

Camp of Bingham—Greatest Shipper of Ore in World

MOST wonderful of Utah's mining camps is Bingham. In production it leads all others. Its increase in shipping for the year amounted to more than all other camps of the state. The amount of ore carried out of this district by the railroad this year amounted to close to 4,000,000 tons, or enough to keep one man digging at the rate of four tons a day for 300,000 years.

Bingham broke all records this year in the development work done in the district, the number of new mills constructed and the amount of ore shipped. All work has been done on a giant scale. There has been nothing small about Bingham. In mining it has forged to the front this year as it never has before.

A study of the shipments of Bingham shows that in five years this great garner house of treasure has sent 10,000,000 tons of ore to the market. If only \$1 a ton was netted the companies it would be an enormous revenue, but the profit was probably more than twice that amount.

The increase in shipments out of Bingham this year has been more than 1,500,000 tons of ore. This increase by itself would be a record for any camp, but Bingham shipped 2,500,000 tons more than that.

White steam shovels have been delving into the mountains and the enormous tonnage tunnels have been run, thousands of feet of underground work done and practically three new mills have been built in the district. Another was remodeled and its capacity increased.

The largest mill built during the year was that of the Ohio Copper. Only the first two units of this big plant, which is the third one built to treat the low grade ore of Bingham, were finished this year. The present plant will treat 2,000 tons of ore a day, but by the end of next year a second section will be added increasing the capacity to 6,000 tons a day.

BUILDS MILL.

The Bingham New Haven property at the head of Carr fork improved its property by the addition of a new 150-ton mill. Through some difficulties encountered on account of the ground on which the mill is situated, it was not started until late this year.

Practically a new mill was built during the year by the Utah Copper company in Carr fork. This mill will also add greatly to the mineral wealth of Bingham.

During 1909 the Utah Copper company remodeled its Copperton mill and increased its capacity. This was necessary on account of the poor savings made in the treatment of ores from the mine. New machinery was put in and the capacity was increased from 750 tons of ore a day to 1,000 tons daily.

Mills were not the only things that were built and improved during the year, as the Yampa smelter owned by the Tintic Mine & Development company, spent close to \$500,000 during the year in improvements so that it is now one of the best equipped plants in the country.

Throughout the year the Boston Consolidated and the Utah Copper companies have been increasing their tonnage. The latter in particular has made rapid advancement in steam shovel work and at present is actually using only that means of working the property. The Boston Consolidated has a wonderful underground system of working as well as a good steam shovel tonnage.

HIGHLAND BOY.

Enormous ore bodies have been blocked out by the Highland Boy Consolidated Mining company during the year. This has long been known as the Highland Boy and probably has more underground workings than any mine in Bingham. In all it has over 15 miles of underground work.

One of the big new companies to make its appearance in Bingham during the year was the Utah Metal company, which is a consolidation of the Bingham Central, Bingham Standard, Bingham Metals and Bingham Central Standard. This company takes in territory of 3,500 acres, 1,600 acres of which is proven mineral land. Work has been commenced on an 11,000-foot tunnel which will afford new transportation avenue in and out of Bingham. It is believed that this will be finished early in 1911. The company has an excellent equipment and treasury that insures the work being carried out to the letter. As this tunnel comes through from Middle canyon on the Tooele side of the range, it will afford an excellent outlet for ores sent to the International smelter.

The Utah Consolidated will shortly have finished a new 100,000 tramway system connecting its mine with the International Smelter in Pine canyon. This goes over the mountain near Clipper Peak at the head of Carr fork.

REORGANIZE COMPANY.

The old Bingham Consolidated company was re-organized during the year and became the Bingham Mines company. It took over all the property of the old company and started work at once on its interests in Bingham and on the Dalton and Lark side. It August

Heinze was formerly the ruling spirit in this company but in re-organizing he dropped out. This company is fast being whipped into shape for an era of more extensive production.

A new mill has been started at the Silver shield property and a consolidation of two old producers, the Clusader and the Yosemite, was made during the year under the name of the Yosemite Mines company.

THE BINGHAM MINES.

THE properties owned by the Bingham Mines company consist of two groups of claims, known as the Commercial and Dalton and Lark mines. It also controls the Eagle and Blue Bell property at Eureka, Tintic mining district, and with Ernest Bamberger and W. Mont Perry, control the Yosemite mines company, embracing the Cluster group of claims, Yosemite No. 1 mine and the Mississippi claim, also located in the West Mountain mining district.

The Commercial mine, situated at the head of Copper Center gulch, in main Bingham canyon, consisting of 62 acres of the mineral zone and covers the lode for a distance of 1,200 feet. The formation consists of limestone and quartzite, with occasional porphyry dikes or porphyry intrusions. The ore is a copper iron sulphide carrying gold and silver, and is a replacement of the limestone.

WORKING AT COMMERCIAL.

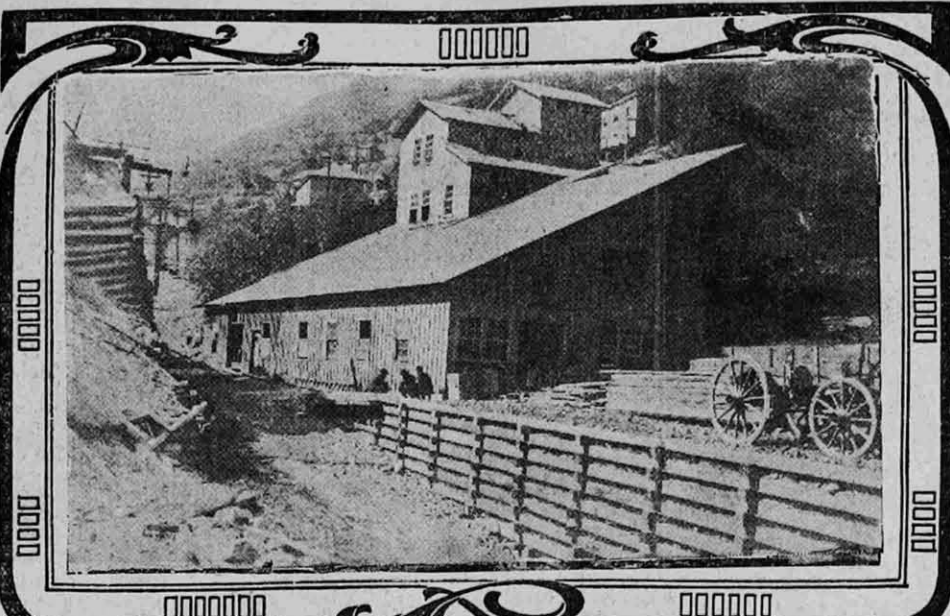
The Commercial is developed by two cross cut tunnels, Commercial upper tunnel, driven from the north, a distance of 1,100 feet to intersect the zone, from which point it was driven in a southwesterly direction on the strike of the lode for a distance of 700 feet, developing a very large tonnage of ore that has been mined and shipped to the smelters in Salt Lake valley. Commercial lower tunnel driven in a southerly direction for 1,700 feet, where it also intersects the lode, developing ore the entire length of the vein within the limits of the property, and to a depth of 500 feet on the plane of the vein. In addition to the above openings, an incline shaft has been sunk in ore from the lower tunnel on the plane of the vein to a depth of 320 feet, levels have also been driven in ore from the incline easterly and westerly, entirely across the property, developing close to 300,000 tons of copper sulphide ore. The physical condition of the property is excellent and the equipment complete, making it possible to produce ore at a minimum cost.

On account of the closing of the company's copper smelter at Bingham Junction by the United States court in the fall of 1907, the Commercial was forced to shut down, but in June, 1909, a satisfactory contract for the treatment of the ores of this mine was secured from the Yampa smelting company, and since that time the mine has been actively worked and the product shipped over the Copper Belt railroad to the smelter.

DALTON AND LARK MINES.

The Dalton and Lark mines embrace several groups, situated on the eastern slope of the Quilira range, on the eastern side of main Bingham canyon, formerly operated under separate management, and known as the Brooklyn, Dalton & Lark, Miners Dream, Sampson and Lead mine, comprising an area of 240 acres of mineral zone and 160 acres of non-mineral land, covering a portion of the eastern side of main Bingham canyon, ample space for ore bins, power plants, dwellings, dumping ground and reduction works.

These groups have three veins, or parallel belts of lime, varying in horizontal thickness from 10 to 450 feet, alternated with belts of quartzite, with a strike north 30 degrees east and a northwesterly dip of 45 degrees. These veins are designated as the Brooklyn-Miners Dream on the south, Lark-Yosemite on the center, and the Lead mine vein on the north. The Brooklyn or Miners Dream lime belt is the largest, its narrowest part being 10 feet thick, and its widest 450 feet. The Bingham Mines company's property covers 7,100 feet of this vein, 7,500 feet of the Lark-Yosemite vein and approximately 6,700 feet of the Lead mine vein. Like the other lime formations of the Bingham camp, these veins are intersected by numerous cross fissures, but there is less evidence of faulting in this portion of the district than farther west. Branches of porphyry and porphyry dikes are numerous. The Lark-Yosemite vein consists of a narrow belt of lime varying from a few inches to 20 feet in thickness lying between quartzite walls. This vein has in all probability produced the richest ore, in large quantities, of the lime in the Bingham district. The ore shoots are remarkable for their length on the strike of the vein, and their persistency with depth. The shoots vary



UTAH APEX AT BINGHAM.

BINGHAM'S MAMMOTH SHIPMENTS.

Like a great flood that is just beginning to increase in strength and volume, ore poured out of the Bingham Canyon district during the past year. All records in shipping in the great Bee Hive state were broken and the enormous increase over last year was better than a million and a half tons. It establishes a mark among the world's greatest.

Each day the trains carry out in the neighborhood of 15,000 tons of ore from this champion storehouse of treasure. This is an advance of 400 per cent in five years. For the year 1909 the camp established a record of close to 4,000,000 tons of ore. With the Ohio Copper, and several other properties that are close to the productive period working during 1910, the possibilities are beyond comprehension.

In 1905 the shipments from the district amounted to 975,410 tons, while the estimated figures for 1909 are 3,903,223 tons. This is close to 1,500,000 tons better than in 1908. It brings the grand total of five years shipments up to 9,989,943, or close to ten million tons. A study of the following figures will show more prominently the crowning feature of mining in Utah.

MONTH	1905 Tons	1906 Tons	1907 Tons	1908 Tons	1909 Tons
January	72,404	88,106	66,462	149,055	223,781
February	65,798	69,479	69,774	161,962	236,613
March	77,891	85,905	80,791	165,412	310,723
April	90,063	86,120	120,404	177,165	368,275
May	90,063	90,955	118,094	203,598	385,305
June	89,330	83,955	121,764	227,764	307,902
July	73,269	83,484	142,888	234,352	352,776
August	89,523	84,694	163,219	231,757	318,242
September	80,600	87,166	165,911	200,676	349,606
October	87,166	88,177	182,427	238,700	360,000
November	85,700	91,700	172,750	210,407	345,000
December	83,603	79,900	153,665	268,753	345,000
	975,410	1,019,641	1,540,149	2,469,489	3,903,223
Grand Total for five years					9,989,943

*Estimated shipments.

In length from 500 to 1,300 feet, and in places so completely replace the limestone that in early operations on the vein, it was supposed to be a fissure in quartzite.

USE MASCOETT TUNNEL.

The Dalton & Lark group is developed by the Mascoett tunnel, the portal of which is situated on the western side of Salt Lake valley, driven in a westerly direction 7,500 feet, where it encounters the Lark-Yosemite vein; from this point it is driven in a westerly direction on the Lark vein 1,600 feet, and then turns in a northerly direction 270 feet to the Lead mine vein, thence in a westerly direction 850 feet on the Lead mine vein. From this point a cross cut has been driven in a southwesterly direction for 850 feet, where it encounters the Brooklyn vein. Active development work is now in progress on the Brooklyn, Lark-Yosemite and Lead mine veins.

The driving of the Mascoett tunnel was a big undertaking, but it must be considered one of the most comprehensive plans for draining and operating, not only the properties of the Bingham Mines company, but a large portion of the camp of Bingham as well. To the Ohio Copper company's shaft it is now a distance of approximately three miles and will undoubtedly be extended to the Commercial mine, a distance of 1,000 feet beyond the Ohio shaft, where it should encounter the Commercial lode, approximately 1,100 feet vertically below the present workings.

METAL PRODUCED.

While the Lark-Yosemite vein has produced a large tonnage of profitable ore, it has a great future before it. There is nearly 7,500 feet of vein yet to be developed, varying from 1,400 feet to 1,800 feet above the Mascoett tunnel. The product of this vein has been copper-lead-silver-gold ore, and has been productive of high grade silver-lead ore, permitting of the shipment of each product separately. The largest and most profitable product, however, has been the lead-silver-gold ore, and the same may be said of the other two veins. While both the Lead mine and the Brooklyn vein have produced a large tonnage of low grade copper iron ore, the lead-silver ore has been the more profitable. The Lead mine vein lying to the north has been developed from the surface to the Mascoett tunnel, a depth of 1,400 feet on the plane of the vein. These developments, however, are confined largely to the center of the property and not more than one-half of the vein has been developed on the strike. At present there is a large tonnage of low grade ore developed and this with the ore of like character from other parts of the Dalton & Lark mines will be concentrated in the Ohio Copper company's mill, located near the portal of the Mascoett tunnel at Lark.

WORKING BELOW TUNNEL.

The development of the Lark vein below the Mascoett tunnel is in progress. The heavy flow of water encountered in the tunnel has been successfully tunneled so that no difficulty so far has been encountered in sinking and developing the vein below the tunnel. The ore encountered at this depth differs little from the mined above, and carries about the same values. This applies to quantity as well as quality.

The equipment consists of three 250 horsepower internal feed Scotch marine boilers and two 60x16 return tubular boilers, one cross compound duplex Corliss valve steam driven compressor having a capacity of 2,200 cubic feet of free air per minute; one 75 K. W. steam driven direct current generator, used for furnishing power for operating electric locomotives in the Mascoett tunnel, a complete machine shop, blacksmith shop, carpenter shop, office, dwelling houses, boarding houses, and store. The equipment is both complete and economical, and is not surpassed by any mine in the Bingham district.

The Dalton & Lark properties have been producing steadily during the year and the product, a silver-lead ore, shipped to Murray and treated by the A. S. & R. company.

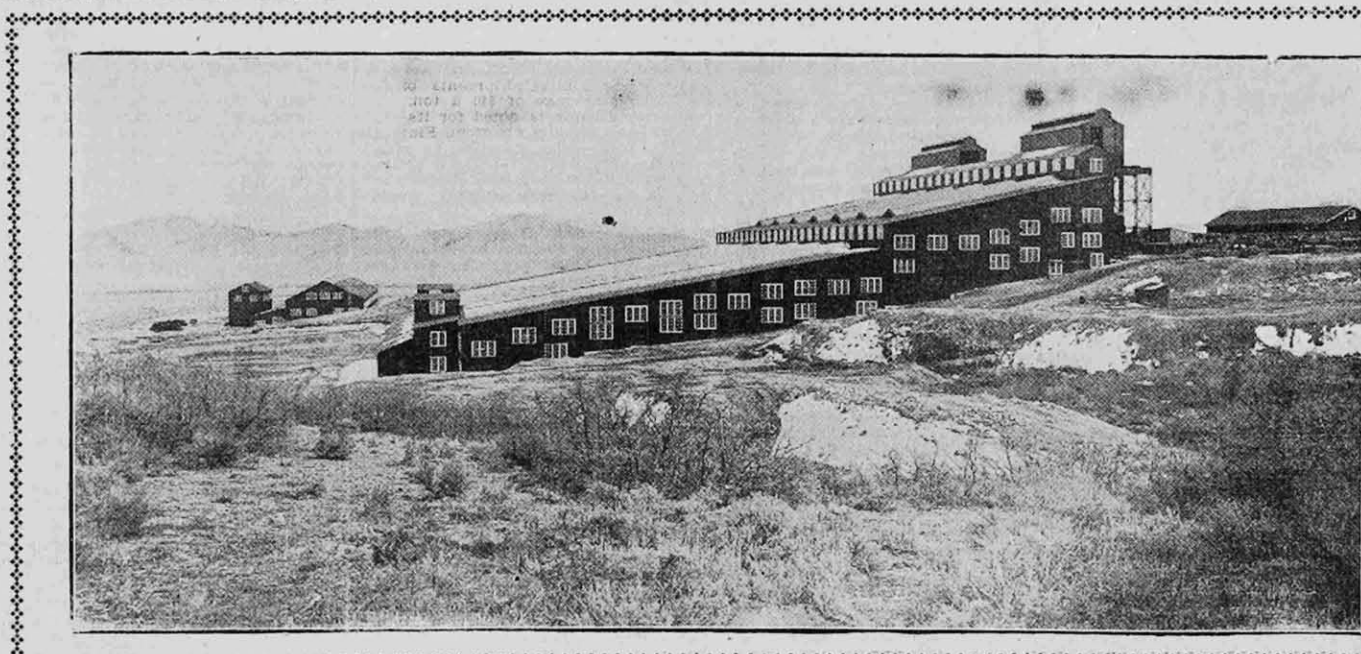
YOSEMITE MINES.

The Yosemite Mines company is con-

trolled by the Bingham Mines company, Ernest Bamberger and W. Mont Perry, and is a consolidation of Yosemite No. 1 mine, the Cluster group of claims and the Mississippi claim, situated in the heart of the lead-silver producing section of Bingham, covering approximately 2,400 feet on the strike of the Lark-Yosemite vein, which has been productive of high grade silver-lead ore on the surface for almost its entire length, and to a depth of approx-

THE OHIO COPPER.

ANOTHER powerful factor that has arisen in the great year of development of the low cost copper producers in the Bingham Canyon district is the Ohio Copper company. The first half of its machinery in its 3,000-ton mill has just been installed.



OHIO MILL AT BINGHAM.

imately 600 feet, leaving an area yet undeveloped of 2,400 feet on the strike of the vein, with from 1,400 to 1,800 feet on the plane of the vein above the Mascoett tunnel. Active development work is being carried on at the Mascoett tunnel level and also on the Cluster group in main Bingham canyon. The company has been granted operating privileges through the Mascoett tunnel, and arrangements have also been made for milling its low grade ore in the Ohio company's copper concentrator at Lark. Experts predict that within the next year, this property will rank among the best producers in the district.

EAGLE AND BLUE BELL.

The property of the Eagle & Blue Bell Mining company is situated in the Tintic Mining district, Utah, and consists of 74 acres of the mineral zone and one mill site, approximately 10 acres non-mineral land. The formation is limestone. The property is located in the center of the mineral district of Tintic, having the Centennial-Eureka on the west, the Eureka-Hill and Bullion Beck to the west and north, the Victoria on the east and the Grand Central to the southeast. The property is developed by No. 1 shaft, a depth of 220 feet and by a tunnel to the south about 1,400 feet. At the end of the tunnel a three compartment shaft has been sunk to a depth of 1,100 feet, from which levels at regular intervals have been extended. The property has been producing steadily during the year and is being actively developed, the product, a lead-silver-gold ore being shipped to and treated by the American Smelting & Refining company's smelter at Murray, Utah.

The principal office of the Bingham Mines company is at 60 Congress street, Boston, Mass.; and the Salt Lake office is at 402-404 Doyle building. The officers of the company are: James P. Graves, president, Boston, Mass.; Imer Pett, general manager, Salt Lake City, Utah; J. E. Bergh, superintendent of mines, Lark, Utah; D. MacViehe, consulting engineer.

mine by a system of raises through which the ore is run by gravity into said bins. From these bins the ore is transported by electric railway to the mill ore bins. The top of which are on a level with the portal of the tunnel. The distance from the portal of the tunnel to the mill is about 3,200 feet, 700 feet of which is a steel truss approach with an average height of 50 feet.

The Ohio concentrator or mill is built at Lark, on the Salt Lake valley side of the Bingham Canyon range. The mill is about 360 feet square and is of steel and concrete construction. The mill and sluice plant are both equipped with up-to-date concentrating machinery. The former with crushers, rolls, jigs, Chilian mills and Wilfley tables and the latter with Calum tanks, Wilfley tables and buddles. The entire plant is run by electricity, the crushers, rolls, jigs and tables, being operated by independent motors. This plant is considered a model of its kind and is said by competent judges to be one of the most complete in the country.

BY CAVING SYSTEM.

The mining will all be done by the caving system and it is believed that the very best results will be obtained by this method. The average assay of the ore demonstrates that it carries 1.75 per cent copper with a trace of gold and silver. Assuming a concentration of 18 into 1 and an extraction of 80 per cent with the usual smelting deductions, we find 18 tons of ore producing 489 pounds of copper which is equivalent to about 70,000 pounds per day, or 25,000,000 pounds of copper per year. It is the intention, and provision has been made, in laying out the present mill, for doubling the capacity of the same in the near future, which will give an average output of 50,000,000 pounds of copper per year.

With the present mill of 3,000 tons capacity there is enough ore in sight to keep the concentrator running at its full capacity for 10 years. With only 12 acres of its 120 developed, there is every prospect that by further development there will be enough ore to keep the plant running for two decades or more.

NEW ORE BODY FOUND.

Recently a new vein, entirely independent from the main body of the Ohio lode, was struck 600 feet north of the hanging wall of the present big ore body. This vein is over four feet in width and is on the 500-foot level. It carries metallic values in gold, silver and copper to the amount of about \$12 per ton. Development is now under way on this vein, which will materially increase the value of the Ohio property.

THE UTAH COPPER.

A GIANT among the low cost producers of copper is the Utah Copper company, which in two years' time has established an enviable name for itself. Four years ago ground was broken for the 6,000-ton mill of the company at Garfield and in the short time that it has been operating it has placed itself in the foremost rank of copper producers. It is now the fourth largest producer in the United States and the second in producing copper at a low cost. Only one other has been able to produce copper at a lower price.

Among the accomplishments of this great company are: high extraction from the lowest grade porphyry ore treated by any company, the large-

as well as on account of our operating costs being less than was formerly expected, we can handle this low grade material at a fair margin of profit, even at the present low price of copper. The character of the ore, with respect to its amenability to concentration, improved in greater proportion than did the value of the ore, to the end that, during the quarter in question, the average recovery per ton was increased by over 1.75 pounds of copper, whereas the increased contents, as compared with the previous quarter, was 1.15 pounds per ton. As previously stated, so that considerable more than the total increased contents of the ore was actually recovered. In other words the metallurgical results were much improved as compared with the previous quarter.

TONNAGE IS GREATER.

The tonnage milled during the third quarter was greater, by an average of approximately 100 tons per day, than for the preceding quarter. This increased tonnage, together with the increased recovery of copper, resulted in the total amount of ore treated during the period having contained approximately 1,100,000 pounds more copper than the previous quarter. The gross output of copper was, however, 1,526,282 pounds greater than that for the previous quarter, the total copper contained in the concentrates produced and shipped to the smelter during the quarter under discussion having been 15,299,647 pounds, as against 13,774,412 pounds for the quarter preceding.

The net profit from mining and milling operations for the quarter amounted to \$715,584, the additional income from rents and other incidental items amounted to \$6,995.24, bringing the total net profit for the quarter up to \$722,579.18.

The increased output of copper due to the slightly higher grade of ore, and to its better concentrating characteristics, reflect itself very decidedly in the per pound cost of production, as compared with either the first or second quarter of this year. For this quarter the average cost at both plants was 8.97 cents per pound for the first quarter, and 9.07 cents per pound for the second quarter, as against 9.92 cents per pound for the second quarter, and for the first quarter, the cost per pound of the net copper produced was 7.67 cents. Costs at the Copperton mill are, as always will be, somewhat higher than those at the Garfield plant, but for the quarter under consideration the condition was magnified by the Copperton plant having run for a greater proportion of the time under short tonnage, on account of the alterations, the result being the Garfield plant produced more than 90 per cent of the total copper resulting from the quarter's operations.

'COST OF MILLING.

The total cost of mining and milling was reduced, as compared with the previous quarter, by nearly 9 cents per ton of ore. The actual cost of milling at the Garfield plant was slightly in excess of 47 cents per ton. Fixed and general charges, such as general office expenses and the like, taxed against this brought the cost up to 52.15 cents per dry ton. On account of the small tonnage treated at Copperton during the last quarter the cost at this mill were naturally high. The average cost of milling at both plants after adding all fixed charges, was 47.67 cents per dry ton. The cost of a ton of ore, including incident thereto, the mine was 15.35 cents per ton. This was added the general carrying, development expenses and fixed charges per ton to retire prepaid stripping ex-

est known ore body of any company, being in the neighborhood of 80,000,000 tons of ore, an earning capacity which is in the neighborhood of \$3,000,000 a year, and the ability to mine, mill at its Garfield plant, smelt and sell copper at a cost of 7.67 cents per pound.

The mining property of this company at Bingham consists of 200 acres of mineral land, all patented. At its Copperton mill in Bingham canyon it owns land that will aggregate about 1,000 acres. The mill site at Garfield and other lands there amount to 2,400 acres.

During the past few months the Copperton mill in Bingham canyon has been remodeled and its capacity increased from 750 tons of ore a day to 1,000.

The last quarterly report of the company sent out by General Manager D. C. Jackling, as chairman of the executive committee, with C. M. MacNeill and Spencer Penrose, shows some interesting facts as to the company's progress. During July and August the Copperton mill was closed down for alterations, the Garfield mill carried practically the same tonnage throughout the last three months, the amount varying but a few hundred tons from the average for the quarter. In part the report says:

INCREASES ACREAGE.

"As predicted in the last quarterly report, the average grade and character of the ores treated were somewhat improved during the third quarter to the extent of 1.15 pounds of copper per ton of ore, although it was still a low grade portion of our ore body. Until about a year ago, as a part of the deposit was excluded from all calculations of our ore reserves, as it was thought to be too low grade to be treated at a profit, but now, on account of more recent developments having shown a slightly better average value in that particular territory than was indicated by the earlier workings,

pense, amounted to 9.83 cents per ton, making the total average cost of mining for the quarter 25.22 cents per ton. Thus the total average cost of mining and milling at both plants, including all charges, is \$2.07 cents per ton.

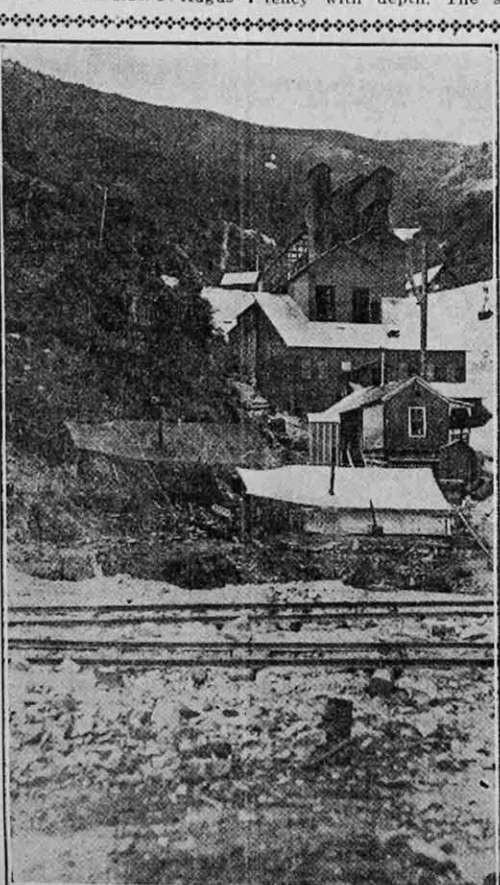
One of the greatest changes of the year by the company is the almost total abandonment of under ground work and the devoting of all its energies to steam shovel work. At present only development work is being carried on under ground and only such ore as it taken out in this work is shipped. At present a very small force is employed under ground.

The company continues to increase its areas of steam shovel work by 1,250,000 tons a month. Stripping operations during the quarter ending Sept. 30, show an average of 151,000 cubic yards per month, or a total of 453,000 cubic yards for the quarter, which was equivalent to the complete stripping of about four acres of ground, containing approximately 4,000 tons of ore. The average stripping cost per yard was 21.43 cents, this figure includes the entire cost of removing the capping, transportation and its disposal.

ORGANIZED SIX YEARS.

The Utah Copper company was organized in 1903 by a syndicate formed by D. C. Jackling, composed of C. M. MacNeill, Spencer Penrose and R. A. F. Penrose, of Colorado Springs, Colorado. They took over the group of mining claims in Bingham Canyon known as the Wall-Delamar group, and began the erection of the Copperton mill in lower Bingham and the development of the mine. Prior to this Mr. Jackling had made an exhaustive examination of the property and had become thoroughly familiar with its great possibilities.

Added by R. C. Gemmell and F. G. Janney, who had direct charge of the development and equipment of the mine and mills, the property has now become the largest copper-porphyry mine in the United States, equipped with concentrating plants operated under the most approved metallurgical methods.



BINGHAM NEW HAVEN MILL.