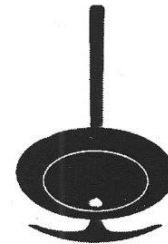


**29<sup>th</sup>**

**ANNUAL CONFERENCE  
OF THE**

**MINING  
HISTORY  
ASSOCIATION**

**MARQUETTE, MICHIGAN  
JUNE 6 – 9, 2019**



## IN MEMORIAM



**Robert “Bob” Trennert**  
MHA President 1997

**Keith Long**  
MHA President 2018

## ACKNOWLEDGMENTS

Many people helped to make this conference possible, and the MHA owes thanks to the following:

Organizing Committee: Mark and Lynn Langenfeld

Program Committee: Terry Reynolds, Stephanie Saager-Bourret and Erik Nordberg

Finally, a big thank you goes to our major sponsors who provided generous support: Travel Marquette, Michigan History Center – Michigan Iron Industry Museum, Eagle Mine – Lundin Mining and Cleveland-Cliffs, Inc.

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# SCHEDULE OF ACTIVITIES

## WEDNESDAY, JUNE 5

7:00 PM – 8:00 PM *Registration, Landmark Inn Lobby*

## THURSDAY, JUNE 6

8:00 AM – 11:00 AM *Registration, Landmark Inn Lobby*  
1:00 PM – 4:00 PM

10:00 AM – Noon **Eagle Mine Humboldt Mill Tour**  
This tour meets at the Humboldt Mill

10:00 AM – Noon **Cleveland-Cliffs Tour**  
This tour meets at the Landmark Inn

1:00 PM – 4:00 PM **Rock Collecting Field Trip**

1:00 PM – 4:00 PM **Central Upper Michigan and Northern Michigan University Archives – Open House and Tour**

1:30 PM – 4:00 PM **Historic Downtown Marquette Walking Tour**  
This tour meets at the Landmark Inn

1:30 PM – 4:00 PM **Cleveland-Cliffs Tour**  
This tour meets at the Landmark Inn

2:00 PM – 4:00 PM **Eagle Mine Humboldt Mill Tour**  
This tour meets at the Humboldt Mill

1:30 PM – 3:30 PM **Council Meeting - Landmark Inn - Board Room**

3:30 PM – 4:30 PM **Editorial Board – Landmark Inn – Board Room**

5:30 PM – 8:00 PM **Reception and Picnic - Cliffs Shaft Museum**  
501 W Euclid Street, Ishpeming

## FRIDAY, JUNE 7

7:00 AM – 11:30 AM *Registration, Masonic Center*

8:00 AM – 4:30 PM *Vendor Tables, Masonic Center Ballroom*

8:00 AM – 8:30 AM *Conference Welcome, Masonic Center Red Room*  
*Stephanie Saager-Bourret, MHA President-Elect, Welcome*  
*Mark Langenfeld, Conference Co-Chair, Conference details*

8:30 AM - 9:40 AM **Session 1: Overview of Upper Peninsula Iron & Gold Mining, Erik Nordberg, Chair**

*Terry S. Reynolds, "Michigan Iron: A Brief History"*

*Paul R. Spyhalski, "Escanaba in the Moonlight: The Escanaba and Gladstone Ore Docks in Hindsight"*

*Daniel R. Fountain, "Michigan Gold and Silver: A Brief History"*

9:40 AM - 9:55 AM **Break**

9:55 AM - 11:30 AM **Session 2: Iron Ore: The Broader Context, Brian Leech, Chair**

*Fred Barnard, "Geological influences on early iron mining in eastern North America"*

*Samuel Di Rocco II, "Jonathan Warner and the Republic Iron Company, 1870-1895."*

*Henry Djerlev, "History of the Berkshire Mine, near Mellen, WI – Miners & Morticians"*

*Tamara Thomsen, "Days of Ore: Underwater Archaeological Investigations of the Freedom Iron Mine, LaRue, Wisconsin, or Captain C. T. Roberts' Wet Prospect"*

11:30 AM - 1:00 PM **Lunch, on your own**

1:00 PM – 2:10 PM **Session 3: Michigan Copper, Eric Nystrom, Chair**

*Sean M. Gohman, "'Unalloyed Potential': The Workscapes of Mass Mining in Michigan's Copper Country"*

*Dan Trepal, "The Minong Copper Mining District National Historic Landmark Project"*

*Seth DePasqual, "Drilling for Hope: Exploration, Technology and the Conclusion of Copper Mining on Isle Royale"*

2:10 PM – 2:20 PM **Break**

2:20 PM – 3:10 PM Session 4: Processes and Machines,  
Eric Clements, Chair

*William W. Culver, "Early Innovations in Copper Hydrometallurgy: The Almost Unknown  
1866 Whelpley & Storer Process"*

*Mark Connor, "Mammoth Machines – The President and Chapin Mine Pumping Engines"*

3:10 PM – 3:20 PM Break

3:20 PM – 4:30 PM Session 5: Coal and Salt,  
Marcus Robyns, Chair

*Patrick Allan Pospisek, "Back to the Salt Mines: Midwestern Saline Leasing and the  
Evolution of the Federal Mining Policy, 1785-1849"*

*Robert P. Wolensky, "Tenancy Systems in the Anthracite Industry: Subcontracting and  
Leasing in the Northern Coalfield of Northeastern Pennsylvania"*

*Stanley Vitton, "The Rise and Fall of Jackson County Michigan Coal Mines: 1853-1893"*

5:30 PM – 6:30 PM Awards Banquet - Social Hour  
Masonic Center Ballroom

6:30 PM – 9:00 PM Awards Banquet, *Masonic Center Ballroom*  
Special presentation by Jack Deo -  
"A 3-D Trip to the Mines in 1870"

## SATURDAY, JUNE 8

8:00 AM – 11:30 AM Vendor Tables , *Masonic Center Ballroom*

8:00 AM – 9:10 AM Session 6: Personalities and Problems,  
Stephanie Saager-Bourret, Chair  
*Masonic Center Red Room*

*Susan Canty, "Jeanne Seaman Farnum: the First Woman Field Geologist in Michigan and  
her Grandfather A. E. Seaman"*

*Allie Penn, "Female Agitators: The Women of the 1913-14 Keweenaw Copper Strike"*

*Ralph W. Godell, "Front Line Stories by a Front Line Mining Lawyer"*

9:10 AM – 9:20 AM Break

9:20 AM – 10:10 AM Session 7: Western Mining,  
Ralph Bourret, Chair

*Ed Raines, "Boulder County (Colorado) steps onto the World Stage with Tungsten in its  
Pocket"*

*Silvia Pettem, "Mining Communities & Characters along the Switzerland Trail of America"*

10:10 AM – 10:20 AM Break

10:20 AM – 11:30 AM Session 8: Mining Miscellany,  
Terry Reynolds, Chair

*Paul T. Brandes and Nathalie Nicole Brandes, "Mining in the Ancient World - - An  
Introduction to Methods and Technology"*

*Matthew Portfleet, "The Adventure Merchant Mine: Provoking Engagement"*

*Brian James Leech and Eric C. Nystrom, "Surveying the Minds: New Trends and Key  
Classics in Mining History"*

Noon – 1:30 PM Presidential Luncheon,  
*Landmark Inn – Harbor Banquet room*  
Passing of the Presidential Pick  
Stephanie Saager-Bourret, MHA President,  
2019-2020, "The Beaver and the Pick: Two  
Worlds Meet"

2:00 PM – 4:00 PM Michigan Iron Industry Museum – Open House  
73 Forge Road, Negaunee  
Exhibits and the film "Iron Spirits"

3:00 PM Presentation by Mary Tippet: "Barnes-Hecker:  
The Legacy of Michigan's Worst Mining Disaster",  
museum auditorium

4:00 PM – 5:00 PM Membership Meeting, museum auditorium

5:30 PM – 8:00 PM The Mather B – Tour, Cudighi sandwiches &  
Documentary Film – "A Vanishing Breed – The  
Men and Memories of the Mather B"  
Negaunee High School  
500 Arch Street, Negaunee, MI

## SUNDAY, JUNE 9

8:00 AM – 7:30 PM All-Day Tour of the Menominee Iron Range

- Cardiff Mine site
- Iron County Historical Museum
- Iron Mountain Cornish Pump and Mining  
Museum
- Iron Mountain (Vulcan) Iron Mine

Bus leaves from the Landmark Inn promptly at 8:00 AM



## MONDAY, JUNE 10

- 8:00 AM – 4:30 PM **Post-Conference Tour of Fayette Historic Townsite** - Transportation by private vehicle
- 10:00 AM **Guided walking tour** - choice of the furnace complex and industrial operations or a tour focused on the company town and social history.
- Noon **Catered lunch at the townsite Hotel**
- Afternoon **On your own**

\* \* \* \* \*

**Gold is for the mistress - - silver for the maid - -  
Copper for the craftsman, cunning at his trade.  
“Good!” said the Baron, sitting in his hall,  
“But Iron - - Cold Iron - - is master of them all.”**

***Cold Iron* by Rudyard Kipling**

**“Because iron, the drudge of industry, is not one of the  
spectacular metals, like gold or silver or uranium, and is content  
to supply people’s everyday needs, it is taken for granted.”**

**D. M. LeBourdais – 1957**

## PAPER ABSTRACTS

**Fred Barnard**

*Geological Influences on Early Iron Mining in Eastern North America*

SESSION 2: Iron Ore: The Broader Context, Friday 9:55-11:30

The Iron Age began in Eurasia about 1200 BC, and strongly influenced the advance of civilization in the Old World through the use of cast iron, wrought iron, and eventually steel. Europeans began smelting iron ores in North America as early as 1620 in Virginia, and by 1646 the famous Saugus Iron Works in Massachusetts was a world-class facility. Canada entered production with iron forges at Saint-Maurice, Quebec in 1730.

Communities in eastern North America prior to the 1800’s were confronted with a paucity of high-quality iron ores for even their modest needs, the huge Lake Superior ores being far out of their reach to the west. Early iron production mainly exploited surficial “bog iron” ores, small deposits of which are locally abundant near the Atlantic coast. Bog iron is an accumulation of iron hydroxides, which precipitate when reduced, acidic groundwater in swamps emerges to the surface and becomes oxidized on contact with air. The resulting surficial scab-like deposits, composed of the mineral goethite (FeO(OH)) and related minerals, are usually small and thin. Furthermore, they are invariably impure and are composed of hydrous minerals which require large energy inputs to de-hydrate, reduce, and melt to elemental iron.

As development proceeded inland, a variety of other iron-ore deposits were found with superior smelting qualities, including some with high phosphorus which rendered them suitable for cast iron, but less so for steel. These included the magnetite ores at Cornwall, in southeastern Pennsylvania, which were mined continuously for 240 years, from 1732 to 1972, at Valley Forge, Pennsylvania (1742), and elsewhere. New York’s Adirondacks yielded high-grade iron mines in Precambrian rocks at Plattsburg (1798), and other places in spite of their rugged, inland locations, far from markets.

Exploration of the Appalachians revealed a sedimentary layer containing iron ore, first named at Clinton in Oneida County, New York in 1797. This layer, the “Clinton Iron Ore”, extends semi-continuously in Silurian age rocks as far south as Birmingham Alabama. It was exploited in New York (from 1852),

Pennsylvania (1845), Virginia (1825), Kentucky (1791), Tennessee (1868), and Alabama (1828). Sedimentary ores of other ages were also exploited in most of these states. The initiation of ore production from huge deposits in the Precambrian Canadian Shield of the Lake Superior area (Michigan in 1846, Minnesota in 1884, Wisconsin in 1884) eventually relegated most of the Eastern mines to niche roles, and ushered in a new era in North American iron mining.

- Fred Barnard is a retired hard-rock minerals exploration geologist. He worked in exploration for two major mining companies (International Nickel and Anaconda Minerals) for a total of 17 years, followed by 28 years as a consulting geologist based in Golden, Colorado. His work included examination of metal mines, mineral prospects, and developments in every Western state and in 45 foreign countries. Fred presented papers at Globe (2006), Prescott (2012), and Trinidad (2014), and has attended several other MHA Conferences. He is promoting the MHA 2021 Conference in Birmingham, where the focus will be on historical iron mining. The Marquette and Birmingham meetings will provide two contrasting case histories of the exploitation of iron ores.

#### **Paul T. Brandes and Nathalie Nicole Brandes**

##### *Mining in the Ancient World-- An Introduction to Methods and Technology*

#### **SESSION 8: Mining Miscellany, Saturday 10:20-11:30**

Traditionally, the ages of ancient history are divided based upon the material used for tools and weapons resulting in the Stone Ages (Palaeolithic, Mesolithic, and Neolithic), Chalcolithic (Copper Age), Bronze Age, and Iron Age.

Even in the earliest of these periods, the Palaeolithic, mining was actively undertaken. These early mines were often surface trenches or shallow bell pits used to extract chert for tools or minerals for making pigments. Mining tools used during this time were mostly hammerstones and horn picks, which were only effective in working softer sedimentary rocks. By the Neolithic, underground mines had grown in size, but were still shallow. Stone, bone, and antler tools were still being used. The Chalcolithic marks a major advancement in mining technology. Metals, especially copper, were extracted using firesetting to soften hard rocks. In addition, the development of smelting

allowed people to separate metal from ore minerals such as copper carbonates and copper sulfides. Casting methods, including lost wax casting, were also developed at this time. Advances continued into the Bronze Age when, in addition to firesetting, bronze tools were used, which allowed underground mines to become deeper and more expansive. The first documented use of iron and thus the beginning of the Iron Age was by the Hittites in present-day Turkey. Although iron is more difficult to smelt than other metals, this new technology spread across Europe.

The high point of the mining industry in the ancient world was with the Romans, who operated both opencast and underground mines throughout the empire. Romans still used firesetting to weaken rock, but also used iron tools such as picks, gad bars, and battering rams. When geologic conditions were favorable for it, they employed a form of hydraulic mining. Roman mining resembled modern mining in several ways. The Romans began timbering their underground mines as well as using room and pillar methods. Ore was extracted from shafts using a windlass and basket or bucket. Illumination of underground mines was accomplished with oil lamps. These lamps were also used to test air quality and determine where dedicated ventilation shafts were needed. The Romans used several methods for dewatering deep mines; including French drains, bailing buckets, screw pumps, and waterwheels. The techniques developed by ancient miners and improved by the Romans would not change significantly until the 19<sup>th</sup> century with the introduction of blasting agents such as black powder and dynamite to aid in breaking rock, followed by steam driven engines to bring this material to the surface.

- Paul Brandes is the proverbial "jack of all trades" geologist. In addition to his everyday job as a Professor of Geology, he is also a professional photographer, world traveler, and mining historian. Mr. Brandes holds degrees in geology from the New Mexico Institute of Mining & Technology and Michigan Technological University. His work as a geologist and photographer has taken him to almost every corner of the world, and his contributions to earth science include numerous photos for college textbook publishers, a contributing advisor on several geology books, and significant involvement with the discovery and naming of the new mineral species "Centennialite". With his geologist wife Nathalie, they travel the world in search of new and exciting places to study geology and add to their mineral and photographic collections.

## Susan Canty

*Jeanne Seaman Farnum: the First Woman Field Geologist in Michigan and her Grandfather A. E. Seaman*

SESSION 6: Personalities and Problems, Saturday 8:00-9:10

During the Mining History Meeting in Telluride in 2016 it was suggested that we get oral histories from our more experienced members of the mining community while we could. My husband Mike and I looked at each other and both mouthed, "Jeanne". I rose to the challenge and interviewed Jeanne. Jeanne Seaman Farnum is currently 96 years old and was the first woman field geologist in Michigan. Her story is fascinating but, then, she comes from a fascinating background. Her father was Wyllys Seaman and her grandfather was Arthur Edmund Seaman. The A E Seaman Mineral Museum located on the Michigan Tech campus is named for Jeanne's grandfather. The presentation will look at Jeanne's early life and education, her professional life, and her married life. I don't think you can look at Jeanne's life without being aware of the influence her grandfather, A. E. Seaman, had in it. Therefore, I plan to weave A E's life throughout the talk.

- Susan Canty is neither a professional historian nor a miner. She is a retired early childhood teacher who has lived with a geologist for 53 years, participated in numerous mining related activities and tours. Jeanne Farnum and her family are very dear to Mike and I, and I thought it would be fun to learn more about Jeanne and present her story from a layman's point of view.

## Mark Connor

*Mammoth Machines – The President and Chapin Mine Pumping Engines*

SESSION 4: Processes and Machines, Friday 2:20-3:10

This presentation will compare The President and the Chapin Mine pumping engines. The President, located in Friedensville PA, and the Chapin Mine engine, located in Iron Mountain MI, represent world-scale mechanical engineering achievements, and are among the largest, most powerful pumping engines ever constructed.

Although described as "Cornish Pumps", both engines are not classic Cornish pump designs, but, rather, they are derivative of earlier Cornish designs. The

two pumping engines have some striking similarities to each other, and we will explore the circumstantial evidence which supports a theory that the designer of The President influenced Edwin Reynolds, the designer of The Chapin Mine engine.

In this presentation, the audience will learn about both engines and how they compare to each other and to a classic Cornish Pump design. The importance of Cornish pumping technology in mining applications will be discussed. We will review the successful, albeit brief, operational history of both engines. Lastly, we will close with an update on efforts underway to create a heritage park around surviving President pumping engine house in Friedensville.

- Mark Connor, a Mine History Association member, is a retired businessman with a long interest in industrial heritage. Mark has had a lifelong fascination in the Friedensville area zinc mines. He has made the protection, preservation, interpretation and recognition of existing physical remains and archival information a primary retirement project.

He is a Founding Member of the National Museum of Industrial History, in Bethlehem PA, and is on the Board of Trustees of the Historic Bethlehem Partnership. He is a member of the Oliver Evans Chapter of the Society for Industrial Archeology (SIA). In his business career, Mark was, at different times, responsible for the commercial relationships required to secure major capital machinery and equipment for a leading, global industrial gas and chemical company. Mark holds an MBA degree from Lehigh University and an AB degree in anthropology from Brown University with subsequent graduate level course work at the University Museum, University of Pennsylvania in Philadelphia.

## William W. Culver

*Early Innovations in Copper Hydrometallurgy: The Almost Unknown 1866 Whelpley & Storer Process*

SESSION 4: Processes and Machines, Friday 2:20-3:10

Existing histories of hydrometallurgy look to the breakthrough processes at the end of the 19<sup>th</sup> century as the starting point for the application of wet processing for metallic ores. Existing histories recognize the early patents for

processing Spanish copper pyrites to produce sulphuric acid, with copper as a by-product, but the myriad other patents and efforts are mostly unexamined.

The research to be presented is part of an examination of decades of work by a number of chemists or scientists, and hydro-metallurgists, over the 1860s to the 1880s. Their efforts, while chemically successful, failed to gain wide commercial application. Yet these pioneers deserve recognition as they are the foundation of subsequent commercial successes – they showed the way ahead.

In the 1860s Samuel Kneeland edited and published in Boston a science annual under the name Annual of Scientific Discovery: or, Year-Book of Facts in Science and Art. In the volume for 1868 he wrote, "At a recent meeting of the Massachusetts Institute of Technology [MIT], Dr. James D. Whelpley read a paper on the chemical process of obtaining red oxide of copper from the ores at Harvey Hill, Canada east, where the first trial was made, on a large scale, of a new metallurgical process, which promises to effect a complete revolution in the working of metallic ores, especially the sulphides." This was the *Whelpley and Storer Process*. It was being tested at a copper property where Dr. James Douglas' was heavily invested. His son, James Douglas, Jr.' experimented with the *Whelpley and Storer Process*; a process which gave him his start in metallurgy.

The paper explores the circumstances of the *Whelpley and Storer Process*, the people involved, and the intellectual context at a time when Boston was a center of metallurgical innovation. This was the era when academic chemistry was organized in the United States, when MIT was founded, and when Harvard University initiated its chemistry program, and when nearby Yale University began the first academic chemistry program under the senior Benjamin Silliman.

The problem at the Harvey Hill mine was how to make commercial use of the lowering grades of ore. In the 1860s "low grade" was applied to ore below 5% copper. Laboratory experiments could then remove metals from ore, but commercial applications escaped the mining industry until the 1840s and *Henderson Process* or *Longmaid Process* was applied to the Spanish "copper pyrites." The challenge was to find a low grade process for other copper ores.

- Bill Culver retired from teaching in 2007 to concentrate on mining history. He taught courses in political science and Latin American studies at the State University of New York at Plattsburgh starting in

1971. His mining history research has concentrated on 19<sup>th</sup> century copper politics, mostly in Chile. His most recent work looks at James Douglas and the nature of Douglas' hydrometallurgical innovations. Culver has one edited book, *Miners and Mining in the Americas* (1986), and many articles on the history of Chilean copper mining in both Spanish and English. His article "*Capitalist Dreams: Chile's Response to Nineteenth Century Copper Competition*," won the 1990 Conference Prize (American Historical Association, Conference on Latin American History, for the "Best Article on Latin American History"), and the article has subsequently appeared in several collections. In addition to the MHA, he is active in the International Mine History Association, and the Historians of Latin American Mining, and the Canadian Metallurgical Society/History Committee. In other interests, Culver writes on the national legislatures in Chile, Argentina, Peru, and Bolivia. He lives in San José del Cabo, Baja California Sur, and Mooers Forks, New York.

#### Seth DePasqual

#### ***Drilling for Hope: Exploration, Technology and the Conclusion of Copper Mining on Isle Royale***

SESSION 3: Michigan Copper, Friday 1:00-2:10

Beginning no less than 4500 years ago, people made the difficult journey to Isle Royale in search of copper. From informal canoe wanderings to systematic diamond drilling, hammerstones to blasting powder, the parties involved employed the latest of survey and extraction methods available to them across several millennia. This paper gives focus to the finale of copper mining on Isle Royale, which is signified by the exploration activities of the Wendigo Copper Company (1889-1892). The Company never located a viable copper resource, nor did it develop a working mine; however, it did produce a series of drill cores, the interpretation of which yielded a lasting contribution to our present understanding of the island's geologic history. Recent archaeological surveys have provided additional detail on the Wendigo Copper Company story. It's extensive network of wagon roads, prospect trenches and drilling stations are evident throughout the island's rugged interior. Some of these features are located along the well-beaten path, within plain view of passing hikers who often believe (or have been led to believe) that they are meandering through pristine wilderness. Such features afford unique



opportunities for interpretation, to celebrate the island's more industrious past within the confines of modern Wilderness management.

- Seth DePasqual is the Cultural Resources Manager for Isle Royale National Park, and has been conducting field work there since 2009. Formally trained as an archaeologist, he has studied the past in locations across America and in Norway. Citing the island's rich inventory of pre-contact and historic endeavors, Seth considers Isle Royale to be a dream medium for archaeological research.

### Samuel Di Rocco II

*Jonathan Warner and the Republic Iron Company, 1870-1895*

SESSION 2: Iron Ore: The Broader Context, Friday 9:55-11:30

This paper proposal is based on my Ph.D. dissertation titled "In the Shadow of Steel: Leetonia, Ohio and Independent Iron Manufacturers in the Mahoning and Shenango Valleys, 1845-1920" (2012). One of the individuals examined within my dissertation is Jonathan Warner (1808-1895). Warner played an instrumental role in the growth of Ohio's Mahoning Valley as a center of coal mining, iron ore mining, and iron manufacturing during the mid to late nineteenth century. By 1870, after more than three decades of significant mining, the once "inexhaustible" block coal of the Mahoning Valley was beginning to vanish, and the highly sought after black-band iron ore was diminishing as well. As a result, Mahoning Valley iron manufacturers started shipping high quality coke from the Connellsville coking fields to their blast furnaces. Likewise, Lake Superior iron ore and iron ore from Missouri started to replace black-band iron ore in Valley blast furnaces starting in the 1860s. Because of these developments, Jonathan Warner redirected his focus to iron ore mining in the Lake Superior ranges through the formation of the Republic Iron Company in the summer of 1870. Examining Warner's transition to iron ore mining in Michigan's Upper Peninsula is critically important when attempting to understand how independent iron manufacturers' at Leetonia, Ohio and throughout the Mahoning Valley remained viable amid diminishing access to high quality local coal and iron ore deposits.

- Samuel Di Rocco II, Ph.D. is currently an adjunct history instructor at Notre Dame College outside of Cleveland, Ohio. He received his Ph.D. in history from the University of Toledo in 2012 under the direction of Dr. Diane F. Britton. Sam has presented papers as well as chaired and commented on panels at the Ohio Academy of

History from 2006 through 2012. He has also presented papers at the 24<sup>th</sup> Annual Ohio Valley History Conference, and the 40<sup>th</sup> Annual American Italian Historical Association Conference.

### Henry Djerlev

*History of the Berkshire Mine, near Mellen, WI – Miners & Morticians*

SESSION 2: Iron Ore: The Broader Context, Friday 9:55-11:30

The Berkshire Mine was a small iron ore producer located on the western end of the Gogebic Iron Range known as the Penokee Range. The Gogebic Range extends from western Michigan, 15 miles east of Wakefield, crossing the State line into Wisconsin and more than ten miles west of Mellen, WI. The mine is now all but lost to time and the heavy overgrowth. Although its ore production was very minor, the significance of the Berkshire is that it was one of the early pioneers in magnetic concentration of lean iron ores in the Lake Superior District. Its only iron ore was shipped from 1922 to 1924, when iron ore prices dropped.

The mine site was originally known as "Hoppenyan Lands" and was acquired by Bernard Herman Hoppenyan, a German immigrant, in 1860 (probably discovered while he was manning a survey crew for Col. Charles Whittlesey). Bernard and his family were among the first pioneers that settled at Chequamegon Bay in Lake Superior which later became the site of Ashland, WI, and were prominent community leaders in many capacities.

As often is the case, the people behind the discovery and development of a mine are the real story. For three generations the Hoppenyan family were well known and respected undertakers in Wisconsin, Michigan, Minnesota, Indiana and eventually California. During their life in Ashland they were city fathers, and their "day jobs" included the first automobile dealership, a cleaning products business and pharmacy along with their mortuary. However they also had a strong interest in exploring and mining on the Gogebic Range.

Bernard and two of his sons Bernard J. and Maytor B. explored their properties with hand dug test pits and several shafts. Investors were sought for the land which was touted in the newspapers: "the Hoppenyan and Pioneer properties are beyond question the most valuable discoveries on the entire range during the past year (ie. 1887), and are attracting many visitors to the west end of the range."

The father passed away in 1914, and subsequently the brothers sold their property to The Berkshire Mining and Development Company, chartered in St. Paul, MN. Electromagnetic separation was used in concentration of the ore, and the product was railed to the Ashland Iron & Steel "Hinkle" charcoal blast furnace, the nation's largest, and shipped out as pig iron. Maytor B. Hoppenyan moved to Los Angeles, CA, took his wife's last name of McKinley, and became the owner of "America's fastest growing funeral firm" (with more than 18 mortuaries in Los Angeles). Following 1924, when the Berkshire closed, reorganization as the Pioneer Mine was attempted several times. Not being successful, the property was sold to Oliver Iron Mining (USS) in 1934.

- Henry Djerlev graduated with a B.A. in geology from the University of Minnesota, Duluth, in 1970. He first worked for Pickands Mather Company, which was eventually absorbed by Cleveland Cliffs, its long-time competitor in the Lake Superior Iron Ore District. After four years as an exploration geologist in Alaska, the western U.S., and western Canada, he spent the following thirteen years as a consulting geologist and owner of Superior GEO-Services, located in Hibbing, Minnesota. He held registration as a Professional Geologist with the AIPG, and was also licensed as a Professional Geologist with the State of Minnesota (now retired status). In 2014, full retirement became the solution to allow extensive leisure travel and numerous hobbies.

## Daniel R. Fountain

### *Michigan Gold and Silver: A Brief History*

#### SESSION 1: Overview of Upper Peninsula Iron & Gold Mining, Friday 8:30-9:40

Finding gold and silver was one of the objectives of the earliest European explorers to visit the Lake Superior country. The native people were familiar with native copper which they used for tools and jewelry, but they knew nothing of the yellow metal. The explorers soon turned their attention to the more abundant copper and iron deposits. Small amounts of gold were found as early as 1845, and silver was a valuable by-product of the Keweenaw copper mines. A discovery of silver lead, a lead ore carrying significant amounts of silver, started a prospecting rush in northern Marquette County in the mid-1860s, but no successful mines were opened. Silver was found again in Ontonagon County in the 1870s, but economic pressures and unfavorable geologic conditions condemned these mines to failure, despite an extensive formation of rich silver ore. It was not until the opening of the Ropes Gold

Mine in the early 1880s that gold mining took its place in Michigan's history. The Ropes mine ran for 14 years and produced \$645,792 in gold and silver, but was never able to pay a dividend to its stockholders.

In the months and years following the establishment of this first mine, more than 75 other gold mines and prospects were begun in the Upper Peninsula. The most famous of these was the Michigan Gold Mine, a few miles southwest of the Ropes, which produced some spectacular specimens of free gold but was never able to turn a profit. Most of the other prospects consisted of only a few trenches and pits, producing no more than traces of the precious metal. Most prospecting had ceased by the early 1900s, but the Great Depression and the increase in the price of gold from \$20.67 to \$35 per ounce brought about another prospecting boom in the 1930s. World War II called a halt to gold mining, and the prospects lay idle until the abandonment of the gold standard in 1971 and the resultant dramatic rise in the price of gold. Improved metallurgical methods and higher gold prices in the 1970s and '80s led to the reopening of the Ropes mine, which again began producing gold in the fall of 1985. The reopened mine produced until 1989, when a combination of low gold prices, poor ore grade, and a collapse of rock in the production shaft prompted its shutdown.

- Dan Fountain is a mining and maritime historian with a deeply rooted appreciation for Michigan's mining heritage and an avid interest in the rich and colorful history of the early sailors, settlers and miners. Dan grew up in the small Upper Michigan mining town of Ishpeming, surrounded by the open pits and towering headframes of the area's iron mines. Much of his understanding and curiosity about the region's mining history stems from growing up in that atmosphere. Three generations of his family were involved in the iron industry, so it was no surprise that Dan made his living in the mines. He worked more than 30 years in the Michigan iron ore mines as an electronic technician. He is a graduate of Northern Michigan University, holding a degree in electronics. For more than three decades, Dan has conducted extensive research on the history of mining in Michigan and shipwrecks of the Great Lakes. To get a better feel for the stories, he has hiked many miles in the rugged forests of Upper Michigan in search of the numerous gold and silver mining prospects about which he writes. Dan is the author of *Michigan Gold and Silver: Mining in the Upper Peninsula*, and is co-author with Frederick Stonehouse of *Dangerous Coast: Shipwrecks of the Pictured Rocks*. He has also written for *Michigan History Magazine* and *Rocks & Minerals*, and has also served as a guest lecturer aboard Great Lakes cruise ships.

## Ralph W. Godell

*Front Line Stories by a Front Line Mining Lawyer*

SESSION 6: Personalities and Problems, Saturday 8:00-9:10

The speaker, who spent 27 years on the front lines of legal work for three major mining companies as in-house counsel worked on projects and mines around the world, including five years in Chile. He recounts several incidents and experiences that were near-disastrous, deviously innovative or with surprising twists. He also lists the lessons learned from those experiences. The incidents include an unwelcome intruder during litigation settlement; the power of a bid; managing the unmanageable - foreign exchange; and a nearly successful claim jumping scheme.

- Born in Marquette, Michigan, Mr. Godell received his B.S. from Michigan State University and J.D. from Wayne State University Law School and was admitted to the Colorado Bar in 1975. He has worked as in-house counsel for Cyprus Minerals Company in Denver; Placer Dome in Santiago, San Jose, Reno and Denver; and Rio Tinto in Centennial, Colorado. While in Santiago, he was named General Manager of the Cerro Casale Project during feasibility studies. He has also worked with several law firms in private practice. He is fluent in Spanish and resides in Fort Collins, Colorado.

## Sean M. Gohman

*Unalloyed Potential: The Workscapes of Mass Mining in Michigan's Copper Country*

SESSION 3: Michigan Copper, Friday 1:00-2:10

This paper adopts the concept of workscape, defined by Andrews (2010) as a three dimensional "constellation of unruly and ever-unfolding relationships" between animate and inanimate actors, to illuminate the unique activities associated with the extraction of mass native copper in Michigan's Keweenaw peninsula, 1845-c.1880. These activities, while occurring over the course of several decades, in effect mark the formative stage of what would become the Lake copper district. The Lake copper industry continued well into the mid-twentieth century, but by the late nineteenth century copper mined from deposits of finely disseminated copper such as the Calumet conglomerate lode had replaced fissure-bound mass copper. The technologies, fuel, and practice

of mining lode copper was far removed from those of mining mass copper, and in many cases the former erased or built over the physical traces of the latter.

Mass mining workscapes were the earliest manifestations of potential for the Keweenaw, and while they were replaced, they set the stage for lode mining's long and fruitful success. Uncovering these earlier workscapes of mass mining, defined by isolation and local organic energy sources, relies on the use of two-dimensional maps of the period to recreate not only the envisioned potential for the Keweenaw, but how that envisioned potential became reality. This paper uses the Cliff mine, the most successful and thoroughly documented mining enterprise of the mass mining period, as a case study to focus the narrative and provide illustrative examples.

- Sean M. Gohman recently received his PhD in Industrial Heritage and Archeology from Michigan Technological University. Gohman has been researching Michigan's Copper Country for nearly a decade, focusing primarily on the earliest phases of activity during the mid-eighteenth century. Currently, Gohman teaches the Copper Country History course at Michigan Tech and is the primary investigator of a three-year archaeological and historical inventory for Isle Royale and Keweenaw National Historical Parks. Gohman's other research interests include landscape perspectives of extraction, historical mapping, the appreciation of waste linked to industrial practice, and the historic connection between industry and sport.

## Brian James Leech and Eric C. Nystrom

*Surveying the Minds: New Trends and Key Classics in Mining History*

SESSION 8: Mining Miscellany, Saturday 10:20-11:30

In Spring 2019, Brian James Leech and Eric C. Nystrom conducted an online survey of mining historians to gather data about readers' perceptions of the best "classic" and "recent" mining history books in the body of literature of mining history. In this presentation, we draw upon our survey, earlier historiographical work, and the traditional techniques of scholarly historiography to sketch the historiography of mining history.

Most historiographic reviews consist of a single scholar attempting to describe recent trends in the field based on her/his assessment of their relative importance, or of a review of relevant works as part of the normal apparatus

of a peer-reviewed publication. Less common are historiographic essays that consider a wider range of input, attempting to survey the subfield as a whole. In this study, the authors solicited input from other self-identified scholars of mining history and cognate fields. This data will be used in conjunction with the traditional historiographic essay technique to create an overview of the field that is not based solely on one scholar's outlook. As noted below, existing historiographical reviews of sufficient scope are quite dated, and a relatively recent wave of promising work by younger scholars has not been examined at all in this fashion.

Some past studies by other authors serve as essential points of comparison, to examine changes in the field over time. There have been a small number of historiographic essays which attempted to survey much of the field but were written in a traditional single-scholar mode; these are now somewhat out of date but are valuable for their review of earlier work. (Rohrbaugh 2004; West 1996; Wyman 1986; Spence 1983) Importantly, Lysa Wegman-French has compiled a list of "Recent Publications on the History of Mining" that has been published annually in the *Mining History Journal* annually since 2002. Finally, a 1998 study surveyed "senior mining history specialists" to develop a list of "most recommended" books in mining history. (Spude 1998) This latter study will be referenced explicitly in the proposed study as a point of comparison, both to see changes in the "classics" over time, and because of its approach utilizing a survey technique.

- Brian James Leech is Associate Professor of History at Augustana College. His book, *The City That Ate Itself: Butte, Montana and Its Expanding Berkeley Pit*, was published by the University of Nevada Press in 2018. Leech serves the Mining History Association as Secretary and chair of the Nominating Committee and the Research Grants Committee, and is a frequent presenter at MHA conferences.
- Eric C. Nystrom is Associate Professor of History in the College of Integrative Sciences and Arts at Arizona State University. He is founding editor of the *Mining and Society* book series at the University of Nevada Press. Nystrom has held a number of positions in the MHA, including a stint as Newsletter Editor and council member, and his book *Seeing Underground* was awarded the 2015 Spence Prize.

## Allie Penn

### *Female Agitators: The Women of the 1913-14 Keweenaw Copper Strike*

#### SESSION 6: Personalities and Problems, Saturday 8:00-9:10

This presentation looks at the women strikers of the 1913-1914 Keweenaw Copper Strike. The women were part of the strike from the first day. They participated in the parades, rallies, and picket duty. They were arrested and harassed by pro-mine forces including the Houghton County deputies, Waddell-Mahon men, and even the Michigan National Guard. They persisted to push for change exhibiting assertive masculinity and at times abandoned their domestic responsibilities at home in order to push for lasting change outside of the house. This presentation uses newspaper reports and first-hand accounts of the strike to show the strength and courage of these female agitators.

- Allie Penn is a graduate student at Wayne State University, studying information science and history. She received her bachelor's degree from Northern Michigan University. She studies twentieth-century history with a focus on labor history.

## Silvia Pettem

### *Mining Communities & Characters along the Switzerland Trail of America*

#### SESSION 7: Western Mining, Saturday 9:20-10:10

*The Switzerland Trail of America* — the name given to the 1898-1919 years of a narrow-gauge railroad in Boulder County, Colorado, tied together a promising gold mining industry with an influx of tourists eager to experience spectacular mountain scenery. As the trains threaded their way through the mining communities of Wall Street, Sunset, Puzzler, Camp Frances, and Ward, they also connected colorful characters that included Charles Caryl (with dreams of forming a utopia) to Horace and Baby Doe Tabor, who tried to recoup their lost fortune.

Lesser-known men and women — from a mine manager and his daughter to a father-daughter team of civil engineers, left a lasting impact as well. This presentation focuses on the railroad's social history and on sites that can still be visited today.



- Sylvia Pettem, a long-time Boulder County, Colorado, resident, has lived in, explored, and studied her area's mining communities for decades. She also writes a history column for the Boulder *Daily Camera* and is the author of more than a dozen books. Pettem and her husband Ed Raines have attended many MHA meetings since their first in Leadville, in 1991.

## Matthew Portfleet

### *The Adventure Merchant Mine: Provoking Engagement*

SESSION 8: Mining Miscellany, Saturday 10:20-11:30

The Adventure Merchant Mine is a historic copper mine located in Northern Michigan. Mined from 1850 to 1920, this native copper mine was part of the famous Keweenaw Copper District. In 2004 The Adventure Merchant Mine reopened as a Heritage Site, using its tremendous history as the framework for educational tours. This presentation describes how the Adventure Merchant Mine has strived to create experiences that engage the public on a personal level in three ways: guest engagement, practical experiences, and community outreach.

The mine offers three distinct categories of tours: easy walks underground, those requiring the use of ropes and harness, and experiences with hands on mining equipment. Adventure Merchant Mine tours strive to push guests just outside their comfort zone, in a safe and non-threatening way through physical experiences such as rappelling, but also in more subtle ways in even the shortest tour. Not every visitor will select a tour that involves rappelling or spending a day in a mining workshop, where they run air drills or use explosives. Few guests actually choose the most demanding or difficult tours, but the fact that they are offered creates a culture of immersive experience that supports the mandate of the Adventure Merchant Mining Company. Additionally, visitors at the Adventure Merchant Mine are placed in physical situations specific to location and the mining experience, affording them the opportunity to learn with their bodies. As this approach requires extensive planning on the part of the tour operator, guide training at the Adventure Merchant Mine positions safety, mining history, and guest experience nearly equally.

The Adventure Merchant Mine's collaborative relationships with The National Park Service, local historic sites, Michigan Technological University, and Keweenaw Trails support developing programs that engage community. This

outreach is reflected in the guest experience as university coursework, cycle racing, site maintenance, and specimen recovery, which offer glimpses into other working facets of the Adventure Merchant Mine.

- Matthew Portfleet is the Director of Mine Safety and Health at Michigan Technological University in Houghton, Michigan, USA. He has owned and operated the Adventure Merchant Mining Company, located in Greenland, Michigan, USA, since 2004 offering historic tours, mining educational workshops, and industrial training programs. Mr. Portfleet also teaches university classes in Drilling and Blasting and in Mine Safety, and works in cooperation with many conservation agencies designing and constructing bat habitat-friendly abandoned mine closures.

## Patrick Allan Pospisek

### *Back to the Salt Mines: Midwestern Saline Leasing and the Evolution of Federal Mining Policy, 1785-1849*

SESSION 5: Coal and Salt, Friday 3:20-4:30

Although the production of salt by means of evaporation might appear unrelated to the wider history of mining in the United States, government officials in the late eighteenth and early nineteenth centuries closely linked the presence of salines and metallic mineral deposits in the formulation of federal land policies. In its 1785 Land Ordinance, Congress required government surveyors to note the location of value enhancing features like salt springs, mineral deposits, and potential mill seats on public lands. Years later, in 1807, the federal Congress would specifically reserve lands containing lead or salines from sale and instead authorize the leasing of those properties. Between 1807 and the late 1840s, multiple presidential administrations constructed, tweaked, and ultimately abandoned a system in which these reserved lands were leased for private development. Generally perceived as a failure by the 1840s, the dismantling of the federal leasing system effectively eliminated the implementation of such a program with the 1848 discovery of gold in California or any of the later mineral rushes of the nineteenth century. Turning instead to a faith in private development, Congress codified the rights of prospectors on public lands in a series of laws culminating in the General Mining Act of 1872.

This presentation will shed light specifically on the role of saline reservation and leasing in the development of federal mining policy during the nineteenth century. Building off of work presented at a previous Mining History

Association conference, I argue that an understanding of mining policy in the First West (namely in the states of Illinois, Missouri, Wisconsin, Iowa, and Michigan) better contextualizes the mining booms of the Great West and the late nineteenth-century embrace of laissez faire policies limiting government involvement in the business of mining.

- Patrick Allan Pospisek holds a Ph.D. from Purdue University and presently teaches in the History Department of Grand Valley State University. His work focuses on the evolution of early American mining policy between the late eighteenth century and the General Mining Act of 1872 as well as the history of the American Midwest. A recipient of a past Mining History Association research grant, his work has also been published in the *Journal of the Illinois State Historical Society*, *Historical Geography*, and *Buildings & Landscapes*. Coincidentally, he currently serves as treasurer of a different MHA (the Midwestern History Association).

#### Ed Raines

*Boulder County [Colorado] Steps onto the World Stage with Tungsten in its Pocket*

SESSION 7: Western Mining, Saturday 9:20-10:10

Boulder County tungsten was introduced to the world at the Paris Universal Exposition in 1899, when John H. Knight exhibited his collection of the manganese tungstate mineral hübnerite from the Ward District. Even Alfred Krupp (owner of Krupp Steel) was impressed. He offered Knight a lucrative contract for some of his tungsten production, but Knight had only collected specimens; he wasn't actually mining anything. None the less, Boulder's coming command of the world's tungsten supply was assured the very next year when Nelson Wanamaker and Samuel Conger picked up more than 40 tons of the iron tungstate mineral ferberite scattered across the surface of some land they had leased about a mile northwest of the little town of Nederland. That lease became the Conger Mine, Nederland became the "Tungsten Capital" of Colorado, and Boulder County became the world leader in tungsten production during the World War I years.

- Ed Raines is Collections Manager at the Colorado School of Mines Geology Museum in Golden, Colorado.

#### Terry S. Reynolds

*Michigan Iron: A Brief History*

SESSION 1: Overview of Upper Peninsula Iron & Gold Mining, Friday 8:30-9:40

Designed to provide those attending with a context for what they will be viewing around Marquette, this presentation provides an overview of the history of iron mining on Michigan's Upper Peninsula. The discovery of rich and abundant deposits of iron ore in Michigan in the mid-19<sup>th</sup> century led to significant changes in the organization and geography of America's iron and steel industry, shifting the industry westward and contributing significantly to America's rise as an industrial power. By 1865 the iron mines in the Marquette Range were already producing a significant share of American iron ore. By 1880 Michigan iron mines had shifted from open pit to underground shafts. Michigan had also become the nation's leading producer of iron ore, a position it retained from 1880-1900, at the height of America's industrial revolution. While surpassed by Minnesota around 1900, Michigan's underground iron mining industry adapted to the challenge of the lower cost open pit mines of Minnesota's Mesabi Range and survived by reducing labor costs and mechanizing. Michigan's iron ore mining industry transformed itself again in the mid-twentieth century, making the transition from direct shipping ores mined underground to beneficiated ores mined in large open pit mines. Michigan remains the nation's second leading iron ore producing state.

- Terry S. Reynolds received his B.S. in History at Southern Arkansas University in 1963 and completed graduate work leading to a PhD at the University of Kansas, where he specialized in the history of science and technology. After ten years at the University of Wisconsin, he moved to Michigan Tech, in 1983, from which he retired in 2012. While at Michigan Tech he served as chair of the Department of Social Sciences for 12 years and won the university's distinguished teaching award. He has published several books and numerous articles on aspects of the history of technology, and served as president of the Society for the History of Technology. Beginning in 2002 he focused his research on Michigan's iron ore mining industry, publishing articles in a variety of venues, including the *Mining History Journal*. In 2011, with co-author Virginia Dawson, he published a book-length study of Michigan's leading iron mining firm: *Iron Will: Cleveland-Cliffs and the Mining of Iron Ore, 1847-2006* (Wayne State University Press).

## Paul R. Spyhalski

### *Escanaba in the Moonlight: The Escanaba and Gladstone Ore Docks in Hindsight*

SESSION 1: Overview of Upper Peninsula Iron & Gold Mining, Friday 8:30-9:40

This presentation focuses on the importance of the Great Lakes to the mining interests in Michigan, both in terms of moving ore to the mills and the movement of coal (and, eventually, limestone) to the mines and ore processing areas for the production of taconite. In doing so, I hope to highlight the importance of ports as outlets for iron ore and other products by using the ports of Escanaba and Gladstone on the Lake Michigan side of the Upper Peninsula as examples of “warmer” weather Great Lakes shipping ports and national security “safety valves” for any damage to the Soo Locks due to sabotage.

The first shipment of ore through Escanaba occurred in the spring of 1864 over the Chicago & Northwestern Railway via the Merchant’s Dock. The first of seven ore docks ultimately built by the Chicago and Northwestern Railway at Escanaba was built in 1872. The Minneapolis, St. Paul & Sault Ste. Marie (Soo Line) arrived at Gladstone, MI (slightly to the north of Escanaba) in roughly 1887, with an ore dock being built shortly thereafter. The Milwaukee Road (Chicago, Milwaukee & St. Paul Rwy) also used the Soo Line’s dock at Gladstone until 1901, when the dock was damaged by a freighter. Thereafter, the Milwaukee Road constructed two of its own docks at Escanaba and used them both until 1934. From 1901 to 2017, Escanaba was the only iron ore port on Lake Michigan. In addition to shipping out ore and taconite from the Marquette and Menominee Ranges, the Port of Escanaba also shipped Minorca taconite from Virginia, Minnesota, during the winter months when the Soo Locks were closed due to weather.

The Port of Escanaba also brought in coal, limestone and salt to Michigan. The limestone was then shipped to the Empire Mine for use in the production of taconite in Michigan. The inbound shipment of coal, limestone and salt provided an important back (or front) haul opportunity for Lake Superior freighters using the Port of Escanaba.

In addition to shipping and tonnage statistics, I will discuss improvements in the design and delivery of ore to the ore boats, from the labor intensive use of hand labor to shovel ore from ore cars into the dock to gravity feed car dumps to load the ore dock itself. In addition, my coverage of the ore docks

themselves will illustrate the improvements in the delivery of ore from the docks to the ships with individual manpower transitioning to gravity feed chutes and to the more recent conveyor loading systems.

I hope that conference attendees will gain a greater appreciation for the use of Great Lakes transportation to delivery ore to other ports for processing, as well as some of the historical aspects of the nearby ore docks at Marquette.

- Paul R. Spyhalski is a practicing attorney in Austin, Minnesota. He has co-authored two books on Minnesota regional railroad histories and is currently writing a history of the Minneapolis & St. Louis Railway. He also presents locally and nationally on baseball history with an emphasis on black baseball teams.

## Tamara Thomsen

### *Days of Ore: Underwater Archaeological Investigations of the Freedom Iron Mine La Rue, Wisconsin, or Captain C.T. Roberts' Wet Prospect*

SESSION 2: Iron Ore: The Broader Context, Friday 9:55-11:30

In the early decades of the twentieth century, industrial-scale mining of the Baraboo Range Iron District in central Wisconsin created a brief economic boom. The population for the region grew rapidly as workers flocked to newly established mines, and villages sprang up to house miners, their families and provide necessary commercial services. Railroad companies expanded their rail networks to capitalize on the new mines’ anticipated shipping demands: ore extracted from mines in the Baraboo Iron Range was shipped out of the region for processing. The mining operations transformed the surrounding landscape and hydrology. Mining engineers’ futile attempts to displace the enormous volumes of water drawn into the mineshafts from the bedrock layers surrounding the iron ore deposits created new surface water channels, wetlands, and ponds.

The Freedom mine, locally referred to as “Captain Roberts’”, is located in La Rue, Wisconsin. The site remains the only example of a Baraboo Range iron mine with accessible underground workings, as well as above ground features that include foundations of the engine house, compressor, boiler house, smokestack, and evidence of the railroad spur connection. Underground its shafts and drifts are inundated and remain immaculately preserved. Extant features underground include intact shaft framing (with skip guides) driven down more than 70 feet, dewatering pumps, sump room, post drill, narrow

gauge rail that remains in 160 feet of drift, an ore cart, and, many hand tools used in the mining process which were left at the ready, including various shovels, a pickaxe, tallow candles, several scaling bars and drill steels.

A preeminent mining captain, C.T. Roberts, was hired away from the Menominee Iron Range by the International Harvester Company around the turn of the last century to operate their Illinois Iron mine in La Rue. After the Illinois was shuttered, Roberts drove the shaft for Freedom mine nearby, and brought much of the equipment from the Illinois to his new operation for re-use. However, facing the ever-present threat from water throughout its operation, the site finally succumbed to flooding in 1911, causing miners to leave tools and equipment in place in their rapid escape. Today, archaeologists find a rare opportunity to study how these iron mines operated. Although operations at the Freedom mine were relatively small and short-lived, the site's features are illustrative of the region's typical mining practices. Utilizing underwater archaeological survey, and surveys of the site's remaining historic foundations, this presentation examines Freedom Mine as a representative example of iron mining in central Wisconsin, and places it within its regional historic context.

- Tamara Thomsen is an underwater archaeologist with Wisconsin Historical Society's Maritime Preservation and Archaeology program. Her research has resulted in the nomination of fifty-five submerged sites to the National Register of Historic Places. She has received awards from the Association for Great Lakes Maritime History, the Great Lakes Shipwreck Preservation Society, and in 2014, she was inducted into the Women Diver's Hall of Fame. Tamara is a cave, rebreather, and technical diving instructor, and has worked as a photographer, researcher, and research diver on projects including the USS *Monitor* with NOAA National Marine Sanctuaries, and RMS *Titanic* with Woods Hole Oceanographic Institution.

#### Dan Trepal

##### *The Minong Copper Mining District National Historic Landmark Project*

SESSION 3: Michigan Copper, Friday 1:00-2:10

Minong Ridge, a volcanic outcrop on the northern shores of Isle Royale in Lake Superior, has played host to more than six millennia of copper mining activity and, thus, ranks among the earliest sites of the human exploitation of metals in North America. This site combines one of the largest, best preserved pre-

contact copper mining landscapes on the continent, with the well-preserved remains of the Minong Mining Company (1874-1883), the largest historic copper mining operation on Isle Royale. Michigan Tech University's Industrial Archaeology field school conducted fieldwork at Minong Ridge in 2015 to explore the potential for nominating Minong Ridge as a National Historic Landmark (NHL).

I present an overview of the NHL nomination project and discuss the historical and archaeological significance of the Minong Copper Mining District. The MTU field school survey results, coupled with historical research, have revealed the intimate connection between pre-contact and historical mining activities, their impact on a federally designated wilderness landscape, and the ways in which research by 19th and early 20<sup>th</sup>-century archaeologists, such as William Henry Holmes, contributed to the development archaeological science as we know it today.

- Dan Trepal is a PhD Candidate in the Industrial Heritage and Archaeology program at Michigan Tech. Previously employed as an archaeologist with the National Park Service in Alaska, specializing in the archaeology of mining, Dan has also investigated numerous mining sites across the United States as a cultural resource management archaeologist. Dan conducted his MS thesis research on a 19<sup>th</sup>-century iron foundry in upstate New York. His current research interests focus on applying geospatial "big data" technologies to the industrial archaeology of post-industrial urban spaces in the Great Lakes regions.

#### Stanley Vitton

##### *The Rise and Fall of Jackson County, Michigan, Coal Mines: 1853-1893*

SESSION 5: Coal and Salt, Friday 3:20-4:30

In 2005, the Michigan Department of Transportation (MDOT) initiated a project to widen Interstate 94 on the north side of Jackson, Michigan. In reviewing the proposed project, however, documents were found indicating that a sinkhole had occurred on the westbound off-ramp in 1976. Since underground coal mining was conducted in Jackson County, MDOT initiated a research project to investigate the possibility of underground abandoned coal mines in the vicinity. The investigation found that the largest underground coal mine in Jackson County, the Slope mine, was under Interstate 94 and the Cooper Street Interchange. This presentation will discuss the history of the



Slope mine and the rise and fall of coal mining in Jackson County Michigan between 1835 and 1893.

Coal was first discovered along the Grand River outside of Jackson, Michigan, in 1835 during the excavations for a gristmill foundation. In 1837, Douglass Houghton, Michigan's first state geologist, investigated the Jackson County coal seams and reported that "*In the bed and bank of the (Grand) River..., the sandstone is seen to embrace a bed of bituminous shale...intermixed with very thin layers of coal.*" By 1840, residents extracted small amounts of coal for domestic use. Due to the region's limited commercial development, however, it was almost 20 years before the development of commercial coal mining in Jackson County. The vast majority of coal mining in Jackson County started following the Civil War. One of the more successful mines, the Woodward mine, located west of Jackson, operated continuously into the 1880s. The largest of the mines, however, was the Slope mine, which started production in 1881 and closed sometime around 1893. The Slope mine employed over 200 workers, and utilized a duel steam tram system for coal haulage.

The main problems for Jackson County coal mining were three-fold. First, the coal was not high quality and contained a large amount of pyrite which, when burned, resulted in significant smoke. (For example, the Slope mine was owned by the Emerson Chemical Works, which utilized the pyrite in the coal to produce sulfuric acid for a chemical plant in Detroit.) Second, mining conditions were severe. The coal seams were thin, less than 30 inches, and shallow (at depths ranging from 60 to 200 feet). The coal seams were also highly discontinuous and rolling with significant faulting, caused to some extent by glacial erosion, limiting mineable deposits to under 200 acres. Due to the depth of the mines and their location near the Grand River, the mines had to also deal with significant groundwater inflow. In 1884, Michigan instituted annual reports by the Bureau of Labor & Industrial Statistics, in an attempt to track the State's mine fatalities and operating conditions. Their 1888 report discusses the problems of coal mining in Jackson County, indicating significant health and safety issues. In 1900 Michigan created the position of County Mine Inspector due to the high fatality rate for underground mines, not only in Jackson County but also in the Northern Michigan copper mines. The 1900 Labor Bureau reported, however, that most of the mines in Jackson County had closed and that only the New Hope, Jackson, and Trumbull mines remained opened. The 1901 report indicated that the Trumbull mine closed and in 1902 the Jackson Mine closed. Finally, the third reason for the decline of Jackson County Coal was the increase in coal mining in Michigan's Bay, Saginaw, and Tuscola Counties and further

south in Ohio, all of which had better quality coal, mining conditions and economics.

- Stan Vitton, Ph.D., P.E., is a Professor at Michigan Technological University in the Department of Civil & Environmental Engineering and an Adjunct Professor in the Department of Geological & Mining Engineering & Geosciences. He obtained his BSE in Geological Engineering and MSE in Mining Engineering at Michigan Tech. His Ph.D. degree is in civil engineering, specializing in geotechnical engineering, from the University of Michigan. In addition to his academic duties, he is a consultant to the civil, mining, and petroleum industries. Before academia, he spent eight years with the Shell Oil Company in their mining division. While at Shell, he was the engineering manager for Shell's subsidiary, the R&F Coal Company, and a senior mining engineer with the Shell Mining Company on mining projects in the eastern and western United States. His research is in the area of applied geomechanics, specializing in geotechnical asset management, the stability of abandoned underground mines, high strain rate mechanics applied to transportation aggregate assessment and rock blasting. He teaches courses in geotechnical engineering, rock engineering for civil engineers, foundation design and advanced geotechnical engineering courses.

#### Robert P. Wolensky

*Tenancy Systems in the Anthracite Industry: Subcontracting and Leasing in the Northern Coalfield of Northeastern Pennsylvania*

SESSION 5: Coal and Salt, Friday 3:20-4:30

Robert P. Wolensky has been conducting research on the Pennsylvania anthracite coal industry since the 1980s. Most of his recent investigations have focused on two tenancy systems—*subcontracting* and *leasing*—within the northern-most of hard coal's four fields between the 1890s and the 1950s.

*Subcontracting* began in the 1890s, and continued into the 1950s. It involved the large, railroad owned, mineral rights-controlling companies who were "putting out" individual coal veins to relatively small, unincorporated entrepreneurs who, in turn, hired teams of miners and laborers to harvest the product. Subcontractors were required to send the raw product to the lessee who processed, transported, and sold the coal.

Large-scale *leasing* commenced in the 1930s and continued into the 1970s. It

involved the same large mineral rights controlling companies who were “putting out” entire mines and even collieries to relatively small, independent, incorporated companies. Although, at first, the lessors were required to send the run-of-mine coal to the lessee, the lessees later processed and sold the coal they harvested.

The purpose of the presentation will be: (1) to scrutinize the structure and operation of the two tenancy systems, including their relationship to organized crime (whose members secured many of the agreements); (2) to detail the tenancy systems’ effects on wages, work rules, and safety; (3) to analyze the outcomes for labor-management relationships, particularly strikes and other workplace protests; and (4) to discuss the effects on the decline and demise of the industry during the 1950s and 1960s.

- Robert P. Wolensky is Professor Emeritus of Sociology, University of Wisconsin-Stevens Point, and Adjunct Professor of History, King’s College, Wilkes-Barre, PA. Among the works he has authored or co-authored are *The Knox Mine Disaster: The Final Years of the Northern Anthracite Field and The Effort to Rebuild a Regional Economy* (1999); *Voices of the Knox Mine Disaster: Stories, Remembrances, and Reflections on the Anthracite Coal Industry’s Last Major Catastrophe, January 22, 1959* (2005); *Tragedy at Avondale: The Causes, Consequences, and Legacy of the Pennsylvania Anthracite Coal Industry’s Most Deadly Mining Disaster, September 6, 1869* (2008); and *Anthracite Labor Wars: Tenancy, Italians, and Organized Crime in the Northern Coalfield of Northeastern Pennsylvania, 1897-1959* (2013).

\* \* \* \* \*

**“There is a romance about iron that has always fascinated me, and it holds me yet as a magnet attracts. I wonder if the courageous men who seek it in the bowels of the earth, realize their big part in the life of the world today. Are they conscious of the fact that the wheels of civilization would stop if they stopped?”**

**Chase S. Osborne**

**“Gold has its uses, but war is won with iron.”**

**George R. R. Martin – Dances With Dragons**

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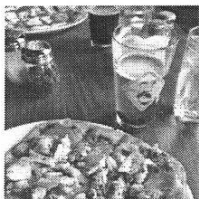
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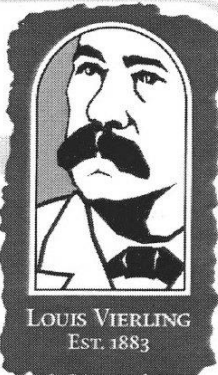
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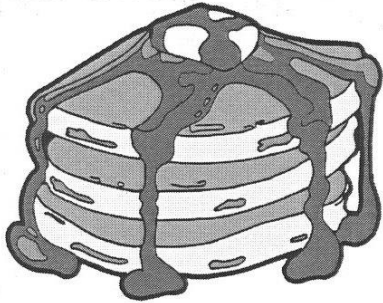




Mon-Sat: 7am - 8pm  
Sun: 8am - 5pm

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## Restaurant, Candy Store & Old Fashioned Soda Fountain



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The logo for Double Trouble Entertainment features a stylized 'dt' monogram. The background is black with white icons of DJ equipment: a turntable, a mixer, a microphone, and a cassette player. The text 'DOUBLE TROUBLE ENTERTAINMENT' is centered below the logo.

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*Save the dates!*

**30<sup>TH</sup> ANNUAL CONFERENCE**  
of the  
**MINING HISTORY**  
**ASSOCIATION**

**June 10 - 14, 2020**  
**Elko, Nevada**

**SCHEDULE CHANGE – FRIDAY, JUNE 7**

**FRIDAY MORNING**

**SESSION 1: Overview of Upper Peninsula Iron & Gold Mining (8:30-9:40)**

*Terry S. Reynolds, "Michigan Iron: A Brief History"*

*Daniel R. Fountain, "Michigan Gold and Silver: A Brief History"*

*Ross Grunwald, "The Ropes Gold Mine: Recovery, Dewatering and Exploration"*

BREAK: 9:40-9:55

**SESSION 2: Iron Ore: The Broader Context (9:55-11:30)**

*Fred Barnard, "Geological influences on early iron mining in eastern North America"*

*Paul R. Spyhalski, "Escanaba in the Moonlight: The Escanaba and Gladstone Ore Docks in Hindsight"*

*Henry Djerlev, "History of the Berkshire Mine, near Mellen, WI – Miners & Morticians"*

*Tamara Thomsen, "Days of Ore: Underwater Archaeological Investigations of the Freedom Iron Mine La Rue, Wisconsin) or Captain C.T. Roberts' Wet Prospect"*

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**Ross R. Grunwald**

**SESSION 1: *The Ropes Gold Mine: Recovery, Dewatering and Exploration***

The Ropes Mine was originally discovered in 1881 by Julius Ropes, a druggist in Ishpeming. The mine was placed into production in 1883 and operated until 1897. Primary and secondary recovery of gold from the mine during the original operations totaled about 34,000 ounces of gold. During the 1930's, Calumet and Hecla reentered the mine and carried out an exploratory drilling program to evaluate the deposit. Activities on the property ceased as a result of the War Production Board order L208 that closed all of the gold mines. The Ropes sat idle until 1975, when Callahan Mining Corporation purchased the property and retained Resource Exploration of Marquette to carry out an active exploration effort at the Ropes. During the period from 1979 to 1983 Resource Exploration recovered and reconstructed the shaft, installed a hoist and headframe, and dewatered the mine workings. At the same time, an extensive exploration program of drilling and sampling identified a resource of economically mineable ore. In 1984 Callahan began to develop the property for mining. During the period 1985 to 1989, under Callahan's management, the Ropes produced 171,000 ounces of gold and 210,000 ounces of silver.

*Ross R. Grunwald received his BSc and PhD in geology from South Dakota School of Mines and Technology and a MSc in Oceanography from the University of Hawaii. Dr. Grunwald has fifty years' experience in various aspects of his profession, but is most qualified in the application of geology to the exploration for and evaluation of mineral deposits. He is registered as a geologist in the states of California, Oregon, and Washington and is a Certified Hydrogeologist in California as well as a member of the American Institute of Professional Geologists. Dr. Grunwald is also a Registered Member of the Society for Mining and Exploration. His extensive experience in working with active mining operations has familiarized him with all aspects of mining, from exploration to the recovery of valuable mineral products. Most of this experience has been focused on gold and base metal deposits. From 1979 to 1983, Dr. Grunwald directed the recovery, dewatering, and evaluation of the Ropes gold mine near Ishpeming, Michigan.*

## Schedule at a Glance

### Thursday, June 6

8:00 – 11:00 am  
& 1:00 – 4:00 pm

10:00 am – Noon

9:30 am – Noon

1:00 – 4:00 pm

1:00 – 4:00 pm

1:30 – 4:00 pm

1:30 – 4:00 pm

2:00 – 4:00 pm

1:30 – 3:30 pm

3:30 – 4:30 pm

5:30 – 8:00 pm

### Friday, June 7

7:00 – 11:30 am

8:00 am – 4:30 pm

8:00 – 8:30 am

8:30 – 9:40 am

9:55 – 11:30 am

11:30 – 1:00 pm

1:00 – 2:10 pm

2:20 – 3:10 pm

3:20 – 4:30 pm

5:30 – 6:30 pm

6:30 – 9:00 pm

### Saturday, June 8

8:00 am – 11:30 am

8:00 – 9:10 am

9:20 – 10:10 am

10:20 – 11:30 am

Noon – 1:30 pm

2:00 – 4:00 pm

3:00 pm

4:00 – 5:00 pm

5:30 – 8:00 pm

### Sunday, June 9

8:00 am – 7:30 pm

### Monday, June 10

10:00 am

Noon

Registration Table Open – *Landmark Inn Lobby*

Eagle Mine Humboldt Mill Tour – *meet at Mill*

Cleveland-Cliffs Tour – *leaves from Landmark Inn*

CUM & NMU Archives Open House

Rock Collecting Field Trip

Historic Marquette Walking Tour –

*leaves from Landmark Inn*

Cleveland-Cliffs Tour – *leaves from Landmark Inn*

Eagle Mine Humboldt Mill Tour – *meet at Mill*

MHA Council Meeting – *Landmark Board Room*

MHA Editorial Board – *Landmark Board Room*

Welcoming Reception – *Cliffs Shaft Museum*

Registration Table Open – *Masonic Center*

Vendor Tables Open – *Masonic Center Ballroom*

Conference Opening – *Masonic Center Red Room*

Session 1

Session 2

Lunch on your own

Sessions 3

Session 4

Session 5

Social Hour – *Masonic Center Ballroom*

Awards Banquet and 3D Presentation by Jack Deo

Vendor Tables Open – *Masonic Center Ballroom*

Session 6 – *Masonic Center Red Room*

Session 7

Session 8

Presidential Luncheon – *Landmark Inn Harbor Room*

Michigan Iron Industry Museum – *Exhibits, Film*

Special Presentation by Mary Tippet – *auditorium*

Membership Meeting – *auditorium*

The Mather B – *Tour, Cudighi Sandwiches & Documentary*

– “A Vanishing Breed” – *Negaunee High School*

All-Day Tour of the Menominee Iron Range

*leaves from Landmark Inn*

Field Trip to Fayette Historic Townsite

Guided walking tours

Catered lunch at townsite Hotel