

Hi Bob,

Here's a brief description of the difference between limestone and sandstone per our telephone conversation.

Although limestone and sandstone such as Glacier Blue Devonian Sandstone are both sedimentary rocks, there are profound differences between the two types of rocks. Being sedimentary rocks, they both began life at the surface of the earth and were buried and lithified (turned to stone), but there the similarity ends.

Sandstone is a kind of rock made of, as you would expect, sand-sized particles of other rocks. In the case of Devonian Stone, igneous and metamorphic rocks in Acadian Mountains in New England, now weathered entirely away, shed particles of feldspar, quartz, rock fragments, and clay. These particles were carried by rivers to the shores of an inland sea where they were deposited in the beaches and sand bars of a large delta, not unlike the modern Mississippi delta. Devonian Stone is made of these particles. For a pile of sand to become stone, it has to be cemented together by some mineral carried in the groundwater and deposited between the grains of sand. Several minerals can do this, e.g. calcite, quartz, feldspar, hematite, and in the case of Devonian Stone, quartz is the cementing material. Mineralogically, Devonian Glacier Blue sandstone made of quartz, rock fragments, clay and feldspar held together by a quartz cement.

Limestone has an altogether different origin. Limestone, of which geologists recognize several varieties, are fundamentally made of calcite that has been precipitated out of shallow marine water. In the simplest case, this happens directly. Calcium carbonate micro-crystals form in sea water and fall to the bottom, forming a limey mud. This mud gets buried, the calcium carbonate recrystallizes, and limestone is formed. Alternatively, calcium carbonate can be withdrawn from the water and used to make the shells of various marine creatures. The creatures die, their shells get broken up, and fragments of the shells accumulate on the sea floor to form (another type of) limestone. It should be noted that small particles of minerals carried off the land into the sea can be incorporated into the calcium carbonate mix and limestones can and do have minor to moderate amounts of such material. However, in all cases, after lithification the rock is primarily calcium carbonate, usually in the form of the mineral calcite.

The strength, durability and weathering characteristics of any rock depends on its constituent minerals. Soft, easily weathered minerals make a soft, not very durable rock. As noted above, limestone is made of calcite. Calcite is a mineral not much harder than a fingernail. It cleaves (breaks) readily and is soluble in weak organic and inorganic acids. Consequently, limestone is soft. It can easily be scratched by a knife or a nail. Further, limestone is subject to attack by acids carried in precipitation. Not only do hydrochloric, sulfuric and nitric acid compounds in "acid rain" attack limestone but naturally occurring carbonic acid, formed by reaction between the carbon dioxide and water in the atmosphere, will deteriorate limestone. A familiar example is the illegibility of marble (metamorphosed limestone) gravestones .

Sandstones, on the other hand, may or may not be subject to such deterioration depending on the mineralogy of the component grains and the composition of the cement. Quartz, under the conditions common at the surface, is very resistant to physical or chemical attack. So, a quartz-rich, quartz-cemented sandstone such as those found in the Catskills of New York, and of which Glacier Blue Devonian Sandstone is one, will be very durable. Such rocks are more difficult to scratch, generally have higher compressive strength, and are much more resistant to erosion.

If you need further clarification, do not hesitate to contact me.
Best regards,
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