

# Idaho

## Gold, Silver, Copper, Lead, and Zinc

(MINE REPORT)

By Philip B. Dettmer



### GENERAL SUMMARY

**C**OPPER was the only metal of the five nonferrous metals to show an increased output in 1951 (3 percent). This was due chiefly to the opening of the Blackbird-Chicago mine in Lemhi County by the Calera Mining Co., which added 295,000 pounds recoverable copper to the State copper total, as well as a substantial quantity of cobalt. Lead, zinc, silver, and gold—the principal metals mined in Idaho—each declined in 1951 output. Lead production dropped from 100,025 tons in 1950 to 76,713 tons in 1951, a decline of 23 percent; zinc from 87,890 tons in 1950 to 78,121 tons in 1951, a decline of 11 percent; silver from 16,095,019 ounces in 1950 to 14,748,188 ounces in 1951, a decline of 8 percent; and gold from 79,652 ounces in 1950 to 45,064, a decline of 43 percent.

The total value of the five metals produced in 1951 was \$70,953,653, an increase of only 1 percent despite advances in market prices of copper, lead, and zinc. The total value of the gold output was \$1,577,240, 2 percent of the State total value; silver \$13,352,231 (19 percent); copper, \$1,045,440 (2 percent); lead, \$26,542,698 (37 percent); and zinc, \$28,436,044 (40 percent). The State remained the largest producer of silver in the United States and was exceeded only by Missouri in lead production and by Montana in zinc output. About 92 percent of the State silver, 87 percent of the copper, 92 percent of the lead, and 96 percent of the zinc came from the Coeur d'Alene region of Shoshone County; the remaining silver, lead, and zinc came largely from the Warm Springs district of Blaine County, and the remaining copper from the Blackbird district of Lemhi County.

About 44 percent of the State gold output in 1951 came from the Yellow Pine mine in the Yellow Pine district, Valley County; the remainder came largely from a lode mine in the Middle Boise district, Elmore County, and dredging operations in the Yankee Fork district, Custer County, and the Boise Basin district, Boise County.

All tonnage figures are short tons and "dry weight"; that is, they do not include moisture.

The value of the metal production reported herein has been calculated at the prices given in table 1.

TABLE 1.—Prices of gold, silver, copper, lead, and zinc, 1947-51

Year	Gold <sup>1</sup> (per fine ounce)	Silver <sup>2</sup> (per fine ounce)	Copper <sup>3</sup> (per pound)	Lead <sup>3</sup> (per pound)	Zinc <sup>3</sup> (per pound)
1947.....	\$35.00	\$0.905	\$0.210	\$0.144	\$0.121
1948.....	35.00	.905+	.217	.179	.133
1949.....	35.00	.905+	.197	.158	.124
1950.....	35.00	.905+	.208	.135	.142
1951.....	35.00	.905+	.242	.173	.182

<sup>1</sup> Price under authority of Gold Reserve Act of Jan. 31, 1934.

<sup>2</sup> Treasury buying price for newly mined silver. July 1, 1946, to date: \$0.9050505 (\$0.905 used in 1947 for calculating purposes).

<sup>3</sup> Yearly average weighted price of all grades of primary metal sold by producers. Price in 1947 includes bonus payments by Office of Metals Reserve for overquota production.

TABLE 2.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by months, in terms of recoverable metal <sup>1</sup>

Month	Gold (fine ounces)	Silver (fine ounces)	Copper (short tons)	Lead (short tons)	Zinc (short tons)
January.....	3,009	1,269,857	199	7,655	7,696
February.....	3,619	1,295,568	204	6,806	6,923
March.....	3,377	1,403,450	213	7,747	7,567
April.....	4,645	1,400,325	205	7,043	6,867
May.....	2,767	1,396,553	206	6,742	6,875
June.....	4,300	1,221,284	168	6,225	6,489
July.....	4,344	1,117,114	156	6,359	5,967
August.....	5,104	981,876	138	5,218	5,796
September.....	2,731	902,527	151	4,720	4,677
October.....	4,599	1,187,940	164	5,860	6,522
November.....	3,240	1,237,447	176	5,940	6,090
December.....	3,329	1,339,082	180	6,398	6,652
Total.....	45,064	14,753,023	2,160	76,713	78,121

<sup>1</sup> Mine production comprises ore, gravel, or other mineral material sold or treated; metal recovered as natural gold or as bullion from cyanidation or amalgamation; and the estimated recoverable metal (or gross metal as indicated) contained in concentrates, ores, tailings, and other mineral materials shipped directly to smelters or sold to ore buyers within the year.

TABLE 3.—Mine production of gold, silver, copper, lead, and zinc in Idaho, 1947-51, and total, 1863-1951, in terms of recoverable metal <sup>1</sup>

Year	Mines producing		Material sold or treated <sup>2</sup> (short tons)	Gold (lode and placer)		Silver (lode and placer)	
	Lode	Placer		Fine ounces	Value	Fine ounces	Value
1947.....	183	99	3,717,697	64,982	\$2,274,370	10,345,779	\$9,362,930
1948.....	194	78	3,981,846	58,454	2,045,890	11,448,875	10,361,810
1949.....	171	82	3,057,075	77,829	2,724,015	10,049,257	9,095,085
1950.....	155	75	3,300,215	79,652	2,787,820	16,095,019	14,566,805
1951.....	187	52	3,254,791	45,064	1,577,240	14,753,023	13,352,231
1863-1951.....			( <sup>3</sup> )	8,166,730	188,974,953	583,177,365	415,770,854

Year	Copper		Lead		Zinc		Total value
	Short tons	Value	Short tons	Value	Short tons	Value	
1947.....	1,640	\$688,800	78,944	\$22,735,872	83,069	\$20,102,698	\$55,164,670
1948.....	1,624	704,816	88,544	31,698,752	86,267	22,947,022	67,758,290
1949.....	1,438	566,572	79,299	25,058,484	76,555	18,985,640	56,429,796
1950.....	2,107	876,512	100,025	27,006,750	87,890	24,960,760	70,198,647
1951.....	2,160	1,045,440	76,713	26,542,698	78,121	28,436,044	70,953,653
1863-1951.....	116,756	36,839,219	6,363,909	788,920,824	1,705,574	326,660,789	1,757,166,639

<sup>1</sup> Includes recoverable metal content of gravel washed (placer operations), ore milled, old tailings, old slimes, and old slag re-treated, and ore shipped to smelters during calendar year indicated.

<sup>2</sup> Does not include gravel washed.

<sup>3</sup> Figure not available.

TABLE 4.—Gold produced at placer mines in Idaho, 1947-51, by class of mine and by method of recovery

Class and method	Mines producing	Material treated (cubic yards)	Gold recovered	
			Fine ounces	Value
<b>Surface placers:</b>				
Gravel mechanically handled:				
Bucket-line dredges:				
1947.....	8	3,381,351	14,112	\$493,920
1948.....	5	3,139,168	14,969	523,915
1949.....	4	2,332,576	10,234	358,190
1950.....	4	2,005,000	13,549	474,215
1951.....	4	1,729,500	10,665	373,275
Dragline dredges:				
1947.....	4	577,000	2,939	102,865
1948.....	2	400,000	1,071	37,485
1949.....	2	406,000	1,409	49,315
1950.....	2	296,000	1,839	64,365
1951.....	5	137,000	938	32,830
Suction dredges:				
1947.....	5	19,590	103	3,605
1948.....	3	1,200	20	700
1949.....	2	11,765	54	1,890
1950.....	1	500	15	525
1951.....				
Nonfloating washing plants: <sup>1</sup>				
1947.....	8	444,490	2,232	78,120
1948.....	5	457,570	4,204	147,140
1949.....	5	259,500	3,064	107,240
1950.....	9	205,117	1,684	58,940
1951.....				
Gravel hydraulically handled:				
1947.....	9	32,560	152	5,320
1948.....	4	32,600	189	6,615
1949.....	5	14,800	87	3,045
1950.....	10	37,085	292	10,220
1951.....	9	17,250	93	3,255
Small-scale hand methods (wet):				
1947.....	58	10,607	218	7,630
1948.....	54	11,087	307	10,745
1949.....	60	20,866	218	7,630
1950.....	49	17,028	182	6,370
1951.....	34	7,261	154	5,390
<b>Underground placers (drift):</b>				
1947.....	7	2,333	20	700
1948.....	5	620	16	560
1949.....	3	1,330	12	420
1950-51.....				
<b>Grand total placers:</b>				
1947.....	99	4,467,931	19,776	692,160
1948.....	78	4,042,245	20,776	727,160
1949.....	82	3,046,837	15,078	527,730
1950.....	75	2,560,730	17,561	614,635
1951.....	52	1,891,011	11,850	414,750

<sup>1</sup> Includes all placer operations using power excavator and washing plant, both on dry land; an outfit with movable washing plant is termed a "dry-land dredge."

<sup>2</sup> A mine using more than one method of recovery is counted but once in arriving at total for all methods.

**Gold.**—The output of recoverable gold in Idaho in 1951 was 45,064, or 34,588 ounces less than in 1950, a decrease of 43 percent. This reverses the upward trend which began in 1946.

The sharp decline in gold output can be attributed partly to a 60 percent decline in gold production of the Bradley Mining Co. Yellow Pine mine in Valley County. The company reported that pit conditions made economic mining of ore difficult, resulting in a great variety of mill feed and poor metallurgical recovery. In addition to the decrease in Yellow Pine production, there was a drop of 8,044 ounces of gold in Idaho County output due primarily to the cessation of operations of the Wild Rose group of placers by the

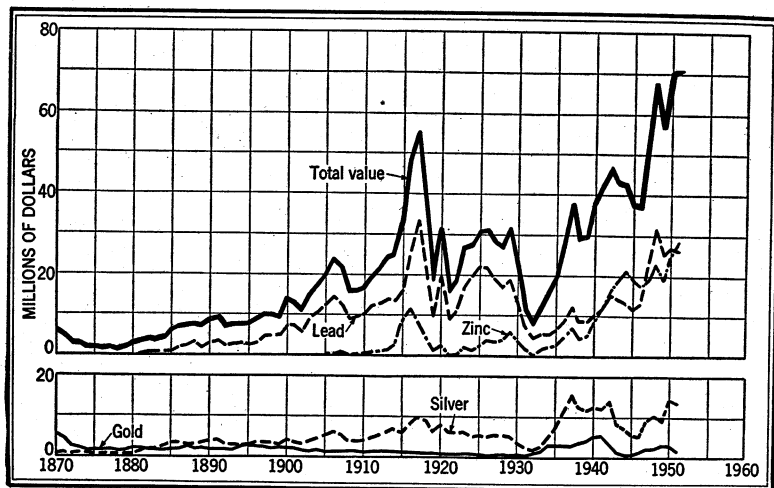


FIGURE 1.—Value of mine production of gold, silver, lead, and zinc, and total value of gold, silver, copper, lead, and zinc in Idaho, 1870-1951. The value of copper has been less than \$2,000,000 annually, except in a few years.

Warren Dredging Co. A summer shortage of underground miners and a strike in late August and early September also contributed to the decreased production.

Gold produced from lode mines in 1951 was 33,214 fine ounces compared to 62,091 fine ounces in 1950, and that from placer properties was 11,850 fine ounces compared with 17,561 fine ounces. The Yellow Pine mine continued to be by far the largest producer of gold in Idaho; it was followed by the Boise-Rochester mine group at Atlanta operated by the Talache Mines Inc., a bucket-line dredge on the Yankee Fork placers property in Custer County operated by the Warren Dredging Co., and a bucket-line dredge at Idaho City operated by the Idaho-Canadian Dredging Co. Of the total gold produced in Idaho in 1951, nearly 64 percent came from gold ore, 24 percent from bucket-line dredging, 6 percent from zinc-lead ores, and 2 percent from dragline dredging. Four bucket-line dredges and 5 dragline dredges treated about 1,866,000 cubic yards of gravel in 1951 and recovered 11,603 fine ounces of gold and 4,789 fine ounces of silver.

**Silver.**—Idaho's output of recoverable silver in 1951 was 14,753,023 fine ounces, a decline of 1,341,996 ounces from the 1950 production. The State continued to be the largest producer of silver in the United States—a rank held since 1933. The Coeur d'Alene region produced 13,639,808 fine ounces of silver, or 92 percent of the State total silver output for 1951. This was 1,416,323 fine ounces less than the Region's 1950 output, the decline being caused by a summer shortage of underground personnel and the strike in late summer. Of the State total silver, silver ore yielded 66 percent, zinc-lead ore and old tailings 28 percent, lead ore 3 percent, and gold ore most of the remainder. The recovery of silver from silver ore increased 65,249 ounces in 1951, decreased 1,377,401 ounces from zinc-lead ores and 338,880 ounces from lead ores, and increased 4,781 ounces from gold ores. Nine

mines—the Sunshine, Polaris, Silver Summit, Bunker Hill, Silver Dollar group, Triumph, Page, Silver Syndicate, and Star mines produced 84 percent of the State total in 1951. Six properties (Sunshine, Polaris, Silver Dollar group, Silver Syndicate, Sunshine Consolidated, and Metropolitan, near Kellogg) operated by the Sunshine Mining Co. produced 7,990,034 ounces of silver in 1951, or 54 percent of the State total.

**Copper.**—The output of copper in Idaho in 1951 was 4,320,000 pounds, an advance of 106,000 pounds over the 1950 output. About 83 percent of the State copper output in 1951 was recovered as a byproduct in the treatment of zinc-lead ore and silver ore from mines in the Coeur d'Alene region and about 7 percent was recovered from copper concentrates produced by the newly opened Blackbird-Chicago mine operated by Calera Mining Co. in the Blackbird district of Lemhi County. The Sunshine mine near Kellogg in the Coeur d'Alene region continued to be the largest producer of copper in Idaho. It was followed by the Silver Summit, Polaris, Bunker Hill & Sullivan, and Silver Dollar properties.

**Lead.**—In 1951 the mines in Idaho produced 76,713 short tons of recoverable lead, 23,312 tons less than in 1950. The decline resulted principally from a shortage of underground miners in late summer and early fall and the strike in late August and early September. Ninety-two percent of the State total lead came from the Coeur d'Alene region; most of the remainder was produced in the Warm Springs district of Blaine County, Bayhorse district of Custer County, and the Texas district of Lemhi County. Zinc-lead ore and old tailings from the Coeur d'Alene region yielded 78 percent of the lead; and lead ore and silver ore from the same region accounted for over 11 percent of the 1951 State lead output.

The Bunker Hill & Sullivan mine at Kellogg was by far the largest producer of lead in Idaho in 1951, although its output was 33 percent less than in 1950. The combined lead output of the five largest

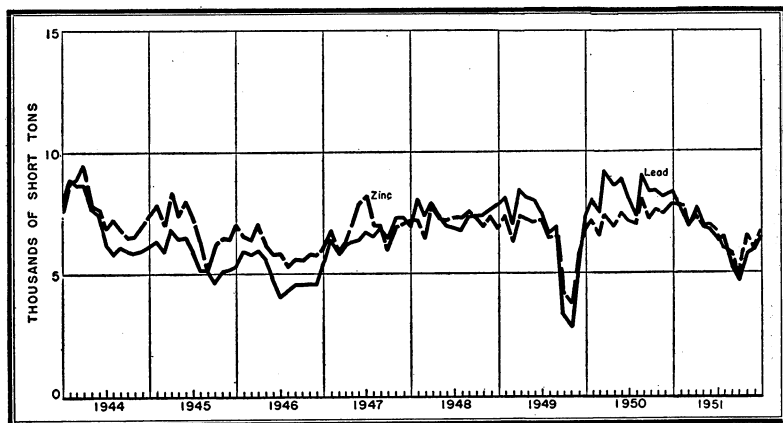


FIGURE 2.—Mine production of lead and zinc in Idaho, 1944-51, by months, in terms of recoverable metal.

**TABLE 5.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by counties, in terms of recoverable metal**

County	Mines producing		Gold (lode and placer)		Silver (lode and placer)	
	Lode	Placer	Fine ounces	Value	Fine ounces	Value
Ada.....		1	5	\$175		
Adams.....	1		2	70	232	\$210
Bear Lake.....	1				21	19
Bingham.....		1	1	35		
Blaine.....	20		832	29,120	528,650	478,455
Boise.....	2	7	5,011	175,385	1,306	1,182
Bonner.....	8		245	8,575	84,066	76,084
Custer.....	22	2	5,513	192,955	215,462	195,004
Elmore.....	4	1	6,335	221,725	37,378	33,829
Gem.....	2		185	6,475	1,074	972
Idaho.....	7	22	1,801	63,035	1,053	953
Jerome.....		2	3	105		
Lemhi.....	14	3	568	19,880	94,292	85,339
Lewis.....		2	38	1,330	10	9
Nez Perce.....		1	9	315		
Owyhee.....	3	2	10	350	1,232	1,115
Shoshone.....	67		2,684	93,940	13,639,808	12,344,715
Twin Falls.....		2	13	455		
Valley.....	1	4	19,614	686,490	141,044	127,652
Washington.....	1				148	134
Other counties <sup>1</sup> .....	4	2	2,195	76,825	7,247	6,559
<b>Total.....</b>	<b>157</b>	<b>52</b>	<b>45,064</b>	<b>1,577,240</b>	<b>14,753,023</b>	<b>13,352,231</b>

County	Copper		Lead		Zinc		Total value
	Short tons	Value	Short tons	Value	Short tons	Value	
Ada.....							\$175
Adams.....	9	\$4,356					4,636
Bear Lake.....			7	\$2,422			2,441
Bingham.....							35
Blaine.....	48	23,232	3,182	1,100,972	1,931	\$702,884	2,334,663
Boise.....							176,567
Bonner.....	3	1,452	114	39,444	27	9,828	135,383
Custer.....	21	10,164	2,101	726,946	1,040	378,560	1,503,629
Elmore.....							255,554
Gem.....	1	484	6	2,076	3	1,092	11,099
Jerome.....			1	346			64,334
Lemhi.....	203	98,252	549	189,954	110	40,040	105
Lewis.....							433,465
Nez Perce.....							1,339
Owyhee.....			3	1,038			315
Shoshone.....	1,874	907,016	70,570	24,417,220	13	4,732	7,235
Twin Falls.....					74,989	27,295,996	65,058,887
Valley.....							455
Washington.....			13	4,498			814,142
Other counties <sup>1</sup> .....	1	484	167	57,782	8	2,912	4,632
<b>Total.....</b>	<b>2,160</b>	<b>1,045,440</b>	<b>76,713</b>	<b>26,542,698</b>	<b>78,121</b>	<b>28,436,044</b>	<b>70,953,653</b>

<sup>1</sup> Includes Bonneville, Boundary, Butte, Cassia, Clark, and Clearwater Counties for which Bureau of Mines is not at liberty to publish separate figures.

producing mines (each producing more than 6 million pounds of lead)—the Bunker Hill, Page, Star, Morning, and Triumph was 91,268,537 pounds, or 59 percent of the State total. Other important producers in 1951 were the Sidney group, Dayrock, Tamarack, Constitution, Sunshine, and Frisco group properties.

**Zinc.**—In 1951 the mines in Idaho produced 78,121 short tons of recoverable zinc, 9,769 tons less than the 1950 output or a decrease of 11 percent. About 96 percent of the State total zinc came from the Coeur d'Alene region and most of the remainder from the Triumph

mine in the Warm Springs district of Blaine County. Zinc-lead ore and old tailing concentrates yielded over 94 percent of the State total zinc; old zinc slag smelted and fumed, 5 percent; and lead ore, silver ore, and old lead tailings most of the remainder. The largest producer of zinc in the State in 1951 was the Star mine operated by the Sullivan Mining Co., with a production of 36,789,257 pounds of recoverable zinc, or 24 percent of the State total zinc. Nine other properties (each producing more than 5 million pounds of recoverable zinc)—the Bunker Hill, Page, Morning, Sidney Group, Bunker Hill smelter slag dump, Constitution, Tamarack, Monitor group, and Frisco group produced the bulk of the remaining output in 1951.

### MINING INDUSTRY

Despite an appreciable advance in the price of copper, lead and zinc in 1951, gold output dropped 43 percent, silver 8, lead 23, and zinc 11. A shortage of underground miners in the late summer and early fall and a regional labor strike from late August to early September were the chief reasons for the decline in output of these metals. The drastic drop in gold output was due to pit conditions of the Yellow

TABLE 6.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by class of ore or other source material, in terms of recoverable metal

Source	Number of mines <sup>1</sup>	Material sold or treated (short tons)	Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
<b>Ore:</b>							
Dry gold.....	25	638,474	28,666	179,659	4,059	898	-----
Dry gold-silver.....	1	219	267	4,310	-----	-----	-----
Dry silver.....	10	280,809	674	9,786,292	2,600,915	8,348,251	664,292
<b>Total.....</b>	<b>36</b>	<b>919,502</b>	<b>29,607</b>	<b>9,970,261</b>	<b>2,604,974</b>	<b>8,349,149</b>	<b>664,292</b>
<b>Copper.....</b>	<b>7</b>	<b>29,942</b>	<b>149</b>	<b>80,372</b>	<b>361,584</b>	<b>937</b>	-----
Lead.....	46	96,174	583	391,987	60,996	11,966,917	797,383
Lead-copper.....	2	41,133	10	62,795	92,089	169,022	-----
Zinc.....	2	357	-----	95	39	2,749	12,255
Zinc-lead.....	61	1,795,402	2,709	4,021,435	1,110,176	124,314,589	143,574,611
<b>Total.....</b>	<b>110</b>	<b>1,963,008</b>	<b>3,451</b>	<b>4,556,684</b>	<b>1,624,884</b>	<b>136,454,214</b>	<b>144,384,249</b>
<b>Other "lode" material:</b>							
Dry gold: Mill clean-up.....	1	1	7	-----	-----	-----	-----
Dry silver: Old tailings.....	1	83	3	790	81	2,452	-----
<b>Lead:</b>							
Mill clean-up.....	2	223	1	3,037	1,010	73,637	16,680
Old tailings.....	3	32,907	32	34,633	25,794	1,528,146	287,697
Old slag.....	1	105	-----	74	500	15,600	6,500
<b>Zinc:</b>							
Old slag.....	1	64,986	-----	34,204	-----	2,535,818	8,062,216
Old tailings.....	1	1,364	1	649	222	10,908	52,323
<b>Zinc-lead:</b>							
Mill clean-up.....	1	5	-----	70	47	1,879	1,398
Old tailings.....	7	272,607	112	147,786	62,488	4,454,197	2,766,645
<b>Total.....</b>	<b>16</b>	<b>372,281</b>	<b>156</b>	<b>221,243</b>	<b>90,142</b>	<b>8,622,637</b>	<b>11,193,459</b>
<b>Total "lode" material.....</b>	<b>157</b>	<b>3,254,791</b>	<b>33,214</b>	<b>14,748,188</b>	<b>4,320,000</b>	<b>153,426,000</b>	<b>156,242,000</b>
Gravel (placer operations).....	52	-----	11,850	4,835	-----	-----	-----
<b>Total all sources.....</b>	<b>209</b>	<b>3,254,791</b>	<b>45,064</b>	<b>14,753,023</b>	<b>4,320,000</b>	<b>153,426,000</b>	<b>156,242,000</b>

<sup>1</sup> Detail will not necessarily add to totals because some mines produce more than one class of ore.

Pine mine, a major producer, which made economic mining of ore difficult and resulted in poor metallurgical recovery. Copper was the only metal that showed an increase in 1951 (3 percent). The opening of the Blackbird-Chicago mine near the town of Cobalt, Idaho, by the Calera Mining Co. added 295,000 pounds of recoverable copper to the State total copper.

About 93 percent of the zinc-lead ore and old tailings (by far the chief ore output of the State), 97 percent of the silver ore, 91 percent of the lead ore and old tailings, and 100 percent of the zinc ore and old zinc slag were produced in the Coeur d'Alene region. Placer mining activity in Idaho declined in 1951. Nine dredges (5 dragline and 4 bucket-line) recovered 11,603 fine ounces of gold in 1951 compared with 16 dredges (11 dragline, including 9 nonfloating washing plants, 4 bucket-line, and 1 suction) in 1950 that recovered 17,087 fine ounces of gold.

Definitions used in ore classification are given in the Gold and Silver chapter of this volume.

### METALLURGICAL INDUSTRY

Of the 3,254,791 tons of ore produced in Idaho in 1951, 3,172,257 tons (97 percent) was treated at milling plants and the remainder—82,534 tons (3 percent)—was shipped crude to smelters.

Milling plants in 1951 treated principally zinc-lead ore and old tailings (2,068,612 tons), gold ore (638,271 tons), silver ore (272,915 tons), lead ore (88,220 tons), and zinc ore (150 tons). Current hot zinc slag totaling 136,928 tons was fumed, and 64,986 tons of old dump lead-smelter slag was delivered for smelting and fuming. Metals

**TABLE 7.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by method of recovery and type of material processed, in terms of recoverable metal**

Method of recovery and type of material processed	Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
<b>Lode:<sup>1</sup></b>					
Amalgamation.....	3,503	2,667			
Cyanidation.....	2,190	137			
Total recoverable in bullion.....	5,693	2,804			
<b>Concentration, and smelting of concentrates:</b>					
Ore.....	26,239	14,319,419	4,165,477	141,656,913	144,057,780
Old tailings.....	153	207,972	98,217	6,405,353	3,819,343
Total.....	26,392	14,527,391	4,263,694	148,062,266	147,877,123
<b>Direct smelting:</b>					
Ore.....	1,118	179,818	54,668	2,734,348	278,083
Old tailings.....	11	3,897	1,138	77,968	18,078
Old slag.....		34,278	500	2,551,418	8,068,716
Total.....	1,129	217,993	56,306	5,363,734	8,364,877
<b>Placer.....</b>	11,850	4,835			
<b>Grand total.....</b>	45,064	14,753,023	4,320,000	153,426,000	156,242,000

<sup>1</sup> Ore only. No old tailings, etc., processed by this method in Idaho in 1951.



TABLE 8.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by method of recovery (except placer) and class of material processed, in terms of recoverable metal

A. For material treated at mills

	Material treated (short tons)	Recoverable in bullion		Concentrate shipped to smelters <sup>1</sup> and recoverable metal					
		Gold (fine ounces)	Silver (fine ounces)	Concentrate (short tons)	Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
BY COUNTIES									
Blaine.....	89, 673			9, 175	797	525, 102	94, 963	6, 315, 188	3, 839, 729
Boise.....	70			2	76	59			
Bonner.....	1, 711			163	38	6, 650	2, 158	122, 926	44, 114
Custer.....	50, 252	12	12	4, 759	147	149, 749	30, 487	2, 865, 835	2, 057, 557
Elmore.....	9, 015	3, 403	2, 595	233	2, 914	34, 778			
Gem.....	53			21	7		127	11, 678	6, 000
Idaho.....	333	86	41	7	5	692		2, 000	
Lemhi.....	63, 330			2, 205	116	62, 886	387, 800	168, 800	
Owyhee.....	125	2	19	31	4	1, 191		6, 000	26, 000
Shoshone.....	2, 328, 462			258, 799	2, 683	13, 601, 994	3, 746, 955	138, 442, 207	141, 895, 531
Valley.....	620, 733			14, 394	19, 605	141, 044			
Other counties <sup>2</sup> .....	8, 500	2, 190	137	97		2, 615	1, 204	127, 632	8, 192
Total: 1951.....	3, 172, 257	5, 693	2, 804	289, 886	26, 392	14, 527, 391	4, 263, 694	148, 062, 266	147, 877, 123
1950.....	3, 231, 079	2, 906	1, 956	346, 809	57, 529	15, 869, 845	4, 083, 601	195, 130, 503	165, 985, 336

BY CLASS OF ORE AND OLD TAILINGS TREATED

Dry gold.....	638, 271	5, 635	2, 769	14, 703	22, 792	176, 332	2, 103	529	
Dry gold-silver.....	200	9	12	8	63	975			
Dry silver.....	272, 915			20, 670	470	9, 713, 416	2, 597, 515	8, 311, 666	664, 292
Copper.....	29, 850			306	146	79, 957	340, 208	537	
Lead.....	88, 220	49	23	8, 661	76	295, 458	34, 857	9, 522, 754	759, 833
Lead-copper.....	41, 132			1, 443	10	62, 780	92, 000	168, 800	
Zinc.....	150			14		86	39	2, 496	6, 759
Zinc-lead.....	1, 784, 281			229, 135	2, 682	3, 990, 415	1, 098, 755	123, 650, 131	142, 626, 896
Lead old tailings.....	32, 907			6, 109	32	34, 633	25, 794	1, 528, 146	287, 697
Zinc-lead old tailings.....	284, 331			8, 237	121	173, 339	72, 423	4, 877, 207	3, 531, 646
Total: 1951.....	3, 172, 257	5, 693	2, 804	289, 886	26, 392	14, 527, 391	4, 263, 694	148, 062, 266	147, 877, 123

BY CLASS OF CONCENTRATE SHIPPED TO SMELTERS <sup>1</sup>

Dry gold.....	14, 695	22, 792	176, 332	2, 103	529	
Dry gold-silver.....	8	63	975			
Copper.....	3, 430	394	2, 000, 057	1, 181, 804	21, 220	19, 918
Lead.....	112, 883	1, 817	4, 439, 422	770, 942	133, 882, 406	12, 034, 686
Lead-copper.....	17, 674	212	7, 471, 912	1, 762, 805	6, 824, 243	584, 618
Dry iron <sup>3</sup> .....	849	41	2, 947	1, 700	12, 888	28, 278
Total to copper and lead plants.....	149, 539	25, 319	14, 091, 645	3, 719, 354	140, 741, 286	12, 667, 500
Zinc.....	140, 201	1, 071	433, 666	543, 681	7, 276, 660	135, 093, 862
Zinc-lead.....	146	2	2, 080	659	44, 320	115, 761
Total to zinc plants.....	140, 347	1, 073	435, 746	544, 340	7, 320, 980	135, 209, 623
Total: 1951.....	289, 886	26, 392	14, 527, 391	4, 263, 694	148, 062, 266	147, 877, 123
1950.....	346, 809	57, 529	15, 869, 845	4, 083, 601	195, 130, 503	165, 985, 336

<sup>1</sup> Excludes concentrates treated only by amalgamation and/or cyanidation.

<sup>2</sup> Includes Bonneville, Boundary, Butte, Cassia, Clark, and Clearwater Counties for which Bureau of Mines is not at liberty to publish separate figures.

<sup>3</sup> From lead and zinc-lead ores.

TABLE 8.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by method of recovery (except placer) and class of material processed, in terms of recoverable metal—Continued

B. For material shipped directly to smelters

	Ma- terial shipped (short tons)	Recoverable metal content				
		Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
BY COUNTIES						
Adams.....	74	2	232	18,000		
Bear Lake.....	30		21		14,000	
Blaine.....	334	35	3,548	1,037	48,812	22,271
Boise.....	3	7	14			
Bonner.....	7,985	207	77,416	3,842	105,074	9,886
Custer.....	5,187	222	62,393	11,513	1,336,165	22,443
Elmore.....	2	17	5			
Gem.....	158	178	443	1,873	322	
Idaho.....	19	18	36			
Lemhi.....	3,003	440	31,406	18,200	929,200	220,000
Owyhee.....	(4)	2	22			
Shoshone.....	65,477	1	37,814	1,045	2,697,793	8,082,469
Washington.....	42		148		26,000	
Other counties <sup>5</sup> .....	220		4,495	796	206,368	7,808
Total: 1951.....	82,534	1,129	217,993	56,306	5,363,734	8,364,877
1950.....	69,136	1,656	217,399	130,399	4,919,497	9,794,664
BY CLASS OF MATERIAL						
Dry gold:						
Ore.....	203	239	558	1,956	369	
Mill cleanup.....	1	7				
Total.....	204	246	558	1,956	369	
Dry gold-silver ore.....	19	195	3,323			
Dry silver:						
Ore.....	7,894	204	72,876	3,400	36,585	
Old tailings.....	83	3	790	81	2,452	
Total.....	7,977	207	73,666	3,481	39,037	
Copper ore.....	92	3	415	21,376	400	
Lead:						
Ore.....	7,954	458	96,506	26,139	2,444,163	37,550
Mill cleanup.....	223	1	3,037	1,010	73,637	16,680
Old slag.....	105		74	500	15,600	6,500
Total.....	8,282	459	99,617	27,649	2,533,400	60,730
Lead-copper ore.....	1		15	89	222	
Total to copper and lead plants.....	16,575	1,110	177,594	54,551	2,573,428	60,730
Zinc:						
Ore.....	89	1	815	366	7,718	18,354
Old slag.....	64,986		34,204		2,535,818	8,062,216
Total.....	65,075	1	35,019	366	2,543,536	8,080,570
Zinc-lead:						
Ore.....	879	18	5,310	1,342	244,891	222,179
Mill cleanup.....	5		70	47	1,879	1,398
Total.....	884	18	5,380	1,389	246,770	223,577
Total to zinc plants.....	65,959	19	40,399	1,755	2,790,306	8,304,147
Total 1951.....	82,534	1,129	217,993	56,306	5,363,734	8,364,877

<sup>4</sup> Less than 0.5 ton.

<sup>5</sup> Includes Boundary, Butte, and Clark Counties for which Bureau of Mines is not at liberty to publish separate figures.

recovered from the old dump slag were credited to the Bunker Hill smelter dump, and metals recovered from the hot slag were credited to various producers of the ores and concentrates that contributed during the year to the slag-making material.

The Bunker Hill & Sullivan Mining & Concentrating Co. operated its Bradley lead smelter and refinery on ore and concentrates, chiefly from mines and mills in the Coeur d'Alene region; both plants were closed on July 20 and from August 27 to September 6 owing to a strike, making a total of 12 days lost.

According to the Bunker Hill & Sullivan Mining & Concentrating Co.'s annual stockholders' report for 1951, continuous lead softening had been firmly established at Bunker Hill and was satisfactory. Construction of a new crushing and fine grinding plant was nearing completion. The company also operated its antimony and cadmium plants, 2,000-ton flotation mill (including a sink-and-float unit), 300-ton tailing-treatment plant for recovery of silver, iron, lead, and zinc from old jig tailings, and the 450-ton zinc slag-fuming plant at

TABLE 9.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by method recovery (except placer) and class of material processed, in terms of gross metal content

Class of material	Quantity shipped or treated (short tons)	Gross metal content				
		Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
<b>ORE AND OLD TAILINGS TREATED AT MILLS</b>						
Dry gold.....	638, 271	51, 317	284, 599	2, 450	620	-----
Dry gold-silver.....	200	80	1, 100	-----	-----	-----
Dry silver.....	272, 915	604	9, 903, 921	3, 506, 475	8, 628, 113	988, 757
Copper.....	29, 850	184	82, 003	438, 209	1, 200	-----
Lead.....	88, 220	178	337, 040	50, 790	10, 566, 221	1, 294, 736
Lead-copper.....	41, 132	20	73, 225	185, 000	233, 000	-----
Zinc.....	150	-----	100	48	2, 900	7, 900
Zinc-lead.....	1, 784, 281	6, 723	4, 412, 118	1, 403, 776	135, 728, 869	167, 932, 023
Lead old tailings.....	32, 907	40	50, 870	35, 774	2, 153, 992	650, 721
Zinc-lead old tailings.....	284, 331	186	266, 025	123, 737	7, 437, 279	5, 069, 840
Total: 1951.....	3, 172, 257	59, 332	15, 411, 001	5, 746, 259	164, 802, 194	175, 943, 977
1950.....	3, 231, 079	78, 625	16, 758, 556	5, 782, 129	215, 933, 455	191, 625, 549

**CONCENTRATE SHIPPED TO SMELTERS**

Dry gold.....	14, 695	22, 792	176, 332	2, 474	551	-----
Dry gold-silver.....	8	63	975	-----	-----	-----
Copper.....	3, 430	394	2, 000, 057	1, 228, 274	29, 136	25, 213
Lead.....	112, 883	1, 817	4, 439, 422	901, 926	136, 213, 205	15, 067, 016
Lead-copper.....	17, 674	212	7, 471, 912	2, 077, 703	6, 943, 500	739, 585
Dry iron <sup>1</sup> .....	849	41	2, 947	1, 968	15, 484	53, 866
Total to copper and lead plants.....	149, 539	25, 319	14, 091, 645	4, 212, 345	143, 201, 936	15, 885, 680
Zinc.....	140, 201	1, 071	433, 842	576, 787	7, 607, 454	144, 533, 080
Zinc-lead.....	146	2	2, 080	725	45, 681	122, 004
Total to zinc plants.....	140, 347	1, 073	435, 922	577, 512	7, 653, 135	144, 655, 084
Total: 1951.....	289, 886	26, 392	14, 527, 567	4, 789, 857	150, 855, 071	160, 540, 764
1950.....	346, 809	57, 529	15, 869, 845	4, 642, 206	198, 821, 859	175, 421, 139

<sup>1</sup> From lead and zinc-lead ores.

TABLE 9.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by method of recovery (except placer) and class of material processed, in terms of gross metal content—Continued

Class of material	Quantity shipped or treated (short tons)	Gross metal content				
		Gold (fine ounces)	Silver (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)
<b>MATERIAL SHIPPED DIRECTLY TO SMELTERS</b>						
Dry gold:						
Ore.....	203	239	558	2,021	615	
Mill cleanup.....	1	7				
Total.....	204	246	558	2,021	615	
Dry gold-silver ore.....	19	195	3,323			
Dry silver:						
Ore.....	7,894	204	72,876	3,532	67,139	
Old tailings.....	83	3	790	83	4,086	320
Total.....	7,977	207	73,666	3,615	71,225	320
Copper ore.....	92	3	415	22,391	648	
Lead:						
Ore.....	7,954	458	96,506	33,311	2,516,961	48,151
Mill cleanup.....	223	1	3,037	1,188	74,911	20,118
Old slag.....	105		74	575	15,829	8,162
Total.....	8,282	459	99,617	35,074	2,607,701	76,431
Lead-copper ore.....	1		15	91	370	
Total to copper and lead plants.....	16,575	1,110	177,594	63,192	2,680,559	76,751
Zinc:						
Ore.....	89	1	815	417	7,853	21,860
Old slag.....	64,986		36,172		2,591,457	10,158,445
Total.....	65,075	1	36,987	417	2,599,310	10,180,305
Zinc-lead:						
Ore.....	879	18	5,310	1,591	249,249	278,846
Mill cleanup.....	5		70	55	1,912	1,770
Total.....	884	18	5,380	1,646	251,161	280,616
Total to zinc plants.....	65,959	19	42,367	2,063	2,850,471	10,460,921
Total: 1951.....	82,534	1,129	219,961	65,255	5,531,030	10,537,672
1950.....	69,136	1,656	217,910	145,665	5,055,705	12,377,220

Bradley. The annual stockholders' report disclosed that the smelter produced 3,283 ounces of gold, 10,147,635 ounces of silver, 149,546 pounds of cadmium, 1,174 tons of copper, 723 tons of antimony, 13,372 tons of zinc, and 54,315 tons of lead. The Sullivan Mining Co. operated its 150-ton electrolytic zinc plant near Bradley, producing 54,468 tons of high-grade slab zinc and 272 tons of electrolytic cadmium. In addition, the plant recovered from residues and other byproducts, 8,480 tons of zinc, 3,441 tons of lead, 160 tons of copper, 515,660 ounces of silver, and 1,929 ounces of gold.

The Bradley Mining Co. operated its 2,200-ton flotation mill and antimony-gold smelter at Stibnite, Valley County, but reported that pit conditions resulted in a varied mill feed and a poor metallurgical recovery.

## REVIEW BY COUNTIES

## BLAINE

**Warm Springs District.**—The Triumph Mining Co.'s North Star mine in the Warm Springs district increased its production of zinc-lead ore 70 percent from 44,846 tons in 1950 to 76,176 tons in 1951. This gain resulted from opening in February the company's new mill, which replaced the plant destroyed by fire in 1947.

Since the company's mining capacity was 200 tons of ore per day, the mill, during much of the year, used dump material mixed with mine ore. It was planned to increase mining activity in 1952 to meet mill requirements. Ore treated in 1951 yielded 553 ounces of gold, 493,641 ounces of silver, 76,518 pounds of copper, 6,045,438 pounds of lead, and 3,571,700 pounds of zinc. This constituted 85 percent of the total ore production from Blaine County for 1951.

The New Hope mine worked by Sun Valley Lead-Silver Mines Co., Ketchum, Idaho, although reported to be only in the development stage, nevertheless, ranked second to the Triumph North Star mine in zinc and lead production in Blaine County. A total of 161 tons of zinc and lead concentrates was produced, which contained 9 ounces of gold, 5,951 ounces of silver, 1,166 pounds of copper, 78,890 pounds of lead, and 59,048 pounds of zinc. Tailings from the North Star mine milled by the United States Smelting, Refining & Milling Co., Utah, produced concentrates containing 20 ounces of gold, 4,815 ounces of silver, 1,685 pounds of copper, 33,125 pounds of lead and 66,082 pounds of zinc.

## BOISE

The principal producer in Boise County continued to be the Idaho-Canadian Dredging Co., which operated its 6-cubic-foot bucket-line dredge on Moores Creek near Idaho City, Boise Basin district, from January to July 31, 1951. A total of 720,000 cubic yards of material was treated which yielded 4,914 ounces of gold and 1,231 fine ounces of silver.

## BONNER

The Hope mine owned by the Hope Silver Lead Mines, Inc., and worked throughout 1951 by lessees, was the largest producer in the Clark Fork district, with an output of 201 tons of lead milling ore, 51 tons of zinc-lead smelting ore, and 7 tons of lead smelting ore, all of which yielded 969 ounces of silver, 313 pounds of copper, 79,739 pounds of lead, and 8,038 pounds of zinc. The Whitedelf mine produced 654 tons of lead milling ore which yielded 60,861 pounds of lead and 4,656 ounces of silver. The Weber mine in the Lakeview district was worked from July to October 1951. A total of 7,893 tons of silver ore containing 72,854 ounces of recoverable silver was produced. Output from the Keep Cool mine, operated by the Idaho Lakeview Mines, totaled 750 tons of zinc-lead ore compared with 7 tons of silver ore in 1950.

## BOUNDARY

Various lessees operated the Idaho-Continental mine in the Port Hill district and shipped a total of 1,211 tons of lead ore during the year.

TABLE 10.—Mine production of gold, silver, copper, lead, and zinc in Idaho in 1951, by county and district, in terms of recoverable metal

County and district	Mines producing <sup>1</sup>		Material sold or treated (short tons)	Gold (fine ounces)			Silver (fine ounces)			Copper (pounds)	Lead (pounds)	Zinc (pounds)	Total value
	Lode	Placer		Lode	Placer	Total	Lode	Placer	Total				
Ada: Highland.....		1			5	5							\$175
Adams: Seven Devils.....	1		74	2		2	232		232	18,000			4,636
Bear Lake: Bear Lake.....	1		30				21		21		14,000		2,441
Bingham: Snake River.....		1			1	1							35
Blaine:													
Galena.....	1		225	1		1	1,591		1,591	200	17,800	14,800	7,296
Little Wood River.....	3		346	2		2	2,360		2,360	6,000	46,400	31,600	17,436
Mineral Hill and Camas.....	12		10,217	239		239	18,336		18,336	9,800	127,200	95,500	66,719
Warm Springs.....	4		79,219	590		590	506,363		506,363	80,000	6,172,600	3,720,100	2,243,212
Boise:													
Boise Basin.....	2	5	73	83	4,926	5,009	73	1,233	1,306				176,497
Grimes Pass.....		1			1	1							35
South Fork Payette River.....		1			1	1							35
Bonner:													
Clark Fork.....	3		1,027				9,605		9,605	500	160,000	10,600	38,423
Lakeview.....	3		8,644	242		242	74,408		74,408	5,300	64,400	40,000	95,517
Pend Oreille.....	2		25	3		3	53		53	200	3,600	3,400	1,443
Custer:													
Alder Creek.....	4		724	6		6	4,844		4,844	5,000	230,600	18,300	49,029
Alta.....	1		129				389		389	400	11,400	8,200	3,913
Bayhorse.....	10		30,016	64		64	178,410		178,410	28,100	3,463,200	1,335,900	1,012,778
Boulder.....	1		23,680	20		20	13,966		13,966	4,300	375,400	541,100	177,805
Seafoam.....	1		660	19		19	10,143		10,143	3,000	121,000	176,500	63,627
Stanley.....		1			2	2							70
Yankee Fork.....	5	1	230	272	5,130	5,402	4,402	3,308	7,710	1,200	400		196,407
Elmore:													
Bear Creek and Featherville.....	3		44	33		33	11		11				1,165
Boise River.....		1			1	1							35
Middle Boise.....	1		8,973	6,301		6,301	37,367		37,367				254,354
Gem: West View.....	2		211	185		185	1,074		1,074	2,000	12,000	6,000	11,099
Idaho:													
Burgdorff-Marshall.....		2			42	42		11	11				1,480
Dixie.....	1		1	7		7							280
Elk City.....	1	9	13	3	1,122	1,125		168	168				39,527
Florence and French Creek.....	1	2	3	5	9	14		10	10				499
Lower Salmon River.....		1			17	17							595
Simpson.....		3			9	9							315
Ten Mile.....	3	3	320	86	480	566	759	95	854		2,000		20,929
Warren.....	1	1	15	8	12	20	10		10				709
Jerome: Snake River.....	1	2			3	3							105

Lemhi:																					
Birch Creek	1		33				105		105		200	15,100						2,755			
Blackbird	1	2	22,168	101	3	104	106		106	295,800								75,320			
Blue Wing	1		41,132	10		10	62,780		62,780	92,000	168,800							108,635			
Gibbonsville		1				9												315			
Indian Creek	1		30	5		5												175			
Junction	1		4				84		84		4,000							768			
Mackinaw	1		2	1		1	11		11		500							166			
McDevitt	1		10				10		10	1,600								396			
Nicholls	1		105				74		74	500	15,600		6,500					4,070			
Spring Mountain	2		104	1		1	284		284	400	16,900		1,900					3,659			
Texas	4		2,745	438		438	30,838		30,838	15,000	877,600	211,600						237,206			
Lewis: Salmon River		2			38	38		10	10									1,339			
Nez Perce: Deer Creek		1			9	9												315			
Owyhee:																			212		
Carson or French Creek	2	1	5	4	1	5	41		41									35			
Snake River		1			1	1												35			
South Mountain	1		120	4		4	1,191		1,191		6,000	26,000						6,988			
Shoshone:																					
Beaver	7		80,190	73		73	45,845		45,845	37,000	2,460,000	7,630,300	1,867,296								
Eagle	1		390	2		2	895		895	2,400	83,700	1,700	16,250								
Evolution	12		331,264	550		550	9,864,886		9,864,886	2,677,000	9,699,000	2,473,000	11,723,317								
Hunter	9		378,552	395		395	618,476		618,476	270,000	27,355,200	49,955,900	14,463,341								
Lelands	12		128,173	103		103	194,208		194,208	90,000	8,323,400	9,636,000	3,394,853								
Placer Center	6		148,541	146		146	284,372		284,372	69,900	11,105,400	9,563,500	3,941,188								
Summit	3		2,658	1		1	1,328		1,328	1,700	216,400	242,000	83,129								
Yreka	17		1,324,171	1,414		1,414	2,629,798		2,629,798	600,000	81,896,900	70,475,600	29,569,513								
Twin Falls: Snake River		2			13	13							455								
Valley:																					
Gold Fork Creek		1			2	2							70								
North Fork Payette River		1			1	1							35								
South Fork Salmon River		2			6	6							210								
Yellow Pine	1		620,733	19,605		19,605	141,044		141,044				813,827								
Washington: Heath	1		42				148		148		26,000		4,632								
Other counties <sup>1</sup>	4	2	8,720	2,190	5	2,195	7,247		7,247	2,000	334,000	16,000	144,562								
Total Idaho	157	52	3,254,791	33,214	11,850	45,064	14,748,188	4,835	14,753,023	4,320,000	153,426,000	156,242,000	70,953,653								

<sup>1</sup> Includes Bonneville, Boundary, Butte, Cassia, Clark, and Clearwater Counties for which Bureau of Mines is not at liberty to publish separate figures.

### CASSIA

Mining activity in Cassia County was confined to the Virginia group of mines, operated from March to December, 1951, by the Duvall Co. A new classifier, agitator tank, and storage tank were added during the year to the company's 225-ton cyanide plant.

### CUSTER

The 1951 increase in the prices of copper, lead, and zinc resulted in a minor boom to Custer County, which recorded a 68 percent increase in overall value of the 5 metals as compared with 1950. The output of silver advanced 24 percent; copper, 63 percent; lead, 23 percent; and zinc 133 percent. The output of gold dropped 51 percent which was due primarily to decreased production at the Lucky Boy mine in the Yankee Fork district.

The Clayton mine in Bayhorse district, owned by the Clayton Silver Mines, produced 43 percent of the County ore output, making it the largest producer in Custer County. A total of 23,562 tons of zinc-lead ore milled in the company's 100-ton flotation mill yielded concentrates containing 42 ounces of gold, 116,688 ounces of silver, 20,932 pounds of copper, 2,277,050 pounds of lead, and 1,310,195 pounds of zinc.

**Alder Creek District.**—Principal district output in 1951 comprised lead smelting ore from the Champion mine operated by David Bell and the Homestake property owned by White Knob Mining Co.

**Bayhorse District.**—The principal output of the Bayhorse district was zinc-lead ore from the Clayton mine. The Red Bird mine, owned and operated by Buchman, Brecken, and Norden, shipped 3,930 tons of lead smelting ore, containing 16 ounces of gold, 42,483 ounces of silver, 1,203 pounds of copper, and 947,766 pounds of lead. The Bayhorse Mines, Inc., began working the McGregor mines in April. Activity was confined principally to construction of a 100-ton gravity and flotation mill and experimentation with mining methods.

**Boulder District.**—The Idaho-Custer Mines Co., Wallace, Idaho, bought all the assets of the Livingston Mines Inc. in 1951 and milled zinc-lead tailings from the Livingston mine located 16 miles south of Clayton, Idaho. This comprised the total output of the district. A total of 598 tons of lead concentrates and 586 tons of zinc concentrates was produced.

**Seafoam (Greyhound) District.**—The Mountain King mine worked by Fred and Earl Shirts was the only producing property in the district in 1951. A total of 660 tons of zinc-lead ore was shipped to a concentrating mill in Utah.

**Yankee Fork District.**—The major output of the Yankee Fork district was placer gold recovered by the Warren Dredging Corp. which operated a bucket-line dredge on the Yankee Fork placer. This property produced a total of 5,129 ounces of gold and 3,308 ounces of silver.

### ELMORE

The Talache Mines, Inc., operated its Boise-Rochester group of claims 1 mile east of Atlanta, Idaho, in the Middle Boise (Atlanta) district, throughout the year and milled 8,973 tons of gold ore, which



was concentrated and amalgamated in its 400-ton amalgamation and concentration mill. A total of 6,301 ounces of gold and 37,367 ounces of silver was recovered.

#### IDAHO

The total value of gold and silver output from placer mines in Idaho County declined 83 percent in 1951. Gold output from bucket-line dredging dropped 92 percent, drag-line dredging, 49 percent, and hydraulic operations, 69 percent; whereas production by small-scale hand methods advanced 78 percent. Lode production fell off 15 percent from the 1950 figure.

#### LEMHI

Substantial increases in the production of copper and zinc were recorded in Lemhi County in 1951. Copper output advanced to nearly 4 times the 1950 output and zinc output to over 9 times the 1950 output. Silver production increased about 29 percent while that of gold and lead remained approximately the same.

The increase in copper output came primarily from the Blackbird-Chicago mine, owned and operated by the Blackbird Division of the Calera Mining Co., a subsidiary of Howe Sound Co. The property, a cobalt-copper producer, is located 9 miles from Cobalt, Idaho, in the primitive area of the Salmon National Forest. The 1,000-ton-per-day concentration mill was started in June 1951 on a 1-shift-per-day basis and treated dump material mixed with minor amounts of development ore from the Chicago ore zone. A total of 761 tons of copper concentrate containing 101 ounces of gold, 106 ounces of silver, and 302,107 pounds of copper was produced. Some cobalt was recovered but not shipped in 1951. This mine was expected to be one of Idaho's major copper producers in 1952.

Zinc output in Lemhi County increased largely as a result of expanded production at the United-Idaho mine located in the Texas district and operated by the United-Idaho Mining Co.

The Texas district contributed 55 percent of the total value of gold, silver, copper, lead, and zinc produced in the County in 1951. The principal producers in the Texas district were the Hill Top mine operated by Joe Hamilton and the United-Idaho property.

#### SHOSHONE (COEUR D'ALENE REGION)

Output of gold, silver, copper, lead, and zinc in Shoshone County in 1951 decreased from the 1950 level. Production of gold dropped 21 percent; silver, 9 percent; copper, 1 percent; lead, 25 percent; and zinc, 13 percent. Due to advances in the market prices of copper, lead, and zinc in 1951 the value of the metal output of the region showed an increase of \$502,940. Shoshone County continued to contribute 92 percent of the output of Idaho in terms of dollar value of gold, silver, copper, lead, and zinc. The region remained the largest silver producing area in the United States and second in lead and zinc; it produced 92 percent of Idaho's silver in 1951, 87 percent of the copper, 92 percent of the lead, and 96 percent of the zinc. The zinc output of the region exceeded that of lead by 8,838,000 pounds or 6 percent.

Of the total material (2,393,939 tons) produced in 1951 in the Coeur d'Alene region, 80 percent was zinc-lead ore and old tailings, 11 percent silver ore, and 3.5 percent lead ore. The chief zinc-producing properties, according to rank, were the Star, Bunker Hill, Page, Morning, Sidney group, Bunker Hill smelter slag dump, Constitution, and Tamarack mines. The chief silver-producing properties, according to rank, were the Sunshine (including the Chester Vein), Polaris, Silver Summit, Bunker Hill, and Silver Dollar group of mines. The chief producers of lead, according to rank, were, Bunker Hill, Page, Star, and Morning mines.

**Beaver District.**—Seven mines in the Beaver district produced 80,190 tons of zinc-lead ore. The largest producer in the district was the Monitor group (Carlisle, Interstate, Silver Tip, Amazon) worked by the Day Mines, Inc., throughout 1951. The zinc-lead ore was treated in the Carlisle 300-ton flotation mill near Wallace. Zinc production from the Monitor group increased considerably in 1951 owing to steady mining of the Amazon vein. The Blue Grouse property owned by Day Mines, Inc., was worked intermittently by Roy Smith, essee; the output was zinc-lead ore, which was treated at the Rex mill, Wallace. The Interstate Callahan property, as well as the Interstate dump, also owned by Day Mines, Inc., was worked intermittently by Zanetti Bros., and the zinc-lead ore produced was treated in the Rex mill operated by Zanetti Bros. Lessees worked the Parrott mine and shipped zinc-lead ore to the Rex mill for milling. The Sunset Lease (a partnership in which Day Mines, Inc., has a 70 percent interest with the Anaconda Copper Mining Co.) was operated the entire year by Korsage Bros. and Zanetti Bros., with some of the ore being treated in the Golconda Custom mill and the remainder in the Rex mill.

**Evolution District.**—Silver ore was the principal output of the Evolution district, with the Sunshine Mining Co. being the major producer. A total of 116,324 tons of silver ore from the Sunshine mine (including the Chester Vein) was treated in the company's 1,350-ton flotation mill, which yielded 125 ounces of gold, 4,106,777 ounces of silver, 1,017,553 pounds of copper, 3,403,888 pounds of lead, and 352,236 pounds of zinc. In addition to ores from the Sunshine mine, the mill treated the output of the Polaris Mining Co., Silver Syndicate, Inc., Silver Dollar Mining Co., Sunshine Consolidated, Inc., Metropolitan Mines Corp. and the Big Creek Apex Mining Co.

The Big Creek tailings deposit along the South Fork of the Coeur d'Alene river, the DeBlock tailings at the mouth of Lake Gulch, and the Osburn tailings deposits were worked by Zanetti Bros. and trucked to the company's tailings mill in Osburn.

The only copper ore produced in the district came from the Coeur d'Alene Mines Corp. Mineral Point mine. A total of 7,682 tons of ore was milled in the company's 600-ton flotation mill and yielded 45 ounces of gold, 79,851 ounces of silver, 44,408 pounds of copper, and 537 pounds of lead.

**Hunter District (Mullan).**—The Star mine of the Sullivan Mining Co. was the major producer of the Hunter district and in 1951 ranked first in zinc production and third in lead in the State. A total of 265,724 tons of zinc-lead ore was produced from this mine, which was

treated in the company's 1,000-ton flotation mill and yielded 9,787 tons of lead concentrates and 36,798 tons of zinc concentrates which together contained 180 ounces of gold, 227,073 ounces of silver, 124,394 pounds of copper, 15,608,945 pounds of lead, and 38,545,792 pounds of zinc.

Production from the Morning mine, owned and operated by the Federal Mining & Smelting Co., declined in 1951 as compared with 1950. A total of 88,817 tons of zinc-lead ore was treated in the company's 1,200-ton flotation mill and yielded 18,602 tons of concentrates containing 72 ounces of gold, 153,945 ounces of silver, 103,452 pounds of copper, 9,874,966 pounds of lead, and 14,422,558 pounds of zinc.

The Lucky Friday Silver-Lead Mines Co. worked the Lucky Friday mine during 1951 and shipped zinc-lead ore to the Golconda custom flotation mill in Wallace. Lead and zinc concentrates amounting to 1,431 and 174 tons, respectively, were produced from this ore and together contained 132 ounces of gold, 208,442 ounces of silver, 60,480 pounds of copper, 1,824,238 pounds of lead, and 413,154 pounds of zinc. Other important producing properties in the district included the Golconda, Hickory, and West Mammoth.

**Lelande District (Burke, Mace, Frisco).**—The Frisco group (Black Bear and Gem Veins) owned and operated by the Federal Mining & Smelting Co. was the largest producer in the Lelande district; 52,100 tons of zinc-lead ore containing 48 ounces of gold, 56,712 ounces of silver, 71,479 pounds of copper, 3,496,000 pounds of lead, and 6,214,200 pounds of zinc was shipped to the Morning mill for treatment. The upper levels of the Frisco mine were worked by the Hull lease; 28,441 tons of zinc-lead ore containing 22 ounces of gold, 9,962 ounces of silver, approximately 16,250 pounds of copper, 463,392 pounds of lead, and 4,300,840 pounds of zinc was milled in the Hull lease 90-ton flotation mill.

Day Mines, Inc., worked its Hercules mine and shipped zinc-lead ore to the Sherman mill for treatment. The Sherman mine and 300-ton flotation mill, also owned by Day Mines, Inc., recorded a drop in production of lead ore, its principal product. The remainder of the district output was chiefly zinc-lead ore from 13 other properties.

**Placer Center District.**—The Tamarack mine, owned and operated by the Day Mines, Inc., had the largest output in the district in 1951. The property was worked throughout the year and the zinc-lead ore was treated in the Tamarack 400-ton flotation mill at Dorn. The Day Mines, Inc., also operated its Dayrock, Option, Black Cloud, California, and Pan Handle groups, treating the lead ore in its 250-ton bulk flotation mill at Bunn. The Success group was worked throughout the year by lessee Wylie Gardner, and the zinc-lead ore produced was treated in the Rex Mill. The remaining district output consisted of lead ore from the Galena mine, lead tailings from the Rex tailings dump, and zinc-lead ore from Tamarack No. 5 mine.

**Yreka District (Kellogg).**—Mine output in Yreka district dropped appreciably in 1951 owing primarily to a shortage of underground

mine labor during the late summer months and early fall and a loss of productive time during a strike from August 27 to September 6. Ore production for the district in 1951 declined about 1 percent; gold, 24 percent; silver, 31 percent; copper, 26 percent; lead, 28 percent; and zinc, 13 percent. Despite price increases of copper, lead, and zinc in 1951, the total value of district metal output was \$29,569,513, a decrease of 3 percent from the 1950 figure. The district remained by far the largest lead and zinc producing area in Idaho and ranked second in silver output.

The Bunker Hill & Sullivan mine at Kellogg continued to be the largest producer of ore in the district, as well as the largest producer of lead in Idaho. Output in 1951, according to the annual report to stockholders, totaled 1,703,121 ounces of silver, 22,478 tons of lead, and 10,298 tons of zinc in terms of gross metal content of concentrates. Zinc output in 1951 was 19 percent greater than in 1950, making the Bunker Hill & Sullivan mine the second largest producer of zinc in Idaho in 1951. The silver and lead output in 1951 decreased 36 percent and 33 percent, respectively, from the 1950 level.

John George continued leasing operations in the upper levels of the Bunker Hill & Sullivan mine and treated about 15,000 tons of lead ore in his 250-ton concentrator, producing lead concentrates containing 27,794 ounces of silver, 695 tons of lead, and 172 tons of zinc.

Production of the Page mine of the Federal Mining & Smelting Co. during 1951 was appreciably less than in 1950 as a result of the shortage of miners during the summer months and the strike in late August and early September. A total of 130,181 tons of zinc-lead ore was treated in the company's 500-ton flotation mill, a decrease of 18 percent from 1950 output. Silver production of the Page mine decreased 12 percent in 1951, lead 22 percent, and zinc 20 percent.

The Highland Surprise Consolidated Mining Co. operated its Highland Surprise mine on Stewart Creek throughout the year and reported the production of 25,100 tons of zinc-lead ore which, when treated in the company's 300-ton flotation mill, yielded concentrates containing a total of 64 ounces of gold, 16,314 ounces of silver, 11,200 pounds of copper, 1,033,015 pounds of lead, and 1,895,447 pounds of zinc in terms of recoverable metal. Sunset Minerals, Inc. worked the Liberal King mine during 1951 and produced 117 ounces of gold, 20,711 ounces of silver, 17,044 pounds of copper, 1,492,647 pounds of lead, and 3,223,986 pounds of zinc as recoverable metal. The Sidney Mining Co. operated its Sidney group and 300-ton flotation mill on Denver Creek near Kellogg throughout 1951 and produced 4,145 tons of lead concentrates and 10,347 tons of zinc concentrates, which together contained 125 ounces of gold, 115,763 ounces of silver, 33,836 pounds of copper, 5,596,205 pounds of lead, and 11,209,347 pounds of zinc as recoverable metal. From the Constitution mine, the Spokane-Idaho Mining Co. produced a total of 2,018 tons of lead concentrates and 8,072 tons of zinc concentrates, which together yielded 142 ounces of gold, 102,607 ounces of silver, 32,876 pounds of copper, 3,439,948 pounds of lead, and 7,983,859 pounds of zinc.

## VALLEY

The Bradley Mining Co. worked its Yellow Pine mine in the Yellow Pine district throughout the year and produced 620,733 tons of gold-antimony ore which, when concentrated in the company's 2,200-ton flotation mill, yielded 14,394 tons of gold concentrate containing 19,605 ounces of gold and 141,044 ounces of silver. Compared with the 1950 production, this was a decrease of 60 percent in the gold output and an increase of 3 percent in the silver output. Nevertheless, the Yellow Pine property produced 59 percent of the State total gold in 1951.

TABLE 11.—Mine production of gold, silver, copper, lead, and zinc in the Coeur d'Alene region, Shoshone County, 1947-51, and total 1884-1951, in terms of recoverable metal

Year	Mines producing		Material sold or treated (short tons)	Gold, lode and placer (fine ounces)	Silver, lode and placer (fine ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)	Total value
	Lode	Placer							
1947.....	61		42,957,143	2,808	9,234,906	2,624,000	146,120,000	158,502,000	\$49,226,932
1948.....	65		73,165,780	3,362	10,598,338	2,775,000	165,174,000	167,601,000	62,168,955
1949.....	61		12,282,614	2,438	9,146,146	2,341,000	148,304,000	148,739,200	50,699,924
1950.....	57		22,542,169	3,416	15,056,131	3,791,000	189,394,000	172,205,000	64,555,947
1951.....	67		2,393,939	2,684	13,639,808	3,748,000	141,140,000	149,978,000	65,058,887
1884-1951.....			(1)	407,774	489,962,753	<sup>2</sup> 73,005	<sup>2</sup> 5,927,133	<sup>2</sup> 1,595,380	1,414,636,027

<sup>1</sup> Figure not available.

<sup>2</sup> Short tons.