

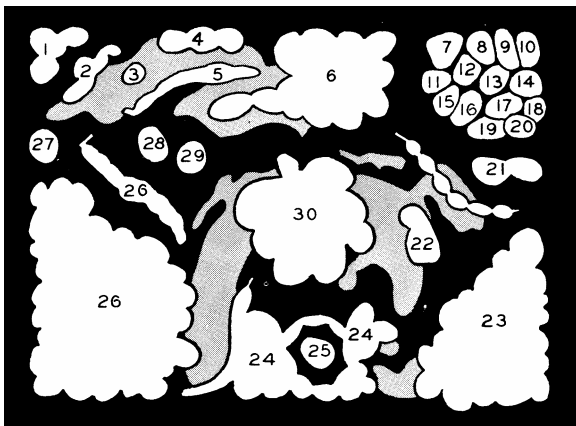
# Michigan Beach Stones

by Robert W. Kelley

OUR GREAT LAKES SHORELINES ARE TREASURE-LADEN WITH A HOST OF TRULY fascinating gem materials—not only hard-to-find agates, but also easy-to-find chert, jasper, granite, quartz, and basalt. Though more plentiful around Lake Superior, the common varieties may be found most anywhere. No special training is needed for rock collecting. Just look for colors and patterns that please you. You're the judge. It's as simple as that. The variety of stones is infinite. Seldom are two precisely alike, so giving them names is also difficult. Unlike plants and animals, classes of stone grade one into another. Divisions are purely arbitrary based upon subtle differences in chemistry and texture. Sometimes, identity is difficult to establish, even in the laboratory!

One note about beachcombing along Michigan's Great Lakes: To walk on the exposed strip of dry beach, you should obtain the consent of the property owner. His rights extend to the edge of the water regardless of water level fluctuations. Permission is not required, however, if you wade in the water, just off the beach. The submerged bottom lands of the Great Lakes are public, owned by all of us together. Now, turn the page and see some of the beautiful stones awaiting you on our beaches. The specimens are reproduced at one-half their true size. Photography is by John R. Byerlay and Robert W. Kelley of the Geological Survey Division, Illustation is by Jim Campbell, and the specimens are shown through the courtesy of Warren and Dorothy Kelley, Calumet, Michigan.

## Description Of Stones Shown In This Folder



1. **AMYGDALOID** (Greek: "almond")—Pebbles of basalt, or lava, with almond-shaped cavities created by gas bubbles trapped beneath the crust of a once molten rock flow. Green "amygdules" are *chrysocolla*; red, *analcite*. Note copper amygdules in pebble nearest upper left corner. 2. **NATIVE COPPER** — Michigan's "honor mineral." Specimens found in old mine waste piles usually have a green *patina* coating; when polished the bright copper color emerges. 3. **NATIVE SILVER**—

Lake Superior copper is noted for its silver content that imparts "superior" qualities for many uses. Hammered nuggets of inter-mixed copper and silver are called *half-breeds*. 4. **LAKE SUPERIOR AGATES**—Typical beach specimens. Besides their inherent hardness and fine lustre, concentric banding is a definite clue to the identity of two of these specimens. The specimen on the right, however, might easily go unnoticed. 5. **LAKE SUPERIOR AGATES**—A string of tumbled round agates of the size most commonly found. 6. **LAKE SUPERIOR AGATES**—cut and polished gem stones collected at various beaches from Ontonagon to Sault Ste. Marie. 7. **HONEYCOMB CORAL**—the original limey skeleton of this fossil has been replaced by *silica* (quartz). 8. **JACOBSTOWN SANDSTONE** — not considered a lapidary material, but sometimes weathering processes cement the grains into a compact mass that takes a fairly good polish. 9. **PREHNITE**—a member of the *zeolite* mineral group, which also includes *thomsonite*, *chlorastronite*, and an *alcite*, common to the Copper Country. See the minute flecks of copper?

10. **BRECCIA** (Italian: stone fragments)—Angular pieces of basalt fragmented in a zone of violent rock breakage and re cemented with other minerals, often quartz or calcite. 11. **JASPIRITE**—a specimen of iron formation in which the usual red iron oxide coloring has been weathered to ochre-colored *limonite*. 12. **CONGLOMERATE** — an aggregation or "conglomeration" of rounded pebbles cemented together by other mineral matter. 13. **RHYOLITE** — red to brown fine-grained type of igneous rock. 14. **QUARTZ**—with green *epidote* and red *jasper*. 15. **QUARTZ**—with red *jasper*. 16. **EPIDOTE**—in basalt. 17. **BRECCIA**—Fragments of basalt cemented by milky *quartz* with traces of red *jasper*. 18. **EPIDOTE**—in basalt. 19. **BRECCIA**—Fragments of basalt cemented by milky *quartz* with traces of green *epidote*.

20. **FINE-GRAINED GRANITE** — contains small interlocked grains of clear *quartz* and flesh-colored *feldspar*. 21. **JASPIRITE**—Interbanded red *jasper* and grey *hematite*. The ever-increasing production of iron from occurrences of this ore is a vital factor in Michigan's economy. 22. **PETOSKEY STONE** — fossil colony coral. 23. **RAW BEACH STONES** — a collection of various hard unpolished pebbles, typical of Lake Superior shores, but also found elsewhere to a lesser extent. True *cherts* are usually white, pale brown, brownish yellow, red grey, sometimes black, and occasionally green. In all cases, how ever, they consist of a dense, non-crystalline water-deposited form of silica that takes an exceedingly high polish. Colors are the result of other mineral impurities: iron oxide imparts the red color; green pebbles (basalts) are colored by *epidote*; glassy white to grey stones with frosted surfaces are usually *vein quartz*, a crystal line variety of silica. 24. **THOMSONITE**—Exquisite shades of pink and green with a radiant fibrous structure. 25. **CHLORASTROLITE**—the famous Lake Superior gem, "*greenstone*". 26. **TUMBLED BEACH STONES**—Same as in group No. 23, except the inherent beauty of their

colors and textures has been enhanced by tumbling. 27. RHYOLITE — A fine-grained igneous rock shaped into a convex gem form known as a *cabochon*. The group of four banded reddish brown pebbles immediately beneath are also rhyolite. 28. CHERT—with small orbs of red *jasper*. 29. CHERT—just chert, but most unusual and pleasing gem specimens.

30. DATOLITE — often very colorful, and though not as hard as either agate or chert, takes a superb polish because of its very dense texture. Unusual, too, because it contains the element *boron*. Rarely occurs on beaches, but the two yellow pebbles were picked up on a Keweenaw beach fifty paces apart—and they're mates!

## Sources

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