

### OBSIDIAN CLIFF

Obsidian Cliff, 11 miles south of Mammoth Hot Springs, is at the northern end of Beaver Lake in Yellowstone National Park. The cliff forms the eastern wall of a narrow cut in plateau country. At an elevation of nearly 7,400 feet above sea level, the cliff extends for a half mile, rising from 150 to 200 feet above Obsidian Creek and falling gradually away to the north. The upper half is a vertical face of rock; the lower half is composed of loose and broken rocks forming a talus slope. The cliff is the remainder of a flow of lava that erupted onto the earth's surface and then poured down the plateau.

Obsidian forms when lava cools so quickly that crystals do not have time to form and grow. Because obsidian is usually found as small globes in other rocks, a massive outcrop the size of Obsidian Cliff is quite rare. Obsidian Cliff possibly formed when molten rock (magma) erupted onto the earth's surface and came into contact with the ice of a glacier. This quick cooling of large amounts of magma prevented the growth of crystals. Also, chemical analyses of the obsidian show that there was very little water in the lava. Without water, crystals could not form, thereby resulting in glassy rock. On close observation, one can see the swirling flow in the rock that shows the last movement of the liquid magma before it cooled and hardened.

Found on the southern face of the cliff are a series of columns which commonly occur in rocks of volcanic origin. Columnar jointing, as this formation is called, is another result of the rapid cooling of magma. The liquid rock shrinks inward, cracks, and contracts as it cools to form these four-to-six sided columns.

For centuries, Native Americans made their arrowheads and spear points from obsidian. The rock itself is dark and glassy in appearance (black in this case), and, when broken, fractures into rounded pieces with sharp edges. Arrowheads from as far away as the Midwest have had their origin traced back to Obsidian Cliff in Yellowstone. This indicates that the quality of obsidian found here was great enough for it to spread long distances in its use among various Indian tribes.