

THE GEOLOGIC COLUMN

c12 Formations < mappable, scale >

The graphic display of data plays a critical role in visualization and exploratory data analysis.
 —Cynthia A. Brewer.¹

A *formation* is a mappable unit of rock.²

Field geology is, for the most part, the art of recognizing and describing formations. Exactly what a formation is will depend on the *purpose* of the mapping, the *size* of the area mapped (**Footnote c12.1**), and the *geological philosophy* of the day.

A geologist strives to describe formations in a way that makes it possible for others to recognize them, be they of a mine or of a region. Even so, geological philosophy changes and so formations that once were recognizable may no longer be so. How is this possible if formations are bodies of rock? The rock stays the same but the interpretation that once synthesized the observations that made it a formation may no longer be reasonable. Thus, when reading old maps or reports it is well to remember that often the formations have meaning only in the context of geological knowledge at the time when they were described or named.

To illustrate this, James Merritt Harrison in 1963 evaluated two geologic maps (**Figure c12.1**) of the same area and scale published thirty years apart. Of these, the more recent map favors geological field evidence for the principle of pervasive “granitization” to explain country rock inclusions in granite and accepts that some of the hornblende-rich and pyroxene-rich rocks could have been derived from limy (calcite containing) sediments. The earlier map was prepared when “laboratory-justified magma theory” was at its apex in North America.

To lessen visual litter, write Morrison fm instead of (the formally correct) Morrison Formation say.

Figure c12.1³ Top map was geologically mapped in 1958. Bottom map was geologically mapped in 1928.

Footnote c12.1 Large-scale geologic maps of mine sites, quarries, and localities are usually and most usefully strictly lithological. This method becomes awkward for small-scale regional maps and outside of geography has been uncommon since Gregory Watt (son of James Watt of steam-engine fame) in 1804 showed with remarkable success the distribution of 46 different rock types on a ~80 x 80 cm map of Italy.⁴

Small scale geological maps of large regions are perforce usually time-stratigraphic (*see* Topic c20).

