Garfield, Location of Immense Mills and Smelters.

ARFIELD, the mill and smelter town out on the western border of Salt Lake county, might be correctly termed a "creature of the smeller smoke cases." of which the Salt Lake fullie is so familiar Had it not been for these suits, the chances are it would never have been the location of two of the largest ore concentration mills and one of the tiggest copper smellers in the country. Had the farmers in the vicinity of Murray and Bingham Junction remained silent, no doubt there would have been no change in the program to make there points two of the tendjoy emailing towns in the United Fines. But everybody, in this country at least, knows what the courts have decread and save with the possible exunion of one or two load smelters, out partian of Salt Laire county seems d-stilled to become aliandoned as far as the nue smelling industry is con-

But months before Judge Marshall of the federal court of the district of Utah handed down his decision granting the injunction of the plaintiffs in the case referred to, the American Emelting & Refining company sought another location for the copper smelfing plant which were proposed about that time. After much investigation, the Garfield site was selected as an advantageous one. The spot was remote from the fertile farms, and the well stocked ranches of the Salt Lake valley; therefore the possibility of a repetition of the troubles experioneed at Murray and al the state city, Bingham Junction, was figured to be among the improbable things. But, be among the improved anything of the as a suferused against anything of the kind, the Guggeshichn Exploration com-pany, one of the brunches of the Amer-ican Smelling enterprise obtained so-tions upon a large area of land to the enst, west and south of Garfield, while the waters of the Great Sait Lake served as a protection on the worth. In due time the Garfield Smelling com-pany was organized, so was the Gar-field improvement company, which had to do with the laying out of a town-aite and the Garfield Water company. The latter erected a system of water works from which the smelter, the town and the mills of the Boston Con-solidated and Utah Copper companies are surglied. The town site and wa-ter companies were not areated, how-ever, until after it had been decided that the location of the mills referred to should be on the present files. The "solidates come jointly interested in them. as a safeguard against anything of the

LOCATION IDEAL ONE.

All things considered, the location is many the second of the location is and things considered, the location is and things on the location is a part the orea of the same is shit take valley: since the building of a branch line by the Rio Grande West-ern it is just as convenient to trans-ort the orea of the same is to the smelt-ers located "within the smoke some." The tawn and the big contracting mills take, while the smelter is three miles-beyond and not far from the old Gar-feld resort, a popular lake bathing have it or if years are. The main have of the Western Pacific and the shifts of the Western Pacific and the portant sustions on their respective sportant sustions on their respective portant sustions on their respective sport and sold from the main line at hingham Junction, while the Oregon by the San Pedro, Los Angeles & Salt lake from Salt Lake City. The pop-ulated to be somewhere close to 5,000; pit in a year's time, if the steady abeen in the past, it should be double bath of the past, it should be double in a the past, it should be double in the past, it should be double.

STRINGENCY HAD EFFECT.

The financial stringency has contrib-uted towards delaying the completion of the Boston Consolidated company's



which are to be treated on 286 Wilfley tables, while the middlings from the Wilfleys are to be re-treated on 254 Joinston vanners with smooth belts. As in the case of the Utah mill the cencentrates and tallings are to be dischagged by gravity. DETAILS OF CONSTRUCTION.

DETAILS OF CONSTRUCTION. The main building of ahe Boston works is 200x355 ft., the larger dimen-sion being lengthwise along the hill, and the smaller the down-hill direc-tion. The framing of the building is structural steel, with roof and sides of corrugated it w, painted, while the floor is of plank. As in the case of the Uinh mill, the Boston goes down the hill in steps and the floors have a small slope downward, but with the exception of one big step from the floor of the Wilfley tables down to the re-treatment floor, comparatively litle grading or retaining-wall work was done, the floors being supported by short plers and posts above the order the steps and posts above the

by short plers and rosts above the original surface of theg round. Extending lengthwise through the mill under the classifier department is a broad commodious tunnel, from which a broad commodious turnel, from which smaller tunnels at right angles go down through the mill, one of these tunnels to a section. At the bottom of the mill these tunnels enter another lengthwise tunnel, sloping from both ends toward the center, and from the center a main tunnel carries the con-centrates and tailings to a point fur-ther down the hill, where the tail-ings ar discharged and the concen-trates are collected in bins. The launders, which throughout the mill are to be lined with plate glass, are to be plased in these tunnels, but in the tunnels at the foot of the mill where the main discharges are collect-ed, the launders are cement troughs constructed on the bottom of the tunnel.

UTAH COPPER MILL.

The Utah Copper company has won the distinction of being the biggest producer of copper in the state. General Manager D. C. Jackling is nuthority for the statement that it is turning out more copper than all other copper mines in the state combined at the presser line. The patput of copper metal for the year, he states, will ag-gregate in round numbers about 15,-000,000 pounds; but production is now going on on the basis of 3,000,000 pounds monthly, or at the rate of 36,-000,000 pounds annually. The new Garfield mill was placed in commission last August, and at this

commission last August, and at this writing seven sections of the plant are in commission and treating approxim-ately 3,000 tons of ore a day. The oncentrate product carries copper values of about 20 per cent, with associated values in gold and sliver. Plans nave been laid to increase the capatre of the Corfled will from time to time as conditions justify ft. In the no doubt, it will handle anywhere from 6,000 to 10,000 tons of ore duily. The Copperton mill, operated by this com-

city, arranged symmetrically with re-spect to the main mill building. It is almed to dump the ore received from the mine into hoppers directly connect-ed with the two crushing departments, ed with the two crushing departments, i. e., so long as the mill is crushing 6,000 tons of ore per day and the rall-way delivery is the same, the ore dumped from the rallway cars will pass directly through the large break-ers. This involves the dumping of the ore normally at two places. The re-mainder of the bin, which is of total capacity for 35,000 tons of ore, is for reserve. There are two pasage ways under the bin, in which large electric larries are operated. When it is neces-sary to take ore from the reserve por-tions of the bin, it is drawn off through gutes, operated by compressed air, into the larries which tram it to the hop-pers, from which the brakers are fed by gravity.

by gravity.

COURSE CRUSHING SECTION.

CODRESCORDSHING SECTION. Each coarse-crushing division has two No. 7½ Gates breakers; reducing the ore to 1.5-inch size, which deliver to two 22-inch belt elevators, which deliver to trommels with 0.5-inch performations, the oversize going to two sets of 20x54 inch rolls, provided with rolled-steel three, as are all the rolls in the mill. These rolls run at 60 rev. per rolls. These rolls run at 60 rev. per min. Their product, 0.5 inch in size, is lifted

by a 20-inch belt elevator, which deliv-

by a 20-inch beil elevator, which deliv-ers it to a series of belt conveyors for distribution in a storage bin of 15,000 tons' capacity in the back of the mill, extending the full width of the latter. Between the elevator and the convey-ors there is a modified Vezin sampler, designed to cut out 1 per cert of the

The initial capacity of the Boston nill is to be 2,500 tons a day; but Samuel Newhouse, president of the company and the promoter of this im-mense enterprise, long ago made it known that it is the ultimate inten-tion to provide such additional equip-ment that will make it possible to hand the present one. are supposed to crush to approximately 40-mesh size. Their product passes to hydraulic classifiers and thence to the slime tables, which are modified John-son vanners. These have corrugated belts for the treatment of the coarser material and smooth belts for the finer. Ther are 92 vanners per section, or a total of 1,104 in the mill.

DISPOSAL OF CONCENTRATE.

The disposal of cencentrates and tail-The concentrates and tail-ings throughout the mill is by gravity. The concentrates flow to a series of rec-tangular masonry bins below the mill, with suitable overflows for the water and lterbotoms. From these bins the mineral is removed by a crane and clam-shell bucket and loaded directly upon the rallway cars.

This is only a sketch y account of the milling process, but perhaps it gives a clearer idea of the nature of the lat-ter than a. more detailed description would do. Apparently the details of the treatment, especially of the near ma-terial, have not yet been fully deter-mined, wherefore it is premature to give a flow-sheet.

FINE POWER PLANT.

All of the furnaces at Garfield, together with the converters, are in the same house. The reverberatories are 112x19 feet, each with two 250-horsepower. Sterling bollers, in tandem. These furnaces smell about are 250 tons of ore per day, when in fair operation, with the consumption of about 50 tons of coal on the grate. The coal is burned with an undergrate coal is burned with an undergrate blast. The atrangement for removing the ash is crude and no provision has yet been made for recovering the un-

THE GARFIELD SMELTER. The Garfield smelter is as modern

plant as can be found anywhere.

From a source which can be relied on,

not official, however, it has been as-

certained that the smelter is producing

copper metal at the present time on

the basis of 6,000,000 pounds monthly.

Undoubtedly these figures are very

The Ideal location of these

works has been referred to and in this

connection it might be well to state that the company has acquired 35,000

close to being correct.

to the charge for the other furnace. The latter sthelts about 500 tons per The latter smelts about 500 tons per day, with 8 per cont of cost, per cent copper. Both with 50 receive their charges from the wise with the furnace. By implies the rans the charge slides into the furnace, the mans being designs in the which should keep rights bootton furnace closed, but the sides of be remaining down and the furnace may

Both from blast furs beratories the sla on a lower level, electric locomoth he sleg is tapped level, which ar sing assays about 6.75 per. The ore choses of 4 per cent copper upward

There are four converters, skill feet, each stand having three boar fix more converters are to by edde

ROASTING FURNACES.

There are in MeDougall fur ench ore pe cent More Mere of the added. The the storage tributed by icipners, re-building. F into cars, wi-trie lacomot furnaces. O uddition of the Utah Co-hand, which content of the content of the McDougall's, ing little ma avoid the down through the down through th the means for h can be greatly less they will b from the McDo the reverberator

In addition to the there are 26 flu pobs, each of which sinters three charg each per 24 hours These start with ore shout 12 per cent sub Dougall furnaces. T calcines from the latter are ed into bins, from which th chuted into water in a pet ening. Then they are take chuted into water in a pot for me ening. Then they are taken in 1 pot by a traveling crune and dum on the priming charge in the pot be blown. One improvement will the molatening of the semi-alle hy water sprays into the stream-charged by the chutes of the hos wherein received from the MeDe alls.

alls. The Huntington-Heberlain pos at Garfield set in a single row commanded by a traveling crane, the said of handling being quite similar to be of handling being quite similar to as at Murray, the only difference leag of a mechanical character. The st-ringement of the pots in a single me feellitates handling and simplifie the removal of the gases, he re-movable hoods communicating with a flue which runs parallel with the linest pots and close to it, so that consec-tion is effected by a short, horized branch pips from the hood of each pit. This eliminates all telescopic pips and reduces the from work in direct cease-tion with the hood. No special atta-tion is given to making a tight join its tween the hood and the main fas Haoh of the Huntington-Heisrie

that the company has acquired 35,000 acres of ground surrounding it. This tract extends eastward and westward for hearly seven mlies and from three to four miles north and south; so it will be seen that when the plant was projected, those responsible for it were careful to guard against the possibility of future "smoke suits." Not long ago W R. Ingalis, editor of the Engl-Hach of the Huntingron-Hebrie pats treats about seven form of an p eight hours, reducing the subar p 3 or 4 per cent. The sintered skip dumped on the breaking four a be end of the line of pots (which by be way stand in the open air, just an Murray) and with the aid of a cess of four men is broken up sufficiently is pass through a 24x36-inch Biske cras-er. The product from the crusher is neering & Mining Journal referred to the smeller as being "essentially a reverberatory furnace a plant," and this appellation is undoubtedly cor-rect. As originally constructed it com-prised three reverberatories and two blast furnaces. During the late months, however, these have been added to and in fact the capacity of the plant has been practically doubled since the first furnace was blown in about a year and a half ago. Still, there is demand for more furnace capacity and it will be increased, no doubt, from time to time. neering & Mining Journal referred to pass through a 24x26-inch Blake cus-er. The product from the cusher is removed by conveying belt, elevate, etc., to the bins for the blast farmace. The ore statested in this way is as e-cellent material for the blast farmace, but the breaking by means of cusher produces considerable incs, wharking the full advantage of the coarsense & the material prepa ton-Heberlein proc the blast furnace. process is not realized in THE DRAFT SYSTEM. Except for the bollar-house which contains four 350-horse power Starling bollers, each with its own steel chin-ney, that being a Custodls construction 300 feet high, 30 feet 6 inches in dome-ter, outside, at the boltom. The first lead up-hill to the base of the chin the rise being such that the top o chimney is about 500 feet above the naces. The system of fines leading is the chimney is very elaborate. burned coal. The matte product assays

mill, which was expected to be ready, for commission last October; but the drop in the market price of copper for commission last October; but the drap in the murket price of copper and the inability of the company to innance the metals obtained from the are shipped from its sulphile mine in Bingham resulted in such a sweeping cartailment that the mill is yet in a state of unfulshedness. It will be ready, however, within a very short time. If called upon to do so, there is not the slightest doubt but that Mill Manager A. J. Bettles could be ready to undertake ore concentration within two or three weeks. The Roston mill is considerably dif-ferent than the one now in use by the Utah Copper company. Notwithstand-ing that the ores treated is identical in character, the methods of crushing it is entirely different, while the ore after arriving from the mines travels

In character, the methods of crushing ft is entirely different, while the ore after arriving from the mines travels by gravity all the way down to the last process of dressing. A characteristic feature about the Boston is the ab-sence of any elevators: which of itself is a symbol of economy.

CONTRACT FOR 20 YEARS.

It is well to state here that the Rio rande Western over a year ago en--PRECIOUS METALS ADDED TO COUNTRY'S WEALTH IN 1906

Grande Western over a yest ago en-tered into a 20-year contract to haul the product of the Boston Consolidated and Utah Copper mines from the mines to the points for reduction. The rate charged is 27 cents per ton, or equal to one-cent a ton, per mile. On reaching the mill, the Boston Con-ore is dumped into the storage bin be-hind the mill, which has two rallway tracks, is of structural steel and 18.000 tops expacity. It is planned that the ore may be dumped indiscriminately in this bin, the delivery from it being by means of belt conveyors, of which there are two, extending lengthwise by means of belt conveyors, of which there are two, extending lengthwise beneath it. The discharge openings in the botom of the bin are open, the feed to the beits being by means of broad traveling belts of corrugated steel. At the bottom of the bin the later is surrounded on the outside by a gallery and holes from the outside slyp access to the feeders in case it be neighboury to remove obstructions.

Elvis access to the feeders in case it be increasing to remove obstructions. The main conveying helts deliver ore from anywhere in this bin to the break-ure at the west end of the his. Each belt feeds a No. 6K thetes breaker. From the latter two short helts on an matter deliver to two No. 4 Gates requers, and the later discharge upon a large belt, rising at 20 deg., which takes the ore forusted to the in, when the main mill building. In the course crushing house, grizzites and accesse crushing house, grizzites and accesse and the step the relieve the breakers of material that is already fire enough.

breakers of material that is already first crough. In the main mill building the ore delivered by the instruct conversion belt is distributed by belts observated with trippers in a bin of 5,000 tons expacity, extending foractivities through the call. From this bin, which is an elevated structure with a char space bemath it, the one is delivered by means of waspended features to the stamps.

MANY STAMPS THERE.

MANT STAMPS THERE. There are 312 Nissen stamps which set back to back in two rows of 153 dearning the stamps to a battery, sight to a group. The individual stamps weigh 1500 fbs, and dross in the times per minut. Each stamp has its own access, which extends around the front of the mortar some what more than iso dag. Berease of 28 mesh, No. 28 wire, are to be used. Fram th stamps the prip flows to hy-draulic classifiers, the products of

tunnel

tunnel. The Boston mill is to be operated with electric power supplied by the Telluride Power company. This is re-ceived in a transformer house at the top of the mill, between the main building and the ore bin. The trans-former bofies is being equipped to take current at 40,000, \$0,000 or \$0,000 volts, it being outloned with the nearly starts. ti being optional with the power co it being optional with the power com-pany to furnish current at any of those voltages. For the operation of the mill motors the current will be re-duced to 400 volts. The mill mators are sub-divided among departments and groups of machines, so that any may be cut out as regulped with the minimum reduction of milling capacity. The transformer house is a building of reinforced concrets, which is de-signed to be absolutely fireproof.

ACCESSORY DEPARTMETS.

sented are the result of conference and

adjustment bitwhen the burenu of the

mint and the geological survey, and

are accepted as final by the two hu-

reaus. This takis is complied from data.

collected by the bureau of the mint,

showing builton deposited in the Unit-

ed states mints and assay offices, and

from statements received by that buy-

reau from smolting and rollning estati-

lishments. The distribution by states

is checked and verified by data col-

lected by the mological survey direct-

GOLD

Fine

1.102.452

1,146 10,101 218,767

448,852 \$2,877

3,609

164

1.107 [8]

Value.

22.954,400

ly from the producing mines.

fitate or Territory. ounces.

Alabama Alaska

California

There is an admirably equipped machine shop, conventent to the mill, in which any kind of work can be done that a city shop is capable of. Near by is a foundry, whore stamp shoes, dies, etc., will be epst. Above the dies, etc., will be cast. Above the mill is a reservoir of 1,500,000 gal, capa-

any in lower Bingham canyon, handies about 1.000 tons a day. The prod-uct of both mills goes to the Garfield smelter, where it undergoes final treatent and the metals reduced to built

DESCRIPTION OF MILL.

The Garfield mill building proper of Utah Copper company is 600x600 and the frame is of structural d. The sides are corrugated iron. floors are concrete, surfaced with out; are arranged in steps, slopidwaward to insure proper drain-. The building is well lighted by nitors on the roof. The crushing artment consists of rolls, screen Chillean mills, set in a broad al-extending the whole length of the ilding, which is clear for the travel of a nowerful overhead crane. This rune has been provided so that in ase of any portion of this heavy ma-bilory getting out of repair or be-oming damaged, it can be lifted bod-

ut of place and a new one subliuted, if necessary, The ore, on being brought from the

designed to cut out 1 per cent of the ore as a sample; but this will not be done as a regular thing, the uniformity of the ore being considered such that constant sa mpling is unnecessary. The distributing conveyors are 200 feet long, 25-inch belts, contained in a traveling frame, which is movable in either direcframe, while is movable in either direc-tion, while the belt can be run either way. The discharge of the ore is over the end of the conveyor, the distribu-tion being effected by the lengthwise movement of the whole apparatus. In this way the use of trippers is avoided. From the bin last described the ore is drawn to the 12 sections of the mill, each drawn to the 13 sections of the mill.

each of which is a precise duplicate of the others. In each sociion the rea passes first to two sets of rolls, 16x36 Inches, in parallel, running at 80 rev. per min., which deliver to two 22-inch belt elevators, which deliver to four wine at Bingham, comes in on a track behind the mill, passing over a scale, and is dumped into a long bin, on the

The Utah Copper company's power plant is one of the most modern ones to be found anywhere in the west. In addition to generating power, light and heat for the company building at Garfield, the same is transmitted and use I for a like purpose in the Copperton milt in lower Bingham canyon and at the mines in Ringham.

A BIG PAYROLL.

The company has an enormous pay-roll to meet. Approximately \$125,000 is paid out in wages to employes every 30 days.

While the Guggenheims are extensive shareholders in the Utah Copper, there are several Salt Lakers heavily terested in the stock, notable among them being Col. E. A. Wall, who was them being con a the entire property and who years ago made the predic-tion that it would become one of the state's big copper mines.

Much credit is due to General Manager Jacking for the successful achievements made by the Utah Cop-per. The president of the company is Charles M. MacNeill of Colorado Springs; Spencer Penrose of the same place is secretary. The organized April 30, 1904. The company was

about 40 per cent copper, and the slag about 40 per cent silica. Two blast furnaces were originally installed, each 20x4 feet at the tuyeres. They set end to end and it is proposed to close the space between them at some time, making one furnace 70x1 feet. The two new furnaces will be constructed with the same end in view. Both furnaces are operated with a 24-ounce blast pressure and a 10-foot column of charge. The hight from he top of the charge to the feed floor s unusual and perhaps excessive. One of the blast furnaces is at present op-erated semi-pyritically, smelling 350 to 370 tons of ore per day, or about 4.5 tons per square foot of hearth area, with a consumption of 8 per cent of

HANDIJNG MATERIAL

The handling of material throughout the works is by transway and by left conveyors. The transways are speared by electric motors? The Garfield plant is well porided

The Garnerd phase is accessory depriments that are necessary in the operation of a large modern smelting works. These a large and exceptionally well-subpet machine shop, a large carpents and and an excellent foundry. The performance pather comprises at present two cross nouse comprises at present two of compound blowing engines for the on verters and two No. 10 rotary blower for the blass furnaces, each blast tu nace having its own blower with a independent air line from the latter the furnace. The location of the bla ngiling far the o the furnace. The localion of the bis furnaces at the eastern end of the ma furnace building necessitated a rul long pipe for the air; but on the other hand the length of the stam pipe in the waste-heat bollers to the por-house is reduced to concern to the the waste-heat bollers to the power house is reduced in comparison to what it would be by the reverse arrange-ment. The arrangement of the fur-nace building is such that addition-blast furnaces can be provided for by extending the building to the sail while additional reverberatory furnaces will be put in an extension of the build-ing to the west. It will be cherved that the blast furnaces, reverberatory furnaces and converters are all ope-tained in the same building. The Garfield plant was constructed

The Garfield plant was constructed upon general lines that have been well approved by the practice of metallar-gical engineers, and the engineers is charge of this particular construction had ample experience in the design and execution, of such a works, together

nucl ample experience in works, together with the advantage of the great and st technical knowledge that the American Smelting & Refining company has are cumulated. record of mint deposits, but a little in-variably escapes detection. Some owners of small mines decline to make re-turns, and some properties are not con-tinucusly operated and their owners cannot be found.

Lastly, there is the ore abstracted by "high graders" or ore thieves, which takes away a notable fraction of the production of mines containing rich ore. Through small assay offices this gold

finds its way to the mints. The practice of stealing ore was caryear. The practice of stealing ore was car-ried on to a disgraceful extent during the year in the rich mines of Goldfield. "The principal mine officers estimate that ore to the value of \$1.250,000 was "appropriated" in that camp during 1506, and state that ore worth \$250,000 was recovered from the thieves. Sev-oral suits in the courts for the recov-ery of parcels of ore indicated that the statement was well founded. Much rich statement was well founded. Much rich ore is probably still secreted, and will gradually reach the mints in 1997. The conditions prevailing at Goldfield in the last months of 1906 were, however, ex-

optional. Gold and silver from old metallurgi-cal by-products, like sing, are also apt

likely to give a correspondingly smaller producers of the same class occasional-ly also misunderstand the questions and

Statistical Compilation By United States Government.

THE production of gold and sil- | Utah Virginia Washington ver in the United States from domestic ores in 1995, by states Wyoming and territories, is shown in the Total accompanying table. The figures pre-

SILVER. State or Territory. | ources. Alabama mererer 100 \$ 208,500 Alaska Arizona California 2,969,200 2,009,82 1,517,500 1.027,18 "olorado . 12,447,400 Georgia Liako ... 8.836.200 5.981.135

Michigan	186,100	1
MDERDIR'S PROFESSION	81.300	
Montana	12,540,300	8.4
Nevada	\$,207,600	1.8
New Mexico	452,400	3
North Carolina	24,700	- 19
OTO BORS A PROPERTY AND A PROPERTY AND	56,700	- 3
Foun Carolina	100	
South Dakota	155,200	1
Tommenter	25,600	- 3
A STREET DOCUMENTS OF THE R.	277.400	13
	11,508,000	7.7
Without advertised in the second seco	and a second second second	1.1.1

\$5.8hb

28,467

8 23,500 Virginia 21.245,100 Washington 42,109 2,747,109 Wyoming 1.100 Total . 56.517,900 38,256,400 21,700 tion of the precious metals from gold

1,435,700 0.278.509 bullion deposited in United States 255,290 95,960 bara reported by the refinerics, and from the gold and silver contained in It is mixed with other ores and its 63,860 1.330,100 0.10.511 6.004.900 1.400

 248,208
 5,130,900

 498
 10,300

 4,983
 105,000

 276
 5,700

 6,700
 four itens: (1) Gold and silver in plactor builton produced during the cal-endary year; (2) gold and silver in mill builton produced in mill of company during the calendar year; (3) gold and silver in base builton, matte, etc. (by ansay value), produced in mill of company during the calendar year; (3) gold and silver in base builton, matte, etc. (by and assay value of ores and concen-trates shipped up to the end of the year. A month or more may pass be-shipped in December is received by the shipped in December is received by the silver in base builton, matte, etc. (by and assay value of ores and concen-trates shipped up to the end of the year. A month or more may pass be-shipped in December is received by the silver in base builton, matte, etc. (by and assay value), produced in smelter of ourses.
 "report net, instead of gross proceeds. The gold is sometimes also given in value only. which is then always simall-trates shipped up to the smelters return for the last ore shipped in December is received by the mine, and this, incidentally, is one of the causes delaying the survey's annu-al report of mine production.

 100
 % for gold and silver in crude ore find concen-trates (by assay value) shipped to crus

 100
 % for gold and silver in erude ore find concen-trates (by assay value) shipped to crus

 100
 % for gold and silver in erude ore find concen-trates (by assay value) shipped to crus

4.565,383 \$94,573,800

gold and silver in crude ore and concen-trates (by assay value) shipped to cus-tom works during the calendar year. The first item meds no explanation. The second and third items are obtain-ed from mining companies which have their own reduction works; they report the solid and silver buildon meduced 187.747 1,027,180 8.425.520

the sold and silver builton produced during the year, or the gold and silver contained in their metallurgical pro-ducts sold to retineries, as there are very few smelting works owned by minime mining companies which also refine their base buillon. There is, as a rule, no great interval of time before the ore 6.719

" there wills and smatters is re and although there is some overlap at

tomage shipped from the mine during the year corresponds very closely to the amount of fine or base buillon or

246 The scalest difficulties are found in

The mint bureau records the produce concentrates shipped to custom works,

builton deposited in United States ten 30 days or more, clapses before the mints and assay offices, from the fine ore reaches the works, and often much

ores and metaflurgical products ex-ported for reduction. The statistics of gold and silver col-

The report of mine production does of give the contents of the ore mined uring the year. Only the oro that is wated or sold is recorded. Neither Neither oes this report give the assay value of the total tonnage; for if this were the case the heavy losses in concentration would be disregarded, and the results would be very much inger and wholly misleading. As far as possible it aims to give the metals recovered from the tounage sold or treated during the year. n items 2 and 1 this is substantially orrect, except for the very small re-ming losses. In item 4 the amount aing losses. In item 4 the amount diven is theoretically larger than the ctual recovery of refined metals, by the combined smelling and refining bases. Practically, however, this is counterbalanced by several factors.

Small quantities of gold and sliter are rehelved from many ores, but not paid for by the smelting com-panies or recorded in the settlements. As a rule, payments are not made on iess than 2 ounces of silver or 0.05 ounce

10 and the sources of shiver or 0.05 of most of gold per ton. 2. Settlements are made on the basis of New York price for sit-ver, and of \$19 to \$20 per ounce of gold. and small producers, who often report in terms of dollars alone, are very likely to give a correspondingly smaller out outful contains.

...X

a. There is always a certain similipercontage of the product which is not reported by the miners. This includes the output of scattered individual placer workers, often allens. Some of this is estimated on the basis of the

The first cost of this plant was ver The Brst cost of this plant was ten high. It is said to have been \$5,000,00 or will be that much when the add-tional furnaces that are now being &-stalled have been completed, which will be very shortly. Its capacity may be estimated at 900,000 Long of chage pir year

TOWN OF GARFIELD.

The town of Garfield has been we The town of Garfield has been wel-laid out and the sentiary regulation there are of the best. The domesti-water supply has been declared by the state chemist to be of the very bir und ample protontion has been pri-vided in case of fire. It is proposed po-connect the smellers mills, the town at Garfield and the city of Sait Lake, by means of an electric traction system. This improvement will probably is pri-vided during the coming year. Just to the west of the sld flarded bathing resort is the site or the pri-

Just to the west of the or the pro-bathing resort is the sile or the pro-posed smelter o the Miners Smelter company, in which P. Augustus Hour to a constrabiling actor. Late informatrolling actor tion from the east invelicates that the construction of this plant will be a

construction of thi

as a considerable interval of time.