Understanding and Finding Agates

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CHAPTER 3 How do you find agates?

If you are reading this section, you have either already been bitten by the agate bug -- or you are about to enter a phase of exploration. Before you head out prospecting, the first thing you must know is that Lake Superior agates are not plentiful. To be successful, along with some luck you must have patience, persistence, and focus. Your chances will improve if you can keep from being distracted by all the other beautiful rocks. Another factor that will help you to succeed is to THINK LIKE AN AGATE. Thus, get ready to transform yourself from the organic being that you are into an inorganic, incredible agate. This section will help you think from within an agate nodule. *Note: Although this section is written to help those searching for Lake Superior agates, many of the suggestions are also relevant to agate prospecting in other locations.*

The Gitche Gumee Museum's Agate Class on Paper

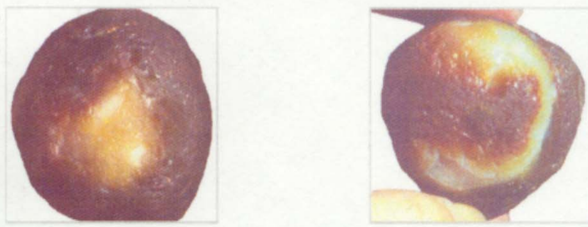
A POCKET FILLED IN Most Lake Superior agates formed in gas pockets inside igneous matrix rock. Water supersaturated with silica filled the pocket. Over time, the concentration of silica became high enough causing it to precipitate out of solution. The silica formed microcrystals and lined the pocket molecule-by-molecule, layer-by-layer from the outside in (see Figure 14). ***Look for rocks that have evidence of layers or other self-organizing structure showing that it was a pocket or seam that filled in.***

Figures 14a & b *These specimens are bottoms of agate nodules. They show how silica microcrystals lined and filled the cavities, conforming to the shapes of the vesicle.*

COLOR Agates from the same area have similar characteristics. Because ferrous iron (Fe++) was present in trace amounts in the silica gel comprising most Lake Superior agates, the majority were stained by this impurity. After agates eroded free of their igneous captors, iron molecules in the silica layers were activated by abrasion during glacial transport. Later, iron reacted with oxygen from the atmosphere to produce a natural rust stain. The concentration of iron in the agate and the amount of oxidation determined the color, ranging from yellow to red to brown. The color can be between the agate's bands, or on the agate's surface.[51] ***While scanning rock piles, keep a keen eye out for the iron-oxide red color of the Lake Superior agate, such as shown in Figure 15.***

Figure 15 *Nodule with red iron oxide color. Approximately 80% of Lake Superior agates have at least some iron oxide staining.*

CONNECTIVE CHANNELS Scientists do not agree on whether the channel connections between the interior of an agate and its exterior are "entrance" channels that allowed the silica-rich solution to enter the cavity, or "escape" channels where pressure that built up during agate formation was released.[52] After examining the disruption of the banding patterns caused by these channels in thousands of agates, I believe that both types of channels exist. See Figures 16 and 17.



Figures 16a & b *There are connective entrance channels on both ends of the nodule pictured in Figure 15.*

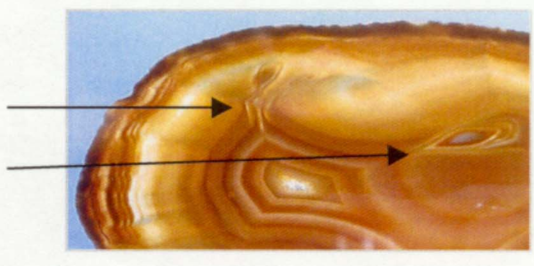


Figure 17 *This specimen clearly shows two pressure relief escape channels that did not have enough pressure to reach the outside of the vesicle.*