Bog Ore in Early Vermont

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Geologic Background of Iron

Iron, which makes up 34.8% of the earth's crust (Chernicoff and Whitney, 2007), is found in an oxygen-free environment, such that existed about 2.5 billion years ago. Iron is the most abundant element. However, the majority of iron ore is extracted from rocks and minerals that combined with the iron detouring what kind of iron ore is produced. The most common iron ore is hematite (Figure 1), which is the iron oxide Fe₂O₃ and usually appears in the mineral form of limonite and mononite. Iron bacteria produce a slimy iron rich coating and can oxidize iron to iron oxide (Fe₂O₃). The iron oxide has enough time to bond with the oxygen, the iron is concentrated in the core of the earth. Iron ore has a high iron content and is used to make a number of iron products (http://www.ironoreusa.com). Hematite usually has a high iron content (66-77%), while magnetite has a lower iron content (60-64%).

Here lies a pile of mined bog ore. This bog ore is made up of iron that was dissolved in the oceans and then washed down due to the erosion of the mountains and the iron has had enough time to bond with the oxygen, the iron is concentrated in the core of the earth. Iron bacteria produce a slimy iron rich coating and can oxidize iron to iron oxide (Fe₂O₃). The iron oxide is insoluble in water, then sank to the bottom of the ocean where it condensed (www.columbia.edu). While on the bottom of the ocean, iron bacteria such as Gallionella and Leptothrix could not "produce iron enough to pay the expense, nor of a quality valuable for smelting" (Smith and Rann 1886). However, "considerable quantities of iron ore were made into cast iron...before 1800, and it is said to have made good castings" (Goodhue 1861).

Iron ore in Early Vermont

Geologic Background of Bog Iron Ore

Iron ore is iron ore that forms in low-lying swamps or bogs. It is generally a "soft, spongy, and porous deposit of impure hydrous iron oxides" (U.S. Bureau of Mines, 1986) (Figure 2). It has high phosphorus and sulfur content and when heated, they are making the ground red. This is because the iron oxide is not oxidized. After the water lands and the iron has had enough time to bond with the oxygen, the iron is concentrated in the core of the earth. Iron bacteria produce a slimy iron rich coating and the "breakdown of the bacteria produces a natural oil discharge that makes a sheen on the water" (Bellacosa et al. 2012). This is because the iron oxide is not oxidized. After the water lands and the iron has had enough time to bond with the oxygen, the iron is concentrated in the core of the earth. Iron bacteria produce a slimy iron rich coating and the "breakdown of the bacteria produces a natural oil discharge that makes a sheen on the water" (Bellacosa et al. 2012).

Here is a spring in Saratoga, New York spouting water onto the ground. Looking closely at the water droplets in mid-air you will see that they are clear and glistening. When they land they are making the ground red. This is because the iron oxide is not oxidized. After the water lands and the iron has had enough time to bond with the oxygen, the iron is concentrated in the core of the earth. Iron bacteria produce a slimy iron rich coating and the "breakdown of the bacteria produces a natural oil discharge that makes a sheen on the water" (Bellacosa et al. 2012). This is because the iron oxide is not oxidized. After the water lands and the iron has had enough time to bond with the oxygen, the iron is concentrated in the core of the earth. Iron bacteria produce a slimy iron rich coating and the "breakdown of the bacteria produces a natural oil discharge that makes a sheen on the water" (Bellacosa et al. 2012).