

"Name that Tune"

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"Stretched" rocks near Dobbins Lookout, on the South Mountains Metamorphic Core Complex, Phoenix, Arizona

I moved to Phoenix about eight years ago, and as I drove around a bit back then and started learning my way around town, I took note of the various landforms surrounding us. I couldn't quite put my finger on why, but South Mountain looked distinct to me -- different from and more rounded than the other mountains that stick out of the relentless grid of asphalt and concrete that stretches on and on through the Valley of the Sun.

I started looking into the reason, and one of the things I soon found out is that the rugged barrier at the south end of Central Avenue is correctly called the South Mountains (note the "s"). Where all the TV towers stand, and what most people refer to as "South Mountain", is more properly named the Main Ridge. Looking south from the downtown area of Phoenix, you can also see a separate, smaller high point on the west end (right) of that rise. Its correct name is the Alta Ridge. Much lower, in front of it, and

just next to the small town of Laveen, is the North Ridge.

Speaking of names, the Pima Indian (Akimel O'odham) name for this set of peaks is "Muhadag Du'ag", or "Greasy Mountain" -- a take-off on the dark sheen of the rocks there, caused by a surface coloration known as "desert varnish". If we really wanted to honor Native Americans, especially those *who actually lived in the Valley*, we would return its name to *what they called it*. We could apply this line of thinking to certain other mountains around Phoenix as well, but I'll save that discussion for another article.

More often than not, like everyone else in town, I also call this aggregate of lumps South Mountain. The big point here is the way it looks - a long, low dome-shaped rampart. There is one simple reason for that: the rocks of South Mountain were *pushed up*, basically through the crust of the Earth. Most of the other ranges around us traverse central Arizona for the opposite reason: the landscape is being pulled apart on a massive scale. They are left standing

as evidence of that strain as the valleys between them, like our own, drop away slowly, surely over time. Gravity never sleeps.

South Mountain is what is called in geology-speak a *Metamorphic Core Complex*, and I'll spare you some of the technical details. That term, which from now on in this article I'll refer to as "MCC", is a great name to throw around at cocktail parties, and one to remember if you are ever to be on one of those TV "Question & Answer" shows with big prize money. There is a whole, albeit small, subset of humanity out there that seems to be fascinated by them, and they're not just geologists. Don't ask me why, but one time, on a whim, I typed the term into a music-sharing website, and was amazed that a song actually came up with that name. Somebody (artist unknown) had in fact named a song to honor one! I downloaded it immediately, of course, certain the musician would not have minded. It is a spacey-sounding instrumental (naturally, and gladly) -- I am not sure what kind of lyrics you could put to the subject of plate tectonics.

There is "belt" of MCC's across western North America, running from British Columbia down into Mexico. They run right through central Arizona, and South Mountain is one of the best of them. They are thought to represent an early phase of the "pulling apart" of North America. Around 25 million years ago, the crust started to stretch in a northeast to southwest direction. As it did so, it thinned out, and lighter rocks, which were once more deeply situated, basically "bobbed up" (the pushing-up I mentioned above)

as sort of dome-shaped wrinkles -- the South Mountains are one such dome.

Then, millions of years later, the crust actually started to fracture and break apart. As you might expect, the resulting cracks -- called faults -- run perpendicular to the orientation of the stretching. This force, then, gave us the big valleys we inhabit, and left in-between massive blocks of rock standing -- these are the mountains (Camelback Mountain and Squaw Peak, for example) around that have weathered into jagged summits with a character unlike that of South Mountain.

I am continually perplexed by the number of Phoenicians who have told me they've never been up onto the South Mountains! There is no better view of the Valley than what you can get from Dobbins Lookout (the most popular spot). When you go that viewpoint, look just to the east, at the canyon wall just below you. There you will see the rocks all stretched out, horizontally, with very gentle curves from side to side -- visible testimony of the doming forces that created the South Mountains MCC (see photo). Once you see that evidence, you will notice the same rock fabric everywhere around in those peaks.

For more on MCC's, go to my website, and look at a string of six photos beginning at www.gemland.com/phx.htm. The fifth view in the sequence is a view from the Space Shuttle *Atlantis*, looking directly down onto the subject of someone's favorite song.

--- *Richard Allen*

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