The History of Iron in the Adirondack Mountains: The Last 1.1 Billion Years

Before the Grenville Orogeny began 1.1 billion years ago, layers of sediment were deposited in shallow seas across proto-North America. The rocks from the Grenville Orogeny are what would become the basement of New York state and regions to the north and south. Four billion million years of erosion buried the Grenville rocks under layers of sediment. Subsequent tectonic events and erosion over the next 550 million years buried the region under more sediment. While the Appalachian and Green Mountains have been eroding for the past 220 million years, the Adirondack Mountains have actually been rising! In fact, in 1980, measurements showed their growth rate to be about 3 millimeters per year, which is about thirty times the rate of erosion. But how could it be that such young mountains could be made up of such ancient rocks? The answer is still debated, but geologists suspect that a hot spot formed under the crust which heated the surrounding material under the Adirondack Dome (figure 1). This caused it to expand and rise between 10 and 20 million years ago. Since then, erosion has carved out the mountains we see today. Hence, the Adirondack Mountains are often described as “new mountains from old rocks.” (Isachsen, 1991)

Virtually all of the iron mined around Port Henry was Magnetite, Fe3O4, which was likely deposited in cracks, fractures or faults in surface rocks as iron precipitated from water in the presence of oxygen. (Chernicoff, 2007). Late 19th century geologic surveys determined that the magnetite in the eastern Adirondacks was usually found in quartzose, shists and limestones. (Kemp, 1897). This geologist also commented that, “what made the mines so good is that there’s a lot of [iron], and it’s very pure, with low amounts of titanium.” While impurities were a fact of life in iron mining in the Champlain Valley, the purity of some of the veins near Port Henry was legendary. Iron tycoon of the region, Frank Witherbee once bragged to prospective investors that “the straight magnetites of the Adirondack field are nearly chemically pure.” And while this may have been an exaggeration, all ore from Port Henry was guaranteed sixty to sixty-five percent pure with some veins reaching seventy-percent purity (All ore from Port Henry was guaranteed sixty to sixty-five percent pure with some veins reaching seventy-percent purity)