

Thunder Bay Agate Mine

Last Spring I lead a group of undergraduate geology students around Lake Superior. One of the best stops we had was at the Thunder Bay Agate Mine. As it is right on the way to the better-known amethyst mines, I'd recommend all headed up that way stop for a visit.

The mine is a dig-your-own fee area. It is located just a few miles north of Thunder Bay, just north-east of the Terry Fox Monument (another place that is worth a stop). A mile or so east of the monument on Hwy. 11-17, turn left on highway 527. There is an agate mine sign at the intersection, so it is hard to miss. The mine is about 1/2 mile up 527, on the left. That turn off is also well marked. There is a big parking area by their shop. You can walk or drive down a short distance down a well maintained dirt road to the mine from there.

We were greeted and given a tour of the shop and the deposit. The students then got to go to work. The fee is \$8 per pound, with the price pro-rated to reflect the poundage of agate rather than the surrounding matrix. There is a reduced rate for clubs. There was agate all over the place, and it could be collected without much in the way of tools. If you want to pound, well, there was opportunity for that too. The agate is a seam or vein agate, formed in brecciated iron carbonate of the Proterozoic Gunflint Formation. It isn't the classic Lake Superior agate, which formed in gas bubbles in Keweenaw basalt lavas extruded about 1.1 billion years ago, but it sure is pretty.

Agate had been collected from a nearby river and in gravel pits for years, but its bed rock source was unknown. In the early 1980's a new logging road uncovered the agate bearing bed rock. After some drilling and years of negotiating property rights, agate mining began in 1997.

The agate thickly veins the rock, with stalactitic growths giving nice patterns. There are open vugs with later quartz crystals (white to yellow, no amethyst though). Some pyrite, a black hydrocarbon and yellow micro sprays of goethite (?) were also seen in the cavities. The agate was well banded, with red, brown white and gray colors dominating.

The origin of the agate is a bit problematic. It occurs as open space filling in the Gunflint. It likely formed when this formation was close to the surface, being weathered and dissolved. Since the host rock is a carbonate rock, caves and sinkholes could develop and allow pore spaces for silica-rich solutions to penetrate. The fluids could have circulated through these fractures during faulting or spurred by the heat of later volcanic rocks. It

could have formed from the same fluids that elsewhere in the area formed the amethyst veins and local silver deposits.

Once you have enough agate (it doesn't take long to get a bunch), you can stop by the shop. I could hardly get my students away from the shop, and they certainly learned a lot about lapidary in a short period of time. There is also a gift shop with items made from the agate. They have a nice web site too, at <http://www.agatemine.com/>

Keep this in mind if you are traveling north next summer. It's easy to get to find, with good hunting for all. What more could one want of a summer trip?

- Dr. Bill Cordua, University of Wisconsin-River Falls