

THE SILVER SHIELD MINE AND COMPRESSOR PLANT.

mine in Shasta county, California, and plans are now being made to equip it with smelting facilities.

THE SILVER SHIELD.

Although Silver Shield has become almost a household word with a good many persons, it is safe to say that not one out of 10 who have bought and sold the stock on the local mining exchange during the past year have any conception of the magnitude of the development work done at this Bingham mine.

From Assistant Secretary E. H. Mead the "News" has learned that the Silver Shield tunnel has been run into the mountain for a distance of a little over 8,000 feet and recently it encountered some interesting ground. A fissure was cut a few weeks ago, but no attempt was made to raise on it owing to the tremendous flow of water. But the superintendent reports that with the present showing should it continue, he can supply the market with 200 tons of ore daily, from which a good profit can be derived, and which seems to be of a character that will carry with it light treatment charges.

Manager H. S. Joseph has diligently pushed development work, and during the past two years almost 8,000 feet of exploratory work has been performed. On Nov. 22 a second fissure was cut in the Silver Shield tunnel, about 50 feet ahead of the first one. An upraise will be run on this fissure and at the same time drifts will be run both ways.

The Silver Shield company has gone through some trying experiences in the past and shareholders became well discouraged on account of the multiplicity of assessments. But the turning point is about to come and officials of the company feel quite confident that from this time on the mine will pay its way. One thing can be truthfully said, and that is, the funds derived from past assessments have been judiciously spent and to show for it is one of the finest equipped tunnels ever built in the state. The electric haulage system is employed and the mine is in every particular fitted for the speedy and economical handling of ore.

The Silver Shield group consists of about 60 acres and adjoins the domains of the United States Mining company. The officers of the company are Henry Cohn, president; H. S. Joseph, vice president and manager; J. W. Langley, secretary and treasurer, with J. M. Solomon, Lewis Moore, D. S. Taggart and E. H. Mead, constitute the board of directors.

UNITED BINGHAM MINE.

The United Bingham has had quite a successful career up to the present time and there is no good reason why this property should not continue. Unlike the Silver Shield and a great many others, assessments have not been required to keep work going ahead. The mine has paid its own way and, in addition, is adding gradually to a surplus. It is estimated that there is \$70,000 worth of ore blocked out in the tunnel and shipments are being made at the rate of about a car load a month to the Salt Lake smelter. In order to increase the production and to insure economic mining in the future, arrangements have been made with the Silver Shield company to operate through its tunnel. With that purpose in view a cross-cut will be run from the Silver Shield tunnel to tap United Bingham vein at a distance of 200 or 300 feet. By cutting the vein at this point will give from 700 to 800 feet of backs for stoping. The ore now being shipped nets the company from \$30 to \$40 per ton.

Harry S. Joseph of Salt Lake, is manager of the United Bingham company. Lewis Moore of Cincinnati, is president and A. Hanauer, Jr., of Salt Lake secretary and treasurer.

BINGHAM CONSOLIDATED.

Bingham Consolidated is counted as one of the solid substantial institutions of Bingham. The company owns upwards of 300 acres, which includes some of the properties active in the early days of the district.

The original corporation organized by the promoters of the enterprise was the Bingham Copper & Gold Mining company. For this organization the Old Commercial, Old Hickory and adjoining properties were acquired. Later, Bingham Consolidated came into existence, the latter taking over the original company. When the matter of building a smelter came up for consideration, it was found that other than those of which the Commercial and kindred mines were producing, would be required to make up a satisfactory combination for economic reduction. The help matters to the Dalton & Lark mines were added to Bingham Consolidated.

Like the Highland Boy, belonging to the Utah Consolidated, the properties mentioned were lead-silver producers in the early days of the camp, and like it, the ores changed to copper bearing with depth; but unlike some of the mines, were opened by means of shafts sunk to the ore bodies instead of tunnels. This was particularly true of the Dalton & Lark, where shafts were put down ranging from a depth of 1,000 to 1,600 feet. Since, however, the Dalton & Lark drain tunnel has been run and the property is now just as well equipped for the economic handling of ore as any other mine in Bingham. The tunnel is about 8,000 feet in length.

The mines of the Bingham Consolidated are shipping about 400 tons of ore daily, the amount being about equally divided between the Commercial and Dalton & Lark properties. The ores from the Commercial in Upper Bingham are brought down over the tracks of the Copper Belt railroad, thence to the D. & R. G. railroad. The Dalton & Lark ores are moved over the tracks of the latter.

Besides the shipping product, there are in the mines a very large tonnage of low grade milling ore, the reduction of which will be provided for at some future date.

a depth of 400 feet; 13 adits were run from points of vantage, constituting practically a mile of tunnel workings. After thoroughly determining the value of the ground, Capt. De Lamar wanted to purchase it outright, but to this proposition Col. Wall turned a deaf ear. Neither would Capt. De Lamar sell until he made up his mind to retire from active operation in Utah camps. By this time Mr. Jackling had formed connections with the MacNeill-Penrose syndicate, operating extensively in Colorado under the name of the United States Reduction & Refining Co. Mr. Jackling, knowing about as conclusively as any one could what could be done with the Bingham property sought to purchase it and after many conferences with the principals succeeded in turning the deal. Col. Wall retaining a large stock interest in the mine.

It was a fortunate thing for the Colorado that Mr. Jackling was associated with them just at this time, for it meant the acquisition by them of interests here which will probably excel their combined interests in the Centennial State. The transaction was a fortunate one for the state of Utah, for it resulted in the bringing of many thousands of dollars to this country to be used in mine exploration and in the building up of a greater Bingham. Besides the development of the mine, more than \$200,000 was expended in the construction in lower Bingham canyon of one of the most completely equipped concentrating mills ever erected in the mining regions of the west. The initial plant, of the capacity of about 400 tons a day, went into commission about April 1 last. The demonstration with the copper leaving properties was so intensely satisfactory that it was decided to make enlargements to the mill, bringing the daily capacity up to 600 tons a day, although the plant frequently takes care of considerably more

This mine will do considerable shipping next year and may be provided with milling facilities. A few other properties in Markham gulch were worked in a small way, while over in what is known as Pine canyon, the Bingham Copper Boy and other properties have been under development. Just over the range on the Tootle side, the Bingham West Dip has undertaken the driving of a long tunnel which is intended to tap the ore bodies of Bingham at great depth. Rhode Island and Utah parties are interested in this enterprise and they feel confident of making a success of their venture.

Pioneer Ore Sampler.

Among one of the leading and most important branches of the mining and reduction industries of this state, may be mentioned that of the Pioneer Ore Sampling company, whose works are located at Sandy on the Oregon Short Line, Denver & Rio Grande, and San Pedro, Los Angeles & Salt Lake railroads.

Until the death of the late Richard Macintosh, this plant was operated by him and was known for many years as the principal sampling works of the state. On the death of Mr. Macintosh, the property was acquired by Mr. A. J. Cushing, the pioneer sampling man of this state, who disposed of the property to the Pioneer Ore Sampling company, a recent corporation under the laws of New Jersey. Of this company, J. B. Jones of Salt Lake, is president and manager; S. L. Butler, who was recently removed to this city from New York, is vice president and Mr. A. J. Cushing, the superintendent.

Since the property was acquired by this company, it has been equipped with the latest automatic sampling machinery, so that it is today, the most modern and up-to-date sampling plant in the west. In addition to the automatic mill, the company has also retained its former floor sampling machinery which was used by Mr. Macintosh, so that the mill contains two separate and distinct sampling departments. One of the features of this mill is the facility for cleaning out all ore channels. The spouts and channels are all made with curved surface making it practically impossible for clump or wet ore to lodge in the machinery. The sampling machinery proper is out in the open and is not housed in as is the case with most other sampling machinery, which makes it always accessible and easily observed to see that everything is in proper order.

The mill has a hand sampling capacity of 200 tons per day, and an automatic capacity of from 300 to 400 tons per day, making the two distinct mills with a combined capacity of from 500 to 600 tons per day.

From the hopper which holds 40 tons, the ore in the automatic sampler passes to a larger gravity crusher which reduces it 2½ inches, and thence up the elevator to the first sampler in the upper part of the mill. Here it is cut out one-fifth of the bulk which is crushed to three-quarters of an inch, while the four-fifths, or reject, passes through a chute directly to the car. The one-fifth now passes through another sampler which cuts out one-fifth of this and crushes it to about three-eighths of an inch. This process is again repeated, the reject being conveyed to the car. The sample is next cased and quartered which gives a more thorough mixing of the ore than any of the processes of riffling or split shoveling as frequently used in other mills. The quartering is continued until the required size of sample is secured for the plate. It is then dried and reduced to pulp, that passes through a 100 mesh sieve. All moisture samples are steam dried which process warrants a complete evaporation of all moisture without the danger of roasting the ore as might be done under the other drying processes.

the exact proportion or grade of sizes of the original as there is no screening or separating of coarse and fine as is done in many other mills. The sample is obtained from an oscillating spout as it passes over segments of desired extension.

The mill is provided with tracks from the S. P. L. A. & S. L., the O. S. L. and R. G. W. railroads, consequently consignments can be received from any part of the country for either of the local smelters or eastern markets. The mill was constructed with the view of being able to receive ore in all kinds of cars, including the various styles of coal cars, steel hopper cars, box cars, etc., and for this reason the large crusher was placed below the track level. It frequently happens that these steel hopper cars are sent to the mine containing clump when there is a shortage of cars for loading ore out. Formerly it was not possible to have ore sampled which was loaded in this class of cars as the mills were not prepared to handle them and it was to prevent the delay which might thus occur, and to enable the shippers to load their ore into this class of cars, that the company went to the heavy expense of installing their crusher in such a way as to overcome these difficulties.

The business of the sampler has steadily increased since it was thrown open to the public two years ago, until today it enjoys a liberal share of the ore sampling business, which is the best indication of satisfaction to its patrons.

Prompt attention and strict supervision is given to every shipment handled by the Pioneer company. Visitors and patrons are always welcome to a thorough inspection of the plant and methods, when any information desired is given in relation to the sampling methods is cheerfully given on such occasions. The main office of the company is at 215 and 216 McCormick block, Salt Lake City.

WASHINGTON CO. COPPER MINES.

While Bingham is universally recognized as the great copper camp of the state, in fact, one of the greatest in the whole country, there is a district in the extreme southwestern part of Utah which cuts quite an important figure in the production of the bronze metal. Last year Washington county contributed 1,311,626 pounds to the world's supply of copper, this production coming from the property of the Utah & Eastern Copper company, owner of what is commonly known as the Dixie mine. The company is operating a smelter at Shem City, situated on the Shoshone Indian reservation, 13½ miles from St. George and about 60 miles from Acoma, the shipping point on the line of the San Pedro, Los Angeles & Salt Lake railroad. The smelter is located several miles from the mine, it being necessary to choose the present location on account of water facilities, which are not available at the mine.

During the present year the Utah & Eastern Copper company has expended considerable money in making improvements, among which was the construction of a wagonroad to Acoma. While this section of Utah is well mineralized, its remoteness from the lines of transportation and the metal markets has seriously handicapped its speedy development. The Dixie is the only producer of any consequence in the whole of Washington county. This year's production of copper bullion will run close to 2,000,000 pounds. C. H. Doolittle is manager of the company. Some mining was done in the old Silver Reef district, but the operations there were of little importance.

uranium, vanadium, etc., have been found.

WHERE LOCATED.

The La Sal mountain region proper is located along the boundary lines between Colorado and Utah, covering the eastern portion of Grand county. Its length is about 50 miles, from north to south, while its width averages probably 20 miles. The La Sal mountains consist of a solitary group rising out of a vast andstone plain to an altitude of 13,000 feet. They are unlike regular chains of mountains; but seem to rise out of the plain. In their uplift they show no stratification from granite to quartzite, and from quartzite to limestone; the whole range seems to be granite from base to summit. Some of the peaks rise abruptly, some peering above the timber line.

RARE METAL DEPOSITS.

The scene of the rare metal deposits is near Richardson, in Grand county. A recent shipment of the ore sent to Buffalo, N. Y., netted \$6,000, after paying the extraordinary expenses attached to it. Other shipments are being made, and those interested in the Welsh, Loftis company, the owner of the mines, believe confidently that the mining of the rarer metals will become an important industry in this state and will contribute more than any other enterprise to the building up and advancement of Grand county. The ore from the Welsh, Loftis properties is mined from off the surface. It comes in a variety of colors; yellow predominates, while orange, blue and black are more or less conspicuous.

WELL MINERALIZED REGION. The country as a whole is well mineralized and contains favorable indications for the development of some good copper and gold mines, but investigations have been carried on only to a limited extent. Capital has not given the mineralogy of the region serious consideration.

DEVELOPMENT IS SLOW.

Prospecting has been carried on in a desultory sort of a way during the year, without recording results of much consequence. The work has been done by men of small means; consequently progress is necessarily slow.

NEWFOUNDLAND MINING DISTRICT.

ON THE west side of the Great Salt Lake, along the line of the Lucin cut-off of the Southern Pacific Railroad company, is situated what seems destined to become an important copper producing country. This is known as the Newfoundland district.

A Boston syndicate, known as the Boston & Terrace Mining company, has been prosecuting an energetic campaign of development and has opened its property to the point of a producer, and during the coming year will probably be a regular contributor to the local markets.

Several properties have been operated in a small way during the past 12 months, but the Boston & Terrace has been the most vigorous of its neighbors. The Newfoundland district is splendidly mineralized on the surface and geological conditions are favorable for the opening of some good mines. The greatest depth attained up to the present not exceed 400 feet.

HENRY MOUNTAIN.

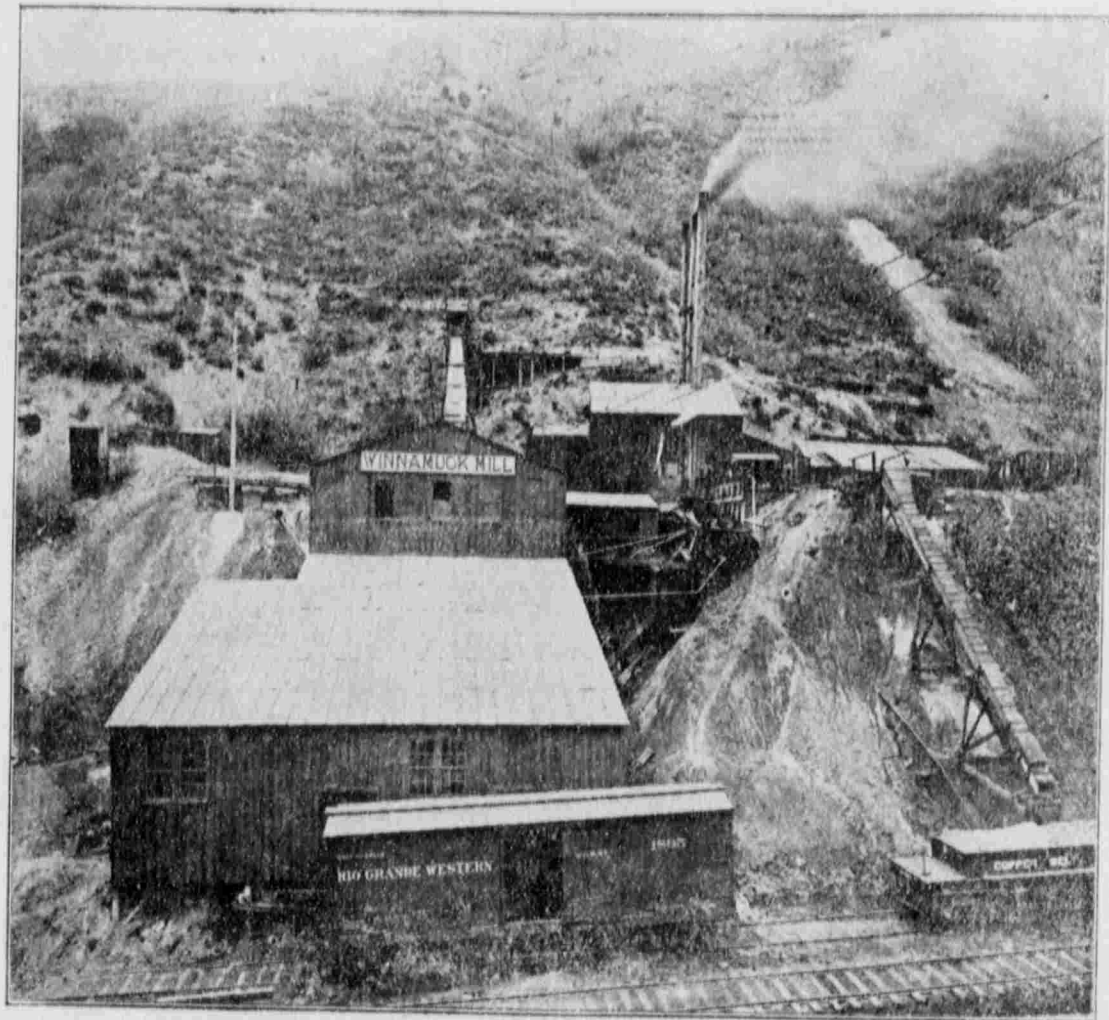
MUCH has been written and said about the possibilities of the Henry mountain mining region, located about 100 miles west of the La Sal mountains in southwestern Utah. While this district presents some interesting geological conditions, capital has not, as yet, become attracted that way. Outside of the usual amount of work done by prospectors, little has been done towards opening up this region during the past year.

STATELINE.

THIS was an unfortunate year for the citizens of the camp of Stateline, in the western part of Iron county. Excepting for the few prospectors, whose faith is still unshaken, the camp is dead. A few months ago the Johnny gold mine and mill were closed down indefinitely, emulating the example set by the Ophir, which, like the Johnny, is equipped with much expensive machinery. As to the Johnny, another attempt may be made at the redemption next year; but owing to the tremendous flow of water expenses of operation are enormous. Before much headway can be made an outlay for heavier pumping machinery is essential. As a consequence of the shutting down of the mine the camp has become practically depopulated, miners have sought other parts for employment, while business men have moved their wares to fields more inviting.

BLUE JAY OPERATIONS.

Some 30 miles north of Stateline, in the extreme southeastern part of Bea-



WINNAMUCK MILL, OPERATED BY OHIO COPPER COMPANY.

The Bingham Consolidated company is the owner of a control of a valuable position in Tintic—the Eagle & Blue Bell mine. Not long ago a Bingham official made the statement that the Tintic property was worth not less than a million dollars.

Capt. Duncan McVie is the Utah manager of the Bingham Consolidated.

THE NEW ENGLAND MINE.

The New England Gold and Copper Mining company, which is composed principally of Massachusetts capitalists, is the owner of what was once known as the Nast group, located just above Boston Consolidated. An experimental mill was installed during the year and the demonstration with it has been so successful that the company is already taking steps to increase its capacity. The Nast in the early days of Bingham was an extensive producer of silver-lead ores and the former owners realized quite a handsome profit from the shipments made therefrom. Practically all the mining has been done above the tunnel level as facilities have not been provided to handle a heavy volume of water, which would be required if sinking below the tunnel were undertaken. However, this will be done sooner or later. Some right good bodies of copper ore were encountered this year, some of which is rich enough to ship out in the crude. Crossing the New England ground are a number of fissure veins. In the respect this is unlike many other Bingham mines, there being a conspicuous absence of the characteristic bedded veins.

The company is preparing to install an air compressor plant and machine drills.

Henry M. Adkinson, a mining engineer of wide experience and training, is manager of the property.

GREAT OHIO COPPER MINE.

The Ohio Copper company is operating the group of mines formerly known as the Columbia, in upper Bingham canyon. The organization of the company was effected during the latter part of 1903, at which time the promoters, and principal shareholders in the present company, purchased the property and absorbed the original corporation—the Columbia Copper Mining company.

The territory embraced in the present company's holdings consists of about 130 acres of ground, the principal claims being the Alf's Well No. 2, What Cheer, Gold Trail, and several others. The claims embrace three or more fine ore veins carrying high grade copper ore, with a large tonnage of concentrating ore in the several veins.

Between these fissure veins there are large bodies of mineralized porphyry, the mining and reduction of which has not yet commenced, but is in contemplation for the near future.

Since commencing operations and up to the present time, the company has treated its concentrating ore in the old Winnamuck mill in lower Bingham, which has been operated under lease from the owners of the Winnamuck mine. When possession of the plant was given, it was remodeled and equipped with modern machinery and appliances, and while of small capacity, about 125 tons, has made a very satisfactory record. It is the intention of the company to increase it at once to 500 tons capacity and, next year, to 700 tons.

During the past few months, the management of the Ohio, realizing the importance of the Winnamuck properties, sought to purchase them and about the first of the present month the deal was consummated and the deeds passed. Through this transaction the Ohio company has come into possession of valuable water rights, from which a supply can be had sufficient to operate a mill several times the size of the present plant. The acquisition was, indeed, an important one for the Ohio company, for there were other companies ready for the opportunity to

do so, and willing to pay a handsome price.

The Columbia and Winnamuck properties are connected by the line of the Copper Belt railroad, over which the concentrating ore is carried from the mine to mill and the high grade ore delivered to the Rio Grande railroad for shipment to the valley smelters. At the present time the mine is considered in the neighborhood of 300,000 pounds of copper monthly.

The officers of the Ohio Copper company are H. G. Catrow, president; Alfred J. Bettles, vice president; Henry Catrow, secretary and treasurer, and Werner Zeigler, general superintendent. Henry Catrow also serves the company as its managing director and it is largely due to his energy and perseverance that the splendid success thus far has been accomplished. Mr. Catrow has surrounded himself with a competent staff of advisers, which includes Supt. Zeigler, and there seems to be no doubt that in a little time the Ohio will develop into one of Bingham's greatest producers of copper. This is the opinion shared in by mining men familiar with conditions in the camp, and there is not the slightest reason to doubt that the fact is considered that the territory owned by the company embraces a large area of the copper bearing porphyry belt in which the Utah Copper is making its almost astonishing record.

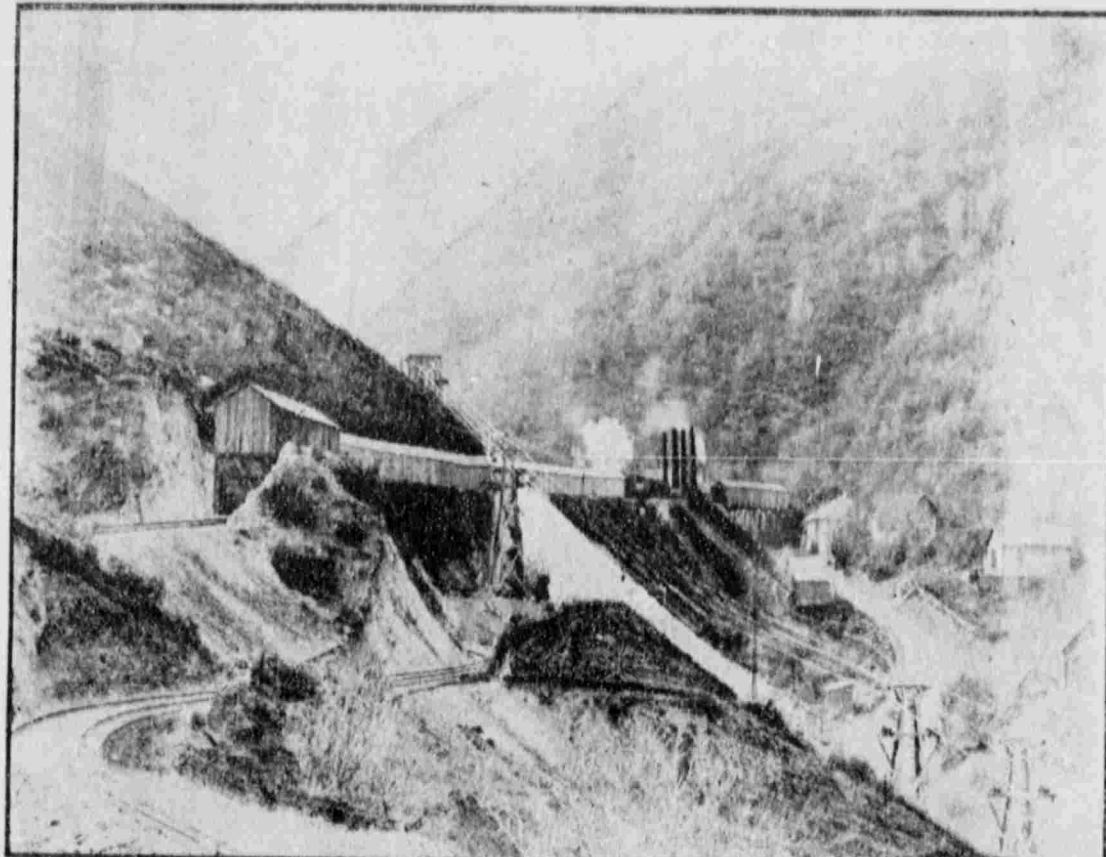
The Ohio's board of directors consists of the following: R. W. Burns, West Carrollton, Ohio; A. J. Bettles, Salt Lake City; N. J. Catrow, Miamisburg, Ohio; H. G. Catrow, Miamisburg, Ohio; Henry Catrow, Salt Lake; J. C. Carns, Massillon, Ohio; J. H. Friend, Dayton, Ohio; R. L. Hughes, Dayton, Ohio; H. L. Newell, West Carrollton, Ohio; O. A. Tibbets, Salt Lake City.

UTAH COPPER COMPANY'S MINE.

Within another year the Utah Copper company will be prepared to handle a larger tonnage and produce more copper than any other Bingham operator. As has already been stated in the introduction, this great corporation has laid plans to enlarge its milling facilities by adding such other units as will make it possible to reduce to concentrates as much as 5,000 tons of ore daily.

The Utah Copper, beyond any question, is a stupendous enterprise and its importance to the mining world has scarcely begun to be appreciated, so quietly, and conservatively, has the proposition been worked out. Some of its propositions can be realized from a statement made not long ago by an officer of the company, who declared that there is now at least 20 years of reserve ore in sight, figuring the extraction at about what it is at the present time between 600 and 700 tons per day. Indeed, there are few mining propositions anywhere that can begin to make any such showing as this and when it is considered that the present management has performed this feat in only about two years' time the result is simply amazing, to say the least. What the Utah Copper will eventually develop into can only be conjectured, of course, but that it will do its share towards making a greater Bingham goes without saying. It will be recognized as one of the world's greatest copper mines.

The domains of the Utah Copper company covers a portion of what is commonly called the copper bearing porphyry belt of the camp. It was not many years ago that this ground was considered to be practically worthless. The territory lies on both sides of the canyon above the main town of Bingham and was formerly the property of Col. Enos A. Wall, the present vice president of the company. In 1899, Col. Wall sold a quarter interest in the property to Capt. J. R. De Lamar. Mr. D. C. Jackling, now general manager of the company, was in the employ of Capt. De Lamar at the time, and conducted the examination, which culminated in the purchase mentioned. Drill holes were put down to



THE YAMPA MINE.

in a day's run. In its enlarged form, the mill went into service about Oct. 1. The new plant to be built next year will be four times the size of the present one and will be erected in units of 600 tons each. The concentrate produced runs about 23 per cent in copper. In the development of the mine this year work has been going on at a vigorous pace. Altogether about 22,000 feet of workings were run, consisting of tunnels, drifts, upraises, etc. Of this amount, 5,000 feet were run on the main level and includes 27 raises. At the present time the management is engaged in stripping the surface capping from an area preparatory to the process of quarrying. Ore is being sunk, the purpose of which is to open up an extension of the Alf's Well and What Cheer veins, from which wealth is being extracted in the ground of the Ohio Copper company, adjoining. Ores are conveyed from the mine to the mill below, over the lines of the Copper Belt and Denver & Rio Grande railroads.

The company acquired during the year some valuable water rights, which includes a large spring at about a mile east of the old Garfield Beach resort on the south end of the Great Salt Lake.

The Utah Copper company is capitalized for \$4,000,000, divided into 400,000 shares of the par value of \$10 each. The officers of the company are Charles M. MacNeill, president; Enos A. Wall, vice president; Spencer Penrose, secretary and treasurer; D. C. Jackling, general manager; with Charles L. Tutt, R. McLaren and J. D. Hawkins, constitute the board of directors. The executive committee consists of Messrs. MacNeill, Penrose and Jackling. The mill is under the careful and efficient superintendency of Frank Janney, while the mine development and ore extraction is directed by a thorough miner—John McDonald.

BUTLER-LIBERAL AND OTHERS.

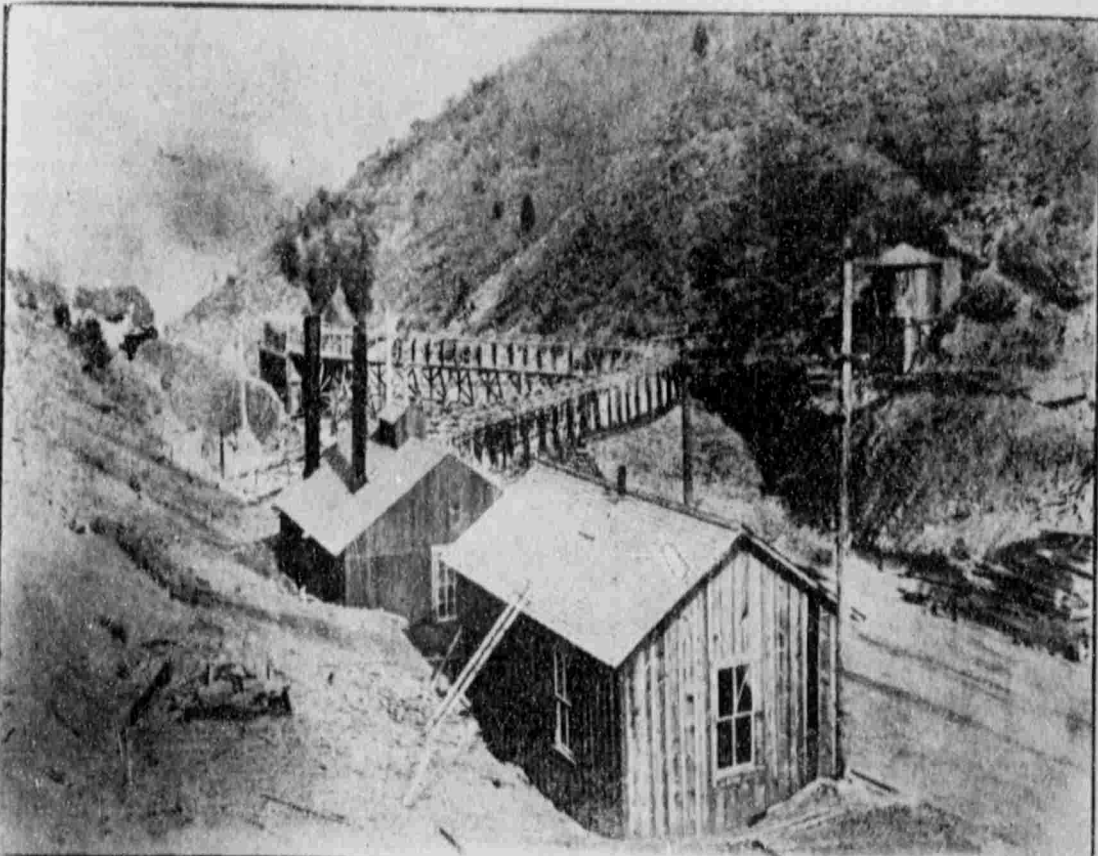
The Butler-Liberal, one of the progressive companies operating in Markham gulch, has added a number of improvements during the year, which include new hoisting and compressor plants. An active campaign has been carried on throughout the year, and energy has been directed towards the opening of the copper bearing ore zone.

The floor sampler is used for the handling of concentrates, and for such other ores as may preferably be sampled by this method when so required by the shippers. The entire mill is regularly cleaned between lots which prevents any salting or reduction in assay values of different ores which are sampled in this mill. The fraction or sample taken contains

LA SAL DISTRICT.

THAT vast territory, which embraces the La Sal mining district in southeastern Utah, has been the scene of little activity during the past year outside of the attention paid to the opening of the properties in which the rare metals—tadium,

ver county, some mining is going on. The Blue Jay Extension Mining company is carrying on operations in an unexplored area with every prospect of success. The year's developments at this mine have been encouraging indeed. Around Modena some prospecting has been done, but no important strikes have been heralded. The region is as inviting one, however.



MINE OF THE UTAH COPPER COMPANY.