

The YEAR with UTAH SMELTERS.

Every preparation is being made to bring Salt Lake Valley to the front rank of smelter districts. With the completion of the work now outlined, the territory adjacent to the city will be furnished with three of the most modern plants to be found anywhere in the United States. In addition to employing many hundreds of men these smelters are valuable as tending to throw Salt Lake into greater prominence as the natural center of the rich mineral districts on the Western Slope of the Rocky Mountains. Already Idaho, Wyoming, Nevada and Arizona furnish ore for reduction in this valley and this condition will be much more pronounced in the near future. The completion of these plants means the expenditure of \$1,500,000.

A GIANTIC PLANT.

The past year has witnessed the start on what is to be the most complete smelting plant in the world. The site was selected near the old Germania smelter at Murray, about 2 miles south of Salt Lake City, and the American Smelting and Refining company is now proceeding with its erection. When completed the plant will be able to take care of 35,000 tons of ore per month. In addition to this vast quantity of ore, 2,000 tons of lime rock for fluxing purposes, 2,000 tons of coke and several hundred tons of coal each month. To operate the complex machinery of such an immense plant, will require engines having a capacity of 1,700 horse power. The power to run these engines will be furnished by seven Scotch Marine boilers having a diameter of 10 feet. These boilers are now being made by the E. P. Allen company. The Gates Iron Works company will furnish 10 Brunswick cylinders while the structural steel for the buildings will be furnished by the Gillette-Herzog company of Minneapolis. The smoke stack will be built of brick and when completed will be 35 feet high. The diameter inside will be 20 feet. Up to December 8th about 150 feet of the big stack had been completed. The contracts have not nearly all been let yet and it is probable that owing to delays in the delivery of the

engines and boilers as well as structural steel, the company will not have the plant in operation before next June. The manipulation of the plant will require about 1,500 men. It is to be fitted so that either steam or electricity may be used.

THE HIGHLAND BOY.

In addition to the magnificent smelter to be completed by the A. S. & R. company, Salt Lake Valley will be equipped next year with one of the largest copper plants in the West. The present plant of the Highland Boy near Bingham Junction is already one of the most successful in operation anywhere, but early next year it will make a new record for itself because of its present capacity being doubled. This will give the company a capacity of from 400 to 500 tons per day. The new work is nearly completed, and it is estimated that the new addition will be started up soon after January 1st, at which time the company will be able to send to the Eastern Refinery about 1,000,000 pounds of copper-gold bullion per month.

In passing, it might be said that the estimate given on the first mining page of this paper, of the Highland Boy output of copper for the year, falls short of the actual figures by more than 1,000,000 pounds. The estimate was based on the report for the fifteen months ending June 30th, 1900. This, it is termed, is not a correct estimate because for the first three months of that time the smelter did not do as well as it has done during the present year. At the present price of copper this would mean an increase of at least \$175,000 in the "News" estimate of the copper production of the State which is otherwise approximately correct.

The plant when completed will consist of 3 wetty roasting furnaces, 8 McDougal roasting furnaces, 3 converter stands. The sampling mill and power plant were built with the idea of ultimately enlarging the plant and no changes are therefore needed now. The engines have a capacity of 500 horse power. A new 250 horse power horizontal boiler has just been added, making three now installed. In addition to this 250 foot stack has been added to the coal bins and the warehouse capacity has been doubled. No delays to speak of have been experienced in

the delivery of material, and excellent progress has been made with the construction work, which makes it probable that the company will start up the plant about January 1st.

A great many changes have also been made at the mine to enable the company to economically handle the increased tonnage. In future the ore will be dropped to the lower tunnel at the mouth of which the new train terminal has been placed to convey it to the railway in Bingham. A very compact building has been built there, which covers a new 15-drill compressor, and also the engine which operates the tramway. In the building are also ore bins and coal bins, the latter to receive the coal which will in future be conveyed from Bingham by the tramway instead of being hauled by teams as heretofore. It may be said in conclusion that in its method of handling the ore and in the equipment of the smelter, the company has not omitted anything that money can buy to make the plant thoroughly up to date in every particular. At the close of 1901 it will be found that the Highland Boy will take rank with the big copper producers of the country, for on the basis of what the plant has done this year the doubling of the capacity will no doubt enable the company to turn out 11,000,000 pounds of copper bullion next year.

PARK CITY SAMPLER.

During the past twelve months, from December 1st, 1899 to November 30th, 1900, the Mackintosh sampler at Park City has handled 73,000 tons of ore, which represents the year's output from seven mines. The tonnage handled by the sampler during the year does not differ materially from that of 1899, which speaks well for the stability of the camp. It is likely that the year 1901 will show an increase in the output, as several prospects are opening up good bodies of ore. The above output represents an average of 230 tons per day sampled by the Park City mill. Some improvements have been made at the mill during the year. Automatic samplers and track scales have been put in at a cost of \$3,000, which has lessened the cost of sampling. The shipments are headed, it will be seen, by the Silver King, which has shipped nearly half of the gross ton-

nage. The Daily-West takes second place, with more than one-third of the output, while the other shipments are divided between the Ontario, Anchor, Apex, Valeo and Crescent. Following are the amounts shipped by each company:

Silver King	67,354.589
Ontario	11,429.045
Daily West	50,712.805
Anchor	14,742.480
Apex	1,203.119
Valeo	588.920
Crescent	85.360

146,601.370

THE PIONEER.

Shipments to the Pioneer Sampling Mill from the Little Cottonwood district have increased this season, and still continue, notwithstanding it has taken about ten days' steady work to clear the roads from the effects of the last storm. The principal shippers this season from that district have been the Albion, Grizzly, Darlington, City Rock, Vallejo, Regular, Montezuma, Ohio River, Columbus, and Homestake. From Bingham and the gulches south has also come a steady stream, namely from the Fortune, Yosemite, Dalton & Lark, Eagle Bird, Reverse, June Blossom, Lucky Boy, Sampson, Congor, Neptune, Saratoga, and others. From Big Cottonwood, the Eclipse, Oregon and Maxfield, the Hidden Treasure at Stockton, while the usual shipments from the Diamond, Excelsior, Silver West and others in Nevada. The Cheekmate in Idaho has also shipped a good deal of ore. Also the Wild Dutchman, Orphan and Miller, in American Fork.

While the Pioneer has unexcelled facilities for handling ores over other line of railroad, having tracks from both roads in its yards, it has also the best facilities of any other sampler for handling the large output of team ore that has come down into the valley this season. The discontinuance of the Alta tramway has necessitated the employment of a large number of teams in that canyon the last two summers, and the entire output, practically, has been handled at the Pioneer, where there are unexcelled facilities for unloading and storage. The total receipts at this mill

for the year, with part of December estimated, have been 24,912 tons.

THE BINGHAM SMELTER.

The plant was built by the Bingham Copper and Gold Mining company to smelt the enormous amount of iron sulphides containing copper, which they have in their mines at Bingham canyon, together with silicious ore, the resulting product being an iron and copper matte.

Metallurgically the process covers the smelting of raw ore in blast furnaces, the carrier being a copper and iron matte, and the amount of carrier being controlled in a general way by the partial elimination of the excess sulphur in the furnaces and the addition of silicious ore to the charge. The plant is not strictly pyritic, as coke will be used and no provision is made for hot blast. In fact, to tersely state the proposition, the plant is built to concentrate 300 to 400 tons per day of generally low grade raw ores just as they come from the mines, both iron sulphides and dry silver and gold ore, into 40 to 60 tons of matte which will contain all the copper, gold and silver, and part of the iron and sulphur, all the rest of the charge going into the slag and over the dump.

THE PLANT.

The plant is located at Bingham Junction and is connected by switch track with the Rio Grande Western yards at that point, and has a complete system of tracks consisting of one elevated track, from which the steel dump cars are unloaded, two tracks on ground level for unloading ore, fuel and fluxes not in dump cars, and one track down on the furnace floor, over which the matte is shipped out. Between the Rio Grande yards and the smelter is the 90 ton registering beam Fairbanks track scales, set in cement and granite, set up and adjusted by Jones & Jacobs and are second to no scale in the United States.

The smelter building is built on a terrace, dump elevation 35 feet, furnace floor elevation 14 feet, charging floor elevation 16 feet. The furnaces were designed and constructed under the direct supervision of W. H. Nutting, superintendent, by the Denver Engineering Works company, and are three in num-

ber 40 inches by 175 inches at the tuyeres and have a minimum capacity of 125 tons net ore each per twenty-four hours. The building is steel structure covered with corrugated iron. Furnace room floor is a steel plate, and the dust fine and stack of steel were all furnished by the Gillette-Herzog Mfg. Co.

The building comprises the ore receiving department, including bin room for 12,500 tons of ore, fuel and flux, the sampling and bricking department, the furnace room and blower and motor room. The plant is in round figures 450 feet long and 150 feet wide, and covers three elevations, all material being handled down from cars to slag dump. The dust saving devices include downstrokes from the furnaces into a steel ladle on shaped dust 150 feet long and then 241 feet of expanded metal and cement plaster dust fine leading to main stack which is 220 feet high by 12 feet diameter. The charging floor is mostly of concrete and is the first smelter floor to be built of this material on an extensive scale.

The motive power will be furnished by the Utah Light & Power company, and will operate four 75 horse-power motors, and also light the plant with a 300 light and 250 incandescent lamps. The blast for the furnace is provided for by 3 No. 7½ Motor Blowers, which will be run by 3 motors.

The smelter site comprises about 55 acres and extends from the Rio Grande Western yards to the Jordan river, and stands unrivaled as to elevation and railroad and water facilities. The laboratory is complete in every detail, and is in charge of a chemist of ability and experience, and the company proposes to sample and analyze all their ore in a systematic manner. Mr. W. H. Nutting has been with the company from the first as superintendent, and the excellence of the work is largely due to his unflinching attention to the details of the construction during its progress. The plant complete will cost about \$300,000, and will be completed within nine months from the breaking of ground. In the operation of the plant there will be required about 120 men, those on the furnaces being divided into three shifts.

Ephraim Hatch.

Parley E. Hatch

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