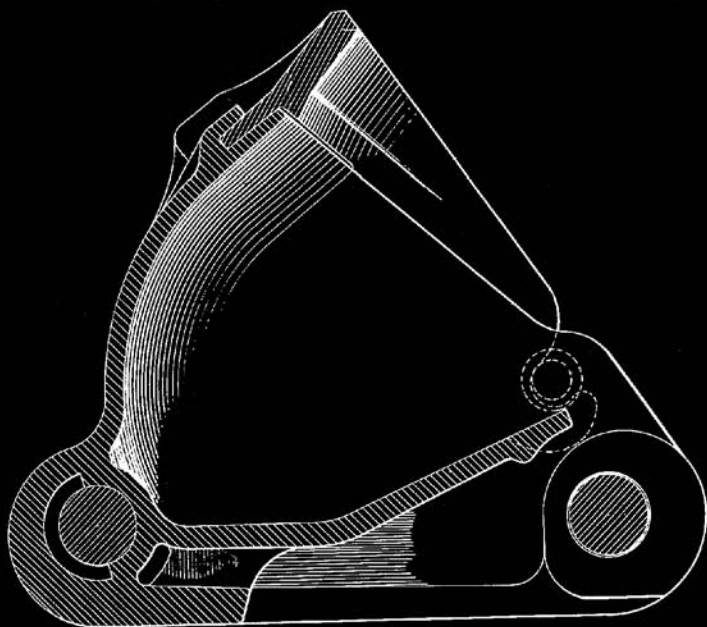
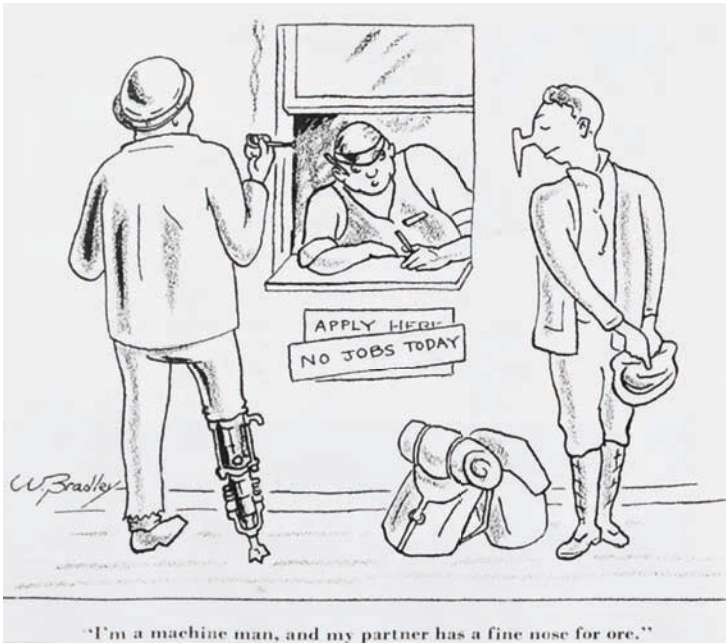
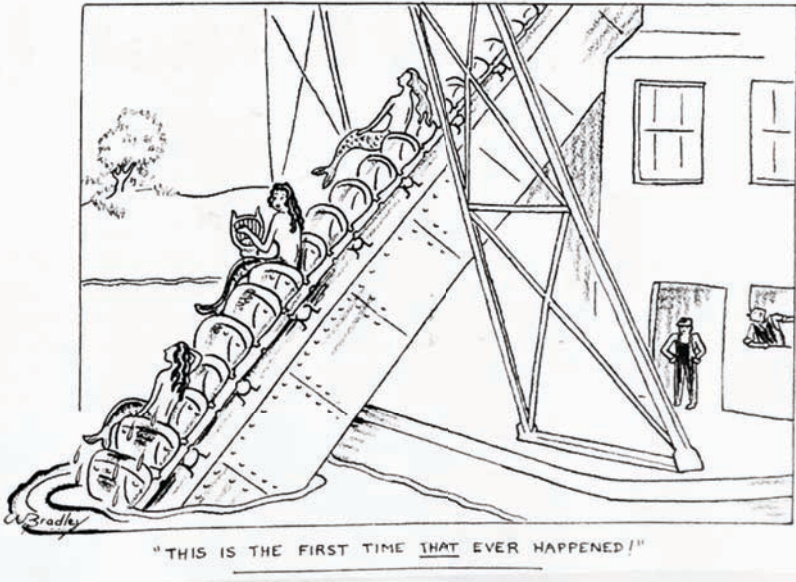


PROGRAM & ABSTRACTS

MINING HISTORY ASSOCIATION



FAIRBANKS, ALASKA
JUNE 15-19, 2017



Mining cartoons by Worthen Bradley (son of F. W. Bradley, manager of the Alaska Juneau Gold Mining Company), appearing in *Mining and Metallurgy* (May 1938) and *Compressed Air Magazine* (March 1939). Bradley Family Papers, Bancroft Library, BANC MS 71/142, carton 1.

27th

ANNUAL CONFERENCE

OF THE

MINING

HISTORY

ASSOCIATION

FAIRBANKS, ALASKA

JUNE 15 – 19, 2017

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WELCOME

Welcome to Fairbanks, the Golden Heart City of the Frontier State! The city of Fairbanks is intimately tied with mining history. Fairbanks was founded in 1901 as a supply post for miners heading to the Yukon fields, but gold discoveries close by transformed the fledgling settlement into the principal supply city for the interior, a function that it continues to serve today. The Fairbanks region saw the working of placer and lode gold deposits at small and large scales, with many aspects of mining still visible on the landscape.

The University of Alaska Fairbanks (UAF) campus is our conference venue for registration, accommodations, paper sessions and the Saturday lunch. Situated on an elevated ridge, the campus offers stunning views of the Alaska Range on a clear day. Free shuttle services are available for transport around the campus, and buses also connect the campus to downtown and the Fairbanks airport.

We have complemented a day and a half of paper sessions with two and a half days of tours to area mines. Beginning on Saturday afternoon, we will tour the machine shop associated with dredging operations by the Fairbanks Exploration Company. On Sunday we have tours to a historic dredge, an operating open-pit mine, and a visit to the Permafrost tunnel, where the bones of Pleistocene mega-fauna jut out from the walls. On Monday we have tours to Pogo, an underground gold mine, and a more informal tour to historic lode mines in the Fairbanks area. For the early birds, we are delighted to offer a tour of the archival collections on the UAF campus. For all registrants, your conference badge allows free admittance to the Museum of the North.

Adding to the Alaskan experience, the timing of our conference coincides with the summer solstice festival, which will be held in downtown Fairbanks on Sunday June 18. This is the largest festival in the state, and one of the only places to catch a midnight baseball game or participate in a late night fun run. We hope that you enjoy your time in Fairbanks and that it also fuels a desire to return to Alaska.

ACKNOWLEDGMENTS

This conference is dedicated in memory of Chuck Hawley (1929-2016), MHA member and Alaskan geologist, miner, and author, who proposed the idea of bringing our society northward.

Organizing Committee: Tom Bundtzen, Rolfe Buzzell, Ted Hawley, Robin Mills, Patricia Peirsol, Paul White. **Paper sessions Committee:** Jeremy Mouat, Eric Nystrom, Bob Spude, Paul White

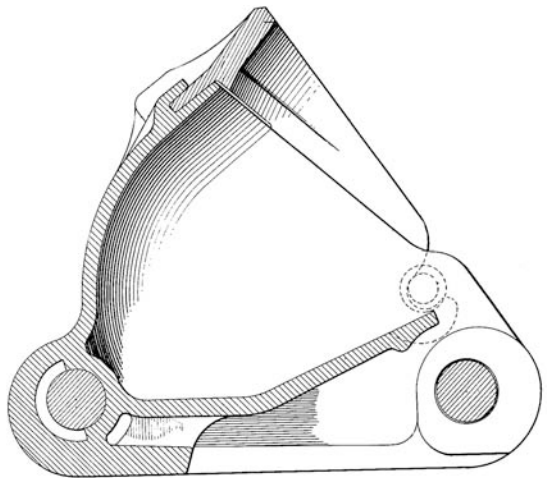
Special Thanks: We are grateful to many people who volunteered time and resources to make this conference a reality. The Alaska Miners Association and Alaska Historical Society helped spread the word. At the University of Alaska Fairbanks, thanks to Kate Avery, Jon Buchholtz, Terrence Cole, Dan David, Angela Linn, Cassie Pinkel, Angela Schmidt, Antoinette Shover, Rosemarie Speranza, and Marge Thompson. Among Mining History Association members, thanks especially to Nathan Delaney, Jay Fell, and Mike Kaas. Our thanks to National Park Service staff Chris Allan and Janet Clemens for coordinating book donations for the welcome packet. Explore Fairbanks assisted with the assembly of conference materials and registration.

We sincerely appreciate the companies and individuals allowing MHA to visit their properties. Our thanks to Anna Atchison, Marlene and Matt Bach, Roger Burggraf, Bureau of Land Management, Jane Haigh, Kinross / Fort Knox, Gary Larsen, George Lounsbury, Patricia Peirsol, John Reeves, Lorna Shaw, Sternwheeler Tanana Chief, Sumitomo Metal Mining Pogo, and U.S. Army Corps of Engineers, and UAF.

And Thanks to Our Sponsors:

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Around Fairbanks



Thank You!

KINROSS

Fort Knox



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**DONLIN
GOLD**



DOWL

A BRIEF HISTORY OF FAIRBANKS

Rolfe Buzzell

The city of Fairbanks is located in the heart of Alaska's interior, 358 miles north of Anchorage on the Parks Highway and 2,305 miles northwest of Seattle. Fairbanks is Alaska's second largest city (population 32,000) and part of the Fairbanks-North Star Borough (population 99,000). The town's history dates to 1901 when Captain E.T. Barnette established a trading post along the Chena River several miles upstream from the confluence of the Chena and Tanana rivers. In July 1902, Felix Pedro, an Italian prospector, discovered gold about 16 miles north of Barnette's trading post. The rush that followed brought hundreds of stampeders to the area. Barnette convinced local miners to name the gold camp "Fairbanks," after U.S. Senator Charles W. Fairbanks of Indiana who became vice president of the U.S. under Theodore Roosevelt. The town was incorporated in 1903, the same year a post office was established, the Northern Commercial Company opened a branch store, and Fairbanks became the headquarters for the Third Judicial District of Alaska. A bank opened in 1904 as the population swelled to 5,000 people. The military built a trail (which became the Richardson Highway) connecting the town to an all-weather port at Valdez. During the next two decades Fairbanks served as the supply hub for expanding mining operations in the interior.



Fairbanks waterfront, 1904. Robert Jones Collection, Alaska & Polar Regions Archives, UAF

Gold mining in the Fairbanks district began with open cut methods (including shoveling gold-bearing gravels into sluicing boxes) and drift mining (sinking shafts to bedrock and tunneling to follow the pay streaks). The placers in the area are generally deep with gravel from a few feet to a hundred feet or more in depth covered by silt (locally called muck) up to as much as 200 feet deep. Most of the muck and gravel are permanently frozen. Fortunes were made from drift mining with production peaking at nearly \$10 million in 1909. As the rich streambeds were exhausted, production dwindled to around \$3 million by 1920 and Fairbanks was on the verge of becoming a ghost town. The first significant lode gold discovery occurred in 1908, and lode production began in 1911 on the Rhoads-Hall or Cleary Hill mine. That mine produced over 280,000 ounces of gold before it was closed by the War Act of 1942. Other lode discoveries also were made in the 1910s. It appeared that lode production would surpass placer gold until World War I put the competition between "quartz men" and "gum boot men" on hold. Post war inflation, lack of equipment, capital and skilled labor in the 1920s retarded the revival of the lode industry, although many abandoned lode claims were re-staked during the 1930s.

Placer mining around Fairbanks experienced resurgence in the 1920s, driven by the opening of the Alaska Agricultural College and School of Mines (now the University of Alaska Fairbanks) in 1922, completion of the



Rhoads-Hall Mill under construction, 1911 (it would later become Cleary). Cornell University Library

Alaska Railroad from Seward to Fairbanks in 1923, and construction of the Davidson Ditch, which brought large volumes of water 90 miles to enable large-scale mining activity. The introduction of huge dredges by the Fairbanks Exploration (FE) Company in the 1920s boosted placer mining by maximizing economies of scale and accessing deeply buried gold deposits. As Alaska's largest city, Fairbanks was the service and supply center for interior mining in the 1920s and 1930s.

Although mining was largely suspended during World War II, the construction of a major military base, Ladd Field (now Fort Wainwright), helped the city survive the war years. Placer mining resumed after the war, but tapered off in the postwar era as the fixed price of gold and higher operating costs cut into profits, resulting in the shutdown of large dredging operations in the 1960s. Lode development languished after World War II until 1972 when the price of gold was allowed to float on the free market.

Fairbanks area miners invested over \$25 million in lode prospecting between 1975 and 1985 with little return until Citigold introduced heap leaching in the late-1980s. Gold grades previously too low to be considered viable suddenly became profitable, and Citigold produced over 19,000 ounces of gold before decommissioning its mine in 1990. In 1987, lode gold was rediscovered on an old prospect on Gilmore Dome on what is now the Fort Knox Gold Mine. Mining resumed on the prospect in 1996, which has become Alaska's largest gold producer. From 1996



FE Company dredge working gravels near Fox. Alaska & Polar Regions Archives, UAF



Open pit operations at Fort Knox Mine, 2015. Photo by P. White

through 2016, the working of this open pit has produced more than 7 million ounces of gold.

Innovations in geochemical and geophysical methods of prospecting and a State of Alaska program in the 1990s using airborne geophysical surveys to attract exploration spurred mineral prospecting for lode deposits at a record pace resulting in a second Alaska gold rush. These activities increased known lode reserves from less than one million ounces to over eleven million ounces worth an estimated \$3.5 billion dollars in 1997 prices.

In recent decades, placer and lode mining have played a significant role in the Fairbanks economy, along with military bases, oil development, the growth of the University of Alaska, and tourism. Over time, the Fairbanks district has been the largest gold producing district in Alaska. As of November 2016, the district has produced in excess of 15.4 million ounces of gold, nearly one third of all the gold mined historically in Alaska. The large open pit lode mine Fort Knox located north of Fairbanks is one of the largest non-government employers in the area. Today, Fairbanks is the transportation and supply hub of the mining industry in interior Alaska. A number of tourist sites commemorate Fairbanks' mining history, including: Pioneer Park, the Chena Pump House, Chatanika Gold Camp, Eldorado Gold Mine, Gold Dredge No. 8, Ester Gold Camp, and the Davidson Ditch (located north of Fairbanks).

SITES ON CAMPUS

MUSEUM OF THE NORTH

Free Admission with Conference Name Tag

The Museum of the North is Alaska's only research and teaching museum, and serves as a primary repository for artifacts and specimens collected on public lands in Alaska. The museum presents both Alaska's cultural and natural history in addition to gallery space for a variety of art collections and installations. Included among the displays is Blue Babe—a 36,000-year-old mummified bison killed by an Ice Age American lion (the carcass preserves the lion's claw and tooth marks). Also of interest is the state's largest gold display, and exhibits of Alaska's native cultures, and a variety of exhibits showcasing the varied wildlife and natural habitats of the Arctic and Subarctic. Museum staff offer behind the scenes tours M-F at 2:00 pm for \$10

ELMER E. RASMUSON LIBRARY

Founded in 1922, the Rasmuson Library is the largest research library in Alaska, and home also to the Alaska and Polar Regions Collections and Archives that includes the records of several Alaska mining companies. Holdings in the library's open stacks reflect UAF's history as the Alaska Agricultural College and School of Mines—the library includes a rich complement of mining textbooks and journals, geological reports, and other periodicals. Be sure to check out a photo exhibit on Level 4 (main floor) tailored for the Mining History Association. On display are photos of various Fairbanks mining scenes—reproductions of these photos can be purchased at the main desk.

CORNERSTONE PLAZA (MAIN QUAD)

The founding of the Alaska Agricultural College and School of Mines owes no small part of its origins to the actions of Judge James Wickersham, a key figure in the Territory's history, having served as a district judge for Alaska's Third Judicial District (1900-1908) and congressional delegate to Congress (1909-1917, 1930-1933). Wickersham pushed for the founding of a university in Fairbanks, seeing it as a means to keep the settlement viable over the long term. Facing strong opposition from the Territorial Legislature, Wickersham opted to force its hand by selecting a site before the legislature met. Only July 4, 1915, he hosted a dedication ceremony, laying a cornerstone engraved with the initials of the future college. The cornerstone was never incorporated into the fabric of a campus building—it is on display on the south side of the main quadrangle.

THREE STAMP MILL (OUTSIDE MUSEUM OF THE NORTH)

On the rise just east of the Museum of the North is a three stamp mill that initially processed ore at the Soo claim, north of Fairbanks, in 1911. For those familiar with the gravity stamp, this battery is unusually light. Each of the stamps weigh 250 pounds—about one quarter of the weight used in a standard battery—but good enough for prospecting. This battery was manufactured by a local foundry, and it's limited crushing power earned it the moniker "coffee grinder." The stamps were donated to the museum in 1983, and the framework has been reconstructed.

**For more information about tours and attractions on campus,
see: www.uaf.edu/visituaf**

SITES AROUND FAIRBANKS

As the gateway to the interior, Fairbanks offers a wide range of visitor attractions. If you have an extra day, consider taking a drive out to the Chena Hot Springs, or trying your hand at mushing sled dogs at one of several operators in the Fairbanks area (yes, the dogs need exercise in the summer, too). In the following pages, we identify sites of particular interest to the Mining History crowd. Bear in mind that this is merely a selection. Please refer to the Fairbanks visitor guide for a fuller listing, or visit the Morris Thompson Cultural and Visitors Center (101 Dunkel Street, 907 459 3700, www.explorefairbanks.com), or talk to Explore Fairbanks staff at the registration desk.

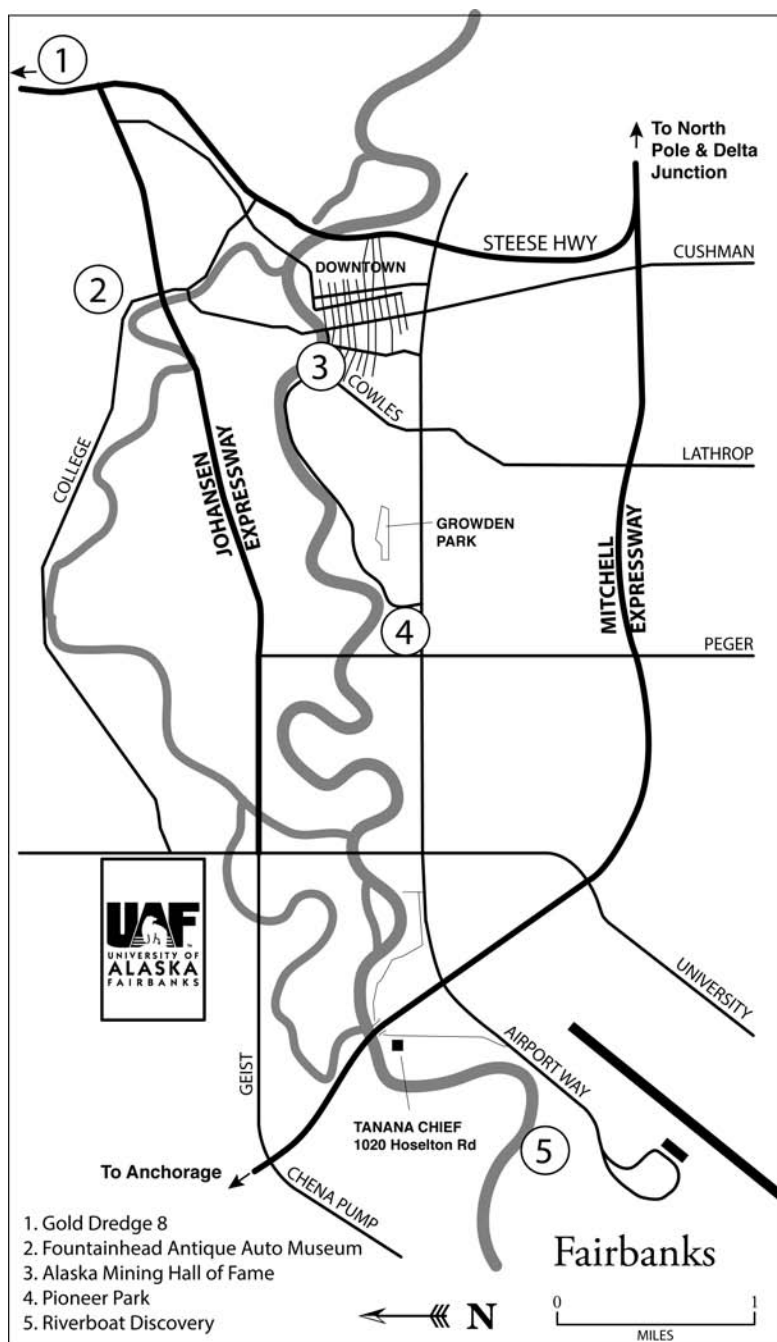
EVENTS

MIDNIGHT SUN FESTIVAL (JUNE 18)

The timing of our conference coincides with the summer solstice (June 21), in which Fairbanks receives almost 24 hours of sunlight. On June 18 (Sunday), downtown Fairbanks will be host to the Midnight Sun Festival. This is Alaska's largest single day event, attracting some 30,000 attendees, with more than 30 live music performances scheduled, and hundreds of exhibitors offering food and an array of Alaskan merchandise. For the fitness minded, consider joining in on the Midnight Sun Run (10:00 pm), which starts at the university. Now in its 34th year, the event attracts over 3,500 runners.

MIDNIGHT SUN GAME (JUNE 21), GROWDEN PARK, 10:00 pm

For over a century, a baseball game has been held in Fairbanks on the longest day of the year. The game continues through the midnight hour without the need for artificial lights. This year, The Goldpanners will host the San Diego Waves. Game time is 10:00 pm. Tickets are \$25 for general admission, or \$75 for a reserved seat. You can purchase tickets by calling 907 451 0095, or by visiting goldpanners.pointstreaksites.com



PLACES

1. GOLD DREDGE 8

Location: 1803 Old Steese Hwy N. Hours: Daily tours at 10:30 am and 1:45 pm (reservations required).

Admission: \$39.95 (Adults), \$24.95 (Child, 3-12yrs)

Admission includes a short ride on a replica of the Tanana Valley railroad near some of the original rail routes, a stop at the Trans-Alaska Pipeline, gold panning demonstration, and Gold Dredge 8, one of the FE Company dredges that remains intact, complete with equipment.

For reservations, see website at: golddredge8.com, or call 907 479 6673

2. FOUNTAINHEAD ANTIQUE AUTO MUSEUM

Location: 212 Wedgewood Drive. Hours: Sun-Thu 10:00 am-8:00 pm; Fri & Sat 11:00 am-6:00 pm.

Admission: \$10

A premier collection of automobiles, the Antique Auto Museum features over 80 vehicles, from horseless carriages through to '30s classics, along with vintage costumes and clothing exhibits. Included among the collection is Alaska's first automobile, built in 1905 in Skagway by Bobby Sheldon to woo a woman's heart. Sheldon assembled this two-seater contraption using buggy wheels, bar stools, and a marine engine—he built it without ever seeing a car before. There is a free shuttle to the Auto Museum from the Museum of the North. Shuttles run Mon-Fri 10:00-8:00, and weekends 12:00-7:00.

See the museum website (www.fountainheadmuseum.com) or call 907 450 2100 for more information.

3. ALASKA MINING HALL OF FAME

Location: 825 1st Avenue (downtown Fairbanks). Hours: Mon-Sat 11:00 am-5:00 pm

Free Admission (donations appreciated)

Founded in 1997, the Alaska Mining Hall of Fame Foundation (AMHF), is a nonprofit organization dedicated to honoring Alaska's mining pioneers. At present, 112 miners, geologists, government administrators, and others that have contributed to Alaska's mining industry have been inducted into the organization. Listed among them are industry bigwigs such as Frederick Bradley and Stephen Birch, who respectively ran the Juneau gold mines and the Kennecott copper mine, as well Wesley Dunkle, "Alaska's flying miner," and Martin Radovan, a prospector who never made a mine, but whose efforts to work a near-inaccessible ore outcrop made him a legend.

See the AMHF website (<http://www.alaskamininghalloffame.org>) for biographical sketches of all AMHF inductees.

4. PIONEER PARK

Location: Corner of Peger Rd & Airport Way. Hours: Daily 5:00 am-12:00 am

Created to celebrate the centennial of the 1867 Alaska Purchase, this 40-acre park in the center of Fairbanks offers a range of attractions for visitors and locals. Entrance to the Park is free, but there is a nominal charge for museums and other concessions operating in the park. Of particular interest to Mining History folks will be the display of mining equipment near the Alaska Salmon Bake (SW corner of the park) and the collection of historic buildings from Fairbanks, including Judge Wickersham's house. Additionally, the park is home to the following attractions:

PIONEER AIR MUSEUM: Hours: Daily, 10:30 am-8:00 pm.

Admission: \$4 (free for children under 12)

An opportunity to learn about the history of aviation in Alaska. The museum includes displays of several aircraft essential to the north, including the Norseman, and Stinson SR Reliant. Exhibits include a display of the 1935 crash that claimed the lives of comedian Will Rogers and aviator Wiley Post en route to Point Barrow.

PIONEER MUSEUM: Hours: Daily, 11:00 am-8:00 pm.

Admission: \$4 (children 6-16: \$2)

This museum houses includes a range of historical displays and artifacts. Of particular interest is the display of mining equipment in the backroom, complete with highly detailed dioramas of mining operations, including a cut through model of a bucket dredge. Well worth the look!

RIVERBOAT NENANA: Hours: Daily, 12:00 pm-8:00 pm.

Free Admission (donations appreciated)

The renovated SS Nenana is the largest sternwheeler ever built west of the Mississippi and the second largest wooden vessel in existence. Designated a National Historic Landmark, the interior of the vessel includes a diorama of life along the Tanana and Yukon rivers in the early 1900s.

TANANA VALLEY RAILROAD MUSEUM: Hours: Daily, 12:00 pm-8:00 pm.

Free Admission (donations appreciated)

The newest facility at Pioneer Park, the railroad museum includes the fully restored Engine #1, constructed in 1899, and the oldest operating steam locomotive in Alaska and Yukon territory. The engine operates on a limited schedule—it is scheduled to run Saturday, 17 June, from 12:00-5:00 (pending decision of Fire Marshall).

5. RIVERBOAT DISCOVERY

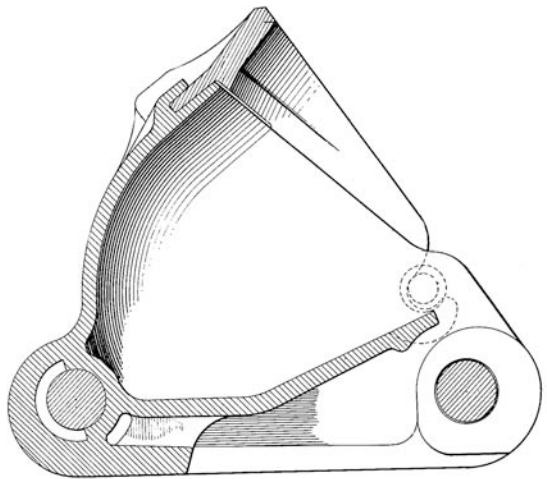
Location: 1975 Discovery Drive. Hours: Daily tours at 9:00 am and 2:00 pm (reservations required).

Admission: \$64.95 (Adults), \$39.95 (Child, 3-12yrs).

A three-hour tour aboard the Sternwheeler Riverboat Discovery. River tour includes demonstrations by an Alaskan bush pilot, a walking tour of Chena Indian Village (a recreated Athabascan Indian village with log cabins); and a tour to the home and kennels of Susan Butcher, four-time Iditarod champion. Dining at Steamboat landing is for an additional charge (\$11.95 adult; \$4.95 child)

For reservations, see website at: riverboatdiscovery.com, or call 907 479 6673

Schedule of Activities



Thank You!

AVALON DEVELOPMENT CORPORATION



Hawley Resource Group



Chatanika Gold Dredge Co.



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THURSDAY, JUNE 15

Registration Desk, 12:00-4:00 Reichardt Hall, Floor 2 corridor

TOUR OF THE ALASKA & POLAR COLLECTIONS, 1:00 pm

[Preregistration Required]

The UAF campus holds one of the premier archival collections for research on Alaska's history politics, and culture (the other being the recently remodeled State Library Archives and Museum in Juneau). Included among the collections are 150,000 monograph and serial volumes, 11,000 rare books, over 20,000 linear feet of archives and manuscripts, more than 1 million photographs, thousands of historical films, and over 11,200 hours of oral history recordings. This tour provides a primer to the resources held by the archives, along with highlights on Alaskan mining.

MHA BOARD MEETING, 2:30 pm, Reichardt Hall, Room 204

OPENING RECEPTION: ALASKA MINING HALL OF FAME,
5:00-7:30 pm

[Registration Desk 5:00-7:00 at Alaska Mining Hall of Fame]

- Shuttles leave from Wood Center 4:00-5:00 pm
- Return to Campus 7:00-8:30 pm

Welcome reception with drinks, nibbles, with a talk by Terrence Cole, followed by a screening of *City of Gold* (1957, 21 minutes). Dr. Cole will provide an introduction to this classic documentary about Dawson City during the Klondike Gold Rush—the event that ultimately led to the founding of Fairbanks.

- Dr. Terrence Cole is Professor Emeritus of History at the University of Alaska Fairbanks. The author of several books on Alaska history—among them, *Crooked Past: The History of a Frontier Mining Camp, Fairbanks Alaska*; *Nome: City of the Golden Beaches*; and *Fighting for the Forty-Ninth Star: C. W. Snedden and the Crusade for Alaska Statehood*—he is also a recipient of the Governor of Alaska's Distinguished Service to the Humanities Award for Excellence.

FRIDAY, JUNE 16

[Registration Desk 7:00-4:00, Reichardt Hall, Floor 2 corridor]

COFFEE & LIGHT BREAKFAST, from 7:00 am.

WELCOME: 8:00. Boyd Lecture Hall

SESSION 1: 8:15-9:30: *Fairbanks and Alaska Mining*

- Jane Haigh / Survey of the Development of Mining in the Fairbanks Area
- John Baeten / The Technology, Mining Methods, and Landscape of the Fairbanks Mining District
- Robert Spude / Fairbanks Assayer G. E. Beraud and 88 Tons of Gold

BREAK: 9:15-9:45.

SESSION 2: 9:45-11:00: *Mining and the Media*

- Jeremy Mouat / When the Medium was the Message: Mining Journals and Journalists, 1880-1920
- Brian Leech / Digging's Degree of Difficulty: The Changing Portrayal of Mining Labor in Movies and Games
- Tetiana Soviak / Real Man's Work as Entertainment: Spike TV's *Coal*

SESSION 3: 11:00-12:15: *Mining History in Worldwide Context*

- Greg Drew / Captain Bagot's Mine: The History of the Kapunda Mine, South Australia, 1844-1878
- Sharon Jenkins Carter / The History and Heritage of Iron Mining on the Canigou Mountain, South Eastern Pyrenees
- Rudy Davison / Murder and Mayhem at the Cashin Mine in Paradox Valley, Colorado

LUNCH (on your own): 12:15-1:45

SESSION 4: 1:45-3:00: *Pioneers*

- Tom Bundtzen / Mineral Resource Development in Alaska Prior to the 1867 Purchase
- Andrew Higgs / The First Stamp Mills of Fairbanks, 1910-1912
- Katherine Ringsmuth / Failure to Flight: How Two Bremner Miners Took the First Step in Building an Aviation Empire

BREAK: 3:00-3:15.

SESSION 5: 3:15-4:30: *Gold and Copper Miners*

- Stephen Hart / Gold Rush and Copper Boom: In Georgia and Tennessee?
- Jennifer Hildebrand and John Callan / Historic Chinese Placer Mining: The History, Techniques, and Application of Archaeology in American Canyon
- William Hawes / Braden Copper Co.: Early Days at the Southern End of the Kennecott Empire

MHA AWARDS BANQUET, 6:00-8:00

- Bus leaves from Wood Center 5:30 pm
- [For those driving, go to 1020 Hoselton Rd]

Buffet dinner and river cruise on the *Tanana Chief*. Buses depart at 6:00 pm from the Wood Center. (see map at back of booklet for location)

SATURDAY, JUNE 17

[Registration Desk 7:00-11:00, Reichardt Hall, Floor 2 corridor]

COFFEE & LIGHT BREAKFAST, from 7:00 am.

SESSION 6: 8:00-9:15: *Alaska Mining Camp Life*

- Rolfe Buzzell / Women in the Sunrise Mining Camp, 1895-1901
- Sheila Kelly / 100th Anniversary of the Treadwell Mine Cave-In
- Catherine Holder Spude / Will Woodin's Klondyke Adventure

BREAK: 9:15-9:30

SESSION 7: 9:30 -10:45: *Mining and Its Discontents*

- Tamara Holman / Rabble Rousers in Fairbanks, Alaska: An Early History of Labor, Capital, and the Western Federation of Miners
- Paul White / Broken Ore, Broken Bodies: The Wear and Tear of Mill Work on Alaska's Gold Miners
- Logan Hovis / Look with Your Eyes, Not with Your Hands: A Firsthand Account of Remediated Abandoned Mine Explosives

BREAK: 10:45-11:00

SESSION 8: 11:00-12:15: *Mining History: New Sources and Perspectives*

- Terry Reynolds / Owe My Soul? Company Stores on the Michigan Iron Ranges
- Eric Nystrom / Witnessing the Alaska Gold Rush: Finding History in Court Records
- William W. Culver / Financing the Mines: Early Industrial Capitalism at Harvey Hill, Quebec, 1847-1881

LUNCH: at Dine 49, Wood Center: *Schedule of Events*

- Presidential Luncheon: 12:30-2:00
- Presentation on MHA 2018 Conference, Deadwood, SD, 2:00-2:15
- MHA Business Meeting, 2:20-3:15

F.E. COMPANY MACHINE SHOP TOUR, 3:30-5:30

- Bus leaves from Wood Center 3:30 pm

Fairbanks became well known for its dredging, but the dredging would have been short lived without a repair shop. The U.S. Smelting, Refining & Mining Company constructed a machine shop in 1927 to support the company's extensive operations throughout the Fairbanks District, making both repairs and tools for the various dredges. When operations closed in 1964, the company left items in place. All of the equipment, including industrial lathes and large-scale welding equipment were left in the condition they were when they turned them off. Workers' clothing still hangs in the lockers, the shelves remain stocked with miscellaneous tools and equipment, and the belt-driven machinery still runs. John Reeves, owner of the machine shop, will be there to explain what is stored and operated there. This is a rare opportunity to see a different facet of mining operations; the site is not otherwise open to the public.



Tools lining the walls of the FE Company Machine Shop

SUNDAY, JUNE 18

[Breakfast 7:00 at Wood Center. Preregistration required]

TOUR 1: PERMAFROST TUNNEL & CHATANIKA DREDGE

- Bus leaves from Wood Center at 8:45 am

Our tour begins with a visit the Permafrost Tunnel, and the private collection of Pleistocene mega-fauna. The Permafrost Tunnel was built by the U.S. Army Corps of Engineers during the 1960s as a research facility. Dug into permanently frozen ground, the tunnel has not only become an important climate change research site, but also features many conditions that historic underground drift miners would experience. Next up, the private collection of John Reeves, includes the largest collection of Pleistocene mega-fossils stored in Alaska, as well as the records of the U.S. Smelting, Refining & Mining Company. On the way to Chatanika, we will stop at the Pedro monument commemorating the discovery of gold in the Fairbanks area, and also at Cleary Summit, the principal lode mining area of the Fairbanks District. We will eat lunch at the Chatanika Gold Camp, the original facility built by the USSRM&M Company to house and feed its employees. We continue next to Dredge #3, one of eight bucketline stacker dredges that the USSRM&C had in operation from 1927-1963. Dredge owners Patricia Peirsol and Jane Haigh will lead a tour of the site. Our tour concludes back in Fairbanks with a talk on the intricacies of dredge buckets, chased down with wine and cheese.



Dredge tailings at Chatanika, from photo by Chris Fastie

TOUR 2: PERMAFROST TUNNEL & FORT KNOX

- Bus leaves from Wood Center at 8:30 am

From the UAF campus, we will travel by bus to the property of John Reeves to see two impressive sights: the largest collection of Pleistocene-age mega-fauna stored in Alaska, and the company records of the U.S. Smelting, Refining & Mining Company (USSR&M). Next up is the Permafrost Tunnel, a facility built by the U.S. Army Corps of Engineers during the 1960s as a research facility. Dug into permanently frozen ground, the tunnel has not only become an important climate change research site, but also features many conditions that historic underground drift miners experienced. In the afternoon, we will head to the Fort Knox Gold Mine, via the Steese Highway, making a stop at the Pedro monument, commemorating Felix Pedro's gold discovery in 1902. The Fort Knox Mine is an active open pit operation located in the vicinity of Cleary Summit. The mine works a low-grade ore body (with less than one gram of gold per ton), and since 2011, its production record now makes this mine the single largest gold producer in the state. The tour will take in a visit to the open pit as well as a tour of onsite processing facilities, that include a mill processing 2,800 tons an hour, and a heap leaching operation.



Permafrost tunnel

MONDAY, JUNE 19

Preregistration required for all tours

TOUR 3: POGO MINE

- Bus leaves from Wood Center at 7:00 am

In 1994, the Teck-Cominco Corporation discovered a rich hard-rock gold deposit about 70 miles southeast of Fairbanks and 35 miles northwest of Delta Junction. It was placed into production in 2005 by Sumitomo Metal and Mining and is currently one of Alaska's largest gold mines (sometimes the largest depending on the year). Gold at Pogo is mined with underground mining technologies and deploys state-of-the-art environmental monitoring and the latest in mining technologies. It is truly a mine worth seeing. A 56-mile-long road was built into the mine site from the Richardson Highway prior to production.

NOTE: Be prepared for a long day, beginning with an early start. The bus will leave at 7:00 am to get to the mine around 12:00. Lunch will be served at the mine, followed by a 3 hour tour. We will return to Fairbanks around 8:00 pm.



Grinding circuit in the Pogo Mill

TOUR 4: FAIRBANKS LODGE MINES

- Car pool. Cars leave from Museum of the North Parking lot 8:30 am

The Fairbanks region is dotted with the remnants of historic lode gold mines, and although some are today a little off the beaten path, the preservation is remarkable. This tour includes a visit to some of the key properties in the two centers of lode mining: Pedro and Ester Domes. Sites in the Pedro Dome vicinity include the Hi Yu Mill, a 10-stamp mill in operation through the 1930s and still largely intact, with the majority of crushing and recovery equipment in place. In Ester Dome, we will visit the Grant Mill as well as the Clipper Mine, where we have an opportunity to venture underground. This small-scale mine remains in private ownership (the original family house stands beside the adit entrance). Although no longer in operation, the mine has an interesting history that included adaptive use for research during the Cold War. This is a full day tour (heading out at 8:30 AM and returning to the UAF Campus by 4:30 PM) that will require traveling some unsealed, backcountry roads, and hiking up to a half mile to reach sites. We recommend car-pooling and taking a high clearance vehicle. Boxed lunch included



Hi-Yu Mill, Fairbanks Creek

Thank You!

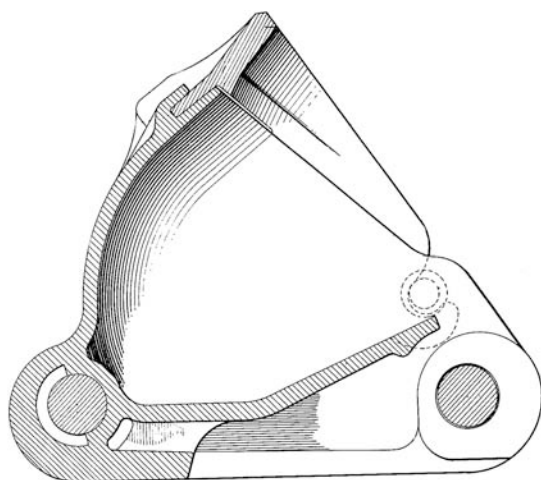
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Paper Abstracts



John Baeten

The Technology, Mining Methods, and Landscape of the Fairbanks Mining District

SESSION 1: Fairbanks and Alaska Mining, Friday 8:15-9:30

From 2010-2012 archaeologists from Michigan Technological University and the University of Alaska Anchorage conducted surveys with the Bureau of Land Management in the historic Fairbanks Mining District. These surveys identified a remarkably well-preserved mining landscape, containing an abundance of both mining artifacts and landscape features. This presentation gives an overview of the history of the Fairbanks Mining District, and an analysis of the mining landscape as seen through the lens of industrial archaeology. At the turn of the 20th century Fairbanks, Alaska was home to the last great North American gold rush. Gold mining in the Fairbanks District underwent three main technological phases, the first focused solely on displaced placer gold located near streambeds and valley floors; the second focused on hard-rock lode deposits, located upstream and upslope from the placer fields; and the third, re-worked the placer fields with more sophisticated machinery, such as dredges. The Fairbanks Mining District experienced concentrated placer and hard-rock mining activity over a span of nearly 100 years. This mining activity produced archaeological features, such as abandoned machinery, stamp mills, mine-pits, and waste rock piles—artifacts that represent a chronology of technological change and economic development. The mining landscape reflects the evolving mining systems used in both placer and hard-rock operations, systems that created a hybrid mining landscape, where more modern mining technologies reworked the historical landscape features. Understanding how different mining technologies produce different landscape features helps archaeologists articulate the age and origin of the surrounding landscape. Mapping these pits, trenches, and ditches with field GPS units and then analyzing this data in a GIS, revealed patterns of prospecting and development within the mining workspace. This analysis shows not only the extent of mining activity in the district, but also the miners' acute sense of the local geology.

- John Baeten is a PhD student in the Industrial Heritage and Archaeology Program at Michigan Technological University. His research explores the intersection of industrial heritage and environmental history as it relates to mining and extractive industries.

Tom Bundtzen

Mineral Resource Development in Alaska Prior to the 1867 Purchase

SESSION 4: Pioneers, Friday 1:45-3:15

Large scale mineral resource development in Alaska began with the discovery and eventual exploitation of large gold deposits in the Juneau Gold Belt beginning in 1880. The discovery of placer gold in the Klondike district in Yukon, Canada in 1896 would trigger more than 30 back-to-back mining stampedes during the Alaska-Yukon Gold Rush, and the establishment of permanent settlements throughout Interior, South-Central, and Western Alaska. The search for gold would also help usher in a four-decade-long period of copper mining in South-Central and Southeastern Alaska and later development of lead, zinc, and strategic minerals such as platinum and tin. What has been overlooked by many that chronicle Alaska's early mining history is mineral resource development prior to the 1867 Alaska Purchase.

For millennia, indigenous peoples quarried and traded stone suitable for tools. Nephrite jade was used in the Kobuk River region for ornamentation and objects of trade. Starting with Vitus Bering in 1741, European explorers noted the extensive use of copper in Prince William Sound, and inland, the Ahtna and Eyak manufactured copper goods for trade and personnel use. In the early 19th century, Russians acquired copper from the Ahtna people for foundry use in their colony. Explorers such as the Estonian Otto Von Kotzebue observed Natives using coal on the arctic coast, the Alaska Peninsula, and on Admiralty Island. The Russians may have exploited local iron as early as the 1792 ship-building venture on Resurrection Bay. Later expeditions actively sought mineral wealth. From 1829 to 1832, Ivan Vasiliev and Pyotr Kolmakof explored portions of the Nushagak and Kuskokwim basins, finding placer gold and cinnabar. On a subsequent expedition, Mikhail Teben'kov joined Vasiliev in the field. Teben'kov became the colony's governor and hired Constantine Grewingk, to produce Alaska's first geologic map and Pyotr Doroshin, a professional mining engineer, to assess its mineral resources. Doroshin's wide travels included investigating placer gold deposits near Kenai Lake and a thorough assessment of the coal resources of Russian America. The last important mining professional of Russian America was Finnish-born Enoch Hjalmar Furuholm, who surveyed throughout Alaska, assisted the lucrative ice trade to San Francisco, and opened a coal mine at Port Graham.

Although Russians would not develop significant mineral resources by the time of the Purchase, a New York Times piece dated March 30th, 1867 summed up what was then known about the region's endowment: "Russian America is not the dreary waste of glaciers, icebergs, white bears, and walrus that some have made it out to be ... In fact the land is rich in gold, copper, iron ore, timber, and fur-bearing animals...and even the ice, so central to many of the critic's jokes, can be harvested and sold."

- Tom Bundtzen is a Research Geologist and avid mining historian based in Fairbanks, Alaska. He obtained BS and MS Degrees in Geology from the University of Alaska in Fairbanks in 1973 and 1981 respectively. After completing a 25-year career with the geological survey division of the Alaska Department of Natural Resources, he retired from State Service and formed Pacific Rim Geological Consulting, Inc. in 1997. Since then, Tom and his staff have worked throughout Alaska, Yukon, Canada, and the Russian Federation for a number of clients on a diverse group of geological projects. Tom currently serves as president of the Alaska Mining Hall of Fame, a nonprofit organization which he helped found that is dedicated to honoring Alaska's mining pioneers.

Rolfe Buzzell

Women in the Sunrise Mining Camp, 1895-1901

SESSION 6: Alaska Mining Camp Life, Saturday 8:00-9:15

Women played an important role during Alaska's gold rush era. Research and literature on the contributions of women in Alaska's early mining camps focus mainly on individual women, particularly those who lived in Dawson, Skagway, Nome and Fairbanks. Published diaries, memoirs, and biographies of these women mostly focus on the larger, better known mining communities. Little has been written about the earliest women, many of them Natives, at the onset of the gold rush era and their experiences in dozens of small, lesser-known mining camps. Few historians have come up with broad conclusions about the number of women who participated in the Alaskan gold rush era as well as the variety of their experiences. Dr. Buzzell, who has been researching and writing about Sunrise and the Sixmile mining district for more than two decades, draws on his research and his recent publication, *Gold Rush Wife* (2016), to summarize data on women who participated in the early years of the Sixmile mining district. His presentation will include conclusions about the role and contributions of women who participated in this portion of the little-known Turnagain Arm Gold Rush of 1896-1898 that began prior to

the onset of the better known Klondike rush.

- Rolfe G. Buzzell, PhD (Historian), Historical research consultant and expert witness Retired (January 15, 2016) from the Alaska State Office of History and Archaeology (35 years with the State of Alaska and 2 years with the National Park Service), Specializing in: Alaska's Mining History; Alaska's Gold Rush Era; the Turnagain Arm Gold Rush; and the History of Transportation in Alaska (Use of Historic Trails and Navigable Waters).

Sharon Jenkins Carter

The History and Heritage of Iron Mining on the Canigou Mountain, Southeastern Pyrenees.

SESSION 3: Mining History in Worldwide Context, Friday 11:00-12:15

This paper is the start of a journey which considers a dialogue between the past, present and the future of these industrial communities in a rural heartland. And it is about the people. I have spent several summers in the region of the Canigou, Eastern Pyrenees. The contrast between the mountain scenery and the heritage of iron mining led me to the idea of identity. The landscape and the people have caught my imagination. The mountain communities of the Canigou still seem remote and distant, and the shoulders of the mountain feature the remains of this industry. Only a few can now remember the mining activity; the last mine closed in 1985. But the number of Associations of Former Miners in the area bear witness to the desire to pass on this heritage to the next generation. In this paper, I would like to introduce you to this mountain legacy, to begin to consider the impact of the industry on the identity of the largely rural population and to relate the symbolic aspects of the mines as landscape features, to the sense of heritage and identity of the villagers.

- Sharon Jenkins Carter has an Honors Degree in French, and a Masters Degree in Mentoring, Education. A former teacher and language trainer, she retired in order to pursue research on the industrial heritage of a rural mountain community in South Eastern France. Her interest in mining has developed over the last few years when she was asked to translate a Powerpoint presentation into French for the SAFEMM, French mining archaeology group, conference. Since then she has enrolled as a PhD student with the University of Wales, Trinity St David, and presented a paper for the NAMHO Ireland conference in Dublin, June 2016. Her enthusiasm for this research interest is the result of a natural inclination to

understand the relationship between human activity and the historical landscape.

William W. Culver

Financing the Mines: Early Industrial Capitalism at Harvey Hill, Quebec, 1847-1881

SESSION 8: Mining History: New Sources & Perspectives, Saturday 11:00-12:15

What encourages investment in industrial innovation? The presentation explores this question by examining a series of mining companies working a copper claim at Harvey Hill, Quebec. The companies date from an initial effort in the 1840s through their final collapse in 1881. The several companies were variously organized in Canada, England, and Scotland. Each company furthered, as best it could, mine and plant expansion. None was ever able to bring production costs below market prices for more than a brief period. Bad luck, transportation issues, fire, theft of financial reserves, and low ore grades combined to bring dissolution of the final company and personal bankruptcy for one of the investors.

Lacking sufficient capital of their own, the organizers each time sought joint-stock incorporation as a means to attract outside investment. The story hinges on business law reforms. Mid-nineteenth century was a time when the legal infrastructure of industrial capitalism took shape. It was a time when, in Canada and the United Kingdom, the role of limited liability for company shareholders was debated as a measure to shore-up investor confidence. James Douglas (1837-1918) appears as a protagonist through all of the companies at Harvey Hill.

Over the years when these companies operated, both Canadian and British Parliaments struggled to put in place laws optimizing business law as a boost to overall national economic development. Many in the British Parliament believed that honest businessmen did not require limited liability. Yet others argued that if some protection was granted to capitalists, something needed to be done to protect workers from risk. Whatever the final protective balance between capital and labor, establishing routine processes for limited liability incorporation constituted an important early state intervention into markets. This intervention was just what the company organizers at Harvey Hill needed.

- Bill Culver retired from teaching at SUNY Plattsburgh in 2007 to concentrate on mining history research and writing. Copper and Chile are his special interests. His publications include work on nineteenth century copper mining and politics, as well as contemporary national legislatures in Chile, Argentina, Peru, and Bolivia.

Rudy Davison

Murder and Mayhem at the Cashin Mine in Paradox Valley, Colorado

SESSION 3: Mining History in Worldwide Context, Friday 11:00-12:15

The Cashin Mine, a copper producer in the Paradox Valley of Colorado, was relatively short-lived, with a heyday from 1899-1908 and intermittent working thereafter. The mine was also the scene of some of Paradox Valley's notorious outlaw activity. The most bizarre of these killings occurred at the Cashin Mine during a time when it was closed and its only resident was a watchman named Lemuel Hecox, commonly known as "Slim." In this presentation, Davison tells the story of the Cashin Mine, Slim's grisly murder, and the hunt for the desperadoes who left him decapitated.

- Rudy Davison earned a BA in Geography from the University of Colorado at Boulder and gained underground mining experience at Climax Molybdenum at Fremont Pass and Dixilyn Mining Company at Silverton, Colorado. He has delved into a broad spectrum of jobs: Zookeeper at the Denver Zoo; Brucellosis Eradication Scheme on the South Island of New Zealand for the New Zealand Ministry of Agriculture and Fisheries; Publisher The Telluride Times newspaper; Telluride Travel Connection owner and tour leader for trips to Australia, Africa, and South America; Telluride real estate developer with Tiger & Elephant Land Development Co.; Author Rudy's View, a Driving Guide from Telluride to the Top of Imogene Pass; Board Member Telluride Historical Museum; Rocky Mountain PBS program creator and commentator for the Colorado Experience historical documentary series. Rudy hosted the 2016 MHA Conference in Telluride, Colorado.

Greg Drew

Captain Bagot's Mine: The History of the Kapunda Mine, South Australia, 1844-1878

SESSION 3: Mining History in Worldwide Context, Friday 11:00-12:15

The Kapunda Mine, about 80 km (50 mi) north of Adelaide, commenced operations in January 1844, just seven years after the British colony of South Australia was proclaimed. It was to be the first successful mine in Australia, predating the much larger Burra Mine by almost two years. It was owned by Captain Charles Bagot, formerly of the Royal Irish Fusiliers, who had decided to migrate to South Australia, due to social unrest in Ireland in the 1830s. He was subsequently contracted to organize a ship to bring more than 200 Irish emigrants to South Australia and, on arrival in late 1840, he was to select a survey of 4000 acres: in return he received 1000 acres. His aim was to become a sheep farmer, but within three years of arrival he was a well-known mine owner and manager. Bagot took possession of his survey in 1841 and began establishing a pastoral property, but in late 1842, his youngest son made a chance discovery of brightly colored copper carbonate mineralization. He had the land surveyed and subsequently purchased the property at auction, which gave him the mineral rights. The mine was rich from the outset, which enabled Bagot to fund the development of the mine from the sale of ore. It was the first copper ore from Australia to be seen on the ore floors at Swansea, along with similar ores from Chile and Cuba. At an international level, the mining settlements which developed around the mine played an important role in the Cornish transnational identity. It was the first mine in Australia to employ Cornish miners and Cornish mining technology on a significant scale. The first Cornish beam engine in Australia was erected at Kapunda in 1848 and the majority of its managers, engineers and miners were Cornish. Bagot also recognized the benefits of smelting the ore at the mine and erected one of the earliest smelters in Australia, which produced initially regulus and then refined copper up to 1866. The mine was run as a private partnership until the formation of the Kapunda Mining Company in 1851. The company operated the mine until 1866 when falling ore grades and copper prices forced it to lease the mine to the Kapunda Copper Company. This Scottish company constructed a treatment plant based on the Henderson process to leach concentrated carbonate ore using sulfuric acid made on site, and precipitate the copper using micaceous hematite. However, the process was an economic failure and the mine eventually closed in 1878.

- Greg Drew holds an MSc and Dip Ed from the University of Adelaide and was employed as a geologist for 30 years by the State Government. He developed a network of interpretive walking trails at mining heritage sites throughout South Australia. He has also published a number of books associated with South Australia's mining heritage including *Cornish Beam Engines in South Australian Mines*. He is currently publishing a book on the history of the Kapunda Mine. Greg continues to be involved in mining history and is the convener and webmaster of the South Australian Mining History Group and a member of the Board of the American Mining History Association 2015-2017.

Jane Haigh

Survey of the Development of Mining in the Fairbanks Area

SESSION 1: Fairbanks and Alaska Mining, Friday 8:15-9:30

This paper will discuss the development of mining in the Fairbanks District. I will survey the developments on the major creeks, from 1906-1909, which focused on underground mining. Because the paying placers were 40-100 feet below frozen overburden, mining companies needed significant capital to operate boiler plants to thaw the ground, and operate elaborate hoist systems. They soon began to run out of the wood that was fueling all of this. Wood also furnished heat for the growing town of Fairbanks, and fueled the town's electrical generating plant. Problems with fuel for mining led to a slowdown, and then a push for a railroad, to bring coal from mines in the Healy area. The railroad was finally finished in 1922-23, and almost immediately, the USSRM, using Boston capital began buying up thousands of acres of claims, and planning the work of the Fairbanks Exploration Company. They shipped in multiple dredges in pieces, which were then constructed on site, and built a coal fired power plant and headquarters in Fairbanks. In addition, they constructed a 90-mile-long ditch to bring water for an elaborate thawing operation. This operation completely dominated the town of Fairbanks until the beginning of military construction for the lend lease operations began in 1939. Eventually World War II shut down mining altogether. At the end of the war, they were able to re-start some of the dredges, but it became less profitable and the company shut down operations in Fairbanks.

- Jane G. Haigh received her PhD from the University of Arizona in 2009, and has taught at Kenai Peninsula College since then. Author of several books about Alaska topics, Haigh has lived in Fairbanks for nearly 40 years, and is co-owner of the Chatanika Dredge, one of the big USSRM dredges.

Stephen Hart

Gold Rush and Copper Boom: In Georgia and Tennessee?

SESSION 5: Gold and Copper Miners, Friday 3:15-4:30

When mining historians mention “gold rush” and “copper boom,” Georgia and Tennessee are not the first states that spring to mind. This despite the fact that these Southeastern booms began before California’s gold rush and Michigan’s Keweenaw copper boom. This despite that some of the most experienced ‘49ers, as well as the prospectors initiating the Pike’s Peak gold rush, were from Georgia and that Tennessee copper mining lasted as long as copper mining in Michigan and Montana. The first published mention of gold in Georgia occurred on August 1, 1829 in a Milledgeville newspaper that stated “Two gold mines have just been discovered in this county, and preparations are making to bring these hidden treasures of the earth to use.” By 1833, the Cherokee Reservation land that contained the placer gold was overrun by 5,000 non-Indian miners and the governor was besieged by those demanding removal of the Indians from their land. This gold rush initiated the notorious Trail of Tears that eventually removed most Cherokees to Indian Territory. The town of Auraria became the first boomtown in the gold region and the nearby town of Dahlonega built a U.S. Mint in 1835. It stamped the “D” mint mark on its coins 70 years before the Denver Mint used it.

In 1857, a party of Auraria gold miners discovered gold in Cherry Creek, Kansas Territory, during their return to Georgia from the California gold fields. The following year, led by Georgian William Greene Russell, they returned to initiate the 1859 gold rush. They also founded and named the new town of “Auraria” at the confluence of Cherry Creek and the South Platte River in what is now downtown Denver, Colorado.

Although the Georgia gold rush peaked and played out by 1849, a gold miner’s 1843 discovery of native copper nuggets in adjacent Polk County, Tennessee, extended the mining history of the region by nearly 150 years. Residents of the Ducktown Basin began mining shallow copper ores in 1847, using the vast hardwood forests for smelting. However, the Civil War and the lack of rail transportation due to the impassable Hiwassee River Gorge hampered large-scale development. In 1889, British-owned Ducktown Sulphur, Copper, Gold, and Iron Company began smelting local sulfide ores on the Georgia state line in Copperhill, Tennessee. However, smoke from the open-pit roasting soon killed most of the surrounding

vegetation and led farmers in Georgia to take their complaints all the way to the U.S. Supreme Court. Tennessee Copper Company (TCC) began pyritic smelting in 1904, with recovered sulfur converted to sulfuric acid and shipped to industries nationwide. Froth flotation was added to the sulfide ore processing in the 1920s and the industry boomed during both World Wars.

The TVA and CCC began reforestation in the Ducktown Basin in the 1930s, with the copper company continuing planting after World War II. However, as long as smelting continued and 60 inches of acid rain fell each year, reclamation was only partially successful. In 1965, when I left Cherokee National Forest and first glimpsed the 50 square-mile basin, the severely eroded, red-clay hills were still shockingly denuded. Not surprisingly, new air- and water-quality laws in the 1960s and 1970s forced closure of the smelters, with the last sulfuric acid plant shutting down in 1987. TCC-successor Occidental Petroleum's 15-year, \$50 million reclamation effort planted more than 16 million trees and dozens of square miles of acid-tolerant grasses and shrubs. Finally, in 2016, the Ocoee River has become sufficiently clean to allow fish survival.

- Steve Hart is a geological engineer who spent 42 years in government service and private consulting. His education at the Colorado School of Mines and Texas A&M University was followed by 12 years with the U.S. Geological Survey and Colorado Department of Natural Resources. Work as a reviewer of Mined Land Reclamation and Radioactive Source Material permit applications led to consulting on radioactive waste cleanup projects at uranium mines and mills, Superfund lead-zinc-silver smelter remediation projects, and coal mine subsidence mapping. From 1995-2001, Steve taught a graduate course in "Case Histories in Engineering Geology and Hydrogeology" as an adjunct at his alma mater, the Colorado School of Mines. In 2006, he retired from URS Corporation (now AECOM Inc.), the world's largest engineering design firm at the time, then worked as an independent consultant until 2011. A long-time MHA member, he served as chairman of the 2014 MHA Annual Conference in Trinidad, Colorado.

William Hawes

Braden Copper Co.: Early Days at the Southern End of the Kennecott Empire

SESSION 5: Gold and Copper Miners, Friday 3:15-4:30

At the start of the 20th Century, Chile was a nation blessed with vast mineral resources, but virtually no technical expertise. For this reason, the bold Americans that invested in mining had to attract expatriate personnel to develop and produce the desired minerals. One of the first foreign investments in a major copper deposit was that made by William Braden, who ultimately sold it to the Guggenheim interests. To adequately staff the mine, engineers from several disciplines were needed, not only to provide engineering services, but supervision as well. (It should be remembered that at this time, mining engineering was considered a glamorous profession, hence more potential recruits.) The only means of access to mine and smelter towns by company narrow gauge railroad. The paper will describe what it was like to be an employee of the Braden Copper Co. in the 1920's and beyond, based on a handbook sent to newly recruited personnel, plus the personal experience of my parents, supplemented by numerous photographs from the family collection. Some items to be covered include travel to Chile, new employees hired on single status, communications (mail took four weeks between Chile and most US addresses, telegraph was expensive, no telephone), alcohol was not allowed on company property, recreation (library, nightly first run movies, golf by late '20's, fishing), housing (singles and married, including housing description), and medical care.

- Bill Hawes is a retired Mining Engineer who has worked throughout the Rocky Mountain States, mostly in underground mines and in positions varying from entry level to management. He has always been a mining history enthusiast, and is a member of the Mining History Association, the National Mining Hall of Fame, and the Mining Foundation of the Southwest. He has written articles for the *Mining History Journal* as well as other mining publications and serves on the American Mining Hall of Fame selection committee.

Andrew Higgs

The First Stamp Mills of Fairbanks, 1910-1912

SESSION 4: Pioneers, Friday 1:45-3:15

The beginning of the hard rock mining in the Fairbanks mining district will be examined through an overview of the initial developments prior to World War I. Within this context, the presentation will focus on the history of the first stamp mills erected in the district that initiated development of several prominent lode properties. Three of the mills were locally made at the Fairbanks foundry of Brumbaugh, Hamilton, and Kellogg. The components of two of these stamp mills survive today and have been rehabilitated and re-erected for public viewing at Pioneer Park and the Museum of the North.

- Mr. Higgs received his MA in Anthropology from the University of Alaska, Fairbanks in 1992. He is currently employed as a Senior Project Archaeologist conducting cultural resource surveys for Northern Land Use Research Alaska, LLC in Anchorage. His professional interests include, but are not limited to, Alaska gold rush/gold mining history and archaeology. A considerable portion of his professional career includes documenting the remains of Fairbanks and Livengood mining history, as well as documenting the remains of the aerial tram systems used during the gold rush over the Chilkoot Trail.

Jennifer Hildebrand and John Callan

Historic Chinese Placer Mining: The History, Techniques, and Application of Archaeology in American Canyon

SESSION 5: Gold and Copper Miners, Friday 3:15-4:30

In the summer of 2016, the Bureau of Land Management (BLM) and Great Basin Institute (GBI) conducted an archaeological survey for the Abandoned Mine Lands (AML) program that focused on public safety and historic preservation. The project area, referred to as American Canyon, is located in the Humboldt Range of Pershing County, Nevada, within the Spring Valley Mining District. The canyon contains the remnants of historic Chinese placer mining, encompassing over 200 shafts in combination with the remains of a Chinese settlement. Mining within the previously identified archaeological site occurred in multiple occupations with the Chinese occupation spanning from 1884 to 1906. Chinese placer mining and its impacts on the western mining frontier is an important topic for

both historians and archaeologists studying small-scale, nonindustrial mining technology on overseas Chinese sites within the field of mining archaeology. This paper will discuss the history of American Canyon and Chinese placer mining in the area, the mining techniques employed within the site, and the contributions of current and future archaeological applications pertaining to preservation, research and safety, in the case study of American Canyon.

- Jennifer Hildebrand is a historical archaeologist specializing in Mining Archaeology. Currently, Jennifer works as an archaeologist for the Abandoned Mine Lands program for the state of Nevada through the Bureau of Land Management (BLM) and Great Basin Institute (GBI). With over ten years' experience in archaeology, her expertise is in historical archaeology, mining archaeology, 19th century material culture, and historical research and preservation.
- John Callan is an Environmental Protection Specialist and the Abandoned Mine Lands (AML) Lead for BLM-Nevada State Office. John received his MS for Environmental Policy and Management from the American Public University System and his BA in Geography from Framingham State University. John's expertise includes hazardous waste management, natural resource management, environmental awareness, permitting, and consulting, environmental site assessments, CERCLA, and environmental policy.

Tamara Holman

Rabble Rousers in Fairbanks, Alaska: An Early History of Labor, Capital, and the Western Federation of Miners

SESSION 7: Mining and Its Discontents, Saturday 9:30-11:00

During a highly contentious labor dispute between gold mine workers and mine owners, the troubled Western Federation of Miners organized local 193 at Fairbanks in 1907 at the height of the mining boom. The locally organized unions were already entrenched in an unsuccessful strike for \$5 daily wages for an eight-hour day. Mine operators also organized, and through tactics such as importing thousands of miners from the lower 48 under false pretenses, capital successfully averted WFM gaining control over the district. This paper examines the early labor history of the Fairbanks district and the competing interests between labor, capital, and the Western Federation of Miners.

- Tamara Holman is an archaeologist at the Alaska Office of History and Archaeology. She has a MA in Anthropology from the University of Alaska

Anchorage. Her thesis research examined Fairbanks lode mines from a sociotechnical perspective, identifying the networks through which milling technologies were adopted and circulated.

Logan Hovis

Look with Your Eyes, Not with Your Hands: A Firsthand Account of Remediating Abandoned Mine Explosives

SESSION 7: Mining and Its Discontents, Saturday 9:30-11:00

The National Park Service has its largest land holdings in Alaska, and the responsibility of managing these properties extends to mitigating hazards at hundreds of abandoned mining sites. In this talk, Logan Hovis provides an accounting of his experiences working as both mining historian and blasting officer for the parks, in which he carried out an extensive program to make Alaska's parks safer. This presentation reviews the dangers presented by abandoned explosives, and covers highlights of mine remediation work conducted in some of North America's most remote settings.

- Logan Hovis recently retired from a long career with the National Park Service. As both historian and an on-the-ground problem solver, he worked closely with the Abandoned Mineral Lands Program, and contributed to the documentation of historic mining sites throughout the Alaska national parks, including the sites of Kennecott, Bremner, Kantishna, and Nuka Bay. He continues to research the Kennecott Mines

Sheila Kelly

100th Anniversary of the Treadwell Mine Cave-In

SESSION 6: Alaska Mining Camp Life, Saturday 8:00-9:15

The year 2017 marks the anniversaries of an important beginning as well as an infamous ending in Alaska mining history. This year is the sesquicentennial of the Alaska Purchase, as well as the centennial of the cave in of the Treadwell gold mine on Douglas Island. In 1867, prompted by Secretary of State William Seward, the United States paid Russia \$7.2 million for a remote, barren and frozen corner of the continent. Alaska was initially ridiculed as "Seward's Folly" and "Seward's Icebox." But starting in 1882, a massive lode of gold was discovered on Douglas Island and the

Treadwell Mines were the first to demonstrate that Alaska was in fact Aladdin's Cave of Riches. By 1915, Treadwell was the largest hard rock gold mining operation in the world, processing 5000 tons of ore a day. And by the time of the 1917 cave in, the Treadwell mines had produced gold worth 10 times the price of the Alaska Purchase.

Treadwell made mining history by profitably processing huge volumes of low grade ore. But it was not just the awesome technology and brilliant innovations that brought thousands of curious tourists (known then as excursionists) on ships to this far northern outpost. Treadwell was a legendary company town where the 2000 residents, miners, managers and families enjoyed a good life, with a club, department store, butcher shop, library, heated swimming pool, orchestra and dances, celebrations, movies, and sports teams. The catastrophic cave in of 1917 ended a golden age. The Treadwell Preservation Society has been established to restore and interpret the original town site.

Sheila Kelly's father and aunts were born and raised in Treadwell. Her interest in life in a company town launched her research on Treadwell. What started out as family memoir expanded to Alaska history and gold mining history. Her book, *Treadwell Gold, An Alaska Saga of Riches and Ruin* was published in 2010 by University of Alaska Press. In 2011 it received a special recognition award from the Mining History Association. A play based on the book is being performed by the Perseverance Theatre on Douglas Island June 23-July 3, 2017.

- Sheila Kelly is a writer, retired environmental educator, and current board member of the Charlotte Martin Foundation. She is a Washington State native with degrees from Gonzaga University and the University of Washington Evans School of Public Policy and Governance. She lives in Seattle.

Brian Leech

Digging's Degree of Difficulty: The Changing Portrayal of Mining Labor in Movies and Games

SESSION 2: Mining and the Media, Friday 9:45-11:00

American popular culture has a strange relationship to the hard work involved in performing mining. Few Hollywood films about mining communities actually feature the process of mining itself, but most of the

Westerns that do, such as *The Treasure of the Sierra Madre* and *Pale Rider*, suggest that finding a mineral resource is relatively easy, but mining it is hard. Twentieth century films focused on coal mining, like *October Sky*, focus less on the discovery of a mineral than Westerns, but they continue to showcase the difficulty and, especially, danger, of the mining profession. In the last two decades, however, most young people have encountered mining through online games, not other forms of popular culture. Such games, like *Minecraft* and *World of Warcraft*, imply the opposite of the movies. In those games, mining typically takes place in an easily accessible place and there are often unlimited amounts of gold, iron, or other minerals available. Online games therefore give young people the impression that mining is a completely sustainable, relatively uncomplicated, way to gather resources.

- Brian Leech is Assistant Professor of History at Augustana College in Rock Island, IL. His book *The City That Ate Itself: A Social and Environmental History of Butte, Montana, and Its Expanding Berkeley Pit* has been accepted for publication at the University of Nevada Press, and is expected Fall 2017. He has served as MHA Secretary since 2010, chair of the MHA Grants Committee since 2010, and on the Nominating Committee since 2015.

Jeremy Mouat

When the Medium was the Message: Mining Journals and Journalists, 1880-1920

SESSION 2: Mining and the Media, Friday 9:45-11:00

Beginning in the last two decades of the nineteenth century, the technical journals of the mining industry began to function as global conduits of information. More generally, the growing effectiveness of long distance telegraphy (beginning in 1866) also affected the reach of the mining industry. This paper explores these developments through an examination of the content as well as the staff of four of the leading mining journals: in the UK, the *Mining Journal* and the *Mining Magazine*, and in the USA, the *Engineering and Mining Journal* and the *Mining and Scientific Press*. It will argue that during this period the journals themselves became increasingly important to the industry. Articles that appeared on specific topics in the *Engineering and Mining Journal* and the *Mining and Scientific Press*, for example, would subsequently be collected and published in book form. (An early example was the compilation that Rickard edited, *Ore Deposits, a Discussion Re-Published from the Engineering and Mining Journal*, New

York, May 1903 (New York: The Engineering and Mining Journal, 1903). Without a robust and well-run print medium—in effect, an emerging intellectual commons that nourished an epistemic community—mining’s growth and technological development would have been far more difficult to achieve.

- Jeremy Mouat is a Professor of History at the Augustana faculty of the University of Alberta. He has published a number of articles and two books on mining history, as well as serving as President of the Mining History Association. He has also received the MHA’s John M. Townley Award for the best article published in the *Mining History Journal*, and the Rodman W. Paul Award “For Outstanding Contributions to Mining History.”

Eric Nystrom

Witnessing the Alaska Gold Rush: Finding History in Court Records

SESSION 8: Mining History: New Sources & Perspectives, Saturday 11:00-12:15

Court records, such as lawyer’s briefs, court transcripts, and judges’ opinions, can be valuable sources for historical inquiry. In the case of Alaska, the area’s earliest court activities, during the rushes North for gold, are documented in federal court records, many of which are now available online. My talk will serve as an overview for doing research in these online records, and will provide a sample of the rich historical material they contain that pertains to Alaska’s early mining and the society it supported. Court records freeze telling historical moments in time, providing tremendous and revealing detail, often about people who might otherwise be lost to history. In the case of Alaska, these court records can help reveal not only mining operations in the narrow sense (including conflicts over the well-known federal mining laws), but also show a mining society in broader detail. Scholars including Catherine Holder Spude and Gordon Morris Bakken have made valuable contributions to the study of law’s relationship with mining and mining societies, and their insights may be extended into new times and places using these valuable primary sources.

- Eric Nystrom is Assistant Professor in the Interdisciplinary Humanities and Communication faculty at Arizona State University. His book *Seeing Underground: Maps, Models, and Mining Engineering in America* won the 2015 Clark C. Spence Prize from the MHA. The sources in this talk were made searchable by his digital history project, “9CHRIS: 9th Circuit Historical Records Index System.”

Katherine Ringsmuth

Failure to Flight: How Two Bremner Miners Took the First Step in Building an Aviation Empire

SESSION 4: Pioneers, Friday 1:45-3:15

In 1931, brothers Peyton Ramer and Lee Ramer formed the Bremner Gold Mining Company and to access their claims, the brothers hired some of the region's most famous flyers, including Harold Gillam, Bob Reeve, Merritt "Kirk" Kirkpatrick and Merle "Mudhole" Smith, who gained his famous moniker at Bremner. Although the Ramer Brothers failed to successfully develop the Bremner Gold Mining Company, by buying up aviation real estate, building hangars and airstrips, backing Cordova Air Service and being themselves important advocates of the fledgling industry, the Ramer brothers and the Bremner Gold Mining Company supported the early careers of some of Alaska's most notable bush pilots and helped to develop an aviation infrastructure that continues to serve the remote region. In the end, the Ramer brothers failed to build a mining empire in the Wrangell-Chugach mountain region, but these footnotes of history were the forgotten pioneers who helped blaze an aviation one. An achievement that would soar beyond their wildest dreams.

- Dr. Ringsmuth received her doctorate at Washington State University with concentrations in American, environmental and public history. She teaches U.S., Alaska and World history at the University of Alaska Anchorage and is sole proprietor of Tundra Vision, a public history consulting business that focuses on history exhibits and curation, Section 106 application, and education support. Dr. Ringsmuth has written five books for the National Park Service, including *Tunnel Vision: The Life of a Copper Prospector in the Nizina River Country* and *At Work in the Wrangells: A Photographic History, 1895-1966*. Her recent book, *Alaska's Skyboys: Cowboy Pilots and the Myth of the Last Frontier* (2015), was published through the University of Washington Press.

Terry Reynolds

Owe My Soul? Company Stores on the Michigan Iron Ranges

SESSION 8: Mining History: New Sources & Perspectives, Saturday 11:00-12:15

Company stores in mining communities have a negative reputation, one largely colored by how they operated in the bituminous coal fields of the northeastern United States. Some recent scholarship has suggested,

however, that this reputation was at least somewhat undeserved. This review of the operation of company stores on Michigan's iron ranges in the late nineteenth century largely supports that less critical view. It categorizes the extent and types of company stores operative on the Michigan iron ranges, the functions that some occasionally served, beyond the obvious one of selling goods to mine company employees, and reviews their overall role and relatively early demise.

- Terry S. Reynolds is Professor Emeritus of History at Michigan Tech. He coauthored *Iron Will: Cleveland Cliffs and the Mining of Iron Ore, 1847-2006* (Wayne State University Press, 2011). In addition, he has written extensively on iron ore mining in the Great Lakes region, including several articles published in MHA's journal. His most recent MHJ piece focused on the importance of the scraper (slushing) in the survival of Michigan's underground iron mines in the early twentieth century.

Tetiana Soviak

Real Man's Work as Entertainment: Spike TV's Coal

SESSION 2: Mining and the Media, Friday 9:45-11:00

Since the early 1990s, the working class has been disappearing from the "people's medium"—television and film has come to be dominated by the middle classes. Yet, since the Great Recession, the number of reality television programs about work has exploded. At the time of economic collapse, chronic unemployment or underemployment, workers and their labor are on every channel, as a spectacle for our entertainment. While there are many types of work depicted on reality television, there is a subgenre of shows most explicitly about traditional working-class white male manual labor: the 'real-men-in-danger' shows depicting working class men doing difficult and dangerous jobs.

Coal mining is a man's job—it is dirty, dangerous, and physically demanding. Mining in general has been central to the development of the capitalist mode of production and coal mining in particular has been key to the expansion of industrial production in the 19th century. The image of the coal miner has come to stand for an unambiguous representation of working-class masculinity and heroism. Thus, a coal mine is a perfect setting for a television show that celebrates the working man and the working-class endurance and masculinity—Spike TV's 10-episode series

Coal about coal miners in Appalachia. *Coal*, according to the press release for the series, gives the viewers “an unprecedented look at one of the world’s most dangerous and valuable professions.” The series follows a group of miners working in an underground mine owned by Cobalt Coal in West Virginia. *Coal*, however, elides history and context of Appalachian coal mining and instead focuses on the dangers of mining and the constant threat of accidents which could damage both the working men’s bodies and the company’s profits. On *Coal*, there is no outside context, whether historical, economic, political, or environmental. The central motif of the show is not mining itself but the pursuit of profit for the mine owners as a common goal for both the workers and the owners.

This conference paper will examine how *Coal* depicts white class male labor within the context of the genre of reality television as well as how it re-constitutes what heroic labor means by equating extraction of natural resources with extraction of surplus value.

- Tetiana Soviak is a PhD candidate at the Centre for Comparative Literature, University of Toronto (ABD). Her dissertation research is on representation of labor and the laboring people in television and film, with particular focus on Stalinist film and American reality television.

Catherine Holder Spude

Will Woodin’s Klondyke Adventure

SESSION 6: Alaska Mining Camp Life, Saturday 8:00-9:15

When Will Woodin wrote his memoir in 1910, he titled his manuscript “My Klondyke Adventure.” At age 24, he accompanied his father and three of their friends to Dawson during the height of the Klondike gold rush. They packed more than twice the amount of supplies they would need over the Skagway trail with the intention of selling their excess at high prices to finance their endeavor. As members of the first generation of farmers to become urban dwellers, Will and his comrades made use of their rural skills to survive the harsh elements of Alaska and Yukon. But at the same time, their camaraderie and social interactions indicated that they were part of a group of men who were rapidly passing through the working class on their way to becoming members of the middle class with all of its diversity of values, job specialization, and rising income. What did it mean to be a miner, an entrepreneur, an adventurer, and a tourist in the opening decades of the twentieth century? And how does Will Woodin’s 1910

memoir of his days in the Klondike shed light on the rise of the middle class?

- Catherine Holder Spude has a PhD in Anthropology from the University of Colorado-Boulder. Between 1978 and 1991, she conducted numerous archaeological excavations in Skagway, Alaska, related to the Klondike gold rush and the evolution of one of the Yukon's primary transshipment points. She acted as the lead editor for *Eldorado! The Archaeology of the Northern Gold Rushes*, and has since published four other books about social structure and politics in Alaska and Yukon. Her latest book is *All for the Greed of Gold: Will Woodin's Klondike Adventure*.

Robert L. Spude

Fairbanks Assayer G. E. Beraud and 88 Tons of Gold

SESSION 1: Fairbanks and Alaska Mining, Friday 8:15-9:30

In January 1919, newspapers across the United States and Canada reported that, during his gold rush era career, 48-year-old Gustav Eugene Beraud had handled an astonishing 88 tons of gold worth \$45 million. His fifteen seconds of fame failed to detail his work in the Klondike and the Fairbanks district, nor answer the many question about what assayers in the North really do. There are many questions overlooked behind that 88 tons of gold: including was assaying different in the North compared to the rest of North America? What are some simple explanations of processes, knowledge and skills required for the job? What impact, if any, of the rapid progress in chemistry on the job? And where did the gold go? A graduate of the Ecoles des Mines, Paris, at a time when Germany had outstripped France as the leader in chemistry theory, Beraud knew the humid process applied by J. L. Gay-Lussac at the French mint, later adopted in the United States, as well as the new technology of electrolysis he was hired to apply at the new refinery at Anaconda, Montana, designed by the German Hermann Tohfehn, before joining the Klondike gold rush. Beraud first worked for Joseph Ladue of Dawson, then the Canadian government, followed by his own assay office, and, finally, for the First National Bank of Fairbanks Alaska. His scientific training at the School of Mines gave him a professional advantage—where improvements in scientific understanding was applied to day to day technical work—over self-taught or apprenticed rule-of-thumb assayers declining in numbers at the beginning of the twentieth century. Beraud also exemplified an assayer's place in the typical social world of mining communities; like so many assayers, he was a member of the local school board, was active in social events, and sports,

including wielding a swift broom in curling contests. The waning of the gold rush ended his career in the North. Beraud moved to San Diego, operating an assay and chemist's office, where he was remembered as a "picturesque character of the 'gold days' of Alaska."

- Bob Spude received his BA and MA from Arizona State University and a PhD from the University of Illinois. He is a founding member of the MHA having served in a number of posts over the years. He recently retired after 35 years with the National Park Service, and is revisiting a number of old projects.

Paul White

Broken Ore, Broken Bodies: The Wear and Tear of Mill Work on Alaska's Gold Miners

SESSION 7: Mining and Its Discontents, Saturday 9:30-11:00

Discussions of fatalities and injuries in hard-rock mining often draw attention to the dangers of underground work for good reason. Falls, cave-ins, explosions, flooding, and toxic gases, ranked as leading causes of death in the industry, and in which a single incident underground could claim multiple lives. The hazards of mining nevertheless extended to a variety of surface operations, one notable locale being where the ore from the underground was processed. Milling plants were a common enough feature at gold mines because their operation promised to make savings on shipping costs and improve profits. But investment in milling facilities also came with a human cost, for accident reports readily indicate that the acts of grinding ore and recovering metals by mechanical and chemical means were not without injury. This paper takes a closer look at milling accidents in the Frontier State, considering in part the ways that local conditions came to exacerbate the problem. The paper also draws upon records of the Alaska Juneau Mine, one of the largest gold producers in the state, where an unusual thoroughness in reporting permits a closer analysis of the causes and frequency of accidents in its milling plant.

- Paul White is an Associate Professor of Anthropology at the University of Alaska Anchorage. His research on the mining industry has explored themes of technological change, environmental impacts, and relations between mining and colonialism. His forthcoming book, *The Archaeology of American Mining* (University Press of Florida, August 2017), synthesizes archaeological findings that have accumulated over the past five decades. He is currently researching the history and archaeology of Alaska's gold mills.

Thank You!



Warming the Hearts & Homes of the Interior

Candace Waugaman



Milt Behr



Lance Roberts

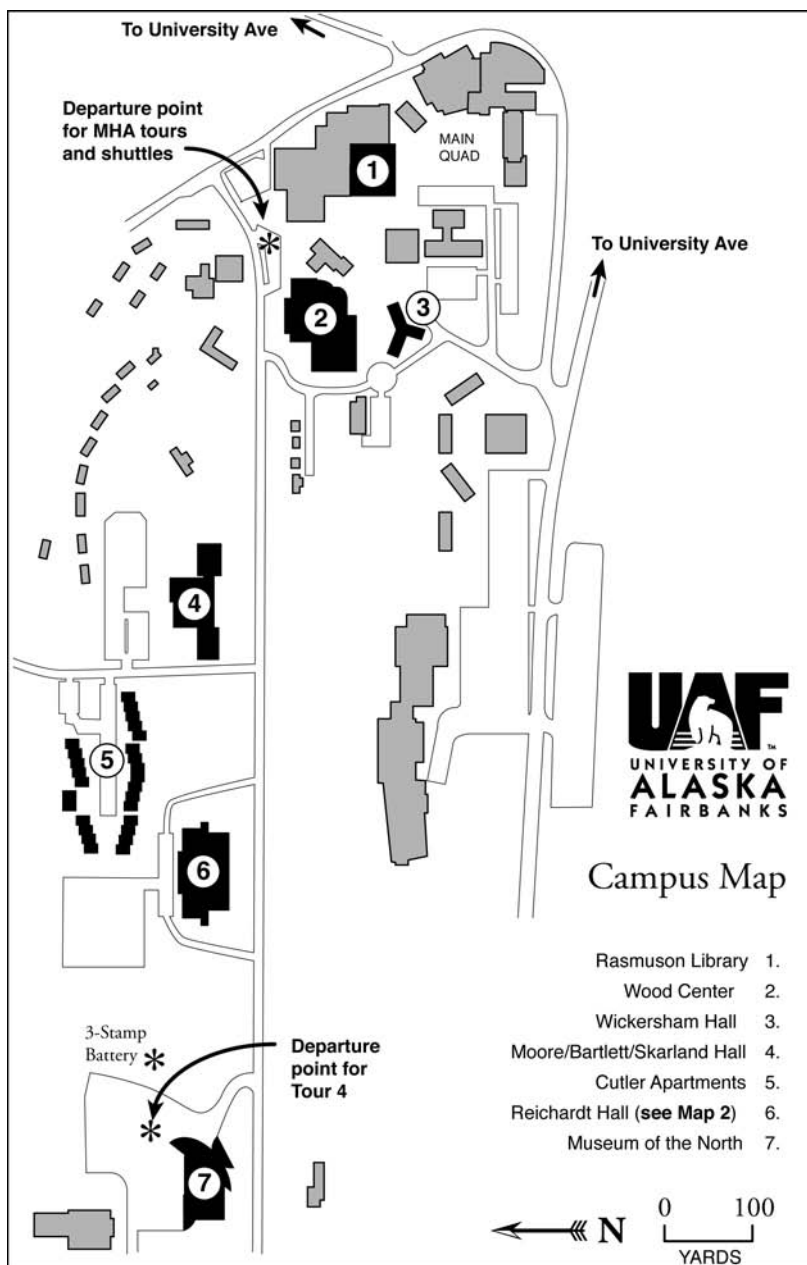
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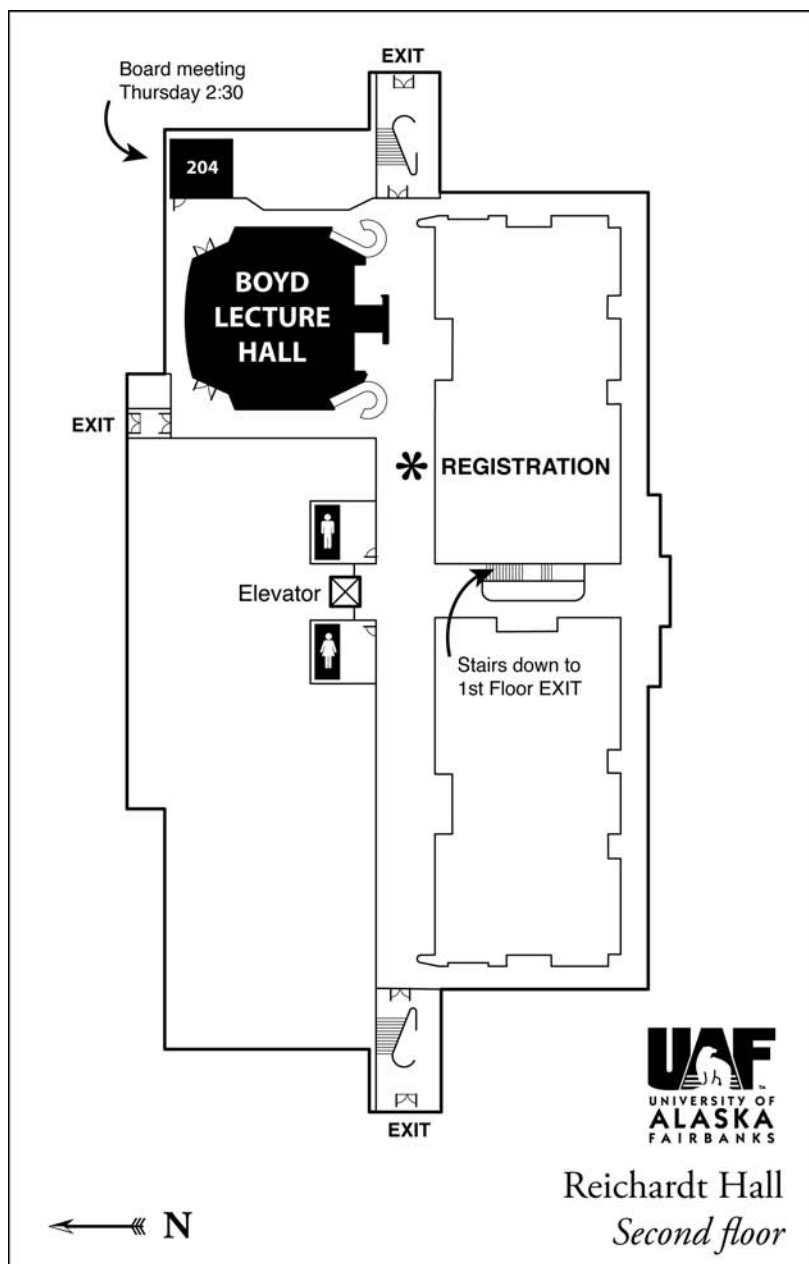
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Map 1. UAF Campus



Map 2. Reichardt Hall



SAVE THE DATE!

28th

Annual Conference of the

*Mining History
Association*

DEADWOOD
SOUTH DAKOTA

June 6-10, 2018

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SCHEDULE AT A GLANCE

Thursday Afternoon (Registration 12-4, Reichardt Hall 2nd floor)

- 12:30 PM UAF Special Collections Tour (*Rasmuson Library*)
- 2:30 PM MHA Board Meeting (*Reichardt Hall 204*)
- 5:00 PM OPENING RECEPTION. Alaska Mining Hall of Fame

Friday Morning (Registration 7-4, Reichardt Hall 2nd floor)

- 7:00 AM BREAKFAST (*Reichardt Hall, 2nd floor corridor*)
- 8:00 AM WELCOME (*Reichardt Hall, Boyd Lecture Hall*)
- 8:15 AM SESSION 1 Fairbanks and Alaska Mining
- 9:45 AM SESSION 2 Mining and the Media
- 11:00 AM SESSION 3 Mining History in Worldwide Context

Friday Afternoon

- 1:45 PM SESSION 4 Pioneers
- 3:15 PM SESSION 5 Gold and Copper Miners
- 6:00 PM MHA AWARDS BANQUET (*Tanana Chief*)

Saturday Morning (Registration 7-11, Reichardt Hall 2nd floor)

- 7:00 AM BREAKFAST (*Reichardt Hall, 2nd floor corridor*)
- 8:00 AM SESSION 6 Alaska Mining Camp Life
- 9:30 AM SESSION 7 Mining and Its Discontents
- 11:00 AM SESSION 8 Mining History, New Sources and Perspectives

Saturday Afternoon

- 12:30 PM PRESIDENTIAL LUNCHEON (*Wood Center*)
- 2:20 PM MHA BUSINESS MEETING
- 3:30 PM F.E. COMPANY MACHINE SHOP TOUR

Sunday

- 7:00 AM BREAKFAST (*Wood Center—preregistered only*)
- 8:30 AM TOUR 1: Permafrost Tunnel and Fort Knox
- 8:45 AM TOUR 2: Chatanika Dredge and Permafrost Tunnel

Monday

- 7:00 AM TOUR 3: Pogo Mine
- 8:30 AM TOUR 4: Fairbanks Lode Mines

Cover Image: Dredge bucket, from patent filed by W. H. Stires, December 8, 1936 (Patent No. 2,063,858)