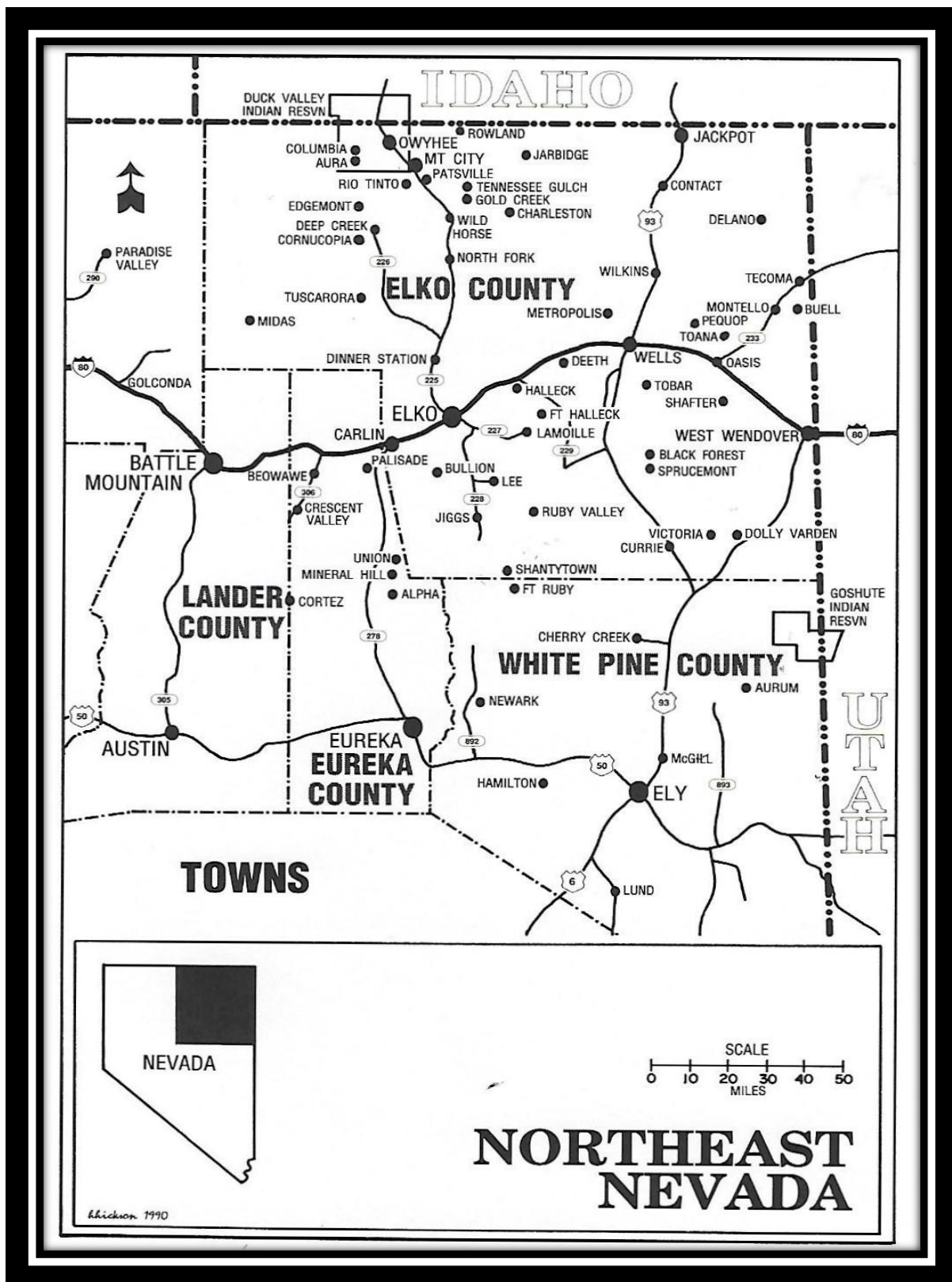




MINING HISTORY ASSOCIATION



**31ST ANNUAL CONFERENCE
ELKO, NEVADA (VIRTUALLY)
JUNE 10-12, 2021**



Nevada's Northeast Frontier (1969)

Front cover: Tuscarora placer miners, courtesy of Northeastern Nevada Museum

31ST
ANNUAL CONFERENCE
of the
MINING HISTORY
ASSOCIATION

A VIRTUAL CONFERENCE
FOCUSED ON
ELKO, NEVADA

JUNE 10-12, 2021



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Toni Scott and her underground hauler on the modern Carlin Trend. Photo courtesy of Nevada Mining Association

**WELCOME
DEDICATION
GRATITUDE**

Welcome to the 2021 Mining History Association Annual Conference!

On behalf of the MHA Council, MHA Officers, and the Elko Conference Committee, I welcome you to our 31st Annual Conference. After a strange, disjointed, out-of-whack (add your own adjective) year, we are ready to get together again. While we won't be together in person, which I know is a disappointment for most of us, we will be gathering via the Internet and the small screen. Our program and planning committees have worked hard to make this a good experience for all of us, and we truly appreciate their efforts. The conference format will be a little different from what we are used to, and we will have to forego some of the good fellowship that we all enjoy, but I think we will all still find plenty to take away.

Thank you for joining us, and we look forward to seeing all of you in Birmingham in 2022!

Stephanie Saager-Bourret
President, 2019-2021
Mining History Association



Stephanie became MHA President with a marvelous presentation in Marquette titled "The Beaver and the Pick: Two Worlds Meet."

She expected to serve for one year as her predecessors had done, but the effects of the recent pandemic left her in office for an additional year. Her invaluable experience guided MHA through unexplored territory.

In 2017, Stephanie retired as Curator of the Mining and Rollo Jamison

Museums in Platteville, Wisconsin, after 32 years of service. She also served on the MHA Council, 2013-2016, and continues to serve on the MHA Besleme-Orell Heritage Award Committee.

DEDICATION

John Sealey Livermore (1918-2013)

The 31st annual MHA conference is dedicated to John Livermore who discovered the Carlin Mine, which led to the modern gold rush on Nevada's Carlin Trend, the greatest gold producer in world history, about 20 miles southwest of Elko, the virtual base camp for the conference.

John Livermore, an exploration geologist and mine developer largely working in Nevada, was born in San Francisco on April 16, 1918, and educated at Stanford University. His family's roots date back to late 18th century Maine. John served in WWII and afterwards



initiated his long career in mineral exploration. His early greatest success was discovering the Carlin gold deposit in Eureka County, Nevada, in the 1960s. This deposit, characterized by gold that could not be seen or concentrated by panning, quickly dubbed "invisible gold," had been overlooked by the thousands of prospectors heading west to the goldfields, including his own great-grandfather who arrived in California in 1850. The Carlin discovery kick-started the current vibrant Nevada gold industry, which has produced

over 200 million ounces of gold over the last 60 years. Other Nevada discovery successes attributed to John include the Pinson, Preble, Dee, and Sterling mines and development of the Getchell Trend to the west of Carlin.

In addition to an entrepreneurial career in exploration and mining, John was engaged in civic leadership, environmental conservation, and philanthropy. His foundational support led to the sustained development of the Tonopah Historic Mining Park in Tonopah, Nevada. He endowed a chair in Geophysics at the Mackay School of Earth Sciences and Engineering and supported major programs at Stanford University and the University of Nevada, Reno, usually anonymously. In the end, however, John was happiest roaming the high sagebrush deserts of Nevada rock hammer in hand, and attendees at this virtual conference will get to see him do exactly that in a documentary film presented on Friday.

John's legacy was honored by the Mining History Association with the establishment of the John Livermore Award in 2019 to recognize individuals, contractors, suppliers, and companies that have gone beyond what was required to preserve, reclaim, conserve, or document mining heritage and the natural environment surrounding mining operations.

ACKNOWLEDGEMENTS

The Mining History Association is grateful for the many people who contributed both time and resources to develop this first-ever virtual conference. Scheduled as an in-person conference in Elko in June 2020, this gathering was postponed as the spread of COVID-19 accelerated. When it appeared that in-person gatherings would continue to be restricted well into 2021, the decision was made to continue with MHA's annual conferences but in a digital format. Much of the original planning infrastructure remained intact.

The conference organizing committee was chaired by Richard Reid, retired geologist, and included Robert McQueen, Dana Bennett, Dean Heitt, and Jennifer Hildebrand.

Eric Nystrom managed the Program Committee, and Barbara Clements provided guidance on the technological aspects of this first-ever gathering.

Sponsors of the 2020 conference also continued their support, and we are grateful for generous contributions from the following:

- Nevada Gold Mines
Created by a joint venture between Barrick (61.5%) and Newmont (38.5%) in 2019, Nevada Gold Mines (NGM) is the single largest gold-producing complex in the world. Operated by Barrick, NGM consists of numerous underground and surface mines, three of which are Tier 1 assets, plus four mills and other related facilities; employs more than 7,000 people; and annually produces nearly four million ounces of gold. More information is available on Barrick's website at [Barrick.com](https://www.barrick.com).
- Nevada Mining Association
Established in 1913, the Nevada Mining Association represents all aspects of Nevada's mining industry from exploration through operation, including a robust supply chain. More information is available on its website at [NevadaMining.org](https://www.NevadaMining.org).
- Newmont
Newmont became a mining company in 1929 with its acquisition of the Empire Star Mine in California. In 1965, it became the first major company to operate on Nevada's Carlin Trend where it developed the world's first open pit gold mine. Newmont celebrated 50 years of gold production from the Carlin Trend in 2015. More information is available on Newmont's website at [Newmont.com](https://www.Newmont.com).

- Jentech Drilling Supply

Jentech is a Nevada-based company that provides drilling supplies to the groundwater, mining, and mineral exploration industries throughout the United States. In 2012, Jentech became part of Di-Corp, a manufacturer of specialty supplies for the energy and mining industries. More information is available on the company's website at www.jentechdrillingsupply.com.

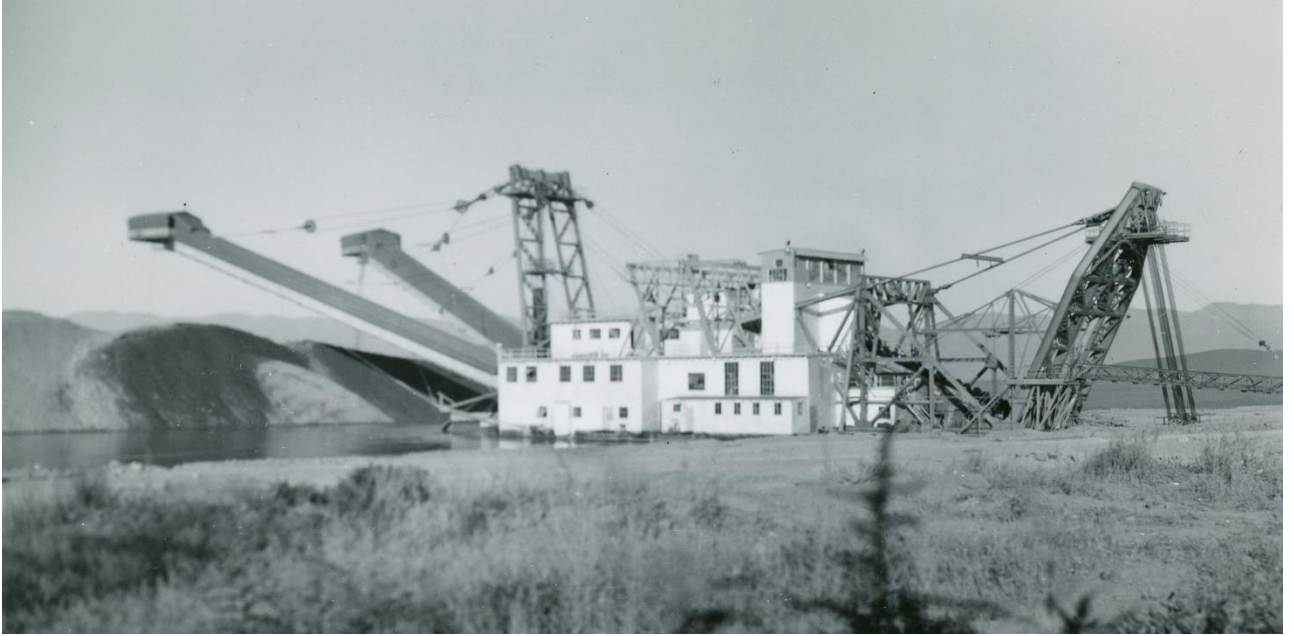
- 5th Gear Power Sports

Based in Elko, 5th Gear Power Sports sells and services motorcycles, off-road vehicles, both new and used. More information is available on the company's website at www.5thgearelko.com.

This program was printed by PNCC (Print N Copy Center), a custom print and sign shop in Elko. More information is available on the company's website at pnccelko.com.



Hydraulic mining at Gold Creek, Nevada, 1897. Photo courtesy of Northeastern Nevada Museum, Elko



This dredge replaced a smaller doodlebug when it was brought north from Manhattan, Nevada, to Copper Canyon just south of Battle Mountain, Nevada, in 1944. The Natomas dredge was 172 feet long and 60 feet wide, weighed 2,000 tons, and floated on 39 pontoons. With 40 employees working 24/7, it processed 25,000 yards of gravel daily. It was also horrendously noisy. The stackers fell in March 1955, and the dredge was dismantled and sent to South America. That ended gold mining in the area until Duval arrived in the old Battle Mountain Mining District in 1965. Photo courtesy of Lander County Historical Society.

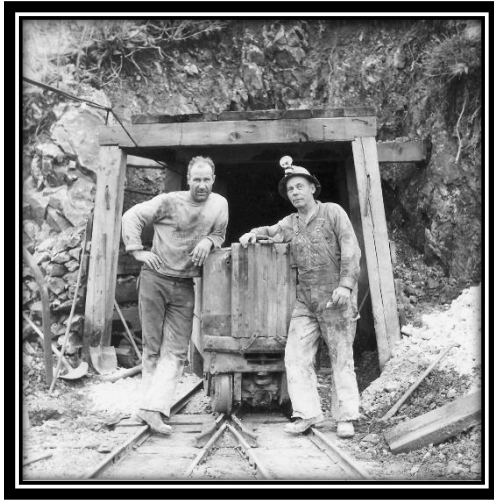
SCHEDULE OF EVENTS

A VIRTUAL CONFERENCE

This information will be updated as the conference date gets closer. For the latest information, please be sure to attend the first session of the conference.

This year's MHA conference will take place completely online. It is recommended that you access the sessions through a desktop or laptop computer that is connected to high-speed internet service. A mobile device might not be satisfactory.

All events will stream live on the Zoom platform. Before the conference begins, you will receive an email with a link, which will be your portal to the site. If you have not used Zoom



Herb Lewis and Bill Gemmill at the portal of the Miner's Gold in the Gold Circle Mining District, Elko County, Nevada, 1958. Photo courtesy of Friends of Midas.

before, it is recommended that you download it now (zoom.us/) to the computer you plan to use and become familiar with its functions. A basic Zoom subscription is free.

During the paper presentations, you will be able to see the speakers, but they will not be able to see you. You are welcome to chat with the speakers, each other, or everyone by using the "chat" feature at the bottom of the screen. There is also a "Q&A" feature where you can record your question at the moment it occurs to you. The Chair will monitor that feature and manage the questions at the end of the presentations. A 15-minute window has been included at the end of each paper session for Q&A.

During the receptions, you will be able to see and communicate with each other. Obviously, food and beverages cannot be provided through this online platform, but you should feel free to eat and drink whatever you would like to provide for yourself. Within the appropriate COVID protocols, you might even gather in person with nearby MHA colleagues and participate in the online events as a group.

After the conference has ended, presentations will be made available on MHA's YouTube channel, which you will be able to access through the MHA website.

At the beginning of the conference, on Thursday morning at 8:45 am in Nevada (Pacific Daylight Time), a presentation will provide additional guidance to this virtual conference with the hope that everyone has an enjoyable experience.

CONFERENCE SCHEDULE

All times are Pacific Daylight Time

For all meals and receptions, you will need to obtain the food and beverages of your choice. The online nature of this conference means, obviously, that no food or drink will be provided, but you should feel free to eat and drink at home or wherever you are during those communal events.

WEDNESDAY, JUNE 9

3 pm – 4 pm

Time subject to change

MHA Council Meeting (MHA)

MHA officers and Council members only

THURSDAY, JUNE 10

8:30 am - 8:45 am

Welcome to Elko

Richard Reid, Chair, Elko Planning Committee

8:45 am - 9:00 am

How the Conference Will Work Virtually

9:00 am – 10:00 am

Session 1 *Early Visions of Nevada*

- Dean Heitt | *Early Gold Discoveries in the Lynn Creek Area, Lynn District, Nevada*
- Keith Russ | *Some Nevada Mines, Maps, and Models*
- Q&A

10:00 am – 11:00 am Session 2 *Traditions and Culture*

- Brian James Leech | *Mining, Music, and Misery: Examining the Popular Songs of Mining Labor*
- Dan Plazak | *Dreams, Crystal Balls, and Willow Wands*
- Q&A

11:00 am – 12:00 pm Session 3 *A Global Perspective*

- Santharam Adibhatia | *Foot Prints of Gold Mining Heritage in India*
- Cory Fischer-Hoffman | *From Company Town to Urban Proletariat: Labor Engineering in Bethlehem Steel's Mining Operations in Chile (1952-1971)*
- Q&A

**12:00 pm – 2:00 pm Lunch on your own
MHA Editorial Board meeting**

2:00 pm – 3:00 pm Session 4 *Sunken Treasure & the Calif. Gold Rush*

- Erik Melchiorre, Bryan Seymour, Robert D. Evans, Katie VonSydow
Gold Assayers' Ingots from the SS Central America Shipwreck: A Window into Mid-1800s California Assaying
- Katie VonSydow, Robert D. Evans, Erik Melchiorre
Reconstructing 1856-7 California Mining Patterns from Placer Gold Recovered from the Wreck of the SS Central America
- Q&A

3:00 pm – 4:00 pm

Virtual Tour of Cortez Mining District, Nevada

Robert McQueen

The Cortez Mining District is the longest running mining district in Nevada with over 150 years of production under its belt. Cortez started in 1863 as a silver camp and in 1968 became a premier gold mining region. From 1870 to 1900, Chinese were employed as underground miners, and a large Italian contingency worked as charcoal burners and freighters. The district is divided into two main regions. Mill Canyon, on Mt. Tenabo's north face, serves as the district's bookends: it is the location of the first silver discoveries, the first town, the first mill, and the first recorded death. Mill Canyon also contained the district's last mill, last residents, and, sadly, the last recorded death in the district. Opposite Mill Canyon is the Nevada Giant, a prominent limestone-quartz ledge on the mountain's south face. Located here were the best mines of the district, the longest running mill, and the largest camp. The virtual tour of Cortez will take you to both locations and show you the mill ruins, the ghost town of Cortez, and other sites along the way. Your guide, industrial archaeologist Robert McQueen, has spent the last 17 years recording and documenting Cortez, having gone over and around the mountain more times than he cares to recall.



Robert McQueen recording the ruins of the Menardi and Roberts Mills, Cortez Mining District, Nevada. Photo courtesy of Summit Envirosolutions, Inc.

4:00 pm – 6:00 pm

Virtual Social Gathering

Collect your cocktails and nibbles of choice and get comfortable in your favorite chair for an opportunity to chat online with your conference colleagues! At 4:30 pm, enjoy a special presentation from the W. M. Keck Earth Science and Mineral Engineering Museum in the Mackay School of Earth Sciences and Engineering at the University of Nevada, Reno.

Garrett Barmore || *Mining in Northeastern Nevada: 170 Years of Objects*

Curator at the W. M. Keck Earth Science and Mineral Engineering Museum, Garrett Barmore has worked as a cultural resource management archeologist for active mines in Nevada and is passionate about the history of mining and the industrial West. He holds a degree in International Affairs with minors in both Historical Archaeology and World History and a graduate degree in Museology. Garrett hosts the wildly popular educational video series “Mineral Monday at the Keck Museum.” The series offers a virtual tour and features a different object in the Keck Museum’s collection each Monday. It is creative, sometimes silly, and highly engaging

for viewers of all ages. More information is available at this website:

www.unr.edu/mackay/keck-museum/mineral-monday.



UNR’s Mackay School of Mines Building, home of the Keck Museum, in 1937. Flanking the John Mackay Statue are the first women to graduate from the school, Jean Horning of Alaska and Betty Bowman of Nevada. Photo courtesy of UNR’s Special Collections.



FRIDAY, JUNE 11

9:00 am – 10:00 am Session 5 ***Nevada Mining and the World***

- Jenny Hildebrand | *Burned Out in Elko and Eureka: Charcoal Production in North Central Nevada*
- Frederic L. Quivik | *Managing the Carlin Mine As Part of Newmont's Global Enterprise*
- Q&A

10:00 am – 11:00 am Session 6 ***Mining Camps and Their People***

- Barbara Clements | *The Nevada Adventures of the Patrick Brothers*
- Ronald H. Limbaugh | *Testing Mining Camp Democracy*
- Q&A

11:00 am – 1:00 pm Presidential Lunch and Passing of the Pick

Eric Nystrom, Incoming MHA President | *Big and Small, they Mined them All:
Thinking about Scale in Mining History*

1:00 pm – 2:00 pm Session 7 ***20th Century: New Processes & Minerals***

- Jane Bardal | *Boom and Bust at the Mt. Taylor Mine, Grants Uranium District, NM*
- Robert L. Spude | *Patent Wars: Edward H. Nutter, Minerals Separation, Ltd, and the Introduction of Froth Flotation into the U.S., 1911-1922*
- Q&A

2:00 pm – 3:00 pm Session 8 ***Mining Corporations; Mining Society***

- Alexandria Penn | *The Visiting Nurses of Cleveland-Cliffs: Medical Care in the Michigan Iron Mines*
- William Culver | *Megantic County's Early Copper Mining Companies and the 1850 Act to Provide for the Formation of Incorporated Joint Stock Companies, for Manufacturing, Mining, Mechanical or Chemical Purposes*
- Q&A

3:00 pm – 4:00 pm

Virtual Tour of Eureka, Nevada

Richard Reid

Eureka is one of the oldest mining districts in Nevada, initiated when silver was discovered by a five-man prospecting party from nearby Austin in September 1864. In 1869, mining and processing began in earnest, resulting in recorded historic production up until 1964 of 1.65 million ounces of gold, 39 million ounces of silver, 10 billion pounds of lead, 224 million pounds of zinc, and 32 million pounds of copper. The narrow-gauge Eureka and Palisade railroad was completed in 1875, connecting the district with the intercontinental Central Pacific Railroad at the Humboldt River. The area quickly became a hub for central Nevada mining districts, and by 1878, Eureka was Nevada's second largest city with a population of 9,000 residents. By 1885, production had dropped, and the rush was over.

In 1919 the Ruby Hill Development Company financed by the famous Canadian mine developer Thayer Lindsley tried to dewater the historic Locan shaft to mine the area. He was apparently in the area establishing his six-week residency to qualify for a divorce in Reno "the divorce capitol of the world." In 1937 Lindsley founded the Eureka Corporation, and efforts resumed with construction of the four compartment Fad shaft. Subsequent efforts continued through 1948 with

limited success. In 1963, a consortium of Newmont, Hecla, Richmond Eureka, and Eureka Mining attempted to dewater the Fad shaft with a complex plan involving pumping 24,350 sacks of cement into the mine to the 2250 foot level. Homestake Mining took a lease on the property in the late 1980's and discovered the blind Carlin type deposit named Archimedes in 1993. This mine produced about 1.5 million ounces of gold before its closure due to a pit wall collapse. It has recently been reactivated by the Ruby Hill Mining Company. At least three other exploration companies are also active in this historic district, and the search for more gold continues.



Ralph Graves and Hedda Hopper, 1927. Getty Images

The virtual tour will visit many historic mining sites and some of the historic buildings in town. At your leisure, please visit the Raines Market website (www.rainesmarket.com) for an excellent overview of the area's history and a nice walking tour. A big thank you goes out to Lee Raines for allowing us the use of the information.

4:00 pm – 6:00 pm

Virtual Social Gathering

Grab some popcorn and a cold beverage, dim the lights, and settle in for a viewing of the documentary film “The Eye of the Prospector.” Introduced by Dana Bennett, recently retired President of the Nevada Mining Association, this 2008 video follows three skilled and experienced prospectors as they comb the vast Nevada desert looking for the treasures that might lie beneath. For the next 26 minutes, travel along with these independent prospectors who have separate claims scattered around Nevada: Bob Steele with more than 50 years of exploration adventures; Debbie Bustos, a former school bus driver with 20 years of prospecting under her belt; and John Livermore who probably tramped over more Nevada ground than anyone.

Shot on Nevada locations in Ely, Tonopah, Lovelock, Goldfield, Rhyolite, and with aerial footage of the Carlin Trend, this documentary was written and filmed by Gwendolyn Clancy and produced by the Nevada Department of Cultural Affairs with additional support from Public Resource Associates. Some of you may have seen this video at the 2015 MHA conference in Virginia City, Nevada, but technical difficulties then prevented its showing at all of the scheduled times. The Elko Planning Committee is delighted to be able to present it again and thanks Gwen Clancy for providing the necessary permission and link to showcase this documentary.



Gwen Clancy at work. Photo courtesy of ClancyFilms.com.

After the video’s conclusion, there will be plenty of time for mingling and chatting with your MHA friends and colleagues.

SATURDAY, JUNE 12

9:00 am – 10:00 am Session 9 *Nevada: First-Hand Sources*

- Ginny Kilander | *1920s Views of Tonopah, Nevada: An Unusual Perspective*
- Peter Maciulaitis | *The Cloud 9 and Other Sagebrush Tales*
- Q&A

10:00 am – 11:00 am Session 10 *Mining as Social Foundation*

- Fred Barnard | *History of Kaiser Steel's Eagle Mountain Iron Mine, Riverside County, California*
- Ed Raines | *Elements of Civilization and Their Effect on Mining: Lessons from History*
- Q&A

11:00 am – 12:00 pm Session 11 *Community Memories of Mining*

- Jen Dunn | *From Democrat to Republican to Superfund: Changing Political Ideologies in a Montana Mining Town*
- James S. Day, *On to Birmingham!*
- Q&A

12:00 pm – 2:00 pm MHA Business Meeting and Awards Luncheon

~ 2021 Virtual Conference Ends ~

*Recorded content will be made available
through MHA website*

See you in Alabama next year!



The 300-foot level of the Rio Tinto Mine, 70 miles north of Elko, 1950s. Photo courtesy of Northeastern Nevada Museum

ABSTRACTS and BIOS

Santharam Adibhatla

Footprints of Gold Mining Heritage in India

SESSION 3: *A Global Perspective*. Thursday, 11 am

Long revered as an asset to be prized above all others, gold is interwoven into the fabric of Indian culture and tradition. More than perhaps in any other country, Gold is viewed as both an adornment and an investment, treasured for its aesthetic beauty and appreciated as a store of wealth. Thus it occupies a special socio-cultural position in the Indian society. The paper deals with the historical aspects of Gold mining heritage and the present scenario of gold mining in India.

Gold deposits are distributed throughout the world; the present major producers are China, Australia, USA, Canada, South Africa, Ghana, Tanzania, and Russia. India has produced large quantities of gold since the times immemorial, but after the closure of the Kolar Gold Fields, Karnataka in 2001, the gold production has steadily declined. Kolar Gold Fields was then regarded as the second deepest underground gold mine in the world. At present the only Indian gold producing mine is operated by Hutti Gold Mines, also located in Karnataka, producing around 2 to 3 tons of primary gold per year. The byproduct gold obtained from copper smelting is around 6 to 10 tons per year. Recent exploration efforts for gold resulted in development of small deposits based on the occurrence of old workings. In India, there are several recorded old workings for gold at which both mining and smelting operations were carried out. The presence of extensive scattered ancient shallow to deep mine workings, enormous heaps of debris, extraction tools, ruins of temples and townships are found throughout the country in the vicinity of the major mining centers of modern India.

The presence of old workings at Kolar, Hutti, Ramgiri, Wynad in South India and in other parts of India bear mute testimony to the art of ancient mining methods and extractive metallurgy practices in vogue during the early period. Though the exact date of commencement of mining and metallurgy in the Indian sub-continent is not certain, it appears that the technology was well developed in India during the early period, notably during the Indus - Valley Civilization (Circa 3200-2500 BC). Ancient Vedic texts refer to the techniques of purifying (smelting) ores and the uses of gold, silver, copper, tin (tripu), lead and iron. Apart from ornamental and monetary value, the therapeutic benefits of gold preparations have been reported in Indian, Arabic and Chinese literature.

The importance of mining was well established as a source of revenue for the state during Mahabharata (circa 1000BC). Chanakya (circa 327BC) refers in his classical compendium "Arthasastra" (Political Economics) that the industries owned, managed, and financed by

the state empire, that included mining and smelting of gold, silver, copper, tin, lead, iron, jewels, and salt. Usually mining of these ores was carried out by fire setting methods as evidenced by the profile of the galleries, the supporting ore pillars, and the smooth surface of the rocks coated with a sooty deposit.

In the text of “Varahasahmita”, the sage Varahmihira (5 th century AD) suggests the use of fire setting technique for the digging of the shafts (kup) or wells. In the Vedic texts, such as Rig-Veda and in Mahabharata, there are several references regarding alluvial placer mining for gold from the rivers. The classical Greek and Roman historians have also given information on the subject of gold recovered from Indian rivers, which collaborates the facts mentioned in the Sanskrit texts, including that Herodotus (3.106) stated gold was obtained from the rivers of India, while. Megasthenes (c350- 290. B.C.), an ancient Greek historian, in his famous book “Indika” gave an account of gold digging ants. He mentioned about the native Derai tribes, who inhabited in the north-western Kashmir province, collecting gold dust. The people coming secretly with beasts of burden carry off the gold dust after dispersing the ants and trading the ore to the travelers. Pliny, the famous Roman historian, mentioned that gold was found in the river Ganga in India. Ralph Fitch (1583-1606 A.D.), one of the earliest English merchant travelers, described the recovery of alluvial placer gold from the river Ganges near Patna town, Bihar, India. Valentine Ball, in his famous treatise “A Manual of Geology of India” Vol III, (1881), presented a detailed account of rivers from which the local people were panning for alluvial gold. It is interesting to note that the alluvial placer gold mining and washing are still practiced in some parts, albeit on a small scale.

□ **Santharam Adibhatla** earned a PhD in mining engineering and is now retired from the India Bureau of Mines. He is a member of the MHA and an active participant in the activities of the International Mining History Congress. He organized an International Mining History Congress meeting at Bhubaneswar, India.

Jane Bardal

Boom and Bust at the Mt. Taylor Mine, Grants Uranium District, New Mexico

Session 7: 20th Century: New Processes and Minerals. Friday, 1 pm

Gulf Energy and Minerals Company began development of its Mt. Taylor Mine in 1974, at a time of high uranium prices and increasing demand from nuclear power plants. It took several years to sink the two shafts to a depth of 3400 feet, which was a much greater depth than any nearby mine. Gulf invested \$400 million in the development of this mine.

Both shafts were completed by 1980, but by then uranium prices had dropped due to several factors: the Three-Mile Island accident caused a drop in orders for new nuclear power plants, and the Atomic Energy Commission lifted the protection from foreign competition in the uranium market.

The mines and mills throughout the Grants Uranium District closed their operations, with the Mt. Taylor Mine closing at the end of 1982. It would remain shuttered for two years, with only a small crew left to maintain the mine and pump out the water.

Chevron merged with Gulf in 1984, which was the largest corporate merger at that time. As a result of that deal, Chevron had to supply uranium for a contract to General Atomics, so they opened up the Mt. Taylor Mine on a trial basis. They employed 175 miners. Uranium prices remained low, so the company appealed to the U. S. Government for support to keep the mine open, but to no avail. The mine shut down in 1990.

This presentation will feature a recent tour of the above ground workings of the mine and interviews with mine managers Joe Lister and Jack Burgess.

□ **Jane Bardal** continues to conduct oral histories with people who worked in the Grants Uranium District. The oral histories are located in the New Mexico State Archives in Santa Fe. Her article "Oral Histories from the Grants Uranium District, New Mexico" was published in the 2017 Mining History Journal.

Fred Barnard

History of Kaiser Steel's Eagle Mountain Iron Mine, Riverside County, California

Session 10: *Mining as Social Foundation*. Saturday, 10 am

Shortly after the 1941 Pearl Harbor attack, Kaiser Company received a loan from the U.S. government to construct an integrated steel mill to provide large steel plates to Pacific Coast war-time shipyards. The operation required substantial quantities of iron ore, coal, limestone, and water, as well as a large labor force and good infrastructure. All of these needs could be met within a feasible radius from Fontana, California, about 40 miles east of Los Angeles. Construction started in April 1942, with the first pour of pig iron on January 1, 1943. The plant produced steel continually until 1982 and is now dismantled.

The Eagle Mountain iron ores are located in the desert, 100 miles east of Fontana. The magnetite skarn mineralization had been known since the late 1800's, but development was begun by Kaiser only in 1944, as a replacement for ores shipped to Fontana from more distant deposits. The principal early source was the Iron Springs District in Iron County, southwestern Utah, more than 400 miles away by rail.

The Eagle Mountain deposit is the largest and southernmost several geologically similar iron deposits in the Mojave Desert region. They were formed by the intrusion of Jurassic granitic rocks (e.g. quartz monzonite) into metamorphosed Paleozoic sedimentary rocks. At Eagle Mountain these were limestones, dolostones, quartzites, arkoses, and conglomerates. The intrusion produced magnetite-pyrite bodies, as well as serpentine, secondary silica, secondary dolomite, and a host of other, lesser, minerals. Oxidation of near-surface zones concerted much of the magnetite to hematite.

Production of iron ore at Eagle Mountain began in 1948, and continued to 1986, when the last stockpiled concentrates were shipped. In the early years, ore was upgraded by screening and by heavy-media and magnetic separation. From 1965, most ore was pulverized and then pelletized for shipment. Cumulative production was about 120 million tons of shipped ore, grading 60% to 70% Fe in various shipments.

Operation of the mine required developing infrastructure hitherto lacking in the remote area, including a water supply (from deep wells), power (from Hoover Dam), rail access (from a new, purpose-built 52-mile railroad), and lodging (a company town eventually housing 4,000 people).

After final closure in 1986, the town of Eagle Mountain was shut down, only one school remaining open for the few children in the surrounding desert region.

□ **Fred Barnard** is a retired hard-rock minerals exploration geologist, educated in geology at the University of California at Berkeley, and the University of Colorado at Boulder. 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 mines and mineral prospects and developments in every Western state and in 45 foreign countries. He was also involved in organizing mining conferences for the AIME/SME in the U.S., and African Mining Conferences for the World Bank, in Morocco and Burkina Faso. Fred's first MHA presentation was at Globe in 2006.

Barbara Clements

The Nevada Adventures of the Patrick Brothers

Session 6: *Mining Camps and Their People*. Friday, 10 am

This paper will look at the mining concerns of James, William, Warren, Edward, and Lucian Patrick in Nevada. Lucian's race across the desert to the future Goldfield in 1903 to obtain the lease for the mines that would become the famous Combination Mine became the spark that brought his brothers from Colorado to Nevada. In addition to developing several mines around Tonopah and the new city of Goldfield, the Patricks were also involved in developing the Bullfrog and Manhattan districts. The brothers also started a transportation

company between Tonopah and Goldfield using automobiles before train tracks were laid between the two cities and the Bullfrog Water, Light, and Power Company.

The paper will also look at mining stock promotion. Lucian was involved in several mining promotion companies, with and without his brothers. Patrick, Elliot and Camp was the largest of these companies with an office in New York and dealings with George Graham Rice, author of "My Adventures with Your Money."

While none of the brothers made a huge fortune, they were well respected in Nevada mining. Their movements and mining interests were mentioned in Nevada newspapers for the next 30 years. Edward also served as Assistant Attorney General of Nevada in the 1920s.

□ **Barbara Clements** was born and raised in Colorado and has a family interest in mining. Her great-grandfather, William Patrick, came to Colorado in 1875 and had an assaying business in Leadville for many years before moving on to other mining towns. William's brother, Lucien, made and lost a couple of fortunes in various mining interests and had the first private bathtub in Goldfield, NV. Barbara has attended most of the organization's conferences and helped organize the 2004 meeting in Farmington, MO. She is the compositor for the annual Mining History Journal, serves as the MHA's social media coordinator, and has served on the Council and Nominating Committee.

William Culver

Megantic County's Early Copper Mining Companies and the 1850 Act to Provide for the Formation of Incorporated Joint Stock Companies, for Manufacturing, Mining, Mechanical or Chemical Purposes

Session 8: *Mining Corporations; Mining Society.* Friday, 2 pm

The paper examines questions about why the Province of Canada's 1850 Act to Provide for the Formation of Incorporated Joint Stock Companies, for Manufacturing, Mining, Mechanical, or Chemical Purposes failed to replace the cumbersome and expensive incorporation process involving passage of private bills by the legislature.

In May 1852 organizers of the Megantic Copper Mining Company promoted their stock offering in the United Kingdom by publishing their prospectus in a multitude of newspapers and magazines. The prospectus stated that incorporation of the company was pending under the Province of Canada's 1850 Act to Provide for the Formation of Incorporated Joint Stock Companies, for Manufacturing, Mining, Mechanical or Chemical Purposes. The prospectus noted that shareholders in this joint-stock company would enjoy limited-liability - their liability would never exceed the value of their paid-up shares. This protection from risk was not then available for mining company shareholders in the United Kingdom; the English Parliament did not pass their own limited-liability legislation until 1855. The 1850

Canadian statute specified that incorporation was to be by a simple county-level registration process. Notwithstanding this progressive business law, the Megantic company sought incorporation through a private bill first read in the Legislative Assembly on September 19, 1854. Once passed it was submitted to the Legislative Council for approval and on to the Governor General for Royal Assent. Now incorporated as the Megantic Mining Company, it intended to develop a copper property in Inverness Township. As it turned out the Inverness copper ore was not commercial, and the company's mine was abandoned after a few years. In the neighboring Leeds Township, another joint-stock company was formed to explore the same mineralized outcropping some miles to the southwest. This initial Leeds company sought legislative incorporation in 1852 under the name Lower Canada Mining Company. After a first reading, the private bill was abandoned. The same organizers came back in September 1854 with a new private bill for incorporation as the Quebec and St. Lawrence Mining and Exploration Company. This bill was processed in parallel with the one for the Megantic Mining Company. The Quebec and St. Lawrence developed what came to be known as the Harvey Hill mine.

This paper is drawn from on-going research into the early career of James Douglas (1837-1918), T. Sterry Hunt, their Hunt and Douglas Copper Process, low-grade copper sulfide ore, and the companies organized to use their hydrometallurgical process. The companies in Chile, Canada and the United States were all joint-stock pioneers curbing risk with limited liability.

□ **Bill Culver** retired in 2007 from teaching *Political Science and Latin American Studies* courses at SUNY Plattsburgh. His most recent research concentrates on copper mining history. Bill's publications include work on Chilean mining history, as well as contemporary national legislatures in Chile, Peru, Bolivia, and Argentina.

James S. Day

On to Birmingham!

Session 11: *Community Memories of Mining*. Saturday, 11 am

The paper sessions will conclude with a look forward to next year's gathering in Birmingham, Alabama.

□ **James S. Day** is co-organizer of the 2022 Mining History Association conference in Birmingham, Alabama. Day is the Michael J. Grainger Professor in Modern History at the University of Montevallo, in Montevallo, Alabama. He holds a B.S. in engineering from the United States Military Academy at West Point, a M.A. in history from the University of Georgia, and a Ph.D. in history from Auburn University. Day's book, *"Diamonds in the Rough": A History of Alabama's Cahaba Coal Field*, combines technological and social history to examine the industrial development of Central Alabama.

Jen Dunn

From Democrat to Republican to Superfund: Changing Political Ideologies in a Montana Mining Town

Session 11: *Community Memories of Mining*. Saturday, 11 am

Located in the remote northwestern corner of Montana, the town of Libby sits in the natural splendor of the Rocky Mountains. For most of the twentieth century Libby's residents enjoyed a strong economy buoyed by a local vermiculite mine that for decades supplied 80% of the world's vermiculite. In the closing years of the century this small town faced a number of challenges. First, the vermiculite mine closed putting many residents out of work. Then, news broke nationally about toxic asbestos found in the homes, yards, and lungs of Libby's residents. Finally, in response to the environmental and health concerns, Superfund, a federal cleanup program, moved into Libby to clean up the town. Between a battered economy, contaminated bodies, and federal oversight, Libby citizens were having a tough time.

In this paper, I connect the closure of the local vermiculite mine with drastic political shifts in Libby. I explore the political changes occurring in Libby at the turn of the twenty-first century and posit that health and environmental issues in the community overrode ideological political objections to governmental oversight. For most of the century, the political bent in Libby, like many union mining towns, had been left-leaning. Oral histories by residents done in the 1980s include jokes about the longtime dearth of Republicans in the area. In the 1990s, a political shift happened in Libby, as well other mining communities, when Republican candidates swept local and national elections. During this decade Montana also saw a rise of the militia movement whose anti-government views gained strength particularly after the tragic standoff in Ruby Ridge, Idaho, located just across the state line from Libby. It was into this volatile political milieu that the national news broke about the asbestos poisoning in Libby. When Libby's toxic environment became a public story, residents and governmental officials deliberated about how to address their environmental and health concerns. Against their anti-federal inclinations, people in Libby needed funding to address the cleanup and resultant health issues. The conservative politics of Libby's residents led them to create an oppositional identity dependent on the federal government. While Libby's asbestos contamination may be unique, many mining towns suffered economic downturns and environmental and human health challenges in the late twentieth century. Examining their responses to these challenges reveals how residents of mining towns framed their ideological beliefs while trying to survive the loss of their economic base and toxic contamination.

□ **Jennifer Dunn** is a History Ph.D. candidate at Montana State University, Bozeman, Montana. Her research interests explore environmental history, history of the

American West, and the history of science by examining former mining, now Superfund communities in the Intermountain West. These are places where residents have found their opportunities conscribed by a number of outside forces – global markets, poisoned landscapes and bodies, and federal regulation. Jen uses Libby, Montana, as a case study to see how residents in these communities navigate their limited choices and assert control over their lives.

Cory Fischer-Hoffman

From Company Town to Urban Proletariat: Labor Engineering in Bethlehem Steel's Mining Operations in Chile (1952-1971)

Session 3: A Global Perspective. Thursday, 11 am

The Bethlehem Steel Corporation dominated iron ore extraction in Chile for the first half of the twentieth century. With anticipation that the creation of the Panama Canal would decrease the shipping costs, the Bethlehem Chile Iron Mines Company purchased an iron mine in 1913, forming a company town in the geographically isolated enclave of El Tofo. Through El Tofo, the company held exclusive control over large scale iron mining and exports until the mid-1950s when high-grade iron ore approached depletion. This paper traces the transition in labor engineering in the period which Bethlehem Chile Iron Mines company moved their mining operations from El Tofo to the expanded commuter-oriented operations at El Romeral mine in the mid 1950s. In line with shifting norms around labor management, this period is also marked by the creation of a Chilean steel industry and a growth of other iron mining companies and iron ore exports from Chile. Based on archival research, interviews and fieldwork, my examination of this transitional period in the under-examined iron mining sector in Chile unearths the transformations in labor relations building towards the nationalization of the mines in 1971.

□ **Cory Fischer-Hoffman** drives past the former Bethlehem Steel mill on her commute from Bethlehem to Easton, Pa where she is a Visiting Assistant Professor in International Affairs at Lafayette College. Her doctorate degree is in Latin American, Caribbean and U.S. Latino Studies from the University of Albany, SUNY. She is currently working on a book project about Bethlehem Steel Corporation's iron ore mining operations in Latin America and thanks to the funding from the Mining History Association's research grant, Cory was able to travel to Chile to explore the first case in this larger project.

Dean Heitt

Early Gold Discoveries in the Lynn Creek Area, Lynn District, Nevada

Session 1: *Early Visions of Nevada*. Thursday, 9 am

The Lynn District forms the northern part of the Carlin Trend in Eureka County, NV. The Carlin deposit, discovered by Newmont Mining in 1962, was the first commercially successful large gold deposit found and mined in the area. However, the first gold deposit was discovered much earlier.

In April of 1907 Joe Lynn discovered placer gold at the head of what is now Lynn Creek and news of the strike led to a minor rush to the new diggings. Lynn reportedly staked 5 claims which he sold to W. S. "Ole" Elliot of Goldfield, NV for \$100. Elliot was one of the first "capitalists" in the district and bought or staked many of the early claims. As the miners fanned out from the original discovery on Lynn Creek, placer gold was also discovered in Sheep Creek which is across a small divide from Lynn Creek and on Simon and Rodeo Creeks. Placer production continued on the various creeks until at least the late 1950's. Both wet and dry placering methods were used to recover gold in this generally dry climate.

With placer gold found in both Lynn and Sheep Creeks it did not take long to find the source. Reports from the time describe a ledge traceable for over 1,100 feet and 10 to 12 feet wide consisting of decomposed jasper quartz that could be shoveled like dirt and when panned, would show multiple colors. The most important hardrock claim staked on the ledge was the Big Six No.3 purchased by Ole Elliott from the original claimants. Between 1907 and late 1912 almost no work was completed on developing the lode mines. That changed in 1912 when a 35-foot shaft at the Big Six hit a 16-inch vein assaying between \$100 to \$260 per ton.

William Barney and his partners were also instrumental in the early development of the district. The partnership either staked or bought many claims in the district including the Gold \$ No.3 on strike of the Big Six vein, the Compromise claims and other placer and lode claims. Barney's efforts to promote the district by never missing an opportunity to talk to the newspapers is responsible for much of what we know about the early history of the district.

The 1912 discovery in the Big Six set off a new rush to the district and renewed development. In addition to the Big Six underground development commenced on the Bull Moose, which is on the Big Six zone, and the Compromise and Badger mines which are on a separate zone to the west of the Big Six. However, the Big Six would be the largest producer of all the mines.

The town of Goldville was likely established in early 1913 as a result of the second rush to the district. While never more than a few houses, several saloons and at least one hotel was reported. The Goldville post office, with William Barney as postmaster, opened in July of

1913 and closed in August of 1917. Barney and his family were the last family reported living in Goldville moving to Fallon, NV in 1921.

The Big Six mine, worked by various companies, was the only significant underground producer in the area. In the early 1920's after ten years of production and development reports from the mine suggests metallurgical problems began impacting production. In 1921 Metallurgist Ben Koering reported that the problems with the fire assays reporting less gold than the mill was the result of "Spirit Ore" where the gold was alloying with gallium. In 1923 reports from the mine were that the mill production was less than the assays due to "Volatile Ore". It seems that the ore was so high grade that when crushed it went off in the smoke.

In 1926 the Lynn Big Six Mining Company, which had worked the property since 1913, became the Beaver Crown Consolidated Mining company and decided to sell the property and moved the mill and all equipment to Beaver, Utah. A series of companies and leases worked the mine till at least 1941 but little production is reported.

Between 1907 and 1961 the district reported 9,460.3 ounces of placer gold and 1,649 ounces from the lode mines. The known development from the lode mines suggest that the gold production is significantly underreported.

□ **Dean Heitt** graduated with Bachelor's and Master's degrees in geology from Eastern Washington University. He worked for Newmont Mining Corporation as a geologist, primarily on the Carlin Trend, for over 31 years before retiring in 2019. He is the author of *Before the Gold: Early Mining History of the Carlin Trend 1874 – 1961*. Dean has also written various professional papers on Newmont's history on the Carlin Trend and on the geology of several deposits. He is currently researching material for his next project. He and his wife make their home in Elko, Nevada.

Jenny Hildebrand

Burned Out in Elko and Eureka: Charcoal Production in North Central Nevada

Session 5: *Nevada Mining and the World*, Friday, 9 am

During the late 1870s and 1880s, charcoal fueled the ore-processing smelters in the mining industry. Woodland areas in northeast and north-central Nevada were a valuable resource that supported nearby mining districts, such as Cortez and Eureka. Charcoal was produced by cutting local pinyon pine and juniper wood and firing it in a slow controlled fashion either above or below ground (Reno 1996). Charcoal production in north-central Nevada is most associated with Italian and Swiss immigrants collectively known as the Carbonari.

This presentation will focus on the history of charcoal production of two areas, Cortez in Elko County and Mt. Hope in Eureka County and will discuss the results of multiple studies conducted throughout this region. An in-depth review of charcoal production, which resulted in large-scale ecological effects and significant cultural changes, will be informed by the written and photographic historical context, as well as through the archaeological assessment of charcoal pits, kiln platforms, watch stations, and wood ranches.

□ **Jenny Hildebrand** is a historic archaeologist who has years of experience working on modern and historic mines throughout Nevada. She has worked as a cultural resources specialist for projects on charcoal production sites in both the Cortez and Eureka Mining Districts. Jenny has been a member of MHA since 2013, is a past board member, and serves on the Elko Conference planning committee. Jenny is currently getting her degree as a Graduate Gemologist from the Gemological Institute of America.

Ginny Kilander

1920s Views of Tonopah, Nevada: An Unusual Perspective

Session 9: Nevada: First-Hand Sources, 9 am

The U.S. Bureau of Mines and U.S Public Health Service teamed, beginning in 1915, on a series of examinations and reports of ventilation and dust conditions in US mines, with recommendations for improvements. These surveys were conducted in cooperation with the mining companies, but the individual reports were confidential and unpublished.

A report for the West End Consolidated Mining Company mines in Tonopah, Nevada, was conducted beginning in 1921. Health issues of the miners, primarily silicosis, was documented, and both underground sanitation and a survey of sanitation in the town of Tonopah was conducted. Not only mining structures (such as change houses, and privies), but also town development, houses, water wells, trash management, and restaurants, among other entities, were studied and recommendations made. This 235-page report, with more than 30 photographs, provides a unique documentary view of Tonopah in the early 1920s. The report is drawn from the papers of H.D. Budelman, collection 4305, American Heritage Center, University of Wyoming, and will serve as the primary visual source for the presentation. Mining engineer Budelman served as the mine superintendent for the Tonopah West End and Halifax mines in the 1920s.

□ **Ginny Kilander** is currently the Manager of Reference Services at the American Heritage Center, University of Wyoming. In addition to serving in the Reference Department since 1999, she is also the archivist responsible for overseeing the acquisition of economic geology collections and serves as the manager of the Center's Anaconda Geological Documents Collection. She has an MA in American Studies from the University of Wyoming and a BA in Anthropology and Folklore from Indiana University.

Brian James Leech

Mining, Music, and Misery: Examining the Popular Songs of Mining Labor

Session 2: *Traditions and Culture*. Thursday, 10 am

Visual media, like Hollywood movies, spend little time on the act of mining. Perhaps movie makers believe that mining itself is dull or maybe this issue is part of what George Lipshitz has argued is the “erasure of the working class from public consciousness.” Popular music, on the other hand, often features working-class miners and their families, mostly in the genres of folk and country music. These songs have almost exclusively emerged out of Appalachian coal mining. This presentation will consider the origins and lyrics of some of the most popular mining songs. Popular music continues to promote the drudgery of coal mining and the poverty of coal communities, suggesting that coal is the kind of mining that has most retained a class-conscious portrayal in music and the media. Partly due to this continued portrayal, the plight of coal miners has become a primary political concern for recent politicians, including figures like presidents Donald Trump, who hoped to bolster the industry, and Joe Biden, who sought to retrain coal miners for new industries.

□ **Brian Leech** is Associate Professor of History at Augustana College in Rock Island, IL. He is currently Secretary of the Mining History Association and author of the recent University of Nevada Press book *The City that Ate Itself: Butte, Montana and Its Expanding Berkeley Pit* (2018). Leech is currently working on a new book about the portrayal of mining in popular culture.

Ronald H. Limbaugh

Testing Mining Camp Democracy

Session 6: *Mining Camps and Their People*, Friday, 11 am

Was the mining West progressive? A model of egalitarian democracy, or a democratic façade that masked authoritarian regimes of power and patronage? These questions suggest the stark contrasts that have emerged out of recent debates among academics in the social sciences and humanities. To explore these issues, I have examined the earliest claim books in Beaverhead County Montana and Boise Basin Idaho. My conclusion is admittedly limited in perspective but offers a more nuanced view than the Manichean extremes implied in these questions.

□ **Ronald H. Limbaugh**, an Idaho native, is a charter member of the Mining History Association. He retired in 2000 after 34 years teaching American history at the University of the Pacific. He has written, co-authored, or edited 11 books and many articles on a variety of topics. He and his wife Marilyn live near Sacramento.

Peter Maciulaitis

The Cloud 9 and Other Sagebrush Tales

Session 9: *Nevada: First-Hand Sources*. Saturday, 9 am

Did you ever wonder what it might have been like in the early days of discovery and development of mega gold districts like the Witwatersrand, Kolar, or the Nevada micron gold trends? When you see a mega district like Carlin it seems like everything must have developed somewhat linearly and logically, but this was not the case. Here are some anecdotal accounts with accompanying pictures of exploration for Carlin-type gold deposits. Discoveries from 1963 to the present were built upon earlier periods of gold discovery that had led to little production, but changing technology, government “assistance”, and untethering the gold price after a long period of price stagnation were major factors that fueled discovery and development. Oh, and luck. As a very senior geologist once said, “We always preferred lucky geologists to good ones.”

With the gold price locked by the US government in the period from mid-1930s to the early 1960s there resulted a shortage of geologists with gold experience at the start of rush that followed the Carlin mine opening. There were some older gold geologists but few had any micron gold experience. Many younger geologists found their way to Nevada as refugees from the downturn in other parts of the mining sector such as the uranium industry. The petroleum companies also got into the game.

This presentation has been drawn from my experiences in Nevada in 1966 and 1980-2002. I hope these stories and accompanying images will paint some of the human and somewhat chaotic side of the Nevada micron gold story. Keep in mind that there are other and likely other very different stories for as the “Carlin Gold” story grew, it cast a wide net attracting people from different backgrounds.

□ **Peter Maciulaitis**, a professional geologist, earned a Professional degree in geological engineering at the Colorado School of Mines in 1967. In the past four decades he has worked in Mexico, Colombia, France, Scotland, Ireland, Canada and the USA. More than half of his career has been spent in gold exploration in the Great Basin, particularly in Nevada. He has served as a consultant for and employee of two junior companies (Franco-Nevada Mining Corporation and Euro-Nevada Mining Corporation) that went from start-up ventures to major gold-mining concerns. Before merging with Newmont, Franco-Nevada was the 5th largest gold mining company in the world as measured by market capitalization. Mining history has long been an interest. Peter is active in the Mining History Association, International Mining History Congress, and Australasian Mining History Association. He was MHA President in 2017-2018 and has served a number of other roles for the organization.

Erik Melchiorre, Bryan Seymour, Robert D. Evans, Katie VonSydow

Gold Assayers' Ingots from the SS Central America Shipwreck: A Window into Mid-1800s California Assaying

Session 4: *Sunken Treasure and the California Gold Rush*. Thursday, 2 pm

The assayers' ingots recovered in 2014 from the SS Central America contain geochemical signatures and anomalies which convey information about the culture of miners and assayers in the late 1850s. A significant number of ingots (21%) contain elevated copper and zinc in the same ratio as a common brass alloy of the period, suggesting that adulteration of placer gold dust was a common issue. This was also documented in contemporary writings. The ingots with the brass-like signature also have a gold fineness much lower than measured for typical California placer gold. Trace elements like palladium in uniform concentrations in all Kellogg & Humbert ingots suggest the use of quality high-temperature tools, while lead and tin in all ingots suggest specific contamination and industrial hygiene issues common to the whole industry. Other trace constituents such as arsenic, antimony, and bismuth are likely to have originated from dense minerals associated with placer gold, or from the natural placer gold alloy itself. Comparison of modern analysis of ingots vs. assay values stamped on the ingots themselves suggests some firms like Kellogg & Humbert did superior assay work, while others like the San Francisco office of Justh & Hunter likely had issues with quality control. The variations in assay ingot alloy chemistry provide a window into this important period in American history.

□ **Erik Melchiorre** was awarded a BS in Geology from the University of Southern California, a MS in Geology from Arizona State University, and a PhD in Earth and Planetary Sciences from Washington University. Prior to becoming an academic, Erik worked at the Cyprus Bagdad, and Phelps Dodge Morenci copper mines in Arizona.

□ **Bryan Seymour** is a graduate student at California State University San Bernardino, who was involved in this research for his senior thesis.

□ **Robert D. Evans** is Chief Science Officer for the original SS Central America discovery, and the subsequent 2014 expedition on which these projects are based. He also holds a position with the American Numismatic Association.

□ **Katie VonSydow** is a graduate student at California State University San Bernardino, with her MS thesis focusing on the gold recovered from the SS Central America.

Alexandrea Penn

The Visiting Nurses of Cleveland-Cliffs: Medical Care in the Michigan Iron Mines

Session 8: *Mining Corporations; Mining Society*. Friday, 2 pm

Paternalism existed within many mining communities. A facet of this paternalism can be seen in company hospitals and nursing staff. The iron mining districts of Michigan's Upper Peninsula had extensive medical staff to care for workers and their families. Nurses carried a large amount of the burden, oftentimes visiting the homes of miners to care for their families. These nurses served a complex role as both a potential spy for the company but also as an advocate for the worker.

The Cleveland-Cliffs Iron Company created a visiting nurse program in 1908, the first of its kind. The program began in Ishpeming and spread throughout the district. The nurses worked under male company-employed physicians. These nurses visited employees and their families instructing them in various public health issues such as hygiene. The nurses completed thousands of visits during the program. Some nurses completed almost 10,000 visits in a single year. This presentation seeks to explore the work of these nurses within Michigan's iron mining districts. It will highlight the work of the nurses tracking number of visits, types of cases they treated, their work to educate miners and their families about hygiene, caring for the sick, and natal care. Further, the project will emphasize the role the nurses played in serving as public health educators and advocates for the miners and families of the Michigan iron ranges.

This project emphasizes a new perspective by focusing on the women within paternalism--the nurses. Moreover it is part of my larger research to study paternalism within the Marquette range of the Michigan iron mines. Compared to Michigan's copper industry, there has been less attention on the Michigan iron range, but also the role of health care within these mining industries. I will offer a unique lens by showing how these nurses actively cared and advocated for their patients while simultaneously existing within the system of company paternalism.

□ **Alexandrea "Allie" Penn** is a history PhD student at Wayne State University. She focuses on labor history and women's history. This research is part of her larger dissertation work studying paternalism in the Michigan iron mines.

Dan Plazak

Dreams, Crystal Balls, and Willow Wands

Session 2: *Traditions and Culture*, Thursday, 10 am

Geologists, myself among them, like to emphasize the history of mineral exploration as a steady march of science. This leads us to ignore or downplay nonscientific methods. But mineral exploration also has an occult side that continues to have a strong appeal to this day. Occult mineral exploration methods are poor in science, but rich in humanity, and deserve the attention of historians.

Dreams, of course, have always been seen as messages from heaven, or glimpses of the future. Many prospectors have chased mines they saw in dreams. A Utah mining company based on dreams is still active – although it never found ore - more than a century after it appeared in a dream.

Psychics, like dreams, have been consulted since antiquity, and this has continued to the present. Psychics who have tried to find mineral deposits have included Peter Hurkos, Sylvia Browne, Edgar Cayce, and Uri Geller.

Dowsing, despite all the claims of greater antiquity, began as a way to search for minerals in German-speaking central Europe circa 1400. It was in the silver mining town of Joachimsthal, Bohemia that physician Georg Bauer wrote the first full description of dowsing in *De Re Metallica*. Dowsing rods were a common sight in 19th-century mining districts across the U.S.

□ **Dan Plazak** is a geologist in Denver, and author of *A Hole in the Ground with a Liar at the Top* (University of Utah Press, 2005). He is most interested in oddball corners of mining history which he considers neglected by historians.

Fredric L. Quivik

Managing the Carlin Mine As Part of Newmont's Global Enterprise

Session 5: *Nevada Mining and the World*. Friday, 9 am

Newmont's Carlin mine is noteworthy as a mineable deposit of gold discovered in the 1960s not through observation of surface indications but rather through analysis, by Newmont's geologists, of mapping conducted over a large area, allowing them to find a promising area in Nevada that appeared to merit exploratory drilling of the subsurface, even though there were no surface indications. Carlin is noteworthy as well for the way that Newmont subsumed the new mine into the company's integrated system of management that it had developed for its global network of mining operations. This paper uses Alfred Chandler's

ideas about the history of large-scale corporate management to show how Newmont developed an organizational structure that allowed its core technical experts to guide the management of the company's several mining operations, including Carlin, even though each mine was owned by a distinct Newmont subsidiary. The paper draws evidence from corporate records produced in Superfund litigation concerning Newmont's Midnite mine near Spokane, Washington, as well as from oral histories collected by the Regional Oral History Office, Bancroft Library, University of California.

Newmont was formed in 1921 by William Boyce Thompson, mainly as a corporate vehicle for his investments aimed at launching and then selling mining companies. Around 1930, Newmont began managing some of the mining operations it had launched, and in the process the company assembled a group of men expert in the several facets of mining, including geology and exploration, finance, mining operations, purchasing, and metallurgy. By the end of the 1930s, Newmont had mining operations in Africa as well as North America. Each operation was owned and operated by a subsidiary corporation that had its own management structure under the direction of a general manager who answered to that subsidiary's board of directors, who tended to be Newmont people. In the 1950s, however, under the presidency of Plato Malozemoff, Newmont began to develop a more centralized management structure for its subsidiaries. That evolution of more centralized management continued into the 1960s, when Newmont formed the Carlin Gold Mining Company to operate the Carlin mine. This paper analyzes how the Carlin operation was integrated into Newmont's larger management structure.

□ **Fred Quivik** retired in 2015 from teaching in the Department of Social Sciences at Michigan Tech, where he was affiliated with the grad program in Industrial Heritage and Archaeology. He recently completed a six-year stint as editor of *IA: The Journal of the Society for Industrial Archeology*. He continues to work as an expert witness in environmental litigation, especially Superfund cases involving former mining sites and operations.

Ed Raines

Elements of Civilization and Their Effect on Mining: Lessons from History

Session 10: *Mining as Social Foundation*. Saturday, 10 am

Ultimately, mining makes civilization possible by furnishing the materials for the tools that allow man to raise himself above a primitive tribalism. The first step in all mining is, of course, discovery. From the beginning, geology and mineralogy step to the forefront, but from this point on three elements of civilization (politics, economics, and science and technology) exert a profound influence over all mining operations.

Most mines do not operate continuously over their lifetimes. As the Cornish used to put it, they start-up, stop, and then perhaps start-up again, and then stop. There are many cases

where starts and stops seem to go on ad infinitum. Most of these starts and stops are directly related to the aforementioned elements of civilization.

Politics entered the mining world early on. In 483 BC, the discovery of rich silver ore at Lavrion (Laurium) prompted Themistocles to insist that the Athenians pool the commonly distributed income traditionally distributed to all citizens in order to build a fleet of Triremes (the battleship of the times). He pointed out that the Persian Empire, following its defeat at Marathon, was still intent on conquering the Greek city states, and that the only safeguard would be a naval fleet to overpower the invading force. Themistocles's wisdom was proved at the straits of Salamis in 480 BC when the Persian Navy was defeated and the resulting inability to transport supplies to the Persian army resulted in its eventual decimation at Plataea.

Politics can also be used to discourage mining, as was the case with the US War Production Board's Order L 208 (in 1942) which halted gold mining so that mining efforts would be concentrated on copper for the war effort.

Economics usually makes an early appearance in mining because mining operations are a capital-intensive process, and the capital is needed up front before any production is even possible. In order to mine, you need to buy the tools, develop the workings, build the structures to fashion the physical plant that will allow you to extract ore at a profit. When news of the Creede discovery reached Denver mining man David Moffat, he hired Nicholas Creede (discoverer of the first claim) to prospect for him. He then financed the development of Creede's the new claim, and the Amethyst Mine became one of the district's most successful operations. Moffat also managed to solve transportation problems when he financed the extension of the Denver & Rio Grande rail line into Creede, allowing shipment of ore to the smelters at Leadville.

Another part of the economics element is the metals market, which controls the price a mine can get for its ore. Examples of the effect of changes in the price of a particular metal abound, but silver is perhaps the best example. Of course, the silver question was not just a supply and demand issue, but also an outstanding example of politically manipulated demand, both in the US and on the international stage.

Science and technology have always been ready players in the mining game. New inventions can create new uses for "old" commodities and thus stimulate new mining efforts. Zinc, copper, tungsten, iron, manganese, fluorine, and aluminum are but a few of the elements that have seen huge surges in mining throughout the last 200 years. Innovative uses for these elements have further stimulated invention and discovery of both the methods of mining as well as the extractive processes of the element(s) from their ore. Both supply and demand have increased as a result. Tracing such innovations through the efforts of talented entrepreneurs can be a gold mine for the mining historian.

□ **Ed Raines** is a geologist, mineralogist, and mining historian. He is the Curator for the Colorado School of Mines Museum of Earth Science. He is a past president of both the Mining History Association and the Colorado Chapter of Friends of Mineralogy. He has written numerous papers on the geology, mineralogy, and mining history of many Colorado mining districts, several of which have received special awards from Friends of Mineralogy. In 2009, his book *Historic Photos of Colorado Mining* was published by Turner Publishing. In 2019, received the Rodman Paul Award for Outstanding Contributions to Mining History.

Keith Russ

Some Nevada Mines, Maps, and Models

Session 1: *Early Visions of Nevada*, Thursday, 9 am

There is much documented material relating to the surface features and remains of mines throughout Nevada. In many cases the casual viewer, historian or explorer cannot appreciate the extent and geometry of the mine workings that are hidden from view.

This short presentation will outline the process by which the underground surveys relating to some of the most famous and productive mines in Nevada coupled with surface topography and Sanborn Fire Insurance maps have allowed a digital reconstruction to be achieved. Thus for the first time, it is now possible to “turn” the clock back and view the mines in 3d and marvel at the creations of the generations of hard rock miners who came from lands afar to mine gold and silver bringing with them traditions and techniques which made Nevada the silver state.

The presentation will be illustrated with models of the mines from three main areas, all world-famous, the mines of Virginia City, Tonopah and Goldfield.

□ **Keith Russ** is a twice graduate and former lecturer of the world famous Camborne School of Mines, Cornwall, UK. A keen mine historian, Keith has spent much time exploring and mapping the underground world. During the past 30 years, Keith has devoted his spare time to the creation of 3d computer models of the underground world, including many of those in Nevada, Michigan, Arizona, Idaho, and of course a model of Cornwall and West Devon containing over 350 mines. This long-term project is to model as many of the mines that the Cornish miners worked and to bring their creations to a wider audience. The results of some of the modeling are available to view on www.abandonedminemodels.com and Facebook (page "abandoned mine models").

Robert L. Spude

Patent Wars: Edward H. Nutter, Minerals Separation, Ltd, and the Introduction of Froth Flotation into the U. S., 1911-1922

Session 7: 20th Century: New Processes and Minerals. Friday, 1 pm

In 1910, Minerals Separation, Ltd, of London organized a company to introduce their flotation process for the concentration of ores into the United States. To lead the project was Theodore J. Hoover, brother of the future president, and his former classmates at Stanford, Jim Hyde and Ed Nutter. On the eve of setting up an office in San Francisco, Hoover and Hyde left the organization, later declaring the MS company's patents invalid and the non-disclosure agreement they signed void; they would declare the process free to all. Over the next decade, while Nutter and his small staff successfully introduced the MS process, especially at Anaconda and allied mining firms, the history of the flotation process became one of an escalating feud between those who believed Hoover and Hyde verses the few supporters of Nutter and officers of the Minerals Separation North America.

The transfer of this revolutionary technological innovation from London and Broken Hill, Australia to the US West also devolved rapidly into a major war between traditional and new forces within the mining community. Disputants stole the process as patent infringers - such as western mining industry giants Daniel C. Jackling, William Boyce Thompson, and J. Parke Channing-- trying to get around the Minerals Separation's patents user agreement and royalties. All went to court, multiple times, including to the U. S. Supreme Court, twice. Minerals Separation prevailed in defending its patents in the courts and earned for itself the vocal detestation of mine operators across the American West. Editor TA Rickard of the Mining & Scientific Press joined the fight, painting the "patent exploiting monopoly" as an obstructor of mining progress. The newly established U. S. Bureau of Mines western research stations entered the fray and offered to discover a better method of flotation, which once patented, its director boasted, would be "free of charge." The American Mining Congress took actions and passed resolutions against the "Intolerable Bondage which Minerals Separation (Ltd.) Have Now Imposed Upon the Mining Industry"; an investigation of Minerals Separation by the Federal Trade Commission followed, as well as hearings in the United States Senate.

In 1922, after years of litigation, major hold-out mining firms settled, signed license agreements, and began paying royalties, which suggests the British company had been victorious in each case, but it was a hollow victory. Belittled and attacked in the technical press and at professional meetings, Nutter and his staff, many of them Australians or Brits with experience at Broken Hill, nevertheless, continued investigations and innovations to create by the 1920s the basics of differential flotation, the next generation of, chemical based, flotation operations. The bitter contest over the *raison d'être* of this purely research & development firm within the mining industry had brought questions about what is an invention/innovation, the value of patent rights, and the protection of intellectual property, the modern practice, which split the mining profession. The early chroniclers, Rickard, A. A.

Taggart, and A. B. Parsons, in their writings would lessen or, in a conspiracy of silence, ignore the Minerals Separation staff contributions, biasing later understandings of their legacy.

□ **Bob Spude** is a past president of the Mining History Association. He has published on mining technology in the American West. He holds the B.A. and M.A. from Arizona State University and Ph. D. from the University of Illinois at Urbana-Champaign. He retired in 2013, after 35 years with the National Park Service as historian and manager.

Katie VonSydow, Robert D. Evans, Erik Melchiorre

Reconstructing 1856-7 California Mining Patterns from Placer Gold Recovered from the Wreck of the SS Central America

Session 4: Sunken Treasure and the California Gold Rush. Thursday, 2 pm

The discovery of the SS Central America 1857 shipwreck site provides a time capsule that can be used to address questions about the spatial and temporal patterns of placer mining in California during the peak of the gold rush. Samples of placer gold in the collections of museums and private individuals can have uncertain pedigree due to labeling issues and been altered by cleaning and curatorial processes. But placer gold from the 1857 shipwreck could only have come from the early days of the Mother Lode of California, as no other significant gold districts had yet been found in western North America. By chemically analyzing and morphologically fingerprinting placer gold recovered from the shipwreck, it is possible to compare these findings to those of locations known to have produced gold during the same time period and refine our understanding of mining history, internal migration, and commerce patterns in California during the mid-1800s. It has been traditionally difficult to reconstruct these facets of placer gold mining patterns during this time period, due to the lack of specific types of written documentation, and the uncertainty of the origins and history of materials attributed to this time and place.

The placer gold in this study was recovered from a set of gold pokes, sewn into the lining of a vest, found within a safe on the SS Central America. The 1-1.5 kg of gold from each of these pokes is unrefined, containing traces of black sand. While most of this black sand is magnetite, some pokes contain grains of platinum group alloys that are unique to only a couple rivers in California. Other trace minerals from the black sands provide similar clues. Furthermore, the purity and shape of the raw gold grains suggest specific rivers, and distances from the lode source of the placer gold. Combined, these clues indicate that the gold from each poke in the vest came from a different and unique placer location, tracing a path through the heart of the California placer districts. It remains unknown if these samples were collected by a single miner during his travels, or from a gold buyer who visited each site to purchase gold.

□ **Katie VonSydow** is a graduate student at California State University San Bernardino, with her MS thesis focusing on the gold recovered from the SS Central America.

□ **Robert D. Evans** is Chief Science Officer for the original SS Central America discovery, and the subsequent 2014 expedition on which these projects are based. He also holds a position with the American Numismatic Association.

□ **Erik Melchiorre** was awarded a BS in Geology from the University of Southern California, a MS in Geology from Arizona State University, and a PhD in Earth and Planetary Sciences from Washington University. Prior to becoming an academic, Erik worked at the Cyprus Bagdad, and Phelps Dodge Morenci copper mines in Arizona.



Pavlak Mill in Jarbidge, Nevada. Photo courtesy of Northeastern Nevada Museum

AROUND ELKO

WELCOME TO ELKO, NEVADA

Welcome to Elko! We are honored to be able to host the 2020-2021 conference. It is unfortunate that we were unable to all meet in person in these unprecedented times but we all felt that the safety of the MHA membership was paramount. I hope everyone has been able to advance towards and/or has received their vaccinations and that things get back to normal in time for next year's Alabama conference. Hopefully, people will have the opportunity to visit Elko in person at some point in the future and can utilize some of the information presented in this program for their entertainment. Elko is conveniently located off Interstate 80 and has a wide variety of attractions from outdoor activities centered around the beautiful Ruby mountains to educational opportunities such as the California Trail Center, the Northeastern Nevada Museum, and the Western Folklife Center. For the more adventurous, the area has many ghost towns formerly centered on historic mining areas as is seen on the frontispiece map. I hope everyone enjoys the program and thank all again for attending and allowing us to showcase our historic legacy.

Richard Reid
Chair, Nevada Planning Committee

Richard T. Reid was born and raised in New York state. He completed a Bachelor of Arts degree in Earth and Environmental Science from Wesleyan University in Connecticut in 1980 and moved to Nevada in early 1981. He worked initially as a mine geologist at the Manhattan and Borealis mines for five years. He then continued his career doing reconnaissance and near mine gold exploration in the western US and internationally. Richard completed his career with Newmont Mining Corporation. During his twenty-one years with Newmont he was a Senior Geologist, Nevada Exploration Manager and Exploration Business Development Manager for North America, ending up his career with Newmont as Chief Geologist of North America. Richard is now semi-retired but is affiliated with several Canadian junior companies.



ABOUT ELKO

Elko is at the base of the beautiful Ruby Mountains and surrounded by the rugged Great Basin Desert in what Nevada's Commission on Tourism touts as *Great Basin Country*. Of course, nowadays mining folks and historians know northern Nevada as *Gold Country*.

In his book *A Great Basin Mosaic*, Nevada historian James Hulse (2017) described Elko County as part of the "other" Nevada. It is not the gaudy neon Nevada of Las Vegas or the resplendent Nevada of Lake Tahoe. Rather, it is the Nevada of livestock towns and mining camps, a quick respite for the weary traveler, and the final frontier experiment. This "other" Nevada fills out the panorama that makes Nevada a unique Western state, and we are excited to share this corner of the Silver State with you in 2021!

The town of Elko is an oasis in this "other" Nevada, a place of 35,000 people intimately connected to the surrounding mines and ranches. Founded in 1868, Elko was born on the tracks of the Transcontinental (Central Pacific) Railroad, but California's gold-seeking 49ers and other emigrant travelers had already been passing through here. By 1868 dozens of mining camps had sprung up in Nevada, and Elko was ideally suited to become a major freighting and stage center in this far northeastern part of the state. By 1869 stage lines were running the toll roads to the camps of White Pine, Tuscarora, Bullion, and Mountain City, Nevada, and north to Silver City and Boise, Idaho. As more mines sprang up (especially Eureka and Mineral Hill), the importance of Elko and other railheads along the line grew.

The earliest ranches in the area were developed to cater to the Westward-bound emigrants and were founded along the Humboldt River. Pine Valley, with a major tributary of the Humboldt River, was a lush environment that also attracted attention, and with the influx of miners in the 1860s quickly encouraged the establishment of ranches and farms centered on Pine Creek. Other valleys with springs or creeks were also settled, though more sparsely.

Cattle drives and rearing occurred early in Nevada's history, but boomed after about 1870. After 1880 stock raising began to have a more dominant role in local economies. Several factors encouraged the transition to cattle rearing, including the general decline in mining activities, the fact that much of Nevada is arid and its land is not suitable to repeated tillage, and the result of better intra-regional and national transportation systems, especially the railroads. The advent of the transcontinental railroad (1869) and the narrow gauge 'feeder' lines such as the Eureka and Palisade Railroad (1873) made stock raising economically viable across large parts of central Nevada. Stock raising was a permanent industry, and Elko County was described as an excellent place for growing hay and raising stock. The devastating "white winter" of 1889-1890, where 40 percent of Nevada's cattle perished, allowed the sheep industry to expand. The Taylor Grazing Act (1934) curbed the sheep industry and guaranteed the predominance of cattle raising that continues in Nevada.

By the 1950s and 1960s the increased scale of Nevada's gold mining, and the large capital investment necessary to pull it off, placed an urgency to find a way to profitably recover ever lower grades of ore. Since the 1930s government officials like William Vanderburg (USBM engineer) and Ralph Roberts (United States Geological Survey [USGS] geologist), were working in Nevada and reporting on the discovery of disseminated gold deposits. Vanderburg, for example, noticed the deposits were found in geologic formations that would have been overlooked by earlier prospectors. Importantly, the deposits were found in several Nevada locations, and Roberts observed some patterning to their occurrence.

In 1960 Roberts published a paper on this patterning. The following year two exploration geologists working for Newmont Corporation, John Livermore and Alan Coope, heard Roberts speak on his discovery and put his observation to practice north of Carlin, Nevada. They discovered a massive but highly diffuse high-grade goldfield that soon became known as the 'Carlin Trend,' and in 1964 Newmont started mining what would soon become the largest gold mining complex in North America. The associated mill entailed large, outdoor cyanide leach vats and used activated carbon to recover the gold.

In 1969 Cortez started its own open pit gold mine. At the same time, Cortez was working with the U.S. Bureau of Mines on an experiment to leach low grade gold deposits in outdoor piles, or heaps, and in 1971 Cortez started the world's first commercial gold recovery heap leach pad. Also, in 1971 President Nixon took the U.S. dollar off the gold standard, sending the price of gold soaring to new highs. The combination of cheap leaching and ever higher gold prices led to a surge in exploration and mine development that continues to the present.

Today, Elko anchors a vast and productive mining region that stretches hundreds of miles, essentially along the Interstate 80 corridor, from the Getchell/Turquoise Ridge region in Humboldt County west of Elko to the Utah state line east of Elko. By a twist of geographic and political fates, the most productive mines are located in nearby Eureka, Lander, and Humboldt Counties, rather than in Elko County, but the town of Elko is much larger than its neighbors. It serves as home to thousands of mining employees and their families and as the business center for the mining supply chain. Each year in June, Elko hosts a Mining Expo that is a must-attend for mining professionals from all over the world. Open to the public, the Expo showcases the latest and greatest in mining technology and services.

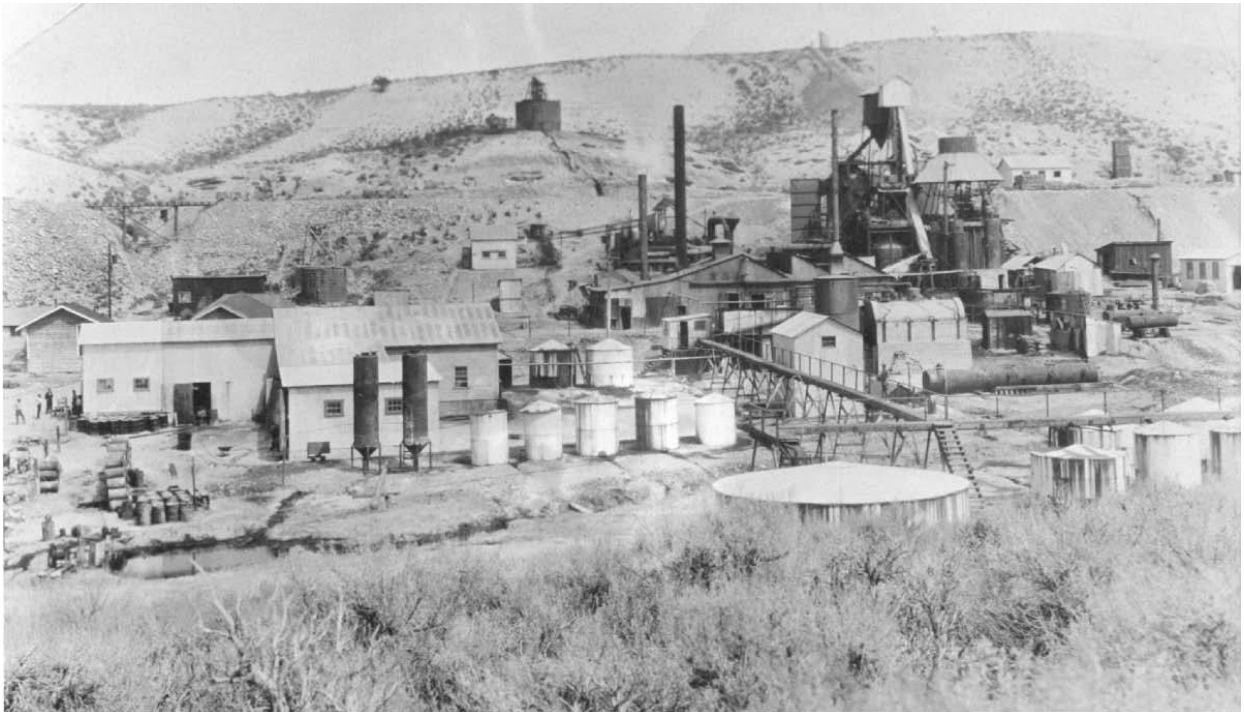
Although much of today's production takes place in nearby counties, Elko County has certainly produced numerous minerals during its history. Coal was discovered in 1859; copper, in 1862; gold, in 1867; and silver, in 1869. In addition, the Elko area has produced lead, zinc, mercury, tungsten, manganese, iron, uranium, antimony, barite, diatomite, oil shale, clay, turquoise, petroleum, and molybdenum.

The town of Elko is easily accessible by plane (Delta via Salt Lake City), train (Amtrak), and automobile (Interstate 80), and offers numerous lodging and restaurant options. In particular, Elko is also the center of Nevada's Basque Country, and unique experiences are

waiting for you at the town's Basque restaurants, especially The Star. The Elko Conference Planning Committee hopes that you will make a trek here as soon as the COVID concerns allow. During your stay in Elko, be sure to visit the following places:

- The Northeastern Nevada Museum (see page 81 and museumelko.org)
- The Cowboy Arts and Gear Museum (cowboyartsandgearmuseum.org)
- The Western Folklife Center (westernfolklife.org), home of the National Cowboy Poetry Gathering every January
- The California Trail Interpretive Center (californiatrailcenter.org)
- The Sherman Station Visitors Center (exploreelko.com/attractions/sherman_station.php)

Elko is surrounded by hundreds of marvelous mining history sites, ranging from piles of metal in the sagebrush to lone headframes to quiet leafy almost-ghost towns, and the Conference Committee is disappointed that we can't take you out to see our favorite mining history sites. We had also hoped to show you the modern mining marvel that is the Carlin Trend in the 21st Century. In lieu of these tours, we are pleased to provide you with the following information about significant mining areas within a reasonable drive from Elko. Directions are provided from the Red Lion Hotel and Casino, which was supposed to be the conference location. The Elko Conference Planning Committee encourages you to visit Elko when you can and use this program as your guide.



Caitlin oil shale retort. In 1916 just outside Elko, geologist Robert Caitlin began developing his oil shale plan with a 600-foot shaft and five tunnels with more than four miles of workings. The plant opened in 1917 and in 1920 employed 35 men and produced 96 barrels of oil daily. It shut down in 1924. While ultimately unprofitable, it was the first oil-form-shale plant in the U.S. Photo courtesy of Northeastern Nevada Museum.

THE CARLIN TREND (1874)

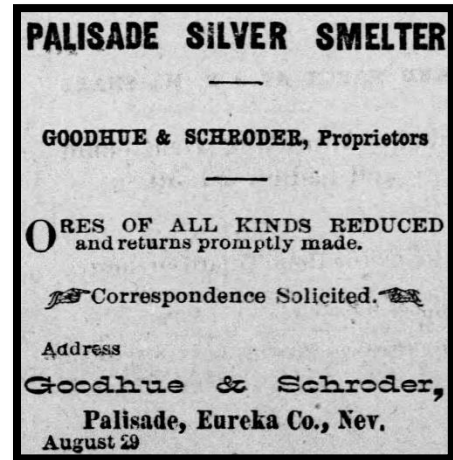


The Carlin Mine mill facility in 1989. Photo courtesy of Special Collections, University of Nevada, Reno.

Directions from the Elko Red Lion in Elko: From the Red Lion, take I-80 West 30 miles to Exit 280, Carlin, and turn north onto SR766. Travel north on SR306 for about seven miles before reaching the beginning of the Nevada Gold Mines Complex. Although the highway is public, the mining operations are restricted. No public access or overlook is provided. It is recommended that you check in with the company's office before leaving Elko. In the past, public tours were regularly scheduled and may resume again after COVID concerns have subsided. (Nevada Gold Mines, 1655 Mountain City Highway, Elko)

Before the Carlin Trend was known as one of the largest gold producing camps in the world, the area was made up of several smaller historic mining districts. The first recorded claim, The Blue Wing, was staked in 1874 approximately 1.5 miles east of the Carlin Mine. However, mining did not really get started in earnest until the discovery of the Richmond District, in 1877. Prospects were generally for silver, lead, and minor zinc. The district was intermittently active into the early 20th century with numerous small mines but had little reported production.

This advertisement for the Palisade Silver Smelter ran from August 30 to October 1, 1884, in various Reno, Nevada newspapers. (Reno Evening Gazette, September 22, 1884)



In 1883 the Schroeder district was established also exploiting primarily silver-lead-zinc and a few copper deposits. Benjamin Goodhue and his partner John Schroeder were instrumental in establishing this district as they were looking for ore to fill the smelter they had built at Palisade. The district was renamed the Maggie Creek district in 1905 with a focus on the Copper King deposit. The Copper King produced almost 875,000 lbs. of copper between 1905 and 1959 with the bulk of the production after 1955. The first gold deposit would not be found until the 1930s. The jasperoid containing the gold would become the discovery for the Gold Quarry deposit which would also be the first deposit on the trend to have confirmed microscopic gold. The Maggie Creek district also produced Barite in the 1930's and had a short-lived marble mine in the late 1800's.

In April of 1907 Joe Lynn discovered the first significant gold in the canyon that now bears his name. The discovery of placer gold kicked off the biggest rush to the area. The largest placers were found in Lynn and Sheep Creeks with smaller diggings in Simon and Rodeo Creeks. For many years, the placers in the Lynn district were some of the largest in the state.

The source of the placers was quickly found on the hill separating Lynn and Sheep Creeks. Several underground mines were established with the largest being the Big Six. The Big Six would be in its heyday between 1913 and 1926 although there are no official production numbers. Under various companies and leasers, it would produce until at least 1940.



1932 photo of the Bull Dog Placer mine located at the head of Lynn Creek. At the time of the photo the mine was owned by John Popovich. (Photo from Northern Nevada Filed Trip notes of A. M. Smith and C. Stoddard 1932, used by permission of Special Collections, University of Nevada, Reno)



This 1932 photo shows the mill building, tailings pond and other mine buildings of the Big Six. The tall building in the upper left corner of the photo is likely the headframe for the Big Six inclined shaft. (Photo from Northern Nevada Field Trip notes of A. M. Smith and C. Stoddard 1932, used by permission of Special Collections, University of Nevada, Reno)

Additionally, the district would produce minor amounts of silver, lead, zinc, copper, barite as well as world class turquoise from the Number 8 mine. Starting in 1929, the Number 8 mine produced some of the best spiderweb turquoise in the world and would be known for its large nuggets. One such nugget weighed over 150 lbs. and is currently housed in the New Mexico Museum of Natural History and Science in Albuquerque, New Mexico.



One of the largest turquoise nodules from the Number 8 mine. This nodule measures 33 inches long, 18 inches wide and 7 inches thick. The nodule is on display at the New Mexico Museum of Natural History & Science in Albuquerque, New Mexico. Photo courtesy of the Nevada Bureau of Mines and Geology.

Open pit gold mining began in 1956 at the Bootstrap Mine. Originally prospected for Antimony in 1914 it was restaked in 1949 by Frank Maloney who eventually leased the property to Marion Fisher and his partners. Lacking the funding to put the deposit into production and not finding a company to lease the project the partners eventually bring in Ray Reed of Fallon to build a mill and do the mining. Reed's mill was unpretentious to say the least and was not protected from the harsh Nevada winters. Bootstrap was the first mine in the area to use cyanide leaching to recover the gold and the first open pit to produce from a mine with "invisible gold." Between 1956 and 1959 Bootstrap produced 7,104 ounces of gold from several small open pits.

The Blue Star mine, on the site of the Number 8 mine, would also produce "invisible gold" prior to the discovery of the Carlin mine. Approximately 800 ounces of gold was produced in 1959 and 1960. It was Morris who enticed Newmont to look over the deposit and eventually lead to the discovery of the Carlin Mine in 1962

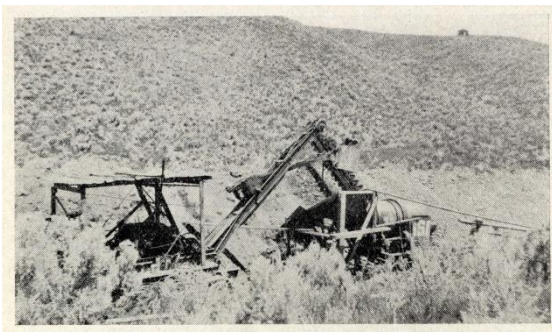


Photo from 1959 shows a diesel shovel working the dumps of the Nevada Star #2 Shaft. The same shovel was likely used at the Copper King mine. Photo courtesy of Newmont Mining Corporation

Prior to the discovery of the Carlin Mine in 1962 the area now known as the Carlin Trend had reported production of 18,581 ounces of gold, 12,928 ounces of silver, 135,481 pounds of lead 10,145 pounds of zinc and 874,242 pounds of copper. Unknown quantities of barite and antimony were also produced. Turquoise production is estimated at \$1.4M.

In the summer of 1961 geologists John Livermore and Alan Coope arrived in Carlin to visit the Blue Star mine and the Gold Quarry prospect. Livermore had recently heard a talk by USGS geologist Ralph Roberts about an area in northern Eureka, County that had the potential for hosting gold deposits. The type of deposit they were searching for was similar to Getchell, Gold Acres or Bootstrap where the gold was microscopic and could not be found using a gold pan. After visiting and examining the local deposits, Livermore and Coope began exploring an area approximately 2 3/4 miles south of Blue Star on Popovich Hill. They postulated that gold would be found in the limestone rocks below a regional fault known as the Roberts Mountains Thrust.

Drilling on the project began in 1962 and on the third hole intersected 100 feet averaging 1.03 ounces per ton gold, marking the discovery of what would become the Carlin Mine. Drilling to outline the orebody progressed quickly and by the end of 1963 had identified approximately three million ounces which was high-grade enough to mine at \$35 gold. Construction of the mine and mill began in 1964.

Unfortunately, with the gold price fixed at \$35 per ounce exploration for new deposits was minimal and those that were found were generally too low grade to put into production. That changed in the 1970's when the government quit fixing the price of gold allowing it to rise based on market conditions. With the increase in price exploration and development increased and Newmont bought and put into production the historic Blue Star and Bootstrap deposits.

Approximately 5 miles north of the Carlin mine the Nevada Syndicate (funded by Lac Minerals) began to reevaluate an area where Atlas minerals had made a discovery of low-grade mineralization in 1962. The Nevada syndicate and its successor companies Polar Resources and Pancana minerals discovered a series of small deposits putting them into production in the late 1970's.

In the 1970's, Newmont began evaluating the portions of the Carlin deposit considered refractory (containing organic carbon) where the gold could not be recovered using standard cyanidation processes. In 1971, Newmont added a flash chlorination process to Mill #1 to treat the carbon laden ore, essentially creating oxide ore that could be recovered using cyanide. This new process added significant new reserves that were previously considered waste. Another significant metallurgical change in 1979 was the opening of the first leach pad at Bootstrap. This process was first used at Cortez and developed with the help of the U.S. Bureau of Mines again allowed lower grade ore to be processed at a profit. The heap leach process takes ore from the mines and places it on a lined pad to then be sprinkled with cyanide and water and collecting the gold laden water at the toe of the pad. While it takes longer to recover the gold with this process the upfront capital and ongoing costs are significantly lower than milling. This process was quickly adopted at other mines and was a significant driving force in the increase in reserves on the Trend.

In 1980 the price of gold hit an all-time high of \$800 per ounce, and the amount of exploration on the trend increased significantly. That year Newmont discovered the giant Gold Quarry deposit near the outcrop found and mined in the 1930's. The Rain deposit was found south of Carlin on claims originally staked for barite.

The Post deposit was discovered in 1982 by Pancana minerals and the extended onto Newmont's ground. Exploration continued until 1986 when a deep core hole was drilled at Post and the Deep Post deposit was discovered. In 1985 Newmont discovered the Genesis deposit near the Blue Star mine.

John Livermore who had left Nevada after the Carlin Discovery returned to the Carlin Trend as part of the Cordex Syndicate and discovered the Dee Mine.

One of the most significant events in the development of the Trend was the acquisition of the Goldstrike property then controlled by Western States and Pancana Minerals by American Barrick Resources Corporation for \$62 million. Considered by some to be an outrageous sum in 1987, it is now considered one of the best deals in the Nevada mining industry. Barrick commenced a drilling program and discovered high-grade deposits including Deep Star, Meikle and most significantly, the Betze. Currently the Betze deposit is the largest deposit found on the Carlin Trend, and a massive open pit exploits this orebody.

With the discovery of high-grade deposits that were too deep for open pit methods Newmont and Barrick began contemplating underground mining in the early 1990's. Newmont began the first underground operation in 1993 from the bottom of the Carlin open pit. This was followed by underground operations at Rain and Deep Star. All of these deposits could be exploited using drifts started from the various open pit mines with significantly less capital than required with a shaft operation. This changed in 1991 when Barrick had outlined sufficient resources at the Meikle deposit to justify a shaft to access the orebody.

While oxide ore for leaching or milling had been the mainstay of ore on the Trend the increase in underground deposits and the large open pits mining below the oxide boundary processing of refractory ore became more important. Newmont built the Mill #6 Roaster in 1994 to process ore primarily from Gold Quarry. Unlike the Carlin ore Gold Quarry also had pyrite in the ore which made the flash chlorination process unusable. Roasting of the ore burns off the pyrite and the carbon allowing cyanide recovery of the gold. Due to the different type of ore Barrick decided on an autoclave for the ore at Goldstrike. Eventually Barrick would also build a roaster to handle ores similar to Gold Quarry. Newmont gained access to an autoclave after their 1997 purchase of Santa Fe Minerals. Ore from high-grade deposits like Deep Star were shipped 120 miles to the Twin Creeks mine for processing. Newmont began developing the Leeville mine in 2002 with a drift from the Carlin East underground and twin shafts from the surface. The Leeville complex which contains several orebodies is the largest underground mine on the Trend.

In 2005 Barrick discovered the South Arturo deposit below the waste dumps of the Dee mine. The discovery was made under the Barrick-Dee Joint venture which through a series of acquisitions became a partnership between Barrick and Premier Gold. Production from South Arturo began in 2015 and a number of new ore zones have been discovered including the El Nino underground.

After nearly 55 years of production on the Carlin Trend the two principal players agreed to a joint venture with Barrick (65%) as the operator and Newmont (35%) as a partner. Nevada Gold Mines now controls 100% of the production from the Carlin Trend. Since 1965 the Carlin Trend has produced over 100 Million ounces from numerous open pit and underground mines. Exploration continues and the end of the Carlin Trend is far from over.

Specific Resources

Dean G. Heitt, ***Before the Gold: Early Mining History of the Carlin Trend 1874-1961***, Southern Nevada Conservancy, 2019.

Dean G. Heitt, "Newmont's Reserve History on the Carlin Trend 1965-2001" in ***Gold Deposits of the Carlin Trend***, Nevada Bureau of Mines and Geology Bulletin 111, 2002.

Keith Bettles, "Exploration and Geology, 1962-2002, at the Goldstrike Property" in ***Gold Deposits of the Carlin Trend***.

J. Alan Coope, ***Carlin Trend Exploration History: Discovery of the Carlin Deposit***, Nevada Bureau of Mines and Geology Special Publication 13, 1991.

Robert H. Ramsey, ***Men and Mines of Newmont: A Fifty-Year History***, Octagon Books, 1973.

Ralph J. Roberts, ***A Passion for Gold: An Autobiography***, University of Nevada Press, 2002.

THE CORTEZ MINING DISTRICT (1863)



Jean Boitano and friends in front of the Cortez Hotel. She was the daughter of Vera and John Boitano who arrived in Cortez in 1919. The Boitanos, including Jean's sisters Virginia and Georgia, were the last family to leave Cortez (1942). Photo courtesy of John Yancy.

Directions from the Elko Red Lion in Elko: From the Red Lion take I-80 West 42 miles to Exit 261, Beowawe, and turn south onto SR306. Travel south on SR306 for about 45 miles, following the signs for Grass Valley (after about 30 miles the road becomes dirt). At 45 miles is signage to the Cortez Historic Marker, and access to the old townsite. Welcome to Cortez!

In 1863 a group of well-financed prospectors left Austin, Nevada (Reese River Mining District, discovered 1862) in search of silver. Traveling north through Grass Valley, they came upon a prominent quartz and limestone mountain, visible from miles away and roughly translated from local Western Shoshone as 'Tenabo.' In the early 1860s miners looked for quartz veins as the host of precious metal, and they were certain this mountain had the silver riches they were looking for.

The prospecting party included Simeon Wenban (mill operator from Virginia City, NV), George Hearst (mine owner and speculator), and Andrew Veatch (assayer, Austin, NV). The

party skirted up and around the mountain and staked claims along the ridge of what became known as Mill Canyon. The Cortez Mining District was born.

Simeon Wenban quickly became the controlling interest in the district, buying out Hearst and the other early discoverers. Wenban owned the most productive mines in the district, the only mill, and had the grandest house in the camp. In the mid-1870s Wenban created a stir by firing his Cornish miners and replaced them with Chinese labor. Wenban put the Chinese underground and in his mill. Having Chinese employed as underground hard rock miners and millers was unprecedented in Nevada and the west. The Chinese are found on the payrolls into the early 1900s and their footprint in the District is all across the mountain. They also ran stores, cut firewood, and had a joss house at Shoshone Wells and their own cemetery.

Wenban adopted a resilience strategy at Cortez that allowed the district to remain profitable for extended lengths and through economic downturns. Wenban was one of the few operators turning a profit during the silver crashes of the 1880s. Wenban had his cheaper Chinese labor, but also smartly maximized use of local resources. A mostly Italian labor pool harvested the surrounding pinyon-juniper forest and converted it into charcoal (pinyon) and cordwood (juniper). Wenban hired local Western Shoshone to harvest salt off the playa in Grass Valley. Two Bruckner furnaces installed in the Tenabo Mill roasted the ore and salt mixture as part of the lixiviation process. Grass Valley also had a clay source suitable for firing brick which was used in construction of the Tenabo mill's smokestack, fireboxes, and other areas. Mt. Tenabo's limestone also came into play. Wenban built three lime kilns at the base of the mountain to convert the lime into calcium carbonate, which was also needed in the milling process.



Tenabo Mill ruins including two Bruckner furnaces on top. The flues under the furnaces are lined with brick made locally in Grass Valley. Photo courtesy of Robert McQueen.

Two other interesting aspects of Cortez is its longevity and milling history. Cortez is one of the most continuously active mining districts in Nevada, with over 150 years of active mining, exploration, and expansion. Its current status as a major gold producer goes back 50 years with only one brief hiatus. Cortez has a nearly complete history of Nevada's 19th century milling technology. From 1864-1940 five mills operated sequentially in the district and represent all precious metal milling experimented with in Nevada. Pan amalgamation (the Washoe process), lixiviation (the Russell process), cyanide leaching, and flotation were all exploited with varying degrees of success. In 1971 Cortez was the first mine in the world to construct a commercial, open air heap leach pad to recover 'invisible' low grade gold deposits. Heap leaching is a fundamental component of gold mining in the world today and accounts for nearly 20% of global gold recovery. Heap leach pads are ubiquitous to Nevada's modern mining operations.

Specific Resources

Erich Obermayr and Robert W. McQueen, ***Historical Archaeology in the Cortez Mining District: Under the Nevada Giant***, University of Nevada Press, 2016.

EUREKA (1864)



Eureka, Nevada. Photo courtesy of Special Collections at the University of Nevada, Reno.

Directions from the Elko Red Lion in Elko: From the Red Lion, take I-80 West 24 miles to Exit 279, Carlin/Eureka, and turn south onto SR278. Travel south on SR278 for 116 miles to U.S. Highway 50 ("The Loneliest Road in America"). Turn east and travel about 3 miles. Welcome to Eureka!

Silver in Eureka was discovered by a five-man prospecting party from Austin Nevada in September 1864 in the eastern portion of the mining district in New York Canyon. The initial discovery was rather insignificant, and it was not until the subsequent discovery at Ruby Hill in the western portion of the district that the significance of the large lead, silver-gold deposits was recognized. Early smelting difficulties were eventually overcome and in 1869 mining and processing began in earnest resulting in recorded historic production up until 1964 of 1.65 million ounces of gold, 39 million ounces of silver, 10 billion pounds of lead,

224 million pounds of zinc and 32 million pounds of copper. The narrow-gauge Eureka and Palisade railroad was completed in 1875 to the main Central Pacific intercontinental line on the Humboldt River and Eureka functioned as an important hub for the various mining districts throughout central Nevada. By 1878 Eureka was Nevada's second largest city with a population of 9,000 residents. There were over 100 saloons and luxurious hotels with all the other ancillary businesses associated with boomtowns in this time period. Fifty producing mines fed 16 smelters, but by 1885 production had dropped, and the rush was over. Exploration and various efforts continued, however.

A notable event at Eureka was the "Fish Creek War." Italian wood cutters, known as Carbonari, who provided charcoal to the smelters, struck in 1879 demanding an increase in the price of coal to 30 cents from 27 1/2 cents. Angry townspeople formed a posse and attacked the Carbonari and killed five of the charcoal burners and wounded at least as many others. The companies had won, and the Carbonari were forced back to work at an even lower rate.

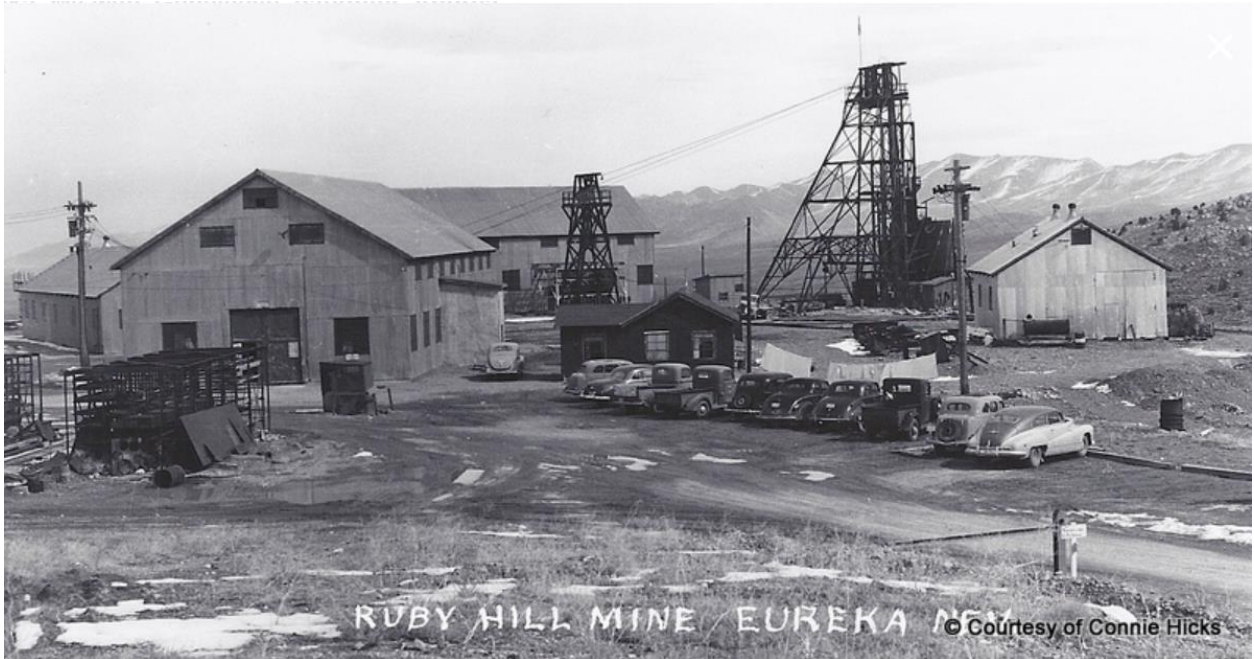
The Ruby Hill orebody was recognized to have been downfaulted to the north of the historic workings, and various efforts were made to exploit the resource. In 1919 the Ruby Hill Development Company financed by the famous Canadian mine developer Thayer Lindsley tried to dewater the historic the Locan historic shaft to mine the area but a high influx of water halted the development efforts. Thayer Lindsley is thought to have been in the area establishing his six-week residency to qualify for a divorce in Reno, "the divorce capitol of the world." In 1937 Lindsley founded the Eureka Corporation and efforts resumed with construction of the four compartment Fad shaft. This development was thwarted by high groundwater flows and equipment shortages during World War II.

Subsequent efforts continued through 1948 with limited success. In the 1950s, the TL shaft (named in honor of Lindsley) was completed in the Adams Hill area nearby, and some ore was mined. In the 1960s, surface drilling was completed in the area by the Ruby Hill Mining Company (Richmond Eureka, Eureka Mining Corp., Newmont Mining, Cyprus Mines, and Hecla). Following this effort, a consortium of Newmont, Hecla, Richmond Eureka and Eureka Mining attempted to dewater the Fad shaft in 1963. In a somewhat complex plan involving pumping 24,350 sacks of cement into the mine to the 2250 foot level, the shaft was dewatered. The area was subjected to an intense program of crosscuts and drilling but when it was all said and done it was decided that the project was not feasible. All of the underground equipment was removed from the project by February of 1966, and the property reverted back to U.S. Mining and Smelting.

In the late 1980s, Homestake Mining took a lease on the property and discovered the blind Carlin type deposit named Archimedes in 1993. This mine produced approximately 1.5 million ounces of gold before its closure relatively recently due to a pit wall collapse. It has recently been reactivated by the Ruby Hill Mining Company. At least three other exploration companies are currently active in this historic district as well, and the search for more gold continues.

In addition, General Moly, Inc. holds a Record of Decision, issued in 2019, to begin the Mt. Hope molybdenum mining operation 21 miles north of Eureka. The company is waiting for an increase in the price of molybdenum and has not yet begun construction of the mine. The plans forecast a 44-year mine life annually producing 40 million pounds of molybdenum.

Many of the Eureka's original buildings still remain, and an excellent walking tour can be guided by information from the Raines market website link below.



Fad Shaft at the Ruby Hill Mine in Eureka, County. Photo courtesy of Raines Market.

Specific Resources

Self-guided tour: <https://www.rainesmarket.com/eureka-self-guiding-tour.html>

Silvio Mano, *Charcoal and Blood: Italian Immigrants in Eureka, Nevada, and the Fish Creek Massacre*, University of Nevada Press, 2016.

Lambert Molinelli & Co., *Eureka and Its Resources: A Complete History of Eureka County, Nevada*, Apple Manor Press, 2017 facsimile reprint of the 1879 edition.

MIDAS (1907)



The developing town of Midas in 1908. Photo courtesy of Nevada Historical Society.

Directions from the Elko Red Lion in Elko: There are two travel options, each of which is about 2.5 hours in duration. The one with the most pavement/best roads begins on I-80. From the Red Lion, take I-80 West 110 miles to Exit 194, Golconda/Midas, and turn east onto SR 789. Continue northeast on SR 789 for about 15 miles. Turn right (east) onto the gravel road marked "Midas Road." Continue on the well-maintained gravel road for about 27 miles. Turn left (north) at the Midas Bighorn Saloon sign and drive 3 miles into Midas.

The second option is the most scenic and could easily include a detour into Tuscarora. Take I-80 West from the Red Lion to the next Elko exit (#301) and turn north on the Mountain City Highway (SR 225). Continue on SR 225 north to Lone Mountain Station and turn left (west) on SR 226. Just past the Taylor Canyon Saloon, about 18 miles, turn left onto the gravel road marked Tuscarora-Midas County Road and travel 41 miles west. At the intersection with the Midas Bighorn Saloon sign, turn right (north) and drive 3 miles into Midas. This route is not maintained during the winter.

Welcome to Midas!

Prospecting in June of 1907, James McDuffy and his young sons struck gold near the Snowstorm Mountains in southwestern Elko County. Word spread quickly, and prospective millionaires swarmed the hills. Paul Ehlers recorded the Elko Prince claim a few days after McDuffy; it ultimately developed into the most productive mine in the district. The richest discovery was made in October 1907 by Richard Bamberger who had relocated McDuffy's original claim and was known to hand out some of the seemingly endless supply of jewelry rock. The area was dubbed Gold Circle Mining District, and a town of the same name soon developed.

But the U.S. Postal Service would not allow another Nevada town's name to begin with the word "gold," and the residents chose to name their town "Midas." (The name had been attached to the post office at Lone, in Nye County, Nevada, from 1883-1903, which continues to cause confusion today.) Like all Nevada mining camps, Midas boomed and busted several times. Unlike most, however, it has never been abandoned.



One of the first mills in the Gold Circle Mining District, this 10-stamp facility was built by Charles L. Geyman (of Butte, Montana, fame) in 1908. It was usually operated by his wife, Josephine Chishart Geyman until about 1921. She had become nationally famous for operating the Yankee Boy Mine and Mill in Butte while Charles was imprisoned in 1905. Photo courtesy of Friends of Midas.

After the initial excitement, the population of the area settled at around 100 people with the usual mining camp collection of saloons, boarding houses, brothels, and schools. In 1921, a fire at the Elko Prince Mill shut down production, and the area languished for a few years.



The Rex Mine and Mill dated to the earliest years of the district and became a central producer in the Getchell era. Photo courtesy of Friends of Midas.

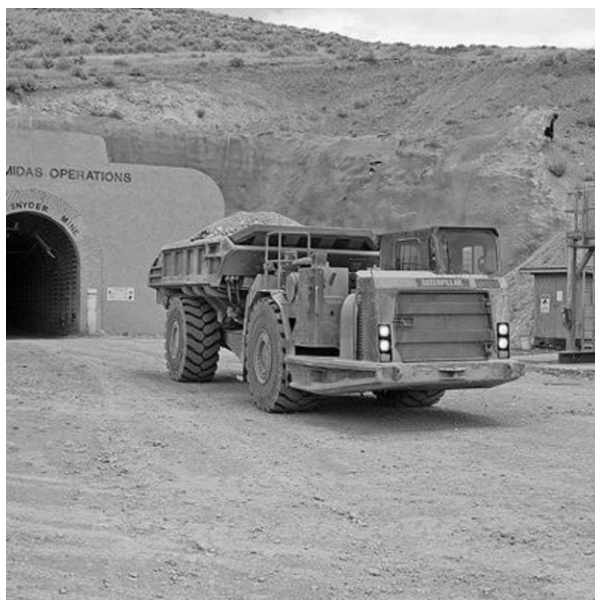
In 1924, Noble Getchell consolidated the mines at Midas with his silver mining operations at Betty O'Neal near Battle Mountain and established the Gold Circle Consolidated Mining Company. It was the district's most productive period to date. The town grew to about 300 people, and a modern schoolhouse was built. Operating until 1935, the company was often the largest annual gold producer in Elko County.



As a State Senator and head of the Republican Party, Noble Getchell attracted many luminaries to Midas, such as former heavyweight boxing champ Jack Dempsey who arrived in 1931 ostensibly to train. This national publicity photo showed Dempsey with local boys in front of one of the general stores. (Photo courtesy of Friends of Midas)

After the Federal Government closed gold mines in 1942, Midas became more of a hunting and recreation destination than a mining one. Over the past 80 years, the town's permanent population has rarely exceeded 20 hardy folks, but weekenders and hunting/fishing enthusiasts often push the temporary population well past 100. At least one saloon has nearly always been in operation, although the school finally closed in 1972.

In 1999, gold and silver mining returned to the area again with the opening of the Ken Snyder Mine by Midas Joint Venture, a combination of Franco-Nevada and Euro-Nevada. In its first year of production, more gold and silver were produced than in all of the previous 90 years combined. The mine, its mill, and related facilities were owned and operated by Newmont from 2002 to 2014. The Midas Mine Complex is now owned by Hecla Mining Company.



*Underground hauler leaves the Ken Snyder portal in 2014.
Photo courtesy of the Elko Daily Free Press.*

Currently, Midas is home to 15 full-time residents, most of whom are retired, and one full-time business, the Midas Bighorn Saloon. Most of the early buildings are gone, but the local historic preservation group has created exhibits that retain the feel of an early 20th century Nevada mining town. The mining district, where exploration for gold and silver continues today, is still officially known as the Gold Circle Mining District.

Specific Resources

Dana R. Bennett, ***A Century of Enthusiasm: Midas, Nevada, 1907-2007***, Friends of Midas, Inc., 2007.

FriendsofMidas.org

TUSCARORA (1867)



Tuscarora c. 1880. Photo courtesy of Nevadatravel.net

Directions from the Elko Red Lion in Elko: Take I-80 West from the Red Lion to the next Elko exit (#301) and turn north on the Mountain City Highway (SR 225). Continue on SR 225 north to Lone Mountain Station and turn left (west) on SR 226. Just past the Taylor Canyon Saloon, about 18 miles, turn left onto the gravel road marked Tuscarora-Midas County Road and travel 5 miles west. Tuscarora will be visible up on the mountain on your right (north), and the road is well-marked. Turn right when indicated and travel 1.5 miles up the mountain.

Welcome to Tuscarora!

The Tuscarora mining district was officially discovered in 1867 when a Native American showed a prospector where to find gold. The area was organized and given the name Tuscarora after a Union battleship for the Civil War. Early mining activity was mainly placering, in particular by Chinese who had been dismissed after the completion of the Central Pacific Railroad.



The 1880 census counted 600 Chinese in the Tuscarora area. Photo courtesy of the Northeastern Nevada Museum, Elko.

In 1871 an unsuccessful (to that point) miner named William O. Weed found silver veins, and the rush was on. Water and fuel were scarce, and Tuscarora became somewhat famous for largescale “timbering” of sagebrush for its mills. Ultimately, the population reached into the thousands with a thriving business center and social life. Carlin, Battle Mountain, and Elko all had vibrant freighting services to Tuscarora.



Tuscarora Miners. Photo courtesy of Northeastern Nevada Museum, Elko.

Between 1878 and 1881, more than 15 mines operated in the area. Tuscarora produced more than half of the total ore produced in all of Elko County in the 19th century. Estimates range from \$9.4 million to \$40 million. Although production declined after the 19th century, Tuscarora silver production continued until 1963. In the 1950s, it was known for mercury production.

A small but colorful community still exists at the town today. For many years, it was the home of the renowned Parks Pottery School, which was established in the old mining camp in 1969, and several artists maintain art studios in Tuscarora. In 2013, the Society Hall was renovated to provide a town museum and meeting place. The Dexter Mine was re-opened in 1987, but soon closed in the face of fierce opposition from residents. Its resulting pit lake has been repurposed into a recreational asset for the town.



Photo courtesy of the Nevada Commission of Tourism

CORNUCOPIA (1872)



Steam boiler is one of the few remains at Cornucopia. Photo courtesy of Robert McQueen.

Directions from the Red Lion: There is no good access to Cornucopia.

Cornucopia is a classic overinflated Nevada mining camp. In 1872, Mart Durfee discovered silver-bearing ore approximately 20 miles north of Tuscarora and the Cornucopia Mining District was quickly organized. Some reports claimed that by August 1873 about 400 miners were in Cornucopia and that 50 more were leaving Elko daily for the new camp. Others place the population at a more conservative 150 to 200 people. The town consisted of three sections or neighborhoods – Kaufmanville, Baldinsville, and Brownsville – that developed separately but within feet of each other. Baldinsville was considered the Leopard Mining Company's company town.

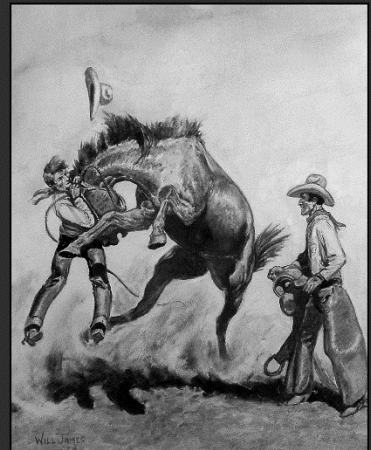
There were at least three good wagon roads that entered Cornucopia from the south and the east: one from Elko, one from Red House, and one from Winnemucca via Paradise Valley and the Little Humboldt River. The district was accessed using Hill Beachey's previously established freighting route between Elko and Idaho and the route to northern Nevada's Cope Mining District. Woodruff and Ennor secured the mail route to Cornucopia and started a stage line on the road, but soon lost the mail contract to Smith Van Dreillen. A stage station was located on Deep Creek at the junction with Chicken Creek, on the Mountain City-Whitlock road. By 1874, the routes to Cornucopia were well-established and the town boomed with a reported population of 1,000, although again this is likely exaggerated.

The main mines were the Leopard, Hussey, Chloride, and Black Diamond. All of the ore was transported to Winnemucca via the Little Humboldt River route until December 1874 when the Leopard Mining Company built a 10-stamp quartz mill on Deep Creek. The area on Deep Creek became known as Mill Town (or Milltown) and included a population of 50 residents. The original mill burned in July 1875 but was replaced within three months by a 20-stamp mill. In 1876 the Hussey and Leopard mines built large hoisting works. That same year Cornucopia was struck by a major setback when a torrential downpour flooded part of the town. By this time most of the readily available ore had been depleted and, with the high production of the mines in Tuscarora creating a draw, most of the population of Cornucopia left for that nearby camp. By 1877 the population had dwindled to 75 persons. The Leopard Mine was abandoned in 1879. In 1880 the U.S. census counted 113 people but in July that year the mill burned down and was not rebuilt. If that was not enough motivation to vacate the district, in December most of the town of Cornucopia was destroyed by a fire that was too large for the few remaining residents to fight. A two-story hotel was one of the few businesses still operating in 1881: in 1882 only two people remained at Cornucopia, and in 1884 the last resident and town constable, Thomas McAvin, finally left.

Having been idle for two decades, by 1908 all of the deep mines in the district had caved in. Brief revivals in the 1910s and 1930s recorded little production. Exploration in the 1970s consisted of geologic sampling and exploratory drilling and led to bulldozing parts of the old town. Estimates place total production for the Cornucopia Mining District at \$1 million to \$1.25 million, a trifle amount for a Nevada mining district. Only a couple of buildings exist in the old town, though main street is lined with building foundations, and the parts of the hoisting works are still extant.



Hoisting drums at Cornucopia. Photo courtesy of Summit Envirosolutions, Inc.



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Edward Weston

**On
To
Alabama!**

32nd Annual MHA Conference: Looking Forward to Birmingham!

Next year will be -- we hope -- a return to the ordinary traditions of the Mining History Association. Most importantly, this means an in-person conference in June 2022, in Birmingham, Alabama!

Alabama might not be on the radar of mining historians who concentrate on gold, silver, or copper, but the state was an important producer of both bituminous coal and iron. This mining and steelmaking was concentrated in Birmingham, which was founded after the Civil War and rose to prominence in the late 19th and early 20th century for mining, iron and steel making, and railroading, earning the nickname "the Pittsburgh of the South." A happy geological accident left iron ore, coal for fuel, and limestone for flux all within a short distance of the new city. The mining and ironmaking persisted long enough to leave some important marks on the landscape, including Sloss Furnace, an industrial ironmaking complex that has been preserved as a National Historic Landmark since its closure in 1970.

Birmingham will also be an important place to reflect on the broader connections between mining and the societies it helps to support. Birmingham iron was cost-competitive in part by keeping labor costs low, through anti-unionization efforts, worker intimidation, and in some cases, use of forced labor through the convict leasing system, which was not outlawed until the late 1920s. As the largest city in Alabama, it was the site of important and somber events in the mid-century struggle for equality and civil rights. Today, the economy has diversified and Birmingham is a major hub for its region. It will also be one of the largest places the Mining History Association has ever met for the annual conference! (Only Boise, Idaho -- site of our 1992 meeting -- comes close.)

I cannot wait to see the program and tours that the Birmingham meeting team -- spearheaded by Jim Day and Fred Barnard -- will have in store for us. And I am more eager than I've ever been for the chance to spend time with my MHA friends in person again. I hope you'll join me next June in Birmingham!

Eric Nystrom

MHA President 2021-22



Eric Nystrom is Program Chair for the Elko conference and is incoming President of the MHA. He is an associate professor of history at Arizona State University where he teaches at the Polytechnic campus and is working on a book about the history of mining displays in museums. As founder and editor of the Mining and Society book series with the University of Nevada Press, he enjoys encouraging the growth of the field by providing a forum for the publication of well-researched scholarship. A native-born Nevadan, Eric was especially bummed that the Elko meeting was impacted by COVID but hopes to get his Basque food fix later this summer, somehow!

CONFERENCE NOTES

2021 SCHEDULE AT A GLANCE

(Pacific Daylight Time)

WEDNESDAY, JUNE 9

3 pm – 5 pm

MHA Council Meeting

Time subject to change

THURSDAY, JUNE 10

8:30 am - 8:45 am

Welcome to Elko

8:45 am - 9:00 am

How the Conference Will Work Virtually

9 am – 10 am

Session 1 *Early Visions of Nevada*

10 am – 11 am

Session 2 *Traditions and Culture*

11 am – 12 pm

Session 3 *A Global Perspective*

12 pm – 2 pm

Lunch on your own; MHA Editorial Board meeting

2 pm – 3 pm

Session 4 *Sunken Treasure and the Calif. Gold Rush*

3 pm – 4 pm

Virtual Tour of Cortez Mining District, Nevada

4 pm – 6 pm

Virtual Social Gathering: *Mining in NE NV: 170 Years of Objects*

FRIDAY, JUNE 11

9 am – 10 am

Session 5 *Nevada Mining and the World*

10 am – 11 am

Session 6 *Mining Camps and Their People*

11 am – 1 pm

Presidential Lunch and Passing of the Pick

*Big and Small, they Mined them All: Thinking about Scale
in Mining History*

1 pm – 2 pm

Session 7 *20th Century: New Processes & Minerals*

2 pm – 3 pm

Session 8 *Mining Corporations; Mining Society*

3 pm – 4 pm

Virtual Tour of Eureka, Nevada

4 pm – 6 pm

Virtual Social Gathering: *The Eye of the Prospector*

SATURDAY, JUNE 12

9 am – 10 am

Session 9 *Nevada: First-Hand Sources*

10 am – 11 am

Session 10 *Mining as Social Foundation*

11 am – 12 pm

Session 11 *Community Memories of Mining*

12 pm – 2 pm

MHA Business Meeting and Awards Luncheon

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