MINING BEGINS IN BINGHAM CANYON

The first mining claim in the Utah Territory was filed on 7 September 1863 after the discovery of mineral-bearing ore in Bingham Canyon. Articles of formation of the West Mountain Quartz Mining District were approved on 17 September, and the following December, the first mining district was established. Various historical accounts offer slightly different versions of the discovery of ore in Bingham Canyon. One story attributes it to two early Mormon pioneers, Thomas and Sanford Bingham, who were the first to use the canyon for cattle grazing and to whom it owes its name. Another says the ore was found during a picnic in Bingham Canyon.

Both of those stories were denied by W. W. Gardner, son of Archibald Gardner, a noted mill builder in the Salt Lake Valley, who was involved almost from the beginning in Bingham Canyon mining operations. Gardner says the story of that first mining claim begins when his father started getting timber for his mill at West Jordan from the West (Oquirrh) Mountains in Bingham Canyon. George B. Ogilvie, who with his brother, Alex, ran cattle in the mouth of Bingham Canyon, was sent out to cut timber and “noticed some stones which one of the logs had loosened in the dragway. . . . He showed it to other loggers and they were all impressed that it might be a piece of valuable mineral.” Since none of them knew what it was, they took it to Gardner.

“Archibald Gardner knew that General [Patrick E.] Connor and some of his soldiers had had some experience while in California in mining. Archibald Gardner advised the men to take the stone to Fort Douglas and show it to General Connor and ask him for advice. Ogilvie and others did as suggested and asked him to examine the sample, and if it had value, tell them what they should do about it.” After
Locations of the early towns and camps in Bingham Canyon. All are now gone, absorbed by the modern Kennecott Utah Copper open-pit mine.

Courtesy Kennecott Utah Copper.
examining the rocks, two groups of about 12 men each—the Bingham Canyon log-
gers and some of the officers from Fort Douglas—met at the Jordan Ward House with
Bishop Archibald Gardner, who was appointed recorder for the meeting. During
that meeting, the Jordan Silver Mining Company was formed, and each member of
the group was given one share, except for Ogilvie, who was given two. In December
1863 Connor led the organization of the West Mountain Quartz Mining District in
the Oquirrh Mountains, which included the Jordan lode of the Jordan Silver Mining
Company. Thus, the stage was set for what was to become one of the most amazing
mining ventures the world has ever known.

In the spring of 1864, several companies of Connor’s Volunteers were officially
ordered to prospect in various promising locations. Numerous outcrops of copper and
other nonferrous metals were located in Bingham Canyon and elsewhere, but none
of these were worked extensively or successfully because of the lack of transportation
and difficulties in smelting. Since the railroad hadn’t yet arrived in Utah Territory,
mining supplies were excessively expensive: a shovel cost $2.50, and a keg of powder
sold for $100.

Regardless of the costs and the inconvenience of primitive mining methods,
interest in Bingham Canyon was fired up by the discovery of gold and silver deposits.
Not only were Connor’s men prospecting the area, but also, as the word spread, men
from around the West converged upon Bingham Canyon. Many were soon discour-
egaged. It was hard work and involved lode mining with drilling tunnels, hauling the
ore out, and then transporting it to the few crude mills by wagon.

“Had it not been for the discovery of gold in 1864, the camp might have been
abandoned until a later date due to the decline in lode mining. However, placer
gold was discovered in the gravels there and many miners became actively engaged
in panning gold along the various streams. Gold mining could go on due to the fact
that the profits from gold were greater from smaller amounts than could be obtained
from the metals.” Placer mining, which had already proved its worth during the
California gold rush, required simply that streambed gravels be washed in mov-
ing water to remove the lighter gravel, leaving the heavier gold at the bottom. In
Bingham,

the most productive and richest placer was that of Clay’s bar, from which
$100,000 in gold had been taken out by 1868. This bar consisted of a shaft
that had to be abandoned due to excessive water encountered below a depth
of 120 feet. Dan W. Heaton suggested that even though the shaft had to be
abandoned, the old tailings, if re-worked, might produce a fair wage. The
tailings were thrown into the sluice boxes and the result was wages ranging
from $7 to $15 per day for the three men who owned the bar.

One day while Ben Clay was cleaning out the sluice boxes, throwing
the larger cobbles high upon a dump, one piece rolled off the shovel. He
picked it up and discovered it to be a gold nugget weighing eight ounces.
This was said to be the largest nugget ever washed out in the state and was valued at $128.65. The Clay boys marketed their “dust” in Salt Lake City, where their frequent comings with such quantities of gold soon attracted attention and quite a few men followed them to the “diggings.”

Most of these miners used traditional sluicing, but, again taking their cue from the California gold-rush miners, soon replaced the old style with ground sluices, larger boxes, and a small hydraulic plant. But the high costs of mining supplies and equipment didn’t prevent the development of small underground mines and camps up and down Bingham Canyon and Carr Fork, the two main canyons that straddled what became known as “the Hill,” a mountain that later became the focal point of the largest mining enterprise in the nation.

The more important early mines in the two canyons were the Galena, the Kingston, the Julia Dean, and Silver Hill. By 1868 there were perhaps 100 people living in primitive cabins in Bingham Canyon. Two years later the U.S. Census Bureau noted that 275 were living in the canyon, and by this time the miners had recovered more than $2 million in gold from the gravels. By 1871 Bingham Canyon’s growth had made it large enough to be organized as a voting precinct in Salt Lake County.

Initially the ore was hauled out of the mines through the canyons and gulches by wagon trains; however, with the completion of the transcontinental railroad in 1869, the mining profile of Bingham Canyon and Carr Fork changed dramatically. Heavy equipment became more readily available and set the stage in 1873 for construction of a branch line, the Bingham and Camp Floyd Railroad, to Bingham Canyon. In the winter of 1873, the narrow-gauge Copper Belt Railroad was completed, bringing a new level of efficiency to the operations. While its capabilities were limited, the shipment of ores from Bingham Canyon mines greatly increased, consequently enlarging profits. Gear-driven Shay engines provided the power for moving the copper ore. They were powerful and built to haul ore over steep grades. But they also were slow. At four miles an hour, a person could walk as fast as they traveled. It was still “a fight to get up the hill and then one to keep from falling down.”

There was a ten-year burst of silver and lead mining in the canyon. Several million dollars worth of lead-silver ore was smelted at a Bingham smelter, at Salt Lake Valley smelters, or at smelters in San Francisco, Baltimore or Wales. Some copper was produced as a by-product of these efforts, but the low-grade copper-bearing ores were not as easily smelted as Bingham’s
Probably the first person to realize that the huge deposits of low-grade copper ores at Bingham Canyon held possibilities for riches was “Colonel” Enos A. Wall, a Pennsylvania lawyer turned mining entrepreneur. He visited Bingham Canyon in 1887, and his attention was drawn to signs of copper mineralization in Carr Fork. A spring on the hillside left green stains on the rocks as the water meandered down. Wall had a close look at the ridge rocks and obtained an ore sample from an abandoned mine. His sample assayed at 2.4 percent copper. Further investigation showed that a large part of the ground surrounding the exposed mineral deposits had been abandoned and was therefore subject to refilling. He immediately staked two claims and located other deposits he envisioned with possibilities.

“By 1900, the spirited Colonel owned all or part of 19 claims covering an area of 200 acres. He recognized the marginal nature of the property and even agreed to allow the local supervisor to use the dumps on his property for road making. Local residents disparagingly referred to his claims as ‘Wall-rock.’” Even though short of money for development, Wall managed to keep up the assessment and development work. Up to 1900 he had spent some $20,000 and driven 3,250 feet of tunnels into the hillside, “following fractures and veinlets in the hope of finding larger masses of rich ore.”

During this same period, Samuel Newhouse and Thomas Weir formed the Highland Boy Company as a gold-mining venture. The fact that they erected a cyanide mill in Carr Fork for processing oxidized gold ore reveals that they had not the remotest idea of developing copper deposits. “Their operation was in business only a short time when the workings revealed vast zones of copper sulphide. The copper present in the ore interfered with the recovery of the gold and caused an exceptionally large consumption of cyanide. The mill proved to be a dismal failure and while the venture seemed to be a loss, it marked the beginning of a new era for Bingham.”

Newhouse was the money promoter for Highland Boy, and while on a trip to Denver to secure backing, he received a telegram from his partner, Weir, that ore containing 15 percent copper had been discovered. The pair soon decided to build a “modern copper smeltery,” with its associated crusher and concentrator and a day-by-day capacity of 250 tons, to process the ore from their mine. The construction contract was awarded in September 1898, and the following spring the facility was ready for business. The plant was the first to be erected in Utah primarily to reduce copper ores. With massive quantities of moderately rich and low-grade ores, the Highland Boy Mine became the largest sulfide copper producer in Utah and one of the largest in the West.

The widely publicized success achieved by Newhouse and Weir in developing the Highland Boy Mine into a profitable copper mining and smelting
venture soon brought their enterprise under the covetous eye of a “Standard Oil Company syndicate,” headed by William Rockefeller [brother of John D.] and Henry H. Rogers [an associate of John D. in Standard Oil]. The “Standard Oil crowd,” as it was called, purchased control of the Utah Consolidated Gold Mines, Ltd., from Newhouse and Weir, for a reported $12 million. A new corporation, the Utah Consolidated Mining Company, including the absorption of the productive Highland Boy mine, resulted.18

The gold/copper-mining industry was rapidly changing with many companies forming, claims consolidating, financiers buying and selling companies, claims and properties trading back and forth—all jockeying for positions of power. Some of the early mines and companies were the Highland Boy Company and the Old Jordan Silver Mining Company in 1893, Utah Consolidated Mining Company in 1896, Boston Consolidated Mining Company in 1897, Yampa in 1897, and U.S. Mining Company in 1899.19 The need for housing led to the creation of the mining towns of the era, including Leadmine, Frogtown, Verona Gulch, Winamuck, Freeman Gulch, Heaston Heights, Markham Gulch, Copper Heights, Carr Fork, Apex, Phoenix, Frisco, Silver Shield, Niagara, Commercial, Telegraph, Terrace Heights, Copperfield, Greek Camp, Japanese Camp, and Dinkeyville.

The rapid change from gold to copper and the resulting success prompted the formation of numerous companies and exchange of shares of existing companies, all with visions of financial success. Among them were the Bingham Consolidated Mining and Smelting Company and the United States Mining Company (later to become the United States Smelting, Refining and Mining Company). Those two concerns, plus Utah Consolidated and the American Smelting and Refining Company (ASARCO), built large smelters. ASARCO came on the industrial scene in early 1899, soon becoming the dominant nonferrous smelting firm in Utah.20 In early 1904 there were three large copper smelters at the south end of the Salt Lake Valley in Murray and Midvale, and ASARCO had a large lead smelter in Murray.

Local farmers near the valley smelters, however, claimed their crops suffered severe damage from the sulfur dioxide gases from the venting stacks. They held several meetings in late 1904 and early 1905 and subsequently filed a suit in the United States District Court of Utah. “A lengthy trial resulted in a verdict against the four smelter companies which perpetually enjoined them from the future roasting or smelting of sulphide ores carrying over ten per centum of sulphur, at their locations so as to discharge said sulphur into the atmosphere in the form of gas or acid, or from further discharging into the atmosphere of arsenic in any form.”21

That court action brought an end to Utah’s booming sulfide copper industry and ordered the closure of at least two copper-smelting plants in the Salt Lake Valley. Just how closely the court order was enforced is not clear, however. In just a matter of months, United States Smelting, after close experimenting, developed a method of running all the smoke from its lead and copper smelters through bags. That process
Bruce D. Whitehead & Robert E. Rampton

successfully filtered sufficient sulfur, and other undesirables, from the stack emissions to satisfy the critics.\textsuperscript{22}

In 1909 District Court Judge John A. Marshall issued a permanent decree which gave permission to resume smelting ores. An obviously biased account of this controversy appeared in the Bingham press:

The farmers of the Salt Lake Valley now seem as anxious to have the smelters remain as they were a little while ago. Just as soon as they found their bluff was taken in earnest, there was much hurrying to and fro across the valley, and the prospects of seeing the easy money they had been getting from the smelters, fade away, did not appeal to the gentleman with the bunch of whiskers on his chin [presumably Uncle Sam]. For the last four years the smelters have paid in damage suits, in and out of court, a half million dollars annually.\textsuperscript{23}

**NEW INVESTORS ARRIVE WITH NEW TECHNIQUES**

Meanwhile, new investors and promoters came to Bingham Canyon. Notable was Joseph R. De Lamar, a former sea captain who developed an interest in mining properties in Georgia, Colorado, Idaho, Nevada, California, and eventually in Utah. He purchased the Brickyard Mine in Mercur from Wall in 1894 and, following some investigations, saw the value of Bingham Canyon’s porphyry copper deposits. De Lamar's Mercur operation used the services of a young mining engineer, Robert C. Gemmell, as supervisor of ore sampling, and of Daniel C. Jackling, a metallurgist in charge of milling tests.\textsuperscript{24} De Lamar’s mining and milling tests proved to be more than just encouraging. During the heated negotiations while forming the mining company, Gemmell resigned and went to Mexico, but Jackling stayed and later proved to be the ultimate driving force in the evolution of Utah’s copper mining and refining industries. His theory that the porphyry copper deposits in Bingham Canyon had enormous potential and could be profitably mined and milled by using large-scale, low-cost mining methods proved to be correct.

Daniel Cowan Jackling was an example of the American dream, working his way from a poor, orphaned Missouri farm boy to an internationally recognized and admired mining engineer and industrialist.

Jackling was one of those rare individuals with dogged determination and foresight—gifts that eventually launched the Bingham project. Those traits were honed by a hard childhood. Daniel C. Jackling was born in 1869 at Hudson, a small town in western Missouri, where his father engaged in trading and forwarding on the old Santa Fe Trail. Before Jackling was a year old his father died and his mother lived only a year longer. Jackling was placed
Bingham Canyon

in the care of his mother’s sister. Jackling and his aunt migrated from one farm to another, from Missouri to Arkansas, to Illinois, and back to Missouri. Finally landing in Sedalia, Missouri, and at age sixteen, Jackling managed to complete the eighth grade, then took a job as a teamster in a freight business owned by his uncle.25

By 19 Jackling had determined that he wanted to go to school and become a teacher, so he enrolled in the state Normal School, at the same time working on his uncle’s farm “where he observed some engineers using a transit to lay out a building site.” He changed career directions and enrolled in the Missouri School of Mines in 1889. He supported his education by spending his vacations working as an assistant to a railroad survey party and an assistant to the professor of chemistry and metallurgy. He completed the four-year course in only three and was awarded a bachelor’s degree in the science of metallurgy.26

After a brief stint at a smelter in Kansas City, Missouri, Jackling struck out for Cripple Creek, Colorado. The story goes that he borrowed enough money for a second-class railroad ticket and got as far as Divide, the end of the line, without money for stage fare to Cripple Creek, then a mining boomtown. He talked a fellow passenger going to Cripple Creek into taking his baggage along, then walked the 18 miles through ice and snow and arrived at the camp with only three dollars in his pocket. Several days later he obtained a job in an assayer’s office.27 After working at several camps as a miner, assayer, mill hand, and metallurgist, Jackling took a job as metallurgical superintendent of the Golden Gate mill at Mercur, Utah. It was there that he met De Lamar and was subsequently assigned, along with Gemmell, to examine the copper property at Bingham, where De Lamar held an option on the properties that would become the Utah Copper Company.28 Their report to De Lamar was to have far-reaching effects.

In 1901 Jackling returned to Colorado, where he was hired as a consulting engineer by Charles M. MacNeill and Spencer Penrose, owners of a controlling interest in the United States Reduction and Refining Company. His interest in the Utah porphyry coppers never waned, and his previous report to De Lamar on the Bingham Canyon potential caught the interest of MacNeill and Penrose, so he returned to Utah to negotiate for the property. But negotiations with the property owners proved difficult, and offers were submitted and resubmitted. Finally, Enos Wall, a major company holder, agreed to convey to Hartwig Cohen, Jackling’s associate, two-thirds of his interest, but Wall kept the remainder to be part of the development and retained the right to nominate one member of the governing board. De Lamar was tired of holding what he felt was a frozen asset and was therefore willing to sell Jackling and his backers his own quarter interest for $125,000. His deal with De Lamar successfully completed, and Cohen’s option from Wall safely in hand, Jackling returned to Colorado Springs. Taking a copy of the Jackling-Gemmell report with him, he visited Charles MacNeill to sell him on the new venture. He had, Jackling told MacNeill,
“without exception, the greatest opportunity in the world and . . . he just had to get
in on it.”

Skeptical at first, MacNeill agreed to a professional inspection of the property
and sent F. H. Minard to Utah. Minard’s investigation and report verified the esti-
mates on the tonnage and grade of ore, but he “rather praised the property with faint
damns.” While he estimated that the workings disclosed nine million tons of copper-
bearing rock, he pointed out “certain physical difficulties” and questioned Jackling’s
cost estimates. “Minard’s final recommendation was that a 200- or 300-ton plant be
erected to make extended experiments covering a period of at least a year, and this
only on the condition that they would be able to acquire an interest in the property
for the construction of the plant without any payment whatever.”

“On June 1, 1903, MacNeill, Spencer and R. A. F. Penrose accompanied Jackling
to Salt Lake City, to inspect personally the property. They drove to the mine and
walked over the property, at the conclusion of which ‘Dick’ Penrose said to MacNeill
that he thought they should go ahead. That evening Jackling gave a dinner at the
Knutsford Hotel to commemorate the occasion. The dinner is said to have cost Jack-
ling his last $100.” Thus, on 4 June 1903, the Utah Copper Company was born and
duly incorporated under the laws of Colorado with a nominal capital of $500,000 in
one-dollar shares. MacNeill and Penrose took 250,000 shares, and their friends paid
$250,000 in cash for the others. That same month Jackling was given the go-ahead
to build a 300-ton experimental concentrator, and a lease was formed up for the sur-
face rights on 20 acres in lower Bingham Canyon, along with the rights to dump tail-
ings. Utah Copper paid $250 a month for the rights, which it would terminate upon
abandoning the mill. Company executives began to focus on specific development
objectives. They determined what measures to take to mine the porphyry copper ore
and how to get it to the mills despite little experience in the kinds of undertakings
required to mine, mill, and make a profit.

As mining increased, the 1901 Copper Belt Railroad was not enough to meet
the demands of new mills in Magna and Garfield. The High Line extension of the
Denver and Rio Grande Western Railroad was built to transport the huge volume of
ore produced at the Utah Copper Mine to its mill in Magna. Although the High Line
set records in ore transport, clearing as much as 6,000 tons of ore daily, it faltered
because of a winding, circuitous route. In the spring of 1908, Utah Copper engineers
surveyed a more direct line. The next year mine production hit well over 71 mil-
ion pounds, and construction began on the Bingham and Garfield Railway in 1910.
Declared “one of the most marvelous little roads in the world,” the tracks traversed
the foothills of the Oquirrh Mountains for 20 miles from a connection with the San
Pedro, Los Angeles & Salt Lake Railroad at Garfield.

The railroads, however, solved only half the problem. The old system of caving
by blasting the hillsides and letting the results fall and break up into smaller pieces
was too expensive and slow and did not produce enough usable ore to be profitable.
Jackling did not give up his vision that, given sufficient quantities, the low-grade
copper ore underneath the cap could move from mine to mill at a profit, however. His assays of Copper Hill showed about 2 percent copper content. That yielded approximately 39 pounds of copper from each ton of ore, which was not acceptable to the mining engineers of that day. Today the average tests show about .6 percent copper content in the huge open-pit mine, yielding 12 to 13 pounds of copper per ton, all at an acceptable profit.

Open-Pit Mining in Bingham Canyon
Jackling knew that in the iron mines of Minnesota, steam shovels had significantly reduced the per-ton cost of mining and thought there was no reason that the methods could not be adapted to the Utah Copper properties. In early 1906 Jackling, now general manager of Utah Copper, appointed his old associate, Robert Gemmell, as general superintendent. In April of that year, both men visited the Minnesota Mesabi Iron Range to study how steam shovels mined the iron ore. The steam shovels could strip away 70 feet of oxidized cap, or overburden, to prepare for terrace mining the higher-grade ore beneath. There the two men met William J. Olcott, a distinguished engineer in the iron-mining industry and a classmate of Gemmell's from the University of Michigan. Olcott recommended that J. D. Schilling take charge of any steam-shovel operation. Five months later in August 1906, Utah Copper put its first steam shovel into service, just two months after Boston Consolidated had activated its huge machines.34

The first steam-shovel equipment included two Marion shovels, one Vulcan shovel, four small Davenport locomotives, and six-yard wooden dump cars. These commenced the job of stripping the overburden from the hillside at the rate of about 100,000 tons per month, or the equivalent of nearly one acre of ground every 30 days. Thus, the mining technique was effectively married to rail transportation, and by June 1907 the shovels had moved about 700,000 cubic yards of capping, exposing nearly six acres of ore. Eighteen months later the shovels had stripped more than 3.2 million cubic yards.35

But the Utah copper industry's picture still was not complete, and difficult decisions remained. Concentrators and mills still had to be financed, strategically located, and built to handle the ever-increasing tonnages of copper ores. As early as the gold/silver/lead heydays of the mid-1800s, a concentrator and leaching works had been erected, and in 1900 the Bingham Gold and Copper Company built a smelter at Bingham Junction. The following year Highland Boy enlarged its plant and added a concentrator at the mine.

In 1904 Utah Copper constructed a mill at Copperton, followed in 1906 by the company's 6,000-ton mill at Garfield. Profitable mining of the Bingham Canyon and Carr Fork properties had been plagued by fits and starts from the beginning, but with the advent of steam-shovel mining, expansion of the railroads, and mill and concentrator construction, the industry rapidly moved ahead. The real
secret to the area’s development was money. The mining companies, particularly Utah Copper and Boston Consolidated, caught the attention of eastern entrepreneurs. If Jackling’s thesis of mining and processing huge tonnages of lower-grade copper ore was to work, it was obvious that some consolidation had to take place. In 1907 Jackling moved to take control of the Arizona property of the Ray Consolidated Copper Company, then added the Chino porphyry copper deposits in New Mexico. The Guggenheim interests brought the Nevada Consolidated Copper Company, located near Ely, into the fold as the fourth addition to the Jackling organization. As these other western copper properties were developed, their mining, transportation, milling, and concentrator facilities were engineered and modeled after the installations serving the needs of Utah Copper.

The Newhouse interests in charge of Boston Consolidated shared Jackling’s vision of dealing in huge tonnages; they also shared the same mountain of ore deposits: Boston Consolidated had the upper portion of the hill, and Utah Copper held the bottom. Merger negotiations were attempted but seemed to be ending in failure and not without some bitterness. Enos Wall, still a minority power in copper development, viewed the proposed merger as a conquest of Boston Consolidated and a violation of common decency and moral ethics. Lending some credence to the conquest theory was Jackling’s candid appraisal: “Sooner or later, I knew that we would have to take them, or they would have to take us.” Finally, on 25 January 1910, “the merger of the Utah copper companies was consummated before the end of the day, on the basis of two-and-one-half shares of Boston Consolidated for one share of Utah Copper.” The merger of the two Bingham Canyon copper giants set the stage for unprecedented growth of the survivor, Utah Copper Company, and the copper industry for the next five decades.

While mining rock containing only 39 pounds of copper per ton was viewed with skepticism by most competent engineers, Jackling foresaw the economic advantage of mining copper at a production scale hitherto unheard of:

He had the courage to back his convictions to the limit; the personality to induce capitalists to finance the enterprise because of their confidence in him; and he had the resourcefulness to devise the methods and create the organization for bringing his elaborate plans to fruition. Concurrent with his development of Utah Copper, he brought into prominence porphyry copper properties in Arizona and New Mexico, the most famous of which were the Ray Consolidated and Chino mines, as well as properties in Nevada. As “Father of Porphyry Mining” Daniel C. Jackling would guide Utah Copper Company for the next thirty-two years.

The movement of so much topsoil made dramatic changes in the Bingham Canyon topography. What once was Copper Hill, mined at the top by Boston
Consolidated and lower levels by Utah Copper, slowly disappeared. That source of copper ore finally became the world’s largest open-pit mine as it succumbed to modern mining, concentrating, and refining technologies.

**Immigrant Populations, Social Changes, and Labor Unions**

The social changes near the mines over the years were perhaps even more dramatic than those to the physical landscape. They were driven by immigrants from many countries converging on Bingham Canyon to work the mines. The early years saw the immigrants heading for the canyon for employment opportunities. In the six years after the first gold strike in 1863, 276 new residents arrived in Bingham Canyon, mostly Irish who had fled their native potato famine. But the Irish resented the growing number of English immigrant workers, whom they called Cousin Jacks, and it wasn’t long before the Irish began to leave the canyon. In 1880 the U.S. Census Bureau in the 10th census described the Bingham Canyon population by origin: America (includes American-born children of immigrants, mostly British and Scandinavian), 452; British Isles, 170; Scandinavia, 83; Ireland, 51; Italy, 35; China, 32; Canada, 22; Finland, 19; Germany, 17; Prussia, France, Nova Scotia, 2 each; Greece, Austria, Africa, Holland, and Portugal, 1 each.

During the next two decades, the ethnic profile of Bingham changed dramatically with Finns, Swedes, Italians, Slovenes, Croatians, Serbs, Greeks, and Armenians coming to live. Japanese and Korean laborers, added to resident Chinese, expanded the Asian colony. In 1912 the Utah Bureau of Immigration, Labor, and Statistics reported to the U.S. Department of Commerce the following: Greeks, 1,210; northern Italians, 402; southern Italians, 237; Austrians, 564; Japanese, 254; Finns, 217; English, 161; Bulgarians, 60; Swedes, 59; Irish, 52; and Germans, 23. It was obvious that English-speaking workers were leaving mining for other opportunities, and new immigrants quickly took their places. Settlement names often reflected the origin of their residents, such as Frogtown, with its French Canadian workers. Copperfield had adjacent towns of Greek Camp, Japanese Camp, and Dinkeyville, named for the tiny old railroad engines. Highland Boy and Phoenix were home to some 1,200 southern Slavs and Italians, and Carr Fork was mostly Finns, with some Swedes, Norwegians, and Irish. The town of Bingham itself was the center for the canyon’s old Anglo families. Nonetheless, an estimated 65 percent of Bingham Canyon’s population was foreign born.

With the rapid growth in mining came equally swift changes in the society surrounding the mine. In 1900 the first rural free delivery mail route outside of a farming district in the United States was established. Businesses in support of the miners and other workers—grocery stores, transportation systems, clothiers, boardinghouses, hotels, restaurants, and a host of other enterprises—came into being. By 1900 the population of Bingham Canyon was tabulated at about 3,000, and Bingham’s Main Street had 30 saloons.
Labor unions were another of the social changes evolving from the developing copper industry. After the merger of Utah Copper and Boston Consolidated in 1910, the first labor dispute occurred.

The years prior to World War I were times of labor ferment. The International Workers of the World (IWW), commonly called Wobblies, was moving into industrial communities (especially in Montana mines) spreading the doctrine of workers' rights. Bingham did not escape its attention. In addition the Western Federation of Labor (WFL) was trying to establish itself as the representative of the miners.

Coupled with these movements was a growing resentment among the miners against the system of labor recruiting then in effect. Certain labor agents arranged with the company to supply workers in any desired number at any time. Those agents collected an initial hiring fee from the workers plus monthly dues as long as the jobs lasted. No one could be hired without going through the agents.45

Company executives and political figures denied that this padrone system existed, however.

The leading agent was Leonidas G. Skliris, who provided workers under a padrone system for Utah Copper, the Western Pacific Railroad, the Denver and Rio Grande Western Railroad, and the Carbon County coal mines at Castle Gate, Hiawatha, Sunnyside, and Scofield.46 His power earned him the title of "Czar of the Greeks"; he had contacts with labor agents in Idaho, Wyoming, Colorado, Nevada, and California. He "could, within minutes of a telephone call, have men on a train traveling to a destination where they would be hired as workers or strikebreakers."47

With his power as the labor agent, Skliris lived high. He resided in the newly completed Hotel Utah in Salt Lake City and traveled extensively throughout the country, making new alliances and recruiting workers. His influence was greatest among the Greek population because he spoke the language. He charged $50, $25, whatever the market would allow, to place a worker and an additional monthly fee for the worker to keep the job. His success was in great measure due to the large number of Greek immigrant workers. Few spoke English, so Skliris spoke for them in negotiating employment and pay. Naturally they gravitated to the jobs, the mines, and the businesses where their native language was used.48 Additionally he coerced workers into trading exclusively with the Pan Hellenic Grocery Store and threatened them with discharge if they didn’t or if they were not spending enough.

The padrone system affected other immigrants, especially the Japanese. Skliris’s Greek workers resented the Japanese because they were paid more. Asians mostly were “bank men,” who were lowered by ropes and manually swung picks to loosen the ore in the steep banks, a dangerous occupation. The difference in pay was a major divisive factor in the mines.49 As the resentments and conflicts, both socially and on
the job, boiled to the surface and the unions gained favor with some of the workers, a strike seemed imminent. Charles Moyer, president of the WFL, came to Bingham from Colorado to head the bargaining with the companies.

The workers felt the company was abetting the unfair system and deliberately trying to get as much work done as possible using cheap labor. Some workers were paid as little as $1.75 a shift, and it did not matter how the labor was furnished. Many of the workers joined in a union-sponsored strike against the company in 1912. As labor unrest grew, men were imported from other parts of the United States as well as foreign lands, primarily as strikebreakers, when workers voted in favor of this first strike in 1912, which turned violent. The Utah National Guard and a large contingent of deputy sheriffs were called in to keep order. The strikers in turn armed themselves, and for a time the Bingham atmosphere was very tense. With the deputies, company guards, strikebreakers, 50 sharpshooters from the Utah National Guard, and many of the strikers armed, lives were lost. Many families became frightened and moved out of Bingham; as a result, commerce ground to a halt. Armed groups of both strikers and strikebreakers intimidated residents, who were afraid to leave their homes. Ultimately some 1,200 miners were involved in the walkout. Many of the Mexican strikebreakers remained in Bingham.50

WFL's President Moyer and company officials were inflexible in their positions, and no meetings ever took place. Moyer forwarded the union demands to the mining companies, and the next day the United States Smelting, Refining and Mining Company informed him that it would not "accede to demand." On 17 September about 1,000 miners assembled at the Bingham Theater to take a strike vote. At that point even Moyer urged caution and pointed out that they might not be able to win with a strike. "When the men were asked whether they favored the strike, they leaped to their feet and broke into cheers. When the negative vote was called for, not a single miner rose to his feet. The vote was unanimous," announced G. E. Locke, the union secretary.51 The strike would commence at seven o'clock the next morning and would affect 4,800 miners at Bingham's principal mines: Utah Copper; United States Smelting, Refining and Mining; Utah Consolidated; Utah Apex; Bingham New Haven, and Ohio Copper. The workers exited the theater firing shots into the air. As the Salt Lake smelters were drawn into the strike, the affected workers totaled some 9,000.52

Word of the strike vote spread rapidly, and anarchy reigned. As a mob of strikers terrorized the town, Salt Lake County Sheriff Joseph C. Sharp and his chief deputy, Axel Steele, mobilized 25 deputies, armed them with several thousand rounds of ammunition, and dispatched them to Bingham aboard a special train. By order of the mayor, all saloons were closed on 18 September and drugstores were forbidden to sell alcohol on penalty of revocation of their licenses.53

With both the company and the strikers refusing to budge, the workers took matters into their own hands. Miners, mostly the Greeks who wanted Skliris immediately fired as agent, bought firearms and ammunition from Salt Lake–area
hardware and sporting-goods stores. They then positioned themselves at strategic points on the mountainsides. “With 800 foreign strikers armed with rifles and revolvers strongly entrenched in the precipitous mountain ledges across the canyon from the Utah Copper Mine, raking the mine workings with a hail of lead at every attempt of railroad employees or deputy sheriffs to enter the grounds, the strike situation . . . reached its initial crisis.” Moyer finally admitted that the union could not handle the Greeks.

Governor William Spry issued an ultimatum for the strikers to leave the hillsides and mines and went to the Bingham Theater, expecting to meet with them. The strikers ignored his order until a bearded priest in black robes with a priest’s black hat on his head walked up Main Street and then up the mountainside.

Their warlike spirit, subdued temporarily by a lone Priest from the Greek Church, Father Vasilios Lambrides, who exhorted them in the name of their religion to refrain from further violence and defiance of the law, the army of strikers on the mountainside commanding the works of the Utah Copper Company, voluntarily descended from their stronghold yesterday afternoon. The little father dressed in flowing clerical robes with a glittering cross of gold upon his breast, went among the militant strikers like the spirit of peace and brought “the truce of God.” Everywhere, guns were laid aside for him and hats were doffed in respectful salute.

Soon after, nearly all the men left their positions to go listen to Governor Spry. Bedlam still prevailed, and some miners sympathetic to the companies were urged to go to work when operations started up again. Then, in early October, Jackling; his assistant, Gemmell; and R. H. Channing, president of Utah Copper, accompanied Sheriff Sharp on an inspection of the Bingham properties. Following that meeting, Jackling told reporters from the Salt Lake Tribune that “the company’s property is there and the company desires to operate it. The company wishes to begin work as soon as possible and the company is looking for men.”

On the morning of 8 October the Highland Boy whistle sounded at six, again at seven, and finally at eight o’clock and a group of miners reported for work at the mine, accompanied by a dozen deputies. Close behind them trooped between 100 and 200 irate strikers who tried to persuade them not to go to work. According to The Tribune, [one of the strikers] became “officious” and was “tapped on the head with the butt of a rifle.” He then went away and molested the men no more. The fifty miners passed onto company property and work was resumed at the Highland Boy Mine. The following day, under the surveillance of a hundred deputies posted on adjacent hillsides, Utah Copper commenced work with a skeleton crew of 150 men using one steam shovel and a single locomotive.
By late October Utah Copper had 1,500 workers on the job, along with 15 steam shovels, and by the end of the month, it was moving 11,000 tons a day, more than half the usual tonnage.

One major festering sore was resolved. Skliris, the Czar of the Greeks, returned from a trip to Idaho and Colorado, still fervently denying that the padrone system of hiring workers existed. He even offered a $5,000 reward to anyone who could prove that it did. Nothing came of his offer, and on 22 September 1912, Skliris “resigned.”59

It took the companies five months to return to normal operations. The actual expense of fighting the strike was slight compared to the loss of profit caused by the walkout. Utah Copper estimated its loss at $1.25 million, and the other mining companies posted similar figures.60 The efforts of unions at mines all over the West were affected by the failure of the 1912 Bingham strike and the damaged prestige of the WFL, but the labor movement at Bingham was not dead. The next year the radical IWW again cast a covetous eye on the mine and mill workers in Bingham’s copper operations. Between 1914 and 1916, the IWW was agitating all over the United States and, in due course, found a few followers in Bingham. The IWW committee attempted to stir up a strike among the Bingham workers and circulated handbills with six demands, which the companies regarded as outlandish and simply would not consider. Few workers were in sympathy with that union, and even fewer were members. Attempts to organize strikes at two properties came to naught. Labor unions were not a force in Bingham for many years and did not gain a foothold on “the Copper” until 1944, when the first collective bargaining agreement on wages and working conditions was negotiated.61

The strike did bring about some improvement in general working conditions. In a few years, the companies granted many of the workers’ demands, such as showers, change rooms, and company insurance plans. In 1913 the company created a training manual for workers and published it in English, Serbo-Croation, Greek, Italian, and Japanese.62 Working conditions also improved through the actions of state agencies and legislation favorable to workers generally. In 1917 the Utah Industrial Commission was formed, the office of the state mine inspector was established, and safety regulations were put in place. That same year the Utah Legislature enacted the Workers Compensation Act.63

With labor strife fading into the background for the time being, Utah Copper moved forward with Jackling’s theory that mining and processing huge tonnages of lower-grade copper ore could be profitable. But that couldn’t be done without some heavy financial backing. Companies were consolidated, ownership shares were traded back and forth, and major financiers took notice of the potential.

Kennecott Enters

Kennecott Utah Copper’s genesis came in the early 1900s, when Dr. Robert Kennicott was commissioned to head an expedition to run a telegraph line across Alaska for
Western Union Telegraph Company. Because of his knowledge of Alaska, he had considerable influence on the exploration and development of that territory. The Kennicott Mining District was named after him. A mine was located and developed in the new district, but a clerical error changed the spelling from Kennicott to Kennecott, resulting in the eventual name of the Kennecott Mines Company. In 1908 New York’s Guggenheim financial interests acquired the Alaska claims and developed and operated the mines under the new Kennecott name.

In a financial consolidation move, Guggenheim decided to bring all its copper interests together for stock-sale purposes, and on 29 April 1915, Kennecott Copper Corporation was incorporated under New York law as a holding company consolidating the properties throughout the world. Nine months later Kennecott Copper Corporation acquired shares totaling 25 percent of Utah Copper from the Guggenheim Exploration Company. During the next eight years, by stock purchase and exchange, Kennecott obtained 77 percent of Utah Copper stock, giving it undisputed control over the company by 1923. Under this single leadership, open-pit mining with removal of heavy tonnages could proceed using increasingly heavy equipment.

After 17 years the original steam shovels had been phased out, and by 1919 the new open-pit operation was using 21 new behemoths, mounted on rails, each scooping up seven tons of material with each bite of its three-and-a-half-yard dippers. Due to continuing improvements in the milling and processing plants, the appetite for even larger ore tonnages grew. More-efficient electric shovels replaced the remaining steam shovels. The use of electric power gravitated to the railroads, and by 1928 mining operations had become increasingly modern with the introduction of electric locomotives. Use of electric power at the mine was nothing new. As early as 1901, the Telluride Power Company built a 44,000-volt main line from Cedar Valley to Bingham, and a branch of the main line from the Provo generating station to Mercur. That power, produced by Telluride’s five generating stations—one as far away as Grace, Idaho, 160 miles to the north—operated an air compressor, saws, and other equipment.

Disasters and City Development

Profound changes were also occurring in Bingham Canyon, fueled by factors only peripherally related to industrial evolution. The early days saw divisiveness among the residents, many of whom were recent immigrants. Language and culture at times were major barriers, but over the years, the actions of several individuals and a series of natural disasters—fires, floods, and snowslides—welded residents of the communities together in caring for the dead and their families, the injured, and the homeless. Fires were numerous over the years, primarily due to the wooden construction of the majority of houses. Fire danger was intensified by the crowded conditions in the canyon, where houses were actually stacked upon each other and packed closely together. Fighting the fires was extremely difficult due to the lack of water and proper
Bingham Canyon

equipment. Additionally many of the homes were located on terraced hillsides, where it was impossible to pump enough water and fire trucks could not go.

That problem became evident on 8 November 1880, when a fire—some believe caused by arson—started in a building by Reed’s store and quickly spread to 31 other buildings. In 1895 two fires, one in July and the other in August, again spread quickly, but the August fire had far more serious consequences. The origin is not known, but the houses in the narrow confines of the canyon were excellent fuel. Lacking proper equipment, the bucket brigades worked heroically but were stonewalled by the blaze. As the fire raced through the canyon, 45 homes were lost, valued at about $200,000. Fortunately, no one died, although many people were homeless for a time. Concerned citizens provided food and shelter. Bingham rebuilt and in November 1903 organized a fire department. By December the apparatus committee reported it was advertising for equipment, and on 23 January 1904, A. L. Heaston and J. Bryant were elected Bingham’s first fire chiefs. A month later, on 28 February, the town of Bingham incorporated.

The organization in place to combat disasters had plenty to do during the next few years. In 1924 a brisk wind whipped a blaze through Bingham, and a main water valve ruptured, making fire fighting essentially impossible. Six families were made homeless; two volunteer firemen, Tommy Price and Harold Anderson, were killed; and Leonard Gust was injured by a falling wall. Another fire on 10 February 1925 razed 20 buildings, but even worse was a huge snowslide in 1926. Heavy snow had fallen for several hours, and early that morning the snow at the top of Sap Gulch started moving. The earth trembled, a terrible crash was heard, and the gigantic avalanche descended on Highland Boy. “Seventeen dwellings and a three-story boarding house were swept from their foundations and buried beneath the on-rushing thousands of tons of rock, snow, ice and other debris.” The lives of 39 people were lost amid the tangled wreckage. Work was suspended at the Utah Apex and Utah Delaware Mines, and some 200 men began the task of removing both the living and the dead from the ruins. Some 200 residents were affected by the slide. At the time that avalanche was said to be most disastrous in the history of Utah.

Six years later, on the morning of 11 August 1930, down the canyon at Markham Gulch, weather struck again, this time with a very heavy rainstorm. The fury lasted for about half an hour and soon reached the flood stage. Thick muddy streams roared down the mountainside, in through the rear doors and windows of homes, and out the front doors and windows. Cars, debris, and other objects were swept down the main road by a torrential stream of muddy water. Nearly every home on the west side of the main canyon was damaged by mud from the immense waste dumps higher up as well as rushing water. Then landslides followed the floods. Though the rainstorm was brief, the floods lasted from 11:30 am to 2:00 pm. They demolished 20 homes and damaged more than 100 buildings. The loss was estimated at $400,000.

Both those disasters, however, paled in comparison to the Highland Boy fire of 1932, labeled one of most devastating in the town’s history. It started in an old
theater where, it was rumored, some children were playing with celluloid film and set it afire to watch it burn. Within minutes the town was an inferno. Wooden houses on the terraced hillside quickly burned to the ground, and people could save only a few belongings. That fire raged for three hours, fought by local, Murray, and Salt Lake County fire departments. Everything on both sides of the narrow canyon for one-third of a mile was reduced to smoking rubble.

Again, the residents mobilized, and all available space was turned into sleeping quarters. A relief station was set up in the Highland Boy Community House, and local organizations brought all possible aid. Fortunately, no lives were lost, although some victims were severely burned. They were treated by a local doctor, who set up a first-aid station at the scene.

While these disasters helped solidify the feeling of community, several individuals also worked to unite the Bingham Canyon residents. The lives of three remarkable women provide outstanding examples of that effort. Georgia Lathouris Mageras (affectionately known as Magerou, the genitive form of Mageras) was a midwife who arrived in Magna from Greece in 1909. She delivered the babies of miners’ wives and earned the reputation of never losing a mother or child in her long years of practice. Her services were sought by Greek, Italian, Austrian, and Slavic workers and their families, who preferred her to the company doctors. Finally, she found herself doing what was called “practicing medicine without a license.” She then began assisting doctors with deliveries, rather than taking charge herself. When babies arrived before the doctor, he had only to sign the birth certificate. Her impact was profound because she insisted on cleanliness, not only for herself in the deliveries but for the mothers and their babies.

Additionally Magerou treated many people outside of childbirth with folk-medicine remedies she had learned while growing up in Greece. Her herbal treatments were widely acclaimed, and workers traveled long distances to be treated. She earned the respect of not only the residents of Snaketown, Ragtown, and all of Bingham Canyon but also the company and community doctors.

Alta Miller, who was born in Bingham in 1904 and eventually taught in the same school she had attended, recalls the various ethnic groups in the community as sources of fun and inspiration:

I remember the wonderful celebrations we had; I especially remember Columbus Day. All the Italian people in Bingham would get together. They would dress in the old Italian costume of Columbus and they would make three ships—the Nina, the Pinta, and the Santa Maria. Then they would have all the children excused from school. We would line up. Each child had two flags, and we would hold one in each hand—one Italian and one American flag. We would follow the three ships up the main street. The bands would play, the people would wave their flags, and everybody in Bingham came out and lined the sidewalks. It was wonderful! In the afternoon
they had all kinds of races—foot races, three-legged races, and horse races. Then the Italian people would serve refreshments. We all looked forward to Columbus Day.

We had other celebration days. The Japanese people had Kite Day and Doll Day. One thing about the people in Bingham, everybody supported everybody else. I feel there was no prejudice among the people of Bingham at that time. There were many different nationalities, especially Spanish, Greek, Austrian, Italian, quite a few English, lots of Scandinavians—about 18 different nationalities. Many of them were young men who came to work and later brought their families. They built homes, many of them up on the side of the mountain just like a crow’s nest. Many of the single men lived in boarding houses.75

Many Bingham residents think much of the unity that Miller recalls came from the work of Ada Duhigg, who arrived in 1932 and became affectionately known as the “angel of Bingham Canyon.” A native of Iowa, she prepared herself for a teaching career, but early in her life, she felt a spiritual call. She enrolled in the Kansas City National Training School for Christian Workers in 1931. A year later she graduated as a Methodist deaconess and joined a group of some 600 deaconesses who would be called to serve in 500 communities. Her assignment by the Women’s Home Missionary Society was superintendent of the Highland Boy Community House (HBCH) in Bingham Canyon, Utah. “The building had been dedicated only five years earlier as a missionary project by the Methodist Church, and a neighborhood house for all races and creeds.”76 Under Duhigg’s guidance, the community house served as a place of worship, a gathering place for fun and parties, and a learning center with a library of some 1,500 books and guided-learning programs for those who knew English only as a second language. The gatherings included leadership training and meetings for Cub Scouts, Boy Scouts, Brownies, Girl Scouts, and Campfire Girls. Training was provided in first aid, Red Cross skills, and nursing. There were well-baby clinics and even tonsillectomy clinics that included the impromptu use of the kitchen as an operating room. Bingham Canyon residents observed, “It’s not surprising that there was very little juvenile delinquency in Highland Boy. Between school and the multitude of activities offered at HBCH, there was little energy left over for mischief.” Teachers and mission-house people worked with families. Duhigg was the intermediary between children at school and their parents and did much to unite the immigrants with the native Americans and make Bingham a closely knit community.77

**World War I and the Great Depression**

That community, like all others in the nation, felt the impact of World War I. The outbreak of the war in Europe saw a worldwide slump in the copper market, and Utah Copper was forced to curtail operations by half. In an effort to cut the flow of
strategic metals to Germany, Great Britain in 1914 placed copper on the conditional contraband list. However, the slump was short lived, and the next year the market rebounded due to the increase in wartime demand for copper. This resulted in a production increase to 33 percent above normal. “During World War I, Utah Copper was second only to Montana’s Anaconda as a source of newly mined copper. In 1916 company profits rose to an all-time high of $33.7 million on production of 93,800 tons of copper.”

At the close of the war, however, the copper market slumped again, and operations were curtailed drastically. The Magna mill closed in 1919, and the Arthur mill shut down in 1921. The following year the postwar demand for copper began to increase, and both mills were reopened. During the shutdown and as the plants went back on line, they were dramatically overhauled and made much more efficient. Froth flotation units were installed, and the copper recovery gradually went up from the 1917 average of about 61 percent of capacity to 73 percent in 1918; it continued to rise to 81 percent in 1923 as both mills fully utilized the flotation process. By 1926 the capacity of the mills had increased to 50,000 tons per day. The never-ending process of developing technology continued, and by 1963 the two plants had a combined capacity of 90,000 tons per day.

Innovation was not confined to Utah Copper’s mills. In the late 1920s, the entire system was electrified. At the end of the decade, 41 electric locomotives were in service. “The modernization of the mining equipment and the initiation of better handling techniques enabled the company to move its 232 millionth cubic yard of material from the Bingham mine in April 1935. By this time the company had moved as much earth as had been moved in the construction of the Panama Canal.”

The volatile copper market started another downward slide with the Great Depression of the 1930s, and Utah Copper Company’s Bingham operations were again curtailed. The Arthur mill closed, and the Magna mill went on a reduced operating schedule. “The company staggered the employment to allow the greatest number of employees to be retained—giving them approximately one-half of full-time employment. Production continued to decline, however, due to the meager demand for copper, reaching a low point in 1933 when operations were only one-fifth of normal capacity.” The market was not much better the following year because domestic consumption of copper increased by only 5 percent.

Despite the Depression-driven low market, Utah Copper continued with innovations to make copper mining, haulage, and recovery more economical and profitable. In the face of the 1929 Depression, the company built a precipitate plant directly at the mouth of Bingham Canyon. By the next year, the Bingham and Garfield Railroad was operating more than 148 miles of rails, including sidings, tracks, and switchbacks in and near the mine. The face of Bingham Canyon was changing. The once dominant Copper Hill was transformed into an open-pit mining operation to compensate for the decreasing concentration of copper in the ores with increased tonnages. The fleet of electric shovels, the haul trains, and the mills and concentrators were
Bingham Canyon

constantly upgraded. Utah Copper appeared to be the beneficiary of a slowly recovering metal market.

The mine operated at varying rates of production in 1935, and the ore was treated entirely at the Magna mill. The Arthur mill continued to lie idle but was reconditioned to ensure its readiness to be put in service on short notice. The plan of rotating employment continued during the latter part of the year for all employees. The slowly increasing demand for copper finally afforded about 84 percent of full monthly time.83

It was not an easy time, however, because the Depression and its effects on the workforce and unemployment were major factors in Bingham Canyon. As the company slowly increased the number of workers, resentment again boiled over in the canyon, apparently because some workers were recruited from other communities in the Salt Lake Valley with a detrimental effect on local business. The Town Board complained to Utah Copper, “These employees make their living here and the majority of them never spend one cent in Bingham. It is believed that if the mines will employ strictly local labor—men who reside in the canyon—local business houses and property owners will benefit, and the town will attain a degree of prosperity that is its just due.”84 It is not known that this resolution had any effect on mining company employment practices.

Within a few years, the company rebounded. A major financial milestone occurred on 10 November 1936. “Kennecott acquired all the property and assets which had been formerly owned by Utah Copper Company. This acquisition completely unified the Utah properties with Kennecott. Your Corporation had previously owned approximately ninety-nine percent of the Utah stock.”85 The corporation’s annual report for 1936, reflecting the final consolidation with Utah Copper, listed the new divisions: Nevada Consolidated Copper Corporation; the Nevada, Arizona, and New Mexico operations were listed as subsidiaries, along with the Nevada Northern Railway Company; the Ray and Gila Valley Railroad Company; the Alaska Division; the Braden Copper Company, a Chilean operation; the Chase Brass and Copper Company, Inc.; and the Kennecott Wire and Cable Company.86 Kennecott merged all its Utah properties into the parent company as a wholly owned subsidiary.

That final unification reflected Jackling’s efforts during the previous two decades in bringing together major copper entities in the West. The company from that period until Jackling’s retirement on 1 October 1942 was referred to as the Jackling organization.87 Then in 1947 Kennecott dissolved the Utah Copper Company and officially organized the Utah Copper Division as an operating division of Kennecott Copper Corporation.88 The 1915 acquisitions by Kennecott had set the stage for decades of growth and the development of new mining, milling, and concentrating techniques.

Utah Copper did not confine its efforts just to copper over the years. While copper, gold, silver, and lead were important by-products of refining almost from the beginning, the recovery of molybdenum caught management’s eye as early as 1898,
when its presence was noticed. At first the graphitelike substance on the water used in copper concentrating was considered simply another “waste” product, not worth any investigation because of its low density. But the development of higher-strength and corrosion-resistant steels following World War I commanded some attention for molybdenum.

By 1935 molybdenite (MoS\textsubscript{3}) proved sufficiently interesting that a workable process was developed, successful enough that a test plant was installed at the Magna mill. “By mid-1936, the operation had proved so successful that the recovery of molybdenite began on a commercial scale. Production increased rapidly as the entire milling operation was converted to the recovery of the metal. By 1938, the Utah Copper Company was the world’s second largest producer of molybdenite.” By the early 1960s, the company was still in second place in world production, and the annual output of this important alloying metal had a value in excess of $30 million.

The investigation of additional minerals did not stop there, however. Utah Copper embarked on a complete spectrographic analysis of copper ore, copper concentrate, and molybdenite concentrate. The analysis showed the presence of some 38 elements in addition to the usual components. The early development of molybdenite-recovery technology, which served the new high-strength and superhard steel markets, gave Kennecott a leadership position as molybdenum found its way into other metal-enhanced steel alloys, electrodes in electrically fired furnaces and forehearts, nuclear-energy applications, and the manufacture of aircraft and missile parts.

**Impact of World War II**

The onset of World War II impelled a number of changes. Kennecott had recognized unions as the employee-bargaining representatives as early as 1938, but the first collective bargaining agreement covering wages and working conditions was not negotiated until 1944. That same year Utah Power and Light built a plant to make Kennecott independent of outside sources of electrical power. But wartime mobilization took its toll on Kennecott’s operations, as well as on the town of Bingham. Some workers abandoned mining work, relocating to other areas for jobs in the defense industry. The shortage of mine and mill workers initiated a government order for draft boards to defer some skilled and nonskilled mine and smelter workers so they could stay on the job. The shortage even stimulated importation of Puerto Ricans to work on six-month contracts.

“Despite the labor shortage, Bingham mines—subsidized by the government and assured of no labor unrest by a freeze on union grievance committees—produced a staggering amount of metal during the war years. From 1941 through 1944, the district produced over three billion pounds of copper—more than one-half of all the copper mined in the United States. Bingham’s contribution to the defeat of the Axis powers was enormous.” Germany capitulated on 8 May 1945, and Bingham rejoiced. Four months later, on Tuesday, 14 August 1945, Japan surrendered. Within minutes
of the announcement, the entire town of Bingham shut down for a two-day holiday and, apparently, much revelry.\textsuperscript{91}

World War II brought about not only subsidiary operational changes but far-reaching executive organizational ones as well. Workers going into military service and others leaving Bingham Canyon to take jobs in the defense industries had to be replaced to keep up with the demands. Throughout the entire industry, women in mining were unusual, even in clerical and secretarial jobs. Utah Copper though created its own versions of Rosie the Riveter.\textsuperscript{92} During the war years, it was not uncommon to see women laying railroad tracks, working on maintenance gangs, running the railroad switches, operating overhead cranes, staffing the parts and supply shops, operating lathes, supervising the vats in flotation mills, and repairing turbines in maintenance shops.

\section*{Postwar Production}

With the end of World War II, all America felt a universal sense of relief and joy that the uncertainties of war had ended. But the transition from a wartime, all-out military effort with its hang-the-costs mentality to a peacetime economy with a sense that business and the entire nation had to move in a direction where sound practices prevailed was not easy. The economic and social driving forces were headed in many, and at times new, directions. Wartime restrictions, price controls, and business decisions imposed by the federal government were gradually lifted. One of these restrictions—the freeze on union grievance committees that assured no labor unrest—terminated early. That left the door open for organized labor to flex its muscles, long dormant since the first collective bargaining agreement had been forged in 1944 with the International Union of Mine, Mill, and Smelter Workers as the recognized bargaining agent. Unionized workers went on general strike in 1946.

Although Kennecott’s copper business reached maturity after World War II, it was far from stable. The three deepest production slumps were the result of strikes. The 1946 strike lasted 152 days. In 1959, workers were out 144 days and the strike, which ran into 1960, totaled 171 days. Again a strike of 259 days spanned two calendar years, 1967 and 1968, with 170 of those days in the low production year of 1967. Strikes were a regular occurrence at contract renewal time. Over the 34-year period from 1946 through 1980, the workers represented by labor unions at Utah Copper were on strike an average of 29 days per year, almost one month out of 12.\textsuperscript{93}

Union members saw this as progress, but management did not. In his 1945 annual report, E. T. Stannard, president of Kennecott Copper, told stockholders that during the reporting year, Kennecott operations had largely been at a standstill because of strikes. He complained that laws and executive and administrative rulings “have
been manifestly favorable to labor. The injurious strikes now so widespread are due in large measure to this increase in power without any corresponding accountability.94

In spite of general labor unrest and the up-and-down gyrations in the demand for copper, Kennecott continued to refine and expand existing processing technology and search for new methods of producing high grades of copper at less cost. Undoubtedly, the first major move in this direction during the national recovery from war mobilization was the design and construction of the first mine rail-haulage tunnel, a 4,650-foot tube built at an elevation of 6,040 feet. It eliminated hauling ore from the bottom of the pit to the top and replaced the old Bingham and Garfield Railroad line. The tunnel provided safer and faster movement by longer trains. It was completed in 1948, and electric locomotives replaced the steam ones for hauling ore to the mills.

The tunnel and railroad line improved the economics enough that a year later construction began on a second mine-haulage tunnel, 7,000 feet long and at 5,840 feet elevation. That project was coupled with the 1950 start-up of an electrolytic refinery at the town of Garfield to produce copper cathodes, gold and silver bars, and commercial-grade selenium. Tunnel haulage was so attractive that in 1958 construction began on yet a third mine rail-haulage tunnel, this one 18,000 feet in length at 5,490 feet elevation. Expansion and consolidation continued a year later with Kennecott buying out ASARCO's interest in the Garfield smelter. The general updating required that the company's power plant expand to 175,000-kilowatt capacity by 1960.

The rapid pace of technological research and development following World War II sparked a renewed interest in some of those exotic minerals present in the Bingham deposits. In 1951 Kennecott established a new metallurgical research laboratory at the University of Utah. The objective was to improve the recovery of copper, gold, and molybdenite and facilitate the recovery of metals outside the Kennecott production inventory. That research brought enhanced recovery of molybdenum, as well as developing technology to recover platinum, palladium, tellurium, selenium, rhenium, and nickel sulfate—all virtually unknown to engineers three decades earlier. In addition, the research laboratory was the impetus for expanding research by Kennecott's four western mining divisions—Utah Copper, Nevada Mines, Ray Mines, and Chino Mines.

In 1954 the National Society of the Sons of Utah Pioneers presented a statue of Colonel Daniel C. Jackling to the State of Utah. The heroic statue, standing nine feet tall, was carved by Dr. Avard Fairbanks, world-famous Utah sculptor, and weighs 2,000 pounds; 86 percent of the bronze casting is copper from the Bingham Mine. It was placed in the rotunda of the Utah State Capitol Building and dedicated on 14 August, Jackling's 85th birthday. The date also marked the 50th anniversary of the first shipment of copper ore to the Copperton mill. Jackling was too ill to attend the ceremonies, but government, business, educational, religious, and civic leaders did. Utah Governor J. Bracken Lee and Nicholas G. Morgan, Sr., president of the National Society of the Sons of Utah Pioneers, paid tribute.95
Bingham Canyon

Jackling died on 14 March 1956 at his home in Woodside, San Mateo County, California. He was 86. The New York Times proclaimed, “Mr. Jackling’s first major accomplishment came . . . in 1896, when his successful experiments on metallurgical processes of low-grade ores were largely responsible for the Consolidated Mercury Gold Mines in Utah. This was followed in a few years by his big copper discovery and its first exploration at Bingham, Utah, where other companies had refused to operate because of the low grades of the ores they encountered.”

Throughout the 1950s, the profile of Bingham Canyon was rapidly changing, with copper mining, processing, and recovery systems constantly updated. The old Carr Fork bridge, built in 1910 and 1911 to connect the rail system from the mine to the Magna and Arthur mills, was targeted for demolition. The bridge was 690 feet high and 190 feet long. It had remained essentially the same since the day of its completion. In its day it was considered an engineering and construction marvel, but it had to be torn down to make way for the expansion of the open-pit mine.

The decade of the 1960s saw even more intense modernization of existing facilities and construction of new ones. Declining ore grades as the Bingham open-pit mine advanced down into the earth drove much of this effort. In its simplest terms, more ore had to be mined and moved to concentrate, smelt, and refine the same amount of copper. In like fashion, more overburden had to be blasted and removed, increasing the stripping ratio, to get at the recoverable copper. The result was a $100 million expansion program, begun in 1963 and designed to increase the Utah Copper Division’s production capacity by 100,000 tons a year. One of the first steps was to start using diesel electric trucks to replace the slower and more cumbersome train hauling the mine waste.

The multimillion-dollar expansion announcement caused considerable concern among employees about whether they would fit into the new operation. Would it require people with new skills? What would happen to people with outdated skills? Would the pay scales stay the same? J. P. O’Keefe, general manager of the Utah Copper Division, addressed those concerns in a statement to employees in the company publication:

New occupations will be created. Further, some of these new occupations will require standards of physical and mental coordination not necessary in many present occupations. For example, the drivers of the big haulage trucks will have to have more than the usual driver’s license; they must be able to pass physical and aptitude tests which demonstrate that the driver will not be a safety hazard to himself and to others.

Another good example is the smelter. When the process changes have been completed, the plant and many of the jobs will be entirely different than now. Just as different, in fact, as if a new smelter had been constructed.

Many other examples could be cited.

However, let me assure you that wherever practical present employees will be trained for the new jobs. This is not the easy way. In fact, this
intention will, by itself, create problems. Fortunately, these problems can be solved, provided we work toward a smooth transition in a spirit of understanding and cooperation. It is impossible in this brief message to deal with specific jobs, but let me again assure you that we will spare no effort to see that you fit into the new Utah Copper Division.98

A major step in the expansion was the opening of a cone precipitate plant at Bingham in 1965. The plant increased the efficiency of leaching solutions, specially treated water pumped over waste dumps and permitted to percolate to the bottom of the heap. The precipitation plant removed the copper from the solution and then recycled the solution. The new plant was designed using cones developed by the Kennecott Research Center at the University of Utah, opening the door for many new approaches to copper recovery.99

The following year the company opened a molybdenite oxide plant, creating a new market for recovering the vital steel-alloying metal, previously bypassed in the copper-production processes. Molybdenum joined the family of gold and silver as important revenue-producing by-products of the Utah Copper Division.

Over the years change came about as necessary and usually without major disruptions in the overall copper environment. But through the 1950s, change accelerated, and as the world’s largest open-pit mine expanded, both downward and outward, something had to give. The town of Bingham was being squeezed out. In 1959 Kennecott made a bid for whatever private property remained in the canyon. By 1971 the once-colorful town of Bingham, the center of commerce for the mining community, had ceased to exist. Today Bingham has been absorbed into the open-pit mine; homes, businesses, and streets are gone, but the legends live on.100

**Last Quarter of the Twentieth Century**

Kennecott’s ore-processing facilities were not immune to change, and the driving force was the necessity to reduce costs. Both the Arthur and Magna mills were hopelessly outdated in spite of continuing redesign and updating. Those facilities had originally been built in the early 1900s, and the escalating costs of maintenance were killing profitability. In 1988 the crushing and grinding operations were discontinued, although flotation facilities remained in limited use. With the construction and expansion of the Copperton concentrator, the old Arthur mill was shut down and demolished. The Magna operation followed with everything now centralized at the modern Copperton concentrator. The old 15-mile rail line from the mine to the Magna and Arthur mills was replaced by a 5-mile ore conveyor from mine to concentrator.

Rapid changes affected not only Utah’s copper production but Kennecott Utah Copper’s infrastructure as well. New environmental regulations dictated nonproductive capital expenditures and increased operating costs. To comply with the Clean Air Act of 1970, Utah Copper Division’s $300 million expansion included new
Bingham Canyon

smelting technology that saw construction of Noranda smelting furnaces in 1977 and a new, 1,200-foot stack at the Garfield smelter in 1978.

In addition to compliance costs, uncertainties surrounding the emerging environmental agenda interfered with long-term planning for the copper operations. Two oil crises and the soaring inflation of the 1970s further exacerbated Kennecott’s problems by escalating copper production costs at an alarming rate. Costs of materials and supplies consumed by the copper operations rose rapidly. In addition, inflation rapidly boosted labor costs as a result of contracts that provided automatic wage increases linked to the consumer price index. By 1980, Kennecott’s copper properties had become high-cost operations.

In addition, 1980 marked the beginning of a worldwide copper recession. The acquisition of Kennecott Copper Corporation by Standard Oil of Ohio (SOHIO) in 1981 was the first step in significant corporate restructuring. Plagued by recessions and difficult labor negotiations, operations at the Bingham Canyon Mine shut down in 1986. Labor negotiations produced new agreements the following year, and all Kennecott Utah Copper operations resumed.

That same year British Petroleum (BP), a London-based firm, took control of SOHIO, making Kennecott a part of BP Minerals America. With new leadership and financing, the company in 1988 announced a new $400 million modernization program under the leadership of a new president, G. Frank Joklik. He had moved up from being head of the new Kennecott Minerals Company’s exploration, technology, and planning section. He was well grounded in exploration and large-project development, both in his native Australia and the United States, but had little experience in operations. Rather than proving a hindrance, however, this situation proved to be a plus. He was not encumbered by the traditional perspectives that had long constrained innovation in Kennecott’s operations. He brought a fresh approach to Salt Lake City as he formulated a new strategic plan for Kennecott’s minerals business.

With new energies and realistic approaches to the economics of operations efficiency, a revitalized Kennecott Utah Copper moved into 1988 with completion of a peripheral tailing-discharge system at the tailings pond near Magna and the opening of modernized facilities at Bingham and Copperton. The new production process included an in-pit crusher and conveying system, and three grinding lines in the Copperton concentrator, increasing production to 85,000 tons per day, some 13 percent above the original design capacity. Utah’s copper industry was becoming even more efficient.

Along with the general overhaul of copper processing with new facilities, new corporate changes occurred. BP had long been anxious to get out of the mineral business and in January 1989 agreed to sell most of its worldwide holdings—BP Minerals America, Kennecott’s parent, included—to Rio Tinto Zinc (RTZ) Corporation, one
of the world’s largest mining enterprises, also based in London. Unlike BP, RTZ’s major business was, and still is, mining. This gave Kennecott a new and solid operational support base, something neither SOHIO nor BP had provided.103

The struggles associated with the 1980 copper recession and frequent corporate ownership changes eliminated most of the internal pressures against major expansions and upgrades. In 1989 RTZ (now Rio Tinto PLC) authorized a $227 million expansion program to increase production by adding a fourth grinding line at the Copperton concentrator, making it one of the world’s largest. Two years later the line was completed ahead of schedule and under budget and increased Kennecott’s annual production capacity to 125,000 tons per day.

“In the early 1990s Kennecott Utah Copper, employing 2,400 people, produced approximately 300,000 tons of copper annually plus significant quantities of molybdenum, silver and gold. In 1993 Kennecott started construction of a new smelter and modernized refinery at the company’s Utah Copper operations at a projected cost of $880 million—the largest private investment ever undertaken in Utah,”104 That project was completed in 1995, making the new copper smelter the largest and cleanest in the world, capturing 99.8 percent of the sulfur contained in the copper concentrates.105

Since 1991 Kennecott Utah Copper has cleaned up more than 25 million tons of waste materials. Most of that waste was generated by mining operations that predated Kennecott’s ownership of the mine. Another 20 million tons of clean material has been returned to the sites. Kennecott has spent more than $350 million on reclamation projects.

Bingham Canyon Today

Modernizing facilities, reducing costs where possible, and, perhaps most importantly, training employees in new skills where required have combined to continually improve the company’s profitability, while at the same time protecting its workforce. In 2003 the International Society of Mine Safety Professionals recognized the Bingham Canyon Mine employees and contractors for working two million man-hours without a lost-time injury.106

Kennecott’s open-pit operation has been a major tourist and visitor attraction for many decades. Utahns, out-of-state visitors, and especially schoolchildren are fascinated by a special overlook area of the open-pit mine and watch the blasting, mining, and loading operations. In 1992 the company completed construction and dedicated the new Bingham Canyon Mine Visitors Center. It opens each spring in April and remains open until October 31, depending on weather conditions. The Visitors Center attracts an average of over 100,000 visitors each year. It was an especially active drawing card during the 2002 Winter Olympics. The minimal entrance fees are the source of major donations to more than 100 Utah-based community charities and nonprofit organizations. These contributions are administered by the
trustees of the Kennecott Utah Copper Charitable Foundation. The foundation has annually donated more than $100,000 to organizations providing assistance to the poor and needy, the disabled, the elderly, youth groups, transplant patients, health and nursing-care organizations, and other important community-based charities.\textsuperscript{107}

Since 1903, Kennecott Utah Copper has been one of the world’s largest mining families. That workforce, which has included grandfathers, fathers, sons, mothers, grandsons, aunts and uncles, brothers and sisters, and cousins, forever changed the way ore is mined and processed. Employees trace family roots to the southern and eastern Europeans, Latin Americans, and Asians who first began making mining history in Utah.

The Bingham Canyon Mine has been the financial resource that has fed more families, educated more people, and contributed more jobs than any other nongovernmental business in Utah. As with any natural-resource industry, the stock of material is not infinite. Nonetheless, Kennecott Utah Copper plans to extend the open-pit operations for as long as economically feasible. Drill tests show copper deposits extend to a depth of 100 feet above sea level or almost a mile deeper than the present pit, and exploration reveals that the recoverable copper deposits can take the open-pit mine about 650 feet deeper than it is now. Current projections are that the open-pit mine can be extended and produce profitably until the year 2028 with other options, including underground incursions, possible after that. Mining in Bingham Canyon still looks forward to a long life.