

Superior Gems in Mississippi Sand



Lake Superior agates found on the Upper Mississippi display a variety of colors and patterns. These stones were polished by six weeks of tumbling.

Story and photos by Constance R. Cherba

There's treasure to be found on the sands of the Upper Mississippi River. Generations of rockhounds have eagerly searched the beaches and river gravel deposits for Lake Superior agates, a semiprecious gemstone found in the Mississippi River Valley from Minnesota to as far south as northern Missouri. These banded beauties — often referred to as “lakers” — are easily identified by their intricate patterns and bright coloring. They make a handsome addition to any rock collection.

Agate hunting runs in my family. My grandfather taught my mother how to identify agates when she was

a young girl. She searched for them along the “river road” in Hannibal, Mo., in the 1920s and 1930s, and kept her collection in a small, drawstring tobacco bag. My parents moved up the Mississippi to Dubuque, Iowa, in 1946 and bought their first boat in 1960. When I was growing up, our family spent many weekends on the river combing the beaches from Cassville, Wis., to Bellevue, Iowa. When our own daughters were old enough to walk, they took up the hobby.

Now my young grandsons are learning. I tell them, “Look for red rocks. Look for rocks with stripes.” They bring me lots of red rocks, and

a few are the real thing. Soon, they'll be regular contributors to the family agate bucket we keep on our boat.

How They Got Here

The story of the formation of Lake Superior agates begins over 1.1 billion years ago, when iron-rich lava spewed from the crack in the North American continent that formed the Midcontinent Rift. The forceful movement of the earth's plates created the Superior Trough, which eventually became the basin of Lake Superior. As the lava cooled and hardened into volcanic bedrock, called basalt, gases got trapped as bubbles, or vesicles.

Later mineral-laden groundwater carrying iron and silica entered the gas pockets, forcing the air out. The solution crystallized into layers or bands of chalcedony, microcrystals of quartz. Eventually, the cavities completely filled with bands of quartz, creating embedded agates.

Two million years ago the earth's climate began to cool, marking the

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beginning of the Great Ice Age. Glaciers up to a mile thick pushed into North America. Then 10,000 to 15,000 years ago, the Superior Lobe of glacial ice moved into the Superior Trough, picking up agates from the surface and freeing agates trapped in the dark reddish brown basalt of the ancient lava flows. The relentless grinding of the advancing glacier carried some of these agates south and scattered them throughout the Upper Midwest, where they are known as Lake Superior agates.

Identification

Identifying Lake Superior agates is easy, because they all exhibit some basic characteristics. Coloring is a key identifier. These agates are almost always shades of red, orange or yellow, from the iron in the water when they were formed. Varying amounts of oxidized iron caused the wide range of colors. Although most lakers are red, orange and yellow, some contain variations of grey and white.

Next to color, the most striking feature of Lake Superior agates is their distinctive banding. The most common pattern is called "fortification" banding and follows the entire outline of the agate, somewhat like the walls of a fort. Another pattern is named "water-level," or parallel, banding. This occurred when silica-rich groundwater puddled in the lava's air pockets and deposited quartz in layers, forming straight bands. Final-

ly, the rarest pattern is called "eye agate," which contains circular, eye-like bands on its surface. The "eye" is thought to have formed when the majority of solution drained from the gas pocket, leaving only a drop on the inside wall. Later, the rest of the pocket filled around the eye with solid-colored quartz.

Size and shape are not major identifying characteristics, since agates reflect the size and configuration of the vesicle in which they were created. Many agates have eroded over time to the size of a pea. Others retain nearly their original size and are as big as quarters or even tennis balls. A very few have been reported to weigh

more than 20 pounds.

Occasionally, an intact agate is discovered, with its interior banding hidden. While these agates are somewhat more difficult to identify, they do reveal some common characteristics. The surface, or husk, of a whole agate is usually rough and pitted. Often, the reddish brown exterior will exhibit a telltale blush of yellow and a slightly waxy luster.

Where to Find Lakers

Glaciers scattered agates throughout Minnesota, Wisconsin, the Upper Peninsula of Michigan and southward into Iowa, Nebraska, Kansas and Missouri. Lake Superior agates are so



The author and her four-year-old grandson, Sam, hunt for agates on Nine Mile Island, south of Dubuque, Iowa. (photo by Mary Ashkar)

common in Minnesota that they were designated the official state gemstone in 1969.

Some of the best hunting spots are on gravel bars along the Mississippi River. The river's current not only transports agates but also acts as a natural tumbler, smoothing out rough edges and revealing identifying characteristics. One of my favorite places to search for agates is Nine Mile Island, south of Dubuque. I've hunted the beach every summer for years and never been disappointed. The flood seems to replenish the supply of rocks each year.

Agates can be discovered in any river rock pile, including stones that landscapers purchase from local sand-and-gravel companies. Although I have hunted agates along the Mississippi for over 50 years, I was surprised to find my largest specimen last fall in some landscape rock surrounding the foundation of an old apartment building in downtown Dubuque.

Dredging operations along the Mississippi often leave deposits of river



The agate on top shows common fortification banding. Note the rough, pitted husk on the two whole agates below.



The stones on the left are rare eye agates. The stones on the right are water level or parallel banded agates.

gravel rich in agates. However, if the gravel is on private property, you'll need permission to hunt. This also holds true for hunting in rock piles of sand-and-gravel companies.

Lapidary Techniques

A lapidary, one who cuts, polishes or engraves gems, can craft Lake Superior agates into jewelry and other decorative pieces. Although some natural agates reveal their beauty, especially when wet, they often appear dull and lifeless. The process of transforming rough agates into spectacular gemstones falls into two basic categories: cutting and polishing.

A circular rock saw with a diamond-coated blade can slice medium to large agates, those weighing a quarter pound or more. The resulting slab can then be fashioned into smaller pieces, such as a "cabochon," a stone that is smoothly rounded and polished on top while the underside is left in a rough state. Cabochons are somewhat flat and can be mounted into rings, earrings, broaches, bracelets, necklaces, belt buckles and other pieces of jewelry.

Tumbling is the most common way to polish agates. During this exercise in patience, rough agates are turned at slow speed in a rotating barrel, or tumbler, with a slurry of water and abrasives. A shiny, smooth agate requires four to six weeks of tumbling with progressively finer grades of

grit, usually silicon carbide. Tumbled agates are prized for their high luster and appealing shapes and patterns. They can be crafted into jewelry or simply displayed in a glass bowl.

Finding and selling Lake Superior agates isn't a get-rich scheme, although there is a market for these

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rocks, especially the highly sought-after red and white banded variety. Some collectors attribute metaphysical properties to lakers. They claim the stones possess powers of protection, courage and healing. Others, like my family, are content to find satisfaction in the hunt itself and feel there is nothing like scanning a Mississippi River beach or gravel pile and discovering a one-of-a-kind agate, a gem created by fire and ice. 🌊

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