

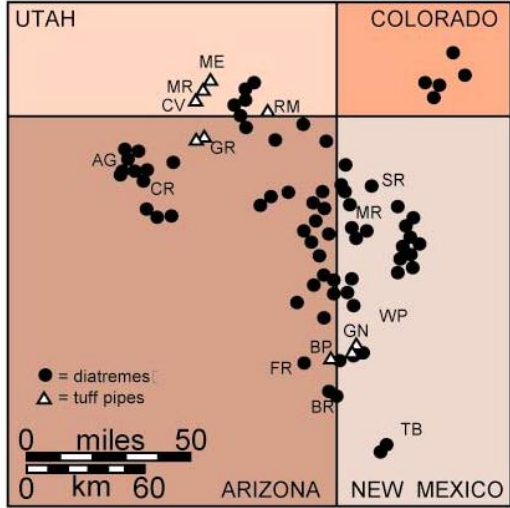
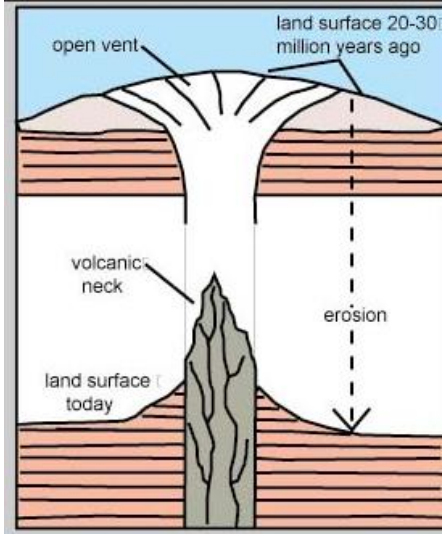


Arizona Rocks 54

Text and photos by Ray Grant

North of Canyon de Chelly and around the Four Corners area is the Navajo Volcanic Field. There are dozens of volcanic necks or plugs and other signs of igneous activity over an area of almost 8,000 square miles. The volcanoes were active about 27 million years ago. Since then, uplift and erosion has removed most of the volcanoes, so that now the volcanic plugs are all that remain. One of the best examples of these plugs is Shiprock. (It escaped from Arizona and is just across the border in northern New Mexico.) The magma feeding the volcano also filled in cracks surrounding the vent and is present today as dikes. The igneous rock weathers more slowly than the surrounding sedimentary rocks resulting in the interesting topography. Agathla Peak and Church Rock are two examples of these volcanic plugs in Arizona.

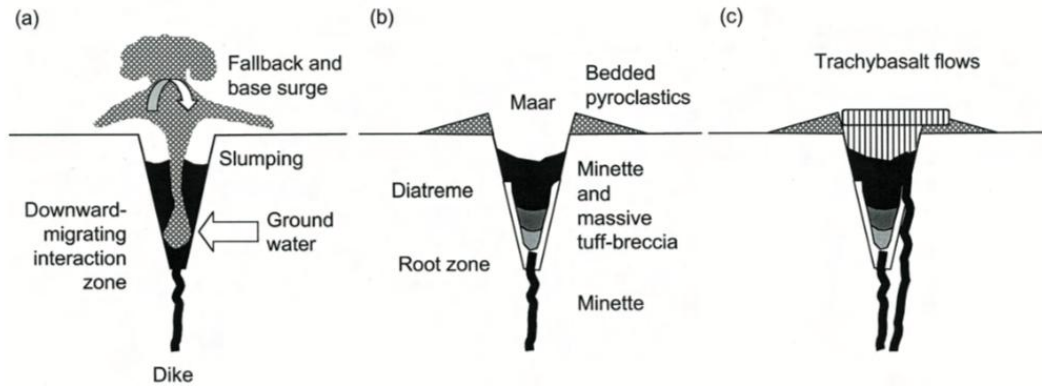
Geologists refer to the type of volcanic plug in the Navajo Volcanic Field as a diatreme. A diatreme is a volcanic pipe formed by a gas rich explosive eruption and is made up of fractured volcanic breccia plus magma. The explosive eruptions would form a crater (these are called maar volcanoes) on the surface instead of lava flows. The igneous rocks found in the Volcanic Field are very unusual; rocks like minette, iherzolite, vogesite, and kimberlite. Next month, I'll discuss the unusual igneous rocks found in the Navajo Volcanic Field and their origin.



Above diagrams from Oregon State University



Church Rock and Agathla Peak, two volcanic plugs near Kayenta, Arizona



*Above 3 photos: Shiprock, NM
Volcanic plug and dike
Ray Grant photos

Black Rock, AZ, Navajo Volcanic Field
Photo by James St. John