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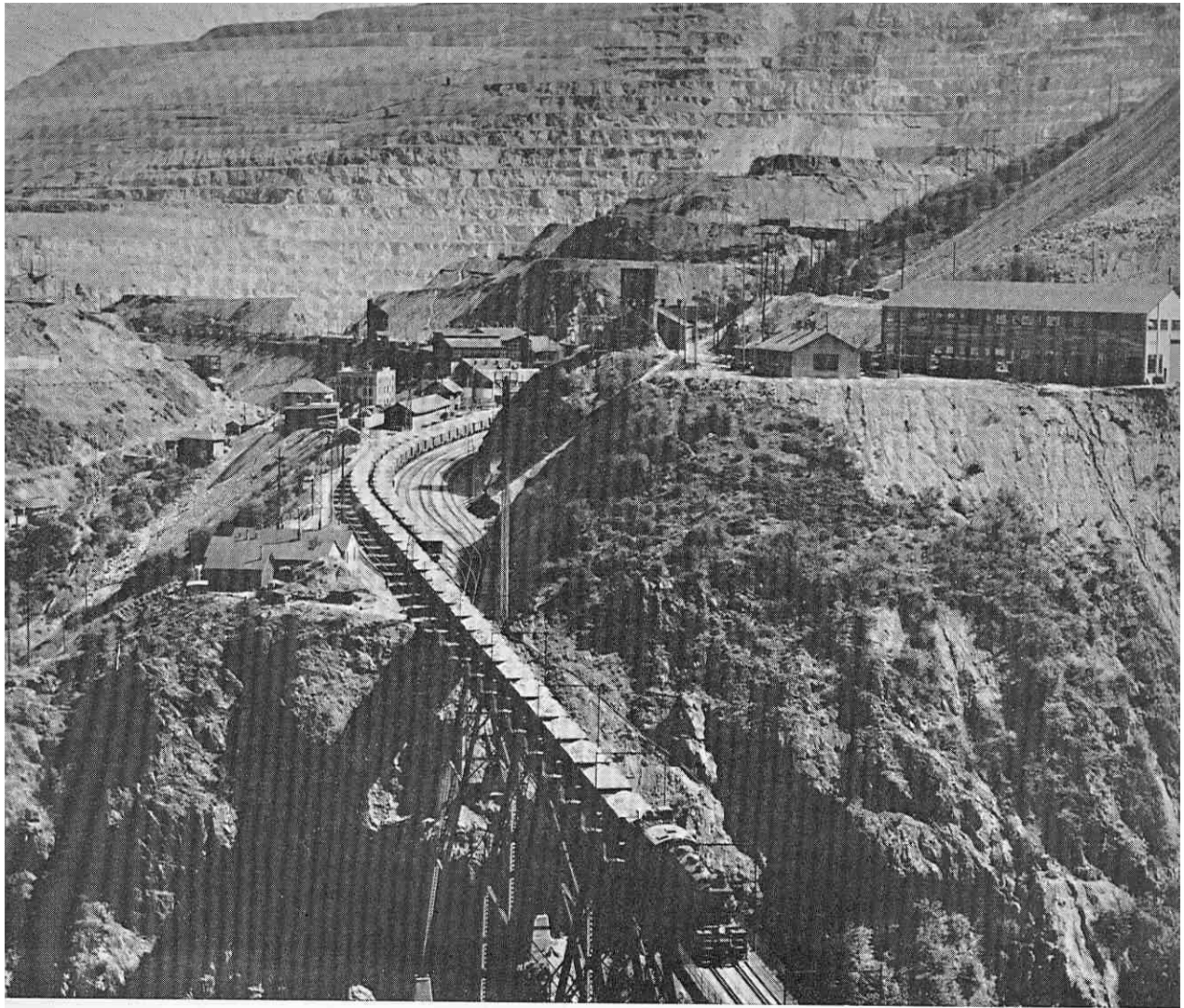
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The Cover

An artist's concept of famous Bingham Canyon about 1915. Prominent in the background is the decade-old Utah Copper Mine. Farther down the canyon are the Wall and Redwing mills and Winnamuck operations. Cogwheel railroads and tramways form part of the scene.

DALE KILBOURNE, ARTIST

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KENNECOTT COPPER CORPORATION

Transporting ore from the Utah Copper Mine in Bingham Canyon.

INDUSTRY OF DESTINY: Copper in Utah

BY GARY B. HANSEN

The presence of copper, the lustrous red metal which would someday become the most important mineral produced in Utah, was evident from early pioneer times. On May 9, 1860, the *Deseret News* carried an article announcing the presence of copper in Utah Territory:

Mr. Hansen received the M.S. degree in economics from Utah State University in June, 1963. This article was prepared under a grant from the Utah State University Research Council and under the direction of Dr. Leonard J. Arrington, professor of economics, Utah State University. Complete documentation and a more detailed presentation of the facts and interpretations in this article are in Gary B. Hansen, "A Business History of the Copper Industry of Utah, 1860-1910" (Master's thesis, Utah State University, 1963).

We have recently been presented with a specimen of virgin copper found in Cedar County, some ten or twelve miles from Camp Floyd, which those well versed in mineralogy, to whom it has been exhibited, pronounce equal to the best they have ever seen.

If it exists in that vicinity, as alleged, in any considerable quantities, it would probably pay well for working, if any felt disposed to engage in such an enterprise, but in these days gold is the principal thing sought after, and a man who would engage in copper mining in an inland country like this, might, by some, be considered in a state of insanity.

Nearly 40 years passed before these prophetic words were invalidated completely.

In 1862, John Lowder, an early Utah pioneer, was reported to have gone into Bingham Canyon to get out "some special kinds of logs" to be used in the making of furniture for Governor Stephen S. Harding.

One day while he and his companions were returning to their camp, they saw what looked to them like copper in a creek bed. They got some out and the next morning decided to look for signs of copper ore which they found on the side of the mountain. When their job was finished they returned to Salt Lake City and turned the samples over to an assayer who was supposed to test it.

Unfortunately, Lowder was never able to capitalize on his discovery. A short time later, he was called by Brigham Young to be a Pony Express rider between Salt Lake City and San Bernardino, California. By the time he returned the ground had already been filed upon.¹

The next mention of copper awaited the arrival of Colonel Patrick E. Connor and the California Volunteers in October, 1862. Among the first discoveries made by Connor and his men, as they prospected the surrounding mountains, were several deposits of copper. In a communication to higher headquarters at San Francisco shortly after the initial discoveries, Connor announced:

Already reliable reports reach me of the discovery of rich gold, silver, and copper mines in almost every direction Within a distance of from twenty-five to fifty miles of this city [Salt Lake City], in the East and West mountains, mines have been discovered yielding, with imperfect tests, rich indications of silver, and largely charged with lead and copper ores.²

Nevertheless, the departure of the Volunteers at the close of the Civil War left the Utah mineral prospects relatively untouched. It was in June, 1868, just prior to the completion of the transcontinental railroad, that the first carload of copper ore from Bingham Canyon was hauled to Uintah, Weber County, by the Walker Brothers and shipped to Baltimore.³ A second shipment containing

¹ Kate B. Carter, ed., *Treasures of Pioneer History* (6 vols., Salt Lake City, 1952), I, 164.

² *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (Washington, D.C., 1897), Series I, Vol. L, Part II, p. 657.

³ Hubert Howe Bancroft, *History of Utah, 1540-1886* (San Francisco, 1889), 741.

10 tons of copper ore mined from the Kingston Mine at Bingham Canyon was shipped out of the territory on July 31, 1869, by the Woodhull Brothers.

In 1870, copper was discovered in the Lucin District, in western Box Elder County on the Utah-Nevada border. At Copper Hill native copper, in large lumps, was found on the surface of the ground.⁴ When galena was found in considerable quantities a short time later, copper mining was neglected until 1886. The copper properties — the most important being the Copper Mountain Mine — were worked from 1886 to 1893, at which time they were sold to the Salt Lake Copper Company. This company built a copper smelter north of Salt Lake City in 1893 at a cost of \$600,000. The smelter operated for a short time but was not profitable. The mining properties were later purchased by the Lewisohn Brothers of New York City (organizers of the United Metals Selling Company), and were operated by them for a number of years. It is estimated that 1,675,200 pounds of copper were produced in the Lucin District from 1870 to 1905, with a total value of \$237,835. Peak production was reached between 1906–13 with output of 12,027,418 pounds of copper valued at \$1,767,346.⁵

Contemporary with the discovery of ore at Lucin, copper was discovered in the Tintic District in Juab County. In 1870, the Mammoth and Crismon-Mammoth mines were discovered and worked intermittently for a number of years. They were both important early copper producers, with considerable quantities of ore being mined and shipped to smelters as far away as England.⁶

In the northwest corner of Beaver County, the Beaver Lake District was organized in August, 1871, after the discovery of a belt of copper veins said to have been from an inch to two feet in width. According to a government investigator, "some work was done in 1872 and 1873, and a few tons of ore were shipped assaying 30 percent copper, 17 ounces silver, and \$12 gold."⁷ In 1873, the Riverside Smelter was built seven miles north of Milford to work the copper ores from the district. After producing a few tons of copper matte and some lead bullion, it was shut down and abandoned.⁸ In the nearby Rocky District, organized in 1872, some copper ore was mined and shipped prior to 1880. Taken together, the Beaver Lake and Rocky districts produced 931,000 pounds of copper between 1870 and 1902.⁹

⁴ Edward L. Sloan, ed., *Gazeteer of Utah and Salt Lake City Directory* (Salt Lake City, 1874), 135.

⁵ B. S. Butler, G. F. Loughlin, V. C. Heikes, and Others, *The Ore Deposits of Utah* (Washington, D.C., 1920), 489; *Deseret News* (Salt Lake City), December 17, 1904.

⁶ D. B. Huntley, "The Mining Industries of Utah," in S. F. Emmons and G. F. Becker, *Statistics and Technology of the Precious Metals* (Washington, D.C., 1885), 456–57.

⁷ *Ibid.*, 474.

⁸ Copper matte is a crude mixture of sulphides formed in smelting sulphide copper ores that contain about 40 per cent copper.

⁹ Huntley, "Mining Industries," *Precious Metals*, 474; Butler *et al.*, *Ore Deposits of Utah*, 505.

Copper was also discovered in the San Francisco and Pruis districts of Beaver County during the 1870's. Several claims were worked during the decade, primarily those located in Copper Gulch, although their output was insignificant prior to 1880. The most important claims of the group were the Comet, Cactus, and Copper Chief. It was not until 1896 that serious and productive copper-mining activity commenced in these districts.¹⁰

Several early copper deposits were located in Washington County and northern Arizona in the 1870's.¹¹ As early as 1874, prospectors had known that the West Mountain Range, about 10 miles west of St. George, was rich in copper. No serious attempt was made until the mid-1880's, however, to develop the prospect. Several St. George residents worked the mine (known as the Apex or Dixie) between 1884 and 1888. During that time they were reported to have shipped 300 tons of copper ore out of the district.¹²

Between 1889 and 1891, the owners of the Dixie Mine are said to have received \$300,000 for ore and bullion shipped to Swansea in Wales, and Denver, Colorado. In 1891, they erected a small smelter at St. George and produced bar copper. For over three years, considerable numbers of wagon teams with bullion from their smelter were consigned to the railroad at Milford, 154 miles distant. From 1894 to 1899, the smelter remained inactive, whereupon it was reactivated and produced 8 to 20 tons of blister copper per month. Copper production for the district prior to 1887 amounted to 300,000 pounds with a value of \$41,400. From 1890 to 1894, production amounted to 1,784,065 pounds, valued at \$209,606.¹³

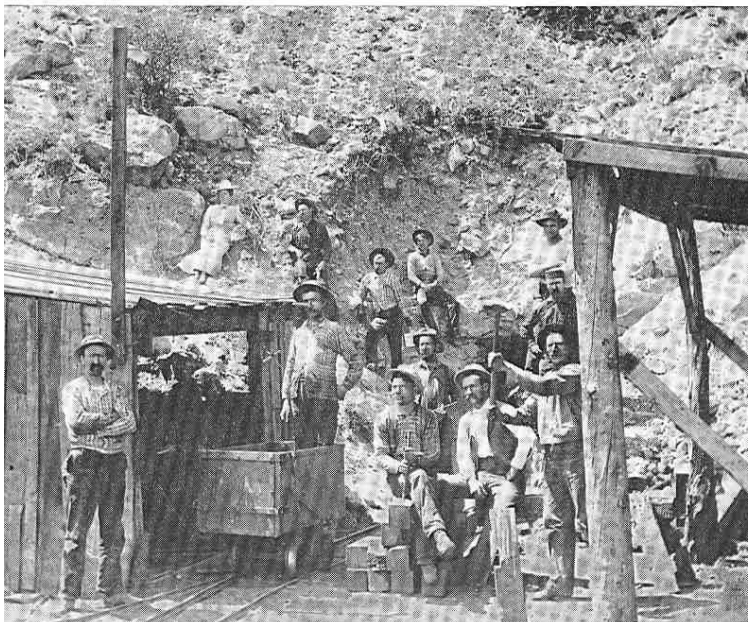
¹⁰ Huntley, "Mining Industries," *Precious Metals*, 471.

¹¹ R. W. Raymond reported that in 1875 a mine known as the Grand Gulch copper mine, located 40 miles south of St. George and 15 miles north of the Colorado River in Arizona, was being worked by St. George residents. In 1875, they erected a copper furnace near St. George on the Virgin River for the treatment of copper ore from the mines. However, it was abandoned shortly after completion. The mine was later reported as having been leased to men from Salt Lake City in 1877. These individuals produced 10 tons of copper bullion in a shaft furnace. R. W. Raymond, *Statistics of Mines and Mining in the States and Territories West of the Rocky Mountains for 1875* (Washington, D.C., 1887), 281; Huntley, "Mining Industries," *Precious Metals*, 483.

¹² The original owners include John Pymm, James Andrus, Thomas Judd, William Lund, S. L. Adams, and other residents of St. George. *Engineering and Mining Journal*, LI (1891), 361 (hereafter referred to as E.M.J.); Butler *et al.*, *Ore Deposits of Utah*, 596.

¹³ *Ibid.*

ORPHA MORRIS



The Apex or Dixie Mine, near St. George, Utah.

In Millard County the Drum Mining District was organized in the fall of 1872. It was abandoned shortly thereafter and was later reorganized as the Detroit District in 1879. Some copper was mined during the 1880's, and a small smelter constructed at Abraham in 1888 produced 130,000 pounds of copper bullion which was said to have been the largest quantity of copper bars produced in Utah up to that time. Subsequently, the smelter was destroyed by fire.¹⁴

In Bingham Canyon several copper mines were in operation prior to 1880; chief among the claims were the What Cheer, Hickman, Murphy, Kingston, and Washington. (One of the first shipments of copper ore, mentioned earlier, came from the Kingston.) According to Huntley, who visited the district in 1880, all of these mines were "small veins in quartzite, from 3 inches to 4 feet wide containing azurite and malachite at the surface, and sulphides of copper and iron at the water line. Traces of silver and gold are also found."¹⁵

Aside from the several mines previously noted, and perhaps a few others, most of the copper produced during the decades of the seventies and eighties came as a by-product of the lead-silver ores then being mined. From 1870 to 1880, production of copper never exceeded a million pounds annually.

After remaining low for several years, the price of copper advanced slightly in 1887 and enabled many of the producers to resume activity at their mines. At the Mammoth Mine in the Tintic District the output increased to about 300 tons of copper ore per month, valued at \$60 per ton. This ore, as it had in the past, was shipped to the Argo Smelting Works in Denver, where it was used as a medium for the recovery of gold and silver. Other Utah producers resumed shipments to the Salt Lake smelters.¹⁶

The market for copper remained high until 1889, when the collapse of the French copper syndicate caused a decline in the price of copper from 16 $\frac{3}{8}$ cents to 10 $\frac{1}{2}$ cents per pound.¹⁷ The industry struggled along until 1893, when the national financial crisis led to a reduction in the price of silver and lead as well. As a result, all of the nonferrous mines in the West were hard hit, including the Utah copper producers. From 1893 to 1896, there was only minimum activity in the Utah copper mines — an interlude before the beginning of a new era.

THE BEGINNING OF SULPHIDE COPPER PRODUCTION

In addition to the rising demand for copper due to its use in the burgeoning electrical industry, the abrupt rise in the production of copper in the late 1890's

¹⁴ *Ibid.*, 463-64.

¹⁵ Huntley, "Mineral Industries," *Precious Metals*, 419.

¹⁶ U.S., Department of the Interior, Geological Survey, *Mineral Resources of the United States* (Washington, D.C., 1883-1934), 68-69. This publication is hereafter referred to as *Mineral Resources*, with the year.

¹⁷ F. E. Richter, "The Copper Mining Industry in the United States, 1845-1925," *Quarterly Journal of Economics*, XLI (1926), 257-58.

was directly related to the decline in the production of lead and silver. Production of lead and silver in Utah in 1894 was only half what it had been in 1890. In the West Mountain District, the total value of minerals produced fell from \$2,097,005 in 1890 to \$1,133,242 in 1894.¹⁸

It was evident to mineowners that alternative methods for obtaining profits from the mines would have to be developed if the industry were to survive. One such alternative was gold. In the late 1870's and again in the 1880's, following the temporary exhaustion of known lead-carbonate bodies of ore, special attention had been directed periodically toward the recovery of gold from ores in the West Mountain District. By the close of 1882, four stamp mills had been erected for operation on ores from the Stewart and Old Jordan mines. Although a little gold was recovered, most of these efforts ended in failure.¹⁹

By the mid-1890's, with the development of the cyanide process, it was hoped that a renewal of the gold-mining activity might have a better chance of success. One such attempt at gold mining, that made by Samuel Newhouse and Thomas Weir, propelled copper mining and smelting into a position of immediate importance in Utah and the nation. It also attracted the attention of William Rockefeller and a group of Standard Oil investors, and of the Guggenheims. Ultimately, it led to the establishment of four Salt Lake Valley smelters, which came to be controlled by three giant corporations or "trusts" — the American Smelting and Refining Company; the United States Smelting, Refining and Mining Company; and the International Smelting and Refining Company. These firms and their backers exerted a controlling influence on the developing copper industry of Utah.

In January, 1896, Thomas Weir, a highly respected mine operator in Leadville, Colorado, and Butte, Montana, went to Salt Lake City to investigate the prospects of the gold-mining activity then under way at Bingham Canyon. Joining Samuel Newhouse (son of European Jewish immigrants) who had gone to Colorado and later to Utah to seek his fortune, Weir set about gathering mining properties. By October, 1896, he had secured bonds from the owners of a group of 10 claims in Bingham Canyon, embracing 75 acres of patented ground in Carr Fork, for the sum of \$200,000. The most important claims in the group

¹⁸ Butler *et al.*, *Ore Deposits of Utah*, 345.

¹⁹ John M. Boutwell, *Economic Geology of the Bingham Mining District, Utah* (Washington, D.C., 1905), 84.

UTAH STATE HISTORICAL SOCIETY



Thomas Weir
(1855-?)

Samuel Newhouse
(1853-1930)

UTAH STATE HISTORICAL SOCIETY



were the Highland Boy, Henry M., and Omaha.²⁰ These properties were held in the name of the Highland Boy Gold Mining Company. A subsequent promotional trip to London by Newhouse was successful in enlisting English capital in the venture. Thus, in October, 1896, the Utah Consolidated Gold Mines, Limited, a British company, was organized in London with a nominal capital stock of 300,000 pounds sterling. Samuel Newhouse was elected president and Thomas Weir general manager of the new company.²¹

The initial object of the company was to apply the newly developed methods to extract gold from the siliceous ores at the Highland Boy Mine, which was originally said to contain about 50,000 tons of "low-grade rock," with an average value of \$10 in gold and \$1.50 in silver. Development work on the property got under way in November, 1896, under the direction of Thomas Weir. In order to process the ore, a contract was signed in May, 1897, for the construction of a cyanide mill, of 100-tons per day capacity.²²

Three days after letting the contract for the mill, an event occurred which eventually revolutionized the entire Bingham mining camp. Working in Highland Boy Tunnel No. 4, the miners discovered an ore channel carrying \$3.00 in gold (per ton), 2.5 ounces in silver, and 6 per cent copper. As the work of exploration continued, on May 26, the face of No. 5 tunnel broke into an ore zone which showed 25 per cent copper, and \$2.40 in gold per ton. This was said to be "over threefold higher in copper than anticipated."²³ Thus, three months before the cyanide mill to treat gold ores was completed, it became apparent that the "profit paying" copper ore in the sulphide zone below the zone of oxidation would be far more important than the gold ore above.²⁴ Shipments of copper ore were commenced in mid-1897, and during the remainder of the year the company shipped 2,100 tons of copper ore to the Salt Lake market.

The most important question confronting Newhouse and Weir after the discovery of the copper sulphide ore deposits was whether the costs of mining and smelting these low-grade ores could be lowered to such a point that they could be worked at a profit. After investigation of smelters in Montana, the partners placed in operation on May 23, 1899, the first smelter erected in Utah primarily for the reduction of copper ores.²⁵ The site selected for the new smelter consisted of 56 acres of land at Murray, eight miles south of Salt Lake City. It

²⁰ *Salt Lake Tribune*, October 6, 1896, May 7, 1899; *E.M.J.*, LXII (1896), 374.

²¹ *Tribune*, August 6, 1908; Horace J. Stevens, ed., *The Copper Handbook*, 1910-1911 (Houghton, Michigan, 1912-1931), X, 1746-47.

²² *Tribune*, January 1, 1898; *E.M.J.*, LXI (1896), 538; LXII (1896), 374, 665.

²³ *Ibid.*, LXI (1896), 582; LXIII (1897), 522.

²⁴ *Tribune*, January 1, 1898; *E.M.J.*, LXIV (1897), 258, 588, 665.

²⁵ *Ibid.*, LXVI (1898), 48, 439, 528; *The Mineral Industry, Its Statistics, Technology and Trade: Calendar Year 1900* (New York, 1901), 165. This publication is hereafter referred to as *Mineral Industry*, with the year.

was located a short distance from the Jordan River, about a mile southwest of the Germania Smelter.

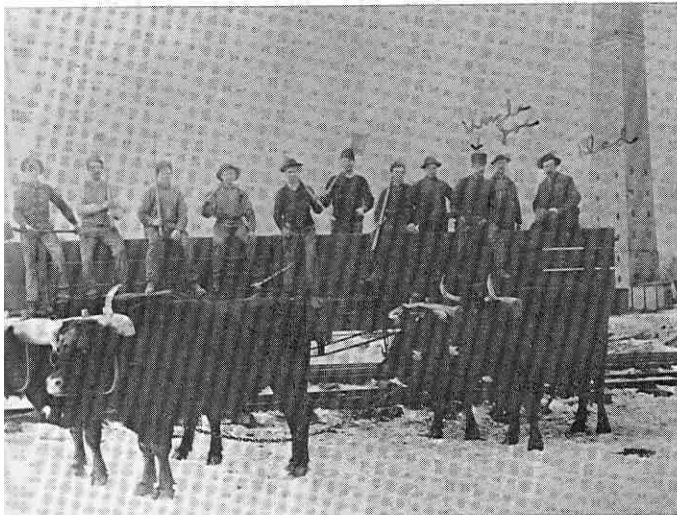
Shortly after construction on the smelter commenced, the partners decided to build a lead-smelting addition of 300-tons per day capacity, which would also be completed at the same time the copper furnaces were ready. In order to save the oxide ores from the upper portion of the mine for later use by the new copper smelter, the cyanide mill at Bingham was closed down, after having crushed and treated 20,000 tons of ore.²⁶ In the meantime, the company continued to make shipments of ore from its mines to the Germania custom smelter. The ore averaged 12.09 per cent copper, 2.78 ounces silver, and \$4.22 in gold values per ton. By the end of 1898, five tunnels were being worked on the Highland Boy property. Continuing its policy of acquisition, the company also purchased additional claims, giving it a total of 235 acres of mineral land located in Bingham Canyon.²⁷

In the spring of 1899, about the time final preparations were getting underway to begin smelter operations, the enterprise came under the covetous eye of the Standard Oil Company syndicate, headed by William Rockefeller and Henry H. Rogers. Wanting to expand their empire into mining, Standard Oil investors began buying Utah Consolidated stock. They first obtained 100,000 shares in late February, 1899, for a total cost of \$3.25 million, but continued buying on the open market, seeking to gain control. At first Samuel Newhouse remained silent over the attempted takeover, but he soon sweetened to the overtures. On May 7, 1899, just two weeks before the company's Highland Boy Smelter was completed, the control of the company passed into the hands of the Rockefeller syndicate, in a \$12-million transaction. The largest block of stock

was purchased by Rogers. Samuel Newhouse was said to have made \$3 million on the sale. The new owners replaced Weir with R. H. Canning as general manager. Urban H. Broughton, a son-in-law of Rogers who had been acting as consulting engineer

²⁶ *E.M.J.*, LXVI (1898), 648.

²⁷ *Tribune*, January 1, March 5, 1899.



JOSEPH C. CAHOON

Switching trains with two yoke of oxen about 1890, at Germania Smelter, built in 1872 in Murray.

for the syndicate during the negotiations, was added to the board of directors and later elected president.²⁸

The new smelter was an immediate success. The pig copper (a crude casting of copper run directly from the smelting furnace convenient for storage and transport) produced in the initial runs was claimed to contain \$60 in gold and 40 ounces of silver per ton. A little later all three reverberatory furnaces and two copper converters, with a capacity of 250 tons per day, were operating at maximum output, producing close to 1 million pounds of copper a month. Operations were considered so successful that plans were immediately drawn up to enlarge the plant and double its volume. This was accomplished in the ensuing months at a cost of \$178,000. The smelter capacity was boosted to 500 tons per day.²⁹

Production from the new smelter during the first year of operation amounted to 6,497,205 pounds of fine copper, 93,221 ounces of silver, and 8,254 ounces of gold. The company was happy to announce a net profit of \$661,627 for the 15-month period of operations from April 1, 1899, to June 30, 1900.³⁰

During ensuing years the production of ores from the Highland Boy Mine continued to increase, giving Utah Consolidated Gold Mines, Limited, the distinction of being the only major copper producer in Utah (there were, of course, larger companies operating in Montana and Michigan). Its engineering and monetary success gave the company a national and international reputation and made its stock a much sought-after investment. Ore reserves were continually being increased by exploration and development work at the Highland Boy Mine, and plans were drawn up in 1903 to increase the capacity of the company's smelter by 40 per cent. At the same time, the board of directors authorized the transfer of the company headquarters from London to New York. (By moving company headquarters to the United States, the company could avoid the English tax of five per cent on corporation dividends, amounting to about \$35,000 a year.) This action resulted in the disorganization of the British corporation and the formation of the Utah Consolidated Mining Company, a New Jersey corporation, with a nominal capitalization of \$1.5 million. Utah Consolidated Mining Company was a holding company — a corporation organized to hold shares of stock in one or more other corporations — owning 2,490 shares of the Highland Boy Gold Mining Company of New Jersey, which in turn held direct title to the Utah properties.³¹

²⁸ *Ibid.*, March 4, May 7, 1899.

²⁹ *Mineral Industry, 1900*, p. 165; *Mineral Resources, 1898-99*, pp. 159-220; 1899-1900, pp. 163-223.

³⁰ *Ibid.*

³¹ Stevens, *Copper Handbook*, 1910-11, pp. 1746-47. While the Newhouse-Weir concern was the most significant of the copper innovators in Utah in the 1890's, there were others. The Bingham Copper Mining Company, incorporated in 1895 with a nominal capitalization of \$200,000, developed copper claims

THE AMERICAN SMELTING AND REFINING COMPANY

On April 4, 1899, a month before the transfer of ownership of the Utah Consolidated to "the Standard Oil crowd," the latter had formed a "mammoth smelter trust" under the name of the American Smelting and Refining Company, often referred to as ASARCO. Under the leadership of Henry H. Rogers and Leonard Lewisohn, the trust's purpose was to own and manage the properties of "all principal [lead] smelting works in the United States with the exception of the Guggenheims." The trust was seeking to restore order, stability, and profitability to an industry that had been plagued during the 1890's by an overcapacity resulting from numerous smelters throughout the country competing with each other for a limited supply of ores. It may also have been seeking profits from the promotion of the gigantic enterprise.

The combine had commenced the acquisition of various nonferrous smelters throughout the nation in 1897, and at the time of Rogers' purchase of a controlling interest in the Utah Consolidated properties in the spring of 1899, ASARCO had achieved its basic objective. Included among the "seventeen corporations and one partnership" were the Germania, Mingo, and Hanauer smelters in the Salt Lake Valley, and the Ibex Smelter located at Leamington, Utah. The three Salt Lake smelters had been the most important in the state, accounting for 60 per cent of the state's production of copper bullion and matte in 1898.³²

Once ASARCO was organized its promoters and managers began a systematic program of shutting down plants to eliminate the "topheavy" condition of the company. By consolidating production in fewer plants, the company hoped to reduce smelter charges and cut costs. And while its officials did not say so, it was clear that consolidation would improve profitability by diminishing competition and strengthening monopolistic powers. In Utah the combine closed down the Hanauer and Mingo smelters in April, 1899, shortly after acquisition. The Ibex Smelter was idle at the time of purchase and was never reopened. Of the many lead smelters which had been built in Utah, only the Germania remained in operation at the beginning of 1900.³³ In 1902, even the Germania was closed when ASARCO completed a new \$1 million lead-silver smelter at Murray.³⁴

in the main Bingham gulch, just east of the town. The two claims owned by the company, the Starlus and Alameda, exposed copper veins averaging from 8.5 to 10.5 per cent copper, with some gold and silver. The property was worked modestly until 1897 when operations were suspended for lack of money. In 1898, with Chicago capital backing the enterprise, operations were resumed, and some 15 men were employed to tap some of the springs carrying copper in solution. (The experiment of precipitating copper had been tried for several years, by running water containing copper over scrap iron.) For a period of time the company used as much as 50 tons of iron per week and a carload of salt daily. Operations were continued for some time on a reduced scale, but eventually ended in failure.

³² Isaac F. Marcossou, *Metal Magic: The Story of the American Smelting and Refining Company* (New York, 1949), 57-69; *Tribune*, January 1, 1899.

³³ *Ibid.*, April 16, 20, 1899.

³⁴ Boutwell, *Bingham District*, 383-84; Marcossou, *Metal Magic*, 74.

By constructing the new plant, ASARCO was now in a position to become the dominant, if not the only, custom smelter in the state. The stage was set for a merciless struggle which eventually led to the weeding out and consolidation of the entire nonferrous mining and smelting industry in Salt Lake and Tooele counties into three gigantic combines: American Smelting and Refining Company; United States Smelting, Refining and Mining Company; and International Smelting and Refining Company.

Although he was no longer attached to the Utah Consolidated Mining Company after its sale to Standard Oil interests in 1899, Samuel Newhouse had by then earned the title of "Father of Copper Mining in Utah."³⁵ He was responsible, more than anyone else, for the events which had occurred at the beginning of the copper era in Bingham. He had "set the pace" in demonstrating that the coppers of Bingham could be mined on an extensive scale and made to pay dividends. For once the extent of the Highland Boy discoveries became known, the search for copper at Bingham proceeded apace. Not all of these efforts, of course, met with success — at least immediately.³⁶

The first of the related attempts to duplicate the success of Samuel Newhouse, Thomas Weir, and the Highland Boy resulted in the creation of the Bingham Copper and Gold Mining Company. In 1895, the Commercial Mine, which had previously been worked for its carbonate and oxidized ores, came under the ownership of the Bingham Gold Mining Company. This company sought to extract and treat the oxidized gold ore by a cyanide process, much as had been done by Utah Consolidated; but these efforts were unsuccessful, and the property remained idle for several years.

When a discovery of high-grade copper-silver-gold ore was made in one of the tunnels in November, 1898, the property took on a new look. To finance the extensive exploration and development of the mine, the principal owner of the company, William Bailey (sometimes Bayly), of Los Angeles, sold the property to an eastern group, which reorganized the company as the Bingham Copper and Gold Mining Company. Incorporated in New Jersey, with a nominal capital of \$2 million in 200,000 shares of \$10 par, the new company included the Commercial, Commercial No. 2, Venard Tunnel, and the Old Hickory mines. The principal new owners were Joseph A. Coram, Orington E. Weller, and Henry H. Boyce, all from Massachusetts and New York.³⁷

During 1899, the company made extensive developments on its property. Discoveries gave encouragement to the company and in October they decided to construct a three-stack semipyrritic smelter of 250-tons capacity to treat

³⁵ *Deseret News*, December 19, 1903.

³⁶ *Tribune*, January 1, 1897.

³⁷ *Ibid.*, November 18, 1898, January 11, 1899; Boutwell, *Bingham District*, 254.

By constructing the new plant, ASARCO was now in a position to become the dominant, if not the only, custom smelter in the state. The stage was set for a merciless struggle which eventually led to the weeding out and consolidation of the entire nonferrous mining and smelting industry in Salt Lake and Tooele counties into three gigantic combines: American Smelting and Refining Company; United States Smelting, Refining and Mining Company; and International Smelting and Refining Company.

Although he was no longer attached to the Utah Consolidated Mining Company after its sale to Standard Oil interests in 1899, Samuel Newhouse had by then earned the title of "Father of Copper Mining in Utah."³⁵ He was responsible, more than anyone else, for the events which had occurred at the beginning of the copper era in Bingham. He had "set the pace" in demonstrating that the coppers of Bingham could be mined on an extensive scale and made to pay dividends. For once the extent of the Highland Boy discoveries became known, the search for copper at Bingham proceeded apace. Not all of these efforts, of course, met with success — at least immediately.³⁶

The first of the related attempts to duplicate the success of Samuel Newhouse, Thomas Weir, and the Highland Boy resulted in the creation of the Bingham Copper and Gold Mining Company. In 1895, the Commercial Mine, which had previously been worked for its carbonate and oxidized ores, came under the ownership of the Bingham Gold Mining Company. This company sought to extract and treat the oxidized gold ore by a cyanide process, much as had been done by Utah Consolidated; but these efforts were unsuccessful, and the property remained idle for several years.

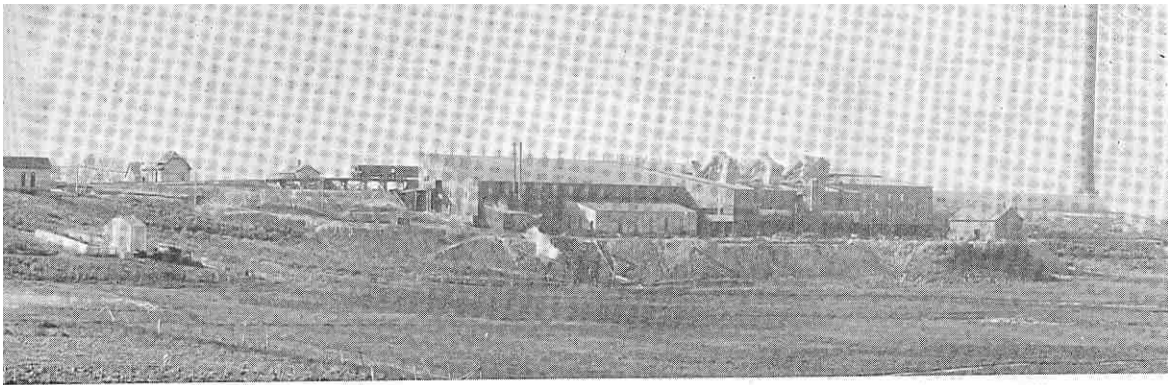
When a discovery of high-grade copper-silver-gold ore was made in one of the tunnels in November, 1898, the property took on a new look. To finance the extensive exploration and development of the mine, the principal owner of the company, William Bailey (sometimes Bayly), of Los Angeles, sold the property to an eastern group, which reorganized the company as the Bingham Copper and Gold Mining Company. Incorporated in New Jersey, with a nominal capital of \$2 million in 200,000 shares of \$10 par, the new company included the Commercial, Commercial No. 2, Venard Tunnel, and the Old Hickory mines. The principal new owners were Joseph A. Coram, Orington E. Weller, and Henry H. Boyce, all from Massachusetts and New York.³⁷

During 1899, the company made extensive developments on its property. Discoveries gave encouragement to the company and in October they decided to construct a three-stack semipyrritic smelter of 250-tons capacity to treat

³⁵ *Deseret News*, December 19, 1903.

³⁶ *Tribune*, January 1, 1897.

³⁷ *Ibid.*, November 18, 1898, January 11, 1899; Boutwell, *Bingham District*, 254.



UNITED STATES SMELTING, REFINING AND MINING COMPANY

Bingham Copper and Gold Mining Company in the early 1900's in Midvale, Utah.

the ore. This smelter, located at Midvale and completed in January, 1901, was essentially a duplication of the Utah Consolidated plant.³⁸ The ore was transmitted from mine to smelter by way of a steep, narrow-gauge railway called the Copper Belt Railroad, organized in 1900.³⁹

With bright prospects for the future, Bingham Copper began to look about for likely properties which could be purchased to provide additional copper and siliceous fluxing ores for the smelter. In April, 1901, the company purchased the Dalton and Lark property at Bingham from Philo T. Farnsworth and Willard Snyder for the sum of \$1.25 million.

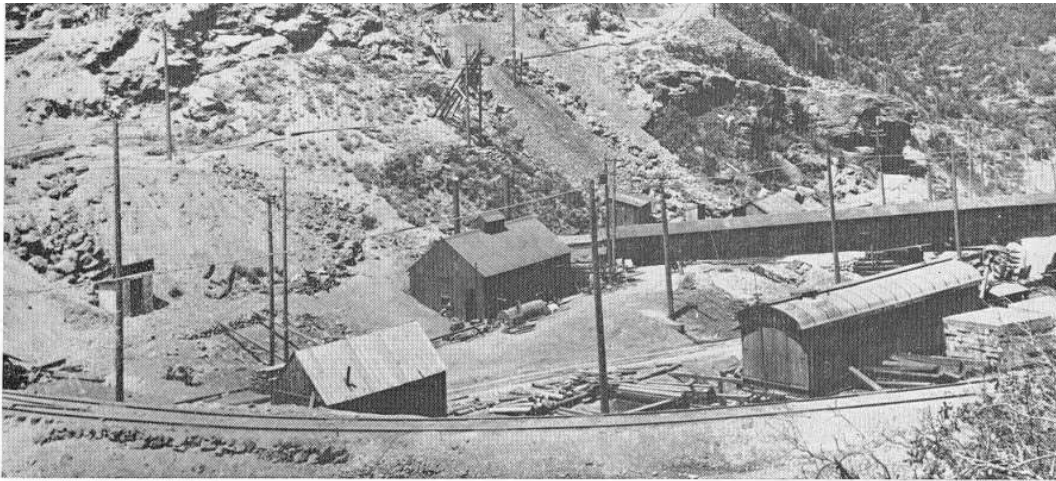
To finance the purchase the Bingham Copper and Gold Mining Company was reorganized as the Bingham Consolidated Mining & Smelting Company. Incorporated under the laws of Maine on April 24, 1901, the new company had a nominal capitalization of \$10 million, with shares at \$50 par. Edward L. White was elected president, W. S. McCornick was elected vice-president, and Duncan McVichie was appointed managing director.⁴⁰

The job of dewatering the Dalton and Lark properties got underway immediately. (By the late 1890's the mine was relatively inactive because of the presence of water in the lower levels.) Both the Brooklyn and Dalton and Lark shafts were deepened, and work commenced on an 8,000-foot drainage and ore-haulage tunnel (with a portal at Lark), called the Mascotte Tunnel. By the spring of 1902, the Dalton and Lark Railroad was completed to connect the tunnel outlet and the mines with the Rio Grande Western, over whose rails the ore could be hauled to the smelter at Midvale. With the completion of the convertor installation in May, 1902, the company was able to produce copper at the rate of 700,000 pounds per month, making it the third largest copper producer in the state (after the Utah Consolidated and United States Mining companies). The operations of Bingham Consolidated were further expanded in

³⁸ *E.M.J.*, LXVIII (1899), 79, 499, 529; *Tribune*, January 30, 1901.

³⁹ L. H. Beeson, "The Copper Belt Railroad of Bingham," *The Mining Review* (February 15, 1905), 17-18.

⁴⁰ Stevens, *Copper Handbook*, 1909, p. 370; *Tribune*, January 1, 1898, April 24, 1901; *Deseret News*, December 23, 1899, December 15, 1900.



KENNECOTT COPPER CORPORATION

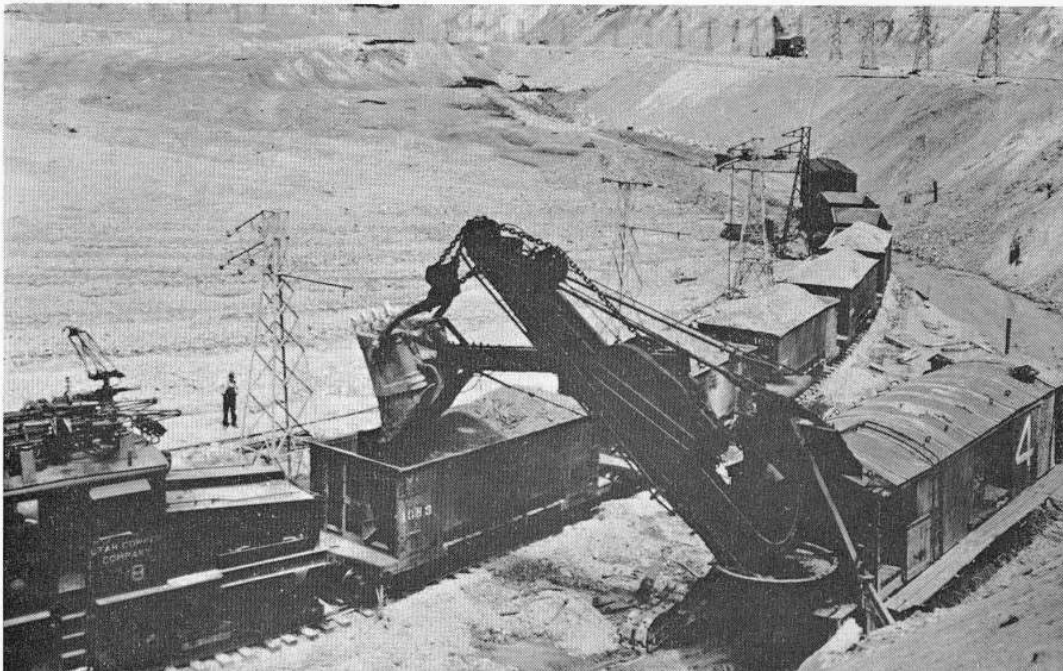
Utah Copper Mine, Bingham Canyon, 1904, before the present day levels were cut.

from 1903 to 1909; and the Utah-Apex Mining Company. Several smaller Bingham companies — the Bingham Central Mining Company, Bingham Standard Copper Company, and Bingham Metals Company — formed the Utah Metal Mining Company in 1909, with important properties in the Carr Fork area of Bingham. In 1914, this company acquired control of the Bingham-New Haven Copper & Gold Mining Company, a small but prosperous copper producer.

In addition to the Bingham area, considerable copper was mined in the Tintic District, Juab County; the San Francisco, Beaver Lake, and Star districts of Beaver County; the Tutsagubet District of Washington County; and the Little Cottonwood, Camp Floyd, and Park City districts of northern Utah. In most of these the copper output was an adjunct to lead-silver operations. The majority of the small companies lacked the capital to develop economically their claims, owned relatively unimportant ore deposits, or suffered from excessive and capri-

Ore from the open pit mine in Bingham being loaded into the company owned rail cars to be transported to the mills at Magna and Arthur.

KENNECOTT COPPER CORPORATION



cious fluctuations in the market price of copper. One by one, they died or were absorbed by the larger, more aggressive firms. The ores of all of them were essentially exhausted by the 1940's.⁴⁶

The production of copper in Utah during the sulphide period was as follows:

COPPER PRODUCTION IN UTAH, 1870-1905

(Source: Butler *et al.*, *Ore Deposits of Utah*. The last column is from University of Utah, Bureau of Economic and Business Research, *A Statistical Review of Utah's Economy* (Salt Lake City, 1960). Figures for 1904 and 1905 include some production from Utah Copper's porphyry mine at Bingham, but this production did not average more than 5 million pounds for either year.)

Year	Copper Produced in Pounds	Value	Per cent of U.S. Copper Production
1870-1885	7,479,284	\$ 1,623,190	1.1
1886-1895	18,344,708	3,326,138	0.8
1896	3,502,012	378,217	0.8
1897	3,919,010	470,281	0.8
1898	3,740,000	465,000	0.7
1899	9,584,746	1,638,991	1.7
1900	18,354,726	3,946,885	3.0
1901	20,116,979	3,359,535	3.3
1902	23,939,901	2,920,668	3.6
1903	32,847,656	4,542,831	4.7
1904	46,417,324	5,802,154	5.7
1905	57,298,054	8,938,496	6.4
Total	245,554,310	\$36,512,386	2.2

THE SMELTER SMOKE SUIT

By the early summer of 1904, the Salt Lake Valley was the home of three large copper smelters, all located between Murray and Midvale. These were the properties of Utah Consolidated Mining Company, Bingham Consolidated Mining and Smelting Company, and United States Mining Company. There was also the lead smelter of the American Smelting and Refining Company. Surrounding the smelters were the prosperous farms and homes of the local inhabitants. Their crops were green and growing from the spring rains and supplemental irrigation, and the animals grazed contentedly in the pastures near the Jordan River. Occasionally, smoke from the busy smelters was blown overhead, and some fly ash dropped on the trees and shrubs. A casual observer would have enjoyed the tranquil picture — a perfect balance between farm and factory.

The situation was not quite so peaceful as one might have supposed. In June, 1904, after a rainstorm accompanied by winds, the farmers living in the neighborhood of the smelters noticed that their crops were turning yellow,

⁴⁶ Fuller treatment of these and other companies may be found, with bibliographical notes, in Hansen, "A Business History of the Copper Industry of Utah."

as if diseased; some of their animals appeared sick as well. Investigation confirmed their suspicions that each time the wind shifted direction black smelter smoke was blown over their lands, and with it came an odor which smelled like sulphur which stung the eyes. Several weeks earlier a series of south winds and the accompanying rains had carried "the blight of the Murray smokestacks," as it was later called, north as far as the limits of Salt Lake City, devastating a wide swath of country. The area soon came to be known as the "smoke belt."

After a series of farmers' meetings in the fall and winter of 1904-5, a suit was filed in the United States District Court of Utah. A lengthy trial resulted in a verdict against the four smelter companies, and a decree was entered on November 13, 1906, perpetually enjoining the defendant companies

from the future roasting or smelting of sulphide ores carrying over 10 per centum of sulphur, . . . at its present location, 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.⁴⁷

While the farmers hailed the decision, the smelter companies had no alternative but to announce the closing of their plants. Utah Consolidated closed its Highland Boy Smelter in January, 1908, and, after a period of time in which it used the huge smelter constructed by Guggenheim interests at Garfield, transferred its ores to the plant of the International Smelting and Refining Company constructed at Tooele in 1910. The company was eventually absorbed by International. Bingham Consolidated closed its Bingham Smelter in 1907, had its ore processed for a time by the Yampa Smelter and the Garfield Smelter, and was eventually acquired by the United States Smelting, Refining and Mining Company. The United States Mining Company, which was reorganized in 1906 as the United States Smelting, Refining and Mining Company, closed its Midvale Smelter in 1908, but later secured a modification of the injunction to permit the smelting of lead-silver-zinc ores. That smelter was finally closed in 1958, although the Midvale flotation mill is still in operation.⁴⁸

The one company which came out of the smoke suit with an improved position was the American Smelting and Refining Company. ASARCO representatives wisely met with officials of the farmers' group in 1907 and agreed to a stipulation whereby the farmers would be compensated to the extent of \$60,000, in return for which they (the farmers) would approve a modification of the decree permitting continued operations of the Murray smelter. By this purchase of immunity ASARCO was left as the sole custom smelter in the Salt Lake Valley. Having also constructed a huge smelter at Garfield in 1906, the Guggen-

⁴⁷ *Deseret News*, February 8, 1905, November 5, 14, 15, 1906.

⁴⁸ *Ibid.*, May 23, December 15, 1907, January 3, 28, February 25, April 4, November 9, December 19, 1908, December 21, 1912; Stevens, *Copper Handbook*, 1910-11, pp. 422 1840-41; 1918, pp. 1356-57; 1925, pp. 1770-71; 1931, pp. 1817-18.

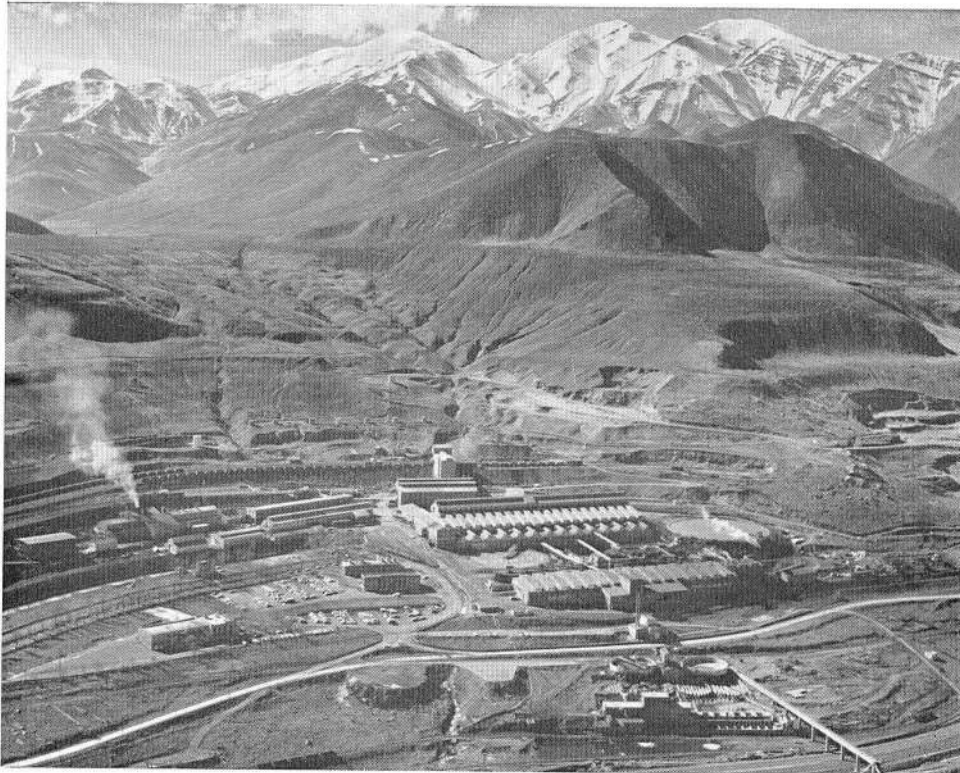
heim-controlled company was in an enviable position indeed. It was only with the construction of the large International Smelter at Tooele in 1910 that a competitive smelter became available. ASARCO and International then both competed for marketable ores, and the many small independent mineowners of the state were assured of receiving fairer treatment.

THE BEGINNING OF PORPHYRY MINING

While the mining of sulphide coppers was declining — with mines which were large copper producers becoming large producers of lead — there occurred the meteoric rise of the porphyry coppers. Not only was the introduction of open-cut copper mining at Bingham a major milestone in the history of mining in Utah, but it had world-wide significance as well. Of all copper mines in the history of the world, the Bingham porphyries came to hold undisputed first place in the aggregate quantity of metal produced by a single mine, with approximately 8 million *tons* of metal produced to 1963. This one mine produced one-third of all the copper used by the Allies during World War II.

Four personalities stand out above all others in launching this most successful of all Utah mining enterprises. The first was "Colonel" Enos A. Wall, of Indiana, who staked out a number of claims in Bingham Canyon in 1887, and for 16 years kept up the assessment work and sought to enlist the interest of persons of financial means to develop the property. The second was Samuel Newhouse, who (in association with Thomas Weir) purchased important claims at Bingham, organized the Boston Consolidated Mining Company in 1898, and (with the able assistance of Lafayette Hanchett and Louis S. Cates) successfully developed some of Bingham's best porphyries. Third was Daniel C. Jackling, the aggressive young metallurgical engineer who induced Colorado capitalists to purchase the Wall properties, organized the Utah Copper Company in 1903, and erected a successful concentrating mill at Copperton. Fourth was the Guggenheim family, owners of a controlling interest in American Smelting and Refining Company and other mining ventures, who agreed in 1905 to provide the enormous financial resources required for expansion and development of the Bingham porphyries. When the Guggenheims arranged for the merger of Boston Consolidated with Utah Copper in 1910, the stage was set for a prolonged period of growth and prosperity.

By 1910, when the sulphide era was well over its peak and on the decline, the combined and expanded Utah Copper Company was successfully applying mass-production methods and revolutionary technology in exploiting the formerly worthless porphyry rock at Bingham. While the combined Utah Copper was quickly rising to the position of premier copper producer in the nation, the sulphide companies one by one retired from the scene, through merger or ex-



KENNECOTT COPPER CORPORATION

The Arthur Mill was acquired by Kennecott Copper Corporation in 1910 when Utah Copper Company and Boston Consolidated Mining Company merged. The plant was built during the years 1906 to 1908.

haustion, and their names were lost to all but those familiar with the industry's history. As Utah Copper was being absorbed by the Guggenheim-dominated Kennecott Copper Corporation, the name of Samuel Newhouse, "Father of Copper Mining in Utah," was heard no more. It was replaced by that of Daniel C. Jackling, the Missouri farm boy who ushered in the rich and profitable porphyry era in the history of Utah copper.

It is in the porphyry era that Utah Copper became synonymous with mining in Utah. In Bingham Canyon, copper mining expanded so greatly that all other mining operations nearly disappeared from the scene. The town itself gave way to the growth of the Utah Copper Mine. By 1963, Bingham Canyon as a residential and business community had disappeared, and Kennecott demonstrated its faith in the future of copper in Bingham Canyon by announcing a \$100-million program of expansion.