EARTHQUAKE
EARTH SCIENCE MUSEUM
e-Newsletter about what's movin' and shakin' at the Earth Science Museum

June 2014
Volume 3, Issue 6

Arizona Rocks 13

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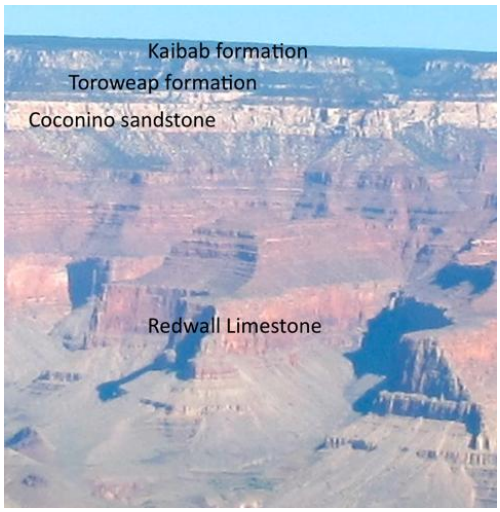
I want to take a digression this month and talk about the naming of rock units. This is more important for sedimentary rocks than it was for igneous rocks, although the same rules apply to all rocks. Rocks are broken into units called formations and a simple definition of a formation would be "a mappable unit". That is, it is large enough to show on a geologic map, so a small mass of rock only a few feet across would not qualify. There are other designations, a number of similar formations can be part of a group and a distinctive rock that is small and part of a formation would be a member.

In the United States the name of each formation consists of two parts, for example, Coconino sandstone, Redwall limestone, Toroweap formation, Kaibab formation. The first is the name of a locality, a place at or near where the formation is found and can be studied. The second part is the name of the rock type or if the formation consists of several rock types the word formation is used. The Toroweap formation has its type locality in Brady Canyon a side canyon to Toroweap Vallley and it is mainly limestone, sandstone and evaporites. The Kaibab formation is mostly limestone with some sandstone and dolostone, and it is named after the Kaibab Plateau. The Coconino sandstone is only sandstone and is named for the Coconino Plateau.



Some of the sedimentary rock formations in the Grand Canyon

Sedimentary rocks like those just described can be traced for long distances. The Toroweap formation covers 25,000 square miles in northern Arizona, and is easily recognized in the Grand Canyon as the tree covered slope below the Kaibab cliff that forms the rim of the canyon and above the Coconino cliff.

An example of an igneous rock formation is the Tea Cup granodiorite found east of Florence. Here is the original description: "Tea Cup granadiorite is here named for the Tea Cup Ranch (headquarters in NW1/4, sec.7, T.5S., R.13E). Typical exposures along the wash in the SE1/4, sec. 36, T.4S., R.12E., which yielded rocks for study and analysis are designated its type locality." The Tea Cup granodiorite is only found between Florence and Kelvin and covers a few hundred square miles. Many times igneous rocks on a geologic map are just labeled with the name of rock such as rhyolite or granite; they are not given a formation name because they may only be present in a small area.

Spheroidal weathered Tea Cup granodiorite on the Florence-Kelvin Road

Metamorphic rocks are named the same way with formations such as Pinal schist, Vishnu schist, Estrella gneiss. The Estrella gneiss is named after the Sierra Estrella Mountains and is found there and at South Mountain and the White Tank Mountains.

Estrella gneiss at the west end of the South Mountains