GOLD, SILVER, COPPER, LEAD, AND ZINC IN ARIZONA, IDAHO, MONTANA, UTAH, AND WASHINGTON

By C. N. GERRY AND PAUL LUFF

ARIZONA

The value of the gold, silver, copper, and lead produced from mines in Arizona in 1932 was $13,172,871, a marked decrease from $40,144,-694 in 1931. The decrease in the value of the copper output alone was more than $25,000,000, and there were also large decreases in the values of the gold and silver productions. The output of lead in 1932 was slightly more than that in 1931, but the value was less on account of the decline in the average price; no zinc was produced from mines in Arizona in 1931 or 1932.

The average price of copper in 1932 (6.1 cents a pound) was less than any annual average price from 1850 to 1932 and resulted in the closing of several mines producing copper ore that had been active operators in the last decade. After the Phelps Dodge Corporation absorbed the smelting and mining assets of the Calumet and Arizona Mining Co. on October 1, 1931 the Copper Queen smelter at Douglas was closed, and in 1932 the Phelps Dodge Corporation operated the adjoining smelter formerly used by the Calumet and Arizona Mining Co. The Phelps Dodge Corporation closed its New Cornelia branch in April 1932, and the Morenci branch was closed in July, leaving only the Bisbee division in active operation. The Miami Copper Co. closed its mine and mill at Miami on May 16, and the Inspiration Consolidated Copper Co. closed its mine, leaching plants, and concentrator on May 9. The closing of these mines and plants resulted in the closing in June of the copper smelter of the International Smelting Co. at Miami. The mine and mill of the Ray branch of the Nevada Consolidated Copper Co. were operated continuously in 1932, but at a greatly reduced rate; the Hayden copper smelter of the American Smelting & Refining Co. was operated intermittently on concentrates from the Nevada Consolidated mill at Hayden and on crude ore and concentrates received from various operators. The mine, mill, and smelter of the Magma Copper Co. at Superior, Pinal County, were closed in June 1932, and the smelter of the United Verde Copper Co. at Clarkdale remained idle throughout the year. The United Verde Extension Mining Co., however, not only operated its mine at Jerome and its smelter at Clemenceau the entire year but increased its output of gold, silver, and copper. Only 3 of the 9 copper smelters in Arizona were active at the end of the year. In normal times Arizona produces approximately 40 percent of the total copper production of the United States, and on account of the general decrease in the copper output of Utah, Montana, and Michigan, the ratio in 1932 was close to that of normal times.
### Mine production of gold, silver, copper, lead, and zinc in Arizona, 1928–32, in terms of recovered metals

<table>
<thead>
<tr>
<th>Year</th>
<th>Ore, old tailings, etc.</th>
<th>Gold</th>
<th>Silver</th>
<th>Copper</th>
<th>Lead</th>
<th>Zinc</th>
<th>Total value</th>
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<tr>
<td></td>
<td>Short tons</td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
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<td>3,967,488</td>
<td>6,791,331</td>
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<td>19,802,919</td>
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<td>3,245,511</td>
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<td>13,600,610</td>
<td>1,310,990</td>
<td>2,657,000</td>
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<td>1932</td>
<td>4,455,000</td>
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<td>2,657,000</td>
<td>183,987,000</td>
<td>2,000,000</td>
<td>13,172,871</td>
<td></td>
</tr>
</tbody>
</table>

1 Subject to revision.

**Gold.**—The gold output in 1932 decreased about 50 percent from that in 1931 due to drastic curtailment in the mining of copper ore and to the decreased output of gold ore from the Tom Reed and other mines near Oatman, Mohave County. In 1932 the output of gold in Arizona was less than half that of any other year except 1908, since detailed records were started in 1903. An exceptionally large decrease was recorded in the production of gold from the Tom Reed mine, and marked declines were also recorded from the properties of the Phelps Dodge Corporation, United Verde Copper Co., and Magma Copper Co. A large increase, however, was reported from the United Verde Extension mine at Jerome, Yavapai County. The United Verde mine, also at Jerome, the largest producer of gold in Arizona from 1924 to 1930, was idle in 1932, as were the mill and smelter at Clarkdale.

There was a decided increase in the production of gold from placer operations, particularly from Copper Basin, Big Bug Creek, Lynx Creek, and Octave in Yavapai County, Greaterville in Pima County, Dome and Quartzsite in Yuma County, San Francisco River in Greenlee County, and Gold Basin in Mohave County. There was also considerable activity in gold mining at lode mines in the Dos Cabezas district in Cochise County; Vulture district in Maricopa County; Weaver district in Mohave County; Arivaca, Cababi, and Quijotoa districts in Pima County; Old Hat district in Pinal County; Oro Blanco district in Santa Cruz County; Black Canyon, Cherry Creek, Hassayampa, and Weaver districts in Yavapai County; and Ellsworth district in Yuma County. The Copper Queen branch of the Phelps Dodge Corporation was by far the largest producer of gold in Arizona in 1932; it was followed in order by the United Verde Extension, Magma, Tom Reed, New Cornelia, and Katherine properties.

**Silver.**—The silver output in Arizona in 1932 decreased 1,188,311 ounces from the output in 1931, and the value from $941,140 to $580,074. Most of the silver, as well as a majority of the gold produced in Arizona, is recovered from copper ore. Since there was an unusual decrease in the output of copper material in 1932 there was a decided decline in the production of both silver and gold. In 1932 the output of silver in Arizona was the smallest since detailed records were started, and the average price (28.2 cents an ounce) was less than that of any year since 1850. The largest decrease in silver output was reported from the properties of the Phelps Dodge Corporation. The inactivity at the United Verde mine, the largest silver producer in
Arizona from 1923 to 1930, resulted in a large decrease in silver output, and there was also a large decrease from the Magma mine at Superior. The Copper Queen branch of the Phelps Dodge Corporation was the leading producer of silver in Arizona in 1932, and it was followed by the Magma and United Verde Extension mines.

**Copper.**—In 1932 Arizona was again the largest producer of copper in the United States, but its output decreased 54 percent from the output in 1931, and the value decreased from $36,522,387 to $11,217,107. The average price of copper in 1932 was only 6.1 cents a pound compared with 9.1 cents a pound in 1931 and 13 cents in 1930. The unusually low price in 1932 resulted in the closing of several of the large producers of copper, some of which had been in continuous operation for 30 years. The value of the copper output in 1932 was nearly 70 percent less than that in 1931, 85 percent less than that in 1930, and less than one fourth of the value of the record output of 1929.

The United Verde Extension Mining Co. was the only important copper producer in Arizona which increased its output in 1932 over 1931, but the output was considerably less than that in 1930. The largest decrease was reported by the Copper Queen branch of the Phelps Dodge Corporation, followed closely by the Inspiration property. Other large decreases were reported at the Miami and Old Dominion mines in Gila County, the New Cornelia in Pima County, the United Verde in Yavapai County, the Morenci property in Greenlee County, and the Magma and Ray mines in Pinal County. The largest copper producers in 1932 were the Copper Queen, United Verde Extension, Morenci, Magma, Miami, Inspiration, Ray, and New Cornelia properties.

**Lead.**—The lead production in Arizona in 1932 increased slightly over the production in 1931, but the value decreased from $72,672 to $56,000, as the average price of lead declined from 3.7 cents a pound in 1931 to 2.8 cents in 1932.

Nearly all the large producing lead mines in Arizona were idle in 1932, which resulted in an output less than that for any year since 1904. Almost all the lead ore or concentrates from Arizona in 1932 was smelted at El Paso, Tex., as the lead furnace at Douglas was idle. The Tombstone Extension property at Tombstone was the largest producer of lead in Arizona in 1932, and it was followed by the Copper Queen branch of the Phelps Dodge Corporation at Bisbee. The Montana mine of the Eagle-Picher Lead Co. at Ruby in Santa Cruz County, and the 79 mine at Hayden Junction in Gila County, each of which produced nearly 2,000,000 pounds of lead in 1930, were idle both in 1931 and in 1932. The increases from the Tombstone Extension property and from the Copper Queen branch of the Phelps Dodge Corporation in 1932 offset the decided decreases at the Grand Reef, Grand Central tailings dump, and small producers.

**Zinc.**—No zinc was recovered from ore mined in Arizona in either 1931 or 1932.

**Review of districts and operations.**—The three leading copper producing districts of Arizona are Bisbee, Cochise County; Globe, Gila County; and Jerome, Yavapai County. The output of the Bisbee or Warren district in 1931 was 1,186,213 tons of ore, which, with copper precipitates, yielded $731,888 in gold, 1,309,398 ounces of silver, 95,327,922 pounds of copper, and 503,242 pounds of lead, valued in all at $9,805,074, a decrease of $8,441,208 from the value of
the output in 1930. The chief producers in the district in 1931 were the Copper Queen and Calumet and Arizona mines. In 1932 the output of the district was again distinctly decreased, and the only operator worthy of note was the Copper Queen branch of the Phelps Dodge Corporation. The output of copper from this property in 1932 was less than half that in 1931, and there was also a decrease in the output of gold and silver, but the output of lead increased. The property, however, was the largest producer of gold, silver, and copper in Arizona. In 1932 about 260,000 tons of ore, chiefly copper material, were produced from the district, which yielded gold, silver, copper, and lead valued at about $3,755,000.

The production of the Globe district in 1931 was 7,429,571 tons of ore and old tailings (chiefly copper ore), $50,869 in gold, 77,670 ounces of silver, 126,443,616 pounds of copper, and 47,065 pounds of lead, valued in all at $11,581,503, a decrease of $9,121,253 from the value of the output in 1930. In 1932 the output of ore in the Globe district was less than one third the output in 1931, as the two chief producers closed in May. The Miami mine was the largest producer of copper in the district in 1932, and the Inspiration mine was second. The Old Dominion mine, a large producer of copper ore for the last 40 years, was closed October 14, 1931, and the mine was permitted to fill with water to the twelfth level. According to the printed annual report of the Miami Copper Co. for 1932, 1,417,810 tons of ore containing 0.774 percent copper were milled during the first 4½ months of the year. Although operating costs were reduced to 6.64 cents per pound of copper, the price was too low to permit further operation. The construction of a new plant to treat 3,000 tons of tailings a day was completed, and it was put in operation in August. This plant operated intermittently until February 8, 1933, when the entire property was closed. On January 1, 1933, the estimated ore reserves consisted of 78,527,502 tons of sulphide ore containing 0.88 percent copper and 6,911,678 tons of mixed ore containing 1.83 percent copper. In 1932 the cost of mining per pound of copper was 3.08 cents, the cost of milling was 2.26 cents, and general costs 1.30 cents, a total cost of 6.64 cents.

According to the printed annual report of the Inspiration Consolidated Copper Co. for 1932, operations began at the property on June 29, 1915, and from this date to the end of 1932, 72,392,583 tons of ore were treated, which yielded 1,328,566,121 pounds of copper. The ore reserves on December 31, 1932, consisted of 41,217,769 tons of milling ore containing 1.458 percent copper and 27,793,001 tons of mixed ore containing 1.276 percent copper. The property is fully equipped to produce 130,000,000 pounds of copper annually. The mill treated 4,092 tons of sulphide ore by flotation in 1932, which yielded 124,785 pounds of copper; 537,929 tons of ore were leached, which yielded 11,061,682 pounds of copper; 28,029 tons of slimes from the leaching plant were concentrated by flotation, which yielded 172,311 pounds of copper; and 667,403 pounds of copper were recovered from slimes leached, a total production of 12,026,181 pounds of copper for the year compared with 61,368,033 pounds in 1931. The combined extraction of ore and slimes treated in 1932 was 88.926 percent of the total copper, and the cost of producing fine copper, including depreciation, but excluding depletion and Federal taxes, was 9.907 cents a pound compared with 8.429 cents a pound in 1931.
The value of the output of the Verde district in 1931 was $4,581,343. The output consisted of copper ore chiefly from the United Verde Extension and United Verde mines. From 1923 to 1930 the United Verde mine was the largest producer of silver in Arizona; during this same period, with the exception of 1923, it was the largest producer of gold in Arizona; and with the exception of 1924 and 1930 it was the largest producer of copper. In May 1931 both the mine and smelter were closed, resulting in an unusual decrease in the output of the district in 1931–32. The United Verde Extension mine was the only important producer in the district in 1932, and it increased its output over that in 1931. According to the company’s printed annual report for 1932, 212,241 tons of ore and concentrates were smelted, which yielded 10,007 ounces of gold, 348,247 ounces of silver, and 35,751,326 pounds of copper. The mine ranked second in the production of gold and copper in Arizona in 1932 and third in silver. The average cost of producing 1 pound of copper was 5.45 cents. Ore reserves at the end of 1932 are estimated to be 360,000 tons. The company paid regular quarterly dividends during the year aggregating $603,750.

The Mineral Creek and Pioneer districts in Pinal County, the Ajo district in Pima County, and the Copper Mountain district in Greenlee County are also large copper-producing districts. The Ray mines of the Nevada Consolidated Copper Co. in the Mineral Creek district, Pinal County, were operated nearly the entire year, and the 12,000-ton flotation concentrator at Hayden was operated 201 days. The ore output in 1932 was less than half that in 1931 and the copper production decreased nearly 40 percent. About 33,700 tons of copper concentrates and 9,900 tons of crude copper ore were smelted at the American Smelting & Refining Co. plant at Hayden. The mine, mill, and smelter of the Magma Copper Co. in the Pioneer district, Pinal County, were closed in June, but the mine was reopened September 16 and mining resumed from November 28 to December 24. According to the company’s printed annual report for 1932 the mine produced 5,151.72 ounces of gold, 486,037 ounces of silver, and 21,675,521 pounds of copper, a decrease of 2,361 ounces of gold, 215,539 ounces of silver, and 7,085,107 pounds of copper from 1931. About 117,000 tons of ore containing 6.90 percent copper and a little gold and silver, treated in 1932 by table and flotation concentration, and more than 86,000 tons of first-class copper ore, were smelted. The New Cornelia mine and 15,000-ton flotation concentrator in the Ajo district, Pima County, was operated by the Phelps Dodge Corporation until April, when all work ceased. The production of copper in 1932 was about one fourth that in 1931, and there was also a decided decrease in the production of gold and silver. The Morenci branch of the Phelps Dodge Corporation in the Copper Mountain district, Greenlee County, was operated until July, when all mining, milling, and smelting ceased. The property is equipped with a 5,500-ton flotation concentrator and a 500-ton smelter. Although the production of copper in 1932 was about 15,000,000 pounds less than that in 1931, the property ranked third as a producer of copper in Arizona.
IDAHO

The value of the gold, silver, copper, lead, and zinc produced from mines in Idaho in 1932 decreased about 34 percent from 1931. The largest decrease was in lead, by far the most important metal produced in the State. The production in 1932 was the smallest since 1902 and was valued at about $3,976,000 compared with $7,352,981 in 1931. There were also decreases in the output of zinc, silver, and copper, but the output of gold was the largest since 1916 and was more than double the output in 1931. Smelting and refining operations at the lead plant at Kellogg were conducted at a considerably lower rate, and the electrolytic zinc plant at Silver King was run on a part-time basis. Several of the large mines that had operated regularly for many years, especially those in Shoshone County near Wallace and Morning, were idle during part or all of 1932. In general, the mining industry in Idaho in 1932 was distinctly subnormal and was a continuation of the depressed conditions in 1931.

Several interesting developments, however, augmented the production of both gold and silver in Idaho during the year. Probably that attracting widest attention was the unusually large gold production made by the St. Joseph Lead Co. at its property near Atlanta, Elmore County, as the mines in this region had been virtually idle since 1917. Development at the St. Joseph property—a consolidation of the Atlanta Mines and Boise-Rochester group—had been in progress before the recent interest in reopening old gold mines, but the dredge activity at Warren in Idaho County, the work at the Mayflower mine in Boise County, and much of the activity in Valley County were new features of 1932. The increased output of silver from the Sunshine (Yankee Boy) property was also notable, not only because the production was greatly increased over that in 1931, but because the ore was mined when silver was sold at such an abnormally low price. The mine became the largest producer of silver in the United States in 1932 and produced about 44 percent of the State output of silver.

Mine production of gold, silver, copper, lead, and zinc in Idaho, 1928–32, in terms of recovered metals

<table>
<thead>
<tr>
<th>Year</th>
<th>Ore, old tailings, etc.</th>
<th>Gold</th>
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<tr>
<td></td>
<td>Short tons</td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
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<td>62,526,648</td>
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<td>1930</td>
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<td>1,097,000</td>
<td>142,000,000</td>
<td>20,400,000</td>
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</table>

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Gold.—The mine output of gold in Idaho remained close to $400,000 from 1928 to 1931 but advanced to an amount valued at $936,434 in 1932 due to the greatly increased production from both placer and lode properties. The value of the production in 1932 was the largest since 1916 when $1,115,810 in gold was produced. The increase in the output of gold in 1932 was due chiefly to the shipment of gold bullion and concentrates resulting from the operation of the mine and mill of the St. Joseph Lead Co. at Atlanta, Elmore County, the increase in the output of gold from the dredge of the Idaho Gold
Dredging Co. near Warren, Idaho County, and to the operation of the mill of the Yellow Pine Co. near Yellow Pine, Valley County. The Talache Mines, Inc., operating the Gold Hill & Iowa mine at Quartzburg, was the largest producer of gold in Idaho in 1931, but it was virtually idle in 1932 following the fire of August 1931. The mine, however, was reopened and the vein developed to a depth of 1,090 feet. The Idawa Gold Mining Co. and the Idaho Gold Dredging Corporation, both large producers of gold since 1926, produced no gold in 1932.

After spending much time and money in developing the Boise-Rochester property and the Atlanta Mines group at Atlanta and building a new 200-ton amalgamation and flotation plant in 1931 the St. Joseph Lead Co. became the largest producer of gold in Idaho in 1932. The new plant had its initial run early in the year, and gold bullion was shipped to the assay office at Boise, Idaho, and rich gold concentrates were hauled to Mountain Home and shipped to Utah for smelting. In 1932 the company produced about 42 percent of the total State output of gold or more than all the mines in the State produced in 1931.

A comparatively new company which began producing gold in 1932 was the Yellow Pine Co. at its property near Yellow Pine, Valley County. The company started operating its new 150-ton flotation plant in January and by the end of the year succeeded in becoming the third largest producer of gold in Idaho; the mill also recovered a large quantity of concentrates containing stibnite, the sulphide of antimony.

The new dredge of the Idaho Gold Dredging Co. at Warren increased its output of gold and ranked second as a producer of gold in Idaho in 1932. A new dredge was constructed on Warren Creek by the Warren Creek Dredging Co., the old Bailey dredge on Rhodes Creek near Pierce was reconditioned by the New York-Idaho Dredging Corporation, and the dredge in Owyhee County, operated in 1931 by the American Gold Dredging Co., was worked in 1932 under lease by the Superior Leasing Co. The combined output from these 4 plants was valued at about $170,000 compared with $80,352 produced by 4 dredges in 1931. Considerable gold was also produced from the Golden Anchor Mine near Burgdorf, Idaho County, and from many small mines throughout the State. There was a substantial increase in the output of siliceous gold ore in 1932 and a marked increase in deposits of gold at the assay office at Boise for the year.

Silver.—The output of silver decreased 520,923 ounces in 1932, a small quantity compared with the decreases in other States. Despite the decrease in value from $2,094,068 in 1931 to $1,889,400 in 1932 the State was the second largest producer of silver in the United States, following Utah, as it was in 1930–31.

In the Coeur d'Alene district, which produced at least 6,500,000 ounces of silver, about 45 percent of the silver was recovered from the ore of the Sunshine (Yankee Boy) Mine on Big Creek east of Kellogg; most of the remainder was produced from the Bunker Hill & Sullivan, Hecla, Morning, and Crescent Mines, which ranked in the order given. The Golconda and Page properties in Shoshone County, the St. Joseph property in Elmore County, and the Whitedelf Mine in Bonner County were also large producers of silver. The Sunshine property increased its silver output about 550,000 ounces and was not only the largest silver producer in Idaho but became the largest silver
producer in the United States in 1932. The 500-ton flotation plant was worked regularly and the company paid four quarterly dividends aggregating $150,000. Large increases in the output of silver were also made from the Crescent on the west side of Big Creek and the Golconda Mines east of Wallace, but unusually large decreases were reported from the Morning, Hecla, Bunker Hill & Sullivan, Hall-Interstate, Page, Blackhawk, Dayrock, and Sherman Mines.

Copper.—The output of copper decreased about 4 percent in 1932, and the value decreased from $104,187 to $66,917 as the average price of the metal decreased 3 cents a pound.

About half the copper produced in Idaho in 1932 came from the Sunshine (Yankee Boy) property, as the chief mineral in the ore of this important producer is a variety of tetrachloride carrying considerable silver as well as copper. It was followed by the Bunker Hill & Sullivan and Hecla properties, where a small quantity of copper is associated with lead ore. The regular copper producers in Idaho, such as the Mackay Metals Co., operating property in Custer County, and the Winder-Stillman Con, operating property in Lemhi County, have been closed since the drop in the price of copper in 1930.

Lead.—The output of lead in 1932 decreased about 28 percent from that in 1931, and the value of the output decreased from $7,352,981 to about $3,976,000 as a result of general curtailment of production caused by a continued drop in the average prices of lead and zinc.

Idaho suffered particularly from the extremely low price of lead, as the State produces about 25 percent of the lead produced in the United States. The State, however, maintained its position as the second largest producer of lead in the United States, after Missouri.

The Bunker Hill & Sullivan, Hecla, and Morning Mines were as usual the three largest producers, but the total output of these mines was 26 percent less than that in 1931; the output from the Morning Mine alone decreased more than 20,000,000 pounds, as the property was closed 5 months of the year. Other large producers of lead in 1932 were the Page, Golconda, Sidney, and Whitelaw properties. According to the annual report of the Bunker Hill & Sullivan Mining & Concentrating Co. for 1932 the company mined and treated 429,880 tons of ore compared with 460,366 tons in 1931. The Bunker Hill smelter and refinery were operated on a 1-furnace basis and produced 60,283 tons of lead, 8,528,772 ounces of silver, and 34,760 ounces of gold compared with a production of 77,687 tons of lead, 10,049,526 ounces of silver, and 44,841 ounces of gold in 1931. The sharp decreases indicate a marked reduction in both company and custom materials received at the plant. Dividends paid in 1932 amounted to only $61,637 compared with $553,246 in 1931 and $2,109,690 in 1930. Ore reserves at the end of the year were 2,118,273 tons, and mine development was limited to the new Flood-Pike-Stanly area where important new reserves of ore were opened. The electrolytic zinc plant of the Sullivan Mining Co., which is worked under the control of the Bunker Hill & Sullivan Mining & Concentrating Co., operated continuously during 1932 at about 29 percent of capacity. Although virtually all the important producers of lead in Idaho decreased their output decidedly the Golconda Lead Mines increased its output nearly 1,000,000 pounds.

Zinc.—The zinc recovered from ore and concentrates in 1932 decreased about 47 percent from that in 1931, and the value de-
creased from $1,487,214 to about $632,400. As the average price of zinc declined from 3.8 cents a pound in 1931 to 3.1 cents a pound in 1932, several of the large producers of lead-zinc ore remained idle throughout the year, and most of those that were active greatly curtailed production. More than 57 percent of the zinc output was recovered by roasting and leaching at the electrolytic plant at Great Falls, Mont., and the remainder was recovered at the plant of the Sullivan Mining Co. at Silver King, which was operated at less than one third capacity. The Morning Mine exceeded all others in zinc production and produced slightly more than half the total zinc of the State, but its output was 56 percent less than in 1931. Next in order were the Bunker Hill & Sullivan, Sidney, Golconda, Frisco, Star, and Page Mines. The output from each of these properties, except the Golconda and Star Mines, was considerably less than that in 1931.

*Mines and mills.*—According to the printed annual report of the Federal Mining & Smelting Co. for the year 1932 the Morning Mine in the Hunter district, Shoshone County, was operated on a basis of 12 days a month from January 1 to May 31 and from November 1 to December 31; the mine was closed from June 1 to October 31. The property is equipped with a 1,200-ton flotation concentrator, and in 1932 the plant treated 102,352 tons of lead-zinc ore, a decrease of 129,267 tons from 1931. The ore contained an average of 3.8 ounces of silver to the ton, 9.8 percent lead, and 6.7 percent zinc. About 12,194 tons of lead concentrates were produced containing 317,216 ounces of silver and 17,981,158 pounds of lead, and 10,086 tons of zinc concentrates were produced containing 56 ounces of gold, 41,929 ounces of silver, 537,361 pounds of lead, and 11,398,865 pounds of zinc. In 1931 a total of 48,146 tons of lead concentrates and zinc concentrates was produced containing 183 ounces of gold, 765,800 ounces of silver, 39,240,023 pounds of lead, and 25,719,970 pounds of zinc. In 1932 the mine was operated at a loss of $318,977 compared to a profit of $65,170 in 1931 and $766,091 in 1930.

Ore reserves at the end of 1932 were estimated at 1,495,000 tons of developed ore. During the year the 3,450 level was opened an additional length of 30 feet, making the total length on the ore 1,120 feet. The 3,650 level was opened an additional length of 280 feet, making a total length of 720 feet on the ore.

The Page and Blackhawk Mines in the Yreka district, Shoshone County, were also operated in 1932 on the same schedule as the Morning Mine by the Federal Mining & Smelting Co. According to the printed company report, 19,174 tons of lead-zinc ore were treated from the Page Mine and 4,428 tons of similar ore were treated from the Blackhawk Mine. The ore from both mines, which was treated in the 300-ton flotation mill at the Page property, contained an average of 4.20 ounces of silver to the ton, 11.11 percent lead, and 2.50 percent zinc. A total of 3,907 tons of lead concentrates and zinc concentrates was produced from both mines, containing 7 ounces of gold, 91,016 ounces of silver, 4,756,646 pounds of lead, and 488,069 pounds of zinc. This represents a decided decrease from the output in 1931 when 54,909 tons of lead-zinc ore were treated from both mines. A total of 9,287 tons of lead concentrates and zinc concentrates was produced containing 18 ounces of gold, 219,042 ounces of silver, 10,885,834 pounds of lead, and 1,604,781 pounds of zinc. Ore re-
serves in the Page-Blackhawk group are estimated at 344,400 tons at the end of 1932. Besides properties in Idaho the Federal Mining & Smelting Co. also owns properties in Kansas, Oklahoma, and Missouri, but the only mines worked in 1932 were those in Idaho. The total value of all metals sold in 1932 was $1,085,844 as compared to $3,007,304 in 1931. After $1,510,133 was deducted for cost of production, freight, treatment, and royalty the net operating loss was $424,289.

The Hercules custom-flotation plant at Wallace was operated part of the year chiefly on ore from the Tamarack & Custer Mine. The total quantity of ore treated in 1932, however, was less than 7 percent of that treated in 1931.

**MONTANA**

Most of the gold and silver and nearly all the copper produced in Montana depend on the output of copper ore from mines at Butte, Silver Bow County, and the value of the metals recovered from copper material in 1931 accounted for nearly 93 percent of the total value of the metal output of the State. In 1932 the value of gold, silver, copper, lead, and zinc produced from mines in Montana was $6,667,957 compared with $19,575,053 in 1931.

The large decrease of nearly $13,000,000 in the combined value of the metals resulted chiefly from curtailment in the output of copper ore by the Anaconda Copper Mining Co. and the continued drop in the average sales prices of silver, copper, lead, and zinc. The output of each metal except gold decreased to a marked degree from that in 1931—copper 54 percent, lead 73 percent, zinc 67 percent, silver 56 percent, and gold less than 1 percent.

**Mine production of gold, silver, copper, lead, and zinc in Montana, 1928–32, in terms of recovered metals**

<table>
<thead>
<tr>
<th>Year</th>
<th>Ore, old tailings, etc.</th>
<th>Gold</th>
<th>Silver</th>
<th>Copper</th>
<th>Lead</th>
<th>Zinc</th>
<th>Total value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short tons</td>
<td></td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
<td>$955,355,949</td>
</tr>
<tr>
<td>1928</td>
<td>4,344,279</td>
<td>$1,203,020</td>
<td>10,853,376</td>
<td>246,262,027</td>
<td>196,187,523</td>
<td>8,800,186</td>
<td></td>
</tr>
<tr>
<td>1929</td>
<td>4,733,445</td>
<td>1,131,949</td>
<td>12,716,977</td>
<td>297,723,973</td>
<td>32,759,444</td>
<td>13,494,986</td>
<td>9,575,953</td>
</tr>
<tr>
<td>1931</td>
<td>2,965,833</td>
<td>925,192</td>
<td>8,829,857</td>
<td>84,717,000</td>
<td>39,213,707</td>
<td>4,475,000</td>
<td>32,720,416</td>
</tr>
<tr>
<td>1932</td>
<td>765,000</td>
<td>825,773</td>
<td>1,671,000</td>
<td>2,375,000</td>
<td>165,600,189</td>
<td>19,575,053</td>
<td>6,667,957</td>
</tr>
</tbody>
</table>

1 Subject to revision.

**Gold.—**The value of the gold output from both lode and placer mines was close to that of 1931, chiefly on account of the interest in the operation of lode gold mines. A feature in 1932 was the general and continued activity in gold mining which resulted in reopening mines formerly productive as well as prospecting for and developing new ones.

The Jardine Mine at Jardine, Park County, a large producer of gold from 1918 to 1926, was again active in September 1932 and produced more than $28,000 in gold during the last quarter of the year. Besides gold, part of which is free, the ore contains arsenopyrite and scheelite. The plant includes a 200-ton amalgamation and concentration mill, arsenic plant, and cyanide plant. The I. B. Mining Co., which started working the Sleeping Princess group near Bannack,
Beaverhead County, in March 1931, continued to work the property throughout 1932. The property is equipped with a 100-ton cyanide plant, and slightly more gold bullion than in 1931 was sold to the mint at San Francisco. The mine ranked second as a producer of gold in Montana in 1932. The Liberty Montana Mines Co. worked its property near Jefferson Island, Madison County, throughout the year at one third of its normal capacity. The ore, containing chiefly chalcopyrite and pyrite, was treated in a 150-ton flotation concentrator, and copper concentrates rich in gold were shipped to Anaconda for smelting. The production of gold from the Liberty Montana property in 1932 was more than double that in 1931, and the mine became the largest producer of gold in Montana. The property has been a large producer of gold recovered from copper concentrates during the last 5 years. The Ohio-Keating group near Radersburg, Broadwater County, was worked by the Ohio-Keating Gold Mining Corporation until September 10, when operations ceased. More than 15,000 tons of iron oxide ore were treated in a 100-ton cyanidation plant and gold bullion valued at about $64,000 was sold. In addition, 247 tons of iron sulphide ore containing nearly 1 ounce of gold to the ton was shipped for smelting. The property not only increased its output of gold in 1932 but ranked third as a producer of gold in Montana. About 2,800 tons of gold ore from the old Gold Coin Mine near Southern Cross, Deer Lodge County, were treated by amalgamation, and exceptionally rich gold ore of smelting grade was shipped from the August Mine near Landusky, Phillips County.

Mines in the Highlands district 15 miles south of Butte in Silver Bow County received more attention in 1932 than in previous years, and the Butte Highlands Mining Co. shipped 600 tons of first-class ore containing more than 1 ounce of gold to the ton. The Spring Hill mine of the Montana Mines Corporation, a large producer of gold since 1928, was idle in 1932. The decrease in gold from this property and from the Anaconda group represented a combined decrease of 14,600 ounces of gold; but the large increases in gold output from the Liberty Montana, Ohio-Keating, Jardine, Gold Coin, Drumlummon, and Butte Highlands properties, and the continued production from the I. B. Mine and from many small producers from various parts of the State nearly offset the decrease.

The largest gold producers in the State in 1932 were the Liberty Montana, I. B., Ohio-Keating, Anaconda, Jardine, August, Gold Coin, and Drumlummon properties.

Silver.—The output of silver in 1932 was less than half that in 1931 and was the smallest since detailed production figures have been recorded. The decrease in silver output was due almost entirely to the curtailment in the output of copper ore from the property of the Anaconda Copper Mining Co., as most of the silver produced in Montana is recovered from copper ore mined at Butte. With a better price for silver, however, much silver-bearing ore may again be mined at Kila, Flathead County; Philipsburg, Granite County; and Neihart, Cascade County.

Copper.—The copper output decreased nearly 100,000,000 pounds in 1932, and the value of the output decreased from $16,794,572 to $5,167,737, the lowest value in the last 30 years. The enormous decrease in the size of the copper output, combined with the decline in the average sales price from 9.1 cents a pound in 1931 to 6.1 cents a
pound in 1932 and the decrease in the value of the silver output, accounted for nearly 95 percent of the total decrease in the value of the metal output of the State.

Despite the large decline in the output of copper the State retained its position as the second largest producer of copper in the United States. In 1932 the Anaconda Copper Mining Co. produced nearly all the State's copper from its mines at Butte, which were kept in operation despite the exceptional drop in the price of copper. The production was less than half that in 1931.

Lead.—The production of lead decreased 73 percent in quantity and 80 percent in value; it was the smallest output since 1903. The decrease of nearly 6,500,000 pounds in the production of lead was due chiefly to the closing of the Jack Waite Mine and mill in March. The property, however, was the largest producer of lead in Montana in 1932, as it was in 1931.

Nearly all the large producers of lead in Montana, especially those at Butte, have been closed since the drop in metal prices. The Block P Mine near Monarch, Judith Basin County, was the largest producer of lead in Montana in 1929 and 1930, but the property was closed during the latter part of 1930 as a result of low metal prices. In 1929 and 1930 considerable lead was also produced from mines near Basin, Jefferson County; Philipsburg, Granite County; Radersburg, Broadwater County; and Melrose, Madison County. The lead smelter at East Helena was operated until June 16 when it was closed for an indefinite period. The receipts in 1932 consisted chiefly of lead concentrates from Idaho and residues from the electrolytic zinc plant at Great Falls.

Zinc.—Nearly all the zinc produced in Montana in 1932 was recovered from treating current slag in the fuming plant of the Anaconda Copper Mining Co. at East Helena. The total output of zinc decreased 67 percent in quantity in 1932 and was the lowest since 1908. The value decreased from $512,809 in 1931 to $138,725 in 1932. This large decrease was due to the fact that the production of zinc from current slag at East Helena was suspended when the lead smelter closed in June. The Jack Waite property in Sanders County produced a little zinc, recovered from zinc concentrates shipped to the electrolytic zinc plant at Silver King, Idaho. The electrolytic zinc plant near Great Falls was operated at less than one half capacity, treating chiefly custom material from Utah and Idaho; the electrolytic zinc plant at Anaconda was idle. The custom flotation plants for the treatment of lead-zinc ore at Anaconda and Butte, owned by the Anaconda Copper Mining Co., remained inactive the entire year. In 1929 nearly 74 percent of the zinc produced in Montana was recovered from zinc ore and lead-zinc ore from the mines at Butte, Silver Bow County, but the mines were closed in 1930 as a result of the drop in metal prices. In 1929-30 considerable zinc was also produced from the Block P Mine near Monarch, Judith Basin County, from current slag at East Helena and from mines near Philipsburg, Granite County.

Butte district and Silver Bow County.—The Butte district, by far the most important mining region of Montana, produced 1,869,330 tons of ore and old tailings in 1931 from which $206,268 in gold, 3,698-676 ounces of silver, and 184,361,564 pounds of copper were recovered, or metals valued at $18,055,786, a decrease from $29,300,026 in 1930.
The production of gold, silver, and copper from ore, old tailings, and precipitates from the Butte mines in 1932 was valued at only \$5,831,736.

The Anaconda Copper Mining Co. was virtually the only producer in the Butte district in 1932. According to the printed annual company report for 1932 the mines continued to produce copper ore but at a greatly reduced rate. In 1932 the Anaconda smelting plant produced 97,573,887 pounds of copper, 2,027,675 ounces of silver, and 18,551.5 ounces of gold; nearly all the copper and silver came from mines at Butte, but about 83 percent of the gold came from shipments from mines outside of Silver Bow County. In 1931 the smelter produced 173,440,855 pounds of copper, 3,640,066 ounces of silver, and 19,486.2 ounces of gold. The electrolytic zinc plant of the Anaconda Copper Mining Co. at Great Falls was operated until May 6, 1932, and the plant at Anaconda has been idle since June 1931. During the time the plant at Great Falls was operated a total production of 33,904,565 pounds of zinc was made, chiefly from zinc concentrates received from mills in Idaho and Utah. In 1931 the two plants produced 125,983,883 pounds of zinc.

The gross sales and earnings of the Anaconda Copper Mining Co. and its subsidiaries in 1932 were \$52,295,611. The cost of sales, including all operating expenses, current development, maintenance charges, repairs, selling and general expenses, and taxes amounted to \$57,240,906, resulting in an operating loss of \$4,945,295 compared with an operating income of \$6,409,427 in 1931. After depreciation, interest, and expense of carrying nonoperating units were deducted and \$610,063 was allowed for miscellaneous income, the net loss to surplus was \$16,893,240. The company paid no dividends in 1932 and the reported surplus at the end of the year was \$42,061,546 compared to a reported surplus of \$69,613,562 at the end of 1931.

No lead or zinc has been produced from the Butte district since 1930 on account of low metal prices. The North Butte Mining Co., a large producer of copper in 1930, was closed in May 1931 and remained nonproductive throughout 1932.

From 1882 to the end of 1932 Silver Bow County, which includes the Butte district, yielded gold, silver, copper, lead, and zinc valued at \$2,172,616,484, as follows: Gold, \$37,367,104; silver, \$329,440,735; copper, \$1,577,522,736; lead, \$21,016,091; and zinc, \$207,269,818. These values represent 1,807,633.58 ounces of gold, 462,084,047 ounces of silver, 10,371,575,359 pounds of copper, 314,289,223 pounds of lead, and 2,567,395,925 pounds of zinc.

**UTAH**

The mines of Utah produced gold, silver, copper, lead, and zinc valued at \$14,825,782 in 1932, a value less than for any year since 1899 and a decrease of \$14,645,192 from the output in 1931. Metal production declined so rapidly in the last 3 years that the value of the five metals in 1932 was only 15 percent of that in 1929, the record year in the history of metal mining in Utah.

The curtailed output of copper ore, chiefly from the Utah Copper property at Bingham, and the decline in metal prices accounted for 41 percent of the total decrease in the value of the metal output of the State. There was also a large decrease in the output of lead-zinc
ore from mines at Bingham and Park City and in lead ore from mines in the Tintic district.

The smelting plants at Murray and Tooele were operated at greatly reduced capacity and for only part of the year, but the lead smelter at Midvale was worked throughout the year on a 1-furnace basis, and the copper plant at Garfield continued to operate at reduced capacity.

Utah remained first in the United States in the production of silver followed by Idaho and Montana, ranked third in copper after Arizona and Montana, and third in lead after Missouri and Idaho.

The fact that the average price of copper dropped to an unprecedented low of 6.3 cents a pound, resulting in the closing of the Utah Copper mine part of the year after the capacity had been greatly reduced, was a severe blow to the mining industry in Utah. Three features of the year, however, were most encouraging for the future of the industry. The Eureka Standard mine continued to be an important producer of gold from ore of smelting grade and surpassed all other mines in Utah in gold production at a time when the Utah Copper Co. was seriously curtailing its output. The high-grade gold ore shipped in 1932 contained the telluride minerals hessite and petzite and gives the mine a unique place mineralogically compared with other active gold mines in Utah. While the Park Utah Consolidated Co. property at Keetley and Park City was virtually idle, the Park City Consolidated Mines Co. resumed operations in March after being idle since June 1, 1931. The company shipped about 21,000 tons of ore containing more than 400,000 ounces of silver, which was sufficient to prevent Utah from losing its lead in silver. The third feature of the year was the continued operation and interesting development in the various properties of the United States Smelting, Refining & Mining Co. at Lark and Bingham.

Mine production of gold, silver, copper, lead, and zinc in Utah, 1928–32, in terms of recovered metals

<table>
<thead>
<tr>
<th>Year</th>
<th>Ore, old tailings, etc.</th>
<th>Gold</th>
<th>Silver</th>
<th>Copper</th>
<th>Lead</th>
<th>Zinc</th>
<th>Total value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928</td>
<td>18,427,117</td>
<td>$4,394,001</td>
<td>17,072,853</td>
<td>263,255,029</td>
<td>291,830,021</td>
<td>286,754,429</td>
<td>$79,288,904</td>
</tr>
<tr>
<td>1929</td>
<td>19,831,975</td>
<td>4,969,915</td>
<td>17,592,396</td>
<td>318,282,523</td>
<td>286,754,429</td>
<td>103,019,455</td>
<td>95,985,201</td>
</tr>
<tr>
<td>1930</td>
<td>11,041,941</td>
<td>4,399,145</td>
<td>13,129,421</td>
<td>160,526,423</td>
<td>280,989,790</td>
<td>88,990,938</td>
<td>55,603,464</td>
</tr>
<tr>
<td>1931</td>
<td>8,954,617</td>
<td>4,108,323</td>
<td>8,290,969</td>
<td>151,226,505</td>
<td>158,425,438</td>
<td>74,881,072</td>
<td>26,970,974</td>
</tr>
<tr>
<td>1932</td>
<td>3,776,800</td>
<td>2,797,726</td>
<td>6,998,545</td>
<td>65,113,000</td>
<td>125,149,500</td>
<td>59,150,000</td>
<td>14,355,782</td>
</tr>
</tbody>
</table>

1 Subject to revision.

Gold.—The gold production decreased about 32 percent in 1932, due chiefly to curtailment in output of copper ore from Bingham and to the decrease in the output of gold from mines in the Tintic district. The output of gold from mines in the Bingham district decreased more than 36,000 ounces compared with that of 1931; the output of gold from mines in the Tintic district decreased more than 27,000 ounces; and there was also a decrease in the output of gold from mines in the Park City region. Unusually large decreases in the production of gold were made by the Utah Copper, North Lily, Eureka Standard, Chief Consolidated, and United States Smelting, Refining & Mining companies. A substantial increase in the output of gold was made
at the Yankee Mine in the American Fork district, Utah County, by the American Smelting & Refining Co. and from mines near Gold Hill, Tooele County.

Although the gold recovered in the past from placers in Utah has been relatively small, more gold was recovered in 1932 from placer operations in Grand, Garfield, and San Juan Counties than in recent years. Most of the gold produced in Utah, however, is recovered from bullion after smelting copper and lead ore and concentrates in furnaces in the Salt Lake Valley or in Tooele County near Tooele.

An effort was made in 1932 to rejuvenate old lode gold mines in the State, particularly in Park Valley district, Box Elder County; at Mercur and Gold Hill, Tooele County; in the Fortuna district, Beaver County; and in the Gold Mountain district, Piute and Sevier Counties.

The largest producers of gold were the Eureka Standard Mine in the Tintic district, the Utah Copper, United States, and Niagara properties in the Bingham district; the Yankee (American Smelting & Refining Co.) Mine in the American Fork district; the Utah-Delaware property in the Bingham district; and the Mammoth Mine in the Tintic district.

Silver.—The production of silver in Utah has decreased decidedly in the last 3 years, and the value of the silver output decreased from $2,404,380 in 1931 to $1,956,952 in 1932. The average price of the metal dropped slightly from 29 cents an ounce in 1931 to 28.2 cents in 1932.

Utah has been the leading silver producer of the United States since 1920. The State retained its position in 1932 but was only slightly ahead of Idaho. The increased output of silver by the Silver King Coalition and Park City Consolidated companies resulted in an increase of nearly 300,000 ounces in the output of silver from the Park City region, but the output of silver from the Tintic district decreased more than 900,000 ounces, and the output from the Bingham district decreased nearly 600,000 ounces. The Silver King Coalition mine at Park City was the largest producer of silver in Utah in 1932, followed closely by the Tintic Standard property at Dividend in the Tintic district, which held first place in 1931. Other large silver producers were the United States, Niagara, Park City Consolidated, Eureka Standard, Utah Copper, and Bluestone Lime & Quartzite properties.

Copper.—Copper has decreased in Utah from more than 318,000,000 pounds in 1929 to 65,113,000 pounds in 1932. The value of the copper output decreased from $13,762,522 in 1931 to about $4,102,119 in 1932. The output in 1932 was the smallest since 1921, and the average price of copper declined from 9.1 cents a pound in 1931 to 6.3 cents a pound in 1932. The decrease of 57 percent in the total copper production of the State was due almost entirely to the curtailment in the output of copper ore by the Utah Copper Co. at Bingham. Following the Utah Copper Co., the leading copper producers were the Silver King Coalition, United States, Utah-Delaware, and Yankee properties.

Lead.—The lead output was valued at $3,694,485, a decrease from $5,861,668 in 1931. The output in 1932 was the smallest since 1921 as the average sales price of lead declined from 3.7 cents a pound in 1931 to 3 cents a pound in 1932. A substantial increase in lead was reported from the Niagara property, controlled by the United States
Smelting, Refining & Mining Co. at Bingham, and smaller increases were made at the United States and Lark properties of the same company. Unusually large decreases were reported at the Tintic Standard, Park Utah Consolidated, North Lily, Utah-Apex, Bullion Coalition (Combined Metals Reduction Co.), Chief Consolidated, Plutus, and Utah-Delaware properties. A decrease of nearly 19,000,000 pounds was recorded in the Tintic district, more than 9,400,000 pounds in the Park City region, and more than 4,400,000 pounds in the Bingham district. The largest producers of lead in order of output were the United States, Silver King Coalition, Tintic Standard, Bluestone Lime & Quartzite, and Niagara properties.

Zinc.—The zinc, recovered entirely from milling lead-zinc ore, decreased from $2,834,081 in 1931 to about $1,774,500 in 1932. The average sales price of the various grades declined from 3.8 cents a pound in 1931 to 3 cents a pound in 1932, which resulted in a large decrease in the output of lead-zinc ore from mines at Bingham and Park City. The production of zinc in 1932 from the United States mine at Bingham, the largest producer of lead-zinc ore in the State, was much less than that in 1931, and there was also a large decrease in the production of zinc from the Park Utah Consolidated properties near Park City. The Silver King Coalition Mines Co. at Park City, which ranked second as a producer of lead-zinc ore in the State, increased its production of zinc. Most of the zinc concentrate made from ore mined in Utah in 1932 was stock-piled to await a rise in the price of zinc. The largest zinc producers in Utah in 1932 were the United States, Silver King Coalition, and Niagara properties.

Review of districts and operations.—According to estimates made early in 1933 the mines of Utah produced 3,776,800 tons of ore and old tailings in 1932, a decrease from 8,954,617 tons in 1931, chiefly in copper ore. The Bingham district produced about 3,450,000 tons compared with 8,485,873 tons in 1931, and the metal output of the West Mountain or Bingham district was estimated at 70,490 ounces of gold, 1,909,800 ounces of silver, 62,526,000 pounds of copper, 62,720,000 pounds of lead, and 43,740,000 pounds of zinc. The output from Bingham, the most important district of Utah, represented a marked decrease from 106,867.66 ounces of gold, 2,502,057 ounces of silver, 147,706,141 pounds of copper, 67,193,735 pounds of lead, and 53,215,489 pounds of zinc produced in 1931.

According to the printed annual report of the Utah Copper Co. for 1932, the total output for the year dropped to about 42 percent of that in 1931 and was about one third the average annual output for the last 5 years. A total of 3,169,411 dry tons of ore containing 0.973 percent copper was mined and milled. The average recovery of copper in the mill concentrates was 93.15 percent. Mining costs were 45.78 cents a ton and milling costs 59.01 cents a ton. The average cost per pound of net copper was 8.48 cents in 1932 compared with 6.99 cents in 1931. Concentrates shipped to the smelter contained 57,477,385 gross pounds of copper and mine-water precipitates contained 4,484,288 pounds of copper. Metals sold during the year consisted of 55,991,783 pounds of copper, 25,398.63 ounces of gold, and 222,417 ounces of silver which had a sales value of $3,489,572. The net cost of the metals sold was $4,595,590 and after miscellaneous income was added and depreciation and metal price adjustments were deducted the net loss for the year to surplus account was $3,218,887. The company paid no dividends during 1932.
In the annual report of the United States Smelting, Refining &
Mining Co. for 1932 the company states that most of the lead and
zinc it produced came from the United States mine at Bingham, which
was operated continuously during the year. The company Lark unit
was nonproductive during the year, but active development was
continued at both properties, resulting in an increase in the known
ore reserves.

The mines of the Tintic district produced about 120,000 tons of
ore and old tailings compared with 216,698 tons in 1931. The esti-
mated production of the district was 50,000 ounces of gold, 2,324,000
ounces of silver, 980,000 pounds of copper, 18,430,000 pounds of lead,
and 115,000 pounds of zinc. The production in 1931 was 77,110.74
ounces of gold, 3,286,748 ounces of silver, 1,568,747 pounds of copper,
36,853,599 pounds of lead, and 791,130 pounds of zinc.

The annual report of the Tintic Standard Mining Co. for 1932 gives
the output from the Tintic Standard mine as 44,527 tons of lead ore
and 8,528 tons of siliceous ore which contained 2,280.20 ounces of
gold, 1,343,612 ounces of silver, 361,561 pounds of copper, and
18,163,057 pounds of lead. The net profit for surplus after all charges
were paid was $253,666, and four quarterly dividends aggregating
$230,663 were paid in 1932. The Tintic Standard Mining Co. owns
64.45 percent of the issued stock of the Eureka Standard Conso-
diated Mining Co. The Eureka Standard mine produced 36,478 tons
of siliceous ore during 1932 containing 39,274.38 ounces of gold, 337,251
ounces of silver, 345,083 pounds of copper, and 842,189 pounds of
lead. The ore had a gross sales value of $950,570 and after all
charges were deducted the net profit for the year was $232,703. The
company paid four quarterly dividends in 1932, aggregating $179,951.

The important output in the section near Eureka came from the
Mammoth mine, which produced more than 16,000 tons of ore con-
taining gold, silver, copper, and lead, but valuable chiefly for its gold.
Production from the North Lily mine in 1932 was unusually small, as
it consisted of 832 tons of ore containing 283.29 ounces of gold,
2,872 ounces of silver, and 96,273 pounds of lead. Production from
the Chief mine was also small compared with past years. It consisted
of 1,351 tons of ore for which the net smelter returns were $8,611.
The Grand Central mine, owned by the Chief Consolidated Mining
Co., produced 5,948 tons of smelting ore in 1932 containing 796 ounces
of gold, 23,348 ounces of silver, and 87,374 pounds of copper.

Mill ore and first-class ore produced by mines in the Park City
region amounted to about 151,500 tons in 1932 compared with
186,521 tons in 1931. The estimated output of the region was 2,800.00
ounces of gold, 2,430,000 ounces of silver, 980,000 pounds of copper,
25,260,000 pounds of lead, and 15,300,000 pounds of zinc. In 1931
the Park City region produced 5,041.06 ounces of gold, 2,124,177
ounces of silver, 818,545 pounds of copper, 34,736,616 pounds of lead,
and 18,871,329 pounds of zinc.

The Silver King Coalition Mines Co. was the chief producer in the
Park City region in 1932 and according to the printed annual com-
pany report 97,496 tons of ore was mined and milled which yielded
19,506 tons of lead concentrates and 13,574 tons of zinc concentrates.
All of the lead concentrates were sold but 10,364 tons of zinc concen-
trates were placed in storage. The company gives the metal contents
of the concentrates and lease ore sold in 1932 as follows: 2,157.82
ounces of gold, 1,816,671 ounces of silver, 1,022,883 pounds of copper,
25,545,861 pounds of lead, and 4,002,672 pounds of zinc. The income from the sale of ore and concentrates was $975,081 and after other income was added and all charges were deducted the net profit to surplus was $2,323. The company paid no dividends in 1932.

WASHINGTON

Due to the interest in gold mining and the operation of the mill at Metalline Falls the value of the gold, silver, copper, lead, and zinc produced from mines in Washington in 1932 was approximately $297,543 compared with $565,498 in 1931. Previous to 1931, when the Pend Oreille Mines & Metals Co. increased the output of lead and zinc in Washington, there was a gradual decrease in the value of the metal output of the State, which was continued in 1932. Marked decreases in the production of copper, lead, and zinc in 1932 resulted from the continued drop in the sales prices of these metals, but there was a fair increase in the gold output, amounting to about $37,000.

The Pend Oreille Mines & Metals Co., an important producer of lead-zinc ore at Metalline Falls in 1931, operated its milling plant and produced both lead and zinc concentrates during the first 4 months of 1932. The production of gold, chiefly from the Boundary Red Mountain mine and the Azurite mine in Whatcom County and from various properties at Republic, Ferry County, was more than the output of 1931 but less than the average annual output of the last decade.

Mine production of gold, silver, copper, lead, and zinc in Washington, 1928-32, in terms of recovered metals

<table>
<thead>
<tr>
<th>Year</th>
<th>Ore, old tailings, etc.</th>
<th>Gold</th>
<th>Silver</th>
<th>Copper</th>
<th>Lead</th>
<th>Zine</th>
<th>Total value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short tons</td>
<td></td>
<td>Pounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fine ounces</td>
<td>Pounds</td>
<td>Pounds</td>
<td>Pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1928</td>
<td></td>
<td>64,554</td>
<td>337,167</td>
<td>1,177,246</td>
<td>1,084,739</td>
<td>85,318</td>
<td>$633,156</td>
</tr>
<tr>
<td>1929</td>
<td></td>
<td>65,527</td>
<td>76,698</td>
<td>1,400,489</td>
<td>1,015,100</td>
<td>2,117,344</td>
<td>$552,233</td>
</tr>
<tr>
<td>1930</td>
<td></td>
<td>45,456</td>
<td>87,745</td>
<td>1,308,458</td>
<td>1,155,585</td>
<td>705,782</td>
<td>$449,589</td>
</tr>
<tr>
<td>1931</td>
<td></td>
<td>62,049</td>
<td>60,003</td>
<td>232,410</td>
<td>232,503</td>
<td>2,771,116</td>
<td>$567,495</td>
</tr>
<tr>
<td>1932</td>
<td></td>
<td>42,200</td>
<td>97,168</td>
<td>17,500</td>
<td>5,000</td>
<td>1,876,000</td>
<td>4,688,000</td>
</tr>
</tbody>
</table>

1 Subject to revision.

Gold.—The production of gold increased nearly 62 percent in 1932 and was larger than in any year since 1928. The Boundary Red Mountain mine south of Sardis, British Columbia, was the largest gold producer in the State in 1932; its output was more than double that in 1931. Mines in the Republic district, chiefly the Knob Hill, Mountain Lion, Morning Glory, and Ben Hur, produced gold valued at more than $46,000. The mines were operated by lessees who shipped about 4,300 tons of siliceous gold ore to the Consolidated Mining & Smelting Co. of Canada, Ltd., of Trail, British Columbia, and to Tacoma, Wash. The Boundary Red Mountain mine, the largest producer of gold in Washington in 1929 and 1930, was active most of 1932, and its gold output was valued at about $29,500 compared with $12,465 in 1931.

During the decade 1923 to 1932 mines in Washington produced $2,137,468 in gold. More than 71 percent of this total was produced from siliceous gold ore from mines in the Republic district, and 13 percent was produced from gold ore from the Boundary Red Mountain mine in Whatcom County.
Silver.—The output of silver in the State decreased 22 percent, and the value decreased from $6,499 in 1931 to $4,935 in 1932. More than 68 percent of the silver produced in 1932 came from siliceous gold ore mined at Republic; most of the remainder was recovered from lead-zinc ore mined at Metaline Falls. In the last decade mines in Washington have produced 1,154,500 ounces of silver. About 30.5 percent of the total output was produced from gold ore from mines at Republic, 25 percent from copper ore and concentrates shipped from Chewelah and Index, and more than 21 percent from lead ore shipped from the Colville district. Silver was also produced from the Springdale and Palmer Mountain districts.

Copper.—The output of copper decreased decidedly in 1932, and the value decreased from $18,428 in 1931 to only about $305 in 1932. The Sunset Copper Co. near Index, the largest producer of copper in the State since 1923, was idle throughout 1932, and shipments of silver-copper ore from Chewelah were suspended.

Lead.—Lead decreased from a production valued at $102,531 in 1931 to an output valued at $52,917 in 1932, due to declines in the quantity of ore mined and in the price of the metal. The largest producer of lead in Washington in both 1931 and 1932 was the Pend Oreille property at Metaline Falls, but the mill was closed on May 8 as a result of the continued drop in the sales prices of lead and zinc. Several cars of high-grade lead ore were shipped from the Electric Point and Gladstone properties near Leadpoint, but the Grandview mine at Metaline Falls, a large producer of lead-zinc ore in 1929, has been idle since January 1930.

During the decade 1923–32, 25,872,957 pounds of lead were produced from mines in Washington. More than half of this output was produced from lead ore from the Gladstone mine in the Northport district, Stevens County, and 28 percent was produced from mines in the Metaline district, Pend Oreille County, chiefly from lead-zinc ore from the property of the Pend Oreille Mines & Metals Co. during the last 3 years. Considerable lead was also produced from the Springdale, Colville, and Bossburg districts, all in Stevens County.

Zinc.—The production of zinc decreased about 55 percent in quantity in 1932, as the mill at the property of the Pend Oreille Mines & Metals Co. was idle 8 months in 1932. The value of the output decreased from $378,005 in 1931 to $142,228 in 1932, and the average price of zinc decreased from 3.8 cents a pound to 3.1 cents a pound. About 33,400 tons of ore containing lead and zinc were treated in the plant during the first 4 months of the year; lead concentrates were shipped to the Bunker Hill smelter at Bradley, Idaho, and zinc concentrates were shipped chiefly to the electrolytic plant of the Sullivan Mining Co. at Silver King, Idaho.

During the last decade a total of about 24,919,000 pounds of zinc has been recovered from ore mined in Washington. More than 61 percent of the total production was recovered from lead-zinc ore from the Josephine mine of the Pend Oreille Mines & Metals Co. at Metaline Falls, and about 25 percent was recovered from zinc ore from the Black Rock mine near Northport. Most of the zinc from the Black Rock mine was produced from 1922 to 1926, and nearly all the zinc from the Josephine mine was produced in 1931 and 1932. Virtually all the zinc produced in 1928 was recovered from lead-zinc ore from the Grandview property at Metaline Falls.