



Arizona Rocks 9

Text and photos by Ray Grant

We are almost finished with igneous rocks, but in Arizona there is a rare ultramafic igneous rock, kimberlite. Kimberlites of course are famous because they contain diamonds many places in the world. Kimberlite is a type of peridotite found as dikes or pipe like intrusions. It is composed of serpentine, olivine, garnet, biotite, pyroxene and a number of accessory minerals. It can also contain angular fragments of a number of other ultramafic rocks and of the rocks surrounding the pipe. This suggests explosive volcanic activity associated with the formation of the pipes.

The Arizona kimberlites are all found on the Navajo Reservation in northeastern Arizona. There are five pipes in Arizona, four at Garnet Ridge and one at Buell Park. There is one just over the border in New Mexico and a couple in southern Utah. The Arizona kimberlites have been known for some time because of the garnets found at them. These deep red pyrope garnets called anthill garnets because they are found where ants bring them to the surface or Arizona rubies because of the color have been collected for many years.

The Buell Park kimberlite pipe may be the largest in the world. It is about 2.7 miles across. Unfortunately, no diamonds have been found in Arizona and chemical studies of the Arizona kimberlites suggest they are not likely to have diamonds. In northern Colorado and southern Wyoming, there are kimberlites which contain diamonds.

Pyrope garnets (Anthill garnets or Arizona rubies) from Garnet Ridge, Arizona

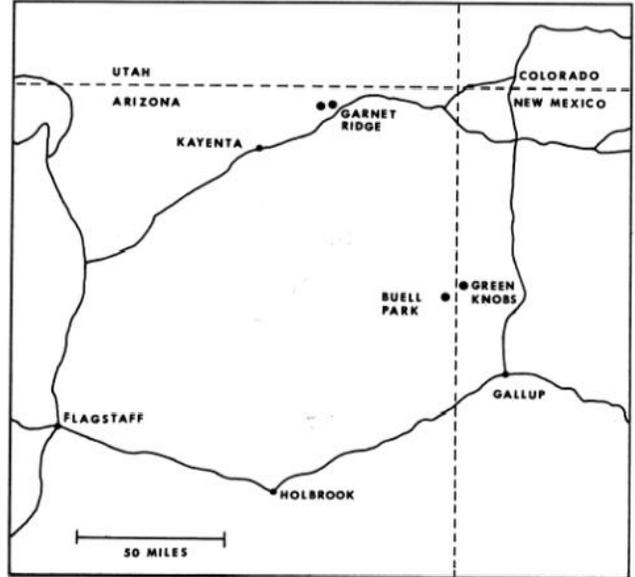
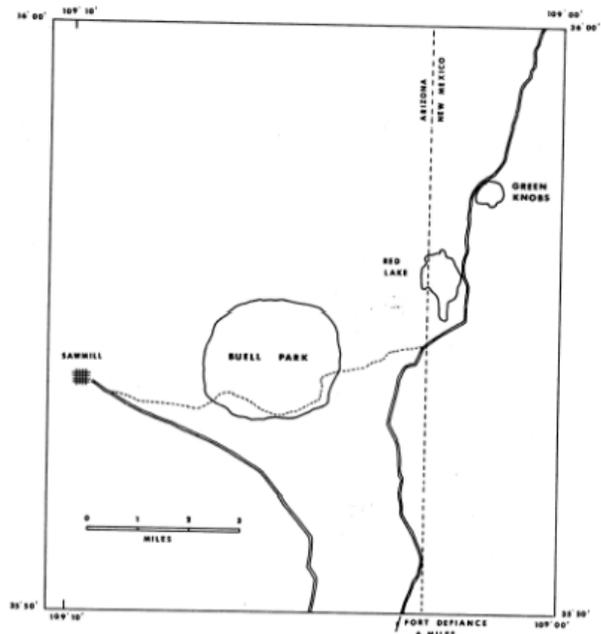


FIGURE 1.—Location of the three kimberlite pipes studied.



Maps: from Switzer, G. S. 1977, *Composition of Garnet Xenocrysts from Three Kimberlite Pipes in Arizona and New Mexico*, Smithsonian Contributions to the Earth Science, Number 10, p 1 - 21.

