Bingham Now One of the World's Biggest Copper Camps

The Town of Bingham From Red Wing Hill

Camp is Now Famous in All the Big Financial Centers.

ing men are directly connected with the development of the mines in Bingham, Samuel Newhouse was one of the first to realize that, as - copper camp, it had a wonderfully bright future. Later came the Guggenheims; while the latest adherent, of international reputation, to drive his of the Utah Copper, Boston Consolistakes there is the man who, during dated and Utah Apex companies. The a series of years, waged relentless warfare against the Amangamated Copper company in Montana-F. Augustus Heinze,

18

There are other big men associated with mining affairs in the greatest of all Utah's copper camps and it would be an injustice to them if such persons as Col. Enos A. Wall, Captain Duncan McVichie, Thomas Weir, D. C. Jackling, A. F. Holden and A. J. Orem, were overlooked. A good many more might be mentioned as having contributed largely towards the upbuilding of the camp, but the above named are entitled to a place of honor among those who have not only aided in solving the difficult metallurgical problems, which stood in the way of the camp's progress a few years ago, but who have been instrumental also in presenting the attractions of the West Mountain district to the eastern investor. It was not very many years ago when Bingham was little heard of and its production of ore was a secondary consideration as compared to some other camps of this state. But to go to the financial centers of the earth now and ask about Utah Consolidated, Boston Consolidated, Utah Copper, United States Mining, Bingham Consolidated or Utah Apex, the chances are 100 to 1 that the inquisitor would not encounter the slightest difficulty in ascertaining the location of these mines. The camp has become as well known as Butte or the regions of Lake Superior and gives promise of surpasing them, in the due course of time, in the production of copper.

OME of the world's biggest min- | period of preparation for Bingham; for while new mills and smelters have been building, or the existing plants enlarged, managers of the various mines have been making ready for the call that will be made upon them during the early part of 1907. The great center of interest has been about the properties first two mentioned have introduced the steam shovel method of mining and have several machines in the copper bearing porphyry belt engaged

in stripping the ore of overburden. By the time the Garfield mills are ready; the mines will be ready to supply them with ore. The Utah Copper will want 7,600 tons per day and the Bos-ton Consolidated plant, when all the units are complete, will require 5,000 tons; the Utah Apex and Utah Developvill start with 300 tons a the Ohio Copper has plans well matured to build additions to its plant and the Yampa Smelting company, oversting the only smelter within the limits of the West Mountain, or Bingham district, is adding more furnaces. It is estimated that the present daily output of ore from the mines of Bingham is between 3,000 and 4,009 tons; but a year from will probably be between 15,000 and 20,000 tons.



ore per day. This company depends on the Copper Belt railroad to transport ore from mine to smelter. A right of way for a tramway has been secured, however, and a system will probably be put in during 1907. The company employs about 180 men in the mine and 175 at the smelter.

NEWHOUSE AND BOSTON CON. Boston Consolidated is a promotion of Samuel Newhouse and he looks upon it as being his most successful one. There is no doubt but that the Boston will become a big producer of copper and one of Bingham's substantial dividend payers. In reality there are two mines in one and they have been designated as the sulphide mine and the porphyry mine. The latter covers an immense area of territory and the company has two steam shovels engaged in clearing the surface of overburden preparatory to sending the orc by rall to Garfield, about 18 miles, to undergo treatment. The company is constructing a large concentrating plant there and will use stamps for crushing. The porphyry de-posit of the Boston Consolidated has been proved over an area 3,000 feet long by 2,500 feet wide and through it are disseminated with wonderful uni-formity, small crystals of bornite, chalchalocite and chalcopyrite. The rock assays from 1% to 2% per cent copper and is overlaid by overburden, or waste, ranging from 20 to 70 fect in thickness. This waste, after being moved by the this waste, after being moved by the steam shovels is loaded into cars and conveyed to a nearby guich and dumped. In this process the whole top of a mountain is being taken off and eventually, the mountain itself will come down, as it yields up its treas-ure boxes of ore. The porphyry mine is opened to the extent that to ascer-tain some idea of the tonnage in sight figures which fairly stagger can be ob-tained. One engineer who had occasion to examine the mine recently figured that the bornite and chalcocite, secondary enrichment minerals, averaged 200 feet in thickness through the area would contain 125,000,000 tons: if 300 feet thick, 187,500,000 tons of ore. Mr. Newhouse and his staff have made a very careful investigation of operating costs and they figure that the ore can be mined and marketed for as low cost as \$2.10 per ton and it is figured that a recovery of from 25 to 36 pounds of copper and from 30 to 50 cents in gold will be obtained from each ton of ore. It will cost the Boston company 27 cents per ton to haul its ore to its Garfield mill; the basis of concentra-tion is from 20 to 22 tons into one, and it is figured that the mill as it is being constructed will make a very close It is expected saving of the values. It is expected that the plant will go into commission before next June. It is estimated that there are more than 1,000,000 tons of ore in sight in the sulphide mine which carries an excess of iron; the copper runs from 2½ to 3 per cent, and the gold and silver values from \$2.59 to \$3 per ton. It is claimed that the Boston Con-solidated company will be able to prosolidated company will be able to pro-duce copper at a cost of not to exceed 8 or 9 cents per pound, perhaps less. With its proposed mill in service and the price of copper where it is today, the company should earn annually around \$4 a share on the 625,000 shares cutstanding. With greater mill fa-cilities, the earnings, of course, would be correspondingly greater.

ground to a considerable extent, Capground to a considerable extent, Cap-tain DeLamar did nothing more. One of the engineers in charge of the work for Captain DeLamar was D. C. Jack-ling, who afterwards became manager of the properties of the United States Reduction & Mining company of Colo-rado. Mr. Jackling knew what the possibilities of the enterprise were, and interested his United States Reduc-tion associates, resulting in the acinterested his United States Reduc-tion associates, resulting in the ac-quisition of the DeLamar interests. Later, enough of Col. Wall's interest was purchased to give them a four-fifths' interest in the property. Then came the organization of the Utah Copper company; the development of the property upon a bread scale and the property upon a broad scale and the crection of the mill near the e-trance to Bingham canyon. Fluw were laid for the building of a lage mill near Garfield, but before they sa carried into execution, the greater p tion of the United States Reduct company's holdings were acquired Guggenneim Explo and an option given on the remainder. Since then, an issue of \$3,000,000 worth of bonds, convertable into new stock at \$20 per share, has been issued, and their conversion will bring the capita stock of the company up to 600.000 shares. It was in this way, together shares. It was in this way, toget with the earnings from the mill operation in Bingham canyon, that the company acquired money with which to carry out its campaign at Garfield The Utah Copper company's proper occupies the bottom of the n canyon, and extends for a ham siderable distance up on both sides. It has been developed about 3,000 feet one way, and 2,500 in another. One ca enter a tunnel on the right hand sid of the canyon near the lower end of the property and, after traveling for miles in the development openings, come to the surface on the left hand side of the canyon, within 200 er 30 feet of the starting point. The same uniformity in values char-acteristic of the Boston Consolidated ores exists in Utah Copper with the possibility that the copper contents range from 16 to 14 per cent higher and that the secondary enrichment zone is 200 feet wider than it has been found in the Boston Consolidated. This means that the whole mass will average about 2 per cent copper at use the language of a shareholder discussed the possibilities of the h "If the new m not long ago: be made to save 28 pounds of co. from each ton of ore, together from 40 to 50 cents per ton in from 40 to 50 cents per ion in the precious metals, the property should eventually pay more money in divi-dends than has so far been distributed by all of the great and wonderfully profitable mines of the Lake Superior copper district." While the ore to be treated in Utah Copper company's Garfield mill is Copper company's Garfield mill identical in character to that to through the Boston Conselldated pla the method of treatment will many respects different. Restead of stamps, will be used for ing. to be followed by grindin Chilean mills to a fine put ing, to be followed by grants Chilean mills to a fine pulp pass it through extremely fine screens, making it—viewed fro standpoint-a milling osition at the start. that the mill will save 1 75 per cont of the conte ore. The present costs of around 65 cents per ton. the company begins mining o steam shovels, this will be great sened. It is figured that whe Garfield mill goes into com-that the company should be produce 70,000,000 pounds in There are not very many mines anywhere that are bigger than the Utah Copper of Bingham. The ore bodies of this property consist of low grade mineralized porphyry described in ref-

How Modern Mining Methods Are Changing Topography.

Modern Steam Shovel at Work

MANY CHANGES WROUGHT.

So many changes have been brought about in Bingham during the past year that it has been a difficult matter to keep track of them, A wonderful transformation has been taking place. New interests have become identified with the camp resulting in the transfer of some of the biggest mines of the district. The taking over of the Utah Copper mine by the Guggenheims, or American Smelting interests, and the reorganization of that corporation, was one of the important events of the year; the advent of Helnze in Bingham Consolidated was another of more or less moment; the acquisition of new territory by the Utah Apex and Utah Development companies followed by the organization in Boston of the Markham Gulch Milling company marked the begining of a new era in the history of those concerns who are jointly interested in the milling enterprise; the Bingham Consolidated has added new ground to its territory. Quite a number of new companies have been formed. The camp has also grown rapidly in population and hundreds of thousands of dollars have been expended in permanent improvements.

TREMENDOUS PROGRESS MADE.

While Bingham has been making tremendous advancement during 1906, the production of the camp will probably show no material increase over last year Nevertheices, railroad facilities of the district have been taxed to the limit and until the transportation situation is improved, the tonnage going to the m'lls and smelters cannot be greatly augmented. But this is being done. The new mills of the Boston Consolidated and Utah Copper, now under construction at Garfield, as well as the building of the Garfield smelter, has made another line into Bingham canyon a necessity and its construction has been in progress during the greater part of the year.

A PREPRARTORY PERIOD.

#### COPPER PRINCIPAL RESOURCE.

While the mining of copper ore repre sents the principal resource of the dis-trict, the production of Isad ore is by no means unimportant. The United States Mining company finds it profita-ble to extract lead ore from its Galena mine; the Bingham Consolidated from its Lark and Lead mine yeing Lead its Lark and Lead mine veins. Its Lark and Lead mine vens. Lead cuts an important gure in the shipments being made from the Phoenix and the same is true with the Utah Apex, Utah Development, New England Gold & Copper and Ringham-New Haven mines. The lead ores at present being worked range from 15 to 25 per cest lead and from 5 to 15 ounces in silver. The copper ores are two general types, viz, sulphide ores occuring in the line: The copper ores are two general types, viz., sulphide ores occuring in the line-stone as replacement denosits, and the siliclous ores. The replacement ores are characterized by a heavy excess of from and carry from 2 to 18 per cent copper, averaging about 3 to 3.5 per cent as mined. The copper ores also carry from \$1 to \$4 in gold and some silver. The replacement ores are treated by The replacement ores are treated by smelling. The silicious ores are of two general types, viz, the low grade por-phyry ores averaging about 2 per cent copper and .03 in gold, which under ge

the process of concentration, the prousually have an excess of from 10 o 15 per cent silica and in that condition is sent to the smelter. The second type of silicious are occurs in the fissure deposits of the quartitie. This ore in also of a concentrating class and when treated shows an iron excess of from 5 to 15 per cent.

TYPE OF ORE DEPOSITS.

The ore deposits are of the three general types, viz, the true fissure veins. replacement deposits in the limestone porphyries. But the true fissure deposaccording to well informed engineers, are rare. Among them are the Galena, Phoenix, Winnemuck and some of the velus found in the Columbia mine of the Ohio Copper company. With the exception of the latter all are lead deposits.

The replacement deposits are mainly copper ores, but therefore some replace-ment of lead in the limestone where the lead fissurs have cut it. These mineralizing fissures have a general north-east-southwest direction. Wherever they have out the different bands of limestone the ore bearing solutions have had a chance to est out in the lime and form large deposits of ore extend-ing laterally from the fissure along the east and west striking limestone. Where the fissures are in quartzite, there has been no mineralization, and the fissures are small in addition to being practic

PORPHYRY ORES LOW GRADE.

The porphyry ores are low grade. They consist of brecclated monzonite porphyry, which has subsequently been mineralized, mostly with chalcocite and bornite of copper. This porphyry shows up more pronounced in the property of the Utah Copper and Boston consolidat-ed, although it extends into the Starless group, gwned by Col. E. A. Wall, and through portions of the Ohio Copper company's ground. company's ground.

The principal mining of the district is carried on by big companies, although there are a great many small proper-ties being operated on a smaller scale and profitably.

GREAT UTAH CONSOLIDATED.

The Utah Consolidated has been op-The past 12 months might be termed a other mine in Bingham. In the early 1. Boston Con.'s Porpyhry Mine. 2. Utah Copper. 3. United States Mine. 4. Starless. 5. Last Chance. A. New England. 7. Boston Con.'s Sulphides Mine. 8 Bingham Central. 9. Utah Consolidated. 10. Yampa. 11. Utah Apex Tunnel.

days it was considered to be a gold i smelter an average of 900 tons of ore, in the lower part of the camp for mine and was equipped with a cyanide mill for the treatment of gold ores which turned out to be the capting to which turned out to be the capital to immense deposits of copper ore. The mine was operated at the time of the construction of this mill by the High-land Boy Gold Mining company and the management was under the direc-tion of Samuel Newhouse and Thomas Weir, who after the mill failure, turned their attention to the development of the property as a corner raine and built the property as a copper mine and built a smelter near Murray. Before the latter went into commission, however, a deal was negotiated which resulted in the transfer of the property of the Highland Boy Gold Mining company to the present owners, who organized the Utah Consolidated which began its ex-Usan Consolidated which began its ex-istence as an English corporation, but was later Americanized. The manage-ment of the mine was placed in the hands of R. H. Channing, Jr., and he has developed it into one of the richest copper mines in the world. During the present year the orgenerative heave been present year the ore reserves have been greatly added to and the writer has been informed from a relia le source that been informed from a role is source that the new one body exposed in the north-son part of the property is not only the largest, but the richest body of ors ever exposed in the mine. When the surfike became generally known, the company's stock took a decided jump. The new ore body was found in ex-plaratory duffic to what is known as ploratory drifts in what is known as fault 13%, about 2.000 feet west from the ore body in which the company confined its original operations, ore carries values of from 8 to 9

ore carries values of from 8 to 9 per-ceat copper and about \$4 in gold with the characteristic values in sliver. The entire operation of the Utah Con-solidated have been confined to a strata of limestone about 2,000 fest long and 300 feet wide, which is tilted to an angle of about 40 degrees and cut lengthwise by a narrow dyke of norphyry

by a narrow dyke of porphyry. The last annual statement of the com-pany indicated that there were 1,000,000 tons in sight; this was before the last ore body was encountered and ai englneer who subsequently made an invesligation has expressed the opinion that the above figures are ultra conserva-tive. The Utah Consolidated company, during the year, has run through its

per day which is brought down to lower Bingham over an aerial tramway and there loaded into railroad cars and conveyed to the place of reduction. The copper produced from this ore will run close to 20,000,000 pounds-perhaps a little in excess of that amount-at a cost of between 4 and 5 cents per pound. Say the cost is 5 cents ar., ropper is worth 20 cents a pound, it does not take much of a mathematician to figure out how the company's profits have been running. According to hourse given out at the eastern office of the corporation not long ago, it was ascertained that the mining costs run about \$1.80 per ton, of which from 27 to 35 cents is used up in doing exploratory work. It costs 7 cents a ton to move one over the tramway and 40 cents per ton for freight to the smelter, while the roasting, smelting and converting costs run under \$2 per ton. Before the com-strika te yield was a little better than any began smelting ore from the new 60 pounds of copper to the ton and be-tween \$3 and \$4 in gold and silver. At the beginning of the year, according to the annual statement last issuel, the company had a surplus on hand of over \$1,500,600 and it is claimed that the earnings this year will be in excess of \$1,200,000 after meeting dividend requirements and expenses. It is not im probable that the management will conclude to provide additional smelter equipment in 1907. There is talk of bringing the ore treating capacity smelter up to at least 1,000 tons perhaps to 1,200 tons per day the and perhaps to 1,200 tons 1 Utah Consolidated heads the Utah dividend payers this year. It is believed however this year. It is believed, however, by many that he company will conclude to erect an thi

entirely new plant, perhaps in some other location than the present one. UTAH APEX FORGES AHEAD.

While Utah Apex is not as far along as some of its neighbors in the way of development it gives promise of devel-oping into a big and profitable mine and it is estimated that it has a half million tons of commercial ore in sight besides a large tonnage of concentrat-ing ore which will go to the plant of the Markham Guich Milling company or which is handling about 500 tons of

treatment. Two-thirds of the tonnage in sight is said to be copper and the balance lead-silver ore. The smelling of the Utah Apex average highest of any yet produced in the Bingham camp and the composition of them is such that it is not infrequent. that the company has received a premium on them from the smelter of from 5 to 50 cents per ton. In other instances the smelting costs run as low as 5 cents per ton. Generally speaking, there are probably no mines in the camp of Bingham that get off as easy at the smelter office when it comes to making settlements. Utah Apex copper ores yield about 3½ per cent copper, \$5 in gold and from \$ to 19 ounces in allver and the average of all the ores the company has shipped has been better than \$5 in gold and \$4.50 in silver to the top. The lead ores run from 15 to 60 per cent lead and from 10 to 160 ounces in silver. The Apex ore bodies are not as large as those found in some adjoining properties but this deficiency is largely settled for in the richness of the ore. There are five parallel years which occur between footwalls of the limestone and regularly alternating quarizite beds, which trav-erse the property from east to west. The company built an aerial tramway this year to convey ore from the mouth of the Andy tunnel to ore bins in Carr Fork gulch and which are to be reached by a spur from the Copper Belt railroad. New power equipment was also added. In the meantime the company is prosecuting work in the Parve-nue tunnel which will eventu-ally become the main avenue through which the mine will be operated in the future. Walter C. Orem is manager of future. Walter C. Orem is manager of the Utab Apex company, also of the

#### Utah Development. YAMPA MAKING MONEY.

Conditions in the Yampa mine, operated by the Tintic Mining & Develop-ment company, are very much the same as those existing in the Utah Apex which is adjoining. This com-pany has passed through some trying

## Began as Placer Mining Camp.

Mineral was first discovered in Bingham canyon in 1863, following which placer mining for gold was carried on successfully for a number of years. Many of these old placer workings can yet be seen. Lode veins were also found in the '60's and up to a few years ago gold, silver and lead ores constituted the camp's principal mineral production. But the development of immense copper deposits in the Highland Boy mine marked the beginning of the copper era and now Bingham is referred to as a copper camp although its mines continue to contribute large tonnages of silver-lead ores to the smelters.

produce 70,000,000 point annually. In the exhaustive examination of the Utah Copper mine by Guggenhein engineers over 1,000 samples were tak-en from the ore body and scaroly any one of them varied over one quarter of 1 per cent. The basis of concentration is about 20 tons of er erence to the Boston Con. The big copper magnates of the country did not begin to appreciate the magnitude of the camp until this company dem-instrated the practicablility of treatconcentration is about 20 tons into one ton of concentrate.

### BINGHAM CON. A BIG ONE.

The Bingham Consolidated Mi The Bingham Consolidated A and Smelting company is anoth Bingham's big concerns, yet lik United States company. It doe confine its operations entirely to camp. But it owns the Daib Lark, Commercial and some mines in the Bingham district. Commercial has between 300.00 350,000 tons of ore in sight probably contain 2 per cent c and \$2.50 per ton in gold and as per ton. The ore is in two bodia both of them carry an excess of and strike ore is in two boars both of them carry an excess of The Brooklyn vein is about 18 wide and approximately of the grade as the Commercial ore def with the exception that the contents are greater while the with the exception that the solu-contents are greater while the solu-is smaller. The lead mine velo has been opened extensively at the Mas-cotte tunnel level, and gives promise of making into a big mine, perhaps the largest in the Bingham Consolidated group. The velo at one place is 160

# ing these great porphyry deposits. The success achieved in this undertaking set mining men to thinking and the lessons learned in Bingham are being lessons learned in Bingham are being applied advantageously in the opening of other copper camps. Conditions are somewhat similar in Ely, Nevada, so the solving of the problem of ore treatment for that camp turned out to be easy. But to Col. E. A. Wall be-longs the credit of straightening out some of the things which stood in the way of progress at Bingham File.

some of the things which stood in the way of progress at Bingham. Fli-teen years or more ago he acquired the ground now owned by the Utah Copper company. Although the price of copper was low then he could see the light ahead. He believed that the time would come when the low grade perphyries would be profitably han-died. Realizing that it would require the investment of a large amount of capital to carry out the enterprise. But others could not see as he did; that the time would come when the ground would form the basis for a wonderfully profitable concentrating enterprise. Finally, the colonel interprise. Finally, the colonel interested Captain J. R. DeLamar, to whom he trans-ferred a one-half interest in the prop-erty. But beyond prospecting the

UTAH COPPER'S MAGNITUDE.

of the