

Pipestone

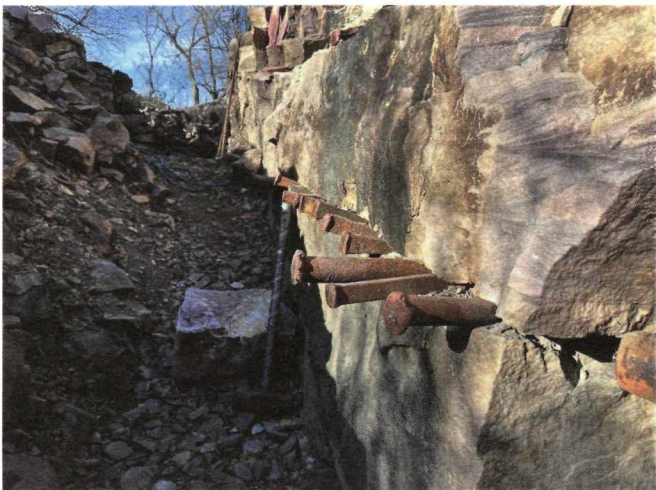
National Monument
Minnesota

National Park Service
U.S. Department of the Interior



Quarrying

Quarrying pipestone is a slow and difficult task that requires a vast amount of knowledge, experience, and time. In addition to this, hand tools such as sledgehammers, pry bars, chisels, wedges, shovels, and picks are the only tools that can be used because explosives and heavy machinery would shatter the precious stone. Quarrying may take weeks or even years depending on the number of quarriers and the depth of the quarry pit. There are several steps involved, but the hardest and most daunting task involves removing the thick layers of Sioux Quartzite which covers the softer pipestone.



Wedges placed in the quartzite wall of a pit

The Quartzite Layer

The Sioux Quartzite consists of 3 to 4 thick layers. Quarriers place wedges into the cracks in these layers and use sledgehammers to drive them in and loosen large chunks of rock. These massive chunks are dropped to the quarry floor and broken into smaller pieces to be removed or used to create a retaining wall for the rock pile (visible along the quarries in the park). This entire process is repeated until the pipestone layer is exposed.

The Pipestone Layer Exposed

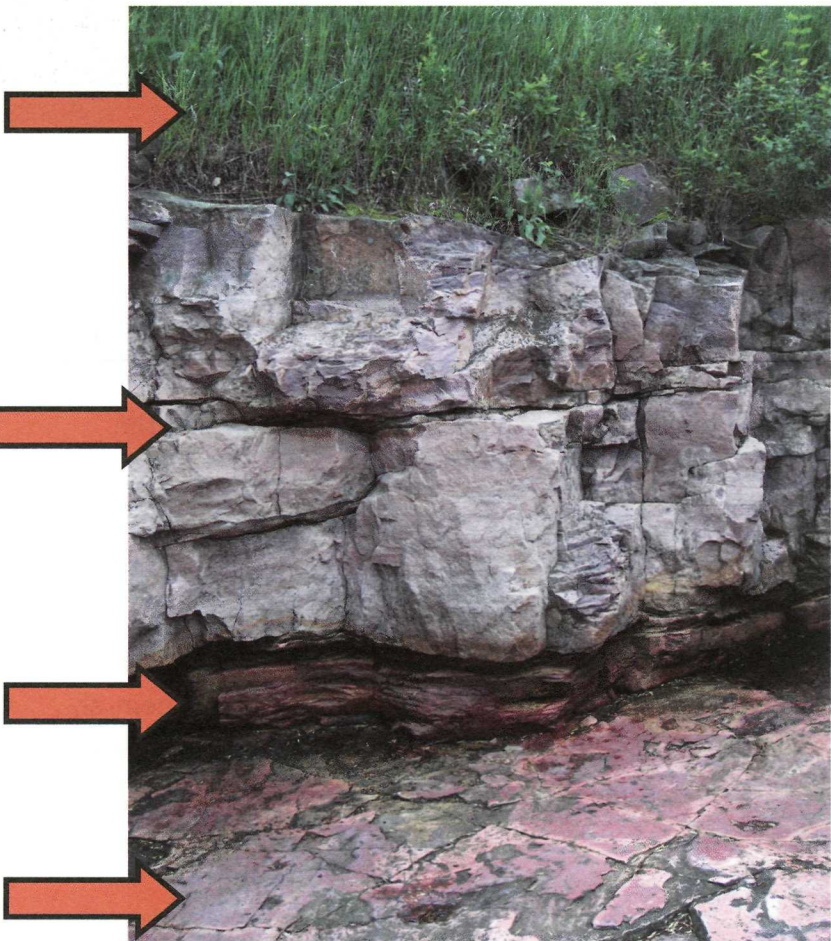
Once exposed, care must be taken to remove the pipestone since it is relatively soft (only as hard as your fingernail). This layer is about 11 to 18 inches thick and, like the quartzite, has natural fissures allowing it to be taken out in sheets 1 to 3 inches thick. Each of the individual pipestone sheets must be carefully removed one at a time since it can break.

Several feet of soil and gravel must first be removed, not an easy task with the roots of the tallgrass prairie.

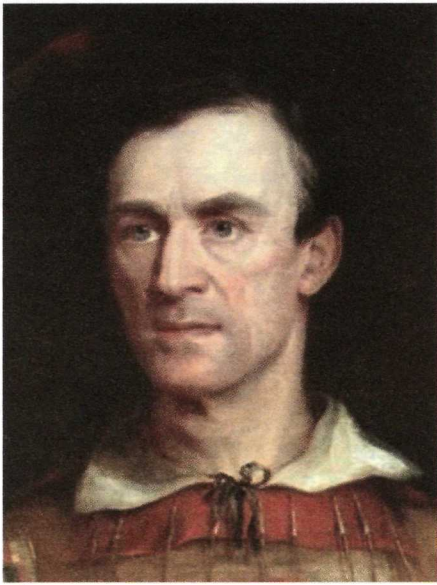
The quartzite layers, harder than steel, vary in height. The average height is 6-8', but some are up to 13'.

The pipestone layer is 11-18" thick and only as hard as a fingernail. It dips ~8 degrees to the east - the same direction quarriers dig. The more they dig the deeper the pipestone gets.

The floor of this pit is a transitional layer; a mix of quartzite and pipestone.



The exhibit quarry next to the visitor center



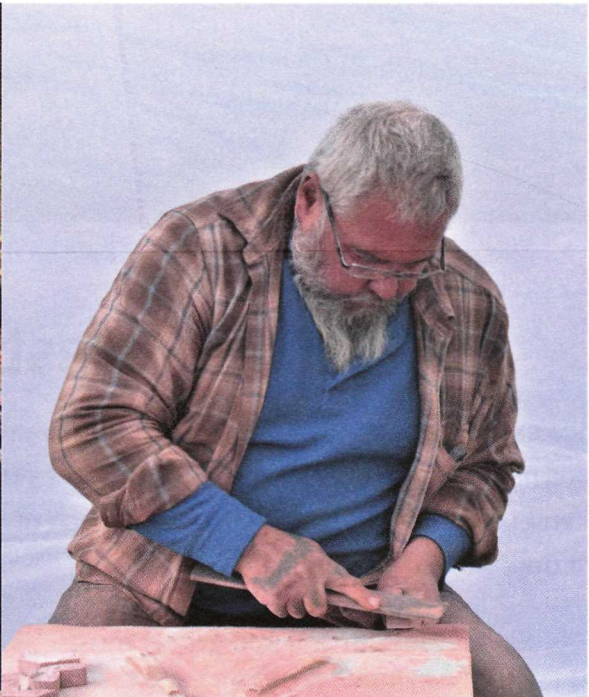
Artist George Catlin

“Catlinite”

Catlinite is the geological term for this particular vein of pipestone. The artist George Catlin visited the pipestone quarry in 1836. He was not the first white man to visit the quarries, but his art introduced this site to the rest of the world. Catlin also brought pipestone to the attention of 19th century geologists. He sent samples of the stone to a Boston scientist who identified it as a “new compound” and named it “Catlinite” in honor of the artist. “Pipestone,” however, has remained the name most commonly used in English while tribal nations throughout the country have had their own words for this stone for thousands of years.

Is Pipestone Hard or Soft?

Some early writers described pipestone as being soft when first removed from the quarries and only becoming hard after exposure to the atmosphere. In reality, the stone is workable right after it is taken from the ground. Even pieces that have been exposed to the elements for years are still just as workable as they were the day they were removed from the ground. Pipestone is a claystone which is slightly harder than soapstone and can be manually cut with a hacksaw.



Above Left: Jessica Arkeketa carves out a pipe from a sheet of pipestone using just a hacksaw.
Above Right: The stone is soft enough to then be shaped with a metal file, as Travis Erickson demonstrates.

Chemical Analysis of Pipestone

Although there are other pipestone deposits around the country, they each have a unique chemical signature. Catlinite is only found at Pipestone National Monument. It consists largely of **silica** and microscopic crystals of **pyrophyllite** (pie-raw-fill-ite), **diaspore** (die-ah-spore), **muscovite** (musk-oh-vite), and **kaolinite** (kay-oh-lihn-ite). Traces of the iron bearing mineral **hematite** (heem-ah-tite) give the stone its red color. Most other red pipestones found in the world contain the mineral **quartz**; catlinite has little or none.



Mark Pederson removing pipestone