“Blowout”

San Francisco Peak, or what is left of it, in silhouette at sunset, from the Northeast.

Geology, for the most part, is a s-l-o-w process. A grain of sand moves here, a rivulet develops there. I have been walking up and down the same picturesque pile of granite boulders in Carefree for 10 years now, and they still look just the same as they did when I first started those hikes.

But every so often, something wild happens on the Earth, and the terrain changes very quickly and markedly. As with an earthquake for example. Or with a volcanic eruption for another. Then people’s heads raise, and they take note. If it only was *all* so exciting.

In our part of the world, both kinds of geologic events have taken place – many times – but it is the volcanoes that have shaped the landscape in the most sensational fashion, and given us so many “Arizona Highways” type memorable scenes and photographs.

One volcano, in particular, stands out above all the others, literally. We know it as the San Francisco Peaks (yes, plural, to most), but it is really one volcano that has erupted a number of times. It forms the dramatic backdrop to Flagstaff, gives Arizonans a place to go skiing in the winter, and can be seen from most all of the northern part of our state. For the Indians, it is a sacred mountain, and a legendary landmark. At 12,633 feet in elevation, it is the highest point in Arizona.

Humphreys Peak, Agassiz Peak, and Fremont Peak are the names of the major summits in the San Francisco Peaks, but they should all be lumped together and called San Francisco *Mountain*, for it is one thing geologically – a *stratovolcano*. It should have a nice conical shape, like Mt. Fuji in Japan, or Vesuvius in Italy. Mt. St. Helens in Washington State also once had such a symmetrically pleasing profile. But then, it blew its top. And now, when viewed from above, it looks “U” shaped and crater-like.

The eruptions that formed San Francisco Mountain began around 1.8 million years ago. That is very recent, relatively speaking. It is after the Grand Canyon was mostly formed, and about the time the latest round of ice-ages was beginning. From the flats of the Colorado Plateau spewed molten rock, in different phases, slowly building towards the sky, sometimes violently, sometimes lazily. And that, you see, is why it is called a *stratovolcano*, or sometimes, a *composite* volcano. It has layers of different kinds of volcanic rock within it, each layer resulting from a separate eruption.

Not all molten rock (called *magma*) is the same. Some is very fluid when it erupts to the world’s surface, and flows readily. It forms broad, dome-shaped mountains like those of the Hawaiian Islands, or the White Mountains of eastern Arizona, and is called *basalt*.

Another type of molten rock explodes violently when let loose, and literally blows its confining mountain mass to pieces. That kind is called *rhyolite*, and such an event in historic time was the 1980 eruption of Mt. St. Helens.

There is whole range of other rock types between these two ends of the volcanic spectrum.

Our own San Francisco Peak blew its top off some 400,000 years ago. The evidence of that is the so-called “Inner Basin”, on the northeast side of the Peak. Humphreys Peak, and the other above-mentioned summits are just the high spots along the rim of the remaining crater of the blowout.

Before that explosion, the summit of San Francisco Peak was probably 15,000 to 16,000 feet above sea-level. Had it not erupted like it did back then, Flagstaff would have had an even better and more spectacular setting, the mountain would have shown a conical profile even higher than the Northwest’s Mt. Rainier, and the skiing would have really been something else indeed.

Volcanism in Arizona is not necessarily over, and in fact, I would bet on that. The last volcanic eruption in the state took place in 1064 AD, and produced Sunset Crater, a small volcano just to the east of San Francisco Peak, on the east side of Highway 89. This date is known from tree-ring studies in the area, and there is a very good chance that the resident humans of the time witnessed the eruption. Once again, in geologic terms, a thousand years, or even 400,000 years, is not a long time ago.

To the north, east, and west of Flagstaff are many other volcanic peaks and lava flows, all indicating that somewhere down below, not too deep, there is still plenty of molten rock waiting to burst forth.

Fortunately, with modern technology at our disposal, the chances of an unexpected blowout are very small.

To learn more about Arizona's fascinating geology and archaeology, visit **www.gemland.com**. There you will find interactive maps, where you can click on any name to initiate a series of images, together with geologic explanations. You can even send any picture you like to your friends as an E-postcard for FREE!

----- *Richard Allen*

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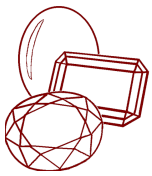

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At right: natural Arizona Peridot and 22K Gold gent's ring by GemLand © 2006

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