Chapter 24

# Long-Distance, Transported Hard Rocks

Erosion from a global flood would affect rocks of every hardness. Soft rocks, like shale, would be easily pulverized within a short distance. Harder rocks, like quartzite, would not be pulverized as quickly and could be transported long distances, then deposited when and where the currents slowed. Another option would be hard to medium-hard rocks would be eroded and amass close to their origin as the mountain ranges were uplifted. Examples of both types will be presented and the implications of transported rocks for the Flood/post-Flood boundary will be discussed.

*Figure 24.1. Boulder with numerous percussion marks found along the edge of the Stillaguamish River along with other quartzite rocks from the Puget Sound area, Washington.*

## Quartzite Rocks Transported up to 800 Miles in the Northwest U.S. and Adjacent Canada

Quartzite is one of the hardest rocks in the world; it is certainly the hardest rock in the northern Rocky Mountains of the United States. It mostly outcrops in the western Rocky Mountains of northern and central Idaho and extreme western Montana. The thick bedded quartzite outcrops have been eroded by water, rounded into cobbles and boulders, and somehow spread in some cases far from the mountains.[1,2] Many quartzites have percussion marks (semicircular, shallow cracks) and indicate they experienced ferocious pounding during transport.[3] Percussion marks are rarely if ever imprinted today on quartzite.

West of the continental divide, quartzite is found to have been transported to the Pacific Ocean, about 400 miles (640 km) from their nearest source. They are found in the Vancouver, Canada area and the Puget Sound area mixed with glacial debris. They spread to these areas before glaciation. The glaciers then picked up the rounded rocks and mixed them with the glacial debris. Even with glacial action, a few rocks still maintain their percussion marks (Figure 24.1). Interestingly, rounded cobbles and boulders have been found on top of the Wallowa Mountains of northeast Oregon (Figure 24.2), the Blue Mountains of central and northeast Oregon, and on the ridges of the basalt uplifts in the Yakima area.

*Figure 24.2. Polished quartzite boulder weighing about 440 pounds (200 kg) from southeast of Lookout Mountain, 8,200 feet (2,500 m) above msl, Wallowa Mountains of northeast Oregon (photograph by Paul Kollas with my youngest son, Nathan, as scale).*

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[1] Oard, M.J., 2013. *Earth's Surface Shaped by Genesis Flood Runoff*. http://michael.oards.net/GenesisFloodRunoff.htm.

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

[3] Love, J.D., Reed, Jr., J.C., and pierce, K.L., 2007. *Creation of the Teton Landscape: A Geological Chronicle of Jackson Hole & the Teton Range*, Grand Teton Association, Moose, WY, p. 59.

Quartzites are abundant in southwest Montana, northwest Wyoming, and adjacent Idaho. They spread into the Bighorn, northwest Wind River, and the southwest Powder River Basins of Wyoming, over 400 miles (640 km) from their nearest source in central Idaho, several mountain ranges from their source. Quartzites are also found on top of the Teton Mountains of northwest Wyoming and the Gravelly Range of southwest Montana indicating mountain building carried them to the tops of mountains after they were dispersed. Quartzites were amassed in large paleovalleys or basins, up to 15,000 feet (4,575 m) deep. The valleys must have sunk to accommodate all the cobbles and boulders. These areas were subsequently deformed and greatly eroded,[4] so that cobbles and boulders with pressure solution marks (Figure 24.3) and fractures were transported even farther east.

*Figure 24.3. Pressure solution marks on an iron stained quartzite with the lens cap from on top of Red Mountain, northern Teton Mountains, Wyoming. Note the vitreous texture of quartzite (the two fractured rocks to the right of the lens cap). The angular rocks are limestone that make up the top layer of the mountain.*

Quartzite is abundant on the four planation surfaces of the High Plains in northern Montana east of the divide and in adjacent Canada, They are often found on plateaus, as in the quartzite capped Cypress Hills planation surface. It lies up to 2,500 feet (760 m) above the rivers to the

[4] Love, J.D., 1973. Harebell Formation (Upper Cretaceous) and Pinyon Conglomerate (Uppermost Cretaceous and Paleocene), Northwestern Wyoming, *U.S. Geological Survey Professional Paper* 734-A, U.S. Government Printing Office, Washington, D.C.

north and south. Quartzite rocks have been widely eroded in glaciated areas and mixed with glacial debris. Deposits of quartzite cobbles are found below glacial debris in southern and central Saskatchewan, southwest Manitoba, and north-central North Dakota. These locations represent a total transport of about 800 miles (1,280 km) from their nearest source, likely from central Idaho. Quartzite has been transported from west of the continental divide to east of the continental divide, across the eastern Rocky Mountains. This makes it impossible to imagine they were transported by normal rivers.

**Cobble and Boulder Transported from Other Mountain Ranges in the U.S.**

Other areas of North America display cobbles and boulders transported by water as well. They include quartzites and other exotic rocks in the Rim Gravel found on top the Mogollon Rim in central and northern Arizona, on the southwest edge of the Colorado Plateau.[5] The Mogollon Rim is a generally northwest-southeast escarpment that extends from northwest Arizona into east-central Arizona. It is on the edge of a broad plateau-like feature that is the highest area in the region. The closest source for quartzite and other igneous and metamorphic exotic rocks of the Rim Gravel is around the Prescott, Arizona, area, about 50 miles (80 km) to the south. But there are also source rocks in mountains farther south.

*Figure 24.4. Outcrop of Ogallala Group gravel along Highway 23 above Smokey Hill River in northwest Kansas.*

Not only has quartzite gravel spread by water over the northern High Plains of the United States, but also over the southern and central High Plains. There it is called the Ogallala gravel

[5] Oard, M.J. and P. Klevberg, 2005. Deposits remaining from the Genesis Flood: Rim Gravels in Arizona. *Creation Research Society Quarterly* 42(1):1–17.

(Figure 24.4) and is significantly different from the gravel found farther north. Remnants of cobbles and boulders of the Ogallala gravel are found in central Texas, generally on top of higher areas, such as inter-stream divides. This gravel has been called the Uvalde gravel but is really an eastern extension of the Ogallala gravel. It is *not* associated with well-developed river terraces. The gravel near Uvalde is found 400 to 1,000 feet (120 to 300 m) above the Rio Grande River.[6] It is about 75 feet (23 m) thick at one location. The fact that the gravel is above the river indicates significant channelized erosion happened *after* deposition. Some of it has been reworked into the river valleys and onto terraces. Based on the inter-stream ridge outcrops in central Texas, the Ogallala gravel has moved about 500 miles (800 km) from its nearest source in central New Mexico.

*Figure 24.5. The Nenana Gravel about 3 miles (5 km) north of Healy, Alaska. Note the rounded rocks (Hank Giesecke for scale).*

The Alaska Range is an arc-shaped, generally east-west mountain range 600 miles (965 km) long in southern Alaska that merges with the Wrangell and St. Elias Mountains on the southeast and the Aleutian Range on the southwest. The Nenana Gravel is composed of a wide variety of rock types and spread north from the Alaska Range where it was piled up to about 3,935 feet

[6] Byrd, C.L., 1971. Origin and history of the Uvalde Gravel of Central Texas. *Baylor Geological Studies Bulletin No. 20*, Baylor University Department of Geology, Waco, TX.

(1,200 m) thick just east of Healy, Alaska (Figure 24.5).[7] It spread much farther north than its outcrops, evidenced by its discovery in drill holes. The quartzites are found below the thick surface deposits of the Tanana River Valley of central Alaska.

Gravel and cobbles spread east, south, and west of the Appalachian Mountains as well.[8] These generally are called the Lafayette Gravel. They are commonly seen as erosional remnants on the highest terrain, 200 to 400 feet (60 to 120 m) above present streams, except when it is found below the surface in Florida.[9] The distance of transport west was about 500 miles (800 km) into western Kentucky (Figure 24.6) from the Blue Ridge Mountains, where some of the gravel originated. The Florida quartzites were derived from the Appalachians, more than 625 miles (1,000 km) away.

*Figure 24.6. The Lafayette Gravel in the Milby pit, western Kentucky. Except for a surficial layer, the in-situ gravel extends from top to bottom of the pit with the lower gravel obscured with talus.*

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[7] Oard, M.J., 2008. Long-distance Flood transport of the Nenana Gravel of Alaska – similar to other gravels in the United States. *Creation Research Society Quarterly* 44(4):264–278.

[8] Oard, M.J., 2011. Origin of Appalachian geomorphology Part II: formation of surficial erosion surfaces. *Creation Research Society Quarterly* 48(2):105–122.

[9] Froede Jr., C.R., 2006. Neogene sand-to-pebble size siliciclastic sediments on the Florida Peninsula: sedimentary evidence in support of the Genesis Flood. *Creation Research Society Quarterly* 42(4):229–240.

## Cobbles and Boulders Pile up Deeply along the South-Central Asian Mountains

I expect cobbles and boulders that were transported long distances can be found around most mountain ranges of the world. I have investigated only one other location, from the scientific literature, and that is the mountains and basins of south-central Asia, including the Himalaya, Tian Shan, and Zagros, as well as the Tibetan Plateau.[10] The conglomerate can be over 6,000 feet (several thousand m) thick and form a sheet hundreds, and even thousands, of miles long parallel to the mountain front or plateau. One section adjacent to the western Himalaya Mountains is 11,150 feet (3,400 m) thick. The gravel thins away from the mountains towards the center of the surrounding basins.

## Hard Rock Transport Puts the Flood/Post-Flood Boundary in the Late Cenozoic

The implication of the transport of hard rocks away from their sources is straightforward. The vast majority of cobble and boulder transport occurred in the Cenozoic, mostly the mid to late Cenozoic. The only exception is the thick conglomerates of northwest Wyoming, where dinosaur footprints and remains were found. This automatically placed some of this gravel into the very late Cretaceous. The thick piles of gravel and boulders around the south central mountains of Asia accumulated during the late Cenozoic.

It is difficult, if not impossible, for uniformitarian scientists to account for the transportation and deposition of cobbles and boulders but is as predicted by a global flood. The cobbles and boulders would have been transported during the Retreating Stage of the Flood when the mountains uplifted and the valleys sank down (Psalm 104:8) to drain the Floodwater. The water rushing off the mountains that were rising out of the Floodwater would carry the hard rocks long distances and occasionally, cause them to amass into thick deposits.

But what mechanism could be employed for the long distance transport, spread, and deposition of quartzites after the Flood? Water would have to be moving as a sheet off most, if not all, the uplifting mountains of the world since the cobbles and boulders accumulated as a sheet. What post-Flood catastrophes are going to make flood water flow over the mountains and erode thousands of feet of rock? It is obvious this must be placed during Flood runoff and not afterwards, especially since the majority of the transport occurred during the mid and late Cenozoic. This once again places the Flood/post-Flood boundary in the late Cenozoic, and in many locations the very late Cenozoic.

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