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Summary of rocks - tests for identification.

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Best

Summary of Rocks - Tests for identification

Metamorphic

Sedimentary

Limestone - spill some drops of hydrochloric acid on it which make it bubble. Varieties of limestone are: chalk, shell, coquina (small shell formation and crumbly and porous, and coral limestone Etc.

Limestone is made up mostly or entirely of calcite (Calcium carbonate). In pure state it's white to light grey. With impurities ranges from near-black thru grey to reddish-brown to buff.

Sandstone. Made of sand. Some contains quartz but may also have feldspar, magnetite, garnet or other minerals. Breaks easily tho sometimes hard enough to use for bldg. as well as limestone In pure state it's creamy white. Impurities color it yellow, pink or red. The St. Peter sandstone in upper Miss. Valley extends over thousands of miles and occupies parts of several states.

Shale originally formed from mud, a clayey rock usually grey, altho often green, buff and red. Usually soft and crumbly.

Clay. A soft clay as it comes out of ground but turns hard later on. Varies from grey to red. Also known as "pipestone".

Conglomerate - "pudding stone", a mixture of pebbles and sand held together by clay, silica or some other material.

Igneous

Granite - coarse grains. Formed from magma that cooled very slowly. Always contains quartz and feldspar. May also contain mica or amphibole. A light-colored rock, running to grey, pink, buff and green.

Kinds of granite :

pegmatite - often contains fluorite, mica, topaz or beryl in addition to quartz and feldspar. Grey, green or black
diabase is dark, Gabbro is dark - grey, black or green.
anorthosite - white, grey, yellow, brown
porphyry refers to texture rather than the name of a particular mineral.

Basalt - (volcanic) - cooled in flows to form lava columns or "ropey" lava. Usually contains lime and magnetite - dark grey to black. When weathered apt to be brown.

Obsidian - glassy - cooled too quickly to form crystals or coarse grains. Aztecs used it for arrowheads and knives. Two thirds quartz and one-third quartz. Usually black tho may also be grey, red or brown.

Rhyolite - pink, red or brown. Often found with bands of various colors.

Pumice is obsidian that contained a lot of gas bubbles when it was hot

Metamorphic

Gneiss - coarse-grained made-over granite, shale or sandstone. Whatever its origin, it is harder than the original. Many colors depending on color of original rock. New colors depending on color of original rock. New colors may be white, grey or black; pink, red or green; and other possibilities. Has wavy bands of light and dark colors running thru it.

Schist (shist) - has more mica or dark minerals than gneiss. Thin, flakey crystallized layers that split easily. A made-over rock, chiefly shale and sandstone. Dark grey to brown. Sometimes light grey or dark enough to be black.

Marble - Its calcite bubbles when hydrochloric acid is spilled on it. May have cloudy, wavy lines in it. Pure marble is white but impurities color it - i.e. graphite makes some parts black; iron, red or pink.

Quartzite - hard enough to be used for paving. When pure it's white. Otherwise green, red, yellow. When the proportion of quartz in sandstone is relatively low it will metamorphose into schist rather than quartzite.

Slate - made-over shale. Shale was grey but organic carbon turns it dark; hematite may make it red or green. Brown and purple also can be seen.

Serpentine is made-over basalt or dolomite. When contains little iron it is white. But some shade of green is more usual.

Semi-precious

agate banded - Mexico

eye agate - Brazil

Carnelian - Brazil and New Mexico

Jasper, Mich.

Biotite - a dark colored mica, brown or black, sometimes green - Ontario, Canada

Phlogopite, Ontario, Canada

Sard - orange - very beautiful

Labradorite - iridescent blue

Thons some often mistaken for agate

meteorites - some stony; some are iron alloyed with nickel and traces of other materials. Surface pitted, oxidized, or rusty. Iron meteorites are magnetic.

Treasures of the earth -

In earliest times, melted rock spurted up out of the ground. The earth's crust hardened as layers of rock were finally formed. As they hardened water vapor and carbon dioxide were pressed out of them and changed into clouds that brought on torrents of rain. For centuries - perhaps for thousands of years - the rains went on without a stop, washing away vast land areas and carrying off huge masses of mud for new rock-forming. When the rains stopped the oceans had been formed. To this day they take up more of the earth's surface than the land does.

Life began in the warm salt sea. The sea somehow blended the 6 necessary elements for living matter: oxygen, carbon, nitrogen, hydrogen, phosphorus and sulphur. The sun and the earth's outer atmosphere provided the other necessary conditions for maintaining life.

"Punch and Judy", two remarkably shaped rocks are part of Chiricahua National Monument an area of 16 sq. miles in Arizona. Some 50,000,000 years ago incessant volcanic action produced these masses of basalt and rhyolite. Later they were tilted and uplifted by powerful forces and still later eroded into queer forms.

| Magma the Greek word for dough

Beautiful effects produced by erosion.

Badlands - fossil remains, area produced by erosion of clay and sand. (Sandstone with reddish layers caused by oxide)

Man's mightiest structures like the Pyramids or Grand Coulee Dam are dwarfed by comparison with the bldg. skill of the coral polyp, a relative of the jellyfish. The Great Barrier Reef along the n.e. coast of Australia was built by corals. It is 1260 mi. long, 8000 ft. deep, and anywhere from 7 to 100 mi. wide. The heyday of corals was in Silurian times, about 350,000,000 yrs. ago. Until the 19th century corals were mistakenly thought to be plants.

Corals secrete lime and limestone is formed. They live in large colonies with their bodies attached to each other and reproduce by growing buds which mature into new corals. Their skeletons become part of the coral reef.

The Florida Everglades rest on coral formations. But more remarkable: much of Midwestern North America stretching from the Gulf of Mexico to Hudson's Bay rests on coral formations from many millions of years ago. This means this area once had a tropical climate.

Death Valley Nat'l Monument in Calif. and Nevada - strange formations, the colors are said to be even more dazzling than those in the Grand Canyon.

Use of clay in pottery goes back to prehistoric times. Man learned early to shape clay on a wheel while it was moist. (Potters' wheels 6000 yrs. old have been found) Clay object is baked

The shaped

to make surface leakproof and attractive enamel glaze is put on and then baked again. China brought art to perfection. "China".

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Fire-born stones.

Wind, rain, frost, sun and all corrosive chemistries slowly planed the heights. Then, with a downward movement of the earth's crust, the continent sank into the sea where surface waste had already been deposited. Finally the sunken continent began slowly to rise again. Molten rock. Pressure and heat metamorphosed sandstone into quartzite, shale into slate, limestone into marble.

Purple-grey rocks seen in the present Baraboo Ranges are quartzite of these periods (Huronian). Huronian slate and marble are both (revealed near Mellen). Some of the rock formations are rich in iron. (Hurley)

The Lake Superior syncline formed in the final movement when mountains were made. St. Croix Falls, Mellen and Superior afford good outcroppings of the Keeweenawan masses of lava, sandstone and conglomerate. With the end of this period more than half of the earth's estimated billion yrs. of record had passed. Living things had developed slightly in complexity but without backbone or shell, still confined to water.

Now follows a period of land rest. The waters gradually crept over the land. With complete inundation came the deposition of sands, fine muds and clays that form the Cambrian series of rocks (Madison, & Crosse, Eau Claire, Camp Douglas, Trempealeau and Lodi). Soft and porous sandstone - the natural reservoirs that supply water to many Wis. cities. While the ancient sea lay in Wis. animal and plant life progressed. Shelled fauna, coral colonies. In southern and eastern parts of the state formations of Ordovician and Silurian times. i.e. lower Magnesian limestone (bldg. and gen'l construction). Second Ordovician - St. Peter sandstone (Viroqua). Also Platteville limestone. Lead and zinc spread thru it. A thickness of 100 to 500 ft. of shale completes this age. Richmond shale is near Fond du Lac. Clinton iron ore from Silurian period. Directly above the Clinton deposits is a series of limestone beds known as Niagara - composed, it's believed, of extensive coral reefs which were reduced to sedimentary muds by erosive water action. Appearing in a line of westward cliffs all the way from a point slightly north of Waukesha to the tip end of Door Co., the formation is known as the Niagara escarpment. Racine, Waukesha, Clinton, Sturgeon Bay and Green Bay lie on or near it.

Devonian period - shallow seas deposited limestone and shale - a small area along the Milwaukee shore of L. Michigan.

Then Wis. rose above sea level and there it remained. Millions of yrs. passed; thru erosion, old mountains again exposed, the Baraboo Ranges took their place as surface features.

Pleistocene - ice period - one million or more yrs. ago - covered all but the southwest quarter of Wis. Glaciers ground away hill tops and left depressions covered with the accumulations of their grindings. Sand, clay, gravel and even huge boulders.