



## Arizona Rocks 19

Text and photos by Ray Grant

A rock that is very similar to limestone is dolostone. In the past it was called dolomite, but since that is also the name of a mineral; the term dolostone was proposed for the rock. Visually the two rocks cannot be told apart. Limestone is composed mainly of the mineral calcite ( $\text{CaCO}_3$ ) and dolostone is mainly the mineral dolomite ( $\text{CaMg}(\text{CO}_3)_2$ ). The two minerals can be told apart with an acid test. In dilute HCl, calcite reacts vigorously and dolomite will not react unless powdered.

Most dolostone forms from seawater reacting with limestone to replace some of the Ca in the limestone with Mg. There are a few areas of high evaporation where primary dolostone crystallizes out of the sea water.

In Arizona dolostone is not common, and because it looks exactly like limestone it is almost never recognized. One formation that contains a fair amount of dolostone is the Devonian Martin Formation. It is named after Mount Martin that is close to Bisbee. Part of a measured section is given below. Note the ratios of calcite to dolomite for the parts of the formation. There is Martin Formation just east of Superior. I have never stopped there so I am not sure how much is dolostone at the location. Also attached below is a brief description of the Martin rocks east of Superior from the website <http://www.t-rat.com/Pages/WhereToFindFossils.html>.



Dolomite crystals on dolostone  
Black Rock, AR  
Photo by S. Coté

*Martin Limestone on east-facing slope of small hill north of Spring Creek—Con.*

Martin Limestone:	Feet
1. Dolomite (calcite: dolomite=10: 90), fine-grained, light-gray, thin-bedded.....	5
2. Covered .....	25
3. Dolomite, calcareous (calcite: dolomite=20: 80 at 4½ ft from top), fine crystalline, very light gray to pinkish-gray; weathers yellowish gray; forms prominent ledge.....	5½
4. Dolomite, calcareous (calcite: dolomite=17: 83 at 3 ft from top), fine-grained, olive-gray; contains irregularly shaped siliceous nodules; in thin beds having indistinct parting planes.....	9
5. Dolomite, fine-grained, thin-bedded; mostly covered.....	5±
6. Siltstone, dolomitic; mostly covered.....	3±
7. Limestone (calcite: dolomite=95: 5 at 10 ft from top), skeletal-micritic, olive-gray; contains some crinoidal debris and scattered silicified horn corals; forms prominent ledge.....	18
8. Siltstone, dolomitic, poorly exposed.....	36
9. Dolomite, very fine grained, olive-gray; minor chert; in one bed.....	2
10. Covered .....	4
11. Dolomite (calcite: dolomite=7: 93), very fine grained, olive-gray; minor chert; in one bed.....	3
12. Covered .....	8
13. Dolomite (calcite: dolomite=5: 95 at 10 ft from top), very fine grained, olive-gray; silicified fossils (USGS colln. 6306-SD from upper part); in beds 1-4 ft thick; forms ledge.....	12
14. Siltstone, dolomitic; weathers pale yellowish brown; poorly exposed in slope.....	9±
15. Dolomite, thin-bedded; poorly exposed in slope.....	10±
16. Dolomite (calcite: dolomite=6: 94 at 5 ft from top), silty, very fine grained; laminated in part; abundant corals in upper part (USGS colln. 6362-SD from top); thin bedded in lower half; one ledge-forming bed in upper half.....	7

Part of a stratigraphic column for the Martin Formation near Bisbee, from USGS Bulletin 1201-F, Paleozoic Stratigraphy of the Mule Mountains, Arizona



Road cut with Martin Formation east of Superior



Martin Formation fossils located north of Payson  
Photo by S. Coté



Devonian rocks at Superior, outcrop on the first ridge east of the city. The fossil locality consists of a basal bone breccia in a light, coarse-grained sandstone located above the base of the Martin Formation. Armor plates of scattered teeth comprise approximately twenty percent of the lithologic material of the breccia. The plates average four millimeters in thickness, lie horizontally and represent two distinct kinds of these primitive fish. Fossil fish teeth were also found in the marine limestone between this fossil bed. Conodonts are also common.

Fossil location in Martin Formation east of Superior, not sure if there is dolostone there, from website: <http://www.t-rat.com/Pages/WhereToFindFossils.html>