Sandstone Encyclopedia Article

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Sandstone

Any sedimentary **rock** composed of stony grains between 1/16 mm and 2 mm in diameter that are cemented together is a sandstone.

Sandstone forms from beds of **sand** laid down under the sea or in low-lying areas on the continents. As a bed of sand subsides into the earth's **crust**, usually pressed down by over-lying sediments, it is heated and compressed. Hot **water** flows slowly through the spaces between the sand grains, importing dissolved **minerals** such as **quartz**, calcium carbonate, and **iron** oxide. These minerals crystallize around the sand grains and cement them together into a sandstone. Spaces remain between the grains, resulting in a porous, spongelike matrix through which liquids can flow.

Petroleum and **natural gas** are often found in sandstones. They do not form there, but seek to float to the surface by percolating through water-saturated sandstones. Sandstone layers shaped into domes by folding or other processes (and overlaid by non-porous rock) act as traps for migrating oil and gas, that ascend into them but then have no way out. Such traps are much sought after by oil companies; indeed, most sandstone sedimentologists work for the petroleum industry.

Another useful feature of sandstones is that they tend to record the surface conditions that prevailed when their sands were created and deposited. For example, the diagonal laminations often seen running across sandstone beds (cross-bedding) record the direction and speed of the water or **wind** that deposited their original sand. Furthermore, the ratio of **feldspar** to quartz in a sandstone reveals whether its sand was produced by rapid **erosion**, such as occurs in young, steep mountain ranges, or more slowly, such as occurs in flatter terrain. Since sand beds are often deposited rapidly by wind or water, tracks of reptiles—and even the pocks made by individual raindrops—may be preserved as **fossils** in sandstone.

A sandstone may be uplifted to the surface and broken down by **weather** into sand. This sand may be deposited in a bed that subsides, turns to sandstone, returns to the surface, breaks down into sand again, and so on. Some individual grains of sand have participated in more than 10 such cycles, each of which lasts on the order of 200 million years.

See Also

Bedding; Petroleum Detection; Petroleum Extraction; Sedimentary Rocks; Sedimentation