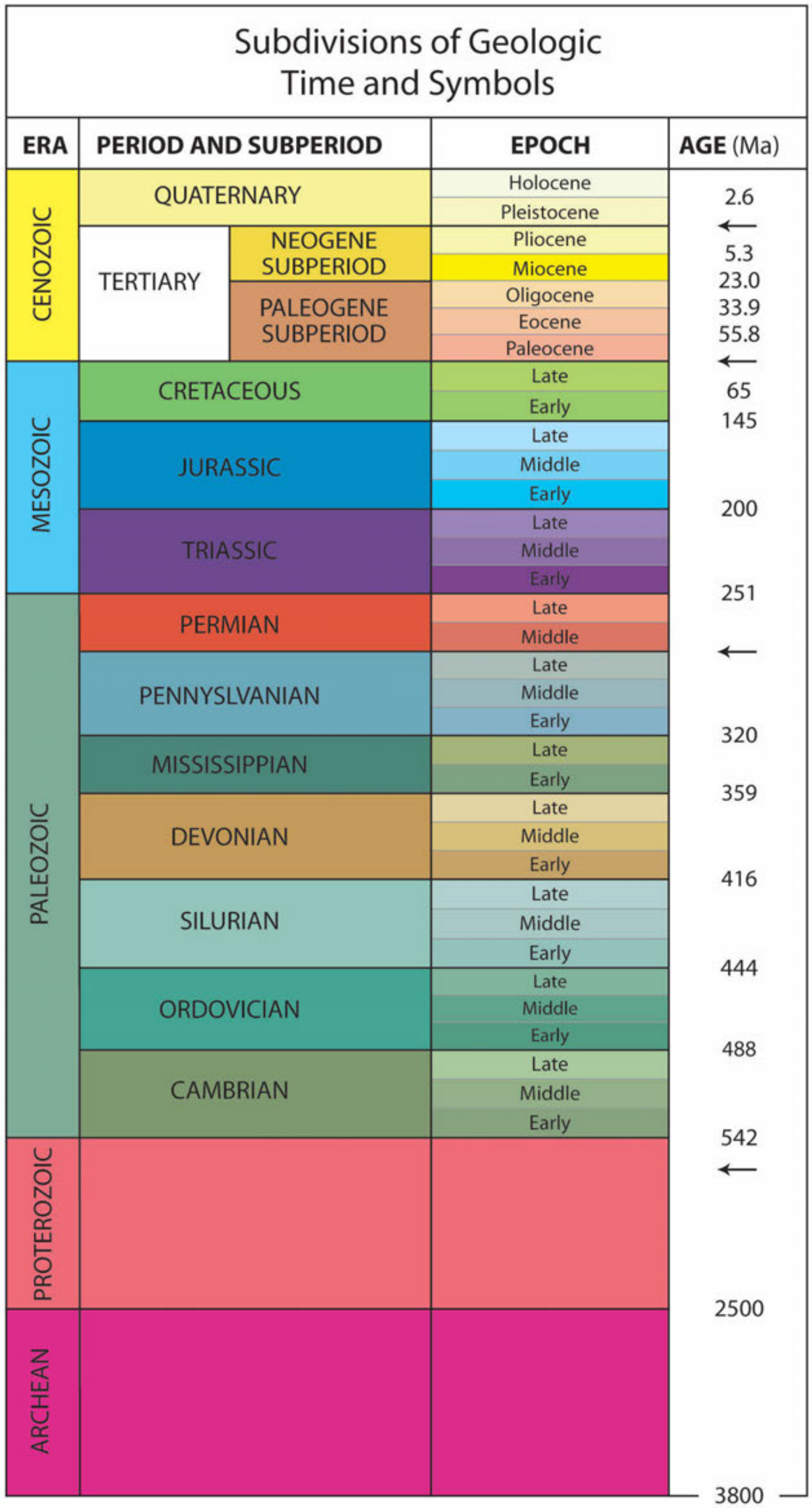

Figure 5.3. The geological column and timescale from the late Archean until the present showing the eras, periods, subperiods, and epochs of evolutionary/uniformitarian earth history. The ages in millions of years are shown on the right. The horizontal arrows on the right show the four main locations for the Flood/post-Flood boundary believed by creationists.

The geological column applies only to the Earth and not to the Universe; so it ignores the origin of the cosmos and the Solar System and picks up after Earth's formation as a new planet, over 4.5 billion years ago in the uniformitarian timescale. This timescale consists of a complex hierarchy of eons, eras, periods, stages, etc. (left side of Figure 5.3) that are assigned absolute ages, shown on the right of the figure. While the most detail is found in the subdivisions of the Phanerozoic eon (the last 542 million years), the vast majority of the time, nearly 90%, is found in the Precambrian, which is further subdivided chronologically into the Hadean, Archean, and Proterozoic eons. The period between 4.5 and 3.8 billion years, which includes the Hadean and early Archean is not shown.

The Phanerozoic includes all of the time younger than the Proterozoic, and has been divided up into the Paleozoic (old life), Mesozoic (middle life), and Cenozoic (young life) eras. The base of the Phanerozoic marks a dramatic increase in the quantity and variety of fossils (called the Cambrian explosion), and is assigned an age of 542 million years before the present. At the other end is the Cenozoic, which is divided into the Paleogene and Neogene periods or the Tertiary and Quaternary, depending on whether one accepts the European or American convention, respectively. The Tertiary covers most of the Cenozoic, leaving only the last 2 million years or so for the Quaternary, the general time of the Ice Age. This reflects a bias towards North America since the Quaternary in many places shows no evidence of glaciation. The Quaternary period is further subdivided into two epochs: (1) the Pleistocene, which is the supposed time of the Ice Age, and (2) the last 10,000 years since the last retreat of the continental glaciers, called the Holocene.