MINERAL RESOURCES OF THE UNITED STATES.

CALENDAR YEAR 1887.

DAVID T. DAY,
Chief of Division of Mining Statistics and Technology.

SUMMARY, 1887.

METALS.

Iron.—The principal statistics for 1887 were: Domestic iron ore consumed, about 11,300,000 long tons; value at mines, $33,900,000. This is an increase over 1886 of 1,300,000 tons in quantity and $5,900,000 in value. Imported iron ore consumed, 1,194,301 long tons; total iron ore consumed in 1887, about 12,494,301 long tons, or 1,454,868 tons more than in 1886. Pig iron made, 6,417,148 long tons; value at furnace, $121,925,800. This is an increase over 1886 of 733,819 tons in quantity and $26,730,040 in value. Steel of all kinds produced, 3,339,071 long tons, an increase of 776,569 tons over 1886; value at works, $103,811,000. Total spot value of all iron and steel in the first stage of manufacture, excluding all duplications, $171,103,000, an increase of $28,603,000, as compared with 1886. Limestone, used as flux in the manufacture of pig iron in 1887, about 5,377,000 long tons; value at quarry, about $3,226,200.

Gold and silver.—The total value of gold produced in 1887 was $33,100,000, a decrease of $1,900,000 from 1886. Silver increased from $51,000,000 in 1886, to $53,441,300 (coining value) in 1887.

Copper.—Total production 184,670,524 pounds, of which 3,750,000 pounds were made from imported pyrites. The total value was $21,052,440, at an average of 11.4 cents per pound. The estimated total consumption of copper in the United States increased by about 14 per cent.

Lead.—The production of lead was 160,700 short tons, valued at $14,463,000 at $90 per short ton. The heavy increase of "desilverized" lead from 114,829 short tons in 1886 to 135,552 in 1887 was probably

due to the importation of Mexican lead-silver ores. The large product of non-argentiferous lead, 25,148 short tons, is due chiefly to the development of the Saint Joe district in Missouri. The production of white lead, and the several oxides, from pig lead increased to a total of about 75,000 short tons.

Zinc.—The producers' returns show an increase from 42,641 short tons in 1886 to 50,340 in 1887. The price increased to 4¾ cents per pound, making the total value in 1887, $4,782,300. The production of zinc oxide was practically steady at 18,000 short tons, valued at $1,440,000.

Quicksilver.—Production and value increased from 29,981 flasks, valued at $1,060,000, to 33,825 flasks, valued at $1,429,000. Except 65 flasks from Oregon the total supply came from California. The price in 1887 varied from $36.50 to $48 per flask in San Francisco.

Nickel.—The supply includes 183,125 pounds of metallic nickel, valued at $117,200; 10,846 pounds of metallic nickel contained in matte, and 11,595 pounds contained in nickel ammonium sulphate. Total value, $133,200.

Cobalt oxide.—The product includes 5,769 pounds of cobalt oxide for potters' use, and 12,571 pounds of oxide in matte exported to Europe. Total value, $18,774.

Chromium.—Shipments from California increased to 3,000 long tons on account of better freight facilities by rail to the Eastern States. The total value in San Francisco was $40,000.

Manganese.—The total production of manganese ore in the year ending December 31, 1887, was 34,524 long tons, valued at $333,844. The production of manganiferous iron ore was 211,751 tons, valued at about $600,000. The production of argentiferous manganese ores was 60,000 tons, valued, chiefly for its silver, at about $600,000.

Antimony.—The production, all in California, was 75 tons, valued at $15,500. This is an increase from 35 tons in 1886, valued at $7,000.

Aluminum.—The production of aluminum bronze containing 10 per cent. of aluminum increased to 144,764 pounds in 1887, valued at $57,905. Other alloys, principally of iron and aluminum, amounted to 42,617 pounds, worth $17,000.

Platinum.—Considerable search by dealers produced 448 ounces of crude platinum, valued at $1,838. Part of this came from British Columbia.

FUELS.

Coal.—The total production of all kinds of commercial coal in 1887 was 124,015,255 short tons (increase over 1886, 16,333,046 tons), valued at the mines at $173,595,996 (increase, $26,483,241). This may be divided into Pennsylvania anthracite, 39,506,255 short tons (increase, 2,809,780 short tons), or 35,273,442 long tons (increase, 2,508,732 long tons), valued at $79,365,244 (increase, $7,807,118); all other coals, including bituminous, brown coal, lignite, small lots of anthracite pro-

duced in Colorado and Arkansas, and 6,000 tons of graphitic coal mined in Rhode Island, amounting in the aggregate to 84,509,000 short tons (increase, 13,523,266 tons), valued at $94,230,752 (increase, $18,676,123).

The colliery consumption at the individual mines varies from nothing to 8 per cent. of the total output of the mines, being greatest at special Pennsylvania anthracite mines and lowest at those bituminous mines where the coal bed lies nearly horizontal and where no steam-power or ventilating furnaces are used. The averages for the different States vary from 2.1 to 6⅞ per cent., the minimum average being in the Pennsylvania bituminous and the maximum average in the Pennsylvania anthracite region.

The total output of the mines, including colliery consumption, was: Pennsylvania anthracite, 37,578,747 long tons (increase over 1886 2,725,670 long tons), or 42,088,197 short tons (increase, 3,052,751 short tons); all other coals, 87,887,360 short tons (increase, 14,179,403 tons); making the total output of all coals from mines in the United States, exclusive of slack coal thrown on the dumps, 129,975,557 short tons (increase, 17,232,154 tons), valued as follows: Anthracite, $84,552,181 (increase, $8,433,061); bituminous, $98,004,656 (increase, $19,523,600); total value, $182,556,837 (increase, $27,956,661). The above figures show a notable increase in 1887 over 1886 in the aggregate output and value of both anthracite and bituminous coal.

Coke.—The total production of coke in the United States for the year ending December 31, 1887, was 7,857,487 short tons, and was valued at $15,723,574. This is the greatest product ever reached in the United States, being 1,022,419 tons greater than in 1886.

Petroleum.—Total production, 28,249,597 barrels of 42 gallons each. The total value, at an average of 66¾ cents, was $18,856,606. The increase over 1886 was very slight, only 139,482 barrels. There was a decrease of 4½ cents per barrel in the average price.

Natural gas.—The production of natural gas in the United States in 1887 was equivalent to 9,867,000 short tons of coal displaced. The value of the coal displaced by natural gas (which is the measure of the value of the gas) was $15,838,500. In 1886 the corresponding quantity was 6,353,000 tons, worth $9,847,150.

STRUCTURAL MATERIALS.

Building stone.—Direct returns from producers show a total value of $25,000,000. This marked increase shows that the statement for 1886 was too small.

Brick and tile.—Value, $47,000,000. This represents an increase of about 13 per cent. in the production of brick and a decrease in tile, owing to the drought in 1887 in Indiana and Ohio. Prices were slightly lower.

Lime.—The production is estimated at 46,750,000 barrels, with an average value of 50 cents per barrel.

Cement.—The production of cement from natural rock was 6,692,744 barrels, valued at 77½ cents per barrel, making $5,186,877 as the value of the year's product.

ABRASIVE MATERIALS.

Buhr-stones.—The value of the total product is estimated at $200,000.

Grindstones.—In Ohio and Michigan 37,400 tons were produced, valued at $224,400.

Corundum.—Total production from North Carolina and Georgia 600 short tons, with a spot value of $108,000.

Novaculite.—Production 1,200,000 pounds, valued in the rough state at $16,000.

Infusorial earth.—Maryland produced 3,000 short tons, worth $15,000. A small quantity was produced in Nevada and in New Mexico.

MISCELLANEOUS.

Precious stones.—The value of American gems in the rough state amounted to $88,600, besides gold quartz for specimens and gems, valued at $75,000.

Phosphate rock.—South Carolina phosphate rock, 480,558 long tons, valued at $1,836,818; an increase of 50,009 tons, but a decrease of $36,118 in value, due to greater competition, reducing the price to $3.75 per ton for land and $4 for river rock.

Marls.—In New Jersey the production is estimated at 600,000 tons, worth about $300,000. While the New Jersey marl is yielding slowly to commercial fertilizers, the Virginia marls, as well as those in North and South Carolina, Georgia, Mississippi, and Florida, are finding increased local use.

Salt.—Production in 1887, 7,831,962 barrels (of 280 pounds), value $4,093,846. The annual production has increased each year since 1883, but the total value has declined, being less in 1887 than in 1884, although only 6,514,937 barrels were made in that year.

Bromine.—Stocks accumulated in 1886 and reduced the output of 1887 to 199,087 pounds, valued at $61,717. The price was held at 31 cents per pound.

Borax.—Production, 11,000,000 pounds, all from California and Nevada. Total value, $550,000, at 5 cents per pound for the average grade. The price was rising at the close of 1887.

Sulphur.—Production about 3,000 tons from Utah, worth $100,000. Litigation checked the use of an increased plant. The imports of Sicilian sulphur, with small shipments from Japan, were 96,882 long tons, valued at $1,688,360.

Pyrites.—Production 52,500 long tons, valued at $210,000, at $4 per ton at the mines.

Barytes.—The production increased to 15,000 long tons of crude barytes, valued at $75,000 at the mines.

Gypsum.—The condition of the industry is practically unchanged. The estimated total product was 95,000 short tons of crude gypsum, valued at $425,000. In addition, there were imported 162,154 long tons of crude gypsum, chiefly from Nova Scotia.

Mica.—The production increased to 70,500 pounds, valued at $142,250. The increase was chiefly in North Carolina. New Hampshire, Massachusetts, and Virginia also produced mica. No shipments were reported from the Black Hills or New Mexico. The use of mica waste is increasing; 2,000 tons, worth $15,000, were ground in 1887.

Feldspar.—The amount consumed, principally by potters, was 10,200 long tons, valued at $56,100 before grinding. This includes freight to the principal markets, Trenton or New York. The consumption in 1886 was about 5,000 tons less than the production returned by quarrymen.

Flint.—For pottery 19,800 tons were used. Including the use for sand-paper and in glass manufacture, the total consumption was about 32,000 tons, worth, unground, $185,000.

Potters' clay.—The consumption of kaolin and ball clay by potters aggregated 28,000 tons, valued at $290,000. In addition, the potters used 15,000 tons of fire-clay, worth $50,000.

Asbestus.—The total product hardly exceeded 150 tons, worth $4,500. In addition, several hundred tons of fibrous actinolite were used for weighting paper.

Mineral paints.—Including ocher, metallic paints, and small quantities of umber and sienna, the production amounted to 20,000 long tons, selling for $310,000 at the mines.

Graphite.—The production at Ticonderoga is reported unchanged. Small lots ranging from graphitic clay to pure graphite were produced in North Carolina. Total production, 416,000 pounds, worth $34,000. This does not include 500 tons of impure graphite mined in Rhode Island for foundry facings.

Fluorspar.—The production remained constant at 5,000 tons in Indiana. The total value was $20,000.

Mineral waters.—The product which was sold amounted to 8,259,609 gallons, worth $1,261,473.

Totals.—The following tabular statement shows an aggregate value of $538,056,345 for the year. This is the largest total ever reached by the mineral industries of any country. It is nearly $73,000,000 more than the product of the United States in 1886 and considerably more than $100,000,000 in excess of the year 1885. Of many items which have contributed to this result it will be noted that all the metals increased in quantity, except gold and the minor metal, nickel, and nearly all increased in price. The significance of this is seen in the increased production of the fuels necessary for reducing these metals and prepar-

ing them for use. All of these fuels, including natural gas, show a marked increase. The increased value of building stone is principally due to a more careful canvass of this industry than has been possible in previous years. It is not probable that the great total recorded for 1887 will be equaled in the present year, 1888.

Metallic products of the United States in 1887.

	Quantity.	Value.
Pig iron, spot value.....long tons..	6,417,148	$121,925,800
Silver, coining value.....troy ounces..	41,269,240	53,441,300
Gold, coining value.....do....	1,596,500	33,100,000
Copper, value at New York City.....pounds..	184,670,524	21,052,440
Lead, value at New York City.....short tons..	160,700	14,463,000
Zinc, value at New York City.....do....	50,340	4,782,300
Quicksilver, value at San Francisco.....flasks..	33,825	1,429,000
Nickel, value at Philadelphia.....pounds..	205,556	133,200
Aluminum contained in alloys.....	.....	74,905
Antimony, value at San Francisco.....short tons..	75	15,500
Platinum, value (crude) at New York City.....troy ounces..	448	1,838
Total.....	.....	$250,419,283

Non-metallic mineral products of the United States in 1887 (*spot values*).

	Quantity.	Value.
Bituminous coal.....long tons..	78,470,857	$98,004,656
Pennsylvania anthracite.....do....	37,578,747	84,552,181
Building stone.....	.....	25,000,000
Lime.....barrels..	46,750,000	23,375,000
Petroleum.....do....	28,249,597	18,856,606
Natural gas.....	.....	15,838,500
Cement.....barrels..	6,692,744	5,186,877
Salt.....do....	7,831,962	4,093,846
Limestone for iron flux.....long tons..	5,377,000	3,226,200
South Carolina phosphate rock.....do....	480,558	1,836,818
Zinc-white.....short tons..	18,000	1,440,000
Mineral waters.....gallons sold..	8,259,609	1,261,473
Borax.....pounds..	11,000,000	550,000
Gypsum.....short tons..	95,000	425,000
Manganese ore.....long tons..	34,524	333,844
Mineral paints.....do....	20,000	310,000
New Jersey marls.....short tons..	600,000	300,000
Pyrites.....long tons..	52,500	210,000
Flint.....do....	32,000	185,000
Mica.....pounds..	70,500	142,250
Corundum.....short tons..	600	108,000
Sulphur.....do....	3,000	100,000
Precious stones.....	.....	88,600
Crude barytes.....long tons..	15,000	75,000
Gold quartz, souvenirs, jewelry, etc.....	.....	75,000
Bromine.....pounds..	199,087	61,717
Feldspar.....long tons..	10,200	56,100
Chrome iron ore.....do....	3,000	40,000

Non-metallic mineral products of the United States in 1887 (*spot values*)—Continued.

	Quantity.	Value.
Graphite ..... pounds..	416,000	$34,000
Fluorspar ..... short tons..	5,000	20,000
Slate, ground as pigment ..... long tons..	2,000	20,000
Cobalt oxide ..... pounds..	18,340	18,774
Novaculite ..... do....	1,200,000	16,000
Asphaltum ..... short tons..	4,000	16,000
Asbestus ..... do....	150	4,500
Rutile ..... pounds..	1,000	3,000
Total	.....	$285,864,942

Résumé of the values of the metallic and non-metallic mineral substances produced in the United States in 1887.

Metals	$250,419,283
Mineral substances named in the foregoing table	285,864,942
	536,284,225
Estimated value of mineral products unspecified	6,000,000
Grand total	$542,284,225

Summary of the mineral products of the United

	Products.	1882.		1883.	
		Quantity.	Value.	Quantity.	Value.
	METALLIC.				
1	Pig iron, spot value.....long tons..	4,623,323	$106,336,429	4,595,510	$91,910,200
2	Silver, coining value.....troy ounces..	36,197,695	46,800,000	35,733,622	46,200,000
3	Gold, coining value.....do ...	1,572,186	32,500,000	1,451,249	30,000,000
4	Copper, value at New York City.....pounds..	91,646,232	16,038,091	117,151,795	18,064,807
5	Lead, value at New York City.....short tons..	132,890	12,624,550	143,957	12,322,719
6	Zinc, value at New York City.....do....	33,765	3,646,620	36,872	3,311,106
7	Quicksilver, value at San Francisco....flasks..	52,732	1,487,042	46,725	1,253,632
8	Nickel, value at Philadelphia.....pounds..	281,616	309,777	58,800	52,920
9	Aluminum, value at Philadelphia.troy ounces..	.....	.....	1,000	875
10	Antimony, value at San Francisco.short tons..	60	12,000	60	12,000
11	Platinum, value (crude) at New York City, troy ounces.....	200	600	200	600
	Total value metallic products.....	.....	219,755,109	.....	203,128,859
	NON METALLIC (SPOT VALUES).				
12	Bituminous coal.....long tons..	60,861,190	76,076,487	68,531,500	82,237,800
13	Pennsylvania anthracite.....do....	31,358,264	70,556,094	34,336,469	77,257,055
14	Building stone.....	.....	21,000,000	.....	20,000,000
15	Lime.....barrels..	31,000,000	21,700,000	32,000,000	19,200,000
16	Petroleum.....do....	30,053,500	23,704,698	23,400,229	25,740,252
17	Natural gas.....	.....	215,000	.....	475,000
18	Cement.....barrels..	3,250,000	3,672,750	4,190,000	4,293,500
19	Salt.....do....	6,412,373	4,340,140	6,192,231	4,211,042
20	Limestone for iron flux.....long tons..	3,850,000	2,310,000	3,814,273	1,907,136
21	South Carolina phosphate rock.....do....	332,077	1,992,462	378,380	2,270,280
22	Zinc-white.....short tons..	10,000	700,000	12,000	840,000
23	Mineral waters.....gallons sold..	.....	.....	7,529,423	1,119,603
24	Borax.....pounds..	4,236,291	338,903	6,500,000	585,000
25	Gypsum.....short tons..	.....	.....	.....	.....
26	Manganese ore.....long tons..	3,500	52,500	8,000	120,000
27	Mineral paints.....do....	7,000	105,000	7,000	84,000
28	New Jersey marls.....short tons..	1,080,000	540,000	972,000	486,000
29	Pyrites.....long tons..	12,000	72,000	25,000	137,500
30	Flint.....do....	25,000	100,000	25,000	100,000
31	Mica.....pounds..	100,000	250,000	114,000	285,000
32	Corundum.....short tons..	500	80,000	550	100,000
33	Sulphur.....do....	600	21,000	1,000	27,000
34	Precious stones.....	.....	75,000	.....	74,050
35	Gold-quartz souvenirs, jewelry, etc.....	.....	75,000	.....	115,000
36	Crude barytes.....long tons..	20,000	80,000	27,000	108,000
37	Bromine.....pounds..	250,000	75,000	301,100	72,264
38	Feldspar.....long tons..	14,000	70,000	14,100	71,112
39	Chrome iron ore.....do....	2,500	50,000	3,000	60,000
40	Graphite.....pounds..	425,000	34,000	575,000	46,000
41	Fluorspar.....short tons..	4,000	20,000	4,000	20,000
42	Slate ground as a pigment.....long tons..	2,000	24,000	2,000	24,000
43	Cobalt oxide.....pounds..	11,653	32,046	1,096	2,795
44	Novaculite.....do....	.....	.....	.....	.....
45	Asphaltum.....short tons..	3,000	10,500	3,000	10,500
46	Asbestus.....do....	1,200	36,000	1,000	30,000
47	Rutile.....pounds..	500	1,800	550	2,000
	Total value non-metallic mineral products	.....	228,410,380	.....	242,111,889
	Total value metallic products.....	.....	219,755,109	.....	203,128,859
	Estimated value of mineral products unspecified.....	.....	8,000,000	.....	8,000,000
	Grand total.....	.....	456,165,489	.....	453,240,748

States, calendar years 1882 *to* 1887 *inclusive.*

1884.		1885.		1886.		1887.		
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
4,097,868	$73,761,624	4,044,525	$64,712,400	5,683,329	$95,195,760	6,417,148	$121,925,800	1
37,744,605	48,800,000	39,910,279	51,600,000	39,445,312	51,000,000	41,269,240	53,441,300	2
1,489,949	30,800,000	1,538,376	31,801,000	1,881,250	35,000,000	1,596,500	33,100,000	3
147,805,407	18,106,162	170,962,607	18,292,999	161,235,381	16,527,651	184,670,524	21,052,440	4
139,897	10,537,042	129,412	10,469,431	135,629	12,667,749	160,700	14,463,000	5
38,544	3,422,707	40,688	3,539,856	42,641	3,752,408	50,340	4,782,300	6
31,913	936,327	32,073	979,189	29,981	1,060,000	33,825	1,429,000	7
64,550	48,412	277,904	191,753	214,992	127,157	205,556	133,200	8
1,800	1,350	3,400	2,550	.....	27,000	.....	74,905	9
60	12,000	50	10,000	35	7,000	75	15,500	10
150	450	250	187	50	100	448	1,838	11
.....	186,426,074	.....	181,599,365	.....	215,364,825	.....	250,419,283	
73,730,539	77,417,066	64,840,668	82,347,648	65,810,676	78,481,056	78,470,857	98,004,656	12
33,175,756	66,351,512	34,228,548	76,671,948	34,853,077	76,119,120	37,578,747	84,552,181	13
.....	19,000,000	.....	19,000,000	.....	19,000,000	.....	25,000,000	14
37,000,000	18,500,000	40,000,000	20,000,000	42,500,000	21,250,000	46,750,000	23,375,000	15
24,089,758	20,476,294	21,842,041	19,193,694	28,110,115	20,028,457	28,249,597	18,856,606	16
.....	1,460,000	.....	4,854,200	.....	9,847,150	.....	15,838,500	17
4,000,000	3,720,000	4,150,000	3,492,500	4,500,000	3,990,000	6,692,744	5,186,877	18
6,514,937	4,197,734	7,038,653	4,825,345	7,707,081	4,736,585	7,831,962	4,093,846	19
3,401,930	1,709,965	3,356,956	1,678,478	4,717,163	2,830,297	5,377,000	3,226,200	20
431,779	2,374,784	437,856	2,846,064	430,549	1,872,936	480,558	1,836,818	21
13,000	910,000	15,000	1,050,000	18,000	1,440,000	18,000	1,440,000	22
10,215,328	1,459,143	9,148,401	1,312,845	8,950,317	1,284,070	8,259,609	1,261,473	23
7,000,000	490,000	8,000,000	480,000	9,778,290	488,915	11,000,000	550,000	24
.....	.....	90,405	405,000	95,250	428,625	95,000	425,000	25
10,000	120,000	23,258	190,281	30,193	277,636	34,524	333,844	26
7,000	84,000	3,950	43,575	15,800	285,000	20,000	310,000	27
875,000	437,500	875,000	437,500	800,000	400,000	600,000	300,000	28
35,000	175,000	49,000	220,500	55,000	247,500	52,500	210,000	29
30,000	120,000	30,000	120,000	30,000	120,000	32,000	185,000	30
147,410	368,525	92,000	161,000	40,000	70,000	70,500	142,250	31
600	108,000	600	108,000	645	116,190	600	108,000	32
500	12,000	715	17,875	2,500	75,000	3,000	100,000	33
.....	82,975	.....	69,900	.....	79,056	.....	88,600	34
.....	140,000	.....	140,000	.....	40,000	.....	75,000	35
25,000	100,000	15,000	75,000	10,000	50,000	15,000	75,000	36
281,100	67,464	310,000	89,900	428,334	141,350	199,087	61,717	37
10,900	55,112	13,600	68,000	14,900	74,500	10,200	56,100	38
2,000	35,000	2,700	40,000	2,000	30,000	3,000	40,000	39
.....	.....	327,883	26,231	415,525	33,242	416,000	34,000	40
4,000	20,000	5,000	22,500	5,000	22,500	5,000	20,000	41
2,000	20,000	1,975	24,687	3,000	30,000	2,000	20,000	42
2,000	5,100	68,723	65,373	.....	36,878	18,340	18,774	43
.....	.....	1,000,000	15,000	1,160,000	15,000	1,200,000	16,000	44
3,000	10,500	3,000	10,500	3,500	14,000	4,000	16,000	45
1,000	30,000	300	9,000	200	6,000	150	4,500	46
600	2,000	600	2,000	600	2,000	1,000	3,000	47
.....	220,059,674	.....	240,114,544	.....	243,963,063	.....	285,864,942	
.....	186,426,074	.....	181,599,365	.....	215,364,825	.....	250,419,283	
.....	7,000,000	.....	7,000,000	.....	6,000,000	.....	6,000,000	
.....	413,485,748	.....	428,713,909	.....	465,327,888	.....	542,284,225	