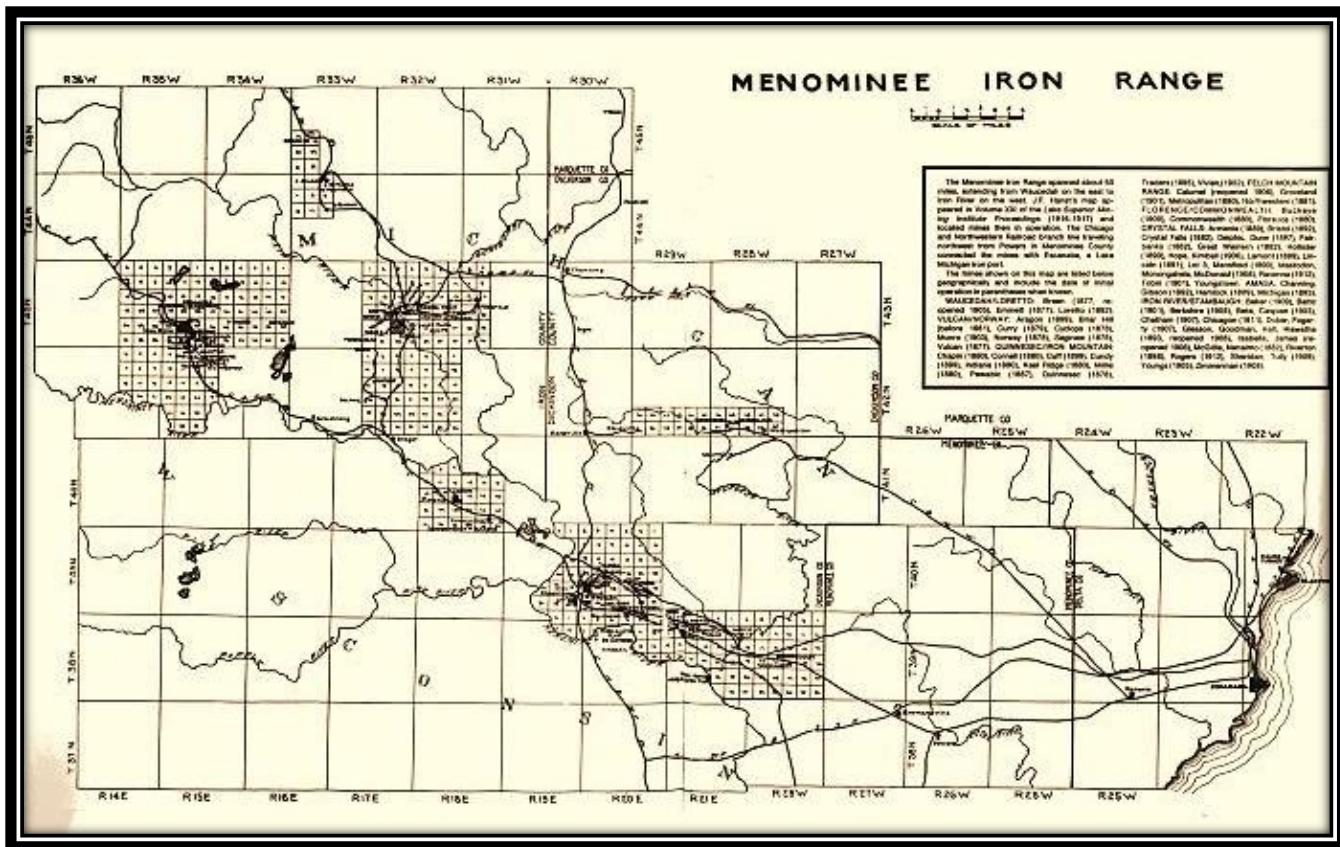


MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian



The Menominee Iron Range spanned about sixty miles, extending from Waucedah, in eastern Dickinson County, through portions of Florence County, Wisconsin, to Iron River, in western Iron County, Michigan. J.F. Hanst's map appeared in Volume XXI of the *Lake Superior Mining Institute Proceedings (1916-1917)* and located mines then in operation. The Chicago & Northwestern Railroad branch line traveling northwest from Powers in Menominee County connected the mines with Escanaba, a Lake Michigan iron port in Delta County. Moving from east to west, mining settlements included the following: Dickinson County – Waucedah, Loretto, Vulcan, Norway, Quinnesec, Iron Mountain and the Felch Mountain District; Florence County – Commonwealth and Florence; Iron County – Crystal Falls, Amasa, Iron River and Stambaugh.

Most of America's iron ore had come from New York and Pennsylvania during the first part of the nineteenth century, with smaller amounts mined in Virginia, Tennessee and Alabama. However, with the discovery of iron ore along the south shore of Lake Superior near Negaunee in 1844, Michigan's Upper Peninsula, along with portions of Wisconsin and Minnesota,

became the nation's major iron producing region by the late 1800's. Since the Upper Peninsula was so remote and underdeveloped, a dozen years elapsed before the new iron region, known as the Marquette Iron Range, began sending ore in quantity to steel mills in the East.

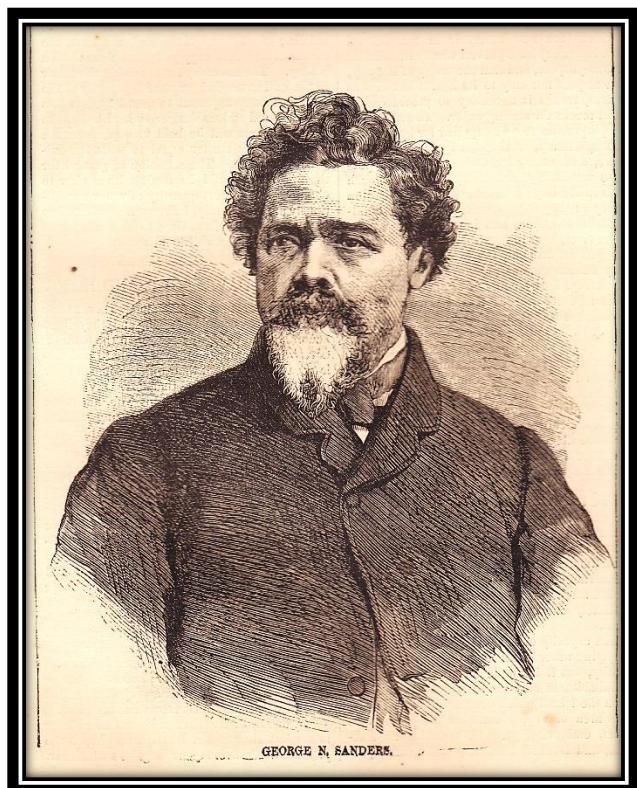
As the Marquette Iron Range developed, the government and private

MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian

industry sent geologists and other agents to the Upper Peninsula to evaluate the area's wealth of natural resources, particularly in terms of mineral and timber assets.

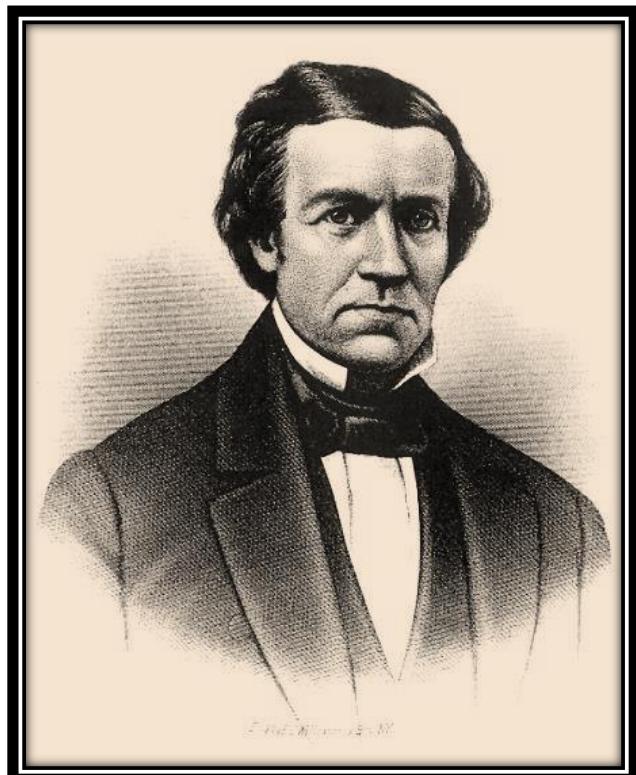
The Menominee Range was situated mainly in the valley of the Menominee River, which lies on the boundary between the Upper Peninsula of Michigan and northern Wisconsin. The fact that iron was located here seems to have been known before the Civil War, but active mining only dates back to the 1870's.



**George Nicholas Sanders
(1812-1873)**

George Nicholas Sanders (1812-1873), while examining the lands along the Menominee River to determine the feasibility of constructing a road from Green Bay on Lake Michigan to Copper Harbor on Lake Superior, passed through what was to become the Menominee Iron Range. In his

report to Congress, published in 1844-1845, Sanders referred to various veins of spar he encountered in his travels.



**William Austin Burt
(1762-1858)**

In 1846 William Austin Burt (1762-1858), the discoverer of the Marquette Iron Range, during his linear land survey, noted signs of iron ore in the Crystal Falls area.

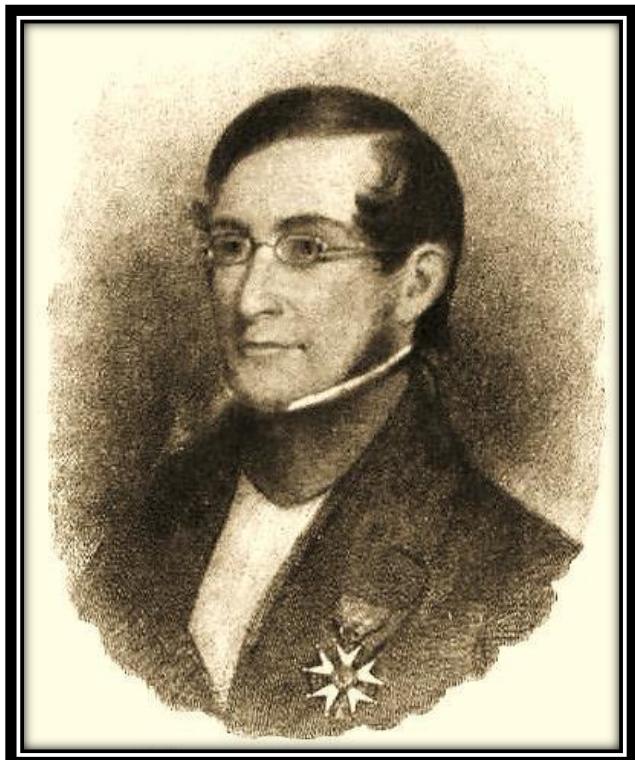
In 1847 Dr. Charles Thomas Jackson (1805-1880), recently-appointed United States geologist for the Lake Superior Land District, was commissioned to lead a geological survey of the Lake Superior region of northern Michigan which was about to become a major copper and iron mining region.

In 1844-45 Jackson was an on-site mining consultant to the Lake Superior Copper Company, one of the first companies to attempt mining the native

MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian

copper deposits of Michigan's Keweenaw Peninsula on Lake Superior.



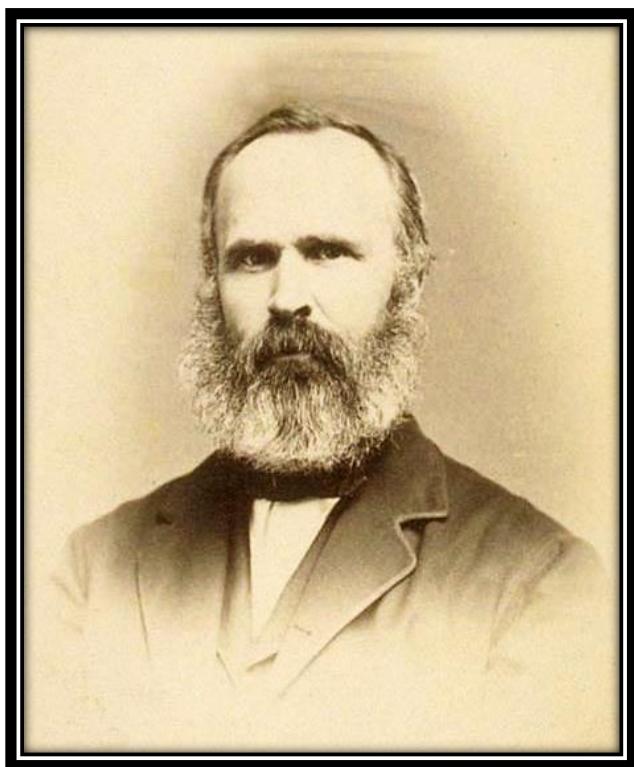
**Charles Thomas Jackson
(1805-1880)**

Jackson was involved in a series of often bitter priority conflicts that left their marks on the scientific and social scenes of the times. A discovery would be announced by someone, Jackson would then claim prior discovery and a controversy would ensue.

Among them were conflicts over the discovery of guncotton (Christian Friedrich Schönbein), the telegraph (Samuel F. B. Morse), the digestive action of the stomach (William Beaumont) and the anesthetic effects of ether (William T. G. Morton).

In 1849 Jackson made a similar priority claim for the discovery that the unusual native copper deposits of Lake Superior, contrary to all previous geological expectations, could be successfully mined.

At that time it was universally acknowledged that credit for that discovery belonged to the recently deceased Douglass Houghton (1809-1845), Michigan's first state geologist. The historical evidence does indicate that Jackson's claim for himself was valid in this case, and his mineralogical insights were significantly in advance of those of his contemporaries, including Houghton.



**Josiah Dwight Whitney
(1819-1896)**

Jackson hired John Wells Foster (1815-1873) and Josiah Dwight Whitney (1819-1896) to assist him in making the survey.

Foster, an American geologist and paleontologist, had served as assistant in the Geological Survey of Ohio in 1837, and participated in the investigations of the coal beds in Ohio until 1844.

In 1847 Whitney had just returned from Europe, where he spent five years studying

MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian

chemistry and geology in France and Germany.

Jackson's leadership of the Lake Superior region survey proved to be a disaster, and he was dismissed from his position. The completion of the survey was turned over to his assistants, John Wells Foster and Josiah Dwight Whitney.

Foster and Whitney completed the survey in 1850. The U.S. Congress authorized the publication of their findings which were completed in 1850 and 1851.

Listing significant finds of large beds of ore in Section 30, Township 40 North, Range 30 West, near Lake Antoine, later the site of Iron Mountain's famed Chapin Mine, Foster's first report stated:

About two miles southeast of the lower falls (of the "Twin Falls" on the Menominee), near S. 30, T. 40, R. 30, there is a large bed of specular iron ore associated with the talcose and argillaceous slates. It makes its appearance on the north side of a lake, and can be traced a mile and a half in length, and in places is exposed one hundred feet in width. It bears nearly east and west, and in external characters resembles that of the iron mountain before described. This bed was first discovered by John Jacobs, from whom I derived the information, and may be regarded as the southern limit of the iron. The distance from this point to the most northerly point where iron was discovered (on the Marquette range) is more than 50 miles in a direct line. Below the falls there are heavy accumulations of drift, so that the subjacent rocks are rarely seen; and this bed of iron ore, if it cross [sic – crosses] the river, is effectually concealed.

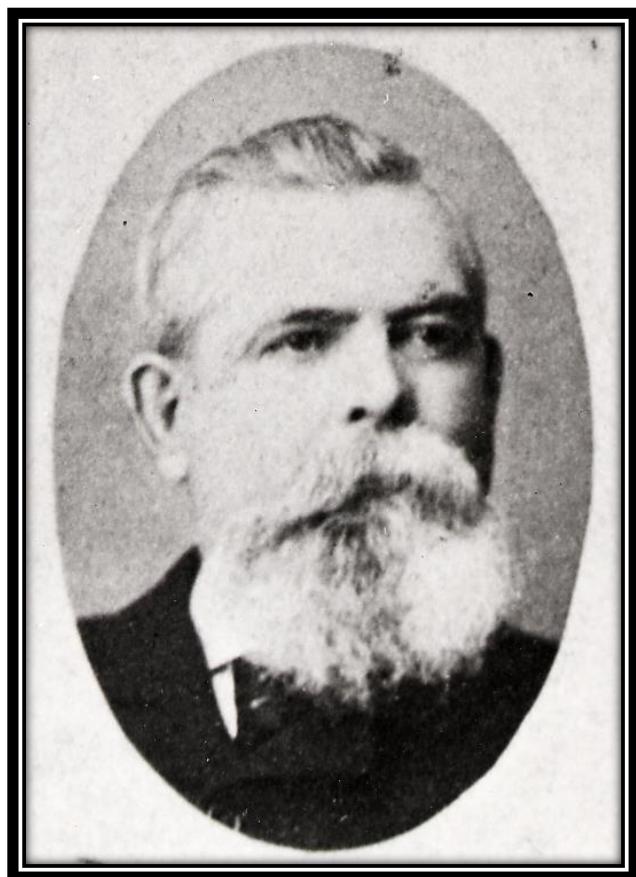
Ironically, little attention was paid to these findings, as noted in the 1894 Lake Superior Mining Institute's proceedings:

It is incredible that the observations of the two geologists should have remained

unverified and forgotten for almost a quarter of a century while the search for iron was feverishly carried on to the north.

Foster and Whitney's report also confirmed William Austin Burt's findings regarding signs of iron ore in the Crystal Falls district.

In 1866, two timber speculators from Menominee, Michigan – brothers Thomas (1836-after 1920) and Bartley (1834-1901) Breen – located iron deposits near what is now Waucedah, Michigan.



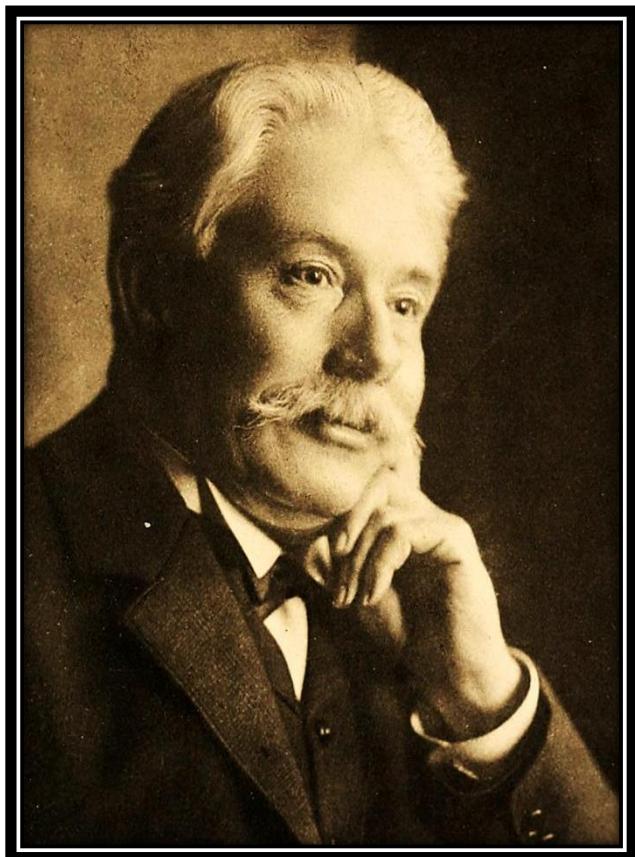
Bartley Breen
(1834-1901)

A year after the Breen brothers made their discovery, Dr. Carl Hermann Credner (1841-1913), a German geologist, passed through the area, making a superficial geological investigation by studying only

MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian

outcrops or surface disclosures, for the purpose of establishing the geological structure of the territory.



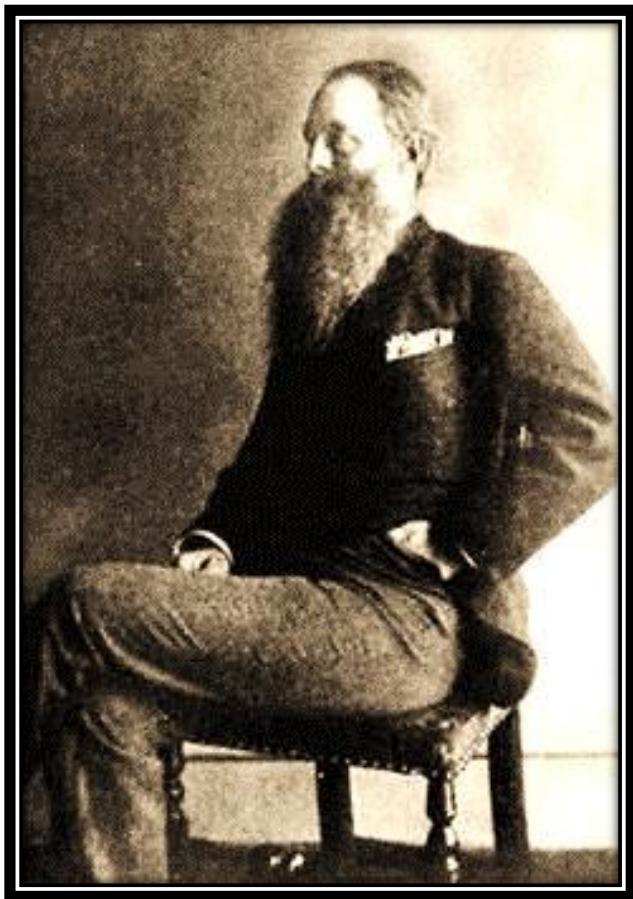
**Dr. Carl Hermann Credner
(1841-1913)**

Educated at Breslau and Göttingen, Credner earned his Ph.D. at Breslau in 1864. From 1864 to 1868, he made extensive geological investigations in North and Central America, the results of which were published in the *Zeitschrift der Deutschen Geologischen Gesellschaft*, and the *Neues Jahrbuch für Mineralogie*.

His descriptions, published in German and apparently not widely read in this country, indicated a large deposit of siliceous iron ore on Section 11, 39-29.

At about the same time, Raphael Pumpelly (1837-1923), a Harvard geology

professor, and Major Thomas Benton Brooks (1836-1900), with John Armstrong as guide and woodsman, traversed every section of the lower Menominee Range, making selections of lands for the Portage Lake & Lake Superior Ship Canal Company.



**Raphael Pumpelly
(1837-1923)**

Between 1868 and 1873 this company constructed a two-mile canal which completed the link between Lake Superior and Keweenaw Bay naturally formed by the Portage River and Portage Lake across the mid-point of the Copper Country's Keweenaw Peninsula. Lake vessels using this route cut one hundred miles from their course on the upper lake region.

MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian

Through petitions to Congress by both Michigan and Minnesota, Michigan was granted 200,000 acres of land to subsidize the company on March 3, 1865. Because the plan of construction finally adopted was more costly than originally anticipated, the legislatures of Michigan, Wisconsin and New York again petitioned Congress, and an additional 200,000 acres were granted on July 3, 1866. Men such as Pumpelly and Brooks served the canal company as landlookers, seeking out the best sections for mineral and timber reserves.

From 1870 to 1871, Pumpelly conducted the geological survey of the copper region of Michigan, for which he prepared "Copper-Bearing Rocks," being Part II of Volume I of the *Geological Survey of Michigan*, published in New York in 1873.

After a year with the New Jersey Geological Survey, having previously served four years in the Union Army during the Civil War, Major Brooks accepted a position as vice president and general manager of the Iron Cliff Mine, near Negaunee on the Marquette Iron Range, in August, 1865.

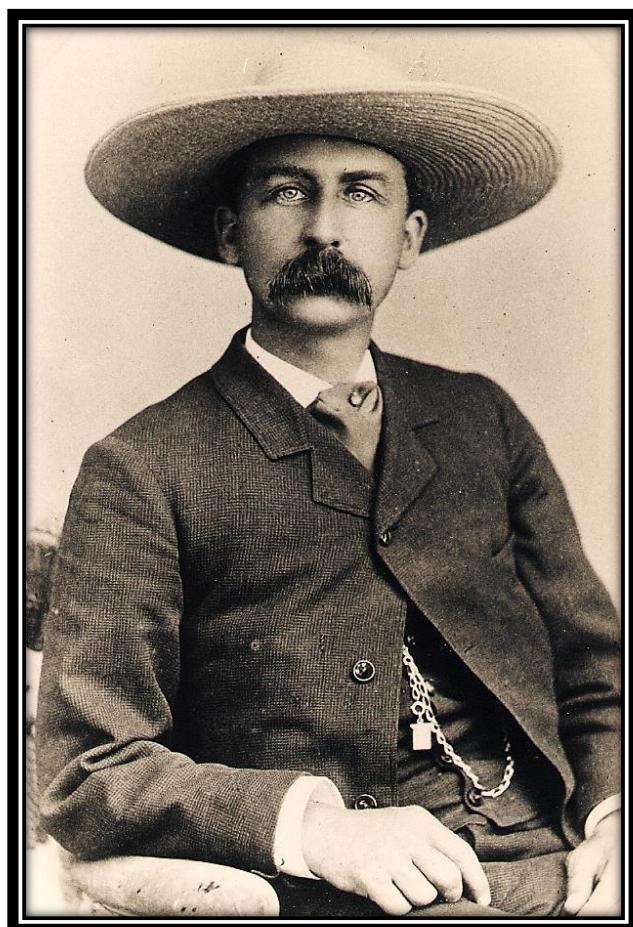
In 1869, Major Brooks, then considered the chief authority on the iron-bearing formations of the Upper Peninsula, was asked to take charge of the Economic State Geological Survey of that district. Brooks served as assistant geologist in charge of the surveys of the Lake Superior iron regions from 1869 until 1879.

In this connection he was associated with Raphael Pumpelly, and prepared the two-volume *Geological Survey of Michigan* which was published in New York in 1873. He also prepared a part of Volume III of *Geology of Wisconsin* which was published in Madison in 1879.

In 1873 Major Brooks' health gave out due to the stress of overwork. He sought relief abroad, residing in London and

Dresden while completing his reports for Volumes II and III of the *Michigan State Geological Survey*.

In 1870, four years after discovering the iron deposits near Waucedah, the Breen brothers, together with Judge Eleazer S. Ingalls (1820-1879) and S.P. Saxton, both prominent Menominee men, obtained title to the land on which the iron ore had been found. Saxton then sunk several test pits and cut two long trenches across the formation, but active mining operations were not fully inaugurated until the Chicago & Northwestern Railway Company completed its branch line from Powers to the Vulcan Mine in the summer of 1877.



Dr. Nelson Powell Hulst
(1842-1923)

MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian

In 1872, this site became known as the Breen Mine and marked the first mining in the district. Soon after, Dr. Nelson Powell Hulst (1842-1923), Milwaukee Iron Company geologist and chemist, began conducting extensive prospecting on the Breen property and a property that would later be known as the Vulcan Mine.

The Breen Mine was opened in 1872, and other locations opened soon afterward. However, in the fall of 1873 the development of the mine was slowed when the effect of the national economic panic hit the Menominee Range and all preparation for mining ceased. By 1874, due to the prior prospecting of Hulst and others, it became evident that mining was a valuable venture and plans were back on track.

The nearest navigable outlet for shipping Menominee Iron Range ore was located at Escanaba, on Lake Michigan's Little Bay De Noc in Delta County.

A direct line known as the Menominee Range Railroad was constructed by the Chicago & Northwestern Railway to the Menominee Iron Range mines on the Peninsular Division from Powers which was completed as far as Quinnesec in 1877. Powers was originally known as "42" as it was located 42 miles from Menominee. During that year the Breen Mine and the Vulcan Mine (originally called the Breitung Mine) shipped a total of 10,405 tons of ore.

By 1878, five mines were actively shipping from the Menominee Iron Range, including the Breen, Cyclops, Norway, Quinnesec and the Vulcan.

By 1879, there were eight shippers moving over 200,000 tons of iron ore.

By 1880 the Chicago & Northwestern's Menominee Range Railroad reached Iron Mountain and Florence, and in 1882 tracks were laid to Crystal Falls and Iron River.

Production at the Menominee Range had steadily increased with each passing

year, and by 1882 a total of more than one and a half million tons had been mined in the first five years. In 1883, production exceeded a million tons, an amount which had taken the Marquette Iron Range more than twenty years to equal.

The Chicago, Milwaukee & St. Paul Railroad also penetrated the region and shipped ore over the Escanaba & Lake Superior line until it reached a pooling agreement for shipment over the Chicago & Northwestern's tracks.

The best known producer was Iron Mountain's Chapin Mine which produced nearly 26 million tons of iron ore from its opening in 1879 to its closing in 1932.

During the twentieth century, high grade ore, originally so plentiful on all three Upper Peninsula iron ranges – the Marquette Iron Range, the Menominee Iron Range and the Gogebic Iron Range – became less available and less profitable to mine. The cost of underground mining became more prohibitive, and the owners of Michigan's mines began to search for other methods of tapping the iron riches of Lake Superior.

Many mining operations were absorbed by larger corporations. Between World War I and World War II, the total tonnage of iron ore shipped fluctuated drastically. In 1920 Michigan shipped over eighteen million tons of ore. In 1921, 1931, 1932, 1933 and 1934 Michigan shipped less than half that amount.

Extensive development of low grade ores and open pit mining began after World War II, and a relatively new process – agglomeration – then began to yield an iron ore concentrate that contained about sixty-five per cent iron compared with fifty-six to sixty per cent from the average underground workings of the high grade ore.

Agglomeration, a process that separates iron ore and waste rock and then roasts the

MENOMINEE RANGE MEMORIES 11: DISCOVERY OF ORE ON THE MENOMINEE IRON RANGE

By William J. Cummings, Menominee Range Historical Foundation Historian

particles until they form small pellets or balls, kept Michigan's iron industry in a strong competitive position and contributed another chapter in the seemingly endless history of Michigan's iron ranges.

The first commercial agglomeration plant began operation in 1952. By 1964, four plants had been opened, but by 1969 only three underground mines were still in operation.

Future Menominee Range Memories installments will feature much more detailed information on the development of the Menominee Iron Range, the building of the railroads and the individuals who played significant roles in the area's iron ore industry.