

Bingham, Utah's Greatest Copper Camp

Mining and Milling
Methods Explained

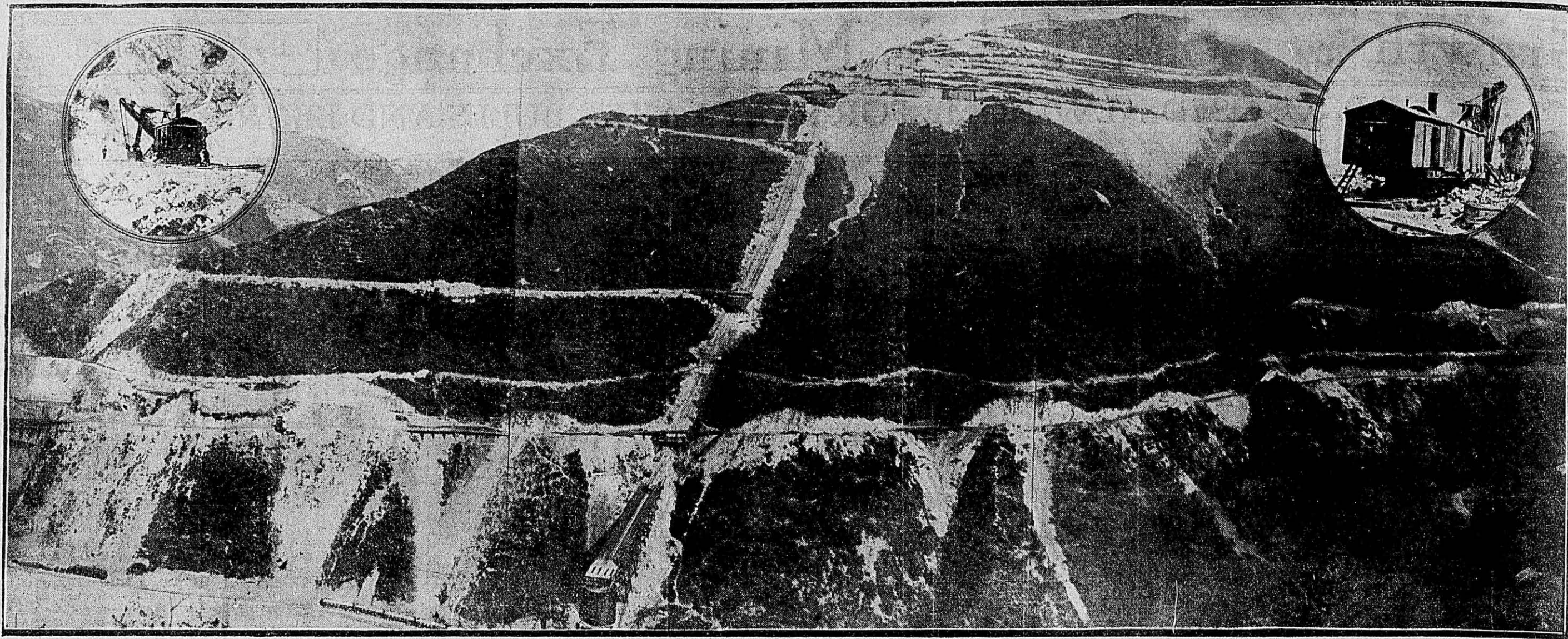


Photo by Harry Shieler.

SCENE IN CAR FORK CANYON, BINGHAM, SHOWING BOSTON CON. PORPHYRY MINE WORKINGS AND TRAMWAY.

BINGHAM is one Utah mining camp where they do things on a large scale. One mine there alone—the Utah Copper, has been outputting anywhere from 6,000 to 7,000 tons of ore per day during the greater part of the year; the Boston Consolidated Mining company has provided mill equipment to handle 3,000 tons per day, which is now running at about one-half its capacity; Utah Consolidated, since its own smelter was forced out of business through a decree of court, is shipping an average of 800 tons of its copper, gold and silver bearing rock to the Garfield smelter; while the Yampa mines of the Tintic Mining & Development company are responding steadily with approximately 1,000 tons per day, which goes to the company's own smelter in Bingham canyon, where the metals are separated from the slag and moulded into a form convenient for handling at the refinery. Many smaller properties are sending out their riches, but a little enumerated in the foregoing are sending to the reduction works at the present time more than 10,000 tons of ore every twenty-four hours. Placing the average at 40 tons per car, this means that more than 250 car loads, or ten trains of 25 cars each are going out each day.

MAKES GREAT SHOWING.

While it is difficult to state accurately just what the production of the camp has been this year in dollars and cents, it is reasonable to presume that it has been somewhere between the \$10,000,000 and \$20,000,000 mark. Next year it will doubtless amount to very much more, for it is a matter of only a few months more until the Ohio Copper company will be supplying its new mill at Lark with 4,500 tons a day out of which engineers of this corporation figure will be obtained more than 38,000,000 pounds of copper annually and net earnings of \$2,000,000 on a 11-cent copper market. The Utah Apex Mining company is another large Bingham enterprise which is being rapidly whipped into shape for a long and prosperous career, and among the improvements planned for the coming year will be a concentrating mill of capacity sufficient to treat at least 500 tons a day. This company recently secured an option on the properties of the Phoenix Mining company, which, if taken up, will place the Utah Apex in possession of some valuable water rights, besides adding greatly to its tonnage of available ore reserves.

HARD TO COMPREHEND.

It is difficult for a person looking from a distance to thoroughly

comprehend the magnitude of the work being done in Bingham. One must visit the camp first and even then, if not posted on mining ways and methods, cannot grasp the real meaning of it all. They may see huge steam shovels busily engaged in tearing down a mountain; they may see the loaded tramway cars bringing ore down from the workings above and many trains going hither and thither along the terraced railroad tracks on the mountain side, yet they do not grasp the real significance of this vast enterprise as it affects the general welfare of the commonwealth. It requires the investment of millions and millions of dollars before a dollar could be returned; but now the reward is being reaped and Bingham now securely occupies a place among the great mining camps of the world. The lesson learned in Bingham regarding the profitable handling of large bodies of low grade copper ores have been applied to advantage in other camps and the best example of this is found at Ely, where the Nevada Consolidated and Cumberland Ely mines are shining examples.

HAD SOME SET-BACKS.

One of the great drawbacks experienced by the mine operators of Bingham in the past has been the lack of adequate transportation facilities. But none have felt the effects of this condition more than the Tintic Mining & Development and the Utah Copper companies. To overcome this trouble, the former constructed and has in operation an aerial tramway between the Yampa mine and the Yampa smelter in the lower part of Bingham canyon. The management of the Utah Copper on being confronted with this situation took steps to bring about remedial measures which were deemed necessary in view of the fact that the company intends in the near future to enlarge its milling facilities at Garfield. About the middle of the year the Bingham & Garfield railroad was organized, the latter taking over the track already in use about the Utah Copper mine, the total length of which was about 12 miles. Rights of way were then secured along the route of the proposed extension to the Garfield mills and smelter; the surveys have been completed, and it is on the program to begin the construction of this additional 25 miles of road early in the coming year. The Denver & Rio Grande Railroad company, however, has promised better service in the future; but the Utah Copper road is really a necessity unless the Rio Grande should go to the great expense of keeping pace with the development of the camp by increasing its track facilities.

Utah Copper One of World's Big Copper Mines

During the third quarter of this year, which ended Sept. 30, the Utah Copper company made a net profit from its mining and milling operations of \$496,666.43, with an additional income from rents and other items of \$4,735.17, making total receipts of \$501,391.60 for the period stated, which places this company an annual earning basis of more than \$2,000,000 on a 13-cent copper market and on the production basis of only a little more than 6,000 tons of ore a day. A total of 12,000,925 pounds of copper were produced during the period stated, at a cost, per pound of \$7.3 cents after making the usual deductions. The foregoing figures serve to indicate what this great company is doing in a material way and it is easy to contemplate what may be expected in the future when the company handles a still greater tonnage than it is doing now. Steam shovels play an important part in the work at Bingham of the Utah Copper company and, in fact, it is the only company using them to any degree of success; the Boston Consolidated having abandoned them recently, returning to the caving system of mining. It has been ascertained from the last quarterly report of the Utah Copper that out of the total tonnage of ore sent to the Garfield mills, between June and October, 68 per cent came from the steam shovels and the balance, or 32 per cent, from underground sources. While these operations have been in progress steam shovels have been engaged in stripping the ore body of overburden at the rate of 87,000 yards per month, or from about .8 of an acre per month.

The Utah Copper company was brought to a realization largely through the efforts put forth by D. C. Jackling, the present general manager, who, while connected with the engineering staff of Capt. Joseph R. DeLaMar, thoroughly sampled the vast ore bodies contained in the property and became thoroughly convinced of the great commercial possibilities of the low grade copper deposits. Capt. DeLaMar, however, did not feel disposed to go into the proposition and the matter was dropped until a few years later when Mr. Jackling called the attention of Charles M. MacNeill and Spencer Penrose of Colorado Springs to this great undeveloped resource. The interests of Capt. DeLaMar were acquired and, likewise, Col. E. A. Wall gave up a portion of his holdings, but retained enough from which he subsequently realized approximately \$3,000,000. The Utah Copper company was formed in 1903. The development of

the mine was commenced in the autumn of that year and in April, 1904, the company began operating its mill at Copperton in lower Bingham canyon which has since been in service almost continuously and at the present time is treating 800 tons of ore per day. It was in this plant that many of the early experiments were made through which it was clearly demonstrated that the treatment of the low grade copper bearing porphyries of the Bingham camp could be carried on at a profit. When this became an accomplished fact, the company began to look for a location for a larger milling plant. There being no room for a structure of the magnitude desired at Copperton, Bingham canyon, it was finally concluded to purchase a site about three miles to the east of the present location of the Garfield smelter, which was done, and this was followed later by the construction of the immense mill and power plant which now adorns it. The location is an ideal one and on the company's own ground are springs which all the water required for milling and other purposes.

ITS BINGHAM HOLDINGS.

In Bingham, the company owns approximately 200 acres of mineral ground which is situated approximately in the center of the West Mountain mining district and is all held under United States patents. From the last annual report of the company reference is made to the early development of the mine, which, it is stated, "were designed along the lines of properly opening the ground for the application of the 'caving' system of mining. Up until June, 1907, all the ores extracted were derived from development work by the application of that system. The entire mineralized area of the property is covered by a thickness of about 70 feet of low grade oxidized ores, which cannot be profitably handled by concentration. At the inception of development it was thought that this low grade zone would be much thicker, but as development progressed it was readily seen that a system of mining, much cheaper than by caving, could be applied; and, after consultation with various specialists, it was determined to adopt the use of steam shovels and remove the low grade, oxidized overburden entirely, leaving the ore uncovered, so that it could also be handled by steam shovels, at a very low cost. This character of work was commenced in the summer of 1906 and has since been prosecuted as rapidly as possible. Nearly 10 acres of ground have been removed in this manner and, as stated, is going on to the extent of about 90,000 yards per month.

UNDERGROUND WORKINGS.

The mine has been developed by approximately 90,000 feet of underground workings. Very little underground development has been done since Jan. 1, 1907, as the ore bodies at that time were blocked out for many years in

advance, and it was, therefore, thought best to confine expenditures to the removal of oxidized overburden.

The ore bodies of the property consist of an altered siliceous porphyry, containing small grains of copper minerals, very uniformly disseminated throughout the mass, both in fracture seams and in the body of the rock, and average about 2 per cent copper, 0.15 of an ounce silver and 0.015 of an ounce gold. The primary copper mineral is chalcocite, but as a result of oxidation of this mineral and secondary deposition of others, practically all of the sulphide minerals of copper are now present, the predominating one being chalcocite. The developed and partially developed area covers 72 acres of ground. About 60 of the 72 acres contain mineralized porphyry of the average value above stated. The remaining 12 acres average somewhat lower, probably not much in excess of 1.5 per cent. The average thickness of the ore body over this 72 acres has not yet been fully demonstrated by development. But existing developments indicate an average depth of about 810 feet, which is equivalent to 1,000,000 tons of ore per acre, or 60,000,000 tons of the better grade ore, and 12,000,000 tons of the lower grade ore, in this body. Of the 60,000,000 tons of better grade material, a body of 20,000,000 tons is fully developed; or, in other words, blocked out, so that it can be accurately measured and its value definitely determined. 20,000,000 tons are partially developed, that is to say, developments have gone far enough to prove the existence of this additional quantity of material, but not sufficiently far to permit of its being measured and sampled on all sides.

SEVENTY-TWO ACRES OF ORE.

The remaining 20,000,000 of the 60,000,000 tons is classed as undeveloped, for the reason that its existence is only shown by a limited number of workings, most of which are diamond drill holes. In the 72-acre area under discussion is a zone of lower grade ore, averaging about 1.5 per cent, and probably containing about 40,000,000 tons. This zone is entirely undeveloped, save by the diamond drill holes that pierce it, but its existence has been proven wherever drilling has been done. The total area of mineralized porphyry contained within the boundaries of the property is about 160 acres, leaving 88 acres which are not considered as in any way developed, although a portion of the area is known to contain ore of profitable grades.

The ground to the south and east of the area shown as developed and partially developed, and lying on the south side of the canyon, also has some possibilities. This is shown by a number of more or less shallow workings on the ground, and by work done in the immediate vicinity, on contiguous property. Taken as a whole, not to exceed one-half of the total area known to contain commercial values has been developed. Possibly not to exceed one-half of the undeveloped portion will prove as high grade as the portion already developed, but it is likely that most of the undeveloped area will contain values that will show profits in operating in the future.

deep mining adding to its greatness at a rapid rate.

GOLD SWEETENS IT.

The Yampa ore bodies, which are among the largest sulphide ore bodies opened in Bingham, average so far a little better than two per cent copper and from \$2 to \$2.50 a ton in gold. The gold pays for the mining and as the company now has its own smelter of 1,000 tons a day capacity, with both mine and smelter equipped for handling the ore with the greatest possible economy, it is easy to guess that the Yampa will have a front seat in the stand when it comes to producing copper cheaply.

The Tintic Mining & Development company also owns some attractive property in the Tintic district, located near the Utah Consolidated and Sioux Consolidated properties.

SILVER SHIELD GETTING IN SHAPE TO PRODUCE

When Harry S. Joseph took hold of the Silver Shield mine in Bingham several years ago he realized that he had a difficult task before him to place the property upon a paying basis. Yet he realized such a thing could be accomplished and he set out to do it. That he has succeeded in what he started out to do is amply verified by the splendid showing the mine now has and shareholders may rest reasonably safe in arriving at the conclusion that the day of assessments is now past. The one loved recently would not have been needed had the company not been interrupted in finding a market for its ores. Early in the year, a contract was entered into with the Tintic Smelting company and shipments of ore began about the time of the blowing-in of the plant; but when it became apparent to the management of the latter that a shut down would be necessary pending a remodeling of certain mechanical defects, the Silver Shield company was requested to cease ore movements until further notified. This had the effect of shutting the Bingham mine out of a market entirely for a time.

IS WELL EQUIPPED.

The Silver Shield mine is splendidly equipped, and in the long tunnel through which the company is directing its energies, is operated a modern electric haulage system. The tracks are of 12 and 20 pound steel and the tunnel and mine buildings are lighted by electricity. Ore bins and chutes contribute to the convenience of loading the cars. This year's developments have been of a highly gratifying character, as several new ore shoots have been encountered. The Silver Shield company owns 225 acres of land in upper Bingham, nearly all of which is patented. As stated, the mine is in excellent condition, and employment is given to about 60 men.

The officers of the Silver Shield company are: President, Henry Cohn, vice president and manager, Harry S. Joseph, secretary, Harry Cram. The directors consist of Henry Cohn, Harry S. Joseph, R. E. Miller, Louis Moore and Isaac Solomon.

Great Yampa Mine And Smelting Works.

One of the strongest mining institutions of this state is the Tintic Mining & Development company, operating the Yampa mine in Bingham. An adjunct to it is the Yampa Smelting company, operating the Yampa smelter in the lower part of the camp and to which the Yampa mine ores are conveyed by aerial tramway.

During the past year approximately \$300,000 was expended for mine and smelter betterments. At the smelter three new roasters have been installed; one reverberatory, one blast furnace, converter plant, blowing engine for converters, blowing engine for blast furnace, electric locomotives, ore bins and stack. The tramway was also completed within the year, while at the mine, the haulage tunnel has been straightened and improved, an electrically driven compressor and a 92-inch air pipe line installed and besides, a new triple compartment shaft has been sunk over 200 feet. The smelter is now handling nearly 1,000 tons of ore a day, which, with the exception of the ores required for fluxes, is coming from the company's own mines,

and from which is being yielded between 800,000 and 1,000,000 pounds of copper monthly.

A NEW DEPARTURE.

One of the new important departures of the year at the Yampa is the inaugurating of a campaign of deep mining. Heretofore all of the mining has been done from the tunnel level, which attains the maximum depth of 1,200 feet from the surface. From the tunnel level General Manager C. W. Saxman has started the triple-compartment shaft which he intends to send down 2,000 feet, giving then a total vertical depth of 3,200 feet for the mine. The new shaft is down about 200 feet now and enough has been seen to convince the management that the Yampa ore bodies will continue to increase in size and richness as depth is attained. Levels will be run out every 100 feet as the shaft is pushed downward, and in the meantime the increased production from the upper levels of the mine will be maintained without a break.

Manager Saxman is ambitious to make the Yampa one of the great sulphide copper mines of the country, and he has already made excellent progress in that direction. It is a big mine now and it is counting upon the

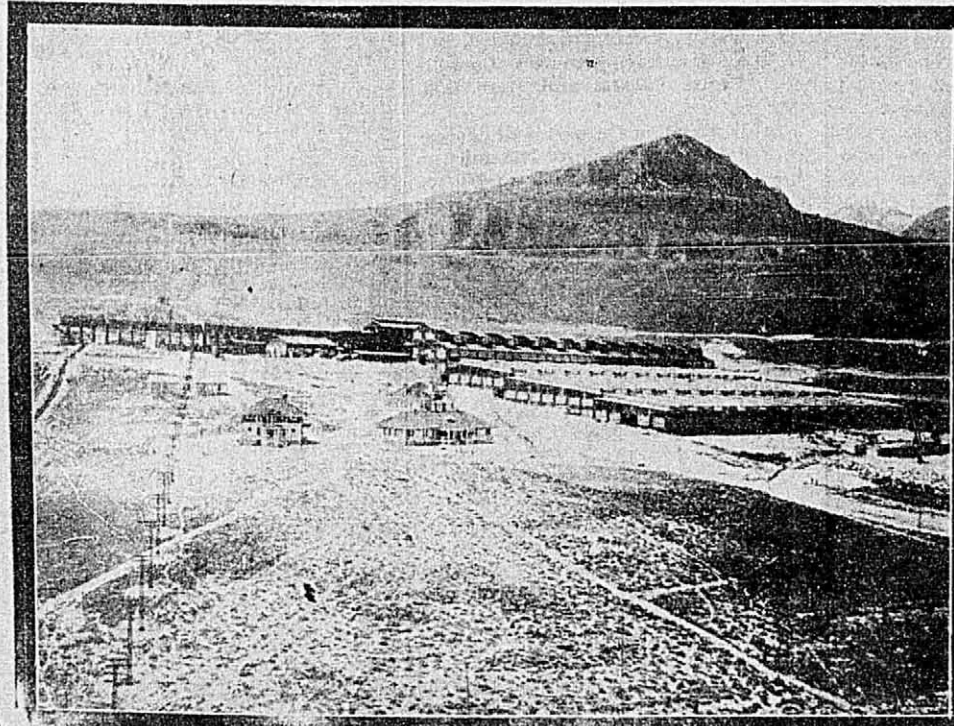
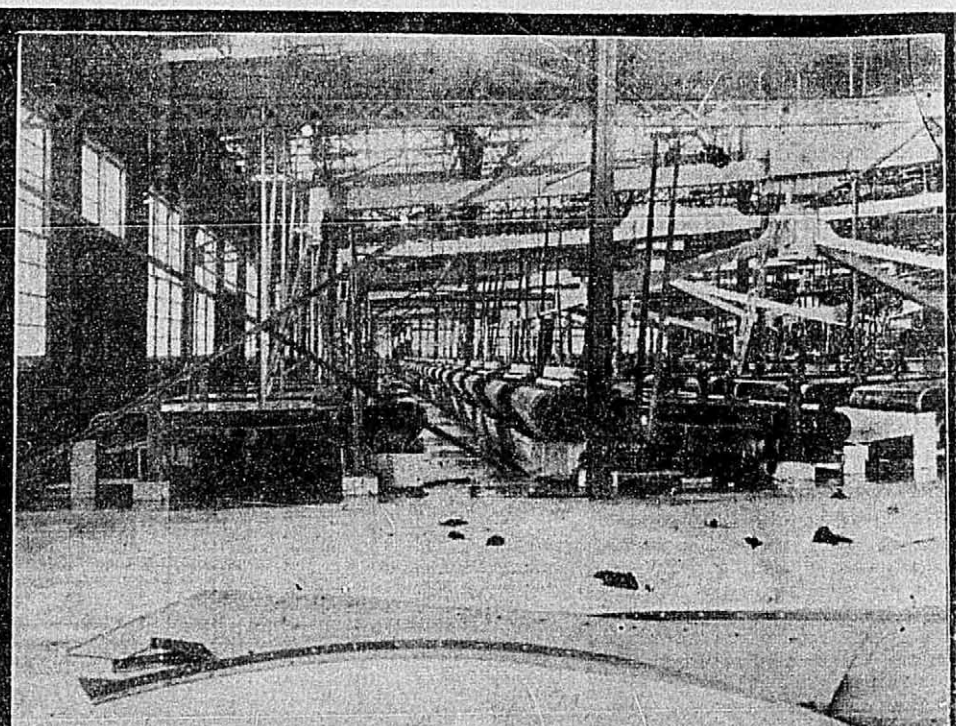
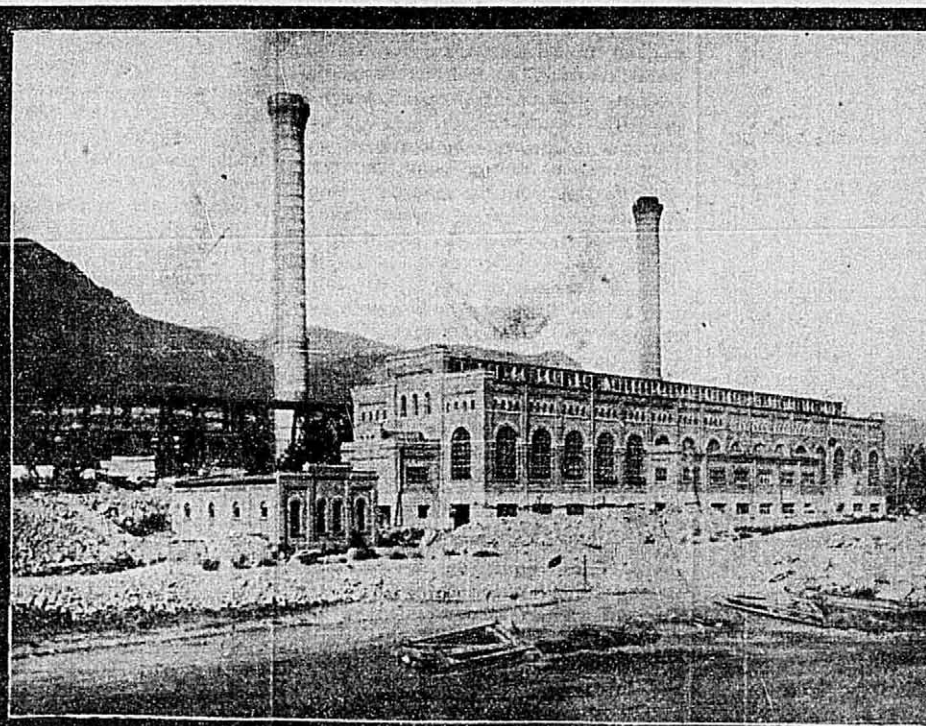


Photo by Harry Shieler.



GARFIELD MILL AND POWER HOUSE OF UTAH COPPER COMPANY, WHERE BINGHAM ORES ARE TREATED