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ABSTRACT—STATISTICS OF MINING, FOR INDUSTRIES AND STATES

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INTRODUCTION.

This advance bulletin contains a summary of the statistics of mining for the United States for the calendar year 1909, as shown by the Thirteenth Census.

The statistics relate both to mines in the narrower sense and to quarries and petroleum and gas wells, but for brevity all these enterprises are often called "mines," using the term in its broad sense.

The principal statistics of mining industries derived from the census inquiry are given in a series of general tables at the end of the bulletin. Table 25 gives a comparative summary of the results of the inquiries of 1909 and 1902, comparing for each geographic division and state the expenses of operation and development, the primary power, and the value of products. Table 26 gives a similar comparative summary for each industry. Table 27 covers all producing mines, quarries, and petroleum and gas wells, and gives for the several geographic divisions and for each state in continental United States the number of operators; the number of mines, quarries, or wells; capital; expenses of operation and development; number of persons engaged in the industry; acreage of land controlled; primary power; and value of products. Table 28 gives similar information for each industry. Table 29 gives information similar to that contained in Table 28 for nonproducing mines, quarries, and wells, in which operations are as yet confined to development work.

The explanatory text deals almost exclusively with the producing mines, quarries, and wells, and gives for all mining industries combined and for a number of the more important industries separately further statistics amplifying the figures given in the general tables, together with averages, percentages, etc., derived from the figures in those tables.

In order to avoid any misapprehension as to the significance of the statistics here published, it seems advisable to offer a few brief explanations of the terms used in the census of mining industries.

Scope of census.—The Thirteenth Census covered all classes of mines, quarries, and petroleum and gas wells that were in operation during any portion of the year 1909, both those which were producing and those whose operations were confined to development work. Mines, quarries, or wells that were idle during the entire year 1909 were omitted from the canvass. The following operations were likewise omitted from the canvass: Prospecting; the digging or dredging of sand and gravel for the construction of roads and for building operations; the production of mineral waters; and the operation of small bituminous coal banks producing less than 1,000 tons annually. Where the mineral products are not marketed in their crude condition, but are dressed or washed at the mine or quarry, the statistics of mining cover the entire work of obtaining the crude material and its preparation for the market.

Period covered.—The returns cover the calendar year 1909, or the business year which corresponds most nearly to that calendar year. The statistics cover a year's operations, except for enterprises which began or discontinued business during the year.

Number of operators.—As a rule, the unit of enumeration was the "operator." Every individual firm or corporation was required to furnish one report for all mines, quarries, or wells which were operated under the same management, or for which one set of books of account was kept. Where several mines, quarries, or wells managed separately were owned by the same operator, it was optional with the operator to furnish one report for all his operations, or a separate report for each of his properties. Separate reports were obtained for all properties operated in different states, even where they were owned by the same operator. Likewise, where the operations of one individual, firm, or corporation covered more than one class of mines and quarries, such as coal, iron, limestone, etc., a separate report was received for each industry. The total number of operators, accordingly, as shown by the original returns, included a small amount of duplication. As far as practicable, all duplications of this character within the same industry were eliminated by the consolidation of the reports for the same operator. All such duplications have been eliminated for the coal, petroleum and natural gas, iron, and copper industries.

Number of mines, quarries, and wells.—This figure represents the total number of mines and quarries in operation or in the course of development at any time during the calendar year 1909, or the business year that corresponds most nearly to that calendar year, and the number of completed petroleum and natural gas wells in operation on December 31, 1909.

In most mining and quarrying industries the number of mines or quarries varies but little from the number of operators, the principal variations being found in the mining of anthracite coal, iron, and copper, with an average of more than two mines per operator; in the mining of tungsten, with an average of more than five mines per operator; and in the quarrying of gypsum, with an average of nearly three quarries per operator. In the production of petroleum and natural gas, on the other hand, there was an average of more than twenty wells to one operator.

Expenses of operation and development.—A certain amount of development work is incidental to the operation of every mine. The expenses reported for producing mines include the cost both of operation and of development work which was done in connection with operation.

Wages.—The amount shown as wages includes only the compensation of regular wage earners hired by the day, week, or month,

or under the piecework system. There is a class of miners variously known under the local names of "leasers," "block lessees," etc., who are compensated by a share of the product. The compensation of such miners is included under the payments for "Contract work" in the general tables.

Supplies and materials.—This item includes the cost of lumber and timber used for repairs, mine supports, track ties, etc.; iron and steel for blacksmithing; rails, frogs, sleepers, etc., for tracks and repairs; renewals of tools and machinery and materials for repairs; and supplies, explosives, oil, etc., as well as the cost of fuel and the rent of power. The schedule called only for the cost of such supplies and materials as had been used during the year covered by the report. Accurate figures, however, could be furnished only in those cases where the operators kept an account of supplies and materials used, or had an inventory made of all in stock at the beginning and at the end of the year. Such a system of accounting is far from general among mine operators, and there is reason to believe that in many cases the reported cost of supplies and materials covered all purchased during the year rather than those used during the year. The crude product of some operators was purchased by others for further dressing or refining; the cost of such materials is shown in a separate column in the general tables for producing mines, but in all other tables it is included in the general item of cost of supplies and materials.

Miscellaneous expenses.—In the general tables royalties and the rent of mines, taxes, and the amounts paid for contract work are shown in separate columns. All other expenses not enumerated separately are combined under the head of "Rent of offices and other sundry expenses," which includes rent of offices and buildings other than at the mine, quarry, or well, use of patents, insurance, ordinary repairs of buildings and machinery (not including materials therefor where carried in separate accounts), advertising, damages, traveling expenses, and all other sundry expenses.

Value of products.—Statistics of the value of each mineral product were obtained by the Bureau of the Census in cooperation with the United States Geological Survey, but the two bureaus follow different methods in presentating these statistics. The Geological Survey shows separately the value of each mineral product, whereas the Bureau of the Census presents the value of products of each mining industry, together with the other data relating to the same. The value of products given for each mining industry often includes the value of some products not covered by the industry designation. The crude product of metalliferous mines may include varying combinations of metals, such as gold, silver, copper, lead, zinc, and iron. Similarly, the total value of all products of the granite quarries is not identical with the value of the total output of granite, but may include the value of some marble or other stone quarried in connection with the principal product.

The value of products for 1909 in most cases represents the value of the products marketed during that year, not the value of those mined during that year. In this respect the data differ from those usually obtained for manufacturing establishments. In order to ascertain the value of the products mined during the year 1909, account would have had to be taken of the inventories at the beginning and at the close of the year. In many mining industries, however, no such inventories are made, by reason of the purely speculative value of the crude product lying on the dump.

Another element of inaccuracy inherent in the statistics as to the value of products is due to the combination of mining with manufacturing. Most of the product of iron mines is not sold, but is used in blast furnaces operated by the owners of the mines. A large proportion of the output of coal is likewise used in iron and steel works operated by the owners of the coal mines, while a considerable proportion also is controlled by railway companies and other industrial concerns which own the coal mines, either directly, or indirectly through subsidiary companies. In such cases the reported value of the mining product is often a mere item of bookkeeping which may or may not reflect the actual market value of the product.

The total value of products for some industries includes a certain amount of duplication, due to the fact that the crude product of some operators was used as material by others whose mines or quarries were equipped with dressing or refining plants; the total value of products for the industry, accordingly, includes both the crude product and the refined product made from it. In order to eliminate this duplication and to obtain the approximate value of products for each industry, the cost of such materials, which is shown in a separate column in the general tables for producing mines, should be subtracted from the total value of products for the industry. There is, however, a certain degree of inaccuracy involved in such a computation, because the purchaser of the crude product usually figures freight as a part of the cost of his materials, whereas the value reported by the producer represents the selling value at the mine.

Cost of production and profits.—It can be seen from the preceding explanations that the difference between the reported value of products and the total expenses reported does not accurately represent profits. As already stated the product reported usually represents that sold rather than the actual output in producing which the expenses were incurred. Furthermore, the census inquiries did not call for depreciation, which is a particularly important element in mining because of the exhaustion of the mine. Few mining concerns keep a separate account for depreciation. Moreover, the heterogeneous character of the returns regarding capital precludes the computation, from census statistics, of the rate of return on the investment.

Capital.—The census schedule required every operator to state the total amount of capital invested in the enterprise on the last day of the business year reported, as shown by his books. There is, however, a great diversity in the methods of bookkeeping in use by different operators. As a result, the statistics for capital lack uniformity. Some of the reported figures apparently represent capital stock at face value; others include large investments in mineral lands which are not at present being actively mined, but are held in reserve; still others may include expenditures for unproductive mining ventures in no way related to the operations carried on during the census year.

Persons engaged in mining industries.—The statistics of the number of operators and officials, clerks, and wage earners, are based on the returns for December 15, or the nearest representative day. The reported number of wage earners includes overseers and foremen performing work similar to that of the men over whom they have charge; those whose duties are wholly supervisory are classed as superintendents and managers. Because of the very common practice of shutting down mines at frequent intervals, it is impossible to ascertain with any satisfactory degree of accuracy the average number of employees—that is, the number who, if continuously employed, would be required to produce the actual output of the year.

Primary horsepower.—This item represents the total primary power generated by the mining enterprises plus the amount of power, principally electric, rented by them from other concerns. It does not cover the horsepower of electric motors operated by current generated by the enterprises themselves, the inclusion of which would evidently result in duplication.

GENERAL SUMMARY.

Continental United States and noncontiguous territory: 1909.—Table 1 gives for 1909 the principal statistics collected by the Bureau of the Census for all mines and quarries and petroleum and gas wells within the area of enumeration. In addition to continental United States this area included in 1909 Alaska, Hawaii, and Porto Rico. The figures here given include nonproducing as well as producing mines and constitute the most general summary of the results of the investigation.

Table 1

	NUMBER OR AMOUNT: 1909.				
	Total.	Continental United States.	Alaska.	Hawaii.	Porto Rico.
Number of operators	24,355	23,664	673	4	14
Number of mines and quarries	27,260	27,240	.....	6	14
Number of petroleum and gas wells	166,448	166,448	.....	.....	.....
Persons engaged in mining industries, Dec. 15, 1909	1,175,188	1,166,948	8,025	45	170
Proprietors and firm members, total	35,208	33,691	1,501	2	14
Number performing manual labor in connection with mines, quarries, and wells	10,740	10,299	441	.....	.....
Salaried employees	46,604	46,475	219	.....	.....
Wage earners	1,093,286	1,086,782	6,305	43	156
Primary horsepower	4,722,479	4,699,910	22,347	197	25
Capital	$3,710,356,533	$3,662,527,064	$47,749,164	$45,700	$34,605
Expenses of operation and development	1,087,437,081	1,074,191,429	13,220,200	19,760	5,692
Services	662,422,226	655,584,467	6,819,850	14,058	3,851
Salaries	56,286,988	55,878,478	408,510	.....	.....
Wages	606,135,238	599,705,989	6,411,340	14,058	3,851
Supplies and materials	263,019,615	260,110,898	2,902,956	5,371	390
Royalties and rent of mines	65,083,334	64,154,926	1,527,995	206	257
Contract work	32,335,580	30,690,458	1,645,063	.....	59
Miscellaneous	63,976,276	63,650,680	324,336	125	1,135
Value of products	1,255,370,163	1,238,410,322	16,933,427	20,955	5,459

Of the total number of persons engaged in mining industries in the area covered by the preceding table, only a little more than one-half of 1 per cent were in Alaska, while the mining operations in Hawaii and Porto Rico were insignificant.

Owing to the fact that a certain number of mines in continental United States and Alaska were engaged in development work only during the census year, the figure for value of products in 1909, $1,255,370,163, relates to a smaller number of enterprises than the figures for persons engaged in the industries, expenses, etc. Of the total, representing the value of the products of all mines in the entire area covered by the canvass, Alaska contributed $16,933,427, or 1.3 per cent, while Hawaii contributed only $20,955 and Porto Rico $5,459. A rough but somewhat convenient measure of the relative importance of mining operations in the areas concerned is found in the per capita production (that is, value of products divided by total population), which was $13.46 for continental United States, $263.12 for Alaska, $0.11 for Hawaii, and less than 1 cent for Porto Rico.

The further discussion of mining operations in this bulletin is confined to the data reported for continental United States (referred to simply as the United States).

Producing and nonproducing mines.—In some aspects of the statistics of mining industries the distinction between producing and nonproducing mines is important. So far, however, as it is possible to bring the figures in regard to production into relation with the various factors of operation, particularly the number of employees and the expenses of operation, it is necessary to confine such comparisons to the producing mines. Table 2 gives comparative figures for producing and nonproducing mines in the United States.

Table 2

	All enterprises.	Producing enterprises.	NONPRODUCING ENTERPRISES.	
			Number or amount.	Per cent of total.
Number of operators	23,664	19,915	3,749	15.8
Number of mines and quarries	27,240	18,164	9,076	33.3
Number of wells	166,448	166,320	128	(1)
Persons engaged in mining industry	1,166,948	1,139,332	27,616	2.4
Proprietors and firm members, total	33,691	29,922	3,769	11.2
Number performing manual labor.	9,937	8,861	1,076	10.8
Salaried employees	46,475	44,127	2,348	5.1
Wage earners	1,086,782	1,065,283	21,499	2.0
Primary horsepower	4,699,910	4,608,253	91,657	2.0
Capital	$3,662,527,064	$3,380,525,841	$282,001,223	7.7
Expenses of operation and development	1,074,191,429	1,042,642,693	31,548,736	2.9
Services	655,584,467	640,167,630	15,416,837	2.4
Salaries	55,878,478	53,393,551	2,484,927	4.4
Wages	599,705,989	586,774,079	12,931,910	2.2
Supplies and materials	260,110,898	247,866,304	12,244,594	4.7
Royalties and rent of mines	64,154,926	63,973,585	181,341	0.3
Contract work	30,690,458	28,887,898	1,802,560	5.9
Miscellaneous	63,650,680	61,747,276	1,903,404	3.0
Value of products	1,238,410,322	1,238,410,322	.....	.....

(1) Less than one-tenth of 1 per cent.

Perhaps the most satisfactory index of the relative importance of the two classes of mines shown in the above table is the number of wage earners and the amount of primary power, the figures for nonproducing mines representing exactly 2 per cent of the total in each instance. The average number of wage earners per operator for the nonproducing mines is 6 and for the producing mines 53.

Additional details in regard to nonproducing mines are given in Table 29 (p. 24), which presents separate figures for most of the different mining industries. The further discussion in this bulletin of the statistics obtained at the census of 1909 will deal primarily with the producing mines, with only incidental reference to the nonproducing enterprises.

There were in all mining industries in the United States in 1909, as shown by the previous table, 19,915 operators of producing mines, who employed 1,065,283 wage earners and reported products valued at $1,238,410,322.

Geographic distribution of producing enterprises.—The distribution of the mining industries by geographic divisions and states is shown in Table 3, which gives the number of wage earners employed, the value of the products for each division and state, and the percentage which such number or value forms of the total.

Table 3 PRODUCING ENTERPRISES: 1909

DIVISION AND STATE.	Number of operators.	Number of mines and quarries.	Number of wells.	Wage earners (Dec. 15, or nearest representative day). Number.	Wage earners (Dec. 15, or nearest representative day). Per cent of total.	Value of products. Amount.	Value of products. Per cent of total.
United States	**19,915**	**18,164**	**166,320**	**1,065,283**	**100.0**	**$1,238,410,322**	**100.0**
GEOGRAPHIC DIVS.:							
New England	510	580	.....	18,254	1.7	17,327,242	1.4
Middle Atlantic	6,333	3,603	71,122	402,937	37.8	370,742,262	30.0
East North Central	4,152	2,662	56,379	213,660	20.1	237,534,170	19.2
West North Central	2,300	2,603	3,450	88,458	8.3	130,252,538	10.5
South Atlantic	1,358	1,652	15,146	118,000	11.1	105,714,462	8.5
East South Central	830	1,109	1,110	70,850	6.7	49,143,289	3.9
West South Central	1,229	452	14,700	28,252	2.0	47,530,937	3.8
Mountain	1,972	3,728	97	93,072	8.7	205,053,900	16.6
Pacific	1,538	1,010	4,316	31,788	3.0	75,111,522	6.1
NEW ENGLAND:							
Maine	97	102	.....	2,471	0.2	2,050,063	0.2
New Hampshire	45	53	.....	1,520	0.1	1,308,597	0.1
Vermont	137	182	.....	8,388	0.8	8,221,323	0.7
Massachusetts	139	147	.....	3,508	0.3	3,407,888	0.3
Rhode Island	21	27	.....	677	0.1	897,606	(1)
Connecticut	71	76	.....	1,690	0.2	1,375,765	0.1
MIDDLE ATLANTIC:							
New York	1,351	752	11,342	11,303	1.1	13,334,975	1.1
New Jersey	131	151	.....	6,801	0.6	8,347,501	0.7
Pennsylvania	4,851	3,000	59,780	384,833	36.1	349,059,786	28.2
E. NORTH CENTRAL:							
Ohio	1,876	964	35,067	57,185	5.4	63,767,112	5.1
Indiana	1,010	480	10,373	27,559	2.6	21,934,201	1.8
Illinois	915	759	10,918	82,436	7.7	76,658,974	6.2
Michigan	83	173	21	40,397	3.8	67,714,479	5.5
Wisconsin	268	286	.....	6,083	0.6	7,459,404	0.6
W. NORTH CENTRAL:							
Minnesota	153	250	.....	18,114	1.7	58,664,852	4.7
Iowa	373	431	.....	19,010	1.8	13,877,781	1.1
Missouri	1,021	1,224	39	29,670	2.8	31,667,525	2.5
North Dakota	53	53	6	860	0.1	564,812	(1)
South Dakota	39	43	3	3,866	0.4	$6,432,417	0.5
W. NORTH CENTRAL—Continued.							
Nebraska	18	20	.....	491	(1)	322,517	(1)
Kansas	643	582	3,402	16,441	1.5	18,722,634	1.5
SOUTH ATLANTIC:							
Delaware	9	9	.....	628	(1)	516,213	(1)
Maryland	126	173	.....	7,745	0.7	5,782,045	0.5
Virginia	150	244	.....	16,803	1.6	8,705,046	0.7
West Virginia	798	718	15,146	78,404	7.4	76,287,889	6.2
North Carolina	118	130	.....	2,825	0.3	1,358,617	0.1
South Carolina	29	32	.....	2,014	0.2	1,252,702	0.1
Georgia	92	109	.....	4,014	0.4	2,874,595	0.2
Florida	36	96	.....	5,483	0.5	8,846,665	0.7
E. SOUTH CENTRAL:							
Kentucky	437	442	1,109	22,033	2.1	12,160,075	0.9
Tennessee	216	365	1	18,028	1.7	12,092,547	1.0
Alabama	177	302	.....	30,795	2.9	24,350,667	2.0
W. SOUTH CENTRAL:							
Arkansas	96	146	62	6,422	0.6	4,603,845	0.3
Louisiana	33	2	246	953	0.1	6,547,050	0.5
Oklahoma	864	242	12,113	13,020	1.3	25,637,892	2.1
Texas	236	92	2,279	6,957	0.6	10,742,150	0.9
MOUNTAIN:							
Montana	373	543	.....	20,503	1.9	54,991,961	4.4
Idaho	174	370	.....	3,592	0.3	8,640,342	0.7
Wyoming	66	95	21	8,499	0.8	10,572,188	0.9
Colorado	672	1,575	76	24,769	2.4	45,080,135	3.7
New Mexico	98	285	.....	5,082	0.5	5,587,744	0.4
Arizona	135	251	.....	13,451	1.3	34,217,651	2.8
Utah	188	235	.....	11,004	1.0	22,683,282	1.8
Nevada	266	374	.....	5,572	0.5	23,271,597	1.9
PACIFIC:							
Washington	93	170	.....	7,343	0.7	10,537,556	0.9
Oregon	116	161	.....	1,087	0.1	1,191,512	0.1
California	1,329	1,279	4,316	23,358	2.2	63,382,454	5.1

[1] Less than one-tenth of 1 per cent.

Whether the importance of the mining industry be measured by the value of its products or by the number of wage earners employed, the Middle Atlantic division easily ranks first among the different geographic divisions, the value of its mineral products in 1909 amounting to $371,000,000, or 30 per cent of the total for continental United States. Next in order was the East North Central division, with products valued at $238,000,000, or about one-fifth of the total. The mineral products of these two divisions consist largely of coal. Other divisions with a considerable mineral production were the Mountain, West North Central, and South Atlantic.

The prominence of the Middle Atlantic division in mineral production is due almost wholly to the state of Pennsylvania, which, with products (mainly coal) valued at nearly $350,000,000 in 1909, reported more than one-fourth of the value of all mineral products in the United States. No other state approaches it in importance. Illinois and West Virginia, which rank next in importance, each had products valued at a little more than $75,000,000, or less than one-fourth the value shown for Pennsylvania. Other states where the value of mineral products exceeded $50,000,000 are Michigan, Ohio, California, Minnesota, and Montana. The eight states named reported in 1909, 65.4 per cent of the value of all mineral products for the United States.

There are several states in which the mineral production is quite insignificant. In the District of Columbia and Mississippi no mineral production was reported. Rhode Island, North Dakota, Nebraska, and Delaware each contributed less than one-tenth of 1 per cent of the whole value of mineral products, while the contribution of Maine, New Hampshire, Massachusetts, Connecticut, North Carolina, South

Carolina, Georgia, Arkansas, and Oregon was less than one-half of 1 per cent in each case.

The distribution of the wage earners employed in producing mines among the different divisions and states follows approximately the distribution of the total value of products. Where coal is the chief mineral product, however, the number of wage earners is relatively greater than elsewhere. The Middle Atlantic division reported a considerably greater percentage of all wage earners in the producing mines of the country than of the total value of mineral products. In less marked degree the same statement holds true of the East South Central, South Atlantic, East North Central, and New England divisions, while each of the remaining divisions reported a larger percentage of the total value of products than of the total number of wage earners. Pennsylvania employed 36.1 per cent of all the wage earners, Illinois 7.7 per cent, and West Virginia 7.4 per cent, these three leading coal states together reporting more than one-half of all the wage earners employed in mining industries.

Principal mining industries.—Table 4 shows the relative importance of the principal mining industries in 1909.

Table 4

INDUSTRY.	PRODUCING ENTERPRISES: 1909				
	Number of operators.	Wage earners (Dec. 15, or nearest representative day).		Value of products.	
		Number.	Per cent of total.	Amount.	Per cent of total.
All industries	19,915	1,065,283	100.0	$1,238,410,322	100.0
Coal	3,695	743,293	69.8	577,142,935	46.6
Anthracite	192	173,504	16.3	149,180,471	12.0
Bituminous	3,503	569,789	53.5	427,962,464	34.6
Petroleum and natural gas	7,703	39,831	3.7	185,416,684	15.0
Metals:					
Copper	161	53,143	5.0	134,616,987	10.9
Iron	176	52,230	4.9	106,947,082	8.6
Precious metals	2,282	37,815	3.6	94,123,180	7.6
Deep mines	1,604	33,616	3.2	83,885,928	6.8
Placer mines	678	4,199	0.4	10,237,252	0.8
Lead and zinc	977	21,603	2.0	31,363,094	2.5
Structural materials	3,988	92,350	8.7	75,992,908	6.1
Limestone	1,665	37,695	3.5	29,832,402	2.4
Granite	707	20,561	1.9	18,997,976	1.5
Sandstone	595	9,908	0.9	7,702,423	0.6
Marble	77	6,313	0.6	6,230,120	0.5
Slate	185	9,438	0.9	6,054,174	0.5
Traprock	190	6,260	0.6	5,578,317	0.5
Bluestone	563	2,175	0.2	1,588,406	0.1
Miscellaneous:					
Phosphate rock	51	8,186	0.8	10,781,192	0.9
Gypsum	78	3,778	0.4	5,812,810	0.5
Sulphur	4	408	(1)	4,432,066	0.4
Clay	261	3,871	0.4	2,945,948	0.2
All other	449	8,775	0.8	8,835,436	0.7

[1] Less than one-tenth of 1 per cent.

The foregoing table presents statistics for 9 industries which in 1909 had products exceeding $10,000,000 in value. These 9 industries employed 95.2 per cent of all the wage earners engaged in producing enterprises and contributed 96 per cent of the total value of the products of mining industries. Statistics are also given in the table for 8 other mining industries having products between $1,500,000 and $10,000,000 in value. The 17 industries shown separately in the table employed over 99 per cent of the wage earners engaged in productive enterprises and contributed more than 99 per cent of the total value of products of mining industries.

Coal mining far outranks any other industry in importance. In 1909 it furnished occupation to more than two-thirds of all the wage earners employed by producing mines, quarries, and wells, and contributed only a little less than one-half of the total value of products reported. Of the total value of coal produced, the anthracite mines furnished approximately one-fourth and the bituminous mines three-fourths. Another fuel industry—the production of petroleum and natural gas—ranks second in importance in value of products, but employs comparatively few wage earners.

Of the metals, copper and iron outrank the precious metals both in the value of the product mined and in the number of wage earners, but lead and zinc fall considerably below the precious metals in both respects.

General comparison for the United States: 1902–1909.—Table 5 on the next page gives statistics regarding expenses and value of products for producing mines, quarries, and petroleum and gas wells in the United States for 1909 and 1902, together with the percentages of increase.

The figures in this table for 1909 vary slightly from those shown in preceding tables by reason of the differences between the present census and that of 1902 in the classification of mining industries. There are many industries on the border line between mining and manufacturing. Certain mechanical and chemical processes required for the preparation of the mineral for the market after its extraction from the ground may be performed either at the mine or at the factory where the mineral is used as material. The practices in this respect vary from industry to industry and from period to period.

At the Thirteenth Census the production of cement was classified as a manufacturing industry. The burning of lime was likewise classified as a manufacturing industry, and where the lime was burned at the limestone quarry the quarrying was regarded as a subordinate part of the manufacturing operations. At the special census of mines and quarries in 1902, however, the cement industry was included, and the burning of lime was treated as a part of the operations of the limestone quarries. In order to make the statistics for the two censuses comparable, the figures given in the table below include for 1909 those for the burning of lime, elsewhere treated as a manufacturing industry, and exclude for 1902 those relating to the production of cement. On the other hand, the special census of 1902 did not include the conversion of coal into coke at the coal mines.

In the Thirteenth Census reports the coke industry is treated both in the report on manufactures and in that on mines. Where coal was turned into coke at the mines, estimates were obtained for the coke-manufacturing operations and included in the statistics of manufactures. At the same time, since the

mining of the coal and its conversion at the mines into coke form, in fact, integral parts of one industrial operation, the complete report for both processes is included in the statistics for bituminous coal mines. In order, however, to make the statistics for 1909 comparable with those for 1902, all statistics relating to coke have been eliminated from the table which follows. By reason of these adjustments the figures here printed do not correspond either to those given in the report for 1902 or to those printed elsewhere in this bulletin for 1909.

Table 5	NUMBER OR AMOUNT.		Per cent of increase.
	1909	1902	
Expenses of operation and development:			
Services	$625,010,068	$401,225,547	55.9
Supplies and materials	208,771,046	114,515,832	82.3
Royalties and rent of mines	62,456,760	34,476,227	81.2
Contract work	24,091,086	20,638,127	16.7
Value of products	1,175,475,001	771,486,926	52.4
Primary horsepower	4,556,214	2,665,114	71.0

Taxes, rent of offices, and other sundry expenses, which are included with the expenses of operation and development in the tables giving statistics for 1909 only, are not shown in this table for the reason that at the special census of mines and quarries in 1902 the corresponding item of expenses included interest, which was excluded at the Thirteenth Census. In 1902 the item of interest on bonds amounted to more than $13,000,000, which was equal to over 2 per cent of the total expenses. The amount of interest paid on other loans was not reported separately, but was included with rent of offices, taxes, insurance, etc. The aggregate expenses shown in the preceding table represent 96.3 per cent of the total expenses reported for 1902 exclusive of interest on bonds, while the aggregate for 1909 represents 90.6 per cent of the total expenses for that year. In 1902 the products of mining industries were valued at $771,486,926, but in 1909 the value was reported as $1,175,475,001, an increase of 52.4 per cent in the seven years.

Table 26, page 19, gives comparative statistics in detail for the years 1909 and 1902, by industries. Table 6, which is based on this table, gives for the leading mining industries the value of products in 1909 and 1902, with the percentage of increase.

Table 6 INDUSTRY.	VALUE OF PRODUCTS.		Per cent of increase.
	1909	1902	
All industries	$1,175,475,001	$771,486,926	52.4
Coal	550,513,806	366,042,015	50.2
Anthracite	149,180,471	76,173,586	95.8
Bituminous	401,333,395	290,468,429	38.2
Petroleum and natural gas	175,527,807	102,034,590	72.0
Copper	99,493,709	51,178,036	94.4
Iron	106,947,082	65,460,985	63.4
Precious metals	87,671,553	82,482,052	6.3
Deep mines	77,434,301	77,154,326	0.4
Placer mines	10,237,252	5,327,726	92.2
Lead and zinc	28,568,547	14,600,177	95.7
Limestone	47,784,479	30,278,877	57.8
Granite and traprock	24,576,293	18,042,943	36.2
Phosphate rock	10,781,192	4,922,943	119.0

This table shows that the greatest relative increase in the seven-year period was in the phosphate rock industry, the value of products of this industry in 1909 being more than double that in 1902. The smallest relative increase (6.3 per cent) was in the mining of precious metals, the deep mines showing an increase in value of products amounting to only 0.4 per cent, although the less important placer mines show an increase of 92.2 per cent. Large increases are shown for the mining of copper and of lead and zinc. There was apparently a large increase in the production of anthracite coal, but on account of the coal strike in 1902 the figures for that year do not represent normal conditions. The percentage of increase in the bituminous coal-mining industry falls considerably below the average for all mining industries in the period under consideration. To some extent this is due to a decline in the average price of bituminous coal, for the tonnage produced increased more than 45 per cent.

Table 25, page 18, gives comparative statistics in detail for the years 1909 and 1902, by states. The following table presents certain figures for those states which show a relative increase in the value of products above the average for the United States:

Table 7 STATE.	VALUE OF PRODUCTS.		Per cent of increase.
	1909	1902	
Louisiana	$9,539,850	$279,327	2,241.3
Florida	8,915,181	2,943,806	202.8
Minnesota	58,975,781	25,020,677	130.2
Nebraska	322,517	148,391	117.3
New Jersey	8,548,858	4,042,047	111.5
Illinois	77,214,345	37,377,226	106.6
California	59,012,046	28,611,307	106.3
Wisconsin	8,575,402	4,257,685	101.4
Washington	10,826,503	5,393,059	100.7
Kansas	18,380,812	9,526,060	93.0
North Dakota	564,812	325,967	73.3
Arkansas	4,764,784	2,840,341	67.8
Texas	11,095,588	6,737,696	64.7

Corresponding figures for those states in which the value of products showed an actual decrease from 1902 to 1909 are given in Table 8.

Table 8 STATE.	VALUE OF PRODUCTS.		Per cent of decrease.
	1909	1902	
Colorado	$39,397,859	$40,508,286	2.7
Massachusetts	4,332,218	4,499,401	3.7
South Dakota	6,415,788	6,697,707	4.2
Georgia	2,924,741	3,080,287	5.0
Maine	3,270,760	3,656,134	10.5
Maryland	6,164,122	7,162,113	13.9
Indiana	22,324,647	26,890,393	17.0
Oregon	1,237,292	2,087,389	40.7

Colorado and Indiana are the only important mining states that show a decrease in mining activity. This decline in Colorado is manifested not only in the value of products, but also in the amount expended for salaries and wages, which decreased 7.2 per cent, and for royalties, which shows a decrease of 4.4 per cent.

Geographic distribution of the principal industries.—Table 9 gives figures, by leading states, for each of the nine leading mineral industries.

Table 9

INDUSTRY AND STATE.	Number of operators.	WAGE EARNERS (DEC. 15, OR NEAREST REPRESENTATIVE DAY). Number.	Per cent of total.	VALUE OF PRODUCTS. Amount.	Per cent of total.
Coal, anthracite	192	173,504	100.0	$149,180,471	100.0
Pennsylvania	189	173,263	99.9	148,957,894	99.9
Coal, bituminous	3,503	569,789	100.0	427,962,464	100.0
Pennsylvania	689	184,408	32.4	147,466,417	34.5
Illinois	470	74,445	13.1	53,030,545	12.4
West Virginia	307	69,666	12.2	46,920,592	11.0
Ohio	441	44,405	7.8	27,353,663	6.4
Alabama	112	23,479	4.1	18,450,433	4.3
Colorado	86	15,401	2.7	15,782,197	3.7
Indiana	223	22,357	3.9	15,018,123	3.5
Iowa	258	17,623	3.1	12,682,106	3.0
Kentucky	240	19,655	3.4	10,003,481	2.3
Kansas	118	12,701	2.2	9,835,614	2.3
Wyoming	35	7,839	1.4	9,721,134	2.3
Washington	32	6,155	1.1	9,226,703	2.2
Tennessee	85	11,154	2.0	6,688,454	1.6
Oklahoma	56	8,814	1.5	6,185,078	1.4
Missouri	173	9,526	1.7	5,881,034	1.4
Montana	48	4,612	0.8	5,117,444	1.2
Petroleum and natural gas	7,793	39,831	100.0	185,416,684	100.0
Pennsylvania	3,030	7,397	18.6	39,197,475	21.1
Ohio	1,188	5,897	14.8	29,620,950	16.0
California	339	7,007	17.6	29,310,335	15.8
West Virginia	442	7,093	17.8	28,188,087	15.2
Illinois	323	4,059	10.2	18,895,815	10.2
Oklahoma	711	3,066	7.7	17,085,092	9.5
Kansas	217	1,302	3.3	6,681,780	3.6
Texas	163	1,405	3.5	6,301,313	3.4
Copper	161	53,143	100.0	134,616,987	100.0
Montana	35	13,697	25.8	45,960,517	34.1
Arizona	43	11,394	21.4	31,614,116	23.5
Michigan	7	19,022	35.8	30,105,443	22.4
California	9	2,510	4.7	10,104,373	7.5
Utah	22	3,304	6.2	8,432,099	6.3
Iron	176	52,230	100.0	106,947,082	100.0
Minnesota	20	16,218	31.1	57,076,135	53.4
Michigan	24	16,125	30.9	32,168,133	30.1
Alabama	25	5,660	10.8	4,939,149	4.6
New York	14	2,542	4.9	3,095,023	2.9
Wisconsin	6	1,455	2.8	2,972,584	2.8
Precious metals, Deep mines	1,604	33,616	100.0	83,885,928	100.0
Colorado	439	7,586	22.6	27,147,937	32.4
Nevada	218	3,818	11.4	17,807,945	21.2
California	305	6,622	19.7	9,690,956	11.6
Utah	108	3,905	11.6	8,541,522	10.2
Idaho	60	3,077	9.2	7,920,602	9.4
South Dakota	13	3,466	10.3	6,120,970	7.3
Precious metals, Placer mines	678	4,199	100.0	10,237,252	100.0
California	302	3,073	73.2	8,751,032	85.5
Lead and zinc	977	21,603	100.0	31,363,094	100.0
Missouri	617	16,319	75.5	22,565,528	71.9
Wisconsin	88	1,753	8.1	1,989,907	6.3
Kansas	180	848	3.9	1,059,540	3.4
Oklahoma	47	724	3.4	695,235	2.2
Limestone	1,665	37,695	100.0	29,832,492	100.0
Pennsylvania	311	7,179	19.0	4,733,819	15.9
Illinois	81	3,276	8.7	3,977,359	13.3
Indiana	126	3,724	9.9	3,616,696	12.1
Ohio	144	3,746	9.9	3,363,149	11.3
New York	127	3,104	8.2	2,650,142	8.9
Missouri	144	2,437	6.5	2,027,902	6.8
Granite	707	20,561	100.0	18,997,976	100.0
Vermont	51	2,035	9.9	2,820,522	14.9
Massachusetts	82	2,278	11.1	2,185,986	11.5
Maine	85	2,132	10.4	1,701,801	9.3
California	62	1,318	6.4	1,518,016	8.0
Wisconsin	21	1,448	7.0	1,433,105	7.5
New Hampshire	40	1,305	6.3	1,205,811	6.3
Phosphate rock	51	8,186	100.0	10,781,192	100.0
Florida	26	5,105	62.4	8,488,801	78.7
Tennessee	23	1,725	21.1	1,395,942	12.9
South Carolina	5	1,307	16.0	862,409	8.0

Statistics are given for each of the states where the industry in question is important either by reason of the absolute value of the product or of its proportion of the total for the industry. In most of the industries here shown the production is so concentrated that the states given represent upward of nine-tenths of the entire production, but in the case of the lead and zinc, limestone, and granite industries, the aggregate value of the products reported by the states named falls short of this fraction.

Of the value of the products of the bituminous coal mines in 1909, Pennsylvania contributed more than one-third, and a group of five states—Pennsylvania, West Virginia, Ohio, Indiana, and Illinois—together reported more than two-thirds of the total. Including those just named, the table shows 16 states, situated in all parts of the Union, which had a product valued at more than $5,000,000. The anthracite coal production is practically confined to the state of Pennsylvania.

Petroleum and natural gas also show production centers in various parts of the country. Pennsylvania leads with a little over one-fifth of the total value of products for the industry, but does not report so large a proportion of the total as in the case of coal.

More than one-third of the value of products for the copper industry in 1909 was represented by the product of Montana, while Arizona and Michigan each contributed over one-fifth. More than one-half of the value of products for the iron industry in 1909 was contributed by Minnesota and somewhat less than one-third by Michigan.

In the production of precious metals by placer mining California was the only important state, but nearly one-third of the value of products for deep mines was reported from Colorado and over one-fifth from Nevada. The production of Alaska is not included in the table, which relates exclusively to continental United States. It may, however, be noted that the canvass of mines in Alaska by the Bureau of the Census gave $12,762,000 as the value of the products of placer mining in that territory. The inquiry of 1909 was the first attempt to secure information concerning placer mining in Alaska by census methods. The wide extent of the field and the difficulties of the inquiry lead to the belief that the product reported is considerably short of the actual product of the Alaska placer mines.

The lead and zinc industry is geographically far more closely concentrated than any thus far considered. In 1909 Missouri reported 71.9 per cent of the total value of products of this industry and employed 75.5 per cent of the wage earners engaged in this industry. The phosphate rock industry shows a marked concentration in the state of Florida, which reported 78.7 per cent of the total value of products and employed 62.4 per cent of all wage earners in the industry. On the other hand, the production of limestone and granite is widely distributed. In the case of the limestone industry, the six states which had a product exceeding $2,000,000 in value together reported but little more than two-thirds of the total value of products; and in the case of the granite industry the six states having a product in excess of $1,000,000 in value reported only 57.5 per cent of the total. In addition the variation in value of products among the states named in the table is much less marked in the case of these industries than in most of the other industries listed.

PERSONS ENGAGED IN MINING INDUSTRIES.

The number of persons engaged in mining industries, by classes, was ascertained as far as possible for December 15 of the year 1909. In those cases, however, where the mines were not in operation on that date, or the time records for that date were not obtainable, the numbers were ascertained for the nearest representative date. In addition to this information, the number of wage earners, without classification, was ascertained for the 15th day of every month.[1]

The whole number of persons engaged in connection with producing mines, quarries, and wells, as reported on December 15, or the nearest representative day, was 1,139,332, of whom 1,065,283 were wage earners. Since the representative day was taken in some other month than December, in many cases, because the mines were not in operation on December 15, as stated above, this number of wage earners is greater than the number actually engaged at any given time. The greatest number simultaneously employed in all producing mines was 1,022,885, this number being reported for November 15. This does not, however, represent the entire number of persons who gave all or a part of their time to mining in 1909. The busiest months do not coincide for all mining industries nor for all mines within a given industry. Mining, moreover, affords some contrast to manufactures with respect to employment. Whereas in the manufacturing cities there is some opportunity for wage earners to pass from one industry where employment is temporarily slack to another where labor is in greater demand, there is rarely sufficient diversity of mining industries in a given locality to permit such a shifting. Furthermore, even within an industry as widespread as bituminous coal mining, distance would largely prevent the employees of a mine temporarily shut down from seeking employment in other coal mines. The total number of wage earners reported for December 15, or the nearest representative date, namely, 1,065,283, may therefore be accepted as less, if anything, than the total number of wage earners who derived a livelihood from mining during the year 1909.

Distribution by sex and age.—Table 10 shows the classification of the persons employed in producing mines on the 15th day of December, or the nearest representative day.

Women were employed only in supervisory and clerical capacities, none being reported as wage earners in mining operations proper. It will be noted, moreover, that the reported number of boys under 16 years of age, 8,151, is less than 1 per cent of the whole number of wage earners employed.

Table 10

CLASS.	PERSONS ENGAGED IN PRODUCING ENTERPRISES: 1909		
	Total.	Male.	Female.
All classes	**1,139,332**	**1,135,528**	**3,804**
Proprietors and officials	49,374	47,931	1,443
Proprietors and firm members	29,922	28,571	1,351
Salaried officers of corporations	5,657	5,577	80
Superintendents and managers	13,795	13,783	12
Clerks and other salaried employees	24,675	22,314	2,361
Wage earners	1,065,283	1,065,283	.....
16 years of age and over	1,057,132	1,057,132	.....
Under 16 years of age	8,151	8,151	.....

Distribution by industrial status.—Table 11 shows for all mining industries and for the nine most important industries separately the distribution of the persons engaged in producing enterprises according to general character of occupation or industrial status, together with the percentage that each class forms of the total.

Table 11

INDUSTRY.	PERSONS ENGAGED IN PRODUCING ENTERPRISES: 1909						
	Number.				Per cent of total.		
	Total.	Proprietors and officials.	Clerks and other salaried employees.	Wage earners.	Proprietors and officials.	Clerks and other salaried employees.	Wage earners.
All industries	**1,139,332**	**49,374**	**24,675**	**1,065,283**	**4.3**	**2.2**	**93.5**
Coal	770,681	12,935	14,453	743,293	1.7	1.9	96.4
Anthracite	178,004	1,315	3,185	173,504	0.7	1.8	97.5
Bituminous	592,677	11,620	11,268	569,789	2.0	1.9	96.1
Petroleum and natural gas	62,172	19,353	2,988	39,831	31.1	4.8	64.1
Copper	55,258	661	1,454	53,143	1.1	2.7	96.2
Iron	55,176	1,109	1,837	52,230	2.1	3.3	94.6
Precious metals	43,191	4,508	868	37,815	10.4	2.0	87.6
Lead and zinc	24,307	2,525	269	21,603	10.4	1.1	88.5
Limestone	41,029	2,645	680	37,695	6.4	1.7	91.9
Granite	22,211	1,248	402	20,561	5.6	1.8	92.6
Phosphate rock	8,573	214	173	8,180	2.5	2.0	95.5

Of the whole number of persons engaged in producing enterprises, 4.3 per cent were proprietors and officials, 2.2 per cent were clerks, and 93.5 per cent were wage earners. The proportion of proprietors and officials ranges, among the industries given, from 1.1 per cent in the copper industry to 31.1 per cent in the petroleum and natural gas industry. Large proportions for proprietors and officials occur also in the production of the precious metals and of lead and zinc. In the anthracite branch of the coal industry proprietors and officials formed only 0.7 per cent of all persons engaged in the industry. The range of difference with respect to the proportion of clerks is much less than with respect to the proportion of proprietors and officials.

Proprietors performing manual labor.—Table 12 gives for the principal mining industries, the whole number of proprietors and firm members compared

[1] It must be borne in mind that the business year for which returns were obtained did not in all cases coincide with the calendar year. As a result, the total for the month of December includes some returns for December, 1908, when the business year ended before Dec. 31, 1909. In such cases it was assumed that the number employed on the 15th day of December, 1909, was approximately equal to the number reported for Dec. 15, 1908. The same applies to the figures for other months, some of which were reported for 1908 and others for 1910. The statistics of the number of wage earners must, therefore, be regarded as approximations; they are sufficiently close, however, for purposes of general comparison.

with the number and percentage who perform manual labor.

Table 12

INDUSTRY.	PROPRIETORS AND FIRM MEMBERS IN PRODUCING ENTERPRISES: 1909		
	Total.	Performing manual labor.	
		Number.	Per cent.
All industries	29,022	8,861	29.6
Coal, bituminous	3,739	1,713	45.8
Petroleum and natural gas	16,213	2,155	13.3
Precious metals:			
Placer mines	951	673	70.8
Deep mines	2,011	951	47.3
Lead and zinc	1,947	1,171	60.1
Limestone	1,634	640	39.2
Granite	730	318	43.6

Mine operators of the old type who operate their mines without the assistance of hired help or with little help are still quite numerous, as appears from the fact that out of a total of 29,922 proprietors and firm members in 1909, 8,861, or nearly three-tenths, were personally performing manual labor in or about their enterprises. The industries in which proprietors of this type were relatively the most numerous include bituminous coal mining, in which 45.8 per cent of the proprietors and firm members were performing manual labor; lead and zinc mining, and placer mining (surface gold washing), in each of which industries a majority of the proprietors were working in their own mines; and deep gold and silver mines, in which nearly one half of all proprietors belonged to this class. There are also a considerable number of proprietors and firm members performing manual labor in the petroleum and natural gas industry, but as the whole number of proprietors and firm members is very large, they constituted a comparatively small percentage of the total.

Wage earners by occupation.—Table 13 gives for all mining industries and for the nine most important industries separately the number of wage earners in producing mines classified by specific occupation and by age group, distinguishing those who work above and those who work below ground.

Table 13.

CLASS OF WAGE EARNERS.	All mining industries.	COAL.			Petroleum and natural gas.	Copper.	Iron.	Precious metals.	Lead and zinc.	Limestone.	Granite.	Phosphate rock.
		Total.	Bituminous.	Anthracite.								
All wage earners (producing enterprises only)	1,065,283	743,293	569,789	173,504	30,831	53,143	52,230	37,815	21,603	37,695	20,561	8,186
Men 16 years of age and over	1,057,132	736,325	566,068	170,257	30,820	53,077	51,741	37,803	21,573	37,572	20,474	8,119
Engineers, firemen, mechanics, etc.	163,519	42,098	29,826	12,272	27,063	6,860	7,073	5,710	3,745	3,224	1,921	1,049
Miners and miners' helpers, quarrymen, and stonecutters	627,513	467,170	384,023	83,156	.....	28,570	24,926	21,855	12,552	25,748	14,290	4,375
All other wage earners	326,100	227,048	152,219	74,829	12,757	17,647	19,742	10,238	5,276	8,600	4,263	2,695
Boys under 16 years of age	8,151	6,968	3,721	3,247	11	66	489	12	30	123	87	67
Above ground, total	366,962	142,843	94,090	48,753	30,831	22,481	24,889	15,333	8,062	37,695	20,561	7,925
Men 16 years of age and over	361,928	138,792	93,273	45,519	30,820	22,420	24,569	15,324	8,037	37,572	20,474	7,858
Engineers, firemen, mechanics, etc.	93,586	34,141	24,389	9,752	27,063	6,238	6,597	5,112	3,584	3,224	1,921	1,049
Miners and miners' helpers, quarrymen, and stonecutters	78,380	.....	.....	.....	.....	1,269	4,736	2,870	427	25,748	14,290	4,117
All other wage earners	189,962	104,651	68,884	35,767	12,757	14,913	13,236	7,342	4,026	8,600	4,263	2,692
Boys under 16 years of age	5,034	4,051	817	3,234	11	61	320	9	25	123	87	67
Below ground, total	698,321	600,450	475,699	124,751	.....	30,662	27,341	22,482	13,541	.....	.....	261
Men 16 years of age and over	695,204	597,533	472,795	124,738	.....	30,657	27,172	22,479	13,536	.....	.....	261
Engineers, firemen, mechanics, etc.	9,933	7,957	5,437	2,520	.....	622	476	598	161	.....	.....	.....
Miners and miners' helpers	549,133	467,170	384,023	83,156	.....	27,301	20,190	18,985	12,125	.....	.....	258
All other wage earners	136,138	122,307	83,335	39,062	.....	2,734	6,506	2,896	1,250	.....	.....	3
Boys under 16 years of age	3,117	2,917	2,904	13	.....	5	169	3	5	.....	.....	.....

This table gives further information in regard to the employment of boys under 16 years of age. Only eight-tenths of 1 per cent of the wage earners in all mining industries were boys under 16 years of age, and of these only three-eighths were employed below ground. The largest number of boys under 16 years of age (3,721) were employed in bituminous coal mining, though 3,247 were employed in the anthracite coal mining industry, where they formed nearly 2 per cent of the whole number of wage earners—a higher percentage than in any other industry shown in the table. Most of the boys in the anthracite coal industry, however, were employed above ground. In none of the other industries shown in the table did the proportion of boys under 16 years of age reach 1 per cent of the whole number of wage earners.

Miners and miners' helpers constitute the most numerous class of wage earners, forming, in 1909, 58.9 per cent of the whole number employed in all industries combined. The proportion reached 67.4 per cent in the bituminous coal industry and 47.9 per cent in anthracite coal mining. It was about the same in the iron mines, but somewhat greater in the other industries employing miners. In the limestone and granite industries quarrymen and stonecutters are naturally the largest numerical group.

The wage earners included under the head of "Engineers, firemen, mechanics, etc.," constituted 9.7 per cent of all wage earners employed in mining in 1909. The proportion was lowest in the coal industry, where such wage earners formed 5.7 per cent of the total, and highest in the petroleum and natural

gas industry, where they constituted 67.9 per cent. The miscellaneous group "All other wage earners," which is composed mostly of unskilled laborers, comprised 30.6 per cent of all wage earners employed. The proportion in this class was largest in anthracite coal mining (43.1 per cent) and smallest in the granite industry (20.7 per cent).

In all mining industries about one-third of the wage earners (34.4 per cent) were employed above ground and about two-thirds (65.6 per cent) below ground. The two branches of the coal-mining industry have a larger proportion of their wage earners below ground than any other mining industry. In the phosphate rock industry only 3.2 per cent of the wage earners were employed below ground, while three of the industries named in the table—the petroleum and natural gas, limestone, and granite industries—are exclusively surface industries.

Contract work.—In addition to the work performed by wage earners regularly engaged in mining and by the proprietors who contribute their own labor to the operation of the mines, a portion of the work incident to mining is done by contract. The number of wage earners employed by contractors can not be ascertained, because the work is temporary and the same men after completing one job are shifted to another place. A special form of contract work common in certain metalliferous mines is the working of mines in return for a share of the product. Under this system a miner "leases" a block in a mine on a royalty basis; the product is delivered by him to the mine owner, who disposes of it, deducts the royalty, and pays the "lessee" his share. In the operation of petroleum and natural gas wells, little labor is required. This condition has called into existence a special class of mechanics who contract with individual operators to take care of their properties, devoting to each property only a part of their time.

The relative importance of work done under contract, as compared with the work performed by regular wage earners, is shown by a comparison of the total amount paid out in wages with the total expenditure for contract work. While the total wages paid in the United States in 1909 amounted to $586,774,000, the total expenditure for contract work amounted to $28,888,000, which included $3,798,000 paid to miners compensated by a share of the product, and $1,035,000 paid to part-time men for taking care of petroleum and natural gas wells. There were 3,261 operators, or 16.4 per cent of the total number in continental United States, whose properties were operated exclusively by contract work, as defined above. This form of operation was more or less general with operators of petroleum and natural gas wells, of whom 3,021, or 38.8 per cent, belonged to this class. Next in point of numbers were 104 operators of deep mines of precious metals, or 6.5 per cent of all operators engaged in that industry, who employed contract labor exclusively. In all other industries combined this class included only 136 operators, or 1.3 per cent of the total number.

Number of persons employed, by months.—Table 14 shows the number of wage earners reported for the 15th of each month in producing enterprises in all mining industries combined and in coal mining separately, the latter industry, as already noted, including nearly 70 per cent of all wage earners in producing enterprises.

Table 14 WAGE EARNERS IN PRODUCING ENTERPRISES: 1909

MONTH.	All mining industries.		Coal.		All other mining industries.	
	Number	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January	940,119	91.9	691,244	94.8	248,875	80.7
February	936,418	91.5	686,322	94.1	250,096	81.2
March	943,493	92.2	679,791	93.2	263,702	85.5
April	928,563	90.8	649,870	89.1	278,693	90.4
May	937,002	91.6	646,592	88.7	290,410	94.2
June	949,615	92.8	652,894	89.5	296,721	96.2
July	961,040	94.0	659,434	90.4	302,606	98.1
August	971,263	95.0	667,146	91.5	304,117	98.6
September	993,075	97.1	685,234	94.0	307,841	99.8
October	1,013,326	99.1	704,939	96.7	308,387	100.0
November	1,022,885	100.0	720,341	98.8	302,544	98.1
December	1,013,895	99.1	729,273	100.0	284,622	92.3

For all industries combined the largest number of wage earners, 1,022,885, was reported for November and the smallest, 928,563, or 90.8 per cent of the maximum, for April. The figure for April, however, is only slightly below the figures for the three preceding months of the year. From April to November the number increased gradually, but December showed a slight falling off. In coal mining the month of greatest activity was December, and that of least activity was May, when the number employed was equal to 88.7 per cent of the number employed in December. From May to December there was a steady increase in the number of wage earners employed. It should be noted that the figures in this table furnish only a most unsatisfactory indication of the regularity of employment. In the coal-mining industry in particular many mines operate only part of the days each week or each month, and while the number of wage earners on the rolls on the 15th of the month (which is more often reported than the number actually drawing pay) may be substantially the same from month to month, yet the average number of days each miner works during the year may be much less than the possible number of working days. In other words, there is a good deal of unemployment so distributed through the year as not to cause much fluctuation in the monthly returns.

For the principal industries Table 15 shows the month of maximum and of minimum employment, the number reported for each of these months, and the percentage which the minimum represents of the maximum.

Table 15 WAGE EARNERS IN PRODUCING ENTERPRISES: 1909

INDUSTRY.	Maximum.		Minimum.		
	Month.	Number.	Month.	Number.	Per cent of maximum.
All industries	Nov ...	1,022,885	Apr....	928,563	90.8
Coal	Dec....	720,273	May....	646,592	88.7
Anthracite	Mar....	173,025	Aug....	165,740	95.8
Bituminous	Dec....	500,089	May....	478,456	85.4
Petroleum and natural gas	Nov....	39,932	Feb....	33,521	83.9
Copper	Oct....	53,148	Dec....	50,151	94.4
Iron	Oct....	51,055	Jan....	43,491	85.2
Precious metals	July....	33,869	Dec....	30,751	90.8
Lead and zinc	Dec....	18,374	Jan....	15,330	83.4
Limestone	Sept....	37,209	Jan....	17,908	48.1
Granite	Sept....	21,899	Jan....	13,732	62.7
Phosphate rock	July....	8,114	Oct....	7,610	93.8

The coal industry is divided in this table into its two constituent groups. Anthracite mining shows greater regularity of employment from month to month than bituminous mining. It will be noted that the months of maximum and minimum employment for the two branches do not correspond. For the remaining industries the month of maximum employment is generally in the fall of the year except in the case of the production of precious metals and of phosphate rock, where it is July. The quarrying industries, limestone and granite quarrying, show a wide divergence between the months of maximum and minimum employment, due to the fact that they are surface industries and much affected by weather conditions. For both industries the smallest number of wage earners was reported for January.

Prevailing hours of labor.—In Table 16 producing mines and quarries have been classified according to the prevailing hours of labor per day in each enterprise. Petroleum and natural gas wells are not included in this table, because many of them are operated without hired labor, or by men who give to each enterprise only a part of their time. Neither are those enterprises included in which all labor is performed by contractors. The table shows the percentage of the total number of enterprises falling into each group, and a percentage in which each enterprise has been given a weight according to the total number of wage earners employed on December 15, 1909, or the nearest representative day. It should be clearly borne in mind that this latter percentage does not show precisely the proportion of the total number of employees working the specified number of hours per day, since in many cases some of the employees work a greater or less number of hours than those generally prevailing in the enterprise. The table shows that about one-half of the enterprises have adopted the 8-hour day, while the other half are operated on a 9-hour or 10-hour basis. There is considerable variation in this respect among the several mining industries. The prevailing hours are 8 or less per shift in more than nine-tenths of the deep gold and silver mines, more than five-sixths of the copper mines, about three-fourths of the lead and zinc mines, more than two-thirds of the bituminous coal mines, about three-fifths of the placer mines, and slightly less than one-half of the granite quarries. The 9-hour shift is predominant in anthracite coal mines and the 10-hour day in iron mines, limestone quarries, and the phosphate rock industry. In very few mines do the prevailing hours exceed 10 per shift, the only conspicuous exception being the phosphate rock industry, in which 11 or 12 hours per shift constitute the prevailing hours for over one-fourth of the enterprises.

Table 16

HOURS.	ESTABLISHMENTS.		Per cent distribution of establishments weighted according to number of wage earners.
	Number.	Per cent.	
All industries	12,192	100.0	100.0
8 hours and under	5,876	48.2	44.5
9 hours	1,822	14.9	26.9
10 hours	4,393	36.0	27.5
11 hours	31	0.3	0.3
12 hours	70	0.6	0.8
Coal, anthracite	353	100.0	100.0
8 hours and under	13	3.7	1.7
9 hours	289	81.9	97.9
10 hours	50	14.1	0.4
12 hours	1	0.3	(1)
Coal, bituminous	4,284	100.0	100.0
8 hours and under	2,922	68.2	59.5
9 hours	554	12.9	13.9
10 hours	804	18.8	25.7
12 hours	4	0.1	0.9
Copper	200	100.0	100.0
8 hours	170	85.0	81.8
9 hours	17	8.5	12.5
10 hours	12	6.0	5.3
12 hours	1	0.5	0.3
Iron	293	100.0	100.0
8 hours	15	5.1	3.9
9 hours	19	6.5	5.0
10 hours	254	86.7	90.4
11 hours	4	1.4	1.5
12 hours	1	0.3	0.3
Precious metals, Deep mines	1,302	100.0	100.0
8 hours and under	1,192	91.6	95.4
9 hours	49	3.8	2.7
10 hours	45	3.5	1.7
12 hours	16	1.2	0.2
Precious metals, Placer mines	485	100.0	100.0
8 hours and under	288	59.4	69.5
9 hours	46	9.5	12.2
10 hours	138	28.5	15.0
11 hours	4	0.8	1.6
12 hours	9	1.9	1.7
Lead and zinc	807	100.0	100.0
8 hours and under	597	74.0	82.1
9 hours	130	16.1	8.6
10 hours	70	8.7	9.6
11 hours	1	0.1	0.2
12 hours	9	1.1	0.1
Limestone	1,544	100.0	100.0
8 hours and under	120	7.8	3.4
9 hours	187	12.1	6.3
10 hours	1,231	79.7	88.8
11 hours	4	0.3	0.4
12 hours	2	0.1	1.1
Granite	692	100.0	100.0
8 hours	332	48.0	54.6
9 hours	171	24.7	18.5
10 hours	188	27.2	26.7
11 hours	1	0.1	0.2
Phosphate rock	69	100.0	100.0
8 hours	1	1.4	(1)
10 hours	50	72.5	67.5
11 hours	8	11.6	11.8
12 hours	10	14.5	20.7

1 Less than one-tenth of 1 per cent.

LAND TENURE.

In mining, as in agriculture, the land is the source from which wealth is drawn, and the control of land is an important factor in mining operations. The Thirteenth Census was the first at which the inquiry into land tenure was extended to all branches of the mining industry. Table 17 gives, for all mining industries combined and for the nine most important industries separately, statistics of the land controlled, distinguishing the character of the land and also the form of tenure.

Table 17 ACREAGE OF LAND CONTROLLED BY PRODUCING ENTERPRISES: 1909

INDUSTRY.	All land.				Mineral and oil land.			Timber land.	Other land.
	Total.	Owned.	Held under lease.	Per cent owned.	Total.	Owned.	Held under lease.		
All industries	**24,215,611**	[1] **9,389,121**	[1] **14,838,179**	**38.8**	**21,414,662**	[2] **6,920,673**	[2] **14,504,964**	**1,138,901**	**1,662,048**
Coal	8,182,749	[1] 5,952,110	[1] 2,242,328	.....	6,847,545	[2] 4,732,556	[2] 2,125,961	435,216	899,988
Anthracite	465,134	[1] 316,867	[1] 159,956	68.1	274,359	[2] 183,144	[2] 102,190	71,851	118,924
Bituminous	7,717,615	5,635,243	2,082 372	73.0	6,573,186	4,549,412	2,023,774	363,365	781,064
Petroleum and natural gas	12,694,838	686,268	12,008,570	5.4	12,694,838	686,268	12,008,570	.....	.....
Copper	275,508	270,771	4,827	98.6	126,851	122,798	4,053	57,781	90,956
Iron	1,313,214	1,064,227	248,987	81.0	387,608	282,661	104,947	450,682	468,924
Precious metals	588,263	461,158	127,105	78.4	469,455	397,097	72,358	33,745	85,063
Lead and zinc	125,322	102,569	22,753	81.8	103,555	81,418	22,137	10,120	11,647
Limestone	128,495	96,084	32,411	74.8	88,152	58,774	29,378	9,176	31,167
Granite	51,398	42,960	8,438	83.6	30,548	32,035	7,513	3,266	8,584
Phosphate rock	340,697	327,726	12,971	96.2	243,221	230,405	12,816	92,580	4,896

[1] Inclusive of 11,689 acres reported both in acreage owned and acreage held under lease.
[2] Inclusive of 10,075 acres reported both in acreage owned and acreage held under lease.

The total acreage of all land controlled by producing enterprises was 24,216,000 acres. Of course, not all of this area was in actual use, large tracts being held in reserve. The greater part of this land was mineral and oil land, but there were 1,139,000 acres of timber land and 1,662,000 acres of other land. Under these two headings are comprised land which had not been prospected and whose mineral resources were still unknown, as well as some land used for building and other purposes.

In comparing the statistics of land controlled for different industries or different states, it should be noted that the area of land is not necessarily an index of the importance of the holdings, as some land is far more rich in minerals than other land.

Of the total area controlled by operators of mining enterprises in 1909, more than one-half was connected with the petroleum and natural gas industries. Of the remainder, by far the largest part was reported for the coal industry. The holdings of the bituminous mines are far more extensive in comparison with the value of the products of those mines than those of the anthracite mines. The holdings of land by operators of iron mines are also very considerable. Some indication of the amount of reserve land held in the different industries is afforded by the proportion reported under the description of "Timber land" and "Other land." This proportion is greatest in the iron industry.

Of the total amount of land controlled by mine operators, 38.8 per cent was owned by the operators themselves and the remainder held under lease. The petroleum and natural gas industry, in which most of the land is held under lease, presents a marked contrast to all the other industries shown in the table. Excluding the land controlled in the petroleum and natural gas industry, operators in other mining industries controlled 11,521,000 acres, of which 8,703,000 acres, or 75.5 per cent, were owned by the operators. The two industries showing the widest departure from this proportion are the copper industry, in which the operators owned 98.2 per cent of the land controlled, and the phosphate rock industry, where the proportion of land owned was 96.2 per cent. The proportions owned in the coal industry and its two branches—72.7 per cent for the industry as a whole, 68.1 per cent for the anthracite branch, and 73 per cent for the bituminous branch—fell somewhat below the proportion given above for all mining industries exclusive of the petroleum and natural gas industry.

FORM OF OWNERSHIP.

Table 18 which follows has for its purpose the presentation of conditions with respect to the form of organization of producing mining enterprises for all mining industries combined and the nine leading industries separately.

The most important distinction brought out by the table is that between corporate and all other forms of organization. Among 19,915 operators of producing mines, quarries, and wells, 7,041, or 35.4 per cent, were corporations. These incorporated enterprises,

however, employed 90.6 per cent of the wage earners engaged in mining enterprises, and reported 91.4 per cent of the total value of products. Individuals formed 32.1 per cent of the whole number of operators, but they employed only 3.9 per cent of the wage earners and are credited with only 3 per cent of the total value of products. The proportions for firms differ but little from those for individuals, being slightly less in the case of the number of operators and slightly greater in the case of the number of wage earners and the value of products. Moreover, it may be noted that while the average value of products was $160,832 per operator for corporations, it was only $9,136 for firms and only $5,723 for individuals.

Corporations constituted a majority of the operators in the phosphate rock industry (88.6 per cent), the iron industry (73.3 per cent), the copper industry (67.4 per cent), and the coal industry (52.6 per cent). In the copper industry corporations employed 99 per cent of the total number of wage earners. Other industries where a very large percentage of the wage earners were employed by corporations are iron mining (98.1 per cent), the phosphate rock industry (95.8 per cent), and coal mining (93.6 per cent). More than 90 per cent of the total value of products in the mining industry as a whole was credited to corporations. The largest percentages for the individual industries were as follows: The iron industry, 99.6 per cent; the copper industry, 99.1 per cent; the phosphate rock industry, 96.4 per cent; the coal-mining industry, 94.4 per cent; and the precious metal industries, 92.2 per cent. The two quarrying industries—the limestone and granite industries—are the only ones shown in the table in which as much as 25 per cent of the total value of products is credited to other than corporate enterprises.

Table 18

INDUSTRY AND CHARACTER OF OWNERSHIP.	PRODUCING ENTERPRISES: 1909				PER CENT OF TOTAL.		
	Number of operators.	Number of wage earners.	Value of products. Total.	Value of products. Per operator.	Number of operators.	Wage earners.	Value of products.
All industries	19,915	1,065,283	$1,238,410,322	$62,185	100.0	100.0	100.0
Individual	6,387	41,908	36,551,114	5,723	32.1	3.9	3.0
Firm	6,202	50,777	57,209,620	9,136	31.4	4.8	4.7
Corporation	7,041	965,483	1,132,418,758	160,832	35.4	90.6	91.4
Other	225	7,115	12,230,830	54,359	1.1	0.7	0.9
Coal	3,695	743,283	577,142,935	156,193	100.0	100.0	100.0
Individual	1,058	17,475	10,490,068	9,915	28.6	2.4	1.8
Firm	664	24,690	17,111,132	25,770	18.0	3.3	3.0
Corporation	1,942	695,985	544,885,641	280,585	52.6	93.6	94.4
Other	31	5,134	4,656,094	150,197	0.8	0.7	0.8
Petroleum and natural gas	7,793	39,831	185,416,684	23,793	100.0	100.0	100.0
Individual	2,298	2,020	9,662,086	4,204	29.5	5.1	5.2
Firm	3,360	3,085	18,954,985	5,641	43.1	7.7	10.2
Corporation	1,906	32,630	149,358,498	75,071	25.2	81.9	80.6
Other	169	2,096	7,441,115	44,030	2.2	5.3	4.0
Copper	161	53,143	134,616,987	836,130	100.0	100.0	100.0
Individual	26	168	163,908	6,304	16.3	0.3	0.1
Firm	26	344	1,038,831	39,955	16.3	0.7	0.8
Corporation	109	52,631	133,414,248	1,223,984	67.4	99.0	99.1
Iron	176	52,230	106,947,082	607,654	100.0	100.0	100.0
Individual	23	481	222,946	9,693	13.1	0.9	0.2
Firm	24	536	201,411	8,392	13.6	1.0	0.2
Corporation	129	51,213	106,522,725	825,757	73.3	98.1	99.6
Precious metals	2,282	37,815	94,123,180	42,146	100.0	100.0	100.0
Individual	622	2,591	3,228,424	5,190	27.3	6.9	3.4
Firm	674	2,783	3,997,463	5,931	29.5	7.4	4.2
Corporation	976	32,232	86,750,458	88,884	42.8	85.2	92.2
Other	10	209	146,835	14,684	0.4	0.5	0.2
Lead and zinc	977	21,603	31,363,094	32,101	100.0	100.0	100.0
Individual	89	779	824,504	9,264	9.1	3.6	2.6
Firm	522	2,926	3,601,589	6,899	53.4	13.5	11.5
Corporation	366	17,898	26,937,001	73,598	37.5	82.9	85.9
Limestone	1,665	37,695	29,832,492	17,917	100.0	100.0	100.0
Individual	911	7,781	4,181,655	4,590	54.7	20.7	14.0
Firm	295	5,178	3,486,343	11,818	17.7	13.7	11.7
Corporation	451	24,551	22,061,746	48,917	27.1	65.1	74.0
Other	8	185	102,748	12,844	0.5	0.5	0.3
Granite	707	20,561	18,927,976	26,871	100.0	100.0	100.0
Individual	323	3,745	3,029,150	9,378	45.7	18.2	16.0
Firm	166	3,225	2,967,038	17,879	23.5	15.7	15.6
Corporation	215	13,490	12,923,039	60,107	30.4	65.6	68.0
Other	3	101	77,849	25,950	0.4	0.5	0.4
Phosphate rock	51	8,186	10,781,192	211,396	100.0	100.0	100.0
Firm	6	346	389 207	64,868	11.8	4.2	3.6
Corporation	45	7,840	10,391,985	230,933	88.2	95.8	96.4

SIZE OF ENTERPRISES.

The tendency toward concentration in the mining industries can be measured by a classification of mine operators according to the number of wage earners employed or according to the value of the products per operator.

Classification according to number of wage earners.—Table 19, on the next page, gives, for all mineral industries combined and for the most important individual industries, a classification of producing enterprises according to the number of wage earners employed, and shows for each class the number of operators and the number of wage earners. It does not include those mines and quarries which were worked on contract or for a share of the product, nor does it include the petroleum and gas wells which were cared for by part-time employees.

It is worthy of note that the most numerous type of mine operator is the small producer, about three-fifths of all operators employing only from 1 to 20 men each, while more than one-tenth of all operators employed no wage earners at all. On the other hand, more than one-half of the total number of mine workers were employed by operators employing more than 500 men each, although such operators constituted only 1.7 per cent of the total number of operators. The degree of concentration varies in different industries. In anthracite coal mining over five-sixths of all wage earners were employed by the 18 largest operators, each of whom employed 1,000 or more men. Copper mining follows next, three-fourths of the wage earners in this industry being employed by the 12 largest operators, with a force of over 1,000 men each. Iron mining holds the third place, with 9 operators of the same size employing more than one-half of the wage earners. There is also a large degree of concentration in bituminous coal mining, where 77 operators of the same size, constituting 2.2 per cent of the total number, employed nearly one-half of the wage earners.

In the production of petroleum and natural gas the degree of concentration is not as high as in the mining of coal, iron, and copper; the 8 largest operators, however, employed over two-fifths of the wage earners. On the other hand, in precious metal mining, stone quarrying, and miscellaneous mining industries, small-scale production is still the predominant type.

Table 19

INDUSTRY AND NUMBER OF WAGE EARNERS[1] PER OPERATOR.	PRODUCING ENTERPRISES: 1909			
	Operators.		Wage earners.[1]	
	Number.	Per cent distribution.	Number.	Per cent distribution.
All industries	16,657	100.0	1,065,283	100.0
No wage earners	2,187	13.1		
1 to 5	6,292	37.8	14,788	1.4
6 to 20	3,837	23.0	43,083	4.0
21 to 50	1,973	11.8	64,327	6.0
51 to 100	983	5.9	71,045	6.7
101 to 500	1,105	6.6	242,999	22.8
501 to 1,000	155	0.9	110,101	10.3
Over 1,000	125	0.8	518,850	48.7
Anthracite coal	192	100.0	173,504	100.0
No wage earners	7	3.6		
1 to 5	39	20.3	102	0.1
6 to 20	28	14.6	317	0.2
21 to 50	19	9.9	612	0.3
51 to 100	19	9.9	1,459	0.8
101 to 500	44	22.9	12,082	7.0
501 to 1,000	18	9.4	11,857	6.8
Over 1,000	18	9.4	147,075	84.8
Bituminous coal	3,476	100.0	569,789	100.0
No wage earners	23	0.7		
1 to 5	600	17.3	2,162	0.4
6 to 20	939	27.0	10,183	1.8
21 to 50	575	16.5	18,988	3.3
51 to 100	466	13.4	33,820	5.9
101 to 500	693	19.9	156,523	27.5
501 to 1,000	103	3.0	73,517	12.9
Over 1,000	77	2.2	274,596	48.2
Petroleum and natural gas	4,772	100.0	39,831	100.0
No wage earners	1,324	27.7		
1 to 5	2,749	57.6	4,875	12.2
6 to 20	519	10.9	5,313	13.3
21 to 50	104	2.2	3,144	7.9
51 to 100	49	0.8	2,823	7.1
101 to 500	28	0.6	5,687	14.3
Over 500	8	0.2	17,989	45.2
Copper	158	100.0	53,143	100.0
No wage earners	8	5.1		
1 to 5	48	30.4	144	0.3
6 to 20	30	19.0	360	0.7
21 to 50	17	10.8	570	1.1
51 to 100	16	10.1	1,248	2.3
101 to 500	19	12.0	4,998	9.4
501 to 1,000	8	5.1	5,508	10.4
Over 1,000	12	7.6	40,306	75.8
Iron	173	100.0	52,230	100.0
No wage earners	4	2.3		
1 to 5	12	6.9	39	0.1
6 to 20	30	17.4	374	0.7
21 to 50	36	20.8	1,227	2.4
51 to 100	24	13.9	1,742	3.3
101 to 500	49	28.3	11,399	21.8
501 to 1,000	9	5.2	7,132	13.7
Over 1,000	9	5.2	30,317	58.0
Precious metals	2,169	100.0	37,815	100.0
No wage earners	378	17.4		
1 to 5	913	42.1	2,330	6.2
6 to 20	527	24.3	5,802	15.3
21 to 50	203	9.4	6,648	17.6
Over 50	148	6.8	23,035	60.9
Lead and zinc	950	100.0	21,603	100.0
No wage earners	133	14.0		
1 to 5	293	30.9	814	3.8
6 to 20	289	30.4	3,500	16.2
21 to 50	184	19.4	5,910	27.4
51 to 100	39	4.1	2,691	12.4
101 to 500	5	0.5	825	3.8
501 to 1,000	4	0.4	3,346	15.5
Over 1,000	3	0.3	4,517	20.9
Limestone	1,642	100.0	37,695	100.0
No wage earners	96	5.9		
1 to 5	565	34.4	1,453	3.8
6 to 20	526	32.0	6,168	16.4
21 to 50	282	17.2	9,201	24.4
51 to 100	104	6.3	7,432	19.7
Over 100	69	4.2	13,441	35.7
Granite	704	100.0	20,561	100.0
No wage earners	10	1.4		
1 to 5	199	28.3	658	3.1
6 to 20	265	37.6	3,069	14.9
21 to 50	132	18.8	4,367	21.3
51 to 100	53	7.5	3,830	18.6
Over 100	45	6.4	8,657	42.1
Phosphate rock	51	100.0	8,186	100.0
1 to 5 wage earners	2	3.9	17	0.2
6 to 20	11	21.6	179	2.2
21 to 50	11	21.6	463	5.7
51 to 100	6	11.8	1,024	12.5
Over 100	21	41.2	6,503	79.4

[1] Based on number reported for Dec. 15, 1909, or nearest representative day.

A marked distinction with respect to the degree of concentration exists between regular producing mines, quarries, and wells, on the one hand, and nonproducing properties which are still in the development stage, on the other.

About two-thirds of all the wage earners engaged in the development of new mining properties were employed by small operators, or those employing not exceeding 20 wage earners each. The largest enterprises in this class were represented by 12 operators employing from 101 to 500 wage earners each. On the other hand, more than one-half of all wage earners engaged in producing mines were employed by operators with a working force of 500 men or over.

Table 20 shows the distribution of operators according to the number of wage earners for producing and nonproducing properties separately.

Table 20

WAGE EARNERS[1] PER OPERATOR.	PRODUCING ENTERPRISES.				NONPRODUCING ENTERPRISES.			
	Operators.		Wage earners.[1]		Operators.		Wage earners.[1]	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Total	16,657	100.0	1,065,283	100.0	3,395	100.0	21,499	100.0
No wage earners	2,187	13.1			196	5.8		
1 to 5	6,292	37.8	14,788	1.4	2,253	66.4	6,207	28.9
6 to 20	3,837	23.0	43,083	4.0	779	23.0	7,659	35.6
21 to 50	1,973	11.8	64,327	6.0	127	3.7	3,751	17.5
51 to 100	983	5.9	71,045	6.7	28	0.8	1,961	9.1
101 to 500	1,105	6.6	242,999	22.8	12	0.3	1,921	8.9
501 to 1,000	155	0.9	110,101	10.3				
Over 1,000	125	0.8	518,850	48.7				

[1] Based on number reported for Dec. 15, 1909, or nearest representative day.

Classification according to value of products.—Table 21 gives, for all mining industries and for the most important industries separately, a classification of the operators according to value of products per operator, and shows, for each class, the number of operators and the total value of products.

Table 21

INDUSTRY AND VALUE OF PRODUCTS PER OPERATOR.	PRODUCING ENTERPRISES: 1909			
	Operators.		Value of products.	
	Number.	Per cent distribution.	Amount.	Per cent distribution.
All industries	19,915	100.0	$1,238,410,322	100.0
Less than $5,000	11,384	57.2	18,518,939	1.5
$5,000 to $20,000	4,276	21.5	43,907,158	3.6
$20,000 to $100,000	2,840	14.3	128,309,227	10.4
$100,000 to $1,000,000	1,251	6.3	335,247,982	27.1
$1,000,000 and over	164	0.8	712,277,016	57.5
Coal	3,695	100.0	577,142,935	100.0
Less than $5,000	1,175	31.8	2,021,829	0.6
$5,000 to $20,000	919	24.9	9,557,288	1.6
$20,000 to $100,000	885	23.9	44,005,693	7.6
$100,000 to $1,000,000	631	17.1	172,101,675	29.8
$1,000,000 and over	85	2.3	348,496,450	60.4
Anthracite coal	192	100.0	149,180,471	100.0
Less than $5,000	59	30.7	95,220	0.1
$5,000 to $20,000	24	12.5	288,261	0.2
$20,000 to $100,000	38	19.8	2,153,044	1.4
$100,000 to $1,000,000	54	28.1	21,020,422	14.1
$1,000,000 and over	17	8.9	125,622,918	84.2
Bituminous coal	3,503	100.0	427,962,464	100.0
Less than $5,000	1,116	31.9	2,826,603	0.6
$5,000 to $20,000	895	25.5	9,269,027	2.2
$20,000 to $100,000	847	24.2	41,852,049	9.8
$100,000 to $1,000,000	577	16.5	151,141,253	35.3
$1,000,000 and over	68	1.9	222,873,532	52.1
Petroleum and natural gas	7,793	100.0	185,416,684	100.0
Less than $5,000	5,446	69.9	8,890,708	4.8
$5,000 to $20,000	1,500	19.3	14,812,243	8.0
$20,000 to $100,000	638	8.2	26,024,025	14.5
$100,000 to $1,000,000	184	2.4	49,108,036	26.5
$1,000,000 and over	19	0.2	85,501,072	46.2
Copper	161	100.0	134,616,987	100.0
Less than $5,000	68	42.2	83,082	0.1
$5,000 to $20,000	32	20.0	337,175	0.2
$20,000 to $100,000	18	11.2	726,467	0.5
$100,000 to $1,000,000	22	13.7	8,708,533	6.5
$1,000,000 and over	21	13.0	124,762,730	92.7
Iron	176	100.0	106,947,082	100.0
Less than $5,000	42	23.9	54,093	0.1
$5,000 to $20,000	34	19.3	363,050	0.3
$20,000 to $100,000	47	26.7	2,416,815	2.3
$100,000 to $1,000,000	38	21.6	14,023,823	13.1
$1,000,000 and over	15	8.5	90,089,331	84.2
Precious metals	2,282	100.0	94,123,180	100.0
Less than $5,000	1,571	68.8	1,775,238	1.9
$5,000 to $20,000	347	15.2	3,599,027	3.8
$20,000 to $100,000	208	9.1	9,226,301	9.8
$100,000 to $1,000,000	140	6.2	38,704,156	41.1
$1,000,000 and over	16	0.7	40,818,458	43.4
Lead and zinc	977	100.0	31,363,094	100.0
Less than $5,000	531	54.4	901,363	2.9
$5,000 to $20,000	231	23.6	2,407,108	7.7
$20,000 to $100,000	173	17.7	7,776,942	24.8
$100,000 to $1,000,000	38	3.9	7,339,203	23.4
$1,000,000 and over	4	0.4	12,938,478	41.2
Limestone	1,665	100.0	29,832,492	100.0
Less than $5,000	940	56.5	1,370,469	4.6
$5,000 to $20,000	401	24.1	4,177,822	14.0
$20,000 to $100,000	270	16.2	12,318,129	41.3
$100,000 to $1,000,000	54	3.2	11,966,072	40.1
Granite	707	100.0	18,997,976	100.0
Less than $5,000	276	39.0	585,023	3.1
$5,000 to $20,000	235	33.2	2,590,945	13.6
$20,000 to $100,000	149	21.1	6,415,992	33.8
$100,000 to $1,000,000	47	6.7	9,406,016	49.5
Phosphate rock	51	100.0	10,781,192	100.0
Less than $5,000	9	17.6	21,132	0.2
$5,000 to $20,000	11	21.6	106,680	1.0
$20,000 to $100,000	8	15.7	445,855	4.1
$100,000 and over	23	45.1	10,207,525	94.7

The relative importance of small-scale and large-scale production in mining can be seen from the fact that the 11,384 operators reporting products valued at less than $5,000, though they constituted 57.2 per cent of the total number of operators, reported only 1.5 per cent of the total value of products, while the 164 operators reporting products valued at more than $1,000,000, though they formed less than 1 per cent of the whole number of operators, reported 57.5 per cent of the total value of products. The degree of concentration varies in the different industries, operators reporting products of more than $1,000,000 in value contributing 92.7 per cent, as measured by value, of the copper product, 84.2 per cent of the iron ore, 84.2 per cent of the anthracite coal, 52.1 per cent of the bituminous coal, 46.2 per cent of the petroleum and natural gas, 43.4 per cent of the precious metals, and 41.2 per cent of the lead and zinc. In the phosphate rock industry which reported a total value of products of $10,781,192 there was one operator whose products were valued at more than $1,000,000. The other mining industries do not show so high a degree of concentration.

EXPENSES.

The census does not purport to furnish figures which can be used for determining profits or exact cost of production.

Table 22 shows, however, for 1909, in percentages, the distribution of expenses in producing enterprises by classes for all mining industries combined and for the most important industries separately. This table shows that for all industries combined 61.4 per cent of the total expenses were incurred for services—that is, salaries and wages—23.8 per cent for supplies, materials, and fuel, 6.1 per cent for royalties and rent of mines, and 8.7 per cent for all other purposes.

Table 22

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED FOR PRODUCING ENTERPRISES.[1]				
	Salaries.	Wages.	Supplies, materials, and fuel.	Royalties and rent of mines.	Miscellaneous.
All industries	5.1	56.3	23.8	6.1	8.7
Coal:					
Anthracite	3.2	66.3	19.2	5.7	5.6
Bituminous	5.5	74.3	12.1	3.1	5.0
Petroleum and natural gas	5.3	20.0	37.8	15.7	21.2
Copper	3.4	45.9	44.2	1.7	4.8
Iron	4.6	40.1	23.3	20.5	11.5
Precious metals	5.6	44.4	37.7	1.7	10.6
Lead and zinc	4.1	43.2	37.6	9.4	5.7
Limestone	7.2	59.0	22.0	2.0	9.7
Granite	6.6	68.6	16.6	1.2	7.0
Phosphate rock	8.0	43.3	30.4	4.7	13.6

[1] For absolute figures on which these percentages are based, see Table 25, p. 18.

As would be expected, the proportions vary considerably in the different industries. The largest percentage for services (79.8) is shown for the bituminous branch of the coal-mining industry, the smallest percentage (25.3) being reported for the petroleum and natural gas industry. The proportion for supplies, materials, and fuel varies from 44.2 per cent for the copper industry to 12.1 per cent for bituminous coal mining; the proportion for royalties and rent of mines, from 20.5 per cent for iron mining to 1.2 per cent for granite quarrying; and the proportion for miscellaneous expenses, from 21.2 per cent for the petroleum and natural gas industry to 4.8 per cent for the copper industry.

POWER.

Table 23 shows, for all mining industries and for the most important industries separately, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower. It also shows separately the number and horsepower of electric motors which were run by current generated by the same establishment.

Table 23

INDUSTRY.	PRODUCING ENTERPRISES: 1909											
	Primary power.										Electric motors run by current generated by same establishment.	
	Aggregate horsepower.	Owned.							Electric motors operated by rented current.			
		Total horsepower.	Steam engines.		Gas or gasoline engines.		Water wheels.					
			Number.	Horsepower.	Number.	Horsepower.	Number.	Horsepower.	Number.	Horsepower.	Number.	Horsepower.
All industries	**4,608,253**	**4,402,554**	**70,573**	**3,786,552**	**23,296**	**518,542**	**908**	**97,460**	**4,770**	**205,699**	**14,213**	**502,921**
Coal	1,304,154	1,877,450	19,318	1,874,001	374	3,101	9	348	872	26,704	10,860	375,386
Anthracite	676,753	675,343	7,580	674,571	25	772	.....	.....	32	1,440	1,152	46,088
Bituminous	1,227,401	1,202,107	11,738	1,199,430	349	2,329	9	348	840	25,264	9,717	329,298
Petroleum and natural gas	1,221,969	1,221,809	36,928	746,658	21,762	475,151	.....	.....	6	160	454	8,589
Copper	376,464	324,178	699	303,848	71	2,325	15	18,005	810	52,280	536	25,888
Iron	346,534	342,069	3,563	326,753	27	2,651	30	12,665	55	4,465	336	22,495
Precious metals	228,244	144,502	1,074	84,953	429	9,696	704	49,853	2,142	83,742	574	16,054
Lead and zinc	110,559	107,276	2,158	94,220	214	12,987	3	69	59	3,283	361	12,048
Limestone	125,624	115,573	2,166	112,390	119	2,911	9	272	206	9,451	170	5,291
Granite	61,095	54,213	1,346	52,549	65	1,142	6	522	159	6,882	57	1,346
Phosphate rock	50,526	50,426	549	46,817	32	3,609	.....	.....	1	100	330	21,388

Of the total primary power used in mining, 4,402,554 horsepower, or 95.5 per cent, was owned by the mine operators, only 205,699 horsepower, all of which was electric power, being rented. The total amount of electric power used, including that generated at the mines, aggregated 708,620 horsepower. Nearly three-fourths of the total rented power was reported from the Mountain and Pacific states, where the abundance of water power and the scarcity of coal makes the transmission of electric power profitable. The ownership of water power by mine operators was insignificant, except in the production of the precious metals, which is mainly confined to the group of states above mentioned. Of the horsepower generated by gas or gasoline engines, 91.6 per cent was utilized in the petroleum and natural gas industry.

QUANTITY OF MINERALS.

The statistics relating to quantity of minerals were collected in cooperation with the United States Geological Survey, but the results given in Table 24 vary slightly from those published by that bureau. The latter relate in every case to the calendar year 1909, whereas the census data are for the business year of each establishment, to accord with the statistics of persons employed in mining industries as well as with the expenses incurred. Moreover, the figures presented in the table deal with products sold or used by the mine operators, whereas the statistics of the United States Geological Survey in many cases show the quantities produced during the calendar year.

For metalliferous, other than iron, mines the United States Geological Survey publishes the quantities of metals recovered by refineries which the ore ultimately reaches, whereas Table 24 which follows relates to the crude products sold by mine operators. Thus, the gold content of all domestic ore mined in continental United States, and sold in crude state, together with the assay content of mill and placer bullion, as given in the table, aggregated 3,876,943 fine ounces, whereas the production of refined gold in continental United States, as estimated by the United States Geological Survey in cooperation with the Director of the Mint, was 3,837,773 ounces; the difference does not exceed 1

per cent of the total production. Likewise, the assay content of all silver ore and mill and placer bullion produced in the United States, as reported by mine operators, was 57,294,492 ounces, whereas the total production of refined bullion in the United States, including Alaska, as estimated by the Director of the Mint and reported by refineries to the Bureau of the Census, aggregated in round figures 54,500,000 fine ounces, the variance being due in greater part to losses in recovery.

No quantities for structural materials are presented in the table below, by reason of the great diversity in the units of measure, depending on quality as well as on the uses for which the stone is intended. The only common measure for the production of building stone is value.

Where the products of a given industry were marketed by some establishments in crude state and by others in dressed or refined state, the figures below are presented as reported by the operators.

Table 24

PRINCIPAL INDUSTRIES.	Unit of measure.	Total.	Crude.	Dressed or refined.	PRINCIPAL INDUSTRIES.	Unit of measure.	Total.	Crude.	Dressed or refined.
FUELS:					MISCELLANEOUS:				
Coal, anthracite	Tons, 2,000 lbs.	80,968,130	.....	.....	Asbestos	Tons, 2,000 lbs.	3,233	2,330	903
Coal, bituminous	Tons, 2,000 lbs.	370,865,510	.....	.....	Barytes	Tons, 2,000 lbs.	48,984	42,979	6,005
Petroleum	Barrels	171,557,485	171,557,485	.....	Bauxite	Tons, 2,000 lbs.	142,341	136,641	7,700
Natural gas	M cubic feet	430,950,466	.....	.....	Clay	Tons, 2,000 lbs.	2,159,647	2,159,647	.....
Peat	Tons, 2,000 lbs.	15,671	1,254	14,417	Corundum and emery	Tons, 2,000 lbs.	1,580	628	952
METALS:[1]					Feldspar	Tons, 2,000 lbs.	76,539	31,037	45,502
Iron	Tons, 2,240 lbs.	50,521,208	50,521,208	.....	Fluorspar	Tons, 2,000 lbs.	48,750	46,319	2,431
Gold, total[2]	Fine ounces	4,860,871	.....	.....	Fullers' earth	Tons, 2,000 lbs.	43,169	19,861	23,308
Continental U. S.	Fine ounces	3,876,943	.....	.....	Garnet	Tons, 2,000 lbs.	2,932	90	2,842
Alaska	Fine ounces	983,928	.....	.....	Graphite	Tons, 2,000 lbs.	16,222	13,248	2,974
Silver[3]	Fine ounces	57,294,492	.....	.....	Gypsum	Tons, 2,000 lbs.	1,845,000	346,069	1,498,931
Copper, total	Pounds	1,089,800,000	.....	.....	Mica:				
Lake[4]	Pounds	234,137,051	.....	234,137,051	Sheet	Pounds	1,809,582	1,809,582	.....
Western[5]	Pounds	855,662,949	855,662,949	.....	Scrap	Tons, 2,000 lbs.	4,000	.....	4,000
Lead:					Monazite and zircon	Tons, 2,000 lbs.	208	.....	208
Argentiferous[5]	Pounds	434,880,257	434,880,257	.....	Phosphate rock	Tons, 2,240 lbs.	2,320,623	2,320,623	.....
Nonargentiferous	Tons, 2,000 lbs.[6]	249,035	249,035	.....	Pumice	Tons, 2,000 lbs.	15,103	15,103	.....
Zinc:					Pyrite	Tons, 2,240 lbs.	247,070	247,070	.....
Argentiferous[6]	Pounds	98,882,370	98,882,370	.....	Quartz	Tons, 2,000 lbs.	117,578	106,248	11,330
Nonargentiferous	Tons, 2,000 lbs.[6]	818,821	818,821	.....	Sulphur	Tons, 2,000 lbs.	268,020	268,020	.....
Quicksilver	Pounds net	1,563,675	.....	1,563,675	Talc and soapstone	Tons, 2,000 lbs.	120,837	30,898	89,939
Manganese	Tons, 2,240 lbs.	1,544	1,544	.....					
Tungsten	Tons, 2,000 lbs.	1,619	1,619	.....					

[1] See explanation in the text.
[2] Assay content of mill bullion and ore shipped.
[3] Assay content, estimate of the Director of the Mint.
[4] Metallic copper.
[5] Assay content of ore.
[6] Concentrate.

PRODUCING MINES, QUARRIES, AND WELLS[1]—COMPARATIVE SUMMARY FOR THE UNITED STATES, BY STATES: 1909 AND 1902.

Table 25

GEOGRAPHIC DIVISION AND STATE.	Census.	PRINCIPAL EXPENSES OF OPERATION AND DEVELOPMENT.				Value of products.[2]	Primary horsepower.	PER CENT OF INCREASE.[3]			
		Salaries and wages.	Supplies and materials.[2]	Royalties and rent of mines.	Contract work.			Salaries and wages.	Royalties and rent of mines.	Value of products.	Horsepower.
United States[4]	**1909**	**$625,610,068**	**$208,771,040**	**$62,456,760**	**$24,091,086**	**$1,175,475,001**	**4,556,214**	**55.9**	**81.2**	**52.4**	**71.0**
	1902	**401,225,547**	**114,515,832**	**34,476,227**	**20,638,127**	**771,486,926**	**2,665,114**	.....	.....	.....	.....
GEOGRAPHIC DIVISIONS:											
New England	1909	11,093,136	3,903,051	190,947	120,440	19,312,271	60,121	5.8	6.8	16.3	37.7
	1902	10,484,388	2,638,713	178,812	1,853	16,608,696	43,670	.....	.....	.....	.....
Middle Atlantic	1909	212,534,186	54,917,283	15,628,491	6,048,625	353,775,070	1,748,418	66.2	42.3	47.2	46.7
	1902	127,847,369	31,582,205	11,100,610	5,959,507	240,365,082	1,191,487	.....	.....	.....	.....
East North Central	1909	129,342,721	34,944,431	12,338,469	5,882,397	233,002,528	919,427	44.9	36.7	34.8	50.8
	1902	89,261,556	25,936,245	9,024,556	4,959,358	172,894,450	609,041	.....	.....	.....	.....
West North Central	1909	55,134,454	21,110,725	14,720,084	2,709,833	129,023,910	371,548	62.2	158.6	78.6	206.6
	1902	33,998,514	9,936,373	5,691,636	770,773	72,257,703	121,171	.....	.....	.....	.....
South Atlantic	1909	53,154,421	18,220,801	8,638,145	4,665,407	102,375,877	532,824	66.5	90.1	47.9	81.9
	1902	31,916,461	11,496,991	4,544,772	5,374,382	69,202,101	292,981	.....	.....	.....	.....
East South Central	1909	31,848,088	6,843,506	1,374,027	970,571	46,394,009	180,503	41.2	79.5	33.2	208.4
	1902	22,550,803	3,941,987	765,974	661,402	34,820,772	58,522	.....	.....	.....	.....
West South Central	1909	9,221,489	4,308,820	1,908,985	303,062	22,400,222	55,199	85.3	348.7	127.2	152.4
	1902	4,976,130	1,216,670	358,555	1,491,206	9,857,304	21,873	.....	.....	.....	.....
Mountain	1909	82,758,040	30,741,950	1,880,957	728,712	170,306,955	399,398	45.1	18.0	51.7	80.9
	1902	57,020,455	20,390,291	1,593,738	770,931	112,270,912	220,774	.....	.....	.....	.....
Pacific	1909	28,627,961	21,956,212	2,073,002	523,657	71,076,741	184,172	57.9	270.2	96.9	116.2
	1902	18,128,437	6,557,854	803,039	570,016	36,092,355	85,203	.....	.....	.....	.....

[1] Exclusive of governmental institutions, and of the coke and cement industries, but including figures for the lime industry.
[2] Exclusive of duplications resulting from the use of products of some enterprises as materials for others within the same industry.
[3] A minus sign (−) denotes decrease.
[4] Embraces Oklahoma, Rhode Island, and South Carolina for both years and the District of Columbia for 1909. These states are not shown separately nor are they included in the totals for their respective geographic divisions, because to do so would disclose individual operations.
[5] Exclusive of the amount paid to miners compensated by a share of the product for both years, and also of the wages of part-time employees for the petroleum and natural gas industries for 1909, which are included under "contract work" in other tables for 1909.

PRODUCING MINES, QUARRIES, AND WELLS[1]—COMPARATIVE SUMMARY FOR THE UNITED STATES, BY STATES: 1909 AND 1902—Continued.

Table 25—Continued.

GEOGRAPHIC DIVISION AND STATE.	Census.	PRINCIPAL EXPENSES OF OPERATION AND DEVELOPMENT.				Value of products.[2]	Primary horsepower.	PER CENT OF INCREASE.[3]			
		Salaries and wages.	Supplies and materials.[2]	Royalties and rent of mines.	Contract work.			Salaries and wages.	Royalties and rent of mines.	Value of products.	Horsepower.
NEW ENGLAND:											
Maine	1909	$1,606,617	$1,032,965	$22,279	$14,448	$3,270,766	8,346	−31.5	75.2	−10.5	20.3
	1902	2,478,603	476,964	12,714	.....	3,656,134	6,939				
New Hampshire	1909	979,840	155,358	4,271	9,246	1,308,597	3,771	11.9	80.1	11.2	44.1
	1902	875,465	134,128	2,372	.....	1,176,312	2,617				
Vermont	1909	4,899,736	1,386,827	85,632	64,988	8,471,725	25,916	40.4	−15.7	43.5	73.0
	1902	3,490,476	1,076,143	101,546	.....	5,904,705	14,979				
Massachusetts	1909	2,516,534	854,090	58,589	18,037	4,332,218	15,020	−8.1	32.2	−3.7	30.8
	1902	2,739,230	727,665	44,325	1,853	4,499,401	11,170				
Connecticut	1909	1,000,409	474,711	20,176	13,121	1,928,965	6,468	11.1	13.0	40.6	−18.8
	1902	900,614	223,813	17,855	.....	1,372,144	7,965				
MIDDLE ATLANTIC:											
New York	1909	5,693,286	2,647,861	408,640	374,435	13,849,494	102,540	26.0	31.0	43.0	60.3
	1902	4,517,851	1,627,489	357,637	350,663	9,682,457	63,953				
New Jersey	1909	3,155,920	1,067,226	101,523	40,799	8,548,858	18,390	38.6	−7.8	111.5	41.4
	1902	2,277,652	892,030	110,163	10,770	4,042,047	13,008				
Pennsylvania	1909	203,684,971	51,202,196	15,358,322	5,632,791	331,376,718	1,027,488	68.3	43.2	46.2	46.0
	1902	121,051,866	20,002,686	10,722,810	5,598,074	226,641,178	1,114,526				
EAST NORTH CENTRAL:											
Ohio	1909	30,226,878	8,850,679	3,068,862	2,745,089	59,031,837	208,635	18.6	−12.4	6.4	46.1
	1902	25,479,977	9,836,370	4,190,544	2,692,557	56,340,184	204,341				
Indiana	1909	16,092,359	2,557,423	595,475	265,259	22,324,647	95,020	36.1	−67.1	−17.0	−20.4
	1902	11,819,807	3,389,898	1,807,948	2,159,980	26,896,393	120,511				
Illinois	1909	49,838,660	9,973,037	3,579,960	2,360,424	77,214,343	226,124	74.6	654.5	106.6	155.5
	1902	28,539,154	3,315,552	474,475	26,016	37,377,226	88,500				
Michigan	1909	20,344,947	11,808,749	4,048,981	472,605	64,956,299	271,891	37.9	75.2	35.3	47.5
	1902	21,277,047	8,037,172	2,311,479	77,047	48,022,062	184,278				
Wisconsin	1909	3,839,877	1,664,543	445,191	30,020	8,575,402	26,848	70.0	85.4	101.4	123.5
	1902	2,145,491	787,253	240,110	3,758	4,257,085	12,011				
WEST NORTH CENTRAL:											
Minnesota	1909	13,592,508	8,964,544	10,732,309	2,157,108	58,975,781	152,153	97.4	191.7	130.2	434.0
	1902	6,887,017	2,839,332	3,678,964	339,244	25,620,077	28,492				
Iowa	1909	11,461,923	1,561,553	349,470	40,791	13,979,453	23,528	57.5	58.3	44.7	60.4
	1902	7,270,272	981,414	220,698	48,106	9,659,330	14,673				
Missouri	1909	15,667,995	7,071,069	1,955,492	135,384	30,378,747	109,071	56.9	30.8	49.8	137.1
	1902	9,980,027	2,850,858	1,308,827	172,514	20,279,481	46,384				
North Dakota	1909	426,010	108,187	10,647	1,325	564,812	2,025	84.8	656.7	73.3	141.3
	1902	231,014	86,467	1,407	2,795	325,967	839				
South Dakota	1909	3,446,944	1,496,495	4,776	50	6,415,788	15,648	−4.1	−45.3	−4.2	27.6
	1902	3,593,242	1,962,937	8,736	406	6,697,797	12,265				
Nebraska	1909	186,582	57,493	1,551	5,494	322,517	815	79.5	88.4	117.3	175.3
	1902	103,936	11,173	823	.....	148,391	296				
Kansas	1909	10,351,532	1,917,384	1,665,839	366,681	18,386,812	67,408	75.0	335.8	93.0	269.9
	1902	5,915,006	1,218,192	382,181	207,708	9,526,066	18,222				
SOUTH ATLANTIC:											
Delaware	1909	287,742	178,432	4,392	5,800	516,213	1,480	14.8	−72.9	15.1	6.0
	1902	250,669	45,361	16,187	.....	448,467	1,396				
Maryland	1909	3,816,561	714,571	136,772	11,148	6,104,122	19,060	−18.7	−3.4	−13.9	53.7
	1902	4,696,260	807,796	141,570	8,499	7,162,113	12,400				
Virginia	1909	5,501,589	1,855,201	421,863	119,043	8,999,920	35,554	41.0	32.3	43.3	128.8
	1902	3,876,556	837,287	318,763	35,964	6,280,148	15,530				
West Virginia	1909	38,177,928	12,801,951	7,766,597	4,307,288	73,452,935	417,282	91.8	101.2	51.8	73.7
	1902	19,905,757	8,513,767	3,874,780	5,194,270	48,362,664	240,170				
North Carolina	1909	1,005,826	268,315	21,412	3,340	1,402,765	6,225	67.6	7.2	51.7	66.2
	1902	599,950	118,494	19,971	9,090	924,676	3,740				
Georgia	1909	1,495,562	415,841	59,317	1,187	2,924,741	10,848	17.2	41.2	−5.0	15.7
	1902	1,276,382	556,229	42,008	122,619	3,080,287	9,373				
Florida	1909	2,870,113	1,092,490	197,792	217,691	8,915,181	42,375	118.9	50.4	202.8	309.1
	1902	1,310,898	618,057	131,493	4,021	2,943,806	10,357				
EAST SOUTH CENTRAL:											
Kentucky	1909	8,800,320	1,537,544	422,702	165,013	12,100,005	53,480	51.7	170.0	45.7	180.3
	1902	5,802,221	1,110,201	156,562	219,027	8,304,706	18,682				
Tennessee	[4] 1909	8,054,131	1,638,019	618,177	43,023	11,803,400	34,370	46.9	49.2	27.4	177.1
	1902	5,483,714	835,754	414,367	174,496	9,268,074	12,407				
Alabama	1909	14,993,031	3,667,943	333,148	767,035	22,491,204	92,647	33.0	70.8	30.4	237.7
	1902	11,273,928	1,995,942	195,045	267,279	17,247,092	27,433				
WEST SOUTH CENTRAL:											
Arkansas	1909	3,325,154	585,357	104,179	111,074	4,764,784	14,217	55.6	375.7	67.8	92.2
	1902	2,137,007	244,379	40,818	860	2,840,341	7,396				
Louisiana	1909	1,109,658	1,586,427	496,198	60,310	6,539,850	8,445	2,757.9	2,038.1	2,241.3	90.2
	1902	41,977	7,354	23,207	105,858	279,327	4,440				
Texas	1909	4,696,677	2,197,036	918,608	130,778	11,095,588	32,537	67.9	211.9	64.7	204.2
	1902	2,797,146	964,937	294,530	1,384,548	6,737,090	10,037				
MOUNTAIN:											
Idaho	1909	4,444,259	2,225,762	27,632	22,665	8,749,050	20,363	−0.8	−1.7	6.5	41.0
	1902	4,480,194	1,626,153	28,103	43,442	8,214,671	18,703				
Colorado	1909	19,959,195	7,273,027	1,017,847	123,828	30,397,859	98,777	−7.2	−4.4	−2.7	19.0
	1902	21,518,160	6,969,796	1,064,653	393,985	40,508,286	83,039				
All other [5]	1909	58,354,586	27,242,261	835,478	582,219	122,159,446	274,258	88.1	66.8	92.2	130.4
	1902	31,031,092	11,794,342	500,982	333,504	63,547,955	119,032				
PACIFIC:											
Washington	1909	6,342,392	1,190,670	141,231	23,849	10,826,503	20,987	56.1	149.7	100.7	76.2
	1902	4,063,773	615,807	56,558	29,600	5,393,059	11,910				
Oregon	1909	854,979	296,489	16,935	3,240	1,237,202	8,070	−30.0	−72.0	−40.7	114.6
	1902	1,222,178	408,112	60,499	10,522	2,087,389	3,761				
California	1909	21,430,590	20,463,053	2,814,926	496,568	59,012,946	155,115	66.9	310.3	100.3	123.1
	1902	12,842,486	5,533,935	685,982	520,894	28,611,307	69,532				

[1] Exclusive of governmental institutions, and of the coke and cement industries, but including figures for the lime industry.
[2] Exclusive of duplications resulting from the use of products of some enterprises as materials for others within the same industry.
[3] A minus sign (−) denotes decrease.
[4] Includes a small production of bituminous coal for Georgia.
[5] Embraces Arizona, Montana, Nevada, New Mexico, Utah, and Wyoming.

PRODUCING MINES, QUARRIES, AND WELLS[1]—COMPARATIVE SUMMARY FOR THE UNITED STATES, BY INDUSTRIES: 1909 AND 1902.

Table 26

INDUSTRY.	Census.	PRINCIPAL EXPENSES OF OPERATION AND DEVELOPMENT.				Value of products.[2]	Primary horsepower.	PER CENT OF INCREASE.[4]			
		Salaries and wages.	Supplies, materials, and fuel.[3]	Royalties and rent of mines.	Contract work.[3]			Salaries and wages.	Royalties and rent of mines.	Value of products.	Horsepower.
All industries[5]	1909	$625,610,068	$208,771,046	$82,456,760	$24,091,986	$1,175,475,001[6]	4,556,214	55.9	81.2	52.4	71.0
	1902	401,225,547	114,515,832	34,476,227	20,638,127	771,486,926	2,665,114	.....	.....	.....	.....
FUELS:											
Coal, total	1909	399,697,241	72,043,898	20,016,639	3,893,257	550,513,806	1,904,154	68.3	69.6	50.2	109.2
	1902	237,557,596	37,517,821	11,799,559	1,650,535	366,642,015	910,310	.....	.....	.....	.....
Anthracite	1909	90,900,963	26,697,966	7,980,739	1,701,514	140,180,471	676,753	132.8	83.1	95.8	62.7
	1902	41,023,406	12,740,780	4,359,051	406,421	76,173,580	416,012	.....	.....	.....	.....
Bituminous	1909	302,796,278	45,345,932	12,035,900	2,191,743	401,333,395	1,227,401	54.5	61.8	38.2	148.3
	1902	195,934,190	24,777,041	7,440,508	1,244,114	290,468,429	494,298	.....	.....	.....	.....
Petroleum and natural gas	1909	34,333,531	41,391,008	21,282,820	15,700,864	175,527,807	1,221,969	63.8	85.7	72.0	21.1
	1902	20,962,110	24,320,573	11,403,780	17,380,696	102,034,590	1,008,710	.....	.....	.....	.....
METALS:											
Iron	1909	33,121,418	17,220,717	15,174,735	2,698,842	106,047,082	346,534	40.1	133.3	63.4	233.3
	1902	23,641,599	8,973,168	6,503,908	422,044	65,466,985	103,974	.....	.....	.....	.....
Copper	1909	45,060,017	23,104,451	259,245	406,999	99,493,799	297,769	96.6	99.1	94.4	54.1
	1902	22,919,861	11,083,175	130,215	188,768	51,178,036	193,272	.....	.....	.....	.....
Precious metals, total	1909	37,466,098	22,075,916	1,305,701	318,303	87,071,553	228,244	−8.2	−8.3	6.3	23.6
	1902	41,154,205	16,699,768	1,423,399	626,090	82,482,052	181,819	.....	.....	.....	.....
Deep mines	1909	34,665,751	19,205,870	1,163,985	225,147	77,434,301	200,966	−11.1	−8.9	0.4	15.5
	1902	39,011,089	15,908,782	1,277,632	606,137	77,154,326	173,961	.....	.....	.....	.....
Placer mines	1909	3,100,347	2,870,046	141,716	93,156	10,237,252	27,278	44.7	−2.8	92.2	151.2
	1902	2,143,116	790,986	145,767	19,953	5,327,726	10,858	.....	.....	.....	.....
Lead and zinc	1909	11,190,025	6,895,802	2,301,850	166,085	28,508,547	109,544	117.1	50.9	95.7	178.2
	1902	5,155,598	2,511,057	1,525,368	108,607	14,600,177	39,374	.....	.....	.....	.....
Quicksilver	1909	486,125	185,378	5,268	4,197	808,458	784	−53.1	−25.6	−44.0	−55.1
	1902	1,035,404	322,267	7,078	23,164	1,550,000	1,748	.....	.....	.....	.....
Manganese	1909	17,088	3,959	.....	.....	20,435	175	−79.7	.....	−88.5	−50.6
	1902	84,319	17,228	1,996	.....	177,011	354	.....	.....	.....	.....
Tungsten	1909	211,486	94,203	1,375	2,400	503,457	480	16,084.6	.....	9,330.2	120.9
	1902	1,260	210	.....	.....	5,975	220	.....	.....	.....	.....
STRUCTURAL MATERIALS:											
Limestone	1909	22,860,012	11,992,659	549,096	254,312	47,784,479	152,695	38.6	29.9	57.8	141.7
	1902	16,496,501	5,378,932	422,993	36,381	30,278,877	63,182	.....	.....	.....	.....
Granite and traprock	1909	15,067,785	3,976,162	476,850	123,808	24,576,293	90,306	23.8	144.7	36.2	94.5
	1902	12,168,784	2,447,761	194,892	.....	18,042,943	46,441	.....	.....	.....	.....
Sandstone	1909	5,352,818	1,389,149	154,513	44,340	9,290,829	36,550	−23.7	−24.4	−15.2	32.6
	1902	7,011,437	1,328,466	204,517	600	10,054,034	27,575	.....	.....	.....	.....
Marble	1909	3,402,130	806,016	47,911	27,344	6,230,120	21,779	35.6	−26.7	23.7	53.8
	1902	2,553,661	825,822	65,385	.....	5,044,182	14,161	.....	.....	.....	.....
Slate	1909	4,494,132	849,158	271,252	28,992	6,054,174	20,777	28.0	0.7	6.3	17.8
	1902	3,512,338	680,361	269,207	.....	5,696,051	25,269	.....	.....	.....	.....
MISCELLANEOUS:											
Asbestos	1909	41,329	23,520	45	400	65,140	380	270.9	.....	41.0	261.9
	1902	10,878	8,233	.....	.....	46,200	105	.....	.....	.....	.....
Asphaltum and bituminous rock	1909	173,106	79,757	1,517	15,546	466,401	828	35.4	−46.9	97.0	15.0
	1902	127,803	21,028	2,856	10,060	236,728	720	.....	.....	.....	.....
Barytes	1909	110,493	28,224	14,232	3,570	224,760	202	−24.0	−47.9	10.6	138.2
	1902	145,444	7,772	27,300	1,000	203,154	110	.....	.....	.....	.....
Bauxite	1909	230,750	55,280	6,900	.....	670,820	1,565	148.1	230.6	423.2	150.8
	1902	92,993	40,019	2,090	500	128,200	624	.....	.....	.....	.....
Buhrstones and millstones	1909	10,850	508	271	.....	34,441	.....	−61.9	−57.4	−42.4	.....
	1902	44,244	1,309	936	.....	59,808	.....	.....	.....	.....	.....
Clay	1909	1,586,599	389,342	85,403	44,318	2,945,048	8,868	43.0	43.8	42.9	122.5
	1902	1,109,397	272,823	59,387	13,241	2,061,072	3,985	.....	.....	.....	.....
Corundum and emery	1909	4,719	200	708	.....	18,185	.....	−87.8	−35.1	−82.6	.....
	1902	38,831	26,114	1,091	.....	104,605	110	.....	.....	.....	.....
Feldspar	1909	135,350	50,744	9,238	8,681	271,437	903	6.1	−12.7	8.4	−17.5
	1902	127,539	50,278	10,584	.....	250,424	1,204	.....	.....	.....	.....
Fluorspar	1909	103,118	59,109	1,917	949	288,509	1,179	40.6	−75.7	4.7	76.2
	1902	137,313	31,374	7,900	300	275,682	669	.....	.....	.....	.....
Fuller's earth	1909	150,979	83,807	582	67	315,762	1,739	258.6	.....	221.7	278.0
	1902	43,775	28,966	.....	4,021	98,144	460	.....	.....	.....	.....
Garnet	1909	44,054	25,280	6,850	.....	101,020	315	−35.1	410.8	−23.3	−25.0
	1902	68,810	10,128	1,341	.....	132,820	420	.....	.....	.....	.....
Graphite	1909	186,083	105,523	5,765	4,000	344,130	2,047	94.5	1,008.7	51.3	244.2
	1902	95,653	51,840	520	900	227,508	769	.....	.....	.....	.....
Grindstones and pulpstones	1909	174,208	114,032	3,348	25,597	413,290	1,048	54.7	67.1	−38.1	33.4
	1902	112,640	31,349	2,003	.....	667,431	1,235	.....	.....	.....	.....
Gypsum	1909	2,372,760	1,560,117	74,916	16,558	5,812,810	17,685	123.0	50.1	178.2	141.6
	1902	1,059,678	341,760	49,012	400	2,089,341	7,319	.....	.....	.....	.....
Infusorial earth, tripoli, and pumice	1909	67,102	23,619	3,587	2,430	172,157	581	270.2	241.6	207.5	41.7
	1902	17,698	2,297	1,050	.....	55,994	410	.....	.....	.....	.....
Marl	1909	13,512	2,988	.....	.....	13,307	105	96.7	.....	4.4	110.0
	1902	6,869	2,755	.....	.....	12,741	50	.....	.....	.....	.....
Mica	1909	139,188	22,769	5,684	.....	200,794	463	142.1	80.9	74.0	150.3
	1902	57,487	11,961	3,142	.....	118,849	185	.....	.....	.....	.....
Mineral pigments	1909	60,856	22,485	3,469	15,288	151,015	840	−61.9	−74.0	−58.2	−52.6
	1902	159,680	58,073	13,320	.....	360,885	1,700	.....	.....	.....	.....
Oilstones, scythestones, and whetstones	1909	74,967	11,558	1,061	6,622	206,028	448	74.0	123.4	80.8	132.1
	1902	43,077	7,062	475	.....	113,968	193	.....	.....	.....	.....
Phosphate rock	1909	3,806,651	2,250,025	345,568	251,849	10,781,192	50,520	66.6	62.7	119.0	257.2
	1902	2,285,207	799,414	212,350	157,402	4,922,043	14,144	.....	.....	.....	.....
Precious stones	1909	134,841	31,401	.....	.....	315,404	109	15.5	.....	−4.0	−27.3
	1902	116,704	17,781	437	.....	328,450	150	.....	.....	.....	.....
Quartz	1909	94,774	29,526	2,959	16,351	231,025	1,219	16.4	−61.3	23.3	60.4
	1902	81,406	19,592	7,638	.....	187,294	760	.....	.....	.....	.....
Sulphur and pyrite	1909	898,208	1,180,447	887	3,001	5,109,050	8,872	100.2	−87.4	439.4	49.5
	1902	448,760	217,262	7,048	3,587	947,089	5,935	.....	.....	.....	.....
Talc and soapstone	1909	907,128	262,393	31,287	3,550	1,174,516	9,433	77.1	−0.2	3.2	139.1
	1902	342,706	125,932	31,364	.....	1,138,107	3,945	.....	.....	.....	.....

[1] Exclusive of governmental institutions and of the coke and cement industries, but including figures for the lime industry.
[2] Exclusive of duplications resulting from the use of the products of some enterprises as materials for others within the same industry.
[3] Exclusive of the amount paid to miners compensated by a share of the product for both years, and also of the wages of part-time employees for the petroleum and natural-gas industry for 1909, which are included under "Contract work" in other tables for 1909.
[4] A minus sign (−) denotes decrease.
[5] The totals for all industries include, besides those specified below, a few industries which could not be separately shown without disclosing the operations of individual operators. The value of products of those industries was less than 0.1 per cent of the total for all industries in 1909 and 0.3 per cent in 1902.

PRODUCING MINES, QUARRIES, AND WELLS—CAPITAL, EXPENSES, VALUE OF PRODUCTS, PERSONS

Table 27

	DIVISION AND STATE.	Number of operators.	Number of mines and quarries.	Number of wells.	Capital.	EXPENSES OF OPERATION AND DEVELOPMENT.						
						Total.	Services.			Supplies, materials, and fuel.		
							Salaried officers of corporations, superintendents, and managers.	Clerks and other salaried employees.	Wage earners.	Supplies and materials.	Purchased ore and natural gas (duplication in product).	Fuel and rent of power.
1	**United States**	[1] 19,915	18,104	166,320	[2] $3,380,525,841	$1,042,642,693	[3] $32,823,748	[3] $20,569,803	$586,774,079	$173,411,438	$29,318,316	$45,136,550
	GEOGRAPHIC DIVISIONS:											
2	New England	510	586	.....	27,950,089	14,696,118	603,790	293,492	9,814,166	1,847,736	.....	753,714
3	Middle Atlantic	6,333	3,903	71,122	919,992,103	315,473,663	8,066,471	5,961,915	204,992,523	47,736,970	3,104,830	7,327,680
4	East North Central	4,152	2,662	56,379	469,041,901	200,211,992	5,936,494	3,434,660	118,672,711	28,179,361	5,656,650	7,309,712
5	West North Central	2,300	2,603	3,450	321,757,330	101,600,234	2,570,135	1,789,303	50,566,348	15,605,588	1,019,554	5,100,860
6	South Atlantic	1,358	1,652	15,146	341,053,471	90,151,345	3,463,174	2,207,740	49,886,136	14,722,485	893,064	3,418,805
7	East South Central	830	1,109	1,110	145,688,421	46,133,257	2,217,967	1,413,822	29,443,806	5,386,232	170,135	1,912,089
8	West South Central	1,229	452	14,700	110,680,029	40,200,158	1,047,442	802,375	15,671,675	7,922,041	173,100	1,505,758
9	Mountain	1,972	3,728	97	709,074,649	166,586,458	4,863,504	3,004,691	82,081,073	32,190,652	14,577,714	14,509,236
10	Pacific	1,538	1,610	4,316	275,819,077	61,589,408	2,481,872	956,406	25,645,641	10,819,473	2,762,660	3,118,687
	NEW ENGLAND:											
11	Maine	97	102	.....	3,825,931	1,876,341	87,779	31,847	1,332,242	219,579	.....	84,683
12	New Hampshire	45	53	.....	1,546,503	1,204,966	45,619	7,869	926,352	100,931	.....	54,427
13	Vermont	137	182	.....	13,992,096	6,795,208	227,650	142,587	4,449,315	905,157	.....	362,438
14	Massachusetts	130	147	.....	5,054,093	2,987,175	153,683	59,675	1,966,997	383,698	.....	153,258
15	Rhode Island	21	27	.....	567,015	673,877	20,948	27,041	499,883	130,947	.....	26,991
16	Connecticut	71	75	.....	2,964,442	1,158,491	59,111	23,573	729,377	127,424	.....	71,917
	MIDDLE ATLANTIC:											
17	New York	1,351	752	11,342	45,171,232	9,087,768	495,776	212,089	4,717,595	1,880,937	65,656	585,161
18	New Jersey	131	151	.....	8,613,663	4,507,940	183,690	79,491	2,801,666	674,902	.....	319,329
19	Pennsylvania	4,851	3,000	59,780	866,207,208	300,977,955	7,387,005	5,670,335	197,473,862	45,175,071	3,099,183	6,423,190
	EAST NORTH CENTRAL:											
20	Ohio	1,876	964	35,007	101,324,529	53,852,530	1,749,762	1,025,222	26,769,229	7,360,280	5,376,075	892,071
21	Indiana	1,010	480	10,373	59,764,947	20,312,752	736,347	365,174	14,782,488	1,823,904	22,595	551,821
22	Illinois	915	759	10,918	116,059,707	68,718,121	2,058,102	1,054,553	46,378,727	8,472,837	101,080	1,325,880
23	Michigan	83	173	21	119,331,087	51,819,838	1,255,559	917,903	27,660,908	9,800,415	.....	4,193,347
24	Wisconsin	268	286	.....	11,660,731	5,508,751	186,724	71,748	3,081,359	721,925	156,000	435,993
	WEST NORTH CENTRAL:											
25	Minnesota	153	250	.....	176,950,369	38,574,180	694,277	874,403	11,907,049	6,736,806	.....	2,024,696
26	Iowa	373	431	.....	8,481,483	13,694,714	320,951	220,024	10,870,446	1,307,919	.....	221,740
27	Missouri	1,021	1,224	39	69,549,081	27,515,101	993,190	281,730	14,393,570	4,730,342	1,471,553	2,220,657
28	North Dakota	53	53	6	1,058,649	570,140	34,372	28,217	364,321	95,352	.....	12,835
29	South Dakota	39	43	3	32,697,991	5,154,263	113,109	94,028	3,224,075	1,054,532	55,130	421,048
30	Nebraska	18	20	.....	222,428	260,049	12,900	3,745	169,937	35,474	.....	22,019
31	Kansas	643	582	3,402	41,797,329	15,831,787	401,336	287,090	9,636,350	1,645,163	392,862	267,964
	SOUTH ATLANTIC:											
32	Delaware	9	9	.....	959,078	508,037	61,900	8,115	217,727	152,054	.....	26,378
33	Maryland	126	173	.....	25,109,678	5,099,157	199,609	131,838	3,339,682	478,555	.....	104,156
34	Virginia	150	244	.....	55,902,693	8,863,954	357,255	255,366	5,229,787	1,173,866	.....	484,527
35	West Virginia	798	718	15,146	219,466,909	71,347,031	2,197,617	1,631,267	35,980,736	11,047,711	893,064	1,212,825
36	North Carolina	118	130	.....	5,985,112	1,416,075	81,046	41,396	802,702	152,714	.....	103,319
37	South Carolina	29	32	.....	1,209,390	1,034,823	55,065	27,175	626,429	124,618	.....	117,899
38	Georgia	92	109	.....	11,475,710	2,064,236	146,888	43,018	1,278,159	254,021	.....	146,666
39	Florida	36	96	.....	20,794,901	5,909,532	366,194	129,565	2,350,854	738,946	.....	1,223,035
	EAST SOUTH CENTRAL:											
40	Kentucky	437	442	1,100	26,786,640	11,721,722	667,739	297,409	7,827,514	1,322,406	.....	218,489
41	Tennessee	216	365	1	33,819,977	11,909,257	909,021	379,267	7,358,583	1,571,612	41,950	645,376
42	Alabama	177	302	.....	85,081,804	22,442,278	941,207	737,146	14,257,709	2,402,214	128,178	1,048,824
	WEST SOUTH CENTRAL:											
43	Arkansas	96	146	62	7,200,417	4,309,211	102,502	75,965	3,026,140	308,207	.....	138,087
44	Louisiana	33	2	246	13,207,232	6,041,555	148,386	178,645	872,627	859,456	7,200	726,971
45	Oklahoma	864	212	12,113	70,696,411	21,071,609	972,829	389,728	7,775,413	4,897,176	130,587	384,186
46	Texas	236	92	2,279	19,575,969	8,177,783	363,725	178,037	3,997,495	1,708,102	35,313	255,014
	MOUNTAIN:											
47	Montana	373	543	.....	145,135,510	46,520,545	718,506	694,477	21,361,406	9,837,503	6,559,820	3,628,056
48	Idaho	174	370	.....	48,802,888	7,198,763	269,251	88,027	4,045,547	1,847,458	.....	356,199
49	Wyoming	66	95	21	9,505,365	9,053,467	255,035	191,772	6,206,787	1,385,504	.....	376,187
50	Colorado	672	1,575	76	144,639,558	38,030,288	1,441,869	671,071	18,403,296	5,459,686	4,030,144	1,955,984
51	New Mexico	98	285	.....	40,125,674	5,553,423	234,187	210,947	3,520,350	805,487	.....	203,083
52	Arizona	135	251	.....	119,772,781	28,608,216	577,885	440,205	13,502,760	5,559,367	1,370,391	5,604,089
53	Utah	188	235	.....	81,000,043	10,606,028	755,233	442,294	8,986,851	3,020,414	106,010	1,074,119
54	Nevada	266	374	.....	120,002,830	14,415,728	610,848	265,208	5,925,070	3,375,103	1,610,449	1,311,625
	PACIFIC:											
55	Washington	93	170	.....	13,074,691	7,800,722	213,198	131,468	5,891,007	843,025	.....	245,852
56	Oregon	116	161	.....	9,166,834	1,223,468	91,387	33,446	705,102	186,796	.....	96,592
57	California	1,329	1,279	4,316	253,577,552	52,565,278	2,177,287	791,492	19,049,442	18,789,652	2,762,660	2,775,643

[1] Exclusive of duplications, 307 operators having reported in two or more states. Such duplications have not been excluded in the totals for the several geographic divisions.

[2] Includes $59,468,780 which could not be distributed among the several states.

[3] In some cases the same operator conducted enterprises in two or more states, all such enterprises being managed through one central administrative office. In such cases it was impossible to assign the corporate officers and the central office force to any particular state; this was also the case in respect to contract work and taxes, which were reported in a lump sum for all properties. The total central office expenses were accordingly apportioned among the several states pro rata to the total expenses reported for each state and the estimated amounts of such administrative expenses were added to "Sundry expenses." In the totals for the United States, however, the number of officers and salaried employees, as well as their salaries, and the amount of contract work and taxes, appear under the proper heads. The amounts thus included in the item of "Sundry expenses" for individual states and distributed in the totals for the United States are as follows: Officers, $922,899; clerks, $645,399; taxes, $142,240; and contract work, $61,801.

ENGAGED, LAND CONTROLLED, AND POWER, FOR THE UNITED STATES, BY STATES: 1909.

	EXPENSES OF OPERATION AND DEVELOPMENT—contd.				Value of products.	PERSONS ENGAGED IN MINING INDUSTRIES.						Land controlled (acres).	Primary horse-power.
	Miscellaneous.					Aggregate.	Proprietors and officials.			Clerks and other salaried employees.	Wage earners Dec. 15, or nearest representative day.		
	Royalties and rent of mines.	Taxes.	Contract work.	Rent of offices and other sundry expenses.			Total.	Proprietors and firm members	Salaried officers of corporations, superintendents, and managers.				
1	$63,973,585	[3] $17,796,703	[3] $28,887,898	[3] $43,950,513	$1,238,410,322	[4] 1,139,332	49,374	29,922	[4] 19,452	[4] 24,675	1,065,283	24,215,611	4,608,253
2	185,637	154,826	110,705	932,052	17,327,242	19,590	938	515	423	398	18,254	67,575	61,259
3	15,945,607	5,920,809	6,533,563	9,823,286	370,742,202	427,091	16,325	11,520	4,805	7,829	402,937	5,874,701	1,738,613
4	12,335,880	3,332,106	6,154,644	9,059,774	237,534,170	229,255	11,301	7,451	3,850	4,294	213,660	4,139,440	913,857
5	14,718,304	3,280,108	2,762,943	3,197,022	130,252,538	95,637	5,230	3,547	1,683	1,949	88,458	1,425,461	370,390
6	8,639,760	1,307,777	4,862,717	6,089,087	105,714,462	124,512	3,500	1,350	2,150	2,997	118,006	6,503,321	536,048
7	1,373,504	376,047	1,000,960	2,832,305	49,143,280	75,004	2,184	501	1,683	1,994	70,856	2,308,739	179,050
8	4,301,962	456,134	2,409,045	5,150,726	47,530,937	31,387	2,156	1,056	1,100	979	28,252	1,844,933	149,002
9	3,410,506	2,143,200	4,308,511	5,497,371	205,053,900	99,711	4,158	2,023	2,135	2,481	93,072	1,022,459	467,184
10	2,972,425	683,456	617,309	2,532,139	75,111,522	36,171	3,263	1,959	1,304	1,120	31,788	968,982	191,050
11	10,302	10,241	6,728	80,940	2,050,063	2,686	168	98	70	47	2,471	11,055	8,141
12	4,271	5,251	9,240	51,000	1,308,597	1,610	75	42	33	15	1,520	7,979	3,771
13	84,332	72,147	64,698	486,944	8,221,323	8,901	311	160	151	202	8,388	35,327	25,668
14	55,409	40,187	16,272	177,996	3,407,888	3,805	222	121	101	75	3,508	8,077	15,031
15	8,652	3,343	.....	35,272	897,606	737	37	18	19	23	677	659	2,350
16	10,771	17,657	13,761	98,000	1,375,765	1,851	125	76	49	36	1,690	3,878	6,298
17	465,454	173,080	513,042	872,009	13,334,975	14,230	2,041	2,294	347	286	11,303	495,570	101,759
18	101,026	47,354	44,489	256,533	8,347,501	7,176	227	96	131	148	6,801	26,809	18,048
19	15,379,127	5,690,466	5,976,032	8,694,684	349,050,786	405,085	13,457	9,130	4,327	7,305	384,833	5,352,313	1,018,806
20	3,667,382	850,766	2,970,544	3,184,599	63,707,112	62,874	4,333	3,004	1,269	1,350	57,185	2,135,777	294,763
21	595,274	176,369	295,982	962,798	21,934,201	31,202	3,259	2,028	931	474	27,559	522,176	95,039
22	3,570,472	287,400	2,376,956	3,082,154	76,058,074	86,389	2,643	1,425	1,218	1,310	82,436	990,389	225,330
23	4,048,666	1,948,756	470,205	1,524,079	67,714,470	42,133	980	118	562	1,056	40,397	452,602	273,801
24	445,146	62,755	40,957	306,144	7,459,404	6,567	386	210	176	98	6,083	38,496	24,804
25	10,731,959	2,824,101	2,157,108	923,751	58,004,852	19,590	547	169	378	935	18,114	337,792	151,834
26	349,440	43,674	40,836	319,784	13,877,781	19,004	968	423	245	226	19,010	81,458	23,453
27	1,054,092	158,086	162,084	1,149,797	31,007,525	32,462	2,450	1,783	667	336	29,676	339,677	109,672
28	10,647	4,300	1,325	18,771	564,812	960	79	51	28	21	860	34,695	2,025
29	4,770	102,963	50	84,843	6,432,417	3,987	75	31	44	46	3,866	31,933	15,648
30	1,551	414	5,593	8,416	322,517	527	28	16	12	8	491	1,038	815
31	1,665,839	147,570	395,947	991,690	18,722,034	18,201	1,383	1,074	309	377	16,441	598,803	66,943
32	4,392	1,024	5,800	30,947	516,213	671	30	9	21	13	628	642	1,480
33	133,786	88,559	8,303	524,669	5,782,045	8,201	270	101	178	177	7,745	109,419	18,118
34	418,353	150,074	119,028	975,698	8,795,046	17,506	320	86	243	374	16,893	294,416	34,630
35	7,796,172	965,443	4,465,926	4,550,270	70,287,889	82,808	2,236	909	1,327	2,108	78,464	5,569,363	416,282
36	20,212	7,565	37,380	109,075	1,358,617	3,094	231	165	66	38	2,825	75,296	6,062
37	10,330	16,783	6,680	55,838	1,252,792	2,079	45	13	32	20	2,014	47,899	7,012
38	58,717	13,236	1,903	121,628	2,874,595	4,267	180	58	128	67	4,014	136,129	10,998
39	197,702	70,493	217,691	614,062	8,846,065	5,796	173	9	164	140	5,483	270,167	42,366
40	422,579	96,122	184,903	684,561	12,100,075	23,393	870	338	532	490	22,033	710,036	53,203
41	617,097	94,575	54,372	597,395	12,092,547	18,068	482	87	395	458	18,028	807,131	34,523
42	333,828	185,350	767,385	1,550,430	24,350,007	32,643	832	76	756	1,016	30,795	850,972	91,024
43	193,990	18,084	117,195	208,141	4,603,845	6,739	215	75	140	102	6,422	110,526	14,080
44	496,198	67,501	62,440	3,222,131	6,547,050	1,163	131	72	59	79	953	102,251	8,445
45	2,783,975	308,216	2,137,314	1,312,185	25,637,802	16,842	1,349	648	701	573	13,920	1,211,893	95,074
46	917,799	62,333	152,096	417,209	10,742,150	7,643	461	261	200	225	6,957	420,263	32,003
47	1,822,875	453,386	304,499	1,049,033	54,991,901	21,791	769	504	265	519	20,503	119,642	174,389
48	27,632	158,145	23,036	382,868	8,049,342	3,940	284	169	115	64	3,592	48,920	26,278
49	107,834	61,409	61,542	346,707	10,572,188	8,983	306	202	104	178	8,499	85,550	30,338
50	1,017,447	542,972	2,996,083	1,151,756	45,680,135	26,783	1,411	647	764	603	24,769	213,875	93,777
51	78,995	40,410	132,535	818,423	5,587,744	6,112	210	86	124	220	5,682	397,174	16,042
52	8,256	431,820	238,982	874,462	34,217,651	14,104	301	100	201	352	13,451	44,217	47,272
53	71,011	211,920	265,066	771,310	22,083,282	11,735	390	102	288	341	11,004	74,650	47,226
54	275,556	243,129	196,708	601,912	23,271,507	6,263	497	213	274	204	5,572	38,431	26,862
55	141,231	93,593	14,462	226,886	10,537,556	7,053	162	48	114	148	7,343	107,989	20,742
56	10,935	12,917	7,717	72,486	1,191,512	1,299	174	112	62	38	1,087	33,708	8,070
57	2,814,259	576,046	595,130	2,232,767	63,382,464	27,219	2,927	1,799	1,128	934	23,358	827,285	162,238

[4] The following numbers of persons, which could not be distributed by states, are included under the proper headings in the United States totals: Aggregate, 974; salaried officers of corporations, superintendents, and managers, 310; and clerks, 664.

PRODUCING MINES, QUARRIES, AND WELLS—LAND CONTROLLED, CAPITAL, EXPENSES, VALUE OF PRODUCTS,

Table 28

	INDUSTRY.	Number of operators.	Number of mines, quarries, and wells.	Land controlled (acres).	Capital.	EXPENSES OF OPERATION AND DEVELOPMENT.						
						Total.	Services.			Supplies, materials, and fuel.		
							Salaried officers of corporations, superintendents, and managers.	Clerks and other salaried employees.	Wage earners.	Supplies and materials.	Purchased ore and natural gas (duplication in product).	Fuel and rent of power.
1	**All industries (U. S.)**	**19,915**	.....	**24,215,611**	**$3,380,525,841**	**$1,042,642,693**	**$32,823,748**	**$20,569,803**	**$586,774,079**	**$173,411,438**	**$29,318,316**	**$45,136,550**
	FUELS:											
2	Coal, anthracite	192	423	465,134	246,928,078	139,324,467	2,317,223	2,266,081	92,317,059	23,504,740	.....	3,103,226
3	Coal, bituminous	3,503	6,013	7,717,615	1,062,197,083	395,907,026	12,724,418	9,076,477	294,196,488	40,064,899	433,801	7,509,947
4	Petroleum and natural gas	7,793	166,320	12,694,838	683,268,497	135,638,644	4,848,224	2,393,657	27,091,650	39,947,013	9,888,877	1,444,595
5	Peat	10	10	1,620	318,024	96,034	17,178	3,018	40,313	6,490	.....	17,974
	METALS:											
6	Iron	176	483	1,313,214	300,735,917	74,071,830	1,749,989	1,630,973	29,731,456	12,597,428	.....	4,632,289
7	Copper	161	368	275,598	301,896,296	107,679,212	1,928,167	1,785,861	49,382,979	23,718,373	10,596,964	13,324,157
	Precious metals—											
8	Deep mines	1,604	2,845	374,685	443,715,258	68,764,692	2,816,966	980,474	30,868,371	14,100,617	6,451,627	5,105,253
9	Placer mines	678	880	213,578	56,840,870	6,810,482	359,376	71,397	2,069,574	2,194,444	.....	675,692
10	Lead and zinc	977	1,142	125,322	62,627,935	24,453,299	896,722	195,844	10,477,657	4,836,023	1,047,047	2,400,724
11	Quicksilver	12	12	22,837	2,718,812	718,861	63,441	15,140	407,544	130,847	.....	54,531
12	Manganese	3	8	3,457	900,000	21,725	4,620	480	11,088	3,461	.....	498
13	Tungsten	22	116	7,624	1,468,428	365,780	20,901	3,240	178,345	85,555	.....	8,048
14	STRUCTURAL MATERIALS	3,088	4,603	341,695	[1] 132,641,780	63,641,585	[2] 3,642,297	[2] 1,504,442	39,661,871	8,800,184	.....	3,482,054
15	Limestone	1,665	1,916	128,495	44,089,476	23,875,507	1,227,758	490,238	14,082,185	3,754,125	.....	1,507,628
16	Granite	707	826	51,398	25,422,307	16,192,138	741,171	328,361	11,112,195	1,921,912	.....	757,078
17	Sandstone	595	677	65,680	15,758,455	6,626,438	398,383	132,086	3,993,340	909,955	.....	319,961
18	Marble	77	108	43,445	20,272,755	4,842,835	281,018	102,089	3,079,023	544,327	.....	261,689
19	Slate	185	219	19,897	12,177,350	5,831,256	306,890	98,580	4,088,653	521,761	.....	327,397
20	Traprock	196	220	18,985	8,745,553	5,090,538	244,777	102,317	2,538,964	1,018,090	.....	270,082
21	Bluestone	563	637	14,795	1,299,789	1,182,873	53,052	8,446	707,511	130,014	.....	29,219
	MISCELLANEOUS:											
22	Asbestos	5	20	3,045	88,000	72,747	7,040	2,200	31,189	23,120	.....	400
23	Asphaltum and bituminous rock.	12	19	7,137	2,557,273	301,073	39,809	4,320	128,977	66,159	.....	13,598
24	Barytes	23	42	14,079	472,751	176,967	13,623	6,500	90,310	21,750	.....	6,468
25	Bauxite	10	10	14,214	3,023,414	316,221	24,878	7,608	198,273	21,665	.....	33,624
26	Buhrstones and millstones	14	14	506	9,685	18,354	225	.....	16,625	483	.....	25
27	Clay	261	336	50,053	6,780,077	2,289,198	180,863	44,024	1,361,622	280,953	.....	108,389
28	Corundum and emery	4	6	1,553	316,909	7,459	1,044	.....	3,675	260	.....	.....
29	Feldspar	22	28	3,556	505,769	238,896	25,367	3,336	106,653	40,852	.....	15,892
30	Fluorspar	13	15	3,434	195,215	310,426	19,649	5,024	168,445	34,695	.....	24,414
31	Fuller's earth	16	21	6,644	1,362,427	274,776	33,880	4,470	118,629	35,707	.....	48,010
32	Garnet	3	4	5,396	181,858	98,206	3,550	900	40,204	19,491	.....	5,795
33	Graphite	19	20	5,984	1,505,768	328,690	23,588	2,426	160,069	69,601	.....	35,922
34	Grindstones	13	25	2,604	304,324	339,261	20,572	5,373	148,323	99,470	.....	14,562
35	Gypsum	78	222	54,215	10,213,284	4,905,662	288,954	202,935	1,820,877	986,658	.....	573,459
36	Infusorial earth	14	16	2,305	147,900	61,033	4,990	120	27,627	4,432	.....	9,235
37	Magnesite	6	13	2,369	89,016	92,444	5,338	2,105	32,479	6,282	.....	7,556
38	Marl	3	3	2,250	70,146	17,812	2,895	1,030	9,587	1,463	.....	1,525
39	Mica	73	78	12,255	1,201,780	182,828	13,570	960	124,658	10,377	.....	12,392
40	Mineral pigments	23	26	1,337	386,501	115,860	15,082	1,800	43,974	14,710	.....	7,775
41	Monazite and zircon	4	4	50,550	63,000	50,909	3,100	600	5,046	1,750	.....	770
42	Oilstones, scythestones, and whetstones.	21	45	3,928	247,478	99,259	4,083	1,000	60,884	4,057	.....	6,601
43	Phosphate rock	51	153	340,607	30,642,656	7,421,430	430,523	160,467	3,215,661	898,657	.....	1,360,368
44	Precious stones	23	27	2,858	701,945	195,908	36,169	2,700	95,972	30,449	.....	1,012
45	Pumice	3	4	320	4,400	6,087	.....	90	4,778	539	.....	.....
46	Pyrite	11	12	9,179	1,717,410	734,355	34,573	20,329	408,419	152,143	.....	71,537
47	Quartz	14	14	1,877	343,883	155,418	10,447	2,070	81,048	17,461	.....	12,065
48	Sulphur	4	4	6,747	5,203,900	4,538,389	64,200	46,059	324,538	248,383	.....	708,384
49	Talc and soapstone	39	46	11,576	8,659,744	1,036,371	71,334	31,678	504,116	199,054	.....	66,339
50	Tripoli	4	7	874	170,800	42,493	6,000	840	22,657	7,407	.....	2,006
51	ALL OTHER INDUSTRIES [3]	10	27	27,843	6,891,550	740,874	38,950	12,086	373,269	125,340	.....	138,929

[1] Includes $4,870,095 which can not be distributed among the several industries.

[2] In some cases the same operator conducted two or more quarries producing different kinds of stone, all quarries being managed through one central administrative office. In such instances it was impossible to assign the corporate officers and the central office force to any particular quarry; this was also the case in respect to taxes, which were reported in a lump sum for all properties. The total central office expenses were accordingly apportioned among the several industries in proportion to the total expenses of each and the estimated amounts of such administrative expenses were added to "Sundry expenses" for each industry. In the totals for "Structural materials," however, the number of officers and salaried employees, as well as their salaries, and the amount of taxes, appear under the proper heads. The amounts thus included in the item of "Sundry expenses" for individual industries and distributed in the totals for "Structural materials" are as follows: Officers, $380,239; clerks, $242,325; taxes, $27,767.

PERSONS ENGAGED IN MINING INDUSTRIES, AND POWER, FOR THE UNITED STATES, BY INDUSTRIES: 1909.

	EXPENSES OF OPERATION AND DEVELOPMENT—continued.							Value of products.	PERSONS ENGAGED IN MINING INDUSTRIES.							Primary horsepower.
	Miscellaneous.				Per cent of total.				Aggregate.	Proprietors and officials.				Clerks and other salaried employees.	Wage earners Dec. 15, or nearest representative day.	
	Royalties and rent of mines.	Taxes.	Contract work.	Rent of offices and other sundry expenses.	Services.	Supplies.	Miscellaneous.			Total.	Proprietors and firm members. Total.	Proprietors and firm members. Number performing manual labor.	Salaried officers of corporations, superintendents, and managers.			
1	$63,973,585	$17,796,763	$28,887,898	$43,950,513	61.4	23.8	14.8	$1,238,410,322	1,139,332	49,374	29,922	8,861	19,452	24,675	1,065,283	4,608,253
2	7,980,739	2,681,877	1,701,514	3,361,408	69.5	19.2	11.3	149,180,471	178,004	1,315	188	72	1,127	3,185	173,504	676,753
3	12,082,488	4,481,816	2,269,672	13,127,020	70.8	12.1	8.1	427,062,464	592,077	11,020	3,739	1,713	7,881	11,268	569,789	1,227,401
4	21,282,820	2,576,980	16,736,510	9,428,312	25.3	37.8	30.0	185,416,684	62,172	19,353	16,213	2,155	3,140	2,988	39,831	1,221,969
5	800	907	.....	9,354	63.0	25.5	11.5	109,047	203	15	1	.....	14	6	182	1,416
6	15,174,735	3,970,355	2,698,842	1,870,763	44.7	23.3	32.0	106,047,082	55,176	1,109	76	24	1,033	1,837	52,230	346,534
7	1,789,050	1,934,158	644,502	2,574,335	49.3	44.2	6.5	134,616,987	55,258	661	79	42	582	1,454	53,143	376,464
8	1,163,985	1,084,576	3,693,984	2,588,899	50.4	37.3	12.3	83,885,928	37,755	3,359	2,011	951	1,348	780	33,616	200,966
9	141,716	119,369	99,582	479,422	45.5	42.2	12.3	10,237,252	5,436	1,149	951	673	198	88	4,199	27,278
10	2,301,850	167,188	197,259	1,032,985	47.3	37.6	15.1	31,303,094	24,397	2,525	1,947	1,171	578	269	21,603	110,559
11	5,268	6,957	9,878	25,255	67.6	25.8	6.6	868,458	640	27	3	.....	24	15	598	784
12	.....	678	.....	.....	78.7	18.2	3.1	20,435	65	7	4	1	3	1	57	175
13	1,375	3,213	40,076	14,527	57.8	25.8	16.4	503,457	227	45	32	20	13	5	177	486
14	1,430,445	[2] 498,235	403,590	[2] 4,151,467	70.4	19.3	10.3	75,902,908	[4] 101,129	[4] 6,744	4,106	1,827	[4] 2,638	[4] 2,035	92,350	303,442
15	488,919	161,117	201,880	1,961,057	66.2	22.0	11.8	20,832,492	41,029	2,645	1,634	640	1,011	689	37,695	125,024
16	104,349	113,097	65,744	958,231	75.2	16.6	8.2	18,997,976	22,211	1,248	730	318	518	402	20,561	61,095
17	97,604	53,075	73,359	648,675	68.3	18.5	13.2	7,702,423	11,025	913	587	215	326	204	9,908	33,487
18	47,911	70,616	27,344	428,818	71.5	16.6	11.9	6,239,120	6,649	188	49	6	139	148	6,313	21,779
19	271,252	33,102	28,962	154,590	77.1	14.5	8.4	6,054,174	10,121	499	221	70	278	184	9,438	29,777
20	282,501	32,301	99,204	532,302	50.7	25.5	17.8	5,578,317	6,748	317	116	22	201	171	6,260	29,211
21	56,909	5,070	6,097	126,555	70.0	13.5	16.5	1,588,406	3,020	827	769	556	58	18	2,176	3,069
22	45	840	400	6,607	56.8	32.3	10.9	65,140	88	5	.....	.....	5	4	79	380
23	1,517	5,694	15,540	26,053	57.4	26.4	16.2	466,461	241	20	.....	.....	20	6	215	828
24	14,232	1,967	14,340	7,705	62.5	15.9	21.6	224,766	372	35	23	11	12	7	330	262
25	6,969	3,933	.....	19,271	73.0	17.5	9.5	670,829	726	27	1	.....	26	9	690	1,565
26	271	28	.....	697	91.8	2.8	5.4	34,441	79	19	18	15	1	.....	60	.....
27	85,463	25,147	48,068	154,729	69.3	17.0	13.7	2,945,948	4,351	404	244	77	160	76	3,871	8,868
28	708	11	.....	1,761	63.3	3.5	33.2	18,185	19	2	.....	.....	2	.....	17	.....
29	9,248	1,473	8,681	27,404	56.7	23.7	19.6	271,437	803	28	11	7	17	10	325	993
30	1,917	1,012	949	63,321	90.5	18.5	21.0	288,509	376	27	8	4	19	7	342	1,179
31	582	2,863	67	30,478	57.1	30.5	12.4	315,702	380	27	3	3	24	8	345	1,739
32	6,850	4,860	.....	10,547	45.5	25.7	28.8	101,920	120	7	5	2	2	1	112	315
33	5,765	3,461	4,000	23,918	56.6	32.1	11.3	344,130	436	26	2	2	24	6	404	2,047
34	3,348	2,134	25,597	19,882	51.4	33.6	15.0	413,296	430	16	5	2	11	6	408	1,648
35	74,916	30,062	16,558	842,243	48.4	31.8	19.8	5,812,810	4,215	163	6	4	157	274	3,778	17,685
36	735	813	2,430	10,701	53.6	22.4	24.0	75,503	99	23	16	1	7	1	75	316
37	253	252	.....	8,179	63.9	22.2	13.9	68,403	84	8	3	2	5	2	74	126
38	.....	247	.....	1,065	75.8	16.8	7.4	13,307	38	7	4	.....	3	2	29	105
39	5,684	852	6,036	8,299	76.1	12.5	11.4	200,794	608	133	116	63	17	2	473	463
40	3,469	1,255	20,388	7,407	52.5	19.4	28.1	151,015	240	35	20	2	15	2	209	849
41	100	303	36,500	2,740	17.2	5.0	77.8	64,472	34	8	6	.....	2	1	25	45
42	1,061	1,211	6,622	3,840	75.5	11.7	12.8	206,028	232	25	19	9	6	1	206	448
43	345,568	86,859	251,849	671,478	51.3	30.4	18.3	10,781,192	8,573	214	17	.....	197	173	8,186	50,526
44	.....	1,740	.....	27,860	68.8	16.1	15.1	315,464	145	33	5	.....	28	5	107	109
45	100	.....	.....	490	80.0	8.8	11.2	30,007	25	5	5	3	.....	2	18	.....
46	887	6,145	2,730	37,592	63.1	30.5	6.4	676,984	1,160	22	4	.....	18	27	1,111	5,758
47	2,959	1,512	16,351	10,296	61.0	19.0	20.0	231,025	208	18	7	.....	11	6	184	1,219
48	.....	53,690	301	3,692,708	9.6	21.1	69.3	4,432,066	460	13	.....	.....	13	39	408	3,114
49	31,287	15,501	3,550	116,512	58.6	25.3	16.1	1,174,516	1,452	64	16	2	48	52	1,336	9,433
50	2,662	713	.....	208	69.4	22.1	8.5	66,557	73	11	4	.....	7	2	60	265
51	2,152	8,033	500	40,715	57.3	35.7	7.0	778,038	560	20	4	3	16	13	527	3,141

[3] Includes enterprises as follows: Antimony, 1; bismuth, 1; borax, 2; chromite, 2; manganiferous iron, 2; nickel and cobalt, 1; and tin, 1.

[4] The following numbers of persons, which could not be distributed among the several industries, are included under the proper headings in the totals for building stone: Aggregate, 326; officers of corporations, 107; and clerks, 219.

NONPRODUCING MINES, QUARRIES, AND WELLS—PERSONS ENGAGED IN MINING INDUSTRIES, LAND CONTROLLED, POWER, CAPITAL, AND EXPENSES: 1909.

Table 29

INDUSTRY.	Number of operators.	Number of mines, quarries, and wells.	PERSONS ENGAGED IN MINING INDUSTRIES.						Land controlled (acres).	Primary horsepower.	Capital.
			Aggregate.	Proprietors and officials.			Clerks and other salaried employees.	Wage earners Dec. 15, or nearest representative day.			
				Total.	Proprietors and firm members.						
					Total.	Number performing manual labor.	Officials.				
All industries (United States)	3,749	.....	27,616	5,494	3,769	1,076	1,725	623	21,499	1,969,067	91,657	$282,001,223
FUELS:											
Coal, anthracite	6	6	327	6	.....	.....	6	.....	321	513	1,945	22,728
Coal, bituminous	38	55	705	50	9	5	41	30	685	89,700	2,609	9,402,665
Petroleum and natural gas	260	[1] 128	1,017	396	207	19	189	70	1,451	1,115,101	8,577	14,166,314
METALS:											
Iron	20	21	804	23	5	2	18	28	753	30,420	3,471	4,850,839
Copper	13	13	799	39	.....	.....	39	54	706	15,570	4,248	11,073,777
Precious metals:											
Deep mines	3,078	8,352	20,453	4,426	3,135	881	1,291	399	15,628	598,832	59,224	233,123,939
Placer mines	132	192	772	199	152	103	47	5	568	54,154	5,001	3,364,271
Lead and zinc	63	71	494	150	123	28	27	8	336	4,737	3,486	1,094,711
Quicksilver	18	28	139	27	19	9	8	1	111	9,139	120	893,800
Manganese	5	9	42	9	6	.....	3	.....	33	4,016	248	105,850
Tungsten	12	84	109	14	7	.....	7	1	94	3,470	127	459,602
STRUCTURAL MATERIALS:											
Limestone	9	9	159	19	17	.....	2	4	136	8,024	879	273,121
Granite	3	3	18	6	5	.....	1	.....	12	76	.....	13,990
Marble	11	20	81	19	13	.....	6	1	61	4,136	206	486,352
Slate	9	10	94	16	12	5	4	.....	78	395	390	166,081
MISCELLANEOUS:											
Asbestos	5	76	25	4	.....	1	4	2	19	2,455	.....	264,734
Clay	6	6	46	16	14	1	2	.....	30	973	20	34,700
Fluorspar	3	3	14	4	3	.....	1	.....	10	147	10	116,500
Graphite	5	6	35	6	1	3	5	3	26	11,005	85	258,018
Gypsum	4	6	25	4	3	2	1	.....	21	1,230	10	40,741
Mica	4	4	29	5	3	3	2	.....	24	165	.....	13,708
Oilstones, scythestones, and whetstones	4	4	13	6	6	1	.....	.....	7	240	50	2,600
Phosphate rock	5	33	137	8	2	4	6	2	127	3,705	455	132,000
Precious stones	7	11	27	11	11	2	.....	.....	16	261	.....	22,125
ALL OTHER INDUSTRIES [2]	29	54	292	31	16	7	15	15	246	15,534	496	1,612,197

INDUSTRY.	EXPENSES OF OPERATION AND DEVELOPMENT.							
	Total.	Services.			Supplies, materials, and fuel.		Contract work.	Miscellaneous expenses.
		Salaried officers of corporations, superintendents, and managers.	Clerks and other salaried employees.	Wage earners.	Supplies and materials.	Fuel and rent of power.		
All industries (United States)	$31,548,736	$2,092,650	$392,277	$12,931,910	$10,877,732	$1,366,862	$1,802,560	$2,084,745
FUELS:								
Coal, anthracite	263,501	7,151	3,009	173,438	58,956	2,563	1,351	17,033
Coal, bituminous	748,807	37,795	14,878	229,028	164,077	2,137	214,310	86,042
Petroleum and natural gas	7,044,383	191,155	25,543	1,002,383	4,037,764	198,552	303,162	385,824
METALS:								
Iron	802,301	18,008	15,902	316,530	237,882	83,074	63,775	126,410
Copper	900,252	57,882	34,556	475,123	167,906	75,113	12,698	76,974
Precious metals—								
Deep mines	20,321,074	1,030,738	270,360	10,086,470	5,017,908	951,148	1,080,536	1,268,914
Placer mines	500,426	49,685	1,375	243,330	145,138	6,219	27,487	33,186
Lead and zinc	241,450	16,501	2,712	86,442	39,205	24,161	63,336	9,093
Quicksilver	96,904	7,050	900	69,354	10,307	1,970	.....	7,263
Manganese	19,107	2,203	.....	12,324	2,108	1,262	.....	1,210
Tungsten	83,877	15,412	816	42,204	14,060	565	.....	9,920
STRUCTURAL MATERIALS:								
Limestone	77,112	874	2,592	22,612	42,424	670	4,420	3,511
Granite	4,574	600	.....	2,395	1,510	.....	.....	69
Marble	43,531	7,380	600	19,054	8,379	2,206	1,800	4,112
Slate	29,175	3,890	.....	19,532	2,625	2,427	.....	701
MISCELLANEOUS:								
Asbestos	36,893	8,177	1,420	14,311	1,422	.....	.....	11,563
Clay	6,936	900	.....	3,773	1,000	.....	40	1,283
Fluorspar	4,218	1,320	.....	2,010	449	245	.....	194
Graphite	62,801	11,100	1,508	14,577	2,225	108	11,028	22,255
Gypsum	6,200	120	.....	4,130	1,035	5	.....	400
Mica	5,343	600	2,378	708	1,102	.....	500	55
Oilstones, scythestones, and whetstones	1,805	.....	.....	937	165	70	.....	633
Phosphate rock	37,567	4,825	350	24,673	1,421	3,828	.....	2,470
Precious stones	2,227	.....	.....	1,811	301	.....	.....	115
ALL OTHER INDUSTRIES [2]	142,002	19,224	7,318	64,755	16,143	9,030	9,117	15,515

[1] Exclusive of wells not completed on Dec. 31, 1909.

[2] Includes enterprises as follows: Antimony, 1; asphaltum and bituminous rock, 2; bluestone, 1; borax, 1; chromite, 1; feldspar, 1; garnet, 1; grindstones, 1; infusorial earth, 1; lithographic stone, 2; lithium, 1; magnesite, 1; mineral pigments, 2; molybdenum, 4; monazite and zircon, 1; pyrite, 1; quartz, 1; tin, 1; titanium, 1; uranium, 1; and vanadium, 1.

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BUREAU OF THE CENSUS

MINING : UNITED STATES

COAL

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INTRODUCTION.

This report is arranged in four parts. Part I treats of the industry as a whole; Part II covers Pennsylvania anthracite; Part III deals with bituminous coal; and Part IV presents a comprehensive summary of the general statistics obtained by the census of coal mines, from which the special tables of Parts I, II, and III are derived.

Definitions and explanations.—In order that the text and tables of this report may be entirely clear, the following definitions and explanations are submitted:

Scope of census.—The statistics of coal refer to the United States exclusive of all outlying possessions. The Thirteenth Census did not extend to the Philippine Islands, and in the other noncontiguous territory of the United States no coal was mined, except in Alaska, where five producing mines reported an output of 3,464 tons, valued at $16,450. Owing to the incompleteness of the reports, no other data can be given for the Alaskan coal mines, and the items just given are not included in any subsequent table or statement.

The census returns cover two general classes of operations: First, those which produced coal during the year 1909, and second, those which were in course of development but did not produce coal during that year. The tables of Parts I, II, and III deal with producing enterprises only; the statistics of nonproducing mines are given in the detailed table in Part IV.

Small bituminous mines producing less than 1,000 tons each and mines idle during the entire year 1909 were omitted from the census.

Period covered.—The returns of all anthracite producers cover the calendar year 1909. Those of bituminous producers cover the calendar year 1909, or the business year which corresponded most nearly to that calendar year. This gives a report of a full year's operations for all mines except those which were shut down during a portion of the year, in which case, of course, the returns cover only a part of a year's operations.

Coal mining and coke manufacture at the mines.—Many bituminous mines are operated directly in connection with coke manufacture at the mines. It was the intention in such cases to secure separate reports for coal mining and for coke making. Many operators, however, did not segregate their reports, but rendered one combined report for both enterprises, on the ground that these activities were so closely related as to render separate reports difficult and possibly inaccurate. In view of this condition of the returns, the statistics of bituminous coal mining have in general been arranged in two groups: First, statistics which relate solely to mines at which no coke was made; second, statistics which cover all those enterprises where both operations were conducted. This is done, not only to secure greater accuracy, but to give figures which reflect the actual conditions of operation for the industry. In order to present data comparable with those of preceding census reports, figures are presented in a few tables for all mines as mines, the data having been adjusted, as explained in connection with the tables, to exclude the items attributable to the manufacture of coke.

In the statistics for enterprises engaged both in coal mining and in coke making there is a certain unavoidable lack of uniformity. It was intended to have these figures cover only mines at which coke was made during the year 1909, but occasionally an operator rendered a single combined report covering several mines, one or more of which were operated with coke production and one or more without coke production; hence a few mines without coke ovens were necessarily included in the statistics of the coke-making group.

In each of the three states, Illinois, Indiana, and Ohio, a single operator made coke at a mine, but the entire quantity produced in these states was too small to justify separate presentation, and it has not been included in any part of this report.

Number of operators.—In determining the number of operators, subsidiary companies have not been considered separate operators, but each holding or owning company, together with all its subsidiary concerns, has been counted as one operator.

Coal land controlled.—The acreage of coal land shown covers the holdings of none but operating concerns, and therefore is exclusive of the lands of nonoperating holders. Since producers reported their total holdings, the acreage given necessarily includes large areas held in reserve for future development.

Pennsylvania anthracite operators reported 10,975 acres of coal land sublet to each other, which was reported twice in the total holdings reported by all operators. This duplication has been eliminated from the total acreage shown for Pennsylvania anthracite, but can not be eliminated from the subtotals given for owned and leased acreage, since the lessors did not report the form of tenure by which they controlled the land reported sublet.

Capital.—Operators were required to report the total amount of capital, both owned and borrowed, which they had invested in the business on the last day of the business year. This includes the operator's investment in property owned, together with cash on hand, operating accounts, and bills receivable. The value of lands, buildings, and equipment held under lease is not included in the amount reported, but the capital reported does cover the value of the leases themselves. Owing to diverse methods of bookkeeping in use by different companies, to the fact that some operators apparently reported capital stock at its par value instead of actual capital invested, and to the further fact that in some cases the returns include investments in large areas of reserve coal lands, the statistics of capital lack uniformity and can be used only to show very general conditions.

Expenses.—The expenses reported include all direct expenses of operation and development. Interest payments and dividend disbursements are not included, nor has any allowance been made for depreciation. In coal mining, depreciation is of two kinds: (1) The gradual destruction of the investment in coal lands, due to the mining out of the coal; (2) the gradual destruction of the investment in the development of the mine, due not only to the deterioration of inside and outside equipment and construction, but also to the fact that shafts, slopes, entries, etc., have no value after the coal is exhausted. Depreciation of the first kind, for mines operated on leased lands, is fully covered in the census returns by the royalties paid and included in the expenses reported by the operators; but for mines operated on lands owned by the operators it is not covered by any item in the expenses reported to the census. For the second kind of depreciation no allowance as such has been included in the expenses reported, but it should be borne in mind that the mine operators did include expenditures for permanent improvements, betterments, and replacements made during the year, which may offset the depreciation of this second kind. The total amount thus expended and included in the total expenses reported by anthracite operators was $6,060,000. Bituminous operators reported a total of $14,152,000 for "cost of development work," but many operators carried no separate account

of such expenditures, nor was there uniformity of method among those who did. Accordingly, the amount actually expended at bituminous mines for this purpose may have been considerably greater than the above total.

Both gross and net expenses are shown for anthracite. The gross expenses given involve a certain amount of duplication, as explained in the paragraph on "Wages."

Salaries.—Except as explained in the following paragraph on "Administrative expenses of general offices," the amount of salaries shown includes all payments to officials, superintendents, managers, and salaried employees in general offices, as well as the payments to salaried employees at the mines.

Administrative expenses of general offices.—Occasionally a company operating bituminous mines in more than one state reported as a total the expenses of its general office and did not apportion these expenses among its different mines or even among the different states covered by its operations. States affected by returns of this kind from bituminous mine operators were Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Ohio, Oklahoma, Pennsylvania, Texas, Washington, West Virginia, and Wyoming. In order to show the total expenses for the mines of the states mentioned it was necessary to distribute these administrative expenses among these states by estimate. It was not thought desirable, however, to include under the heading of "Salaries" the salary payments thus distributed, since the employees of general offices to whom these salaries were paid could not be similarly distributed by states. Accordingly, the distribution was made as follows: The total expenses of each general office were apportioned as a single item among the mines of that company in the proportion which the total expenses as separately reported for each mine bore to the aggregate for all the mines of the company, and the amount so assigned to each mine was included in "Miscellaneous expenses." In consequence, the total amount of salaries appearing as such in the statistics of bituminous coal for the several states mentioned is slightly less than it should be, while the total for miscellaneous expenses is correspondingly exaggerated. However, these apportioned items are relatively small, so that the items for each state are approximately correct, and, in the totals for the United States, the general office employees, their salaries, and other general office expenditures, are included under the proper headings. The condition herein noted applies only to the statistics of bituminous coal in tables of Part III and Part IV.

Wages.—The wages shown in the tables of this report for the year 1909 are the gross earnings of the men. The census schedule of inquiries for mines called for the amount of net wages; that is, the amount remaining after deductions had been made from gross earnings on account of blacksmithing, explosives, oil, etc., furnished the employees by the operators, and also called for the amount of such deductions made. Deductions aggregating $12,108,000 were reported by bituminous operators, but examination of the returns showed that the practice as to entries under this heading, and consequently as to the reporting of net wages, was not uniform. It was evident that uniform data for wages at bituminous mines could be secured only by using gross earnings, and this figure was obtained, where not directly given, by adding together the net wages and the amount of deductions reported, which gave the original gross earnings. For the sake of uniformity the returns of anthracite operators were treated in the same manner, and hence gross earnings constitute the "Wages" shown in all the tables of this report. However, the total gross expenses thus obtained for anthracite mines involve a certain amount of duplication, due to the fact that the cost of explosives and oil afterwards sold to employees for mining purposes is included in the cost of supplies reported by the operators, while at the same time the wages shown are the gross earnings of the men before any deductions had been made for these supplies. In order to eliminate this duplication, the amount deducted by the operators from the gross earnings of their employees on this account, namely, $4,872,913, has been subtracted from the gross expenses to give net expenses.

Supplies.—This item includes the cost of all mine supplies used during the year, of fuel charged to operating expenses, and of power rented. In addition to the coal used at the mines and charged to operating expenses, a quantity—some of it refuse—was burned under the boilers; to this coal no value was assigned by the operators. The cost of supplies given does not include any estimated value for this coal.

The cost of supplies reported by anthracite operators includes the cost of mining supplies afterwards sold to employees, with deduction from wages in payment therefor. There is thus a duplication in gross expenses, which has been eliminated in the item of net expenses shown in the tables. To a slight extent, a similar condition exists in the returns of bituminous operators, as explained in connection with Table 51.

In the statistics of mines at which coke was manufactured, the value of coal charged into the ovens has not been included in the cost of supplies, except in the case of a small quantity purchased from other operators, nor has the value of the coal made into coke been included in the total value of products. Duplication of expenses and of value of products is thus avoided.

Miscellaneous expenses.—Except as already explained under "Administrative expenses of general offices," the figures for miscellaneous expenses include taxes, cost of contract work, rent of offices, use of patents, insurance, ordinary repairs to buildings and machinery, advertising, damages, traveling expenses, and all other sundry expenses.

Use of long and short tons.—In all the tables of Part I, Part III, and Part IV, the quantities of anthracite and bituminous coal and of coke are given in tons of 2,000 pounds; but in all the tables of Part II, which deals with Pennsylvania anthracite, the long ton of 2,240 pounds is used.

Value of products.—The schedules called for the value of the products at the mines. However, the value reported was not always the actual value which would have resulted from sale in the open market, since a considerable part of the output of coal and coke was produced by operators closely affiliated with various industrial enterprises, and the value reported by such operators may have been a matter of intercorporate accounting rather than an expression of market value. Furthermore, the total value of products reported includes the value of that portion of the coal used at the mines for steam and heat to which a value was assigned by the operators and which was charged to operating expenses, but not all operators assign a value to such coal.

The total value of products for coal mining combined with coke manufacture has been obtained by adding together the value of coal sold, or used for fuel in other departments of the producing concerns, of coal used at the mines for steam and heat and charged to operating expenses, and of coke produced, together with the value of all by-products. This excludes the value of the coal coked at the mines, and avoids duplication of value of products.

Persons engaged in the industry.—The statistics of the number of proprietors and firm members, salaried employees, and wage earners are based on the returns for December 15, 1909, or the nearest representative day. The number of wage earners reported includes bosses performing work similar to that of men over whom they had charge, but foremen whose duties were wholly supervisory are included among salaried employees.

Primary horsepower.—The figures given under this heading represent the total primary power used by the operators. The horsepower of electric motors run by current generated by the primary power of the mine operators is not included, since this would obviously result in duplication.

PART I.—THE INDUSTRY AS A WHOLE.

GENERAL SUMMARY FOR THE UNITED STATES.

Table 1 summarizes the more important statistics of producing coal mines in 1909 for the entire United States. It relates only to mines which reported in full all the important items requested; a few other mines with a small production of coal (about 2,000,000 tons), which did not furnish full statistics as to value, expenses, or some other items, or were operated by penal institutions, are not included in this table.[1]

SUMMARY FOR PRODUCING MINES: 1909.

[Statistics of nonproducing mines are given only in Table 62.]

Table 1

	Total.	Anthracite.	Bituminous.		
			Total.	Mines without coke manufacture.	Mines with coke manufacture.
Number of operators	3,695	192	3,503	3,322	181
Number of mines	6,436	423	6,013	5,365	648
Acres of coal land controlled	6,847,545	[1] 274,359	6,573,186	4,883,967	1,689,219
Owned	4,732,556	183,144	4,549,412	3,225,778	1,323,634
Held under lease	2,125,964	102,190	2,023,774	1,658,189	365,585
Capital	$1,309,125,161	$246,028,078	$1,062,197,083	$697,357,137	$364,839,946
Gross expenses	[2] $535,231,493	$139,324,467	[2] $395,907,026	$301,451,896	[2] $94,455,130
Less charges to miners for explosives, oil, and blacksmithing	[3]	$4,872,913	[3]	[3]	[3]
Net expenses	$530,358,580	$134,451,554	$395,907,026	$301,451,896	$94,455,130
Products:					
Tons (2,000 pounds)—					
Coal, including that made into coke at mines	457,833,640	80,968,130	376,865,510	280,652,040	96,213,470
Coal, excluding that made into coke at mines	407,761,037	80,968,130	326,792,907	280,652,040	46,140,867
Coke made at mines	32,450,482		32,450,482		32,450,482
Value at mines of all products	$577,142,935	$149,180,471	$427,962,464	$315,894,935	$112,067,529
Coal for sale or use as fuel	[4] $509,232,811	$149,180,471	[4] $360,052,340	$315,659,346	[4] $44,392,994
Coke made at mines	$67,483,162		$67,483,162		$67,483,162
Other products	$426,962		$426,962	$235,589	$191,373
Persons engaged in industry	770,081	178,004	592,677	453,473	139,204
Proprietors and firm members	3,927	188	3,739	3,648	91
Salaried employees	23,461	4,312	19,149	14,411	4,738
Wage earners (number employed Dec. 15, 1909, or nearest representative day)	743,293	173,504	569,789	435,414	134,375
Primary horsepower	1,904,154	676,753	1,227,401	910,778	316,623
Gross expenses by items:					
Services	$412,808,346	$96,900,963	$315,907,383	$244,595,955	$71,401,428
Salaries	26,384,199	4,583,304	21,800,895	16,501,064	5,299,831
Wages	380,514,147	92,317,659	294,196,488	228,094,891	66,101,597
Supplies	[2] 74,706,613	26,697,966	[2] 48,008,647	34,392,734	[2] 13,615,913
Royalties	20,063,227	7,980,739	12,082,488	9,715,232	2,367,256
Miscellaneous	27,563,307	7,744,799	19,818,508	12,747,975	7,070,533

[1] The total acreage of anthracite land is exclusive of a duplication of 10,075 acres in figures for owned and leased acreage. See Introduction.
[2] Includes $433,801 worth of coal purchased for coking at mines.
[3] Expenses reported for bituminous mines are approximately net expenses. As to possible slight duplication in expenses for bituminous mines, see remarks preceding Table 51.
[4] $41,281,055 worth of bituminous coal was made into coke at mines.

The total production of coal in 1909, in round numbers, as shown in Table 2, was 460,049,000 tons. The total tonnage of bituminous coal was 378,975,000 and the total tonnage of anthracite 81,074,000. The mines covered by Table 1 produced 457,834,000 tons, of which 407,761,000 tons were produced for sale or for use as fuel, and 50,073,000 tons (of bituminous coal) were converted into coke at the mines, producing 32,450,000 tons of coke. The total value of all products of the industry (including only the mines covered by Table 1) was $577,143,000; and the total net expenses of coal mining and coke manufacture at the mines were $530,359,000, of which about four-fifths was for wages and salaries. The number of wage earners employed at mines with complete reports was 743,293.

The relation between expenses and value of products is more fully discussed in connection with the separate analyses of the statistics for anthracite and bituminous coal, respectively.

[1] *Number of operators and of mines.*—The number of producing operators given in Table 1, namely, 3,695, is exclusive of 3 anthracite and 93 bituminous operators who furnished incomplete reports and of 2 state penal institutions. In addition to these there were 6 anthracite and 38 bituminous operators of nonproducing mines; that is, mines in course of development but which produced no coal during 1909. However, of these latter 44 operators, 3 anthracite and 8 bituminous operators also reported producing mines, and hence were included in the above total of 3,695, so that, excluding these 11 duplications and including the remaining 33 concerns reporting nonproducing mines, the 96 furnishing incomplete reports, and the 2 penal institutions, the total number of operators in 1909, both producing and nonproducing, covered by the census was 3,826, of which 198 were anthracite and 3,628 bituminous operators. In this grand total there is a slight duplication, due to the fact that a few companies having both anthracite and bituminous mines have been counted in the total of each of these classes and hence have been duplicated in the above grand total of all classes, but the duplication is too slight to be of any material significance.

In Table 1 the number of producing mines given, 6,436, is exclusive of 7 anthracite and 113 bituminous enterprises for which incomplete reports were received, and of 2 bituminous mines operated by state penal institutions. However, in Tables 2, 4, 5, and 7, covering the entire coal production reported in 1909, as pointed out by accompanying footnotes and explanations, the output and value of coal from these 122 enterprises have been included in the totals given for the various states and for the United States. The number of anthracite mines given, 423, is made up of 308 mines proper, 52 washeries, and 63 river dredges.

GEOGRAPHICAL DISTRIBUTION OF COAL MINING: 1909.

Producing fields of the United States.—The map on the opposite page shows the general localities from which anthracite, bituminous, and subbituminous and lignite coals were mined in 1909. Various coal bearing areas with no output in that year are not shown on this map.

Anthracite is produced almost exclusively in a comparatively small area in eastern Pennsylvania. The most important bituminous field is the Appalachian, extending from western Pennsylvania and eastern Ohio southwestward as far as Alabama; the next most important is that embracing a large part of Illinois, southwestern Indiana, and part of western Kentucky. The large areas shown in North Dakota and the Rocky Mountain states are mainly of lignite and subbituminous coal. Although the map indicates a productive area in South Dakota, coal mining there in 1909 was confined to a few small local "banks" not covered by the census.

Production, by geographic divisions and leading states.[1]—The following table gives the total reported production and value of coal in the different geographic divisions and in the leading coal producing states. It includes coal made into coke at the mines, with a value assigned to it either by the operators or by the Census Bureau. The table also includes coal produced by mines operated by penal institutions, and by mines furnishing incomplete reports as to expenses, etc., which were not covered by Table 1. The statistics for the South Atlantic, East South Central, and West South Central divisions are combined, and also those for the two western divisions, in order to avoid disclosing the operations of individual concerns in certain states.

Statistics for the geographic divisions of the country have less significance in the case of mining than in the case of agriculture or manufactures. The divisions named include, respectively, the following coal producing states: The Middle Atlantic—Pennsylvania; the East North Central—Ohio, Indiana, Illinois, and Michigan; the West North Central—Iowa, Missouri, North Dakota, and Kansas; the Southern divisions—Maryland, Virginia, West Virginia, Georgia, Kentucky, Tennessee, Alabama, Arkansas, Oklahoma, and Texas; the Western divisions—Montana, Idaho, Wyoming, Colorado, New Mexico, Utah, Washington, Oregon, and California.

The table shows the marked preeminence of Pennsylvania among the coal mining states. In 1909 Pennsylvania produced nearly half the total coal output of the United States. The anthracite industry was practically confined to this state, and its bituminous tonnage was greater than that of any other three states combined. Next in order were West Virginia, Illinois, and Ohio. Together these four states mined 75.9 per cent of the total coal production of the United States.

[Includes coal made into coke at the mines.]

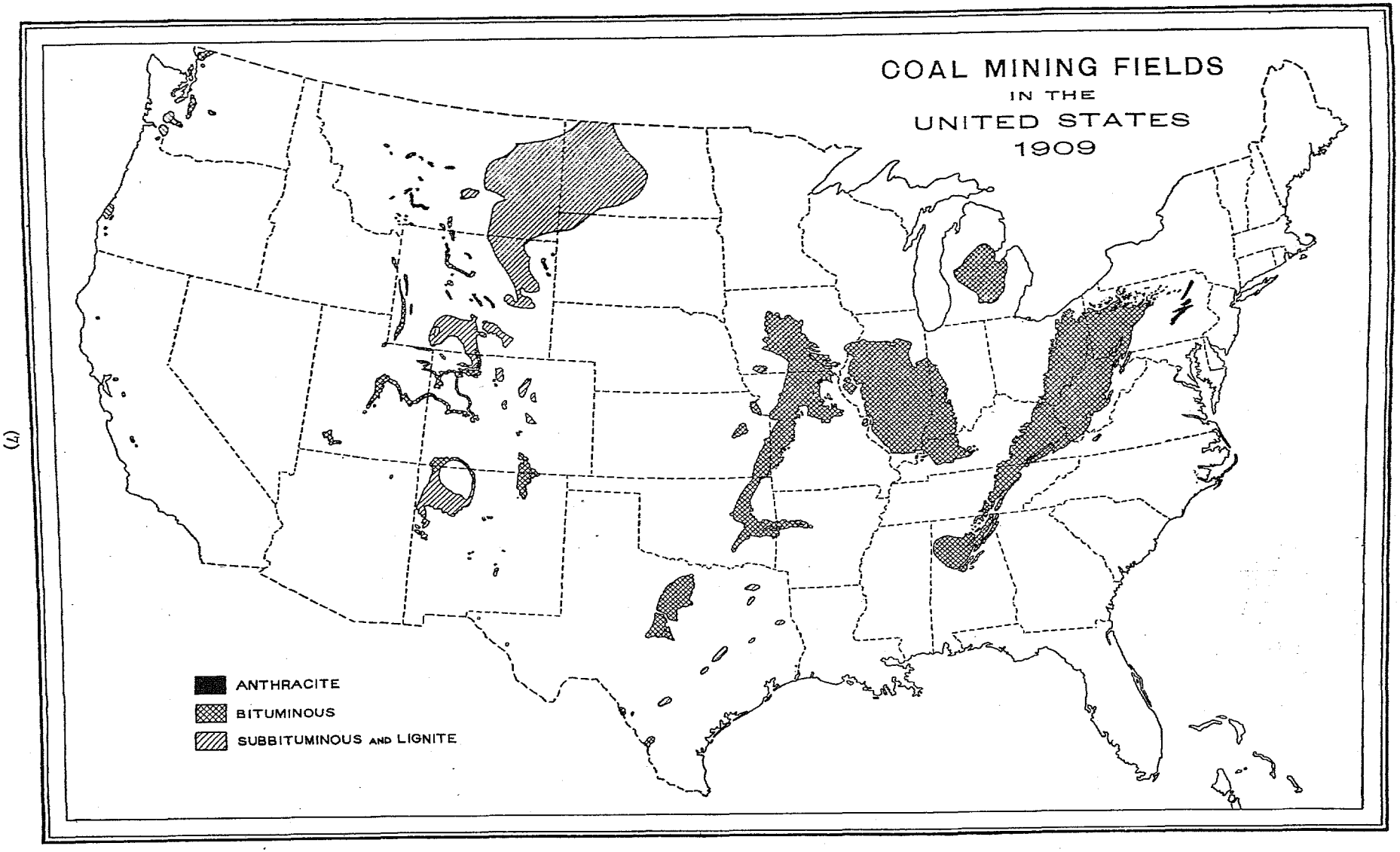
Table 2

	COAL PRODUCED.[1]		VALUE OF COAL AT MINES.[1]	
	Tons (in thousands).	Per cent of total.	Total (in thousands).	Per cent of total.
United States	**460,049**	**100.0**	**$552,895**	**100.0**
Anthracite	**81,074**	**17.6**	**149,251**	**27.0**
Bituminous	**378,975**	**82.4**	**403,644**	**73.0**
GEOGRAPHIC DIVISIONS:				
Middle Atlantic	218,622	47.5	278,826	50.4
Anthracite	80,987	17.6	149,028	27.0
Bituminous	137,635	29.9	129,798	23.5
East North Central	95,278	20.7	99,240	18.0
West North Central	18,692	4.1	29,187	5.3
Southern divisions[2]	98,972	21.5	99,641	18.0
Western divisions[3]	28,485	6.2	45,992	8.3
Anthracite	87	(4)	223	(4)
Bituminous	28,398	6.2	45,769	8.3
LEADING STATES:				
Pennsylvania	218,622	47.5	278,826	50.4
Anthracite	80,987	17.6	149,028	27.0
Bituminous	137,635	29.9	129,798	23.5
West Virginia	51,823	11.3	44,608	8.1
Illinois	50,896	11.1	53,429	9.7
Ohio	27,863	6.1	27,628	5.0
Indiana	14,735	3.2	14,996	2.7
Alabama	13,692	3.0	16,107	2.9
Colorado (bituminous)	10,643	2.3	14,104	2.6
Kentucky	10,583	2.3	9,960	1.8
Iowa	7,732	1.7	12,693	2.3
Kansas	6,970	1.5	10,098	1.8
Wyoming	6,427	1.4	9,874	1.8
Tennessee	6,350	1.4	6,869	1.2

[1] Includes the production of mines for which incomplete reports were received, and of mines operated by penal institutions.
[2] Includes the South Atlantic, East South Central, and West South Central divisions.
[3] Includes the Mountain and Pacific divisions.
[4] Less than one-tenth of 1 per cent.

Statistics of coal mining by geologic regions.—Table 3 (p. 8) summarizes the principal statistics of coal mining in the different geologic regions as designated by the United States Geological Survey. In this table the figures have been adjusted to give statistics of coal mining only, by deducting the capital, expenses, wage earners, and value of products attributable to the manufacture of coke at the mines. In large part the estimates of the numbers and amounts to be deducted on this account were made by the operators themselves; the few remaining estimates were made by the Bureau of the Census. The statistics relate to the same mines covered by Table 1, namely, those furnishing complete reports.

[1] Although the returns of production and value of coal in 1909 were secured by the Bureau of the Census for the United States Geological Survey, it will be observed that the figures in the table vary slightly from similar statistics of coal mining published by the Geological Survey. This is due, first, to the fact that the returns tabulated by the Geological Survey include those of numerous bituminous mines with an output of less than 1,000 tons for the year, while such mines were excluded from the statistics of the Bureau of the Census; second, to the fact that in the statistics of the Geological Survey the data for output and value of anthracite coal in Colorado and New Mexico are included with those for bituminous coal, while the census figures include this coal with anthracite; and, third, to the fact that errors in the reports of a few operators were discovered and corrected by the Bureau of the Census after the publication of the report of the Geological Survey for 1909.


COAL MINING FIELDS
IN THE
UNITED STATES
1909
ANTHRACITE
BITUMINOUS
SUBBITUMINOUS AND LIGNITE

STATISTICS OF COAL MINES, BY GEOLOGIC REGIONS: 1909.

[Data relating to coke manufacture at the mines are excluded, partly by estimate.]

Table 3

REGION.	Number of mines.	Acres of coal land controlled.	Capital.	Total expenses (net).	PRODUCTS.			Number of wage earners.	Total primary horse-power.
					Total value.[1]	Tons of coal (2,000 lbs.).	Value of coal at mines.		
United States	**6,436**	**6,847,545**	**[2] $1,207,217,543**	**$512,610,836**	**$550,757,948**	**457,833,640**	**$550,513,866**	**716,415**	**1,904,154**
Appalachian	3,902	4,979,766	938,481,026	357,466,476	387,269,562	330,906,906	387,106,050	507,418	1,447,309
Anthracite	[3] 420	273,499	246,713,318	134,245,600	148,957,894	80,881,106	148,957,894	173,263	676,128
Bituminous	3,482	4,706,267	691,767,708	223,220,876	238,311,668	250,025,800	238,148,162	334,155	771,172
Northern Interior	28	23,135	6,805,156	2,985,802	3,175,102	1,772,315	3,175,102	3,572	7,912
Eastern Interior	1,094	873,539	126,309,799	71,687,451	72,773,372	70,959,640	72,709,238	106,412	239,922
Western and Southwestern Interior	953	522,636	33,031,095	41,288,146	41,228,426	25,529,540	41,222,394	58,450	93,764
Rocky Mountain, Northern Great Plains, and Pacific Coast	459	448,469	90,204,647	39,182,961	46,311,486	28,665,179	46,301,076	40,563	115,256
Anthracite	3	860	214,760	205,954	222,577	87,024	222,577	241	625
Bituminous	456	447,609	89,989,887	38,977,007	46,088,909	28,578,155	46,078,499	40,322	114,631

[1] Includes value of minor products.
[2] Includes $11,725,820 which can not be distributed among the Eastern Interior, Western and Southwestern Interior, and Rocky Mountain, Northern Great Plains, and Pacific Coast regions.
[3] Includes 52 washeries and 63 river dredges.

The Appalachian region includes Alabama, Georgia, Maryland, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and eastern Kentucky; the Northern Interior region, Michigan; the Eastern Interior region, Illinois, Indiana, and western Kentucky; the Western and Southwestern Interior regions, which here also include a relatively small output of lignite from the Gulf fields of Texas, embrace Arkansas, Iowa, Kansas, Missouri, Oklahoma, and Texas; and the Rocky Mountain, Northern Great Plains, and Pacific Coast regions include California, Colorado, Idaho, Montana, New Mexico, North Dakota, Oregon, Utah, Washington, and Wyoming.

The Appalachian region reported 72.7 per cent of the total coal land held by mine operators, 70.8 per cent of the total number of wage earners employed, and 72.3 per cent of the total output of coal. Two-thirds of the output of bituminous coal and practically the entire production of anthracite came from this field. Although not shown by this table, the manufacture of coke at the mines was also far more important here than in any other region. Of the total output of coke made at the mines, namely, 32,450,482 tons, valued at $67,483,162, 30,717,145 tons, valued at $61,697,177, were produced in the Appalachian field. Practically all the remainder of the coke made at the mines was manufactured in the Rocky Mountain and Pacific Coast fields.

While the figures given for total expenses and for average expenses per ton require some qualification (see remarks preceding Table 51), they clearly indicate higher average expenses per ton in the northern and western producing regions than in the eastern. This is due, not to greater difficulties of mining, but to the differences in wages and in the cost of mine supplies.

The acreage of coal land given in Table 3 is only the acreage held by active mine operators and by no means approaches the total area underlaid by workable coal deposits in these various regions.

PROGRESS OF THE COAL MINING INDUSTRY.

Comparative production by geographic divisions and leading states: 1909, 1902, and 1889.—The next table gives the total quantity and value of the coal produced in the different geographic divisions and the leading states for the years 1909, 1902, and 1889. For 1909 it includes mines operated by penal institutions and mines furnishing incomplete reports; it covers coal made into coke at the mines, as well as that produced for sale or for use as fuel. In 1889 small local mines, such as were omitted from the census of 1909, were canvassed and data with reference to the quantity and value of coal produced were secured, and are here included, although other statistical data were not secured regarding such mines. However, their total production was not great enough to affect the comparability of the statistics appreciably.

The table shows the great development of the coal mining industry from 1889 to 1909. The total output was 141,230,000 tons in 1889 and 460,049,000 tons in 1909, an increase of 318,819,000 tons, or 225.7 per cent. By far the greater part of this increase was in the bituminous production, which rose from 95,629,000 tons to 378,975,000 tons, an increase of 296.3 per cent. In Pennsylvania the increase in the bituminous output was 101,461,000 tons, in West Virginia 45,591,000 tons, in Illinois 38,792,000 tons, and in Ohio 17,886,000 tons, or 280 per cent, 732 per cent, 320 per cent, and 179 per cent, respectively.

The decrease of 9.2 per cent in Pennsylvania anthracite production from 1889 to 1902, as well as a part of the increase of 95.7 per cent from 1902 to 1909, is accounted for by the prolonged strike in 1902, which greatly curtailed the output of the collieries for that year. The progress of this industry is much better indicated by a comparison of the figures of 1889 and 1909; between these years the increase in production was 35,442,000 tons, or 77.8 per cent, and in value, $83,306,000, or 126.8 per cent.

PRODUCTION AND VALUE OF COAL FOR GEOGRAPHIC DIVISIONS AND FOR THE LEADING STATES: 1909, 1902, AND 1889.

[Includes coal made into coke at the mines.]

Table 4

	TONS OF COAL (IN THOUSANDS).			VALUE OF COAL AT MINES (IN THOUSANDS).			INCREASE,[2] TONS.				INCREASE, VALUE.			
							1902–1909		1889–1902		1902–1909		1889–1902	
	1909[1]	1902	1889	1909[1]	1902	1889	Amount (in thousands).	Per cent.	Amount (in thousands).	Per cent.	Amount (in thousands).	Per cent.	Amount (in thousands).	Per cent.
United States	**460,049**	**301,588**	**141,230**	**$552,895**	**$367,013**	**$160,226**	**158,461**	**52.5**	**160,358**	**113.5**	**$185,882**	**50.6**	**$206,787**	**129.1**
Anthracite	**81,074**	**41,468**	**45,601**	**149,251**	**76,174**	**65,880**	**39,606**	**95.5**	**—4,133**	**—9.1**	**73,077**	**95.9**	**10,294**	**15.6**
Bituminous	**378,975**	**260,120**	**95,629**	**403,644**	**290,839**	**94,346**	**118,855**	**45.7**	**164,491**	**172.0**	**112,805**	**38.8**	**196,493**	**208.3**
GEOGRAPHIC DIVISIONS:														
New England			2			6			(3)	(3)			(3)	(3)
Anthracite			2			6			(3)	(3)			(3)	(3)
Middle Atlantic	218,622	139,948	81,719	278,826	182,206	93,675	78,674	56.2	58,229	71.3	96,620	53.0	88,531	94.5
Anthracite	80,987	41,374	45,545	149,028	76,174	65,722	39,613	95.7	—4,171	—9.2	72,854	95.6	10,452	15.9
Bituminous	137,635	98,574	36,174	129,798	106,032	27,953	39,061	39.6	62,400	172.5	23,766	22.4	78,079	279.3
East North Central	95,278	66,870	24,994	99,249	72,952	24,113	28,408	42.5	41,876	167.5	26,297	36.0	48,839	202.5
West North Central	18,692	15,287	8,004	29,187	21,224	12,249	3,405	22.3	6,383	71.7	7,963	37.5	8,975	73.3
Southern divisions[4]	98,972	60,634	19,323	99,641	66,204	19,482	38,338	63.2	41,311	213.8	33,377	50.4	46,782	240.1
Western divisions[5]	28,485	18,849	6,288	45,902	24,367	10,701	9,636	51.1	12,561	199.8	21,625	88.7	13,666	127.7
Anthracite	87	94	54	223	(6)	152	—7	—7.4	40	74.1	(7)	(7)	(7)	(7)
Bituminous	28,398	18,755	6,234	45,709	[6] 24,367	10,549	9,643	51.4	12,521	200.9	(7)	(7)	(7)	(7)
LEADING STATES:														
Pennsylvania	218,622	139,948	81,719	278,826	182,206	93,675	78,674	56.2	58,229	71.3	96,620	53.0	88,531	94.5
Anthracite	80,987	41,374	45,545	149,028	76,174	65,722	39,613	95.7	—4,171	—9.2	72,854	95.6	10,452	15.9
Bituminous	137,635	98,574	36,174	129,798	106,032	27,953	39,061	39.6	62,400	172.5	23,766	22.4	78,079	279.3
West Virginia	51,823	24,571	6,232	44,668	24,740	5,087	27,252	110.9	18,339	294.3	19,919	80.5	19,662	386.5
Illinois	50,896	32,939	12,104	53,429	33,046	11,755	17,957	54.5	20,835	172.1	19,483	57.4	22,191	188.8
Ohio	27,803	23,520	9,077	27,628	20,954	9,355	4,343	18.5	13,543	135.7	674	2.5	17,599	188.1
Indiana	14,735	9,446	2,845	14,906	10,400	2,888	5,289	56.0	6,601	232.0	4,596	44.2	7,512	260.1
Alabama	13,692	10,355	3,573	16,197	12,420	3,961	3,337	32.2	6,782	189.8	3,777	30.4	8,459	213.6
Colorado (bituminous)	10,643	7,349	2,544	14,104	[8] 8,338	3,814	3,294	44.8	4,805	188.9	5,766	69.2	4,494	116.9
Kentucky	10,583	6,767	2,400	9,960	6,637	2,374	3,816	56.4	4,367	182.0	3,293	49.4	4,263	180.8
Iowa	7,732	5,905	4,005	12,693	8,660	5,427	1,827	30.9	1,810	44.2	4,033	46.6	3,233	59.6
Kansas	6,970	5,266	2,221	10,008	6,863	3,297	1,704	32.4	3,045	137.1	3,145	45.8	3,566	108.2
Wyoming	6,427	4,420	1,389	9,874	5,236	1,749	1,998	45.1	3,040	218.9	4,638	88.6	3,487	199.4
Tennessee	6,350	4,383	1,926	6,809	5,400	2,338	1,967	44.9	2,457	127.6	1,409	27.2	3,062	131.0

[1] Includes production of mines for which incomplete reports were received and of mines operated by penal institutions.
[2] A minus sign (—) denotes decrease.
[3] None produced in 1902.
[4] Includes the South Atlantic, East South Central, and West South Central divisions.
[5] Includes the Mountain and Pacific divisions.
[6] Value given for bituminous includes value of anthracite.
[7] Not computed. See Note 6.
[8] Estimated value of anthracite has been deducted from figures published in 1902.

Comparative production by geologic regions: 1909 and 1889.[1]—The following table gives the quantity and value of the coal produced in the different geologic regions for 1909 and 1889. The table includes the coal reported by penal institutions and by mines for which incomplete reports were received.

[Includes coal made into coke at the mines.]

Table 5

REGION.	TONS OF COAL (IN THOUSANDS).			VALUE AT MINES (IN THOUSANDS).			AVERAGE VALUE PER TON.	
	1909[1]	1889	Per cent of increase.	1909[1]	1889	Per cent of increase.	1909	1889
United States	**460,049**	**141,230**	**225.7**	**$552,895**	**$160,226**	**245.1**	**$1.20**	**$1.13**
Anthracite	**81,074**	**45,601**	**77.8**	**149,251**	**65,880**	**126.5**	**1.84**	**1.44**
Bituminous	**378,975**	**95,629**	**296.3**	**403,644**	**94,346**	**327.8**	**1.07**	**0.99**
Appalachian	332,479	108,569	206.2	388,541	119,305	225.7	1.17	1.10
Anthracite	80,987	45,547	77.8	149,028	65,728	126.7	1.84	1.44
Bituminous	251,492	63,022	299.1	239,513	53,577	347.0	0.95	0.85
Northern Interior	1,783	68	2,522.1	3,195	115	2,678.3	1.79	1.69
Eastern Interior	71,297	16,240	339.0	73,150	15,796	363.1	1.03	0.97
Western and Southwestern Interior	25,623	10,036	155.3	41,433	14,268	190.4	1.62	1.42
Rocky Mountain, Northern Great Plains, and Pacific Coast	28,867	6,317	357.0	46,570	10,742	333.6	1.61	1.70
Anthracite	87	54	61.1	223	152	46.7	2.56	2.81
Bituminous	28,780	6,263	359.5	46,353	10,590	337.7	1.61	1.69

[1] Includes production of mines operated by penal institutions and of mines for which incomplete reports were received.

Of the total increase of 318,819,000 tons in output between 1889 and 1909, 223,910,000 tons, or seven-tenths, represents the increase in the Appalachian region. In bituminous coal the increase in this region was 188,470,000 tons, out of a total increase for the United States of 283,346,000 tons. While the greatest absolute increase took place in the Appalachian region, greater percentages of increase are shown for every other field except the Western and Southwestern Interior regions. In the Northern Interior region almost the entire development of the industry has been accomplished in the 20 years covered by the table. The somewhat slower growth of the industry in the Western and Southwestern Interior fields is accounted for by the fact that these fields serve markets, largely rural, in which coal consumption has not increased so rapidly as in the markets supplied by the other regions.

It will be noted that the average value per ton has increased in every region except the Rocky Mountain, Northern Great Plains, and Pacific Coast. For the entire country the increase for bituminous coal was from $0.99 in 1889 to $1.07 in 1909; in the Appalachian field, the most important, the average value of bituminous coal was $0.85 per ton in 1889 and $0.95 in 1909, and that of anthracite, $1.44 and $1.84, respectively. In general, the increases in average values may be ascribed to higher wages and greater cost of mine supplies. The decrease in average values in the far western fields is discussed in connection with Table 36.

[1] For statement of area included in each region, see discussion following Table 3.

Comparative statistics for the United States: 1909 and 1889.—Table 6 gives the chief items from the census returns for 1909 and 1889 which are comparable or which can be so adjusted as to be comparable. The statistics for 1909 have been made to relate solely to coal mining by deducting (see explanation accompanying Table 3) the capital, total expenses, wages, cost of supplies, and value of products attributable to coke manufacture, and by adding the tonnage and value of coal made into coke at the mines. All the data for 1909 are exclusive of those for mines with incomplete reports and for penal institutions.

The tonnage and value of coal shown for 1889 include the quantity and value of the output of many small "banks" or local mines, which are not included in the number of mines given or in the statistics of acreage, capital, or expenses. However, the total output of these mines was very small, so that the average expense per ton, although based on the output of all mines and the expenses of only part of them, is substantially comparable with that for 1909.

Salaries of foremen, totaling $3,510,543, have been deducted from the wages published in the 1889 statistics, since in 1909 the payments to inside and outside foremen were included in salaries.

It is also to be observed that the acreage given in the table covers all lands controlled by operators, both coal bearing and noncoal bearing. In 1889 the holdings of coal land were not reported separately from those of other land, and hence to obtain comparable data it is necessary to include the holdings of noncoal bearing lands in the figures for 1909. However, this does not materially affect the value of the figures for comparative purposes, since the control of barren land is often necessary for the development of coal deposits, and since nearly 85 per cent of the total land shown for 1909 was reported as coal bearing and much of the remainder, although not fully prospected, is known to be underlaid with coal measures, which may eventually prove workable.

The figures for total expenses for the two census years are not strictly comparable, because the 1889 schedule called for the inclusion in miscellaneous expenses of interest on borrowed money, while the schedule for 1909 excluded interest payments. However, the amount of interest included in the returns for 1889 was doubtless so small as not to affect the total expenses appreciably. For all coal mines, both anthracite and bituminous, the amount expended for miscellaneous expenses in 1909—not shown separately in the table—was $45,742,610, of which $20,016,639 was for royalties and $3,893,257 for contract work. The balance ($21,832,714) covered taxes, rent of offices, use of patents, insurance, ordinary repairs of buildings and machinery, and all other sundry expenses. In 1889 the miscellaneous expenses amounted to $18,576,762, of which $3,155,171 was for contract work. The remaining $15,421,591 included not only interest and sundry expenses similar to those covered in 1909, but royalties as well. The item of interest in 1889 must therefore have been small as compared with total expenses.

In considering the total expenses and the average expenses per ton, the remarks in the Introduction under "Expenses" as to the significance of the data should be borne in mind.

COMPARATIVE SUMMARY FOR COAL MINES: 1909 AND 1889.

[Statistics relating to coke manufacture at mines excluded, partly by estimate.]

Table 6	1909	1889	INCREASE. Amount.	INCREASE. Per cent.
All mines				
Number of mines	[1] 6,436	[2] 2,564	3,872	151.0
Acres of coal and other land controlled	[3] 8,182,749	1,741,491	6,452,947	370.5
Owned	5,952,110	1,248,373	4,703,737	376.8
Held under lease	2,242,328	493,118	1,749,210	354.7
Capital	$1,207,217,543	$342,757,929	$864,459,614	252.2
Expenses (gross), total	$517,483,749	$146,536,280	$370,947,469	253.1
Wages	$374,696,545	$103,426,515	$271,270,030	262.3
Supplies	$72,043,898	$18,828,590	$53,215,308	282.6
Coal produced, including coal coked at mines:				
Tons (2,000 pounds)	457,833,640	141,229,513	316,604,127	224.2
Value at mines [4]	$550,513,866	$160,226,323	$390,287,543	243.6
Anthracite				
Number of mines	[1] 423	[2] 346	77	22.3
Acres of coal and other land controlled	[3] 465,134	214,558	262,265	122.2
Owned	316,867	107,362	209,505	195.1
Held under lease	159,956	107,196	52,760	49.2
Capital	$246,928,078	$162,035,610	$84,892,468	52.4
Expenses (gross), total	$139,324,467	$61,212,087	$78,112,380	127.6
Wages	$92,317,650	$37,854,273	$54,463,388	143.9
Supplies	$26,697,966	$10,834,380	$15,863,586	146.4
Average expenses per ton, total	$1.72	$1.34	$0.38	28.4
Wages	$1.14	$0.83	$0.31	37.3
Supplies	$0.33	$0.24	$0.09	37.5
Coal produced:				
Tons (2,000 pounds)	80,968,130	45,600,487	35,367,643	77.6
Value at mines [4]	$149,180,471	$65,879,514	$83,300,957	126.4
Average value per ton	$1.84	$1.44	$0.40	27.8
Bituminous				
Number of mines	6,013	[2] 2,218	3,795	171.1
Acres of coal and other land controlled	7,717,615	1,526,933	6,190,682	405.4
Owned	5,635,243	1,141,011	4,494,232	393.9
Held under lease	2,082,372	385,922	1,696,450	439.6
Capital	$960,289,465	$180,722,319	$779,567,146	431.4
Expenses (gross), total	$378,159,282	$85,324,193	$292,835,089	343.2
Wages	$282,378,886	$65,572,242	$216,806,644	330.6
Supplies	$45,345,932	$7,994,210	$37,351,722	467.2
Average expenses per ton, total	$1.00	$0.89	$0.11	12.4
Wages	$0.75	$0.69	$0.06	8.7
Supplies	$0.12	$0.08	$0.04	50.0
Coal produced, including coal coked at mines:				
Tons (2,000 pounds)	376,865,510	95,629,026	281,236,484	294.1
Value at mines	$401,333,395	$94,346,809	$306,986,586	325.4
Average value per ton	$1.06	$0.99	$0.07	7.1

[1] Includes 52 washeries and 63 river dredges.

[2] The figures representing the number of mines in 1889 are exclusive of 9,969 small mines—49 anthracite and 9,920 bituminous—the quantity and value of whose products are included in the tonnage and value of coal produced (forming about 2 per cent of the total), but for which no other statistics are available.

[3] The total acreage of anthracite land (coal and other land combined) is exclusive of a duplication of 11,089 acres in figures for owned and leased acreage. See Introduction.

[4] No value was assigned to anthracite coal used for fuel at the mines in 1889.

The capital invested in coal mines and the output and value of coal produced were more than three times as great in 1909 as in 1889, and the acreage of land controlled was more than four times as great. By far the greater part of this development took place in bituminous mining, which is explained by the fact that the anthracite deposits are narrowly limited in extent, while the great area covered by the bituminous fields has permitted wide extension of the industry.

The growth of bituminous mining has involved—first, an increase in the number of mines operated and in the acreage of land brought under development, and second, an increase in the output of the individual mine, while that of anthracite mining has involved chiefly an increase in the output of the individual colliery. For bituminous coal in 1889 the average output per mine, exclusive of small local "banks," was, in round numbers, 42,000 short tons, as compared with 63,000 in 1909, an increase of about 50 per cent. In the anthracite industry this increase was much greater. In 1889 the average output for each anthracite mine was about 132,000 short tons, as compared with about 191,000 tons in 1909, if the entire number of enterprises (423) given in the above table be taken as a basis. However, if the comparison be restricted to mines proper, by eliminating the production of the 115 washeries and river dredges included in the data for 1909, the number of anthracite mines shows a decline from 346 in 1889 to 308 in 1909, while the average output per mine shows an increase from 132,000 tons to nearly 250,000 tons, or approximately 90 per cent.

In 1889 lands owned comprised 74.7 per cent of the total acreage controlled by the operators of bituminous mines, while the corresponding proportion in 1909 was 73 per cent. On the other hand, in the case of anthracite mining the proportion of the land owned by operators was decidedly higher in 1909 than in 1889. In 1889 about half the holdings of anthracite land reported were owned by the operators, while in 1909 about two-thirds were owned. This change may be explained in part by the fact that leased tracts have usually been worked out more rapidly than owned lands, since on leased holdings royalties must be paid whether coal is mined or not.

In general, from 1889 to 1909 both the average expense of production and the average value of coal increased. This is especially true of anthracite. In 1889 the average expense reported per short ton of anthracite was $1.34, as compared with $1.72 in 1909, while the average value per short ton was $1.44, as compared with $1.84 in 1909 (see remarks under Table 22). The increase in expense thus amounted to $0.38 per ton and the difference in value to $0.40 per ton. The average amount paid out in wages increased $0.31 per ton. The increase in average expense may have been due in part to higher rates of wages, but was doubtless also due in part to the greater difficulty of mining measures deeper and thinner than were generally worked in 1889. For bituminous coal the average expense per short ton reported in 1889 was $0.89, as compared with $1 in 1909. This increased expense is attributable mainly to increased rates of wages and the higher cost of mine supplies.

Population and coal production: 1849–1909.—The following table compares the growth of population with the increase in the output of coal during each decade from 1849 to 1909.

Table 7

YEAR.	POPULATION.[1] Number.	POPULATION.[1] Per cent of increase over preceding census.	COAL PRODUCTION. Quantity (ton of 2,000 pounds).	COAL PRODUCTION. Per cent of increase over preceding census.	COAL PRODUCTION. Tons per capita.
1849	23,191,876	.....	6,445,681	.....	0.28
1850	31,443,321	35.6	14,333,922	122.4	0.46
1869	38,558,371	22.6	36,807,333	156.8	0.95
1879	50,155,783	30.1	71,481,570	94.2	1.43
1889	62,947,714	25.5	141,229,513	97.6	2.24
1899	75,994,575	20.7	[2] 253,741,192	79.7	3.34
1909	91,972,266	21.0	[3] 460,048,585	81.3	5.00

[1] Population is for the year following that covered by the statistics for coal.
[2] From the report of the Geological Survey.
[3] Includes the production of mines operated by penal institutions, of mines for which incomplete reports were received, and of coal coked at the mines.

This table shows an enormous increase in the production of coal, as compared with the increase in population. In 1849 only about one-fourth of a ton was produced per capita, as compared with 5 tons per capita 60 years later. While the population of the country in 1909 was less than four times that in 1849, the production of coal was more than seventy times that in the earlier year. Even in the later periods, when the quantity of coal mined had reached large proportions, the increase in coal production was very rapid. From 1889 to 1899, and again from 1899 to 1909, coal output increased nearly four times as rapidly as population. These comparative figures reflect the industrial expansion of the nation.

Comparative statistics of engines and power: 1909 and 1902.—The next table shows the total primary horsepower, the number and horsepower of steam engines, and the number and horsepower of electric motors used in anthracite and bituminous producing coal mines in 1909 and 1902. The total primary horsepower given represents that of steam engines owned by the operators, plus that of motors operated by purchased electric current, plus an insignificant amount of power of other kinds, not shown separately. The statistics include the power used in coke manufacture at the bituminous mines, which, however, was comparatively unimportant in amount.

The total primary horsepower used in the anthracite mines increased 62.5 per cent between 1902 and 1909, while that used in the bituminous mines increased 149 per cent in the same period. Most of the primary power used in the coal mines is that of steam engines. The bituminous mines reported 25,294 horsepower of primary electric power (motors operated by purchased current) in 1909, however, or more than 11 times as much as in 1902. The anthracite mines reported no power of this kind in 1902 and only 1,410 horsepower in 1909. Of the miscellaneous primary power included in the totals for 1909, but not shown separately in the table, gas engines furnished 3,101 horsepower—2,329 for the bituminous mines and 772 for the anthracite—and water wheels furnished 348 horsepower, all of which was used in the bituminous mines.

COMPARATIVE STATISTICS OF ENGINES AND POWER: 1909 AND 1902.

Table 8

CLASS OF MINES.	Census.	Primary horsepower, total.	STEAM ENGINES.		ELECTRIC MOTORS.				
			Number.	Horsepower.	Total horsepower.	Run by current generated by operator.		Run by purchased current.	
						Number.	Horsepower.	Horsepower.	Per cent of total primary power.
Total	**1909**	**1,904,154**	**19,318**	**1,874,001**	**402,090**	**10,869**	**375,386**	**26,704**	**1.4**
	1902	**909,160**	**11,142**	**904,305**	**73,849**	**1,400**	**71,682**	**2,167**	**0.2**
Per cent of increase		**109.4**	**73.4**	**107.2**	**444.5**	**676.4**	**423.7**	**1,132.3**	
Anthracite (Pennsylvania)	1909	676,128	7,567	673,946	47,498	1,152	46,088	1,410	0.2
	1902	416,012	4,629	415,827	5,755	78	5,755		
Per cent of increase		62.5	63.5	62.1	725.3	1,376.9	700.8		
Bituminous	1909	[1] 1,228,026	[1] 11,751	[1] 1,200,055	354,592	9,717	329,298	25,294	2.1
	1902	493,148	6,513	488,478	68,094	1,322	65,927	2,167	0.4
Per cent of increase		149.0	80.4	145.7	420.7	635.0	399.5	1,067.2	

[1] Thirteen steam engines of 625 horsepower, reported by anthracite mines outside of Pennsylvania, are included in the figures for bituminous mines.

Nearly all electric motors used at the mines were run by current generated by the mine operators themselves. The use of such motors shows a marked increase from 1902 to 1909, their total horsepower increasing in this period from 71,682 to 375,386. Much the greater number were reported by bituminous mines.

CHARACTER OF ORGANIZATION.

General summary.—The relative importance of the different forms of organization is shown in the following table, which gives for individuals, firms, corporations, and other organizations the number of operators, the number of mines, the number of wage earners employed, the tonnage of coal mined (including that for conversion into coke), and the total value of coal, coke, and other products reported. The statistics do not cover the few mines with incomplete reports or those operated by penal institutions.

PRINCIPAL STATISTICS FOR OPERATORS OF COAL MINES CLASSIFIED ACCORDING TO CHARACTER OF ORGANIZATION: 1909.

Table 9

CHARACTER OF ORGANIZATION.	TOTAL.					ANTHRACITE.					BITUMINOUS.				
	Number of operators.	Number of mines.	Number of wage earners.	Tons of coal, including coal coked at mines (in thousands).	Value of products (in thousands).	Number of operators.	Number of mines.	Number of wage earners.	Tons of coal (in thousands).	Value of products (in thousands).	Number of operators.	Number of mines.	Number of wage earners.	Tons of coal, including coal coked at mines (in thousands).	Value of products (in thousands).
All classes	**3,695**	**6,436**	**743,293**	**457,834**	**$577,143**	**192**	**423**	**173,504**	**80,968**	**$149,180**	**3,503**	**6,013**	**569,789**	**376,866**	**$427,962**
Individual	1,058	1,195	17,475	8,812	10,490	37	38	308	216	283	1,021	1,157	17,167	8,596	10,207
Firm	664	805	24,690	12,999	17,111	44	54	6,872	3,662	5,754	620	751	17,827	9,337	11,357
Corporation	1,942	4,393	695,985	432,940	544,886	105	325	164,499	76,327	141,554	1,837	4,068	531,486	356,013	403,331
Other	31	43	5,134	3,083	4,656	6	[1] 6	1,825	763	1,589	25	[2] 37	3,309	2,920	3,067
Per cent of total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Individual	28.6	18.6	2.4	1.9	1.8	19.3	9.0	0.2	0.3	0.2	29.1	19.2	3.0	2.3	2.4
Firm	18.0	12.5	3.3	2.8	3.0	22.9	12.8	4.0	4.5	3.9	17.7	12.5	3.1	2.5	2.7
Corporation	52.6	68.3	93.6	94.6	94.4	54.7	76.8	94.8	94.3	94.9	52.4	67.7	93.3	94.6	94.2
Other	0.8	0.7	0.7	0.7	0.8	3.1	1.4	1.1	0.9	1.1	0.7	0.6	0.6	0.6	0.7
Average per operator			**201**	**124**	**156**			**904**	**422**	**777**			**163**	**108**	**122**
Individual			17	8	10			8	6	8			17	8	10
Firm			37	20	26			156	83	131			29	15	18
Corporation			358	223	281			1,567	727	1,348			289	194	220
Other			166	99	150			304	127	265			132	93	123

[1] Comprises 2 mines operated by estates and 4 operated by limited partnerships, combined in order to avoid disclosing individual operations.
[2] Includes 21 mines operated by cooperative companies.

The table shows the predominance of the corporate form of organization among the producers of coal. The 1,942 corporations comprised 52.6 per cent of the total number of concerns reporting, operated 68.3 per cent of the total number of mines, employed 93.6 per cent of the wage earners in the industry, and produced 94.6 per cent of the entire quantity of coal mined. While there were also 1,058 individual operators, 664 firms, and 31 others reporting, nearly all of these were relatively small concerns. For corporations the average production per operator was about 223,000 tons, for firms 20,000 tons, and for individuals 8,000 tons.

Detailed statement for incorporated and unincorporated operators.—The following table gives somewhat more detailed statistics for incorporated and unincorporated operators in 1909.

STATISTICS FOR OPERATORS CLASSIFIED AS INCORPORATED OR UNINCORPORATED: 1909.

Table 10

	BITUMINOUS.				ANTHRACITE.	
	Mines without coke manufacture.		Mines with coke manufacture.		Incorporated operators.	Unincorporated operators.
	Incorporated operators.	Unincorporated operators.	Incorporated operators.	Unincorporated operators.		
Number of mines	3,468	1,897	600	48	325	98
Number of operators	1,670	1,040	161	20	105	87
Capital	$681,353,862	$16,003,275	$345,521,191	$19,318,755	$241,038,086	$5,289,992
Net expenses	$284,333,940	$17,117,950	$90,837,416	$3,017,714	[1] $127,586,768	[1] $6,804,786
Salaries	$15,883,421	$617,043	$5,059,504	$240,327	$4,303,423	$219,881
Wages	$214,080,729	$13,414,102	$63,425,551	$2,076,046	$87,736,209	$4,581,450
Persons engaged in industry	416,061	37,412	133,618	5,586	168,609	9,395
Proprietors and firm members	.....	3,048	.....	91	.....	188
Performing manual labor	.....	1,709	.....	4	.....	72
Salaried officers of corporations	1,994	[2] 11	306	[2] 4	171	.....
Superintendents and managers	3,760	428	1,293	85	887	69
Clerks and other salaried employees	7,895	323	2,945	105	3,052	133
Wage earners	402,412	33,002	129,074	5,301	164,499	9,005
Products:						
Quantities (tons of 2,000 pounds)—						
Coal, total production	264,121,957	16,530,083	92,490,571	3,722,899	76,326,564	4,641,566
Coal (exclusive of coal made into coke)	264,121,957	16,530,083	45,957,497	183,370	76,326,564	4,641,566
Coke made at mines	.....	.....	30,038,884	2,411,598	.....	.....
Value at mines	$290,081,343	$19,813,592	$107,249,002	$4,817,807	$141,554,636	$7,025,835
Coal (exclusive of coal made into coke)	$295,875,314	$19,784,032	$44,219,327	$173,607	$141,554,636	$7,025,835
Coke made at mines	.....	.....	$62,838,962	$4,644,200	.....	.....
Other products	$290,029	$29,560	$191,373	.....	.....	.....
Average per ton:						
Net expenses	$1.08	$1.04	$0.98	$0.07	$1.67	$1.48
Salaries	0.06	0.04	0.05	0.06	0.06	0.05
Wages	0.81	0.81	0.69	0.72	1.15	0.99

[1] Gross expenses were reported as follows: Incorporated operators, $132,210,139; unincorporated operators, $7,114,328.
[2] Salaried officials of cooperative associations, limited partnerships, etc.

In considering the average expenses per ton shown in the table the remarks in the Introduction as to the limitations of the data should be borne in mind. Moreover, the average expenses per ton for incorporated and unincorporated producers are not strictly comparable, owing to the fact that such supervisory services as are performed for corporations by salaried officers or managers are in part performed for unincorporated producers by proprietors and firm members, many of whom receive no salaries for these services, but look to the profits of the enterprise for their compensation. Indeed, a considerable number of such proprietors and firm members were returned as performing manual labor at their mines, although the expenses reported included no wage payments for this labor. While the salary payments averaged $0.06 per ton for anthracite produced by corporations and $0.05 per ton for the output of other concerns, the latter figure would be materially higher if an allowance were made for the supervisory services of proprietors and firm members of unincorporated enterprises, especially in view of the fact that the latter were, as a rule, conducted on a much smaller scale than those under corporate ownership, so that the services of the proprietors would have to be apportioned to a smaller output.

The average wage payment per ton for anthracite produced by corporations was $1.15, as compared with $0.99 for the output of other concerns, but the latter figure includes no valuation for the services of the 72 proprietors who performed manual labor; moreover, the production of the unincorporated concerns contained a higher proportion of output from culm banks, which was recovered at a comparatively low wage cost, and in turn was of lower value. (See Table 28.) A comparison between bituminous mines under corporate and other forms of ownership can properly be attempted only for those without coke manufacture. For such mines the wage payment averaged $0.81 per ton for each class of ownership, but the fact that the unincorporated concerns reported 1,709 proprietors performing manual labor, for which no wages were included in the expenses returned, must be considered in this connection.

INDUSTRIAL AFFILIATIONS OF OPERATORS.

Numerous manufacturing, transportation, and other industrial enterprises which consume large quantities of coal either operate their own mines or, through the ownership of securities, are affiliated with coal mining companies. The conditions of marketing, and hence of producing, coal may be affected by this relationship. In the first place, the values assigned to coal by producers thus affiliated may bear little relation to market prices. In the second place, the coal mining subsidiaries of industrial concerns are assured of a demand for a more or less definite tonnage, are free from the uncertainty of disposing profitably of their output in competitive markets, and accordingly may operate their mines on a larger scale and with greater regularity. On the other hand, coal producers not thus connected are assured of no market for their output beyond the terms of the contracts they may have, are often subjected to rigorous competition in the open market, and in consequence their mines must often be operated on a smaller scale and with less

regularity. In order to obtain statistics bearing on this relationship, all operators have been classified according to their industrial affiliation—so far as definitely known—as connected with iron and steel concerns, with other industrial concerns, or with railroads, respectively, or as unaffiliated. No mining enterprise was assigned to any of the first three groups except on official information. Railroads interested in coal mining companies through the ownership of securities report such ownership to the Interstate Commerce Commission, and these reports were used to determine what operators were affiliated with railroads. Any coal mining companies controlled by railroads in ways not reported to the Interstate Commerce Commission have, therefore, been included with unaffiliated operators in this classification. The control of coal mines by iron and steel and other industrial concerns was determined from the census reports of such companies for their coal mining operations and by correspondence with them. It is probable that some mines classified as unaffiliated for lack of definite information were, as a matter of fact, controlled directly or indirectly by industrial concerns. The following table gives the production of coal in 1909 by operators classified as above outlined; it does not cover the few mines with incomplete reports, nor those operated by penal institutions.

COAL PRODUCTION OF OPERATORS CLASSIFIED ACCORDING TO THEIR INDUSTRIAL AFFILIATIONS: 1909.

Table 11 AFFILIATION OF OPERATORS.	TONS OF COAL PRODUCED (2,000 POUNDS).		
	Total.	Anthracite.	Bituminous.
Total	**457,833,640**	**80,968,130**	**376,865,510**
Affiliated with—			
Iron and steel companies	46,587,216	.....	46,587,216
Other industrial companies	45,376,419	.....	45,376,419
Railroad companies	121,985,188	61,170,097	60,815,091
Unaffiliated	243,884,817	19,798,033	224,086,784

The table shows that of the entire output of coal in 1909 nearly one-half was mined by operators known to be closely affiliated with railroads or industrial concerns. Producers connected with railroads mined more than one-fourth of the total coal production, and more than three-fourths of the total in the case of anthracite. The coal mining subsidiaries of iron and steel companies produced about one-tenth of the total tonnage, and those of other industrial concerns nearly as much. These figures show that the large consumers of coal have quite commonly taken measures to secure their own supplies of fuel. (See also Tables 23, 45, and 47.)

SCALE OF PRODUCTION.

The scale of production in coal mining may be considered in two aspects: First, that of the individual mine; and, second, that of the operator. The fact that many operators rendered combined reports for all their mines—though, of course, stating the number of mines covered—instead of a separate report for each, made impossible any complete classification of mines according to output, so that only general information is available as to average size of the individual mine, based on the entire number of mines reported and the entire output.

Size of mines.—While the size of both anthracite and bituminous mines varies widely, yet, broadly speaking, the scale of operations is much larger in the former than in the latter. While many bituminous mines in 1909 produced more than 250,000 tons each, and some exceeded 500,000 tons, the average for all bituminous mines covered by the census was only about 63,000 (short) tons, and for all "commercial" mines—that is, mines selling in general markets—only about 76,000 tons. If the very small local mines were included, which were not canvassed because their aggregate production is negligible, the average would be much lower. On the other hand, the average output of anthracite mines in 1909 (not counting washeries and river dredges) was nearly 250,000 (short) tons. By far the greater part of the anthracite mined is produced by comparatively large collieries. The limited area of the anthracite deposits and the depth of the measures encourage the concentration of production in large collieries, while the wide extent of the bituminous fields, the cheapness of great areas of coal land, and the general accessibility of the deposits favor the opening of many small mines. As shown by Table 6, the average size of mines, both bituminous and anthracite, has increased materially since 1889.

Classification of operators according to value of products.—Three classifications of operators have been made to show the size of the producing organizations in coal mining. The first classifies operators according to value of products, the second according to the number of wage earners employed, and the third according to the acreage of land controlled.

The next table gives for 1909 the number of operators classified according to the value of product per operator (based on all products, including coke made at the mines), together with the total value of products for each class. Penal institutions and mines with incomplete reports are excluded.

This classification shows a marked degree of control by large producing organizations. Of the total value of products for all operators, namely, $577,143,000,

the 85 concerns each having products valued at $1,000,000 or over together reported $348,496,000, or about 60 per cent. At the other extreme, the 2,979 operators each having products valued at less than $100,000 together reported but $56,485,000, or less than 10 per cent of the total. In the anthracite industry 9 producing concerns, each having a value of product exceeding $5,000,000, together reported nearly three-fourths of the total value of anthracite. Among the bituminous mining organizations, the 10 each reporting products valued at $5,000,000 or over together reported one-fourth of the total value of products, while the 68 operators each having products valued at $1,000,000 or over together contributed more than half the total. In this industry production is relatively much less closely concentrated in the hands of great companies than in anthracite mining.

Table 12

VALUE OF ALL PRODUCTS (INCLUDING COKE) PER OPERATOR.	TOTAL. Number of operators.	TOTAL. Value of all products.	ANTHRACITE. Number of operators.	ANTHRACITE. Value of products.	BITUMINOUS. Number of operators.	BITUMINOUS. Value of all products (including coke).
Total	3,695	$577,142,935	192	$149,180,471	3,503	$427,962,464
Less than $10,000 [1]	1,666	6,407,712	69	172,699	1,597	6,235,013
$10,000 to $100,000 [2]	1,313	50,077,098	52	2,364,432	1,261	47,712,666
$100,000 to $500,000	561	125,783,899	39	10,871,318	522	114,912,581
$500,000 to $1,000,000	70	48,377,776	15	10,149,104	55	36,228,672
$1,000,000 to $5,000,000	66	132,499,197	8	17,651,088	58	114,848,109
$5,000,000 and over	19	215,097,253	9	107,971,830	10	108,025,423
Per cent of total	100.0	100.0	100.0	100.0	100.0	100.0
Less than $10,000	45.1	1.1	35.9	0.1	45.6	1.5
$10,000 to $100,000	35.5	8.7	27.1	1.6	36.0	11.1
$100,000 to $500,000	15.2	21.8	20.3	7.3	14.9	26.9
$500,000 to $1,000,000	1.9	8.0	7.8	6.8	1.6	8.5
$1,000,000 to $5,000,000	1.8	23.0	4.2	11.8	1.6	26.8
$5,000,000 and over	0.5	37.4	4.7	72.4	0.3	25.2

[1] Includes 1 anthracite operator with a product valued at more than $10,000, in order to avoid disclosing individual operations.
[2] Includes 1 anthracite operator with a product valued at more than $100,000.

Classification of operators according to the number of wage earners employed.—The following table gives the number of operators in 1909, classified according to the number of wage earners employed per operator (including those employed in coke manufacture at the mines), together with the number of wage earners employed by each group. Penal institutions, operators failing to make complete reports, and operators employing no wage earners directly, are excluded.

The classification indicates the importance of the larger coal mining companies as employers of labor. The 22 concerns, each of which employed more than 5,000 wage earners, together reported over 269,000 employees, or an average of more than 12,000 each, and the employees of these 22 companies constituted more than one-third of all the wage earners reported. Of these 22 operators, 10 were anthracite producers, and their total of 134,000 wage earners constituted more than three-fourths of all the men employed in the anthracite industry. Among the bituminous operators, 77 with more than 1,000 wage earners each, together reported 274,596 wage earners, or nearly half the total for the industry.

Table 13

NUMBER OF WAGE EARNERS (ALL CLASSES) EMPLOYED PER OPERATOR.	NUMBER. Operators.	NUMBER. Wage earners (including those making coke at mines).	PER CENT OF TOTAL. Operators.	PER CENT OF TOTAL. Wage earners (including those making coke at mines).
Total, all classes	[1] 3,638	743,293	100.0	100.0
20 or less	1,606	12,704	44.1	1.7
21 to 50	594	19,600	16.3	2.6
51 to 100	485	35,279	13.3	4.7
101 to 500	[2] 737	168,605	20.3	22.7
501 to 1,000	121	85,374	3.3	11.5
1,001 to 5,000	73	152,140	2.0	20.5
Over 5,000	22	269,522	0.6	36.3
Anthracite, all classes	[1] 185	173,504	100.0	100.0
20 or less	67	419	36.2	0.2
21 to 50	19	612	10.3	0.4
51 to 100	19	1,459	10.3	0.8
101 to 500	[2] 44	[2] 12,082	23.8	7.0
501 to 1,000	18	11,857	9.7	6.8
1,001 to 5,000	8	13,061	4.3	7.5
Over 5,000	10	134,014	5.4	77.2
Bituminous, all classes	[1] 3,453	569,789	100.0	100.0
20 or less	1,539	12,345	44.6	2.2
21 to 50	575	18,988	16.7	3.3
51 to 100	466	33,820	13.5	5.9
101 to 500	693	156,523	20.1	27.5
501 to 1,000	103	73,517	3.0	12.9
1,001 to 5,000	65	139,088	1.9	24.4
Over 5,000	12	135,508	0.3	23.8

[1] Six anthracite and 50 bituminous operators reported no labor hired directly, and one anthracite operator failed to report the number of wage earners.
[2] Includes two operators employing less than 100 wage earners, in order to avoid disclosure of individual operations.

Classification of operators according to the number of acres of land controlled.—The table below gives the number of operators in 1909 holding specified areas of land, together with the total holdings of each group. River dredge operators, washery operators reporting only culm banks held, and mine operators failing to report acreage, are excluded. Not only coal land, but timber tracts and other holdings are included. However, the bituminous operators held relatively little noncoal bearing land, and the Pennsylvania anthracite operators, who reported a considerable proportion of barren acreage, are classified in Table 26 according to their holdings of coal land.

Table 14

ACRES OF LAND (COAL AND OTHER) PER OPERATOR.	NUMBER. Operators.	NUMBER. Acres of coal and other land controlled.	PER CENT OF TOTAL. Operators.	PER CENT OF TOTAL. Acres of coal and other land controlled.
Total, all classes	[1] 3,593	[2] 8,213,767	100.0	100.0
Less than 100 acres	1,275	49,939	35.5	0.6
100 to 1,000 acres	1,485	564,151	41.3	6.9
1,000 to 10,000 acres	703	1,956,755	19.6	23.8
10,000 to 100,000 acres [3]	119	2,956,532	3.3	36.0
100,000 acres and over	11	2,686,390	0.3	32.7
Anthracite, all classes	[1] 137	[2] 476,759	100.0	100.0
Less than 100 acres	47	1,693	34.3	0.4
100 to 1,000 acres	55	19,801	40.1	4.2
1,000 to 10,000 acres	27	61,863	19.7	13.0
10,000 to 100,000 acres [3]	8	393,402	5.8	82.5
Bituminous, all classes	[1] 3,456	[2] 7,737,008	100.0	100.0
Less than 100 acres	1,228	48,246	35.5	0.6
100 to 1,000 acres	1,430	544,350	41.4	7.0
1,000 to 10,000 acres	676	1,894,952	19.6	24.5
10,000 to 100,000 acres	111	2,563,070	3.2	33.1
100,000 acres and over	11	2,686,390	0.3	34.7

[1] Fifty-five operators of anthracite washeries and river dredges are excluded together with 47 bituminous operators who failed to report acreage controlled.
[2] Sixty-four acres of farm lands reported by operators of river dredges are excluded and a duplication of 31,082 acres is included, of which 11,689 acres are in the anthracite total and 19,393 acres in the bituminous. See Introduction.
[3] Includes 1 operator reporting more than 100,000 acres, in order to avoid the disclosure of individual operations.

The table shows that 11 concerns, each of which reported 100,000 acres and over, together held nearly 2,700,000 acres, or almost one-third of the total acreage reported by all operators in the United States; and that 130 operators, each reporting 10,000 acres and over, together held over 5,600,000 acres, or more than two-thirds of the total acreage reported. At the other extreme, 1,275 operators, each reporting less than 100 acres, while comprising more than one-third of the total number of operators, together held less than 50,000 acres, an insignificant fraction of the total.

The control of anthracite land is far more concentrated than that of bituminous. The significance of the difference in degree of concentration of tenure is not fully indicated by a comparison of the percentages in the table, since the total area of all anthracite deposits is small and no extensive new fields are known which may be exploited by new operating companies, while, on the contrary, there are great areas of bituminous coal, entirely undeveloped and not controlled by any present operators, upon which thousands of new mines may be opened in the future by new mining companies.

DISTRIBUTION OF EXPENSES.

The distribution of the total reported expenses for 1909 among the several items is shown by the following table of percentages. The absolute numbers are given in Table 1. As to the significance of total reported expenses see the remarks in the Introduction under "Expenses."

Table 15 — PER CENT OF TOTAL REPORTED EXPENSES.

CLASS OF EXPENSES.	All mines.[1]	Anthracite.	Bituminous.[1]		
			Total.	Mines without coke manufacture.	Mines with coke manufacture.
Total (gross expenses)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Salaries	4.9	3.3	5.5	5.5	5.6
Wages	72.3	66.3	74.4	75.7	70.3
Supplies	13.9	19.2	12.0	11.4	14.0
Royalties	3.8	5.7	3.1	3.2	2.5
Miscellaneous	5.2	5.5	5.0	4.2	7.5

[1] The cost of coal purchased for coking at the mines has not been considered in calculating these percentages.

From these figures it is apparent that wages constitute by far the greater part of the expense of mining coal. This item covered 66.3 per cent of the total (gross) expenses reported for the anthracite industry in 1909 and 74.4 per cent of the total for the bituminous.

The next largest item is cost of supplies, including fuel and rent of power. The cost of colliery supplies constitutes a much higher percentage of expenses for anthracite operators than for bituminous. This would remain true even after deducting the cost of explosives and oil sold to miners, which is included in the total cost of supplies reported by anthracite operators. This higher percentage is explained by the fact that the methods of mining and preparing coal are more costly for anthracite than for bituminous. The higher percentage for supplies at mines with coke manufacture than for mines without coke production is due to the fact that the cost of supplies reported by the former group of mines includes the cost of coke yard and oven supplies.

The greater proportionate payment for royalties in anthracite as compared with bituminous mining is of course due, primarily, to the higher rate of royalty prevailing in the anthracite fields.

PERSONS ENGAGED IN THE INDUSTRY.

Occupational status: 1909.—The following table (which excludes penal institutions and the few mines with incomplete reports) shows the occupational status of the persons engaged in coal mining, including those employed in coke manufacture at the mines. The statistics for wage earners relate to December 15, 1909, or the nearest representative day. The relation between this number and the average number employed for the year is discussed in connection with Table 18. As shown by the table, in 1909 wage earners constituted 96.4 per cent of the total number of persons engaged in the industry. In view of the large scale of production prevailing, the methods of mine operation, and the simplicity of the marketing branch of the business, the small proportion of persons other than wage earners is only to be expected. The num-

ber of proprietors and firm members reported as performing manual labor, 1,785, represents mainly those interested in little local bituminous mines employing few or no wage earners.

Table 16

OCCUPATIONAL CLASS.	NUMBER.			PER CENT DISTRIBUTION.		
	Total.	Anthracite.	Bituminous (including coke manufacture at mines).	Total.	Anthracite.	Bituminous.
All classes	**770,681**	**178,004**	**592,677**	**100.0**	**100.0**	**100.0**
Proprietors and firm members	3,927	188	3,739	0.5	0.1	0.6
Officers of corporations	2,486	171	2,315	0.3	0.1	0.4
Superintendents and managers	6,522	956	5,566	0.8	0.5	0.9
Clerks and other salaried employees	14,453	3,185	11,268	1.9	1.8	1.9
Wage earners, number Dec. 15, 1909, or nearest representative day	743,293	173,504	569,789	96.4	97.5	96.1
Proprietors and firm members performing manual labor (included above)	1,785	72	1,713	.....	.....	.....

Classification of wage earners according to occupation.—The following table gives the number and percentage of wage earners employed in various occupations outside and inside, December 15, 1909, or the nearest representative day. For mines with coke manufacture the data include wage earners engaged in coke making. Penal institutions and mines with incomplete reports are not considered in this table.

The table gives a total of 743,000 wage earners employed in coal mining and coke manufacture at the mines in 1909. Of this total, 173,000 were employed in the anthracite and 570,000 in the bituminous industry. About 600,000 wage earners, or four-fifths of the total, were employed below ground and about 143,000 or one-fifth, above ground. Of those below ground, 475,000 were in bituminous mines and 125,000 in anthracite; while, of those outside the mines, 94,000 were bituminous employees and 49,000 were anthracite. However, this total of outside bituminous wage earners includes 27,000 coke employees; if these are deducted, it appears that 12.4 per cent of the bituminous mine workers were employed above ground and 87.6 per cent below ground, while the corresponding percentages for anthracite workers were 28.1 and 71.9, respectively. The higher proportion of outside employees in the anthracite as compared with the bituminous industry is chiefly due to the relatively greater amount of labor expended in crushing, cleaning, and preparing anthracite for market.

Table 17

CLASS OF WAGE EARNERS.	TOTAL.		ANTHRACITE.		BITUMINOUS.					
					Total.		Mines without coke manufacture.		Mines with coke manufacture.	
	Number.	Per cent of total.	Number.	Per cent of total.	Number.	Per cent of total.	Number.	Per cent of total.	Number.	Per cent of total.
All classes	**743,293**	**100.0**	**173,504**	**100.0**	**569,789**	**100.0**	**435,414**	**100.0**	**134,375**	**100.0**
Outside	**142,843**	**19.2**	**48,753**	**28.1**	**94,090**	**16.5**	**51,260**	**11.8**	**42,830**	**31.9**
Inside	**600,450**	**80.8**	**124,751**	**71.9**	**475,699**	**83.5**	**384,154**	**88.2**	**91,545**	**68.1**
Engineers, firemen, and mechanics	42,008	5.7	12,272	7.1	29,826	5.2	22,154	5.1	7,672	5.7
Outside	34,141	4.6	9,752	5.6	24,389	4.3	18,051	4.1	6,338	4.7
Inside	7,957	1.1	2,520	1.5	5,437	0.9	4,103	0.9	1,334	1.0
Miners and miners' helpers (all inside)	467,179	62.9	83,156	47.9	384,023	67.4	314,226	72.2	69,797	51.9
Other wage earners 16 years of age and over	227,048	30.5	74,820	43.1	152,219	26.7	96,576	22.2	55,643	41.4
Outside	104,651	14.1	35,767	20.6	68,884	12.1	32,804	7.5	36,080	26.9
Inside	122,397	16.5	39,052	22.5	83,335	14.6	63,772	14.6	19,563	14.6
Boys under 16 years of age	6,908	0.9	3,247	1.9	3,721	0.7	2,458	0.6	1,263	0.9
Outside	4,051	0.5	3,234	1.9	817	0.1	405	0.1	412	0.3
Inside	2,917	0.4	13	(1)	2,904	0.5	2,053	0.5	851	0.6

[1] Less than one-tenth of 1 per cent.

Miners and miners' helpers in the anthracite industry constitute a smaller part, while engineers, firemen, and mechanics, and other employees 16 years of age and over, constitute a larger part of the total than the corresponding classes in bituminous mines. This is more clearly shown if the comparison is limited to the inside men. Of the total number of inside wage earners, miners and their helpers constituted in anthracite mines, 66.7 per cent, and in bituminous mines, 80.7 per cent; engineers, firemen, etc., 2 per cent and 1.1 per cent, respectively; other wage earners 16 years and over, 31.3 per cent and 17.5 per cent. This difference in the composition of the inside forces of the two classes of mines reflects the larger scale of production, the further division of labor, and the greater complexity of organization in the anthracite mines, as compared with the bituminous.

Boys under 16 years of age constituted less than 1 per cent of all wage earners employed in the coal mining industry as a whole. Nearly half those reported were employed in the anthracite collieries, practically all above ground, while of those employed by bituminous operators by far the greater number were working below ground.

Wage earners employed, by months.[1]—The following table gives the number of wage earners employed on the 15th day of each month during the year 1909. Penal institutions and incomplete reports are excluded from this table.

In general, the smaller number of wage earners employed in the spring and early summer months, reflects the seasonal fluctuation in the consumption of coal. In this respect the anthracite industry shows much greater steadiness of employment than the bituminous, with the number employed in the minimum month, August, equaling 95.8 per cent of the number in March, the maximum month. The anthracite producers obtain this regularity of operation partly by reducing the price of anthracite in the spring, in order to induce consumers to buy and store their supplies in the warmer months, and partly by storing large quantities of coal themselves. No such action is ordinarily taken by bituminous producers and the operation of their mines is more irregular. In this regard the mines combining coal mining and coke manufacture have an advantage over those without coke manufacture, since the consumption of furnace and foundry coke is not subject to seasonal fluctuations such as affect the use of coal for fuel, and, normally, the coke making mines operate more regularly.

Table 18 WAGE EARNERS EMPLOYED AT COAL MINES.

MONTH.	Aggregate.		Anthracite.		Bituminous.					
					Total.		Mines without coke manufacture.		Mines with coke manufacture.	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January	691,244	94.8	172,847	99.0	518,397	92.6	394,661	93.0	123,736	91.2
February	686,322	94.1	172,505	99.7	513,817	91.7	390,332	92.0	123,485	91.0
March	679,791	93.2	173,025	100.0	506,766	90.5	383,003	90.2	123,763	91.2
April	649,870	89.1	168,009	97.1	481,861	86.0	361,899	85.3	119,962	88.4
May	646,592	88.7	168,137	97.2	478,455	85.4	359,174	84.6	119,281	87.9
June	652,894	89.5	168,964	97.7	483,930	86.4	362,893	85.5	121,037	89.2
July	650,434	90.4	167,425	96.8	492,009	87.8	369,599	87.1	122,410	90.2
August	667,146	91.5	165,740	95.8	501,406	89.5	377,174	88.9	124,232	91.6
September	685,234	94.0	166,003	95.9	519,231	92.7	393,150	92.6	126,081	92.9
October	704,939	96.7	169,961	98.2	534,978	95.5	405,772	95.6	129,206	95.2
November	720,341	98.8	170,601	98.6	549,740	98.2	418,401	98.6	131,339	96.8
December	729,273	100.0	169,184	97.8	560,089	100.0	424,407	100.0	135,682	100.0

In 1909, in the bituminous industry, the maximum number of men, 560,089, was employed in December, and the minimum, 478,455, equal to 85.4 per cent of the maximum, in May. The number employed in December was considerably larger than the number employed in January, although the latter was also a month of heavy coal consumption and normally should have about equaled December in numbers employed. In January, however, the industry had not yet fully recovered from the preceding financial depression, while in December demand and output had much increased. This change in conditions is further shown by the fact that the mines with coke production had relatively fewer men working at the beginning of the year than the mines without coke production. The operation of many of these mines depends chiefly on the demand for coke from iron and steel manufacturing enterprises, which are usually affected greatly by any industrial disturbance. The anthracite collieries show no such difference in numbers employed between the beginning and the end of 1909, since this industry depends chiefly on consumption for domestic purposes, which is little affected by industrial depression.

Hours of labor.—The following classification gives for 1909 the number of mines operated specified numbers of hours per day or per shift, and the per cent of wage earners employed in mines of each class. River dredges, penal institutions, mines employing no wage earners, and mines with incomplete reports are excluded. The wage earners employed in coke manufacture at mines are included in calculating the percentages of wage earners given.

This classification is based on the normal hours of operation per day or per shift, and occasional departures from this standard have not been considered. The percentages shown in the last three columns indicate the distribution of the total number of wage earners among mines of the different classes. In this

[1] The table gives a total of 729,273 wage earners employed December 15, 1909, while Table 16, showing the specific occupations, gives a total of 743,293 wage earners employed on December 15, 1909, or the nearest representative day. This difference of 14,020, or less than 2 per cent, is due to the fact that these figures were obtained from two separate inquiries on the census schedule. The first of these inquiries asked for the specific classes of wage earners employed on December 15, or the nearest representative day. If the mine was not operated on December 15, or was running under abnormal conditions, then in answer to this inquiry the operator reported the number of men employed on the nearest day when conditions were normal. The second inquiry asked for the number of wage earners on the 15th day of each month, which might or might not be a normal day. In all other tables in this section giving statistics of wage earners the number obtained from the occupational inquiry has been used, since it is considered that this number more closely approximates the true total of wage earners depending upon the industry for a livelihood than does the number actually employed on any one day.

connection it must be distinctly understood that the census inquiry asked only the prevailing hours of labor for the mine, and took no account of exceptions in the nature of employment of some wage earners for more or fewer hours than those of the bulk of employees. Sometimes one class of wage earners has regularly a different working time from that of another class. However, the table may be taken as indicating approximately the actual distribution of wage earners according to the number of hours worked per day.

The classification shows that practically all wage earners in anthracite mines in 1909 were working on a 9-hour basis. This corresponds to the terms of the agreement between the operators and the mine workers. In the bituminous industry nearly three-fifths of all wage earners reported were employed at mines operated 8 hours per day, about one-fourth at mines operated 10 hours per day, and about one-eighth at mines operated 9 hours per day. No mines were reported in operation 11 hours per day, and less than 1 per cent of the total number of wage earners were working at mines operated 12 hours per day.

MINES CLASSIFIED ACCORDING TO HOURS OF OPERATION PER DAY OR PER SHIFT: 1909.

Table 19

NUMBER OF HOURS MINES WERE NORMALLY OPERATED PER DAY OR PER SHIFT.	NUMBER OF MINES.			PER CENT OF MINES.			PER CENT OF WAGE EARNERS EMPLOYED IN MINES WITH PREVAILING HOURS SPECIFIED.		
	Total.	Anthracite.	Bituminous.	Total.	Anthracite.	Bituminous.	Total.	Anthracite.	Bituminous.
Total	6,338	360	5,978	100.0	100.0	100.0	100.0	100.0	100.0
Less than 8 hours	68	3	65	1.1	0.8	1.1	0.4	0.3	0.4
8 hours	3,757	10	3,747	59.3	2.8	62.7	45.2	1.4	58.5
9 hours	1,146	336	810	18.1	93.3	13.5	33.4	98.0	13.8
10 hours	1,279	9	1,270	20.2	2.5	21.2	19.5	0.3	25.4
12 hours	9	.....	9	0.1	.....	0.2	0.7	.....	0.9
Not specified	79	2	77	1.2	0.6	1.3	0.8	(1)	1.1

[1] Less than one-tenth of 1 per cent.

POWER.

The following table shows the number and total horsepower of engines, water wheels, and other motors used in 1909. So-called "rented power" represents that of electric motors, usually owned by the mine operator, which are run by current furnished by some outside concern. The table does not cover the few mines with incomplete reports or those operated by penal institutions. The statistics for mines with coke manufacture include power used in the coke business, which, however, is small in amount.

The total primary horsepower for the industry in 1909 was 1,904,154, of which 676,753 was reported for anthracite and 1,227,401 for bituminous mines. Practically all power used was owned, the horsepower of electric motors operated by purchased current amounting to only 1.4 per cent of the total primary power used. Nearly all the primary power was generated by steam engines. The number of electric motors in use at the mines, most of which are operated by current generated by the mine operators themselves, is large.

The anthracite operators use relatively much more power than the bituminous. The average primary power per mine for anthracite mines exclusive of the small river dredges in 1909 was 1,877 horsepower; for bituminous mines without coke manufacture, 231 horsepower; and for those with coke manufacture, 494 horsepower. The higher figure for anthracite is due not only to the fact that the average output of coal per mine is much greater than for bituminous mines; but is also attributable to the greater depth and extent of the mine workings and the greater volume of water to be pumped, and to the further fact that the method of crushing, screening, and washing anthracite requires relatively far more power than is similarly used at bituminous mines. The high average per mine for mines making coke, as compared with mines without coke manufacture, is due chiefly to their larger scale of production, and only in small degree to the additional power required by the coke yards.

Table 20

KIND.	Total.	Anthracite.	BITUMINOUS.		
			Total.	Mines without coke manufacture.	Mines with coke manufacture.
Primary horsepower, total	1,904,154	676,753	1,227,401	910,778	316,623
Owned	1,877,450	675,343	1,202,107	896,365	305,742
Rented	26,704	1,410	25,294	14,413	10,881
Owned power:					
Steam engines—					
Number	19,318	7,580	11,738	9,309	2,429
Horsepower	1,874,001	674,571	1,199,430	894,070	305,360
Gas engines—					
Number	374	25	349	333	16
Horsepower	3,101	772	2,329	2,232	97
Water wheels—					
Number	7	.....	7	5	2
Horsepower	334	.....	334	59	275
Water motors—					
Number	2	.....	2	1	1
Horsepower	14	.....	14	4	10
Rented power—electric motors run by purchased current:					
Number	872	32	840	517	323
Horsepower	26,704	1,410	25,294	14,413	10,881
Average primary horsepower per mine [1]	385	1,877	208	231	494
Electric motors run by current generated by operator (secondary power)—					
Number	10,869	1,152	9,717	6,665	3,052
Horsepower	375,386	46,088	329,298	212,610	116,688

[1] Excludes Pennsylvania anthracite river dredges and bituminous mines operated without mechanical power.

PART II.—PENNSYLVANIA ANTHRACITE COAL.

INTRODUCTION.

This section deals with the statistics of Pennsylvania anthracite coal. Anthracite is also mined in the Rocky Mountain fields, but their output in 1909 was very small, and the separate statistics for the industry there are confined to the figures given in the detailed table, Part IV. The tables of this section cover only producing operations; the statistics of nonproducing collieries are given in Table 62.

Location of the anthracite deposits.—The anthracite coal of Pennsylvania is produced in the northeastern part of the state, in the counties of Carbon, Columbia, Dauphin, Lackawanna, Luzerne, Northumberland, Schuylkill, Sullivan, Susquehanna, and Wayne. About 85 per cent of the output comes from Lackawanna, Luzerne, and Schuylkill Counties. The deposits are divided into three general producing regions. The Upper Region, except some small outlying deposits in Sullivan County, extends from northeast to southwest in a narrow belt coinciding roughly with the valleys of the Lackawanna and Susquehanna Rivers, from near Forest City to the vicinity of Shickshinny, and contains about 176 square miles. The Middle Region extends approximately east and west through Columbia, Schuylkill, Luzerne, and Northumberland Counties, the coal occurring in several irregular valleys containing about 127 square miles of productive measures. The Southern Region embraces about 180 square miles in Carbon, Schuylkill, and Dauphin Counties. (See map on page 25.)

Methods of production.—Anthracite coal is now recovered by three methods: Mining, washing culm banks, and dredging from stream beds. The culm banks are dumps of slate and dirt from the mines, containing more or less coal. These were formerly considered valueless, but in recent years it has been found profitable to recover the coal contained by washing. In 1909 more than 4,300,000 tons of coal were thus obtained. The coal dredged from the streams comes from old culm banks that have been partially washed away. The action of the flowing water has effected a natural separation of the coal from its accompanying refuse, and where this coal has been deposited along the stream beds it can be recovered by dredging. The total quantity so recovered is not large, and in fact the industry is confined to small operators supplying chiefly local markets. Dredging is necessarily dependent on the seasons and the stage of the rivers. Statistics of these dredge operators are not included in any of the tables for Pennsylvania anthracite, except Table 21.

Number of collieries.—The word "colliery" is used in this chapter to designate a single producing unit. If the coal from several mine openings was prepared at one breaker, this has been counted as one colliery. Each washery operated independently of fresh mine production, that is, recovering coal from culm banks, has been counted as a colliery, but washeries operated as a part of the equipment for cleaning freshly mined coal have not been counted separately. Of the 357 collieries reported in Table 21, 52 were washeries recovering coal from culm piles independently of fresh mine production and 305 were breakers at active mines. In addition, incomplete reports were received for 3 mines and 4 washeries, which have not been included in any of the tables of this section.

GENERAL SUMMARY: 1909.

The general statistics of the Pennsylvania anthracite industry for the calendar year 1909 may be found in Table 62. The following table summarizes the more important details:

Table 21	Total.	Collieries.[1]	River dredges.[2]		Total.	Collieries.[1]	River dredges.[2]
Number of operators	189	139	50	Number of wage earners	173,263	173,098	165
Number of collieries or dredges	420	357	63	Total primary horsepower	676,128	675,196	932
Acres of coal land controlled	[3] 273,499	[3] 273,499	.....	Gross expenses by items:			
Owned	183,044	183,044	.....	Services	$96,742,305	$96,710,289	$32,106
Held under lease	101,430	101,430	.....	Salaries	4,572,489	4,569,565	2,924
Capital	$246,713,318	$246,599,761	$113,557	Wages	92,169,906	92,140,724	29,182
Total gross expenses	$139,110,444	$139,048,811	$61,633	Supplies	20,662,088	20,640,773	21,315
Deduct charges to miners for explosives, oil, and blacksmithing	$4,864,844	$4,864,844	.....	Fuel and rent of power	3,189,279	3,183,908	5,371
Total net expenses	$134,245,600	$134,183,967	$61,633	Other	23,472,809	23,456,865	15,944
Coal:				Royalties	7,969,785	7,967,209	2,576
Total tons produced (2,240 pounds)	72,215,273	72,109,034	106,239	Miscellaneous	7,736,176	7,730,540	5,636
Value at mines	$148,957,894	$148,866,422	$91,472				
Total tons marketed	64,524,302	64,419,923	104,379				
Value at mines	$145,880,526	$145,791,493	$89,033				

[1] Exclusive of 3 operators with 3 mines and 4 washeries, producing 94,871 tons, valued at $69,848, for which capital, number of employees, and operating expenses were not reported.
[2] Statistics of river dredges are not included in any subsequent table of Part II.
[3] The total is exclusive of a duplication of 10,975 acres in figures for owned and leased acreage. See Introduction, "Coal land controlled."

The total production of Pennsylvania anthracite in 1909 was 72,310,144 long tons, of which the concerns covered by the above table produced 72,215,273 tons, while 94,871 tons were reported by operators who furnished incomplete reports. Of the total shown in the table 67,776,000 tons (in round numbers) were the product of mines proper, 4,333,000 tons that of washeries not connected with mines, and 106,000 tons that of river dredges. The total value reported for these 72,215,273 tons was $148,957,894 and the total gross expenses were $139,110,444, of which 66.3 per cent was for wages. The number of wage earners employed was 173,263, and the operators used a total of 676,000 primary horsepower.

PROGRESS OF THE INDUSTRY.

In Table 22 the recent progress of the anthracite industry is shown by various items selected from the census returns of 1889 and 1909, which have been rendered comparable by the following adjustments: 19 idle collieries and 49 small local operations have been deducted from the total number of collieries given for 1889; the salaries paid to foremen have been deducted from the wages for 1889, since in 1909 the payments to such foremen were included in salaries. The cost of fuel was included in the cost of supplies for 1909 but not for 1889; but no adjustment has been made on this account because in 1889 the refuse coal burned beneath the boilers was unmarketable, while in 1909 the conditions of preparing and selling anthracite had so changed that such refuse had a distinct value, and most companies were charging to operating expenses the value of coal used for power.

COMPARATIVE STATISTICS OF PENNSYLVANIA ANTHRACITE COLLIERIES: 1909 AND 1889.

Table 22.	1909	1889	INCREASE.	
			Amount.	Per cent.
Number of collieries	357	[1] 343	14	4.1
Acres of coal and other land controlled	[2] 464,210	213,938	250,272	117.0
Owned	310,711	107,282	203,429	105.2
Held under lease	159,188	106,656	52,532	49.3
Capital	$246,599,761	$101,784,473	$84,815,288	52.4
Gross expenses	$139,048,811	$61,109,958	$77,938,853	127.6
Wages	$92,140,724	$37,768,431	$54,372,293	144.0
Colliery supplies	$26,640,773	$10,822,363	$15,818,410	146.2
Tons of coal marketed (2,240 pounds)	64,419,923	37,146,456	27,273,467	73.4
Value at mines of coal marketed	$145,701,493	$65,721,578	$80,009,915	121.8

[1] Exclusive of 19 which were idle during the year, 49 small diggings and washeries supplying local trade, and 18 new establishments in course of construction.
[2] The total is exclusive of a duplication of 11,089 acres in figures for owned and leased acreage. See Introduction, "Coal land controlled."

The quantity of anthracite marketed increased from 37,146,000 long tons in 1889 to 64,420,000 in 1909, or 73.4 per cent. The value of the coal marketed increased 121.8 per cent, the average value per ton rising from $1.77 to $2.26. The total reported expenses increased 127.5 per cent, while wage payments increased 144 per cent and the cost of colliery supplies 146.2 per cent. At the same time the average expense per ton also materially increased. Considering the entire production, both the tonnage marketed and that consumed at the collieries, the average gross expense per ton reported in 1889 was $1.50, while in 1909, for all collieries, it was $1.93. But in 1909, 4,333,000 tons of coal were produced from culm banks, while practically none was so produced in 1889. Table 28, which gives separate statistics for mines as distinguished from washeries, shows that the average gross expense per ton mined in 1909 was $2.03, or $0.53 more than in 1889. The increase in the cost of production, however, was probably even greater, since in 1909 the tonnage reported included small sizes of coal which in 1889 were not marketable and were not included, while for both years the expenses reported, of course, necessarily included the expense of producing the entire output, both of salable and unsalable sizes. This increase has all been in wage payments and cost of supplies, and, speaking broadly, is accounted for by the greater expense of working deeper deposits and measures generally thinner than in 1889, and by advances in the rates of wages and the prices of colliery supplies.

The number of collieries operated increased but little. Indeed, if the 52 washeries recovering coal from culm banks in 1909 are excluded, there were but 305 mines proper, as compared with 343 in 1889. The average output per mine has largely increased. If comparison is restricted to mines proper by excluding from the figures for 1909 the 4,333,000 long tons recovered by washeries, the average production per mine in 1909 (including the coal used for steam and heat, as well as that marketed) was about 222,000 tons, as compared with about 118,000 tons in 1889.

RAILWAY AFFILIATION OF OPERATORS.

The affiliation of coal producers with railways, by affecting the distribution and consumption of their product, may also influence materially the conditions of operation. The following table gives the principal statistics of anthracite operators classified according to their affiliation with railways. This classification, as stated in connection with Table 11, was based on official information.

The 11 coal mining concerns affiliated with railroads reported 84.4 per cent of the total coal land in 1909, 75.7 per cent of the total output of anthracite, and 78.2 per cent of the total number of wage earners reported for the industry. Their average acreage of coal land controlled per operator was more than 20,000 acres, as compared with an average of less than 350 acres for the unaffiliated operators, and their average

annual output per operator was nearly 5,000,000 tons, as compared with less than 140,000 tons for the other operators. The difference in the size of the collieries of the two groups is indicated by the fact that these 11 concerns, affiliated with the anthracite carrying railroads, show an average of 645 men employed and over 260,000 tons of coal produced per colliery, as compared with 256 men employed and less than 120,000 tons of coal produced per colliery by the unaffiliated operators.

STATISTICS OF PENNSYLVANIA ANTHRACITE OPERATORS AFFILIATED AND UNAFFILIATED WITH RAILROADS: 1909.

Table 23	Total.	Operators affiliated with railroads.	Unaffiliated operators.		Total.	Operators affiliated with railroads.	Unaffiliated operators.
Number of operators	139	11	128	Total tons (2,240 pounds) of coal produced	72,109,034	54,616,158	17,492,876
Number of collieries (including washeries)	357	210	147	Loaded at mines for shipment	62,630,012	47,617,579	15,012,433
Acres of coal land controlled[1]	273,499	230,739	42,760	Sold locally	1,789,911	960,589	829,322
Owned	183,044	180,567	2,477	Used at mines for steam and heat	7,689,111	6,037,990	1,651,121
Held under lease	101,430	61,129	40,301	Total value of coal at mines	$148,886,422	$113,779,555	$35,086,867
Leased by operators to each other	10,975	10,957	18	Employees:			
Capital	$246,599,761	$218,198,695	$28,401,066	Salaried	4,297	3,262	1,035
Gross expenses	$139,048,811	$106,493,484	$32,555,327	Wage earners	173,098	135,407	37,691
Deduct charges to miners for explosives, oil, and blacksmithing	$4,864,844	$3,862,611	$1,002,233	Outside	48,505	35,713	12,792
Net expenses	$134,183,967	$102,630,873	$31,553,094	Inside	124,593	99,694	24,899
Royalties	$7,067,209	$4,219,299	$3,747,910	Total primary horsepower	675,196	539,365	135,831

[1] Total is exclusive of duplication of acreage leased by operators to each other. See Introduction, "Coal land controlled."

SCALE OF PRODUCTION.

Tables 12, 13, and 14 of Part I give statistics relating to the size of anthracite operating organizations, but include the Rocky Mountain anthracite mines and the Pennsylvania river dredges as well as the anthracite collieries proper; furthermore, Table 14 classifies operators on the basis of all land controlled. The following tables, classifying operators according to value of products and number of wage earners, not only confine the statistics to Pennsylvania colliery operators, but distinguish the operators as affiliated and unaffiliated with railroads; while the table classifying operators according to acreage controlled is based on holdings of coal land exclusive of barren areas.

Classification of operators according to value of coal produced: 1909.—Of the 139 anthracite operators in Pennsylvania in 1909, exclusive of those operating dredges, 19 produced less than $10,000 worth of products each; 49, from $10,000 to $100,000; 39, from $100,000 to $500,000; 15, from $500,000 to $1,000,000; 8, from $1,000,000 to $5,000,000; and 9, $5,000,000 or more. The following table distinguishes the 139 operators according as they are affiliated or unaffiliated with railroads, and classifies those of each group according to the value of coal produced per operator:

Table 24	Operators affiliated with railroads.		Unaffiliated operators.	
Value of coal produced per operator.	Number of operators.	Value of coal produced.	Number of operators.	Value of coal produced.
Total	11	$113,779,555	128	$35,086,867
Less than $10,000			19	81,227
$10,000 to $100,000			49	2,141,855
$100,000 to $1,000,000			54	21,020,422
Over $1,000,000	11	113,779,555	6	11,843,363

Each of the companies affiliated with railroads reported an output valued at more than $1,000,000, and the average value of coal per company was more than $10,000,000. On the other hand, only 6 of the 128 unaffiliated operators reported an output valued at more than $1,000,000, and the average value of coal for these 6 operators was less than $2,000,000 each.

Classification of operators according to number of wage earners employed: 1909.—Table 13 gives the number of anthracite operators in the United States as a whole employing specified numbers of wage earners, together with the number of wage earners employed by each group. Table 25 presents a similar classification for Pennsylvania anthracite operators affiliated with railroads, and unaffiliated respectively. The river dredges, included in Table 13, are excluded from this table.

Table 25	Operators affiliated with railroads.		Unaffiliated operators.	
Number of wage earners per operator.	Number of operators.	Number of wage earners.	Number of operators.	Number of wage earners.
Total	11	135,407	128	37,691
100 or less			62	2,325
101 to 500			41	11,841
501 to 1,000			18	11,857
Over 1,000	11	135,407	7	11,668

All of the 11 operators connected with railroads were in the class of employers reporting more than 1,000 wage earners, with the average number employed per company exceeding 12,000 men. Among the unaffiliated operators, 7 reported more than 1,000 wage earners each, but the great majority of unaffiliated operators were relatively small employers of labor.

Classification of operators according to number of acres of coal land controlled: 1909.—The following table gives the principal facts regarding the control of coal lands and the accompanying coal production for Pennsyl-

vania anthracite operators holding specified areas. Thirteen operators who reported their entire production from washing culm piles have been excluded from this table.

Table 26

	NUMBER OF ACRES OF COAL LAND CONTROLLED PER OPERATOR.				
	Total.	Less than 100 acres.	100 to 1,000 acres.	1,000 to 10,000 acres.	10,000 acres and over.
Number of operators	126	42	62	16	6
Acres of coal land controlled [1]	273,490	1,468	22,721	38,328	210,982
Owned	183,044	149	1,259	12,753	168,883
Held under lease	101,430	1,319	21,480	26,289	52,342
Average number of acres per operator	2,171	35	366	2,396	35,164
Total tons of coal produced (2,240 pounds)	68,558,720	663,366	10,474,306	13,295,247	44,125,801
Average per operator	544,117	15,794	168,940	830,953	7,354,300
Average per acre controlled	251	452	461	347	209
Tons sold locally	1,616,495	219,330	263,995	327,550	805,614
Per cent of total output	2.4	33.1	2.5	2.5	1.8

[1] Exclusive of duplication of land leased by operators to each other. (See Table 21.)

The above figures are of particular interest because the acreage of anthracite land is very limited and is practically all covered by the table. The tabulation shows that six large concerns controlled more than three-fourths of all the anthracite land reported. That they hold a considerable part of this area in reserve is clearly shown by a comparison of the average actual output of coal per acre controlled for the various groups. This average for the six largest holders was 209 tons per acre, or less than half as much as for the two groups of smallest holders, whose limited acreage precluded the holding of reserve areas.[1] The figures show not only greatly concentrated control of the anthracite deposits, but also show that the small and medium sized concerns are mining out their deposits much more rapidly than the largest concerns, so that increased concentration of the industry may occur in the future. Furthermore, the larger operators hold their lands chiefly through direct ownership, while all the other groups report much the greater portion of their acreage held under lease.

The table also indicates the importance to the small land holders of local sales of coal. The 42 operators each with less than 100 acres of coal land were limited by their restricted acreage to an average annual output of less than 16,000 tons each; but they were able to sell about one-third of their output locally. Much of this coal was retailed and brought better prices than could be secured for coal shipped to distant markets. This is of material assistance to these operators in offsetting the greater cost of small-scale production. The local markets, however, are by no means abandoned to these small operators by the large producers. On the contrary, of the total coal marketed locally, the 22 largest operators sold nearly three-fourths, though such local sales formed only a small proportion of their total output.

EXPENSES.

The analytical figures for the distribution of expenses at the anthracite collieries are presented in three tables. The first covers all classes of collieries combined, the second gives separate figures for mines and for washeries, and the third deals with royalties.

Distribution of expenses for all collieries: 1909.—The following table shows for all anthracite collieries, the average expenses per ton, and the percentage of gross expenses formed by the several items:

Table 27

	Average expense per ton.	Per cent of total gross expenses.
Total net expenses	$1.86	
Total gross expenses	1.93	100.0
Salaries	0.06	3.3
Wages	1.28	66.3
Supplies	0.37	19.2
Royalties	0.11	5.7
Miscellaneous	0.11	5.6

It will be noted from the above figures that the chief element of expense is services, salaries and wages together amounting to $1.34 per ton and comprising 69.6 per cent of the reported gross expenses in 1909. The next largest item was colliery supplies, including the cost of fuel and power. The average gross expense for this item was $0.37 per ton. As explained in the remarks under "Wages" and "Supplies" in the Introduction, the operators' net cost of supplies was somewhat less than the above amount.

The average cost per ton given for royalties, $0.11, must not be taken as the average rate of royalty, since the foregoing figure is computed from the total output of anthracite, but on the greater part of this total, namely, the coal produced from lands owned by operators, no royalty was paid. (See Table 29.)

Expenses and related data for mines and for washeries.—The expense of producing anthracite from mines is much greater than the expense of recovering coal by washing culm banks. In order to give separate data for these two kinds of operations, the following table has been prepared summarizing the principal statistics relating to expenses for mines and for washeries which were recovering coal from culm piles, independently of fresh mine production. As explained in the footnote on the following page, certain operations have necessarily

[1] This average output per acre disregards variations in the original coal contents of the land and differences in the methods of mining. Variations in the thickness of the coal measures might readily cause considerable difference in the average output per acre, but in general the lands of the small holders are not underlaid by more productive coal measures than the lands of the large holders, so that the differences in the averages quoted above can not be attributed to this cause. Furthermore, the mining methods of the large operators are certainly not inferior to those of the small operators, and hence the smaller average output per acre for the large producers can not be accounted for in this manner.

been excluded from the table, and certain administrative expenses (relatively small in amount) have been apportioned to the mines and the washeries by estimate.[1]

Table 28	Mines.	Washeries.
Number of collieries	272	43
Total gross expenses	$114,613,120	$1,324,325
Less charges to miners for explosives, oil, and blacksmithing	$4,165,815	$251
Total net expenses	$110,447,305	$1,324,074
Tons (2,240 pounds) of coal produced	55,536,022	3,550,314
Value at mines	$121,248,035	$2,274,004
Wage earners, number [1]	144,030	1,712
Outside	38,244	1,712
Engineers, firemen, and mechanics	7,278	248
Others, 16 years and over	27,862	1,440
Boys under 16 years	3,104	24
Inside	106,305	.....
Engineers, firemen, and mechanics	1,987	.....
Miners	39,934	.....
Miners' helpers	32,588	.....
Others, 16 years and over	31,873	.....
Boys under 16 years	13	.....
Total primary horsepower	574,300	11,584
Gross expense by items:		
Services	$77,029,135	$728,106
Salaries	2,046,249	53,413
Wages	74,982,886	674,693
Supplies	21,864,411	387,657
Fuel and rent of power	2,501,620	91,375
Other	19,362,791	296,282
Royalties	7,187,342	122,038
Miscellaneous	8,532,232	85,624
Taxes, contract work, and sundries	3,211,123	57,775
Apportioned administrative expenses	5,321,109	27,849
Average value of coal per ton at collieries	$2.14	$0.64
Average net expense per ton	1.95	0.37
Average gross expense per ton	2.03	0.37
Salaries [2]	0.06	0.02
Wages [2]	1.34	0.19
Supplies	0.39	0.11
Royalties	0.13	0.03
Miscellaneous	0.11	0.02

[1] Exclusive of 1,486 wage earners employed on general work who could not be distributed, but the wages of these men were part of the administrative expenses apportioned.

[2] Includes the average amount of general office salaries and wages per ton.

This table shows an average gross expense for coal recovered by washeries of $0.37 per ton, as compared with $2.03 per ton for coal produced from mines. This low average expense for washeries is to be expected, since the recovery of coal from culm banks is largely mechanical, and few employees are needed. The average value of the washery product is likewise much below that of the mine output, which is due to the fact that most of the washery coal is of smaller, less valuable sizes.

Royalty payments: 1909.—The following table gives data regarding royalties:

Table 29	Tons of coal from leased land (2,240 pounds).	Royalty payments.	Average royalty per ton.
Total, all collieries	15,705,262	$3,691,544	$0.24
Mines	14,929,912	3,595,366	0.24
Washeries	775,350	96,178	0.12

This table does not cover all mines and washeries operating under lease, since the reports of some operators did not specify the tonnage of coal produced under lease with the royalty payments therefor, but the tonnage covered is sufficiently large to show prevailing conditions.

The rates of anthracite royalties vary according to the sizes of coal produced. The table shows that for coal from mines the average rate was about $0.24 per ton, and for coal washed from culm banks, with the greater proportion of small sizes, about $0.12 per ton.

WAGE EARNERS.

The more general statistics as to the employment of persons in anthracite collieries have already been presented in Table 16. Additional details are given in the following tables.

[1] In 1909, 52 washeries were operated independently of fresh mine production, but the table deals with only 43 of these washeries. This is due to the fact that the reports for 9 washeries were combined by the operators with the reports for 33 mines, and of course these operations covered by combined reports were necessarily excluded from this analysis. Accordingly, 9 washeries with a total production of 862,012 tons and 33 mines with a total production of 11,159,786 tons have been excluded from the table. However, the number of operations and the total tonnage covered by the table are sufficiently large to give representative figures for each class of producing units.

Miscellaneous expenses given in this table include certain administrative expenses. These were salaries and other general office expenses reported by various companies as a total. In all other anthracite tables, which show expenses for the industry as a whole, these expenses could be and have been included under the proper heads of salaries, wages, taxes, rent of offices, etc., but in this table based on individual collieries it was necessary to distribute such general office expenses reported in toto for the company to the several collieries, in order that no part of the expenses should be omitted. For this purpose these administrative expenses were distributed in the proportion which the total expense of each colliery bore to the total expense of the company. While this method lowers in this table the total amount of salaries and wages reported as such, and increases the total amount of miscellaneous expense by an equal amount, as compared with other tables for anthracite, the total expenses as shown are substantially correct for the collieries covered by the table. Moreover, in the lower part of the table the average amounts of salaries and wages per ton have been calculated to include these general office salaries and wages, so that the averages shown approximate the actual average amounts and proportions of the various items given.

Employment of wage earners above and below ground for different classes of collieries: 1909.—At some collieries washeries are used as part of the breaker equipment for cleaning coal from the mines, while at other collieries the coal is cleaned by other means. This difference in equipment affects the employment of labor in the breakers. The following table, giving the number and per cent of wage earners employed outside and inside the mines for different classes of collieries, presents data bearing on this subject:[2]

Table 30	Collieries without washeries.	Collieries with washeries.	Washeries.
Wage earners, number, Dec. 15, 1909, or nearest representative day	112,834	31,805	1,712
Outside	31,242	7,002	1,712
Inside	81,592	24,803	.....
Per cent of total	100.0	100.0	100.0
Outside	27.7	22.0	100.0
Inside	72.3	78.0	.....

The table shows that in 1909 the collieries using washeries in the breakers employed but 22 per cent of their wage earners above ground as compared with 27.7 per cent thus employed in collieries cleaning coal by other means. While some other factors may also

[2] The figures in this table are exclusive of the employees of the collieries omitted from Table 28, as explained in connection therewith.

contribute to this result, the primary cause is doubtless the reduction in the number of breaker employees through the use of washeries.

Number of days collieries were operated: 1909.[1]—The following table gives the number of collieries which were operated specified numbers of days during the year 1909.

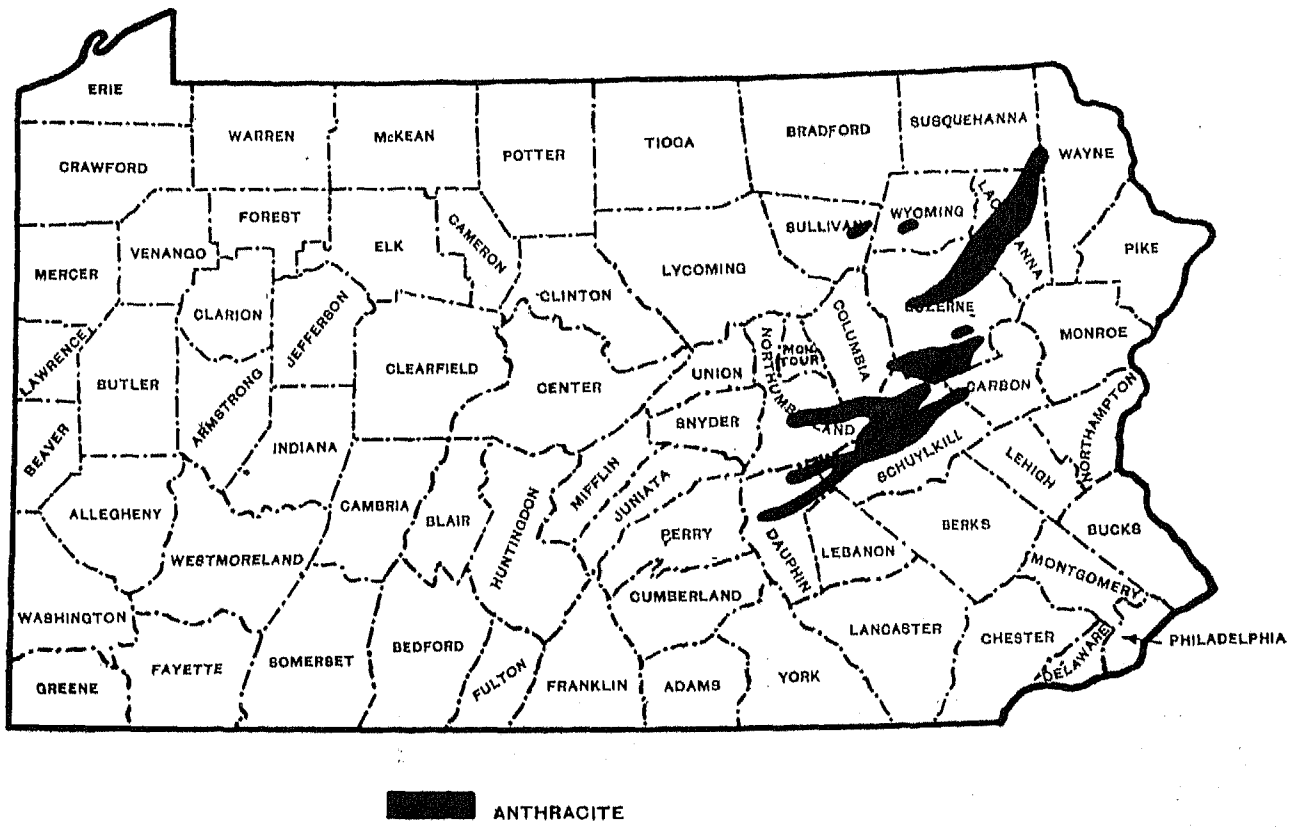
The table indicates the irregularity of employment in the anthracite collieries from day to day. Of the total number reported, 30.5 per cent were in operation more than 240 days, 54.9 per cent more than 210 days, and 74.2 per cent more than 180 days. Except in a few cases time was not lost in one continuous period of nonoperation, but the breakers were shut down for a day or two at more or less frequent intervals to permit repairs, to restrict output, or for other reasons. This feature of operation is not peculiar to anthracite, but is true generally of the entire coal mining industry.

[1] By agreement between the operators and their employees the anthracite collieries were operated on a 9-hour day basis.

Table 31

NUMBER OF DAYS IN OPERATION.	Number of collieries.	NUMBER OF DAYS IN OPERATION.	Number of collieries.
Total	357	181 to 210	69
30 or less	5	211 to 240	87
31 to 60	3	241 to 270	54
61 to 90	8	271 to 300	42
91 to 120	14	301 to 330	12
121 to 150	27	331 to 365	1
151 to 180	34	Time not specified	1

MAP SHOWING ANTHRACITE FIELDS OF PENNSYLVANIA.



PART III.[1]—BITUMINOUS COAL.

GENERAL SUMMARY: 1909.

Statistics for mines with and without coke manufacture, by states.—Table 32 summarizes for the year 1909 the more important statistics of the bituminous coal industry as conducted in the various states, distinguishing mines operating coke ovens from those without such manufacture. For total production and value of bituminous coal for each state, including coal used for making coke, see Table 33.

SUMMARY OF STATISTICS FOR BITUMINOUS COAL MINES, DISTINGUISHING THOSE WITH AND WITHOUT COKE MANUFACTURE, BY STATES: 1909.

Table 32

STATE.	Number of mines.	Acres of coal land controlled.	Capital.	Expenses.	PRODUCTS.					Number of wage earners.	Primary horsepower.	Number of mining machines.	Number of completed coke ovens.
					Value of all products.	Coal, exclusive of coal made into coke.		Coke made at mines.					
						Tons (2,000 lbs.).	Value at mines.	Tons (2,000 lbs.).	Value at mines.				
All mines: United States	**6,013**	**6,573,186**	[1] **$1,062,197,083**	[2] **$395,907,026**	**$427,962,464**	**326,792,907**	**$360,052,340**	**32,450,482**	**$67,483,162**	**569,789**	**1,227,401**	**13,585**	**86,341**
MINES WITHOUT COKE MANUFACTURE.													
United States	**5,365**	**4,883,967**	[1] **697,357,137**	**301,451,896**	**315,894,935**	**280,652,040**	**315,659,346**			**435,414**	**910,778**	**11,502**	
Alabama	167	231,765	19,632,647	7,806,117	8,125,811	6,515,922	8,114,505			11,721	18,776	182	
Arkansas	69	54,359	[1] 2,256,942	3,030,526	3,508,590	2,373,619	3,508,490			5,462	10,508	12	
Colorado	140	65,047	18,046,592	9,304,037	10,208,042	6,904,756	10,208,042			10,308	27,350	258	
Illinois	631	552,396	[1] 75,257,067	51,097,504	53,030,545	50,570,503	52,999,918			74,445	166,174	1,372	
Indiana	322	140,244	[1] 35,037,961	14,906,831	15,018,123	14,723,231	14,984,616			22,357	45,910	672	
Iowa	311	70,192	[1] 7,212,033	12,816,076	12,682,106	7,725,679	12,679,225			17,623	19,118	7	
Kansas	202	80,469	[1] 6,262,203	9,778,297	9,835,614	6,895,660	9,835,567			12,791	19,707	16	
Kentucky	299	332,084	22,807,715	9,140,144	9,006,946	9,386,178	9,005,539			17,935	38,409	783	
Maryland	70	68,220	22,871,136	3,941,359	4,483,137	4,001,272	4,445,041			5,798	9,845	39	
Michigan	28	23,135	6,865,156	2,985,802	3,175,102	1,772,315	3,175,102			3,572	7,912	115	
Missouri	220	116,108	[1] 5,650,407	5,715,727	5,881,034	3,596,691	5,879,972			9,520	11,898	103	
North Dakota	53	10,356	1,023,278	523,410	563,212	364,536	563,212			857	2,025	20	
Ohio	640	400,336	64,131,141	27,153,497	27,353,663	27,518,704	27,274,403			44,405	97,422	1,537	
Oklahoma	104	75,744	[1] 5,072,886	6,535,441	6,185,078	3,113,149	6,184,420			8,814	26,316	34	
Oregon	9	3,122	642,410	238,246	225,026	83,704	225,026			251	1,109	27	
Pennsylvania	1,179	1,338,003	[1] 227,746,738	79,351,941	85,773,883	85,103,949	85,749,052			116,074	238,250	4,471	
Tennessee	129	320,650	9,830,983	5,185,588	5,130,791	4,057,257	5,130,791			8,470	11,580	167	
Texas	47	125,774	5,894,808	2,812,079	3,136,004	1,824,742	3,134,720			4,234	6,217	11	
Virginia	44	35,190	21,846,844	1,628,096	1,379,024	1,490,135	1,379,924			3,061	5,214	57	
Washington	51	83,313	[1] 13,040,036	6,205,090	8,915,528	3,496,242	8,915,528			5,857	10,252	18	
West Virginia	479	505,457	[1] 77,077,008	24,327,363	23,330,421	27,166,931	23,330,248			36,463	79,238	1,387	
Wyoming	65	64,783	[1] 7,699,220	8,146,526	9,721,134	6,294,596	9,721,134			7,839	28,071	121	
All other states [3]	106	112,230	[1] 21,210,879	7,532,199	9,225,221	4,982,209	9,214,811			7,491	23,477	93	
MINES WITH COKE MANUFACTURE.													
United States	**648**	**1,689,219**	**364,839,946**	[2] **94,455,130**	**112,067,529**	**46,140,867**	**44,392,994**	**32,450,482**	**67,483,162**	**134,375**	**316,623**	**2,083**	**86,341**
Alabama	36	367,404	39,969,749	[2] 9,062,318	10,333,622	2,396,543	2,662,911	2,883,774	7,670,711	11,758	35,308	118	8,697
Colorado	15	27,895	12,488,341	[2] 4,885,458	5,574,155	1,991,393	2,275,494	1,061,808	3,296,590	5,693	6,735	1	3,281
Kentucky	11	32,585	1,892,818	1,031,805	996,535	1,089,780	915,902	38,503	80,633	1,720	5,005	124	374
Pennsylvania	330	335,534	189,851,802	[2] 48,809,122	61,692,534	18,425,118	17,566,627	22,499,706	43,937,062	68,334	160,404	1,254	49,510
Connellsville district	238	116,520	127,652,905	34,120,088	46,908,398	[4] 8,622,591	7,747,190	20,207,354	39,141,363	46,735	111,192	470	42,777
Tennessee	13	120,274	10,498,083	[2] 1,673,616	1,557,663	920,381	971,978	213,759	585,685	2,684	4,495	24	1,457
Virginia	41	134,106	20,490,378	3,658,824	3,608,404	1,546,223	1,397,041	1,264,213	2,211,363	6,981	11,416	55	5,130
Washington	3	5,298	758,544	328,074	311,265	35,263	70,661	42,980	240,604	208	560	.....	185
West Virginia	182	569,028	71,125,226	21,142,396	23,599,171	18,160,306	16,466,779	3,809,028	7,132,392	33,203	76,338	503	15,966
All other states [5]	17	88,005	17,764,915	3,863,517	4,394,180	1,575,851	2,065,601	636,651	2,328,122	4,304	9,462	4	1,831

[1] The total includes $18,229,388 which can not be distributed among the individual states. The states to which the item relates are Arkansas, Illinois, Indiana, Iowa, Kansas, Missouri, Montana, Oklahoma, Pennsylvania, Washington, West Virginia, and Wyoming. See footnote to Capital, Table 62.

[2] The total includes $433,801 cost of coal purchased for coking at mines, made up of $128,176 in Alabama, $261,475 in Colorado, $27,804 in Pennsylvania, and $16,346 in Tennessee.

[3] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

[4] There were 30,107,187 tons of coal, valued at $23,015,677, made into coke at mines.

[5] Includes Georgia, Montana, New Mexico, and Utah.

In round numbers the total quantity of bituminous coal produced in 1909 by all mines covered by the census was 378,975,000 tons (see Table 2), of which 376,865,510 tons were produced by the mines covered by the table given above (mines with complete reports). Of this quantity, 326,792,907 tons were produced for shipment or use as fuel, and 50,072,603 tons for conversion into coke at the mines, from which

[1] No statistics of mines operated by penal institutions, nor of mines furnishing incomplete reports are included in any table of Part III. The product of these mines is included in Tables 2, 4, 5, and 7, Part I.

32,450,482 tons of coke were made. The total value of the coal shipped or used as fuel, of the coke made at the mines, and of sundry by-products, was $427,962,464, and the total expenses reported were $395,907,026. Mines with coke manufacture reported 23.9 per cent of the total expenses and 26.2 per cent of the total value of products. Among the states with coke made at the mines Pennsylvania, West Virginia, and Alabama lead, with 22,499,706 tons of coke, valued at $43,937,062; 3,809,028 tons, valued at $7,132,392; and 2,883,774 tons, valued at $7,670,711, respectively. By far the most important coking region is the Connellsville district of Pennsylvania, which produced 20,207,354 tons, valued at $39,141,363.

In the United States as a whole the total expenses reported for mines without coke manufacture amounted in 1909 to $301,451,896, and the total value of products to $315,894,935, showing a difference of only $14,443,039, or about 5 cents per ton of coal produced. In Arkansas, Iowa, Kentucky, Oklahoma, Oregon, Tennessee, Virginia, and West Virginia the expenses reported exceeded the value of products.

For mines with coke manufacture the total reported expenses amounted to $94,455,130, and the value of products to $112,067,529, showing a difference of $17,612,399. In Kentucky, Tennessee, Virginia, and Washington the expenses reported by mines of this class exceeded the value of products reported.

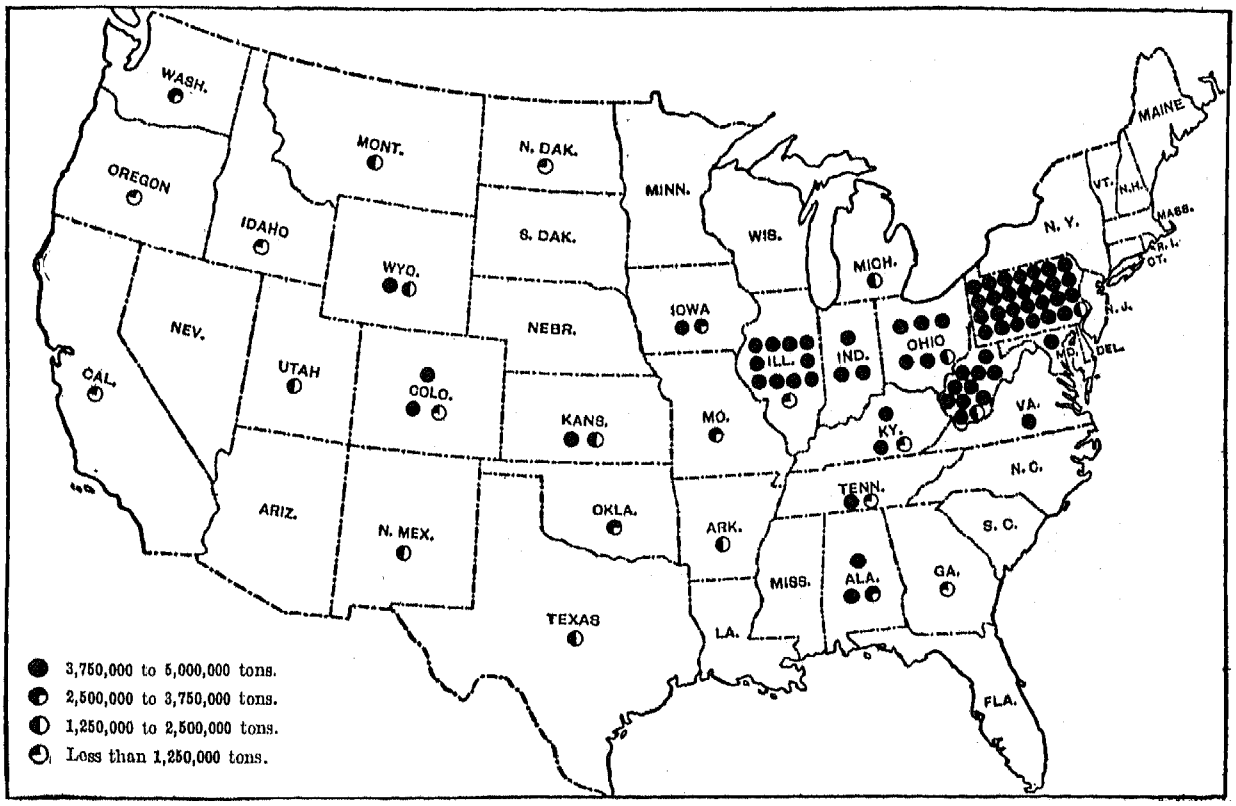
These data can not be taken as showing accurately the amount of profit or loss in the coal mining industry of the several states, but they do seem to indicate clearly that in many states the industry obtains only a very low rate of profit, if any. The remarks made in the Introduction to this report as to the significance of the reported expenses, and particularly with reference to the matter of depreciation and of development work, should be carefully considered in connection with these statistics. While charges for permanent improvements not properly assignable to the operations of the current year have been included in the returns of the mine operators, it is uncertain whether the expenses of this character are sufficient in general to offset depreciation, for which, as such, no charge has been included in the expenses reported.

Among other reasons why the statistics in this table do not furnish conclusive evidence as to profits in the coal industry is the fact that a large proportion of the coal and coke is produced by mines affiliated with railway companies and other industrial concerns, and the value of coal or coke reported by them in many cases is fixed at an arbitrary figure which may be higher or lower than the current market prices.

It should also be noted that many mine operators make a considerable profit by renting houses and selling merchandise to their employees. The Bureau of the Census corresponded with many operators whose returns showed an excess of expenses over the value of products, and not a few of them stated that, while there was a loss in their coal mining business proper, this was more than counterbalanced by profits from selling merchandise and renting houses.

Relative production, by states: 1909.—The relative importance of the different states as producers of bituminous coal is indicated by the map below.

RELATIVE PRODUCTION OF BITUMINOUS COAL, BY STATES: 1909.



Coal mining exclusive of coke manufacture at the mines, by states.—In order to present data comparable with previous census reports the following table has been adjusted to cover coal mining only, by deducting from the figures given in the preceding table the estimated capital, expenses, number of salaried employees and wage earners, and the reported value of products, assignable to the manufacture of coke at the mines. Most of these estimates of numbers and amounts to be deducted on account of coke manufacture were made by the operators themselves, and the remainder were made by the Bureau of the Census.

STATISTICS FOR BITUMINOUS COAL MINES, EXCLUDING (PARTLY BY ESTIMATE) ITEMS RELATING TO COKE MANUFACTURE, BY STATES: 1909.

Table 33 STATE	Number of operators.	Capital.	EXPENSES. Total.	Salaries.	Wages.	Supplies.	Royalties.	Miscellaneous expenses.	Number of salaried employees.	Number of wage earners.	COAL PRODUCED, INCLUDING COAL COKED AT MINES. Value, including minor products.[1]	Tons (2,000 pounds).
United States	[2] 3,503	[3] $960,289,465	$378,159,282	[4] $20,417,392	$282,378,886	$45,345,932	$12,035,900	[4] $17,981,172	[5] 17,793	542,911	$401,577,477	376,865,510
Alabama	112	43,337,899	15,361,842	1,118,008	10,035,850	2,165,618	223,033	1,818,433	1,153	20,914	16,185,524	13,676,561
Arkansas	44	[3] 2,256,942	3,630,526	[4] 166,067	2,758,127	302,212	163,896	[4] 180,224	[5] 178	5,462	3,508,590	2,373,619
Colorado	86	25,491,031	13,159,671	[4] 662,201	9,776,702	1,749,382	430,136	[4] 541,250	[5] 498	14,447	14,104,268	10,642,863
Illinois	470	[3] 75,257,667	51,697,504	[4] 2,083,668	41,991,246	4,944,371	744,860	[4] 1,033,359	[5] 1,788	74,445	53,030,545	50,570,503
Indiana	223	[3] 35,037,901	14,906,831	[4] 604,111	12,273,544	1,198,074	240,494	[4] 589,708	[5] 550	22,357	15,018,123	14,723,231
Iowa	258	[3] 7,212,033	12,816,076	[4] 468,169	10,383,672	1,330,436	322,673	[4] 311,126	[5] 411	17,623	12,082,166	7,725,679
Kansas	118	[3] 6,262,203	9,778,207	[4] 286,523	8,106,670	609,521	266,545	[4] 509,038	[5] 300	12,791	9,835,614	6,895,660
Kentucky	240	24,508,533	10,127,987	[4] 787,205	7,122,056	1,189,022	325,230	[4] 704,465	[5] 855	19,583	9,940,485	10,501,276
Maryland	40	22,871,136	3,941,359	[4] 222,116	2,713,294	408,227	95,757	[4] 501,965	[5] 243	5,708	4,483,137	4,001,272
Michigan	15	6,865,156	2,985,802	125,140	2,267,272	325,517	61,555	206,318	100	3,572	3,175,102	1,772,315
Missouri	173	[3] 5,650,407	5,715,727	[4] 209,230	4,695,972	397,068	160,182	[4] 253,275	[5] 221	9,526	5,881,034	3,596,691
North Dakota	52	1,023,278	523,410	60,069	357,221	75,187	10,647	20,286	46	857	503,212	304,536
Ohio	441	64,131,141	27,153,497	[4] 1,367,036	20,022,039	2,681,281	892,398	[4] 1,200,743	[5] 1,220	44,405	27,353,663	27,518,764
Oklahoma	56	[3] 5,672,886	6,535,441	[4] 302,330	4,803,392	912,614	269,651	[4] 247,454	[5] 275	8,814	6,185,078	3,113,149
Oregon	8	642,410	238,246	11,714	152,845	62,590	438	10,659	11	251	225,026	83,704
Pennsylvania	689	[3] 358,698,722	117,443,350	[4] 5,427,150	86,191,515	15,855,616	3,950,870	[4] 6,018,193	[5] 4,716	168,513	120,545,547	137,304,760
Connellsville dist.	76	78,517,182	24,966,514	1,203,480	17,683,509	4,043,056	469,879	1,565,981	1,046	32,715	30,770,903	38,729,778
Tennessee	85	19,471,452	6,691,482	547,534	4,751,419	665,884	404,420	322,216	535	10,832	6,548,515	5,072,930
Texas	29	5,894,808	2,812,070	[4] 177,103	2,126,043	334,867	30,247	[4] 137,819	[5] 174	4,234	3,136,004	1,824,742
Virginia	42	36,139,055	4,392,440	278,099	2,680,685	685,830	251,824	487,002	243	8,480	4,336,185	4,049,341
Washington	32	[3] 13,663,880	6,474,630	[4] 239,502	4,991,561	861,700	103,330	[4] 278,537	[5] 181	6,004	9,130,707	3,601,213
West Virginia	307	[3] 136,244,496	43,021,716	[4] 2,742,374	29,420,055	5,503,192	2,870,850	[4] 2,428,245	[5] 2,451	64,780	44,344,067	51,495,666
Wyoming	35	[3] 7,609,220	8,146,526	[4] 411,569	5,808,248	1,435,465	104,008	[4] 386,336	[5] 243	7,839	9,721,134	6,294,596
All other states [6]	84	[3] 37,167,662	10,601,843	597,118	8,040,458	1,531,358	105,032	327,877	[5] 392	11,294	12,634,811	7,802,434

[1] Value of minor products for the United States was $244,082.
[2] Exclusive of 136 operators duplicated in the numbers given for the various states.
[3] The total includes $18,220,388 which can not be distributed among the individual states; the states to which the item relates are Arkansas, Illinois, Indiana, Iowa, Kansas, Missouri, Montana, Oklahoma, Pennsylvania, Washington, West Virginia, and Wyoming.
[4] The United States total for salaries includes $1,523,350, paid to employees of general offices, which, for the reasons given in the Introduction under "Administrative expenses of general offices," have been included in the statistics of the separate states, not under the heading of "Salaries," but under "Miscellaneous expenses;" the states affected by this arrangement are Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Ohio, Oklahoma, Pennsylvania, Texas, Washington, West Virginia, and Wyoming.
[5] The total includes 1,003 salaried employees who could not be distributed by states for the reasons given in the Introduction under "Administrative expenses of general offices;" the states affected are Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Montana, Ohio, Oklahoma, Pennsylvania, Texas, Washington, West Virginia, and Wyoming.
[6] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

In considering the relation between the total reported expenses, as shown in this table, and the value of products, the comments made in connection with the preceding table should be borne in mind. Moreover, the fact should be noted that in states where some of the mines made coke the amount of expenses shown as attributable to mine operation proper involves an element of estimate, while the total value assigned to the coal produced by such mines is in some cases arbitrary and scarcely in conformity with market prices.

Statistics of different kinds of bituminous coal: 1909.—The following table summarizes the principal statistics for bituminous coal mines classified according to the kind of coal produced. Data relating to coke manufacture at the mines have been excluded in the manner already described, so that the figures shown for bituminous proper involve a certain amount of estimate.

[Data relating to coke manufacture at mines excluded, partly by estimate.]

Table 34	Bituminous proper.[1]	Subbituminous and lignite.	Semianthracite.	Cannel.
Number of mines	5,760	183	49	12
Acres of coal land controlled	6,431,661	83,505	45,467	12,553
Owned	4,476,148	52,876	10,472	9,916
Held under lease	1,955,513	30,629	34,995	2,637
Total expenses	$365,881,773	$9,458,880	$2,581,598	$237,031
Average per ton	$1.00	$1.27	$1.44	$1.21
Salaries	$18,161,403	$574,150	$132,125	$20,358
Wages	$273,376,688	$6,945,855	$1,885,975	$170,368
Supplies	$43,747,567	$1,272,802	$306,945	$18,618
Royalties	$11,669,891	$237,321	$118,011	$10,677
Miscellaneous	$18,926,224	$428,752	$138,542	$11,010
Tons of coal produced (2,000 lbs.)	$367,417,737	7,459,426	1,703,011	195,336
Value of coal at mines	387,047,709	$11,198,868	$2,831,959	$254,859
Average per ton	$1.05	$1.50	$1.58	$1.30
Number of wage earners	528,468	10,478	3,569	398

[1] Includes bituminous, semibituminous, splint, and block coal.

The table does not show precisely the tonnage of the different kinds of coal, owing to the fact that a few companies producing chiefly bituminous coal proper, with a small output of other kinds, returned one combined report for all their operations. Under such conditions it was necessary to include the entire production under the heading of bituminous coal proper.

The table shows the marked predominance of the bituminous proper, under which heading are also included semibituminous, block, and splint coal. This type, with the exception of a little semianthracite and cannel coal, includes the entire production of the Eastern states. Most of the subbituminous and lignite coal is produced in Colorado, Montana, New Mexico, North Dakota, Texas, Utah, Washington, and Wyoming. More than 24 per cent of the combined output of these states in 1909 was of this class, but nearly all of their remaining production was bituminous proper.

The output of semianthracite is restricted by limited deposits. Nearly the entire production in 1909 came from Arkansas, such coal constituting more than one-half the total output of that state. Small quantities were also produced in Colorado, Oklahoma, Utah, and Virginia. Cannel coal occurs only in occasional small deposits. Kentucky, Ohio, Pennsylvania, and West Virginia were the chief producing states.

In considering the statistics in this table as to value of coal and expenses the comments in connection with the two preceding tables should be borne in mind. Furthermore, the variations in average value per ton shown by the table do not reflect similar differences in the quality of these coals, nor do the variations in average expenses conform to corresponding differences in physical conditions of mining. The average values per ton in 1909 were as follows: Semianthracite, $1.58; subbituminous and lignite, $1.50; cannel, $1.30; and bituminous proper, $1.05. Semianthracite and cannel are superior domestic fuels and under similar conditions command better prices than bituminous proper, but subbituminous and lignite are inferior to bituminous proper, and their higher average value is due primarily to the fact that these coals are produced in Western states where higher prices are realized for coal generally than in the eastern fields of great bituminous production. In the Western states producing both kinds of coal the average value per ton for bituminous proper was about $0.17 more than for subbituminous and lignite.

The average reported expenses per ton are as follows: Semianthracite, $1.44; subbituminous and lignite, $1.27; cannel, $1.21; and bituminous proper, $1. As compared with bituminous proper, the higher averages for semianthracite and cannel may be due to natural conditions of mining; that is, the working of thinner measures, justified by the higher prices which can be realized for these coals; but the higher average expense shown for subbituminous and lignite is due not to any such conditions as these, but to the uniformly higher cost of production in the West as compared with the East. In the Western states concerned the average expense for bituminous proper was $0.17 per ton higher than for subbituminous and lignite.

PROGRESS OF THE INDUSTRY.

Comparative statistics, by states: 1909 and 1889.—The following table gives comparative statistics of capital, total expenses, wages, supplies, and contract work, and of the tonnage and value of coal produced in 1909 and 1889. The figures in this table have been adjusted (as explained in connection with Table 6) to give comparable statistics for these two years. The data for the manufacture of coke at the mines have been excluded, partly by estimate, in the manner already described. The remarks as to expenses and value of coal made in connection with Tables 32 and 33 should be borne in mind.

The table shows marked progress in the industry in the period covered. For the United States as a whole, the output increased 294.1 per cent and its value 325.4 per cent. At the same time, the total expenses increased 343.2 per cent, the wage payments 330.6 per cent, and the cost of supplies 467.2 per cent.

Among the states showing an increase in output exceeding 500 per cent, namely, Arkansas, Michigan, North Dakota, Texas, and West Virginia, the latter is the only one which is an important coal producer. In the other states named coal mining was in an incipient stage 20 years ago. The greatest absolute increase in output is found in Pennsylvania, 101,100,000 tons (in round numbers); in West Virginia, 45,300,000 tons; in Illinois, 38,500,000 tons; and in Ohio, 17,500,000 tons.

COMPARATIVE STATISTICS FOR BITUMINOUS COAL MINES, BY STATES: 1909 AND 1889.

[Data relating to coke manufacture at mines excluded, partly by estimate.]

Table 35

STATE.	Census.	Capital.	EXPENSES. Total.	Wages.	Supplies.	Contract work.[1]	COAL PRODUCED (INCLUDING COAL COKED AT MINES). Tons (2,000 pounds).	Value at mines.	PER CENT OF INCREASE. Capital.	Expenses. Total.	Wages.	Supplies.	Coal produced. Tons.	Value, at mines.
United States	**1909**	**[2] $960,289,465**	**$378,159,282**	**$282,378,886**	**$45,345,932**	**$2,134,569**	**376,865,510**	**$401,333,395**	**431.4**	**343.2**	**330.6**	**467.2**	**294.1**	**325.4**
	1889	**180,722,319**	**85,324,193**	**65,572,242**	**7,994,210**	**832,051**	**95,629,026**	**94,346,809**						
Alabama	1909	43,337,809	15,361,842	10,035,850	2,165,618	751,384	13,676,561	16,174,278	245.7	312.2	227.6	728.1	282.8	308.3
	1889	12,535,104	3,726,030	3,003,059	261,512	36,524	3,572,983	3,961,491						
Arkansas	1909	[2] 2,256,942	3,630,520	2,758,127	362,212	26,511	2,373,619	3,508,490	([3])	1,076.0	1,052.2	825.0	749.0	788.3
	1889	1,289,751	308,711	239,385	39,158	.....	279,584	395,836						
Colorado	1909	25,491,031	13,159,671	9,776,702	1,749,382	9,139	10,642,868	14,104,268	102.1	256.1	282.8	256.9	318.3	266.9
	1889	12,611,849	3,695,298	2,553,850	490,152	91,089	2,544,144	3,843,992						
Illinois	1909	[2] 75,257,667	51,697,504	41,991,246	4,944,371	51,480	50,570,503	52,999,918	([3])	398.7	417.7	411.3	317.8	350.9
	1889	17,630,351	10,366,069	8,111,253	966,927	26,662	12,104,272	11,755,203						
Indiana	1909	[2] 35,937,961	14,906,831	12,273,544	1,198,974	10,674	14,723,231	14,984,616	([3])	477.4	500.0	397.3	417.5	418.9
	1889	3,435,703	2,581,669	2,045,641	241,094	5,807	2,845,057	2,887,852						
Iowa	1909	[2] 7,212,033	12,816,076	10,383,672	1,330,436	38,266	7,725,679	12,679,225	([3])	170.8	180.5	272.6	88.6	133.7
	1889	6,279,179	4,732,950	3,701,331	357,033	65,194	4,095,358	5,426,509						
Kansas [4]	1909	[2] 6,262,203	9,778,207	8,106,070	609,521	49,793	6,895,660	9,835,567	([3])	258.1	273.7	131.9	210.3	197.9
	1889	3,488,539	2,730,782	2,169,137	262,820	6,330	2,222,443	3,301,788						
Kentucky	1909	24,508,533	10,127,987	7,122,056	1,189,022	86,660	10,561,276	9,939,078	272.4	369.6	340.5	401.0	340.1	318.6
	1889	6,581,380	2,156,548	1,584,400	237,321	45,099	2,399,755	2,374,339						
Maryland	1909	22,871,136	3,941,359	2,713,294	408,227	1,053	4,001,272	4,445,041	26.9	91.2	62.6	100.9	36.1	76.6
	1889	18,025,367	2,061,058	1,668,847	203,155	5,763	2,939,715	2,517,474						
Michigan	1909	6,865,156	2,985,802	2,267,272	325,517	2,203	1,772,315	3,175,102	13,737.1	2,525.7	2,562.4	3,483.0	2,528.3	2,660.7
	1889	49,650	113,714	85,158	9,085	.....	67,431	115,011						
Missouri	1909	[2] 5,650,407	5,715,727	4,695,972	397,068	23,903	3,596,691	5,879,972	([3])	100.8	98.7	119.1	40.6	69.0
	1889	3,992,293	2,846,137	2,363,300	181,218	18,779	2,557,823	3,479,057						
North Dakota	1909	1,023,278	523,410	357,221	75,187	1,325	364,536	563,212	1,436.0	2,307.6	2,336.0	2,402.7	1,161.1	1,259.4
	1889	66,580	21,740	14,664	2,900	.....	28,907	41,431						
Ohio	1909	64,131,141	27,153,497	20,022,039	2,681,281	52,854	27,518,764	27,274,403	357.5	229.8	222.8	372.0	175.8	191.5
	1889	14,018,236	8,232,183	6,482,215	568,020	58,767	9,976,787	9,355,400						
Oklahoma	1909	[2] 5,672,886	6,535,441	4,803,302	912,614	22,266	3,113,149	6,184,420	([3])	457.2	434.0	1,608.9	313.5	367.2
	1889	1,402,000	1,172,821	899,592	53,404	20,000	752,832	1,323,807						
Pennsylvania	1909	[2] 358,698,722	117,443,350	86,191,515	15,855,616	769,234	137,304,760	120,512,680	([3])	352.1	337.8	562.5	270.6	363.3
	1889	53,322,330	25,977,106	19,086,240	2,303,386	282,222	36,174,089	27,953,315						
Tennessee	1909	19,471,452	6,691,482	4,751,419	605,884	6,036	5,972,930	6,548,515	346.3	216.6	218.9	145.4	210.2	180.1
	1889	4,362,711	2,113,292	1,490,034	271,390	13,324	1,925,689	2,338,309						
Texas	1909	5,804,898	2,812,079	2,126,043	334,867	21,214	1,824,742	3,134,720	1,818.1	767.5	775.8	516.3	1,323.2	820.3
	1889	307,335	324,157	242,762	54,333	.....	128,216	340,020						
Virginia	1909	36,189,055	4,392,440	2,689,685	685,830	114,453	4,949,341	4,330,185	3,328.6	543.7	356.5	1,366.9	471.7	439.0
	1889	1,055,516	682,408	589,230	40,754	932	865,786	804,475						
Washington	1909	[2] 13,663,880	6,474,630	4,991,561	861,700	10,162	3,601,213	9,139,707	([3])	187.2	204.7	200.0	249.4	281.9
	1889	3,186,441	2,254,486	1,637,960	287,211	9,296	1,030,578	2,393,238						
West Virginia	1909	[2] 136,244,490	43,024,716	29,420,055	5,563,192	62,279	51,495,666	44,343,894	([3])	788.6	719.0	1,102.6	726.3	771.8
	1889	10,508,050	4,841,796	3,592,202	462,591	47,099	6,231,880	5,080,584						
Wyoming	1909	[2] 7,609,220	8,146,526	5,808,248	1,435,465	10,644	6,294,596	9,721,134	([3])	346.6	284.4	538.5	353.2	455.9
	1889	2,239,252	1,823,956	1,511,117	224,804	7,881	1,388,947	1,748,617						
All other states [5]	1909	[2] 37,810,072	10,840,089	8,193,303	1,593,948	12,436	7,886,138	12,848,070	700.8	323.4	345.1	319.5	426.9	342.7
	1889	4,244,603	2,560,373	1,840,769	379,942	80,683	1,496,750	2,902,461						

[1] A small amount of contract work reported from the general offices of a few companies with mines in more than one state could not be distributed as such to the various states and has been omitted from the total given for this item in 1909. However, since the amount so omitted was less than 3 per cent of the total shown, this omission does not materially affect the value of the figures for comparative purposes.

[2] The total for 1909 includes $18,229,388 which can not be distributed among the individual states; the item relates to Arkansas, Illinois, Indiana, Iowa, Kansas, Missouri, Montana, Oklahoma, Pennsylvania, Washington, West Virginia, and Wyoming. The increase in the combined capital for these states was 530.6 per cent.

[3] See Note 2.

[4] Includes Nebraska in 1889.

[5] Includes California, Georgia, Idaho, Montana, New Mexico, Oregon, and Utah in 1909; California, Georgia, Montana, New Mexico, North Carolina, Oregon, and Utah in 1889.

Table 36, derived from the preceding table, shows average expenses and average values per ton, by states, for 1909 and 1889.

In several states the average value per ton decreased, notably in Texas, where the average fell from $2.66 per ton in 1889 to $1.72 in 1909, but during the same period the average wage cost decreased from $1.89 to $1.17 per ton and the cost of supplies from $0.42 to $0.18 per ton. In Colorado, the value decreased from $1.51 per ton in 1889 to $1.33 in 1909, the wage cost decreased from $1 to $0.92 and the cost of supplies from $0.19 to $0.16 per ton. The decrease in average wage payments per ton and the accompanying decrease in average cost and value per ton in these Western states are probably due in part to the greater scale of production now prevailing, and in part to the relatively greater supply of labor now available for coal mining.

Table 36

STATE.	AVERAGE EXPENSES PER TON.						AVERAGE VALUE PER TON OF COAL.	
	Total.		Wages.		Supplies.			
	1909	1889	1909	1889	1909	1889	1909	1889
United States	**$1.00**	**$0.89**	**$0.75**	**$0.69**	**$0.13**	**$0.08**	**$1.06**	**$0.99**
Alabama	1.12	1.04	0.73	0.86	0.16	0.07	1.18	1.11
Arkansas	1.53	1.10	1.16	0.86	0.15	0.14	1.48	1.42
Colorado	1.24	1.45	0.92	1.00	0.16	0.19	1.33	1.51
Illinois	1.02	0.86	0.83	0.67	0.10	0.08	1.05	0.97
Indiana	1.01	0.91	0.83	0.72	0.08	0.08	1.02	1.02
Iowa	1.66	1.16	1.34	0.90	0.17	0.09	1.64	1.33
Kansas[1]	1.42	1.23	1.18	0.98	0.09	0.12	1.43	1.49
Kentucky	0.96	0.90	0.67	0.66	0.11	0.10	0.94	0.99
Maryland	0.99	0.70	0.68	0.57	0.10	0.07	1.11	0.86
Michigan	1.68	1.69	1.28	1.26	0.18	0.13	1.79	1.71
Missouri	1.50	1.11	1.31	0.92	0.11	0.07	1.63	1.36
North Dakota	$1.44	$0.75	$0.98	$0.51	$0.21	$0.10	$1.55	$1.43
Ohio	0.99	0.83	0.76	0.65	0.10	0.06	0.99	0.94
Oklahoma	2.10	1.56	1.54	1.19	0.29	0.07	1.99	1.76
Pennsylvania	0.86	0.72	0.63	0.54	0.12	0.07	0.94	0.77
Tennessee	1.12	1.10	0.80	0.77	0.11	0.14	1.10	1.21
Texas	1.54	2.53	1.17	1.89	0.18	0.42	1.72	2.66
Virginia	0.89	0.79	0.54	0.68	0.14	0.05	0.88	0.03
Washington	1.80	2.19	1.30	1.59	0.24	0.28	2.54	2.32
West Virginia	0.84	0.78	0.57	0.58	0.11	0.07	0.86	0.82
Wyoming	1.20	1.31	0.92	1.09	0.23	0.16	1.54	1.26
All other states[2]	1.37	1.71	1.04	1.23	0.20	0.25	1.63	1.94

[1] Includes Nebraska in 1889.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, Oregon, and Utah in 1909; California, Georgia, Montana, New Mexico, North Carolina, Oregon, and Utah in 1889.

STATISTICS OF LAND HELD BY OPERATORS.

Extent of holdings.—While a few of the 3,503 operators of the mines covered by the general tables failed to report their land holdings, 3,456 of these operators reported 6,573,186 acres of coal land and 1,144,429 acres of other land, making a total for the entire United States of 7,717,615 acres controlled. The average holding of coal land per operator was about 1,900 acres, but excluding small local mines from consideration, the average for commercial producers was about 2,700 acres. The great variations in the extent of the holdings of single operators are shown by Tables 14 and 50. The following table gives, by states, the acreage of coal land owned and held under lease by operators, respectively, with percentages:

COAL LAND CONTROLLED BY OPERATORS OF BITUMINOUS COAL MINES: 1909.

Table 37

STATE.	ACRES OF COAL LAND CONNECTED WITH—									PER CENT OF COAL LAND CONNECTED WITH—					
	All mines.			Mines without coke manufacture.			Mines with coke manufacture.			All mines.		Mines without coke manufacture.		Mines with coke manufacture.	
	Total.	Owned.	Held under lease.	Total.	Owned.	Held under lease.	Total.	Owned.	Held under lease.	Owned.	Held under lease.	Owned.	Held under lease.	Owned.	Held under lease
United States	**6,573,186**	**4,549,412**	**2,023,774**	**4,883,967**	**3,225,778**	**1,658,189**	**1,689,219**	**1,323,634**	**365,585**	**69.2**	**30.8**	**66.0**	**34.0**	**78.4**	**21.6**
Alabama	599,259	525,355	73,904	231,765	160,261	71,504	367,494	365,094	2,400	87.7	12.3	69.1	30.9	99.3	0.7
Arkansas	54,350	23,885	30,474	54,350	23,885	30,474	.....	.....	.....	43.9	56.1	43.9	56.1	.....	.....
Colorado	92,042	65,101	27,841	65,047	41,226	23,821	27,805	23,875	4,020	70.0	30.0	63.4	36.6	85.6	14.4
Illinois	552,396	396,965	156,431	552,396	396,965	156,431	.....	.....	.....	71.7	28.3	71.7	28.3	.....	.....
Indiana	140,244	103,910	36,334	140,244	103,910	36,334	.....	.....	.....	74.1	25.9	74.1	25.9	.....	.....
Iowa	70,192	20,152	50,040	70,192	20,152	50,040	.....	.....	.....	28.7	71.3	28.7	71.3	.....	.....
Kansas	80,459	53,340	27,119	80,459	53,340	27,119	.....	.....	.....	66.3	33.7	66.3	33.7	.....	.....
Kentucky	364,669	247,006	117,663	332,084	214,421	117,663	32,585	32,585	.....	67.7	32.3	64.6	35.4	100.0	.....
Maryland	68,220	63,596	4,624	68,220	63,596	4,624	.....	.....	.....	93.2	6.8	93.2	6.8	.....	.....
Michigan	23,135	3,696	19,439	23,135	3,696	19,439	.....	.....	.....	16.0	84.0	16.0	84.0	.....	.....
Missouri	116,108	70,805	45,303	116,108	70,805	45,303	.....	.....	.....	61.0	39.0	61.0	39.0	.....	.....
North Dakota	10,356	7,971	2,385	10,356	7,971	2,385	.....	.....	.....	77.0	23.0	77.0	23.0	.....	.....
Ohio	406,336	260,423	145,913	406,336	260,423	145,913	.....	.....	.....	64.1	35.9	64.1	35.9	.....	.....
Oklahoma	75,744	910	74,834	75,744	910	74,834	.....	.....	.....	1.2	98.8	1.2	98.8	.....	.....
Oregon	3,122	1,452	1,670	3,122	1,452	1,670	.....	.....	.....	46.5	53.5	46.5	53.5	.....	.....
Pennsylvania	1,673,537	1,321,981	351,556	1,338,003	1,050,246	287,757	335,534	271,735	63,799	79.0	21.0	78.5	21.5	81.0	19.0
Connellsville district[1]	116,520	98,228	18,292	.....	.....	.....	116,520	98,228	18,292	84.3	15.7	.....	.....	84.3	15.7
Tennessee	458,024	353,054	104,970	329,050	232,080	96,970	129,274	121,274	8,000	77.1	22.9	70.6	29.4	93.8	6.2
Texas	125,774	104,513	21,261	125,774	104,513	21,261	.....	.....	.....	83.1	16.9	83.1	16.9	.....	.....
Virginia	169,296	85,217	84,079	35,190	11,353	23,837	134,106	73,864	60,242	50.3	49.7	32.3	67.7	55.1	44.9
Washington	88,611	67,635	20,976	83,313	66,295	17,018	5,298	1,340	3,958	76.3	23.7	79.6	20.4	25.3	74.7
West Virginia	1,134,485	583,263	551,222	565,457	215,401	350,056	569,028	367,862	201,166	51.4	48.6	38.1	61.9	64.6	35.4
Wyoming	64,783	50,024	14,759	64,783	50,024	14,759	.....	.....	.....	77.2	22.8	77.2	22.8	.....	.....
All other states[2]	200,236	139,258	60,977	112,230	73,253	38,977	88,005	66,005	22,000	69.5	30.5	65.3	34.7	75.0	25.0

[1] Excludes the acreage of a few mines without coke manufacture in order to avoid disclosing individual operations.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

In the United States as a whole, 69.2 per cent of the coal land reported in 1909 was owned by the operators, while 30.8 per cent was held under lease. For mines without coke manufacture, 66 per cent was owned by operators, as compared with 78.4 per cent for mines with coke manufacture. This difference is due chiefly to the fact that the latter group includes many large companies with ample capital to permit the purchase of land. (See remarks following Table 49.)

The marked differences among the states with respect to the proportion of land owned and of land leased by mine operators can be attributed only to varying local conditions.

Production according to tenure of land, by states: 1909.—The following table gives, by states, the number of mines reported operated on land owned, on land held under lease, and on land partly owned and partly held under lease, together with the total output for each class of mines:

Table 38

STATE.	NUMBER OF MINES OPERATED ON LAND—			TOTAL TONS (2,000 POUNDS) OF COAL PRODUCED BY MINES OPERATED ON COAL LAND—		
	Owned.	Held under lease.	Partly owned and partly held under lease.	Owned.	Held under lease.	Partly owned and partly held under lease.
United States.	**2,220**	**2,410**	**1,383**	[1] 165,161,940	[2] 82,800,403	[3] 128,903,167
Alabama	109	63	31	10,360,417	1,639,530	1,070,605
Arkansas	19	35	15	1,178,105	550,642	644,872
Colorado	48	54	53	1,999,949	1,660,106	6,082,813
Illinois	237	256	138	26,638,767	5,940,057	17,991,079
Indiana	147	115	60	7,220,506	2,506,029	4,996,606
Iowa	57	178	76	1,408,230	2,365,695	3,951,754
Kansas	56	121	25	3,185,115	1,868,893	1,841,652
Kentucky	144	121	45	5,507,607	3,055,051	1,907,018
Maryland	42	17	11	2,910,850	341,265	749,157
Michigan	3	2	23	9,987	[4]	[5] 1,762,328
Missouri	75	113	32	1,179,523	1,095,589	1,351,579
Montana	42	12	11	1,287,913	282,190	973,280
New Mexico	18	3	7	1,052,254	32,990	1,089,968
North Dakota	44	9	.....	330,305	34,231	.....
Ohio	260	225	155	12,473,327	4,022,418	11,023,019
Oklahoma	6	94	4	50,394	2,906,888	165,867
Oregon	4	3	2	20,067	[6]	[7] 54,037
Pennsylvania	587	471	451	64,782,860	21,400,517	51,121,383
Tennessee	38	75	29	2,002,475	3,043,900	926,555
Texas	28	11	8	1,282,486	383,603	158,593
Utah	21	1	.....	[1] 2,259,780	[8]	.....
Virginia	10	54	21	147,896	2,761,667	2,039,778
Washington	25	10	19	2,470,080	138,244	992,889
West Virginia	157	352	152	11,008,781	26,111,412	14,375,473
Wyoming	35	15	15	3,470,907	688,717	2,134,072
All other states [9]	8	.....	.....	224,350	.....	.....

[1] Includes tonnage of 1 mine operated on coal land held under lease, to avoid disclosing individual operations.
[2] Excludes 112,553 tons produced by 6 mines operated on coal land held under lease, to avoid disclosing output of individual operators.
[3] Includes tonnage of 5 mines operated on coal land held under lease.
[4] See Note 5.
[5] Includes tonnage of 2 mines operated on coal land held under lease.
[6] See Note 7.
[7] Includes tonnage of 3 mines operated on coal land held under lease.
[8] See Note 1.
[9] Includes California, Georgia, and Idaho.

Of the total production covered by the table, namely, 376,865,510 tons, 165,161,940 tons, or 43.8 per cent, was that of mines on land wholly owned by the operators; 82,800,403 tons, or 22 per cent, that of mines on land wholly leased; and 128,903,167 tons, or 34.2 per cent, that of mines on lands partly owned and partly leased by the operators. Although mines of the latter class did not report what part of the output came from owned and what part from leased land, it is probable that the greater portion was taken from owned land. This is shown by the amount of royalties reported by these operators as paid on coal taken from leased tracts, which indicates that the coal mined from such lands was somewhat less than half the total production of these mines. (See Tables 33 and 55.) Consequently, of the total coal output of the United States in 1909, it may be said that between 60 and 65 per cent was mined from lands owned by the operators, while between 35 and 40 per cent was produced from leased holdings.

The table indicates that mines operated on land owned were usually larger than those operated on land held under lease by operators. In the United States, as a whole, the average output per mine for these two classes of mines was, respectively, 74,000 and 34,000 tons, while in Illinois these averages were 112,000 and 23,000 tons, in Ohio 48,000 and 18,000 tons, and in Pennsylvania 110,000 and 45,000 tons, respectively. This difference in size, however, is due not to the form of tenure, but to the fact that concerns able to purchase large holdings of coal lands outright usually have the capital also to open large mines.

Comparative statistics of holdings, by states: 1909 and 1889.—Table 39 shows, by states, the number of acres of land owned and the number held under lease by operators, for 1889 and 1909.

Inasmuch as the returns for 1889 did not distinguish between coal land and other land held by operators, it has been necessary, in order to present comparable data for 1909, to include not only coal land, but all land controlled by operators. However, more than 85 per cent of the acreage reported in 1909 was coal land, and much of the remainder is underlaid with coal measures which may eventually prove workable.

Table 39

STATE.	COAL AND OTHER LAND CONTROLLED.						
	Total acres.			Acres owned.		Acres held under lease.	
	1909	1889	Per cent of increase.	1909	1889	1909	1889
United States	**7,717,815**	**1,526,933**	**405.4**	**5,635,243**	**1,141,011**	**2,082,372**	**385,922**
Alabama	776,244	222,749	248.5	701,790	216,129	74,454	6,620
Arkansas	54,680	17,064	220.5	24,137	15,969	30,549	1,095
Colorado	113,630	73,789	54.0	84,915	53,529	28,721	20,260
Illinois	585,366	191,740	205.3	424,739	161,468	160,627	30,272
Indiana	155,576	24,808	527.1	117,619	15,785	37,957	9,023
Iowa	77,790	38,682	101.1	26,771	24,239	51,025	14,443
Kansas [1]	83,869	40,016	109.6	56,205	36,077	27,664	3,939
Kentucky	399,840	128,100	212.1	280,053	108,622	119,793	21,478
Maryland	92,814	50,520	83.7	88,129	48,100	4,685	2,420
Michigan	25,661	622	4,025.6	6,222	142	19,439	480
Missouri	119,822	35,917	233.6	74,519	24,276	45,303	11,641
Montana	54,335	9,510	471.3	44,098	9,110	10,237	400
New Mexico	294,318	11,280	2,509.2	240,124	10,480	54,194	800
North Dakota	14,695	520	2,726.0	12,300	520	2,395	.....
Ohio	432,204	104,898	312.0	283,439	66,697	148,765	38,201
Oklahoma	82,504	14,766	458.7	910	.....	81,594	14,766
Pennsylvania	1,965,568	230,836	751.5	1,604,753	132,811	360,815	98,025
Tennessee	661,507	133,912	394.0	548,247	78,289	113,260	55,623
Texas	130,063	4,780	2,621.0	108,132	1,000	21,931	3,780
Utah	27,541	5,910	366.0	27,341	5,910	200	.....
Virginia	170,470	17,690	863.7	86,282	13,900	84,197	3,790
Washington	98,167	23,198	323.2	76,271	20,322	21,896	2,876
West Virginia	1,176,860	107,521	994.5	611,023	61,531	565,837	45,990
Wyoming	70,908	13,360	430.7	55,744	13,360	15,164	.....
All other states [2]	53,150	24,745	114.8	51,480	24,745	1,670	.....

[1] Includes Nebraska in 1889.
[2] Includes California, Georgia, Idaho, and Oregon in 1909; California, Georgia, Oregon, and North Carolina in 1889.

The table shows a remarkable increase in the total acreage of lands controlled by mine operators between 1889 and 1909. For the entire United States this increase was more than 400 per cent, and for many individual states it was much greater. This increase is due chiefly to the great development of the industry in these 20 years, but may in part indicate an increased practice of securing reserve lands for the future. While, for the United States as a whole, the total acreage held under lease has increased but little more rapidly than the total acreage owned by operators, in a good many important states, notably Alabama, Illinois, Kentucky, and West Virginia, the area leased by operators increased far more than the acreage owned. In a few states, for example, Indiana, Ohio, Pennsylvania, and Tennessee, the opposite was the case.

MINES CLASSIFIED ACCORDING TO THE RELATION OF TOTAL EXPENSES TO VALUE OF PRODUCTS.

According to the relation of expenses to the value of products the coal mining enterprises reporting at the census of 1909 were classified as explained in the text following Table 40. The table gives, by states, for 1909 the number and output of mines in "Class A," "Class B," and "Class C."

[See text below for explanation of classification.]

Table 40

STATE.	NUMBER OF MINES.			TONS OF COAL PRODUCED BY MINES (2,000 POUNDS).						TONS OF COKE MADE AT MINES (2,000 POUNDS).					
	Class A.	Class B.	Class C.	Class A.	Class B.	Class C.	Per cent produced by mines.			Class A.	Class B.	Class C.	Per cent produced by mines.		
							Class A.	Class B.	Class C.				Class A.	Class B.	Class C.
All mines: United States	**4,088**	**983**	**942**	[1] 282,866,545	[2] 54,037,376	39,961,580	[2] 75.1	[2] 14.3	10.6	28,075,777	2,303,892	2,070,813	86.5	7.1	6.4
MINES WITHOUT COKE MANUFACTURE.															
United States	**3,571**	**899**	**895**	[1] 201,685,134	[2] 44,935,390	34,031,516	[2] 71.9	[2] 16.0	12.1						
Alabama	109	28	30	5,057,083	820,316	629,523	77.6	12.7	9.7						
Arkansas	32	10	18	1,075,722	889,034	498,803	45.3	37.5	17.2						
Colorado	94	12	34	4,832,791	426,035	1,735,030	69.1	6.1	24.8						
Illinois	408	140	83	32,382,469	12,104,725	5,993,309	64.0	24.1	11.9						
Indiana	224	54	44	8,084,863	3,420,569	2,608,799	59.0	23.3	17.7						
Iowa	230	30	45	4,558,946	960,501	2,206,232	59.0	12.4	28.6						
Kansas	125	58	19	4,390,216	2,005,820	499,615	63.7	29.1	7.2						
Kentucky	169	64	66	5,893,522	1,745,465	1,747,191	62.8	18.6	18.6						
Maryland	62	2	6	[3] 3,874,534	(4)	126,738	[4] 96.8	(4)	3.2						
Michigan	18	.....	10	1,144,916	.....	627,399	64.6	.....	35.4						
Missouri	168	25	27	1,775,001	855,062	966,028	49.4	23.8	26.9						
North Dakota	39	1	13	[5] 280,251	(6)	75,285	[5] 79.3	(6)	20.7						
Ohio	451	116	73	18,342,526	7,083,550	2,092,679	66.7	25.7	7.6						
Oklahoma	42	33	29	1,454,089	1,092,020	657,040	46.7	32.2	21.1						
Oregon	5	.....	4	30,512	.....	53,192	36.5	.....	63.5						
Pennsylvania	873	105	141	71,269,885	7,422,550	6,411,514	83.7	8.7	7.5						
Tennessee	62	27	40	3,123,127	636,365	897,765	67.1	13.7	19.3						
Texas	28	7	12	1,456,156	178,581	190,005	79.8	9.8	10.4						
Virginia	19	12	13	990,602	134,039	365,494	66.6	9.0	24.5						
Washington	20	.....	22	3,054,624	.....	441,618	87.4	.....	12.6						
West Virginia	200	100	119	17,803,418	4,927,035	4,376,478	65.8	18.1	16.1						
Wyoming	51	4	10	5,890,150	215,105	183,341	93.7	3.4	2.9						
All other states [7]	67	2	37	[3] 4,244,731	(4)	737,478	[4] 85.2	(4)	14.8						
MINES WITH COKE MANUFACTURE.															
United States	**517**	**84**	**47**	**81,181,411**	**9,101,986**	**5,930,073**	**84.4**	**9.5**	**6.2**	**28,075,777**	**2,303,892**	**2,070,813**	**86.5**	**7.1**	**6.4**
Colorado	15	.....	.....	3,648,112	.....	.....	100.0	.....	.....	1,061,868	.....	.....	100.0	.....	.....
Pennsylvania	284	25	21	46,509,334	4,186,128	1,505,349	89.1	8.0	2.9	20,515,361	1,263,595	720,750	91.2	5.6	3.2
Connellsville district	220	5	13	37,389,151	918,027	991,700	96.5	0.9	2.6	19,388,382	226,274	592,608	96.0	1.1	2.9
West Virginia	151	21	10	20,935,504	2,020,853	1,372,378	86.1	8.3	5.6	3,133,341	417,607	258,080	82.3	11.0	6.8
All other states [8]	67	38	16	10,088,461	2,895,005	3,052,346	62.0	18.1	19.0	3,365,207	622,690	1,091,983	66.2	12.3	21.5

[1] Includes tonnage of 5 "Class B" mines.
[2] See Note 1.
[3] Includes tonnage of 2 "Class B" mines.
[4] See Note 3.
[5] Includes tonnage of 1 "Class B" mine.
[6] See Note 5.
[7] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.
[8] Includes Alabama, Georgia, Kentucky, Montana, New Mexico, Tennessee, Utah, Virginia, and Washington.

The foregoing classification was made as follows: First, whenever a report showed an excess of value of products over all reported expenditures, including expenses of operation and outlays for development work (if any), the enterprise was placed in "Class A." Second, whenever a report showed expenditures greater than the value of products, and no expenses were reported for development work, the enterprise was placed in "Class B." In all cases where there was doubt as to the accuracy of such a report the operator's attention was called to the fact that it showed an excess of expenses over value of products, a verification or correction was requested, and the enterprise covered by the report was then classified in accordance with the reply received. Third, those reports which showed an excess of expenditures over value of products. but stated that

a part of the expenditures were for development work, were placed in "Class C," no attempt being made, on account of the uncertainty as to the significance of the expenditure for development work, to determine whether the strictly operating expenses exceeded the value of products obtained or not. In each case the expenses and value of products of the coke business, where conducted in connection with mining, were taken into account in making the classification.

In considering this classification the discussion in the Introduction regarding the difference between the expenses of mining as reported and the true cost of mining as determined by scientific methods of accounting, together with the remarks in connection with Table 32 should be borne in mind. With a proper allowance for depreciation some mines reporting a value of product in excess of the expenses reported might have been operated at a loss. On the other hand, some mine operators who lost on their mining business recouped themselves by profits from operating stores, renting houses, and from other nonmining business not covered by the returns.

Of the 6,013 mines covered by Table 40 it appears that 4,088, producing about three-fourths of the total coal output, were in "Class A;" that is, their value of products exceeded their expenses as reported. Marked differences appear from state to state. In Maryland and Wyoming more than 90 per cent of the total coal output was produced by such mines, in Pennsylvania and Washington more than 85 per cent, and in Colorado, Texas, and West Virginia more than 75 per cent. On the other hand, in Arkansas, Missouri, Oklahoma, and Oregon less than half the tonnage produced was reported by mines at which the value of products exceeded the total reported expenses, but in Arkansas and Oklahoma there was some duplication of the expenses reported which may have materially affected this classification. (See remarks preceding Table 51.)

In general, a greater proportion of the mines operated in combination with coke manufacture are found in "Class A" than of the mines without coke ovens. Many of these coke-making mines operated under peculiarly favorable conditions. The majority were closely affiliated with large consumers of coke, and were thus enabled to operate more regularly and on a larger scale, while the output was doubtless often charged to the parent companies at values more or less independent of market prices.

METHODS OF MINE OPERATION.

Pick and machine mining.—In some mines practically the entire output of coal is machine mined, in others the entire output is pick mined, while in many the output is partly machine and partly pick mined.

The following table gives the total quantity and percentage of coal produced by machine and by pick mining in different states, and Table 53 gives additional data relating to this subject.

OUTPUT OF BITUMINOUS COAL MINES CLASSIFIED ACCORDING TO METHOD OF MINING, BY STATES: 1909.

Table 41	TONS (2,000 POUNDS) OF COAL PRODUCED AT—									PER CENT OF COAL PRODUCED AT—					
STATE.	All mines.			Mines without coke manufacture.			Mines with coke manufacture.			All mines.		Mines without coke manufacture.		Mines with coke manufacture.	
	Total.	By machine.	By pick.	Total.	By machine.	By pick.	Total.	By machine.	By pick.	By machine.	By pick.	By machine.	By pick.	By machine.	By pick.
United States	**376,865,510**	**144,775,410**	**232,090,100**	**280,652,040**	**122,881,301**	**157,770,739**	**96,213,470**	**21,894,109**	**74,319,361**	**38.4**	**61.6**	**43.8**	**56.2**	**22.8**	**77.2**
Alabama	13,076,561	2,295,500	11,381,061	6,515,922	1,151,808	5,364,114	7,160,639	1,143,692	6,016,947	16.8	83.2	17.7	82.3	16.0	84.0
Arkansas	2,373,619	4,444	2,369,175	2,373,619	4,444	2,369,175	.....	.....	.....	0.2	99.8	0.2	99.8	.....	.....
Colorado	10,042,808	2,046,645	8,596,223	6,994,756	2,046,645	4,948,111	3,648,112	.....	3,648,112	19.2	80.8	29.3	70.7	.....	100.0
Illinois	50,570,503	18,140,591	32,429,912	50,570,503	18,140,591	32,429,912	.....	.....	.....	35.9	64.1	35.9	64.1	.....	.....
Indiana	14,723,231	7,450,091	7,273,140	14,723,231	7,450,091	7,273,140	.....	.....	.....	50.6	49.4	50.6	49.4	.....	.....
Iowa	7,725,679	8,414	7,717,265	7,725,679	8,414	7,717,265	.....	.....	.....	0.1	99.9	0.1	99.9	.....	.....
Kansas	6,895,660	54,976	6,840,684	6,895,660	54,976	6,840,684	.....	.....	.....	0.8	99.2	0.8	99.2	.....	.....
Kentucky	10,561,276	6,494,960	4,066,316	9,386,178	5,512,263	3,873,915	1,175,098	982,697	192,401	61.5	38.5	58.7	41.3	83.6	16.4
Maryland	4,001,272	117,568	3,883,704	4,001,272	117,568	3,883,704	.....	.....	.....	2.9	97.1	2.9	97.1	.....	.....
Michigan	1,772,315	628,211	1,144,104	1,772,315	628,211	1,144,104	.....	.....	.....	35.4	64.6	35.4	64.6	.....	.....
Missouri	3,596,691	798,878	2,797,813	3,596,691	798,878	2,797,813	.....	.....	.....	22.2	77.8	22.2	77.8	.....	.....
North Dakota	364,536	164,365	200,171	364,536	164,365	200,171	.....	.....	.....	45.1	54.9	45.1	54.9	.....	.....
Ohio	27,518,764	22,112,063	5,406,701	27,518,764	22,112,063	5,406,701	.....	.....	.....	80.4	19.6	80.4	19.6	.....	.....
Oklahoma	3,113,149	50,811	3,062,338	3,113,149	50,811	3,062,338	.....	.....	.....	1.6	98.4	1.6	98.4	.....	.....
Oregon	83,704	22,000	61,704	83,704	22,000	61,704	.....	.....	.....	26.3	73.7	26.3	73.7	.....	.....
Pennsylvania	137,304,760	57,574,954	79,729,806	85,103,949	46,873,329	38,230,620	52,200,811	10,701,625	41,499,186	41.9	58.1	55.1	44.9	20.5	79.5
Connellsville district[1]	38,729,778	4,065,186	34,664,592	.....	.....	.....	38,729,778	4,065,186	34,664,592	10.5	89.5	.....	.....	10.5	89.5
Tennessee	5,972,930	1,024,398	4,948,532	4,657,257	944,599	3,712,658	1,315,673	79,799	1,235,874	17.2	82.8	20.3	79.7	6.1	93.9
Texas	1,824,742	17,230	1,807,512	1,824,742	17,230	1,807,512	.....	.....	.....	0.9	99.1	0.9	99.1	.....	.....
Virginia	4,949,341	1,439,811	3,509,530	1,490,135	616,076	874,059	3,459,206	823,735	2,635,471	29.1	70.9	41.3	58.7	23.8	76.2
Washington	3,601,213	48,690	3,552,523	3,496,242	48,690	3,447,552	104,971	.....	104,971	1.4	98.6	1.4	98.6	.....	100.0
West Virginia	51,495,666	20,945,819	30,549,847	27,166,931	13,871,026	13,295,905	24,328,735	7,074,793	17,253,942	40.7	59.3	51.1	48.9	29.1	70.9
Wyoming	6,294,596	1,391,101	4,903,495	6,294,596	1,391,101	4,903,495	.....	.....	.....	22.1	77.9	22.1	77.9	.....	.....
All other states[2]	7,802,434	1,943,890	5,858,544	4,982,209	856,122	4,126,087	2,820,225	1,087,768	1,732,457	24.9	75.1	17.2	82.8	38.6	61.4

[1] Exclusive of the tonnage of a few mines without coke manufacture in order to avoid disclosing individual operations.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

Although in some mines the condition of the roof and floor, and the structure of the coal measure itself may seriously affect, or even prevent the use of machines for undercutting and shearing coal, this is not the case in most mines now operating; and, speaking broadly, it may be said that the use of machines generally indicates more advanced and more efficient methods of mine operation.

While this table shows that 38.4 per cent of the total coal output of the United States in 1909 was machine mined, great differences appear from state to state. In Ohio 80.4 per cent, in Kentucky 61.5 per cent, and in Indiana 50.6 per cent of all coal was mined by machines. Although Pennsylvania shows the greatest absolute tonnage mined by machines, only 41.9 per cent of the state's total coal output was thus produced. In Arkansas, Iowa, Kansas, and Texas the proportion mined by machines was insignificant.

As a group the mines with coke ovens show only 22.8 per cent of their production machine mined, as compared with 43.8 per cent for the mines without coke manufacture. In the important Connellsville coke district of Pennsylvania only 10.5 per cent of the output of coal was machine mined, as compared with 55.1 per cent for the Pennsylvania mines without coke manufacture. This difference in the use of machines between mines with and those without coke manufacture is partly accounted for by the fact that mines which market a large part of their output of coal in the form of coke—including the less remunerative "slack"—are thereby often rendered less urgently in need of introducing machines to lower operating costs and to decrease the percentage of "slack" produced, than are those mines which must market their entire output of coal as such, including the "slack."

Kind of mine opening.—Coal is produced from four general types of mine openings: Vertical shafts, slopes, horizontal or upward sloping drifts, and open cuts or strippings. Some mines have openings of two or more kinds. To some extent mine operation is affected by the kind of opening. For example, many drift mines of commercial importance are operated without the use of mechanical power, but no shaft mine thus operated can produce any considerable tonnage. Scores of drifts are self-draining, but in slope and shaft mines pumps are used to keep the workings clear of water. The initial cost of opening drifts is less than that for shafts, since the drift starts at once in the coal, while the shaft must first be sunk some distance through rock or other material. Since drifts open coal measures which have been partially eroded, and which outcrop along hill or mountain sides, the quantity of coal which can be mined through such an opening is often limited, and this may affect the size of the mine, but the size of slope or shaft mines may be less limited in this manner. Open cuts or strippings are quarries rather than true mines, since the entire overburden is removed before the coal is taken out.

The following table gives for various states the total quantity and percentage of coal produced from different openings, and Table 54 gives additional information relating to this subject.

OUTPUT OF BITUMINOUS COAL MINES CLASSIFIED ACCORDING TO KIND OF OPENING, BY STATES: 1909.

Table 42

STATE.	TONS (2,000 POUNDS) OF COAL PRODUCED BY—						PER CENT FROM—				
	All mines.	Shaft mines.	Slope mines.	Drift mines.	Open cuts or strippings.	Mines with opening not specified or with two or more kinds.	Shaft mines.	Slope mines.	Drift mines.	Open cuts or strippings.	Mines with opening not specified or with two or more kinds.
United States	**376,865,510**	[1] **132,128,764**	**62,059,748**	**156,855,362**	[2] **291,578**	[3] **24,630,058**	**35.1**	**16.7**	**41.6**	**0.1**	**6.5**
Arkansas	2,373,619	1,368,386	883,595			[4] 121,638	57.7	37.2			5.1
Colorado	10,642,868	2,451,078	5,004,350	2,647,616		479,818	23.0	47.6	24.9		4.5
Illinois	50,570,503	48,780,105	540,303	529,564	70,570	649,871	96.5	1.1	1.0	0.1	1.3
Indiana	14,723,231	13,732,135	307,004	95,638	20,825	567,629	93.3	2.1	0.6	0.1	3.9
Iowa	7,725,070	5,737,097	224,484	81,240		[4] 1,682,252	74.3	2.9	1.0		21.8
Kansas	6,805,060	6,070,924	51,031		93,342	70,763	96.7	0.7		1.4	1.2
Kentucky	10,561,270	2,470,280	2,035,391	5,180,910		[4] 865,089	23.4	19.3	49.1		8.2
Michigan	1,772,315	[5] 1,772,315					100.0				
Missouri	3,596,601	2,890,940	232,213	219,057	58,256	195,025	80.4	6.5	6.1	1.0	5.4
Montana	2,543,383	197,757	1,134,171	1,073,766		137,689	7.8	44.6	42.2		5.4
New Mexico	2,774,912		1,818,382	901,560		[6] 54,934		65.5	32.5		2.0
Ohio	27,518,764	7,816,280	3,556,732	14,390,513		1,755,233	28.4	12.9	52.3		6.4
Oklahoma	3,113,149	1,294,103	1,412,634	20,443	27,320	358,649	41.6	45.4	0.7	0.9	11.5
Pennsylvania	137,304,760	31,237,388	27,595,960	70,117,374		8,354,038	22.8	20.1	51.1		6.1
Tennessee	5,972,930		522,528	5,169,325		[4] 281,077		8.7	86.5		4.7
Texas	1,824,742	1,408,024	276,823			138,995	77.2	15.2			7.6
Virginia	4,040,341		114,201	3,906,407		[7] 928,583		2.3	78.9		18.8
Washington	3,601,213		2,420,581	681,997		[4] 498,635		67.2	18.9		13.9
West Virginia	51,495,666	3,867,070	2,395,423	44,700,542		532,625	7.5	4.7	86.8		1.0
Wyoming	6,294,596		4,149,128	1,390,536		[6] 754,932		65.9	22.1		12.0
All other states[8]	20,610,212	433,364	8,223,428	5,739,202	21,265	6,192,953	2.1	39.9	27.8	0.1	30.0

[1] Includes the product of 1 slope mine and excludes 460,286 tons, the product of 5 shaft mines, in order that individual operations might not be disclosed.
[2] Excludes 17,834 tons, the product of 4 open cut mines, in order that individual operations might not be disclosed.
[3] Includes 460,286 tons, the product of 5 shaft mines, and 17,834 tons, the product of 4 open cut mines, in order that individual operations might not be disclosed.
[4] Includes the product of 1 open cut mine.
[5] Includes the product of 1 slope mine.
[6] Includes the product of 1 shaft mine.
[7] Includes the product of 2 shaft mines.
[8] Includes Alabama, California, Georgia, Idaho, Maryland, North Dakota, Oregon, and Utah.

In the United States as a whole drift mines have the greatest output, 41.6 per cent of the total, in 1909, shaft mines following with 35.1 per cent, and slope mines with 16.7 per cent. Drift mines are especially numerous in the Appalachian fields. Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia, each reported more than 50 per cent of its output produced from such openings, and these states together reported nearly 90 per cent of all the coal mined from drifts in the United States. The predominance of drifts in these states is explained by the fact that in the Appalachian region immense deposits of coal have been cut through in all directions by streams, while the measures are but little displaced from the horizontal, and consequently there are thousands of miles of outcrops on which drift mines may be opened.

Shaft mines characterize the states of the Eastern and Northern Interior and of the Western and Southwestern Interior regions. Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, and Texas, each reported more than 70 per cent of its output produced from such mines. In these states the coal measures generally lie at some distance below the surface, outcrops are few, and shafts are necessary for extensive development. The greater part of the small tonnage of open cuts or strippings was also produced in these states. These open cuts or strippings are made along the outcrop of the coal, or where it lies near the surface, and the overburden is removed until its thickness limits the stripping. Although but a small aggregate tonnage was thus obtained in 1909, there is considerable coal available in many fields for such operations.

Slope mines are of two general types: Those which open on the outcrop of a pitching vein and follow the incline of the deposit, and those which first go through more or less rock and earth to reach a deposit which may be approximately horizontal. Slope mines of the first type are found chiefly in the Rocky Mountain and Pacific Coast states, where many coal measures with the inclosing strata have been much disturbed by folding and displacement. Slope mines of the second type are scattered through many states, slopes often taking the place of shafts where the distance to the underlying bed is not great.

The quantity of coal entered in the sixth column includes not only the output of mines the reports for which failed to specify the kind of opening, but also the production of such individual mines as have two or more openings of different kinds, and that of operators with several mines of different types covered by one combined report. The states included among "All other states" were those in which the proportion not specified was too large to justify separate presentation of the figures for the several classes.

DISPOSITION OF COAL.

A small part of the coal produced is used at the mines for steam and heat, a part is made into coke at the mines, a small part is sold locally, and the remainder is either used in the vicinity of the mines by the producing concerns in other departments of their business (manufacturing, transportation, etc.) or is shipped from the mines for such use or for sale. The following table gives, by states, the percentages disposed of in the four different ways above outlined. The absolute quantities appear in Table 62.

In the United States in 1909, 81.7 per cent of the total bituminous coal output was shipped from the mines for sale or was used as fuel in other departments by producers, 13.3 per cent was coked at the mines, and the remaining 5 per cent was either sold locally or used at the mines for steam and heat. For mines at which no coke was made 94.4 per cent was shipped away for sale or was used as fuel in other departments by the producers. For the mines at which coke was manufactured 44.8 per cent of the output was disposed of similarly and 52 per cent was coked. Considerable variations appear among the states with reference to the disposition of coal by mines of this class. In the Connellsville district of Pennsylvania 77.7 per cent of the entire output of mines having coke ovens was coked at the mines and much of the remainder was coked elsewhere. On the other hand, in Kentucky, where coke manufacturing was merely incidental, in 1909, but 7.3 per cent of the output of mines with ovens was coked.

The table shows that of the total output of bituminous coal 2.5 per cent was burned at the mines for steam and heat. With the single exception of Oregon the variation from state to state in the percentage thus used was not large. The unusual proportion thus consumed in Oregon is accounted for by the fact that a considerable tonnage of refuse from washing coal for market was burned under the boilers.

BITUMINOUS COAL MINES—DISPOSITION OF OUTPUT, BY STATES: 1909.

Table 43

STATE.	PER CENT OF TOTAL TONS OF OUTPUT FROM—									
	All mines.				Mines without coke manufacture.			Mines with coke manufacture.		
	Loaded at mines for shipment or used in other departments by producers.	Sold locally.	Made into coke at mines.	Used at mines for steam and heat.	Loaded at mines for shipment or used in other departments by producers.	Sold locally.	Used at mines for steam and heat.	Loaded at mines for shipment or used in other departments by producers.	Sold locally.	Made into coke at mines.	Used at mines for steam and heat.
United States	**81.7**	**2.5**	**13.3**	**2.5**	**94.4**	**3.1**	**2.5**	**44.8**	**0.8**	**52.0**	**2.4**
Alabama	60.2	1.0	34.8	3.9	94.3	1.8	3.9	20.2	0.3	66.5	3.9
Arkansas	95.6	0.6	.....	3.8	95.6	0.6	3.8	.....	.....	.....	.....
Colorado	79.0	2.3	15.6	3.1	93.4	3.4	3.2	51.3	0.4	45.4	2.9
Illinois	92.2	5.0	.....	2.9	92.2	5.0	2.9	.....	.....	.....	.....
Indiana	91.6	5.5	.....	2.9	91.6	5.5	2.9	.....	.....	.....	.....
Iowa	88.5	8.8	.....	2.7	88.5	8.8	2.7	.....	.....	.....	.....
Kansas	95.4	2.5	.....	2.1	95.4	2.5	2.1	.....	.....	.....	.....
Kentucky	92.9	3.8	0.8	2.5	93.9	4.0	2.1	85.4	1.9	7.3	5.4
Maryland	97.9	0.9	.....	1.2	97.9	0.9	1.2	.....	.....	.....	.....
Michigan	90.9	5.1	.....	4.0	90.9	5.1	4.0	.....	.....	.....	.....
Missouri	90.0	8.2	.....	1.8	90.0	8.2	1.8	.....	.....	.....	.....
North Dakota	66.6	30.0	.....	3.4	66.6	30.0	3.4	.....	.....	.....	.....
Ohio	95.1	2.7	.....	2.2	95.1	2.7	2.2	.....	.....	.....	.....
Oklahoma	92.5	1.4	.....	6.1	92.5	1.4	6.1	.....	.....	.....	.....
Oregon	52.9	26.4	.....	20.7	52.9	26.4	20.7	.....	.....	.....	.....
Pennsylvania	71.7	1.5	24.6	2.2	95.9	2.0	2.1	32.3	0.8	64.7	2.2
Connellsville district [1]	19.3	0.8	77.7	2.2	.....	.....	.....	19.3	0.8	77.7	2.2
Tennessee	90.4	1.3	6.6	1.7	97.3	1.2	1.5	66.0	1.6	30.0	2.4
Texas	97.0	0.3	.....	2.6	97.0	0.3	2.6	.....	.....	.....	.....
Virginia	56.6	1.0	38.7	3.7	96.5	1.5	2.1	39.5	0.8	55.3	4.4
Washington	92.5	1.6	1.9	4.0	94.4	1.6	4.0	29.5	0.6	66.4	3.5
West Virginia	85.1	1.1	12.0	1.8	96.9	1.4	1.7	71.9	0.9	25.4	1.9
Wyoming	94.4	1.1	.....	4.5	94.4	1.1	4.5	.....	.....	.....	.....
All other states [2]	78.9	2.0	15.9	3.2	93.1	2.8	4.1	53.7	0.5	44.1	1.6

[1] Exclusive of a few mines without coke manufacture, omitted to avoid disclosing individual operations.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

STATISTICS OF COMMERCIAL AND OF LOCAL OPERATORS.

The census of bituminous coal mines covered all operations with an output of 1,000 tons or more in 1909. Particular interest attaches to the statistics of producers for the general trade, who may be called commercial producers, as distinguished from local operators (shipping no coal, but catering entirely to local demand). Separate statistics for these two classes of operators for the United States as a whole are summarized in the following table. The commercial mines of course include many which do not produce primarily for sale in the open market, but whose product is largely used by railroads or industrial concerns controlling the mines.

While the table shows a total of 1,084 operators selling their entire output locally, it must be remembered that hundreds of such operators were not covered by the census because their output fell below 1,000 tons. These 1,084 operators constituted nearly one-third of the total number reporting and operated nearly one-fifth of all the mines covered, but their output, aggregating 3,678,000 tons, was only a fraction of the total for the industry.

Table 44

	All operators.	LOCAL OPERATORS.		COMMERCIAL OPERATORS.	
		Amount or number.	Per cent of total.	Amount or number.	Per cent of total.
Number of operators	3,503	[1] 1,084	30.9	2,419	69.1
Number of mines	6,013	1,131	18.8	4,882	81.2
Acres of land controlled	7,717,615	151,211	2.0	7,566,404	98.0
Total expenses	$395,907,026	$4,632,372	1.2	$391,274,654	98.8
Exclusive of coking expenses (partly estimated)	$378,159,282	$4,632,372	1.2	$373,526,910	98.8
Average per ton of coal	$1.00	$1.26	.....	$1.00	.....
Products, total value	$427,962,464	$5,490,440	1.3	$422,472,024	98.7
Coal, exclusive of coal coked at mines—					
Tons (2,000 pounds)	326,792,907	3,678,320	1.1	323,114,587	98.9
Value at mines	$360,052,340	$5,490,440	1.5	$354,561,900	98.5
Coke made at mines—					
Tons (2,000 pounds)	32,450,482	.....	.....	32,450,482	100.0
Value	$67,483,102	.....	.....	$67,483,102	100.0
Coal, including coal coked at mines—					
Tons (2,000 pounds)	370,865,510	3,678,320	1.0	373,187,190	99.0
Value	$401,333,395	$5,490,440	1.4	$395,842,955	98.6
Average per ton	$1.08	$1.49	.....	$1.06	.....
Number of proprietors and firm members	3,739	1,601	42.8	2,138	57.2
Number of wage earners	569,789	9,072	1.6	560,717	98.4

[1] These operators were distributed among the several states, as follows: Alabama, 9; Arkansas, 1; California, 1; Colorado, 22; Idaho, 2; Illinois, 180; Indiana, 121; Iowa, 140; Kansas, 12; Kentucky, 49; Maryland, 11; Michigan, 3; Missouri, 58; Montana, 12; New Mexico, 2; North Dakota, 32; Ohio, 179; Oklahoma, 3; Oregon, 4; Pennsylvania, 101; Utah, 5; Virginia, 5; Washington, 2; West Virginia, 23; and Wyoming, 11.

The average expense of mine operation of these local producers was reported as $1.26 per ton, as compared with $1 per ton for the commercial mines (excluding coking expenses); but the true cost of production of these small operators was even higher than the figure given, since many proprietors and partners performed services, sometimes manual labor, at their mines for which no charges were included in the expenses reported. These partners and proprietors looked to the profits of the business for their compensation, but in arriving at the average expenses of production, allowance should be made for these services. The relatively high average value per ton of coal reported for these mines, $1.49, as compared with $1.06 for the commercial operations, is explained by the fact that much of their output was retailed.

STATISTICS OF OPERATORS CLASSIFIED ACCORDING TO THEIR INDUSTRIAL AFFILIATION.

The following table gives statistics for operators in 1909 affiliated with railroads, with iron and steel companies, and with other industrial companies, and for operators without such affiliations, respectively. In order to render these figures fairly comparable, the operators selling only in local markets—small irregular producers—have been eliminated from the statistics of the unaffiliated group, leaving in this class only commercial operators. The classification throughout has been based on official information.[1] When this information was not conclusive the operator was classified as unaffiliated. Accordingly the actual number of affiliated operators is probably somewhat larger than shown by the table.

The relatively great importance of the operators affiliated with railroads and industrial concerns is shown by this table. Such affiliated operators in 1909 held nearly one-half the total acreage of lands reported by all commercial operators and produced more than two-fifths of the total coal output and more than three-fourths of the coke made at mines. The average output per operator for the unaffiliated operators was less than 100,000 tons, as compared with more than 1,800,000 tons for operators affiliated with railroad companies, nearly 1,300,000 tons for those affiliated with iron and steel companies, and more than 300,000 tons for those affiliated with other industrial companies. On the average, the individual mines of operators affiliated with railroad and industrial companies were also much larger than those of unaffiliated commercial operators.

Of the total tonnage of coke made at the mines in 1909, more than half was reported by operators affiliated with iron and steel companies. This showing is to be expected, since such concerns are the chief consumers of coke, and their coal mines are operated mainly to furnish this fuel. Nearly 60 per cent of the total coal output of this group was coked at the mines and a considerable part of the remaining tonnage was coked by the parent companies after shipment to blast furnaces. As a class, the unaffiliated operators did not coke any considerable proportion of their coal at the mines; in the aggregate they used less than 6 per cent of their total output in making coke. Of course many of these operators were mining noncoking coals.

Table 45

	Total.	Operators affiliated with—			Unaffiliated commercial operators.
		Railroad companies.	Iron and steel companies.	Other industrial companies.	
Number of operators	2,419	33	36	131	2,219
Number of mines	4,882	430	252	455	3,745
Acres of coal and other land controlled[1]	7,585,707	1,513,384	1,401,618	715,551	3,955,244
Per cent of total	100.0	20.0	18.5	9.4	52.1
Total expenses (including expenses of coke manufacture at mines)[2]	$391,274,654	$65,026,550	$47,203,171	$47,226,716	$231,218,217
Number of wage earners	560,717	93,692	62,803	63,490	340,729
Coal produced for use or sale as fuel:					
Tons (2,000 pounds)	323,114,587	57,102,392	19,291,173	38,968,588	207,692,434
Value at mines[3]	$354,805,982	$68,695,501	$20,317,073	$42,035,493	$223,757,915
Coke made at mines:					
Tons (2,000 pounds)	32,450,482	2,392,428	17,842,486	4,120,871	8,094,697
Value at mines[4]	$67,066,042	$5,250,570	$38,690,029	$8,595,538	$15,123,896
Coal produced, including coal coked at mines:					
Tons (2,000 pounds)	373,187,190	60,815,091	46,587,216	45,376,419	220,408,464
Per cent of total	100.0	16.3	12.5	12.2	59.1
Value at mines[5]	$396,087,037	$71,781,217	$42,633,998	$47,715,279	$233,956,543
Average tons produced per operator	154,273	1,842,882	1,204,089	346,385	99,328
Average tons produced per mine	76,441	141,430	184,870	99,728	58,854

[1] Includes duplication of 19,393 acres sublet by operators to each other.
[2] Includes $405,997, cost of coal purchased for coking at mines by operators affiliated with iron and steel companies, and $27,804 by operators affiliated with other industrial companies.
[3] Includes a small value of other products.
[4] Includes value of by-products.
[5] Includes a small value of other products but not that of coke.

SCALE OF PRODUCTION.

The scale of production prevailing in the bituminous coal mining industry is considered in two aspects: First, that of the individual mine, and, second, that of the operator.

Size of mines: 1909.—The size of bituminous mines varies widely. The annual output ranges from a few hundred tons in the case of some local "banks" to a half million tons and more for the largest mines. The census did not cover mines with less than 1,000 tons of output in 1909. Mines producing 500,000 tons or more were relatively few, those exceeding 250,000 tons were much more numerous, while hundreds mined more than 100,000 tons; but by far the great majority were of smaller size.

Table 46 shows the average output per mine in 1909, by states.

[1] For detailed explanation of the method of making this classification see remarks in connection with Table 11.

Table 46

STATE.	AVERAGE OUTPUT OF COAL PER MINE (TONS OF 2,000 POUNDS). All mines.	Mines without coke manufacture.	Mines with coke manufacture.
United States	**62,675**	**52,312**	**148,478**
Alabama	67,372	39,017	198,007
Arkansas	34,400	34,400	.....
Colorado	68,664	49,963	243,207
Illinois	80,143	80,143	.....
Indiana	45,724	45,724	.....
Iowa	24,841	24,841	.....
Kansas	34,137	34,137	.....
Kentucky	34,060	31,392	100,827
Maryland	57,161	57,161	.....
Michigan	63,207	63,207	.....
Missouri	16,349	16,349	.....
North Dakota	6,878	6,878	.....
Ohio	42,998	42,998	.....
Oklahoma	29,934	29,934	.....
Oregon	9,300	9,300	.....
Pennsylvania	90,991	72,183	158,184
Connellsville district [1]	162,730	.....	162,730
Tennessee	42,063	36,103	101,206
Texas	38,824	38,824	.....
Virginia	58,228	33,867	84,371
Washington	66,089	68,554	34,000
West Virginia	77,906	56,716	133,674
Wyoming	90,840	90,840	.....
All other states [2]	63,434	47,002	166,896

[1] Exclusive of a few mines without coke manufacture, omitted to avoid disclosing individual operations.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

From this table it appears that for the United States, as a whole, the average output of all bituminous mines covered by the census in 1909 was 62,675 tons, but if the small local mines are excluded, the average for commercial mines was about 76,000 tons. (See Table 44.) Wyoming showed the highest average output per mine, followed by Pennsylvania and Illinois, while the output per mine in North Dakota and Oregon was much lower than in any of the other states separately named.

As a group the mines with coke manufacture produced on the average nearly three times as much coal per mine as those without coke manufacture, while the coke-making mines in Colorado had a greater average output per mine than the mines of either class in any of the other states listed in the table.

Although the size of mines may be determined by many conditions, the character of the deposit worked, the capital available, the market for the product, and the presence or absence of affiliation with railroads or industrial concerns are highly important factors.

Classification of operators according to value of products: 1909.—Table 12 classifies the organizations operating bituminous mines according to the value of products reported. Tables 47, 48, 49, and 50 show how the size of these organizations is affected, first, by the the industrial affiliation of operators, and second, by the presence or absence of coke manufacture at the mines. "Commercial" operators, in the sense used in Table 47 and elsewhere, are those producing coal for general markets; "local" operators, those producing only for local consumption.

Table 47

VALUE OF ALL PRODUCTS PER OPERATOR.	ALL OPERATORS. Number.	ALL OPERATORS. Value of all products.	OPERATORS AFFILIATED WITH RAILROADS AND INDUSTRIAL CONCERNS. Operators. Number.	Operators. Per cent.	Value of all products. Amount.	Value of all products. Per cent.	UNAFFILIATED COMMERCIAL OPERATORS. Operators. Number.	Operators. Per cent.	Value of all products. Amount.	Value of all products. Per cent.	UNAFFILIATED LOCAL OPERATORS. Operators. Number.	Operators. Per cent.	Value of all products. Amount.	Value of all products. Per cent.
All classes	**3,503**	**$427,062,464**	**200**	**100.0**	**$183,590,213**	**100.0**	**2,219**	**100.0**	**$238,881,811**	**100.0**	**1,084**	**100.0**	**$5,490,440**	**100.0**
Less than $5,000	1,116	2,820,603	30	15.0	84,460	(1)	335	15.1	888,091	0.4	751	69.3	1,854,142	33.8
$5,000 to $10,000	481	3,408,410	15	7.5	117,838	0.1	247	11.1	1,827,276	0.8	219	20.2	1,463,296	26.7
$10,000 to $100,000	1,261	47,712,666	63	31.5	2,208,922	1.2	1,084	48.9	43,330,742	18.1	114	10.5	2,173,002	39.6
$100,000 to $1,000,000	577	151,141,253	50	25.0	15,550,531	8.5	527	23.7	135,590,722	56.8	.....	.....	.....	.....
$1,000,000 and over [2]	68	222,873,532	42	21.0	165,628,462	90.2	26	1.2	57,245,070	24.0	.....	.....	.....	.....

[1] Less than one-tenth of 1 per cent.
[2] Includes 10 operators each reporting products valued at $5,000,000 and over which can not be shown by groups on account of the disclosure of individual operations. The total value of their products was $108,025,423.

In connection with these statistics it should be borne in mind, as explained in the Introduction, that, when a parent company had several coal mining subsidiary companies, these subsidiaries have not been treated singly as separate operators, but have been considered together as one operator under the name of the parent company.

From Table 47 it is apparent that much greater operating organizations are found among companies affiliated with railroads and industrial concerns than among unaffiliated operators. In the entire industry 10 operators each reported products valued at more than $5,000,000, and of this number, 8 were allied with outside enterprises. Sixty-eight operators reported products valued at more than $1,000,000, and 42 of these were classed as having such affiliations. The average value of products per operator for the 200 producers with such connections was more than $900,000, as compared with only about $100,000 for the unaffiliated commercial operators. The coal mining companies affiliated with railroads reported an average value of products per company of more than $2,000,000, as compared with average values of about $1,600,000 and $400,000, respectively, for the coal mining subsidiaries of iron and steel companies, and those of other industrial enterprises. (See Table 45.)

Among the affiliated operators those reporting products valued at more than $1,000,000 each, constituted by far the chief producing group, and together reported 90 per cent of the total value shown for the affiliated producers. Among the unaffiliated commercial operators the chief producing group was composed of those whose products were valued at $100,000 to $1,000,000.

The table also shows the limitation usually imposed on the scale of operations by dependence on local markets. None of the unaffiliated operators selling exclusively in local markets reported products equaling $100,000 in value and only 114 out of a total of 1,084 such operators reported products exceeding $10,000 in value.

Table 48 shows, for 1909, the number of operators affiliated with railroads, iron and steel companies, and other industrial concerns, respectively, classified according to value of all products per operator.

Table 48

VALUE OF ALL PRODUCTS PER OPERATOR.	NUMBER OF OPERATORS AFFILIATED WITH—		
	Railroad companies.	Iron and steel companies.	Other industrial companies.
All classes	33	36	131
Less than $5,000			30
$5,000 to $10,000			15
$10,000 to $100,000	2	8	53
$100,000 to $1,000,000	10	19	21
$1,000,000 and over [1]	21	9	12

[1] Includes 8 operators reporting products valued at $5,000,000 and over.

Table 49 compares the size of the coal mining organizations which also manufactured coke at their mines with the size of those which did not make coke.

Table 49

VALUE OF ALL PRODUCTS PER OPERATOR.	NUMBER OF OPERATORS—		
	Total.	Without coke manufacture at mines.	With coke manufacture at mines.
Total	3,503	3,322	181
Less than $10,000	1,507	1,500	7
$10,000 to $100,000	1,261	1,212	49
$100,000 to $500,000	522	442	80
$500,000 to $1,000,000	55	40	15
$1,000,000 to $5,000,000	58	37	21
$5,000,000 and over	10	1	9

The proportion of large organizations is much higher among operators combining coal mining with coke manufacture than among other operators. The growth of extensive organizations among the former has been fostered not only by close affiliation with large consumers of coal and coke, but also by the fact that the areas of good coking coal are of limited extent, are largely controlled by big companies, and few tracts are available for small operators, while, on the other hand, hundreds of thousands of acres of steam and domestic coal are available for cheaply opened small mines, and by the further fact that the heavy initial cost of beginning coke manufacture necessitates a larger scale of production.

Classification of operators according to acreage of land controlled: 1909.—The following table gives the number of bituminous operators, with and without coke manufacture at their mines, classified according to the acreage of land (coal and other) controlled:

Table 50

NUMBER OF ACRES PER OPERATOR.	NUMBER OF OPERATORS—		
	Total.	Without coke manufacture at mines.	With coke manufacture at mines.
Total	[1] 3,456	[1] 3,275	181
Less than 100 acres	1,228	1,208	20
100 to 1,000 acres	1,430	1,386	44
1,000 to 10,000 acres	676	602	74
10,000 to 100,000 acres	111	77	34
100,000 acres and over	11	2	9

[1] Forty-seven operators failed to report acreage.

This table shows that holders of large areas of land are relatively much more numerous among operators making coke than among those without coke manufacture. On account of limited deposits many operators, particularly those affiliated with large coke consumers, have obtained extensive areas of coking coal for reserve supplies.

EXPENSES.

Average expenses per ton of coal, by states.—Statistics showing, by states, the average expenditures per ton of coal produced are presented in two tables. The first table (51) covers all mines furnishing complete reports. The data have been adjusted to relate exclusively to coal mining by omitting the expenses attributable to the manufacture of coke at the mines. (See Table 33.) The second table (52) covers only those mines without coke manufacture which reported a value of product in excess of expenses and were classified in Table 40 as class A mines.

In connection with these tables the remarks under "Expenses" in the Introduction, as to depreciation and expenditures for mine development included in the expenses reported, must be taken into account.

For certain states the total average expenses per ton and the averages for supplies given in the table may be slightly in error. This is due to the fact that under cost of supplies some operators included the cost of mining supplies afterward sold to employees with deductions therefor from wages, but the wages tabulated were the gross earnings before these deductions were made, and hence the total expenses for these operators were slightly exaggerated. By correspondence most of such reports were corrected. Although it was not possible to correct the remaining reports, it was possible to ascertain the extreme limit of possible error on this account, by tabulating the deductions made from wages. When thus treated it appears that the limit of error from this cause in the above averages for the entire United States is only about half a cent per ton. In Alabama this error may amount to slightly over $0.02 per ton; in Iowa, to $0.05 per ton; in Michigan, to $0.05 per ton; in North Dakota, to $0.04 per ton; in Oklahoma, to $0.08 per ton; and in Texas, to $0.04 per ton. In all other states

any such error, if existing at all, is negligibly small. Furthermore, it must be distinctly understood that these figures mentioned represent not a certain error, but only the extreme limit of a possible error, while doubtless the actual error is much within this limit.

AVERAGE REPORTED EXPENSES PER TON (EXPENSES CONNECTED WITH COKE MANUFACTURE EXCLUDED, PARTLY BY ESTIMATE) FOR ALL BITUMINOUS COAL MINES, BY STATES: 1909.

Table 51. STATE.	AVERAGE EXPENSE PER TON OF COAL PRODUCED. Total.	Salaries.	Wages.	Supplies.	Royalties and miscellaneous expenses.
United States	**$1.00**	**$0.05**	**$0.75**	**$0.12**	**$0.08**
Alabama	1.12	0.08	0.73	0.16	0.15
Arkansas	1.53	0.07	1.16	0.15	0.14
Colorado	1.24	0.06	0.92	0.16	0.09
Illinois	1.02	0.04	0.83	0.10	0.05
Indiana	1.01	0.04	0.83	0.08	0.06
Iowa	1.66	0.06	1.34	0.17	0.08
Kansas	1.42	0.04	1.18	0.09	0.11
Kentucky	0.96	0.07	0.67	0.11	0.10
Maryland	0.99	0.06	0.68	0.10	0.15
Michigan	1.68	0.07	1.28	0.18	0.15
Missouri	1.59	0.06	1.31	0.11	0.11
North Dakota	1.44	0.10	0.98	0.21	0.08
Ohio	0.99	0.05	0.76	0.10	0.08
Oklahoma	2.10	0.10	1.54	0.20	0.17
Oregon	2.85	0.14	1.83	0.75	0.13
Pennsylvania	0.86	0.04	0.63	0.12	0.07
Tennessee	1.12	0.09	0.80	0.11	0.12
Texas	1.54	0.10	1.17	0.18	0.10
Virginia	0.89	0.06	0.54	0.14	0.15
Washington	1.80	0.07	1.39	0.24	0.11
West Virginia	0.84	0.05	0.57	0.11	0.10
Wyoming	1.29	0.07	0.92	0.23	0.08
All other states [1]	1.36	0.08	1.03	0.20	0.06

[1] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

The average expense per ton given in the above table varies widely in different states, as do the separate items making up the total. Owing to the differences in the wage scales, the methods of mining, the scale of the operations, and in other conditions of production, not only between different states, but often within a state itself, these figures can be used only for very general comparisons.

Average expenses per ton of coal for selected mines, by states.—As explained in connection with Table 40, class A mines are those reporting a total value of products greater than the total expenses reported. In order to indicate the conditions of operation of such mines in different states, the following table gives data similar to those presented in the foregoing table. Mines with coke manufacture are not included.

The figures in Table 52 for the United States as a whole, and for Alabama, Colorado, Kentucky, Pennsylvania, Tennessee, Virginia, Washington, West Virginia, and "All other states" are not strictly comparable with those in the preceding table, since in that table the figures for the United States as a whole and for the states named are based on all mines, including those with coke manufacture, while the results given here are based entirely on mines without coke manufacture. The consequent incomparability of the figures is shown by the averages for Pennsylvania, which are $0.86 per ton for all mines, and $0.89 per ton for the class A mines covered by Table 52. This difference is due to the inclusion in the former table and the exclusion from the latter of the Connellsville coke district, a region of cheap, large scale, coal mining. However, when the averages in the two tables for the states without coke manufacture at mines, such as Illinois, Indiana, and Ohio, are compared, it appears that the uniformly lower average expenses for the class A mines are due chiefly to lower average wage payments.

In considering these averages the remarks in connection with the preceding table concerning the possible errors and the general limitations of the data must be taken as also applying to this table.

AVERAGE EXPENSES PER TON FOR CLASS A BITUMINOUS COAL MINES, BY STATES, EXCLUDING MINES WITH COKE MANUFACTURE: 1909.

Table 52 STATE.	AVERAGE EXPENSE PER TON OF COAL PRODUCED. Total.	Salaries.	Wages.	Supplies.	Royalties and miscellaneous.
United States	**$1.00**	**$0.05**	**$0.76**	**$0.11**	**$0.08**
Alabama	1.10	0.10	0.77	0.15	0.08
Arkansas	1.36	0.06	1.05	0.11	0.14
Colorado	1.27	0.07	0.93	0.16	0.10
Illinois	0.99	0.04	0.81	0.09	0.05
Indiana	0.93	0.04	0.77	0.07	0.05
Iowa	1.60	0.07	1.20	0.15	0.09
Kansas	1.33	0.04	1.13	0.08	0.08
Kentucky	0.85	0.06	0.63	0.08	0.08
Maryland	0.98	0.05	0.68	0.10	0.16
Michigan	1.52	0.05	1.22	0.16	0.09
Missouri	1.55	0.06	1.29	0.10	0.10
North Dakota	1.24	0.14	0.89	0.10	0.05
Ohio	0.91	0.04	0.72	0.08	0.07
Oklahoma	1.85	0.09	1.30	0.25	0.15
Oregon	2.19	0.16	1.76	0.15	0.12
Pennsylvania	0.89	0.04	0.66	0.11	0.08
Tennessee	0.98	0.08	0.67	0.08	0.14
Texas	1.43	0.09	1.08	0.18	0.08
Virginia	0.84	0.06	0.60	0.07	0.11
Washington	1.61	0.05	1.29	0.19	0.08
West Virginia	0.70	0.06	0.55	0.09	0.09
Wyoming	1.27	0.06	0.90	0.23	0.07
All other states [1]	1.28	0.07	0.98	0.17	0.06

[1] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.

Expenses and related data for mines classified according to method of mining, selected states.—The following table has been prepared to show broadly the differences in the cost of coal production resulting from different methods of mining. It has been necessary to exclude mines with coke manufacture, because the expenses attributable to the coke business can not be segregated here with sufficient precision to make comparisons with entire safety. Data are shown only for states in which the number of enterprises of each class was large enough to furnish significant information. No totals for the United States are given, because conditions differ so widely in different parts of the country with respect to factors other than the method of mining that no conclusions could safely be derived from such totals. For the same reason in comparing the several methods of mining each state or group of states should be considered by itself.

STATISTICS OF BITUMINOUS COAL MINES, CLASSIFIED ACCORDING TO METHOD OF MINING: 1909.

[Exclusive of mines with coke manufacture.]

Table 53

STATE AND METHOD OF MINING.	Number of mines.	EXPENSES.											
		Total.	Salaries.	Wages.	Fuel and rent of power.	Other supplies.	Royalties and miscellaneous.	Average per ton.					
								Total.	Salaries.	Wages.	Fuel and rent of power.	Other supplies.	Royalties and miscellaneous.
ILLINOIS:													
Machine mining	39	$5,681,627	$225,285	$4,735,214	$81,038	$426,453	$213,637	$0.84	$0.03	$0.70	$0.01	$0.06	$0.03
Pick mining with mechanical power	436	29,807,306	1,115,809	24,393,872	595,415	2,087,271	1,614,939	1.13	0.04	0.92	0.02	0.08	0.06
Pick mining without mechanical power [1]	67	364,466	11,865	293,268	1,651	33,615	24,067	1.11	0.04	0.89	0.01	0.10	0.07
Mixed pick and machine mining [2]	89	15,844,105	730,709	12,568,892	327,149	1,391,779	825,576	0.93	0.04	0.74	0.02	0.08	0.05
OHIO:													
Machine mining	138	10,339,534	486,009	8,046,387	130,386	953,969	722,783	0.93	0.04	0.73	0.01	0.09	0.07
Pick mining with mechanical power	98	1,917,219	128,717	1,490,656	22,793	176,048	99,005	1.22	0.08	0.95	0.01	0.11	0.06
Pick mining without mechanical power [1]	250	1,063,322	52,738	860,210	3,897	65,646	80,831	1.01	0.05	0.84	[3]	0.06	0.08
Mixed pick and machine mining [2]	154	13,833,422	699,572	10,524,786	231,390	1,007,152	1,280,522	1.00	0.05	0.76	0.02	0.08	0.09
PENNSYLVANIA:													
Machine mining	52	5,834,991	200,028	4,360,739	125,775	510,042	629,407	0.89	0.03	0.67	0.02	0.08	0.10
Pick mining with mechanical power	309	15,096,905	606,340	11,899,186	241,624	1,475,545	1,414,300	1.00	0.04	0.76	0.02	0.09	0.09
Pick mining without mechanical power [1]	420	3,509,090	170,479	2,721,572	3,179	239,658	374,202	0.90	0.04	0.70	[3]	0.06	0.10
Mixed pick and machine mining [2]	398	54,310,865	2,049,410	39,673,780	1,147,106	6,305,564	4,565,005	0.92	0.04	0.67	0.02	0.11	0.08
WEST VIRGINIA:													
Pick mining with mechanical power	100	4,811,112	325,664	3,180,438	69,275	710,472	525,263	1.04	0.07	0.69	0.02	0.15	0.11
Pick mining without mechanical power [1]	60	825,722	72,609	559,444	1,460	90,142	102,076	0.86	0.08	0.58	[3]	0.09	0.11
Mixed pick and machine mining [2]	313	18,699,529	1,312,358	12,743,699	308,422	2,020,883	2,305,167	0.87	0.06	0.59	0.01	0.09	0.11
WESTERN STATES: [4]													
Machine mining	23	1,622,634	83,335	1,211,727	27,899	102,561	107,112	1.27	0.07	0.95	0.02	0.15	0.08
Pick mining with mechanical power	116	10,177,305	494,573	7,527,431	329,346	1,146,882	679,073	1.39	0.07	1.03	0.05	0.16	0.09
Pick mining without mechanical power [1]	57	438,174	38,328	294,380	275	54,557	50,634	1.62	0.14	1.09	[3]	0.20	0.19
Mixed pick and machine mining [2]	67	9,373,525	484,385	6,700,931	256,092	1,281,371	650,746	1.36	0.07	0.97	0.04	0.19	0.09

Table 53—Continued.

STATE AND METHOD OF MINING.	COAL PRODUCED.					WAGE EARNERS.					AVERAGE PER MINE.		
	Tons.	Per cent distribution.			Value at mines.	Maximum number.		Minimum number.			Primary horsepower.	Tons produced.	Wage earners.	Primary horsepower.
		Loaded at mines for shipment or used in other departments by producers.	Sold locally.	Used at mines for steam and heat.		Month.	Number.	Month.	Number.	Per cent of maximum.				
ILLINOIS:														
Machine mining	6,785,177	96.6	1.1	2.3	$5,879,392	Nov...	7,548	July ..	6,433	85.2	21,128	173,979	201	542
Pick mining with mechanical power	26,384,175	89.0	8.0	3.0	20,949,150	Dec...	42,850	June..	34,859	81.4	93,935	60,514	102	215
Pick mining without mechanical power [1]	329,450	54.8	43.3	1.9	434,448	Jan...	1,583	July ..	273	17.2	.....	4,917	7	.....
Mixed pick and machine mining [2]	17,071,701	96.0	1.0	2.9	16,736,928	Dec...	20,454	Aug...	16,516	80.7	51,111	191,817	242	574
OHIO:														
Machine mining	11,088,693	96.8	1.1	2.1	10,464,186	Nov...	16,335	Apr...	13,493	82.6	45,251	80,353	122	328
Pick mining with mechanical power	1,567,156	87.4	9.8	2.8	1,912,640	Dec...	2,954	May ..	2,060	69.7	5,843	15,991	35	60
Pick mining without mechanical power [1]	1,023,002	57.1	42.6	0.3	1,214,810	Dec...	2,089	June..	1,246	59.6	.....	4,092	9	.....
Mixed pick and machine mining [2]	13,839,913	97.4	0.3	2.3	13,682,707	Nov...	22,546	June..	19,543	86.7	46,328	89,870	143	301
PENNSYLVANIA:														
Machine mining	6,524,973	96.4	0.7	2.9	5,963,828	Dec...	8,100	May ..	7,388	91.2	31,444	125,480	157	605
Pick mining with mechanical power	15,717,481	95.7	2.7	1.5	16,284,546	Dec...	23,870	May ..	20,893	87.2	35,372	50,868	79	114
Pick mining without mechanical power [1]	3,892,521	82.0	17.9	0.1	3,939,700	Dec...	6,501	Apr...	4,842	74.5	.....	9,268	16	.....
Mixed pick and machine mining [2]	58,968,974	96.8	0.9	2.3	59,560,978	Dec...	75,442	Jan...	65,816	87.2	171,434	148,163	193	431
WEST VIRGINIA:														
Pick mining with mechanical power	4,613,525	96.7	1.7	1.5	4,249,234	Dec...	6,877	May ..	5,706	83.0	14,518	46,135	69	145
Pick mining without mechanical power [1]	957,102	95.1	4.8	0.1	784,401	Dec...	1,518	May ..	1,176	77.5	.....	14,502	25	.....
Mixed pick and machine mining [2]	21,590,304	97.0	1.2	1.8	18,296,013	Nov ..	27,940	Mar...	24,710	88.4	64,720	68,998	89	207
WESTERN STATES: [4]														
Machine mining	1,280,891	95.2	1.8	3.0	2,077,007	Dec...	1,801	Apr...	1,147	63.7	7,675	55,691	80	334
Pick mining with mechanical power	7,301,932	94.2	1.8	4.0	11,643,777	Dec...	10,212	July ..	7,875	77.1	35,477	62,948	89	306
Pick mining without mechanical power [1]	270,108	69.0	30.9	0.1	490,726	Dec...	580	July ..	237	40.2	.....	4,739	11	.....
Mixed pick and machine mining [2]	6,882,594	93.7	2.2	4.1	10,544,825	Dec...	9,494	July ..	7,698	81.1	28,087	102,725	141	419

[1] This group includes the following numbers of proprietors and partners performing manual labor at the mines, for whom no wages were reported: Illinois, 44; Ohio, 131; Pennsylvania, 162; West Virginia, 10; and Western states, 25.

[2] The following percentages of tonnage in this class were mined by machine: Illinois, 66.5; Ohio, 79.8; Pennsylvania, 68.4; West Virginia, 64.2; and Western states, 43.8.

[3] Less than 1 cent.

[4] Includes Colorado, Montana, and Wyoming.

As shown by the table pick mines operated without mechanical power are generally small, irregular operations, and in most states, as a matter of fact, they are chiefly dependent upon local trade. The average expenses per ton given for these mines are not strictly comparable with those of the other three classes covered by the table, since a relatively large number of proprietors and partners performed services in these small mines—administrative work or manual labor—without including any charge therefor in the expenses reported. (See Table 60.)

The table shows uniformly lower average expenses per ton for machine mines than for pick mines with mechanical power. The average difference per ton in favor of the machine mines in Illinois was $0.29; in Ohio, $0.29; in Pennsylvania, $0.11; and in Western

states, $0.12. The greater part of this advantage is, naturally, due to a considerably lower average expense per ton for wages.

Inasmuch as the total output of the mines using only the machine method may be considered comparatively small in some of the states shown, the average expenses per ton for the "mixed" mines should also be compared with those for mines using the pick method exclusively. This "mixed" group contains a few exclusively machine and a few exclusively pick mines (included by operators in one combined report), but is composed chiefly of mines operated partly by machine and partly by pick mining. As shown by the footnote, the major part of the great output of this group in each of the four states separately named is machine mined, and in each of them the average total expenses and the average wage payments per ton were lower than for pick mines with mechanical power. This difference in total expenses per ton in Illinois was $0.20; in Ohio, $0.22; in Pennsylvania, $0.08; in West Virginia, $0.17. In the Western states, where the difference was $0.03 per ton, less than half the output of the "mixed" mines was machine mined.

The differences in average wage payments and in average total expenses per ton shown by this table are not to be taken as measuring precisely the general advantage of machine over pick mining. Numerous other factors also affect expenses. For example, in every instance except the Western states, the mines using the machine method exclusively, and also the "mixed" group, show a larger average output per mine than the pick mines, which doubtless tends to reduce the expenses of production. Differences in the regularity of operation may also affect the expenses of production, while diversity of wage scales and variations, not only in the thickness and character of the veins worked, but also in numerous other details of mine operation, such as haulage, drainage, ventilation, and the preparation of coal, likewise affect costs. It is likely that the mines using machines for undercutting and shearing coal have also adopted better methods in these other details of operation, but probably a large part of the difference in average expenses per ton shown for the classes of mines in this table is due to the use or nonuse of mining machines.

Expenses and related data for mines classified according to kind of opening, selected states.—Table 54 gives, for selected states, comparative expenses, with related analytical data, for mines classified according to the kind of opening as defined in connection with Table 42. Open cuts are omitted because the number of such operations is small. Mines not reporting expenses separately, mines including the cost of coke manufacture in their expenses reported, and mines with two or more kinds of openings, are excluded because the data for such mines would have no significance. No United States totals are given because conditions other than the kind of opening differ so widely in different states as to render such totals valueless for comparative purposes.

STATISTICS OF BITUMINOUS COAL MINES CLASSIFIED ACCORDING TO KIND OF OPENING: 1909.

[Exclusive of mines with coke manufacture.]

Table 54

STATE AND CHARACTER OF MINE OPENING.	Number of mines.	EXPENSES.		COAL PRODUCED.					NUMBER OF WAGE EARNERS.		PRIMARY HORSEPOWER.	
				Tons (2,000 pounds).		Per cent of total tonnage.		Value at mines.				
		Total.	Average per ton.	Total.	Average per mine.	Mined by machines.	Sold locally.		Total.	Average per mine.	Total.	Average per mine.
ILLINOIS:												
Shaft mines	509	$48,805,100	$1.01	48,007,159	94,403	37.5	4.4	$50,082,859	69,523	137	157,302	309
Slope mines	56	580,531	1.14	517,281	9,237	.....	33.5	624,524	1,001	18	1,504	27
Drift mines	22	220,019	0.91	252,868	11,494	.....	49.2	288,988	447	20	458	21
OHIO:												
Shaft mines	67	4,580,520	1.12	4,087,321	61,005	85.6	2.3	4,477,244	7,477	112	18,579	277
Slope mines	60	2,272,140	1.07	2,117,234	35,287	78.5	2.8	2,150,501	3,945	66	8,638	144
Drift mines	403	10,044,230	0.96	10,503,436	26,063	75.5	5.3	10,383,318	16,290	40	29,281	73
PENNSYLVANIA:												
Shaft mines	55	6,093,886	0.98	6,223,447	113,154	66.1	1.7	5,965,817	7,909	144	24,554	446
Slope mines	76	6,070,058	0.95	6,430,217	84,608	50.7	1.9	6,363,708	8,148	107	20,217	266
Drift mines	758	34,285,681	0.93	36,927,127	48,717	45.3	2.8	37,704,318	50,076	66	88,842	117
WEST VIRGINIA:												
Shaft mines	20	2,411,495	1.06	2,282,226	78,697	54.0	1.3	1,901,820	3,264	113	11,501	397
Slope mines	22	1,287,800	1.10	1,175,252	53,421	46.3	2.7	1,036,587	1,412	64	4,022	183
Drift mines	382	18,668,236	0.87	21,388,002	55,990	49.5	1.3	18,434,841	29,358	77	56,793	149
WESTERN STATES:[1]												
Shaft mines	36	3,255,860	1.52	2,141,432	59,484	51.6	4.2	3,206,703	3,530	98	9,067	252
Slope mines	121	11,591,048	1.37	8,462,898	69,941	14.0	2.4	13,655,663	11,630	96	44,136	365
Drift mines	77	4,030,252	1.37	2,953,841	38,362	37.0	2.6	5,023,416	4,147	54	11,664	151

[1] Includes Colorado, Montana, New Mexico, Utah, and Wyoming.

This table shows that in all the states covered, shaft mines were comparatively large operations. In Illinois drifts and slopes were small workings largely dependent on local trade, while in the other states shown they were larger, and, although usually of smaller average output than shafts, were important commercial producers.

Since drainage and haulage expenses are usually lower in drifts than in shafts and slopes, drift mines would be expected to have lower average expenses per ton than shafts and slopes in the same field. Although somewhat obscured by other factors, Table 54 shows this to be the general result. The figures of these three groups of mines in Illinois are not

strictly comparable owing to the difference in the scale of production and in methods of mining, and to the fact that in the Illinois drifts a number of proprietors and partners performed services for which no compensation was included. However, in Ohio, Pennsylvania, West Virginia, and the Western states, where the returns for these different classes are fairly comparable, the average expenses per ton for drifts were from $0.05 to $0.19 lower than those for shafts. In connection with these figures the remarks following Table 53 as to the significance of such averages should be borne in mind and it should be clearly understood that other factors, such as the differences in rates of wages, methods of mining and the scale of production may render the kind of mine opening a distinctly minor factor in determining the expense of production. Accordingly these figures are to be taken, not as measuring precisely the advantage of one kind of opening over another in these states, but only as indicating such advantage in a general way.

Although not shown in this table, the open cuts or strippings in Iowa, Kansas, and Missouri (taken together) reported an average expense of $1.17 per ton, as compared with $1.55 per ton for slopes and for shafts in these states. Many of these open cuts, supplying chiefly local trade, were worked rather primitively, but others made use of the latest mechanical equipment for such operations.

In every instance the table shows a higher average horsepower per mine for shafts and slopes than for drifts. Although the smaller average output of the drifts doubtless accounts for a part of this difference, it is also in part due probably to the relatively greater power requirements of shafts and slopes for handling coal and draining the workings.

Royalty payments, by states: 1909.—Table 55 gives for different states the number of tons of coal produced by mines operated on lands held under lease by operators, the total amount of royalties paid by these producers, and the average royalty per ton.

This table does not cover all mines operated on land held under lease by the operators. The reports for numerous mines of this kind were combined by the operators with the reports of other mines operated on land owned by the producers, and the mines covered by such combined reports could not be included in this table. However, the figures do cover a sufficient number of mines to show the general rates of royalty prevailing in different states.

Table 55 MINES ON LEASED LAND.

STATE.	Total tons of coal produced (2,000 pounds).	Royalties.	
		Amount.	Average per ton.
United States	**82,912,956**	**$6,882,568**	**$0.08**
Alabama	1,639,530	112,892	0.07
Arkansas	550,642	74,974	0.14
Colorado	1,660,106	102,528	0.12
Illinois	5,940,057	408,269	0.07
Indiana	2,506,029	162,724	0.06
Iowa	2,365,695	182,743	0.08
Kansas	1,868,893	173,053	0.09
Kentucky	3,050,051	247,677	0.08
Missouri	1,065,589	87,903	0.08
Ohio	4,022,418	272,013	0.07
Oklahoma	2,900,888	260,517	0.09
Pennsylvania:			
Without coke made at mines	10,222,867	1,050,285	0.09
With coke made at mines	2,177,650	333,388	0.15
Tennessee	3,043,900	337,985	0.11
Virginia	2,761,667	191,040	0.07
West Virginia:			
Without coke made at mines	15,538,143	1,222,014	0.08
With coke made at mines	10,573,269	739,180	0.07
Wyoming	688,717	68,370	0.10
All other states [1]	1,324,830	142,830	0.11

[1] Includes Maryland, Michigan, Montana, New Mexico, North Dakota, Oregon, Texas, Utah, and Washington.

The average rate of royalty shown for the United States in 1909 was $0.08 per ton. Indiana shows the lowest average, $0.06 per ton, while the highest were reported from Arkansas, $0.14 per ton, and Pennsylvania, for mines at which coke was made, $0.15 per ton. The superior quality of the Arkansas semianthracite and of some of the Pennsylvania coking coal explains these higher rates.

PERSONS ENGAGED IN THE INDUSTRY.

Classification according to general occupational status, by states: 1909.—The number of persons engaged in the bituminous coal industry in 1909, classified according to general occupational status, is shown, by states, in Table 56.

Wage earners constituted 96.1 per cent of all persons reported in the industry in the United States as a whole, and the proportion did not vary greatly from state to state. Owing to the prevalence of incorporated companies, the number of individual proprietors and firm members was relatively small. These were generally small operators, and nearly one-half of the total number were reported as performing manual labor in mines. Many of these latter were the proprietors of small local "banks" with few or no wage earners.

Table 56

STATE.	Total.	Proprietors and firm members.	Salaried officers of corporations.	Superintendents and managers.	Clerks and other salaried employees.	Wage earners, number December 15, 1909, or nearest representative day.	Proprietors and firm members performing manual labor.
All mines: United States[1]	**582,677**	**3,739**	**2,315**	**5,566**	**11,268**	**569,789**	**1,713**
MINES WITHOUT COKE MANUFACTURE.							
United States[1]	**453,473**	**3,648**	**2,005**	**4,188**	**8,218**	**435,414**	**1,709**
Alabama	12,427	40	100	171	386	11,721	6
Arkansas	5,678	38	27	70	81	5,462	20
Colorado	10,942	165	65	151	193	10,368	10
Illinois	76,761	528	243	593	952	74,445	359
Indiana	23,109	202	99	157	294	22,357	110
Iowa	18,332	298	79	137	105	17,623	225
Kansas	13,374	283	40	78	182	12,791	152
Kentucky	18,869	118	170	229	417	17,935	30
Maryland	6,069	28	20	82	141	5,798	13
Michigan	3,782	104	17	33	56	3,572	70
Missouri	9,991	244	32	105	84	9,520	208
North Dakota	954	51	5	21	20	857	19
Ohio	46,046	421	201	371	648	44,405	203
Oklahoma	9,124	35	39	69	167	8,814	22
Oregon	271	9	1	4	6	251	0
Pennsylvania	119,972	724	336	911	1,927	116,074	179
Tennessee	8,931	20	69	102	270	8,470	0
Texas	4,446	8	22	49	103	4,234	.....
Virginia	3,197	10	26	32	68	3,061	.....
Washington	6,035	6	15	40	117	5,857	2
West Virginia	38,107	57	194	475	918	36,403	12
Wyoming	8,267	185	24	63	156	7,830	4
All other states[2]	7,816	74	34	71	146	7,491	38
MINES WITH COKE MANUFACTURE.							
United States	**139,204**	**91**	**310**	**1,378**	**3,050**	**134,375**	**4**
Alabama	12,395	.....	26	210	401	11,758	.....
Colorado	5,224	.....	8	28	95	5,093	.....
Kentucky	1,763	.....	3	17	23	1,720	.....
Pennsylvania	70,630	84	139	802	1,271	68,334	4
Connellsville dist.	48,391	78	96	655	827	46,735	2
Tennessee	2,798	.....	9	35	70	2,684	.....
Virginia	7,221	5	16	39	180	6,981	.....
Washington	313	.....	1	7	7	298	.....
West Virginia	34,370	2	93	217	855	33,203	.....
All other states[3]	4,490	.....	15	23	148	4,304	.....

[1] Includes 138 salaried officers of corporations, 174 superintendents and managers and 691 clerks employed in general offices who could not be distributed among the individual states; the states to which their services related were Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Montana, Ohio, Oklahoma, Pennsylvania, Texas, Washington, West Virginia, and Wyoming.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.
[3] Includes Georgia, Montana, New Mexico, and Utah.

Classification of wage earners according to occupation, by states: 1909.—The following table gives for mines with and without coke manufacture in different states, the average number of miners and miners' helpers per mine, the percentage of wage earners employed outside and inside, and the percentage in various occupations. The absolute numbers appear in Table 62. For mines with coke manufacture the percentages are based on all wage earners, including those in the coke branch of the business.

The table shows, of course, a much higher percentage of wage earners employed above ground for mines combining coal mining with coke manufacture than for mines without coke ovens. In the mines without coke manufacture considerable variation appears among different states in the proportions of wage earners employed outside and inside, the percentage employed inside ranging from 91.2 per cent in Kansas to 76.8 per cent in North Dakota. These variations are due chiefly to different methods of mine operation and coal preparation, which also explain the variations in the proportions for the different occupations.

The marked variations from state to state in the percentages for mines with coke manufacture are due chiefly to the fact that in some states most of the mines in this group coked a large part of their coal and hence required relatively more coke employees, while other mines of this group made but little coke and had few employees of this kind. In the Connellsville district, a region of great coke production, miners and miners' helpers constituted but 46 per cent of the total number of employees; while in Kentucky, where coke production was relatively insignificant, this class constituted 83.5 per cent of the total for mines with coke manufacture.

Table 57

STATE.	PER CENT OF WAGE EARNERS EMPLOYED— Outside.	Inside.	PER CENT OF WAGE EARNERS EMPLOYED AS— Engineers, firemen, and mechanics.	Miners and miners' helpers.	Others 16 years and over.	Boys under 16 years.	Average number of miners and miners' helpers per mine.
All mines: United States	**16.5**	**83.5**	**5.2**	**67.4**	**26.7**	**0.7**	**64**
MINES WITHOUT COKE MANUFACTURE.							
United States	**11.8**	**88.2**	**5.1**	**72.2**	**22.2**	**0.6**	**59**
Alabama	14.6	85.4	6.3	69.6	23.0	1.2	49
Arkansas	12.8	87.2	7.2	69.6	23.0	0.2	55
Colorado	16.5	83.5	5.7	67.2	26.6	0.4	50
Illinois	9.7	90.3	5.0	71.9	23.1	0.1	85
Indiana	9.4	90.6	4.5	76.6	18.6	0.2	53
Iowa	10.1	89.9	4.3	74.2	20.8	0.7	42
Kansas	8.8	91.2	4.0	78.0	18.0	(1)	40
Kentucky	13.7	86.3	4.9	73.5	21.3	0.4	44
Maryland	16.8	83.2	4.3	66.1	26.7	2.8	55
Michigan	8.9	91.1	5.9	78.3	15.9	.....	100
Missouri	10.4	89.6	3.7	73.6	22.4	0.2	32
North Dakota	23.2	76.8	5.6	67.8	26.5	0.1	11
Ohio	9.2	90.8	4.4	74.7	20.5	0.4	52
Oklahoma	17.2	82.8	6.0	61.4	29.6	(1)	52
Oregon	15.9	84.1	11.2	78.1	10.8	.....	22
Pennsylvania	10.5	89.5	4.5	75.0	19.2	0.7	74
Tennessee	14.3	85.7	4.9	69.1	24.3	1.7	45
Texas	13.7	86.3	5.5	75.4	19.1	.....	68
Virginia	12.7	87.3	5.1	63.4	30.6	0.9	44
Washington	21.0	79.0	8.1	64.0	27.4	0.5	73
West Virginia	16.1	83.9	6.1	63.0	29.6	1.4	48
Wyoming	16.3	83.7	5.8	64.5	29.7	0.1	78
All other states[2]	29.4	70.6	10.4	65.7	23.6	0.4	46
MINES WITH COKE MANUFACTURE.							
United States	**31.9**	**68.1**	**5.7**	**51.9**	**41.4**	**0.9**	**108**
Alabama	37.8	62.2	10.4	45.2	41.9	2.4	148
Colorado	33.1	66.9	7.3	52.5	40.0	0.2	178
Kentucky	15.6	84.4	7.3	83.5	9.2	.....	131
Pennsylvania	33.0	67.0	4.2	51.6	43.7	0.5	107
Connellsville dist.	37.7	62.3	4.4	46.0	49.0	0.5	90
Tennessee	23.6	76.4	4.3	55.8	36.5	3.3	115
Virginia	39.9	60.1	8.8	43.4	46.4	1.4	74
Washington	35.9	64.1	9.7	28.9	61.4	.....	29
West Virginia	27.6	72.4	6.2	53.4	39.3	1.0	97
All other states[2]	26.8	73.2	6.1	63.5	27.5	2.9	161

[1] Less than one-tenth of 1 per cent.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.
[3] Includes Georgia, Montana, New Mexico, and Utah.

Maximum and minimum numbers of wage earners reported, by states: 1909.—The next table gives, for different states, the number of wage earners employed December 15, 1909, or the nearest representative day,[1] together with the number employed on the 15th day of the month of maximum employment, and the number employed on the 15th day of the month of minimum employment, with the per cent which the latter forms of the maximum number.

[1] See footnote to text accompanying Table 18, Part I.

Table 58

STATE.	Number of wage earners Dec. 15, 1909, or nearest representative day.	MAXIMUM MONTH. Month.	MAXIMUM MONTH. Number.	MINIMUM MONTH. Month.	MINIMUM MONTH. Number.	Per cent of maximum.
All mines:						
United States	**569,789**	**Dec...**	**560,089**	**May ..**	**478,455**	**85.4**
MINES WITHOUT COKE MANUFACTURE.						
United States	**435,414**	**Dec...**	**424,407**	**May ..**	**359,174**	**84.6**
Alabama	11,721	Dec...	11,456	July...	9,884	86.3
Arkansas	5,462	Nov...	5,253	Apr...	2,674	50.9
Colorado	10,368	Dec...	10,303	July...	7,235	70.2
Illinois	74,445	Dec...	71,193	June..	58,799	82.6
Indiana	22,357	Dec...	21,318	June..	16,670	78.2
Iowa	17,623	Dec...	17,235	June..	13,381	77.6
Kansas	12,701	Dec...	12,586	May ..	9,906	78.7
Kentucky	17,935	Dec...	17,435	May...	12,984	74.5
Maryland	5,798	Jan...	5,825	Aug...	5,257	90.2
Michigan	3,572	Jan...	3,703	May...	3,112	84.0
Missouri	9,526	Dec...	9,370	May...	5,616	59.9
North Dakota	857	Dec...	848	June..	321	37.9
Ohio	44,405	Nov...	43,770	May...	36,684	83.8
Oklahoma	8,814	Dec...	8,720	May...	6,377	73.1
Oregon	251	Feb...	270	July ..	112	41.5
Pennsylvania	116,074	Dec...	113,913	Apr...	100,236	88.0
Tennessee	8,470	Jan....	8,559	July...	7,633	89.2
Texas	4,234	Oct...	4,174	Aug...	3,896	93.3
Virginia	3,061	July...	3,343	Feb...	2,472	73.9
Washington	5,857	Nov ..	5,752	{Mar... Apr...}	5,376	93.5
West Virginia	36,463	Nov ..	35,901	Mar...	31,862	88.7
Wyoming	7,830	Dec...	7,825	July...	6,563	83.9
All other states[1]	7,491	Dec...	7,404	May...	5,891	79.6
MINES WITH COKE MANUFACTURE.						
United States	**134,375**	**Dec...**	**135,682**	**May ..**	**119,281**	**87.9**
Alabama	11,758	Dec...	13,171	June..	10,292	78.1
Colorado	5,093	Dec...	5,093	June..	4,313	84.7
Kentucky	1,720	Jan....	1,849	June..	1,595	86.3
Pennsylvania	68,334	Dec...	68,233	Apr...	58,584	85.9
Connellsville district	46,735	Dec...	46,656	Apr...	37,944	81.3
Tennessee	2,684	Nov...	2,717	July...	2,325	85.6
Virginia	6,981	Dec...	6,981	May...	5,653	81.0
Washington	298	May...	330	Mar...	282	85.5
West Virginia	33,203	Nov...	33,260	Apr...	30,995	93.2
All other states[2]	4,304	Apr...	4,583	Oct...	3,996	87.2

[1] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.
[2] Includes Georgia, Montana, New Mexico, and Utah.

The above table shows that in the United States as a whole the maximum number of wage earners reported in the industry on the 15th day of any month, namely, 560,089, was employed December 15, 1909, while the minimum number reported, namely, 478,455, was employed May 15, 1909. For mines without coke manufacture Washington showed the greatest regularity of employment, with the minimum number employed equaling 93.5 per cent of the maximum. Next in order in this respect was Texas (93.3 per cent), Maryland (90.2 per cent), Tennessee (89.2 per cent), and West Virginia (88.7 per cent). North Dakota shows the greatest irregularity, with the minimum number reported equaling only 37.9 per cent of the maximum. For mines with coke manufacture West Virginia showed the greatest regularity of employment, the number of wage earners in the minimum month equaling 93.2 per cent of that in the maximum month, while the greatest variation is shown for Alabama.

Hours of labor, by states.—The following table gives, by states, the number and percentage of mines operated specified numbers of hours per day or per shift, together with the percentage of the total number of wage earners (including those engaged in coke manufacture) employed by each class of mines. As explained in connection with Table 19, the latter percentages can not be taken as showing precisely the relative number of wage earners working the number of hours specified—for example, engineers, firemen, pumpmen, etc., sometimes work longer hours than the general standard for the mine, and at some mines with coke ovens the coke men work longer hours than the mine employees. However, these percentages may be taken as showing roughly the general distribution of wage earners according to hours of labor. Mines employing no wage earners are omitted from the table.

BITUMINOUS COAL MINES CLASSIFIED ACCORDING TO THE PREVAILING HOURS OF OPERATION PER DAY OR PER SHIFT, BY STATES: 1909.

Table 59

STATE.	Total number of mines.	NUMBER OF MINES OPERATED (PER DAY OR SHIFT)— Less than 8 hours.	8 hours.	9 hours.	10 hours.	12 hours.	Hours not specified.	PER CENT OF TOTAL NUMBER OF MINES OPERATED— Less than 8 hours.	8 hours.	9 hours.	10 hours.	12 hours.	Hours not specified.	PER CENT OF WAGE EARNERS EMPLOYED IN MINES OPERATED— Less than 8 hours.	8 hours.	9 hours.	10 hours.	12 hours.	Hours not specified.
Total	**5,978**	**65**	**3,747**	**810**	**1,270**	**9**	**77**	**1.1**	**62.7**	**13.5**	**21.2**	**0.2**	**1.3**	**0.4**	**58.5**	**13.8**	**25.4**	**0.9**	**1.1**
Alabama	203	2	37	51	103	3	7	1.0	18.2	25.1	50.7	1.5	3.4	0.1	8.5	26.5	43.7	14.3	7.0
Arkansas	69	.....	69	.....	.....	.....	.....	.....	100.0	.....	.....	.....	.....	.....	100.0	.....	.....	.....	.....
Colorado	154	.....	70	23	61	.....	.....	.....	45.5	14.9	39.6	.....	.....	.....	28.7	10.3	61.0	.....	.....
Illinois	628	9	600	4	6	.....	9	1.4	95.5	0.6	1.0	.....	1.4	0.6	99.3	0.1	0.1	.....	.....
Indiana	320	15	289	6	1	.....	9	4.7	90.3	1.9	0.3	.....	2.8	1.3	98.3	0.2	0.2	.....	.....
Iowa	308	3	291	7	3	.....	4	1.0	94.5	2.3	1.0	.....	1.3	1.4	96.6	0.3	0.1	.....	1.6
Kansas	199	1	187	21	2	.....	8	0.5	83.9	10.6	1.0	.....	4.0	1.4	96.7	1.7	0.1	.....	(1)
Kentucky	310	3	93	85	127	.....	2	1.0	30.0	27.4	41.0	.....	0.6	1.0	32.8	24.4	41.8	.....	.....
Maryland	70	1	5	11	53	.....	.....	1.4	7.1	15.7	75.7	.....	.....	0.1	0.3	12.7	86.9	.....	.....
Michigan	28	1	26	1	.....	.....	.....	3.6	92.9	3.6	.....	.....	.....	0.3	98.5	1.3	.....	.....	.....
Missouri	217	.....	192	18	2	.....	5	.....	88.5	8.3	0.9	.....	2.3	.....	97.8	1.8	0.2	0.1	.....
Montana	65	2	63	.....	.....	.....	.....	3.1	96.9	.....	.....	.....	.....	0.3	99.7	.....	.....	.....	.....
New Mexico	27	.....	3	10	14	.....	.....	.....	11.1	37.0	51.9	.....	.....	.....	1.0	25.8	73.2	.....	.....
North Dakota	51	1	18	11	21	.....	.....	2.0	35.3	21.6	41.2	.....	.....	0.9	26.8	16.7	55.6	.....	.....
Ohio	634	8	591	21	14	.....	.....	1.3	93.2	3.3	2.2	.....	.....	0.8	97.7	1.2	0.2	.....	.....
Oklahoma	104	1	97	.....	6	.....	.....	0.9	93.3	.....	5.8	.....	.....	0.2	98.0	.....	1.8	.....	.....
Oregon	9	.....	7	1	1	.....	.....	.....	77.8	11.1	11.1	.....	.....	.....	45.0	1.2	53.8	.....	.....
Pennsylvania	1,502	14	904	310	268	2	4	0.9	60.2	20.6	17.8	0.1	0.3	0.1	52.4	23.6	23.2	0.8	(1)
Tennessee	140	2	17	80	34	4	3	1.4	12.1	57.1	24.3	2.9	2.1	1.4	10.1	47.7	32.6	1.6	6.8
Texas	47	.....	27	2	16	.....	2	.....	57.4	4.3	34.0	.....	4.3	.....	69.5	1.5	27.5	.....	1.6
Utah	22	.....	19	1	.....	.....	2	.....	86.4	4.5	.....	.....	9.1	.....	99.8	0.2	.....	.....	.....
Virginia	85	.....	3	11	68	.....	3	.....	3.5	12.9	80.0	.....	3.5	.....	0.6	5.7	89.6	.....	4.0
Washington	54	.....	51	1	1	.....	1	.....	94.4	1.9	1.9	.....	1.9	.....	98.8	0.9	0.3	.....	.....
West Virginia	659	2	42	132	466	.....	17	0.3	6.4	20.0	70.7	.....	2.6	0.4	2.7	18.8	74.0	.....	4.2
Wyoming	65	.....	59	2	3	.....	1	.....	90.8	3.1	4.6	.....	1.5	.....	99.5	0.1	0.5	.....	.....
All other states[2]	8	.....	7	1	.....	.....	.....	.....	87.5	12.5	.....	.....	.....	.....	16.5	83.5	.....	.....	.....

[1] Less than one-tenth of 1 per cent.
[2] Includes California, Georgia, and Idaho.

The table shows that nearly 60 per cent of all the wage earners were employed in mines operated on an 8-hour basis; nearly 14 per cent in mines operated on a 9-hour basis; and about 25 per cent in mines operated on a 10-hour basis. There was considerable variation in the prevailing hours of labor in different states. In Illinois, Indiana, Iowa, Ohio, in some districts of Pennsylvania, and in various other fields, the time of operation was fixed at 8 hours by agreement between the operators and the mine workers. In most other states the most common working time was 9 or 10 hours per day.

POWER.

Mines operated with and without mechanical power, by states: 1909.—The following table classifies bituminous coal mines according to their operation with or without mechanical power, gives the number of mines and total output for each class and the average horsepower per mine for mines using mechanical power (including that used in coke manufacture, which is relatively unimportant). It should be remembered that the many small mines or banks producing less than 1,000 tons each—most of which use no mechanical power—were not canvassed at the census of 1909.

Table 60

STATE.	NUMBER OF MINES.			Average horsepower per mine with power.	TONS (2,000 POUNDS) OF COAL PRODUCED BY MINES—		PER CENT OF COAL PRODUCED BY MINES—	
	Total.	With power.	Without power.		With power.	Without power.	With power.	Without power.
All mines:								
United States	**6,013**	**4,584**	**1,429**	**268**	**366,962,460**	**9,903,050**	**97.4**	**2.6**
MINES WITHOUT COKE MANUFACTURE.								
United States	**5,365**	**3,943**	**1,422**	**231**	**270,888,623**	**9,703,417**	**96.5**	**3.5**
Alabama	167	128	39	147	6,042,774	473,148	92.7	7.3
Arkansas	60	50	10	175	2,336,613	37,006	98.4	1.6
Colorado	140	117	23	234	6,855,459	139,207	98.0	2.0
Illinois	641	564	67	295	50,241,053	329,450	99.3	0.7
Indiana	322	266	56	173	14,582,185	141,040	99.0	1.0
Iowa	341	249	92	87	7,391,020	334,050	95.7	4.3
Kansas	262	154	48	128	6,771,905	123,905	98.2	1.8
Kentucky	326	205	94	183	8,539,351	846,827	91.0	9.0
Maryland	70	49	21	201	3,808,065	193,207	95.2	4.8
Michigan	28	28	....	283	1,772,345	.....	100.0	.....
Missouri	220	142	78	84	3,360,805	235,880	93.4	6.6
North Dakota	53	19	34	107	280,101	84,345	76.9	23.1
Ohio	640	390	250	250	26,405,702	1,023,002	96.3	3.7
Oklahoma	304	92	12	280	3,057,934	55,215	98.2	1.8
Oregon	9	7	2	158	80,104	3,000	95.7	4.3
Pennsylvania	1,179	759	420	314	81,211,428	3,802,521	95.4	4.6
Tennessee	129	90	39	129	4,081,751	576,500	87.6	12.4
Texas	47	45	2	138	1,820,825	3,917	99.8	0.2
Virginia	44	31	13	168	1,385,570	104,505	93.0	7.0
Washington	51	48	3	330	3,486,880	9,352	99.7	0.3
West Virginia	479	413	66	192	26,209,829	957,102	96.5	3.5
Wyoming	65	53	12	330	6,241,860	52,736	99.2	0.8
All other states[1]	106	64	42	307	4,835,165	147,044	97.0	3.0
MINES WITH COKE MANUFACTURE.								
United States	**648**	**641**	**7**	**494**	**96,073,837**	**139,633**	**99.9**	**0.1**
Alabama	30	30	....	981	7,160,630	.....	100.0	.....
Colorado	15	15	....	449	3,648,112	.....	100.0	.....
Kentucky	11	11	....	537	1,175,098	.....	100.0	.....
Pennsylvania	330	325	5	512	(2)	(2)	(2)	(2)
Connellsville district	238	235	3	473	(2)	(2)	(2)	(2)
Tennessee	13	13	....	346	1,315,673	.....	100.0	.....
Virginia	41	40	1	285	(2)	(2)	(2)	(2)
Washington	3	3	....	187	104,071	.....	100.0	.....
West Virginia	182	181	1	422	(2)	(2)	(2)	(2)
All other states[3]	17	17	....	557	2,820,225	.....	100.0	.....

[1] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah.
[2] Omitted in order to avoid disclosing operations of individual operators.
[3] Includes Georgia, Montana, New Mexico, and Utah.

These figures show that 1,429 mines, or nearly one-fourth of the entire number reporting, operated without the use of mechanical power in 1909; only 7 of these had coke manufacture. Mines without power are widely distributed among the states, but their relative importance is much greater in some states than in others. Such mines generally are small irregular producers depending largely on local trade. (See also Table 53.) For the United States these mines showed in 1909 an average output of less than 7,000 tons per mine as compared with about 80,000 tons for mines operated with mechanical power.

The variations in average horsepower per mine from state to state are due to differences in the kind of mine openings, the scale of production, the methods of operation, and the degree of development reached.

It will be observed that mines combining coal mining with coke manufacture show a much greater average horsepower per mine than mines without coke ovens. This is due, not so much to the need of power for the operation of the coke-yard machinery as to the fact that the mines of this group are generally much larger mines than those without coke manufacture. The average output of such mines was nearly 150,000 tons per mine, as compared with an average of less than 55,000 tons for mines without coke manufacture.

Comparative statistics of power, by states: 1909 and 1902.—The next table gives, by states, for 1909 and 1902, the total primary horsepower used in bituminous coal mines, the number and horsepower of steam engines, the number and horsepower of electric motors run by current generated by the operators themselves, together with the percentage of increase in the various items. The difference—comparatively small—between total primary power and power of steam engines is represented chiefly by the power of electric motors operated by purchased current. (See Table 62.)

In preparing this table no deduction was made on account of power used for coke manufacture at the mines, since one power plant ordinarily suffices for both mine and ovens, and since only a relatively small amount of the total power is used in coke manufacture.

The table shows a great increase in the use of mechanical power from 1902 to 1909. For the entire United States steam engines show an increase of 80.2 per cent in number and 145.5 per cent in total horsepower while the average horsepower per engine increased from 75 to 102 horsepower, or 36 per cent. Electric motors run by current generated by the mine operators increased 635 per cent in number and 400 per cent in total horsepower. This advance in the use of power was much more rapid than the increase in

coal production, as shown by the fact that the total output of coal from 1902 to 1909 increased but 45 per cent, while the total primary horsepower increased nearly 150 per cent. The greatest percentages of increase in primary horsepower appeared in the following states: Kentucky, 267.1 per cent; West Virginia, 247.6 per cent; Texas, 228.1 per cent; Tennessee, 199.2 per cent; Pennsylvania, 196.1 per cent; and Alabama, 194.7 per cent. In the same period the coal output of these states increased as follows: Kentucky, 56.1 per cent; West Virginia, 109.6 per cent; Texas, 102.3 per cent; Tennessee, 44.9 per cent; Pennsylvania, 39.3 per cent; and Alabama, 32.1 per cent. The lowest percentages of increase in total horsepower were in Maryland, Missouri, Iowa, Wyoming, Arkansas, Washington, and Kansas; but even in these states the increase in total horsepower was far greater than the increase in the coal output for the same period. These figures of increase in the use of power reflect the general improvement in the scale of production and in various details of mine operation which has characterized this period.

STEAM ENGINES AND POWER AT BITUMINOUS COAL MINES, BY STATES: 1909 AND 1902.

Table 61

STATE.	Census.	Total primary horsepower.	STEAM ENGINES.		ELECTRIC MOTORS RUN BY CURRENT GENERATED BY THE MINE OPERATORS.	
			Number.	Horsepower.	Number.	Horsepower.
United States	**1909**	**1,227,401**	**11,738**	**1,199,430**	**9,717**	**329,298**
	1902	**493,148**	**6,513**	**488,478**	**1,322**	**65,927**
Per cent of increase		**148.9**	**80.2**	**145.5**	**635.0**	**399.5**
Alabama	1909	54,084	503	53,334	366	11,584
	1902	18,350	279	18,264	.....	.....
Per cent of increase		194.7	80.3	192.0	.....	.....
Arkansas	1909	10,508	140	10,508	20	1,746
	1902	6,437	153	6,432	15	940
Per cent of increase [1]		63.2	−8.5	63.4	33.3	85.7
Colorado	1909	34,085	404	32,132	281	9,816
	1902	16,449	258	16,102	83	3,276
Per cent of increase		107.2	56.6	98.4	238.6	199.6
Illinois	1909	166,174	1,987	165,441	298	12,165
	1902	78,586	1,212	78,493	102	4,322
Per cent of increase		111.5	63.9	110.8	192.2	181.5
Indiana	1909	45,810	577	45,739	187	7,476
	1902	22,045	393	22,026	29	2,247
Per cent of increase		108.3	46.8	107.7	544.8	232.7
Iowa	1909	19,118	354	18,746	32	1,375
	1902	11,815	298	11,673	14	296
Per cent of increase		61.8	18.8	60.6	128.6	364.5
Kansas	1909	19,707	330	19,604	15	960
	1902	11,812	220	11,795	9	270
Per cent of increase		66.8	50.0	66.2	66.7	255.6
Kentucky	1909	44,314	563	43,230	354	11,736
	1902	12,071	191	11,881	40	1,824
Per cent of increase		267.1	194.8	263.9	785.0	543.4
Maryland	1909	9,845	194	9,795	40	1,273
	1902	7,624	54	7,612	.....	.....
Per cent of increase		29.1	259.3	28.7	.....	.....
Michigan	1909	7,912	94	7,900	47	2,162
	1902	3,701	46	3,699	12	376
Per cent of increase		113.8	104.3	113.6	291.7	475.0
Missouri	1909	11,898	238	11,619	78	2,042
	1902	8,220	190	8,184	7	300
Per cent of increase		44.7	25.3	42.0	1,014.3	580.7
North Dakota	1909	2,025	37	2,014	26	565
	1902	839	21	839	12	86
Per cent of increase		141.4	76.2	140.0	116.7	557.0
Ohio	1909	97,422	1,003	95,545	1,211	35,501
	1902	45,790	597	45,517	131	5,527
Per cent of increase		112.8	68.0	109.9	824.4	542.3
Oklahoma	1909	26,316	277	25,881	31	4,700
	1902	12,709	169	12,709	9	290
Per cent of increase		107.1	63.9	103.6	244.4	486.2
Oregon	1909	1,109	15	1,109	9	290
	1902	527	11	527	.....	.....
Per cent of increase		110.4	36.4	110.4	.....	.....
Pennsylvania	1909	404,654	2,993	393,371	3,017	115,195
	1902	136,666	1,440	134,032	432	20,508
Per cent of increase		196.1	107.8	194.5	737.3	461.7
Tennessee	1909	16,075	153	16,027	103	4,054
	1902	5,372	65	5,278	12	760
Per cent of increase		199.2	135.4	203.7	758.3	433.4
Texas	1909	6,217	92	6,217	.....	.....
	1902	1,895	53	1,895	1	40
Per cent of increase [1]		228.1	73.6	228.1	−100.0	−100.0
Virginia	1909	16,630	128	16,451	286	9,775
	1902	6,224	52	5,849	28	1,280
Per cent of increase		167.3	146.2	181.4	957.1	663.7
Washington	1909	16,812	133	16,360	169	5,834
	1902	10,146	85	9,146	77	2,133
Per cent of increase		65.7	56.5	78.8	119.5	173.5
West Virginia	1909	155,576	1,114	149,815	2,232	81,598
	1902	44,757	433	44,495	217	16,894
Per cent of increase		247.6	157.3	236.7	928.6	383.0
Wyoming	1909	28,071	172	27,356	79	2,461
	1902	17,283	132	17,283	24	1,079
Per cent of increase		62.4	30.3	58.3	229.2	128.1
All other states [2]	1909	32,030	237	31,206	226	10,080
	1902	13,433	101	13,090	68	3,479
Per cent of increase		138.1	47.2	126.9	232.4	189.7

[1] A minus sign (−) denotes decrease.
[2] Includes California, Georgia, Idaho, Montana, New Mexico, and Utah in 1909; Alaska, California, Georgia, Idaho, Montana, New Mexico, North Carolina, and Utah in 1902.

PART IV.—GENERAL STATISTICS: 1909.

INTRODUCTION.

The principal statistics obtained by the census of coal mines in 1909 are given for the different states in the following general summary. The table gives for the United States as a whole the data obtained not only for producing, but also for nonproducing mines, that is, those which were in course of development but which did not reach the producing stage during the year 1909. These data for nonproducing mines could not be published for the several states because of the disclosure of individual operations and are not included in any other table. This general summary does not include any statistics of mines operated by state penal institutions, nor of mines for which the operators failed to furnish full reports as to capital, expenses, employees, etc. The quantity and value of the coal produced by these mines—about 2,000,000 tons—are included in Tables 2, 4, 5, and 7, of Part I.

In the states of Alabama, Colorado, Kentucky, Montana, New Mexico, Pennsylvania, Tennessee, Utah, Virginia, Washington, and West Virginia coke is manufactured at many coal mines, and the returns received from numerous operators in these states covered coal mining and coke making combined. In view of this condition of the returns, and for the other reasons given in the Introduction to this report, it was deemed advisable, in general, to present combined statistics of coal mining and coke manufacture where the two enterprises were conducted in combination. Accordingly, the totals given in this summary for the above states and for the United States include both coal mining and coke making at the mines. The statistics given in the upper portion of the table for Alabama, Colorado, Kentucky, Pennsylvania, Tennessee, Virginia, Washington, and West Virginia are subdivided in the lower portion under the headings (1) "Producing bituminous coal mines without coke manufacture," and (2) "Producing bituminous coal mines with coke manufacture." Under the first heading are given the statistics of mines in these states at which coke was not made, while under the second heading are given the combined statistics of coal mining and coke making for the mines at which coke manufacture was combined with mine operation. Such subdivision of the returns for Montana, New Mexico, and Utah could not be made on account of disclosing the business of individual concerns. It is recognized that for various reasons, such as comparison with the statistics of previous years, it is desirable to present certain data for coal mining in 1909 exclusive of coke manufacture. Accordingly, in Tables 2, 3, 4, 5, 6, 7, and 11, of Part I, and Tables 33, 34, 35, 36, 42, and 51, of Part III, the figures have been adjusted to give statistics of coal mining only, by deducting the estimated capital, expenses, wage earners, etc., attributable to the manufacture of coke at the mines.

The figures given for the anthracite industry include the statistics of river dredges and washeries, as well as of mines proper. The returns for river dredges are summarized in Table 21, and separate statistics for mines and for washeries are given in Table 28, Part II.

Stated briefly, then, the United States total for all mines, given in this general summary, is the total for all anthracite and bituminous enterprises, both producing and nonproducing, which rendered complete reports of their operations; the figures for anthracite coal cover river dredges and washeries, as well as mines proper, while those for bituminous include both coal mining and coke manufacture at the mines.

In the preliminary definitions and explanations, given in the Introduction to this report, the limitations of the census data are stated, the terms used are defined, and the methods of presenting the figures are explained in detail. These definitions and explanations relate to the scope of the census of coal mines, the period covered by the returns, the close connection of coal mining with coke manufacture at many mines, the treatment of subsidiary companies in determining the number of operators, the acreage of coal land controlled by coal mining concerns, the amount of capital invested, the expenses reported, the use of long and short tons in the statistics, the value of products, the number of persons engaged in the industry, and the figures for primary horsepower. Particular attention is directed to the remarks concerning the expenses reported. Those remarks consider mine development and depreciation, point out the limitations of the data obtained, give a full account of the method of dealing with administrative expenses of general offices when these were reported in toto by companies operating bituminous mines in more than one state, define the "gross" and "net" expenses shown for the anthracite industry, and give detailed explanations pertaining to the figures presented for wages, cost of supplies, and miscellaneous expenses. Attention is also directed to the remarks under "Value of products," referring not only to the amounts given for mines combining coal mining with coke manufacture, but also to the possible difference between the reported and the market value of products. All the definitions and explanations given in the Introduction must be taken into account in considering the statistics presented in this general summary.

COAL MINES—GENERAL STATISTICS, BY STATES: 1909.

	Table 62 (pp. 50-55). STATE.	Number of mines.	LAND CONTROLLED (ACRES). All land. Total.	All land. Owned.	All land. Held under lease.	Coal land. Total.	Coal land. Owned.	Coal land. Held under lease.	Timber land.	Other land.	Capital.
1	**UNITED STATES—All mines**	6,497	[1] 8,272,962	6,006,938	2,277,713	[1] 6,932,730	4,782,470	2,161,235	437,956	[1] 902,276	[2] $1,318,550,554
	ANTHRACITE										
2	**All mines**	[6] 429	[1] 465,647	316,868	160,468	[1] 274,870	183,144	102,701	71,851	[1] 118,926	246,950,806
3	Nonproducing mines	6	513	1	512	511	.....	511	.....	2	22,728
4	Producing mines	[6] 423	[1] 465,134	316,867	159,956	[1] 274,359	183,144	102,190	71,851	[1] 118,924	246,928,078
5	Pennsylvania	[6] 420	[1] 464,274	316,767	159,196	[1] 273,499	183,044	101,430	71,851	[1] 118,924	246,713,318
6	Colorado and New Mexico	3	860	100	760	860	100	760	.....	.....	214,760
	BITUMINOUS										
7	**All mines**	6,068	7,807,315	5,690,070	2,117,245	6,657,860	4,599,326	2,058,534	366,105	783,350	[2] 1,071,599,748
8	Nonproducing mines	55	89,700	54,827	34,873	84,674	49,914	34,760	2,740	2,286	9,402,665
	Producing mines:										
9	United States	6,013	7,717,615	5,635,243	2,082,372	6,573,186	4,549,412	2,023,774	363,365	781,064	[2] 1,062,197,083
10	Alabama	203	776,244	701,790	74,454	599,259	525,355	73,904	126,790	50,195	59,602,396
11	Arkansas	69	54,686	24,137	30,549	54,359	23,885	30,474	130	197	2,256,942
12	Colorado	155	113,636	84,915	28,721	92,942	65,101	27,841	400,	20,294	30,534,933
13	Illinois	631	585,366	424,739	160,627	552,306	395,965	156,431	3,255	29,715	75,257,667
14	Indiana	322	155,576	117,619	37,957	140,244	103,910	36,334	3,436	11,896	35,937,961
15	Iowa	311	77,796	26,771	51,025	70,192	20,152	50,040	472	7,132	7,212,033
16	Kansas	202	83,869	56,205	27,664	80,459	53,340	27,119	.....	3,410	6,262,203
17	Kentucky	310	399,846	280,053	119,793	364,669	247,006	117,663	16,538	18,639	24,700,533
18	Maryland	70	92,814	88,129	4,685	68,220	63,596	4,624	8,345	16,249	22,871,136
19	Michigan	28	25,661	6,222	19,439	23,135	3,696	19,439	4	2,522	6,865,156
20	Missouri	220	119,822	74,519	45,303	116,108	70,805	45,303	160	3,554	5,650,407
21	Montana	65	54,335	44,098	10,237	49,825	39,588	10,237	1,880	2,630	8,546,343
22	New Mexico	28	294,318	240,124	54,194	115,549	64,929	50,620	.....	178,769	23,558,127
23	North Dakota	53	14,695	12,300	2,395	10,356	7,971	2,385	.....	4,339	1,023,278
24	Ohio	640	432,204	283,439	148,765	406,336	260,423	145,913	5,767	20,101	64,131,141
25	Oklahoma	104	82,504	910	81,594	75,744	910	74,834	6,720	40	5,672,886
26	Oregon	9	6,630	4,960	1,670	3,122	1,452	1,670	2,910	598	642,410
27	Pennsylvania	1,509	1,965,568	1,604,753	360,815	1,673,537	1,321,981	351,556	38,573	253,458	417,598,630
28	Tennessee	142	661,507	548,247	113,260	458,924	353,954	104,970	128,540	74,043	20,329,066
29	Texas	47	130,063	108,132	21,931	125,774	104,513	21,261	80	4,209	5,894,898
30	Utah	22	27,541	27,341	200	17,341	17,221	120	4,600	5,600	5,856,501
31	Virginia	85	170,479	86,282	84,197	169,296	85,217	84,079	710	473	42,337,222
32	Washington	54	98,167	76,271	21,896	88,611	67,635	20,976	620	8,936	13,799,480
33	West Virginia	661	1,176,860	611,023	565,837	1,134,485	583,263	551,222	13,435	28,940	148,802,294
34	Wyoming	65	70,908	55,744	15,164	64,783	50,024	14,759	.....	6,125	7,609,229
35	All other states [8]	8	46,520	46,520	.....	17,520	17,520	.....	.....	29,000	1,014,823
	Producing bituminous mines without coke manufacture										
36	Alabama	167	241,651	169,597	72,054	231,765	160,261	71,504	1,790	8,096	19,632,647
37	Colorado	140	83,081	58,380	24,701	65,047	41,226	23,821	400	17,634	18,046,592
38	Kentucky	299	348,861	229,068	119,793	332,084	214,421	117,663	838	15,939	22,807,715
39	Pennsylvania	1,179	1,568,407	1,273,202	295,205	1,338,003	1,050,246	287,757	33,761	196,643	227,746,738
40	Tennessee	129	367,064	261,804	105,260	329,650	232,080	96,970	26,540	10,874	9,830,983
41	Virginia	44	36,263	12,418	23,845	35,190	11,353	23,837	600	473	21,846,844
42	Washington	51	92,269	74,931	17,338	83,313	66,295	17,018	620	8,336	13,040,936
43	West Virginia	479	596,979	236,585	360,394	565,457	215,401	350,056	11,353	20,169	77,677,068
	Producing bituminous mines with coke manufacture										
44	Alabama	36	534,593	532,193	2,400	367,494	365,094	2,400	125,000	42,099	39,969,749
45	Colorado	15	30,555	26,535	4,020	27,895	23,875	4,020	.....	2,660	12,488,341
46	Kentucky	11	50,985	50,985	.....	32,585	32,585	.....	15,700	2,700	1,892,818
47	Pennsylvania	330	397,161	331,551	65,610	335,534	271,735	63,799	4,812	56,815	189,851,892
48	Tennessee	13	294,443	286,443	8,000	129,274	121,274	8,000	102,000	63,169	10,498,083
49	Virginia	41	134,216	73,864	60,352	134,106	73,864	60,242	110	.....	20,490,378
50	Washington	3	5,898	1,340	4,558	5,298	1,340	3,958	.....	600	758,544
51	West Virginia	182	579,881	374,438	205,443	569,028	367,862	201,166	2,082	8,771	71,125,226

[1] Exclusive of duplications due to the fact that anthracite operators reported 11,689 acres, both in acres owned and in acres held under lease, of which 10,975 acres were coal land and 714 acres were other land. See Introduction, "Coal land controlled."

[2] The United States total includes $18,229,388 not distributed by states, due to the fact that several operators with bituminous mines in more than one state reported capital as a whole without segregating the investment for each state. The states affected are Arkansas, Illinois, Indiana, Iowa, Kansas, Missouri, Montana, Oklahoma, Pennsylvania, Washington, West Virginia, and Wyoming.

[3] See Notes 5 and 7.

[4] The statistics of salaries for the United States include $897,857, salaries of officials, and $625,499, salaries of clerks, etc., employed in general offices; these amounts are not included in the statistics of salaries for the individual states, but are included under sundries in the expenses of the several states. Similarly for the United States the statistics of taxes include $172,937 and the statistics of contract work include $57,174, reported by general offices, which have been included for the several states, not under the heads of taxes and contract work, respectively, but under sundries. The states affected by these items of salaries, taxes, and contract work are the following: Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Ohio, Oklahoma, Pennsylvania, Texas, Washington, and West Virginia. See Introduction, "Administrative expenses of general offices."

COAL MINES—GENERAL STATISTICS, BY STATES: 1909.

	EXPENSES OF OPERATION AND DEVELOPMENT.											
		Services.				Supplies.				Miscellaneous.		
			Salaries.									
	Aggregate.	Total.	Salaried officers of corporations, superintendents, and managers.	Clerks and other subordinate salaried employees.	Wages.	Total.	Fuel and rent of power.	Other.	Royalties.	Total.	Taxes.	Contract work.	Rent of offices and sundries.
1	[3] $531,351,592	[4] $413,363,645	[4] $15,086,587	[4] $11,360,445	$386,916,613	[5] $74,934,946	$10,707,873	[5] $64,227,073	$20,067,727	[4] $27,877,543	[4] $7,178,898	[4] $4,126,847	[4] $16,571,798
2	[7] 134,695,699	97,084,561	2,324,374	2,269,090	92,491,097	26,759,485	3,195,789	23,563,696	7,981,639	7,762,283	2,685,633	1,702,865	3,373,785
3	[7] 244,145	183,598	7,151	3,009	173,438	61,519	2,563	58,956	900	17,484	3,756	1,351	12,377
4	[7] 134,451,554	96,900,963	2,317,223	2,266,081	92,317,659	26,697,966	3,193,226	23,504,740	7,980,739	7,744,799	2,681,877	1,701,514	3,361,408
5	[7] 134,245,600	96,742,395	2,311,003	2,261,486	92,169,906	26,662,088	3,189,279	23,472,809	7,969,785	7,736,176	2,677,853	1,701,514	3,356,809
6	[7] 205,954	158,568	6,220	4,595	147,753	35,878	3,947	31,931	10,954	8,623	4,024	.....	4,599
7	[5] 396,655,893	[4] 316,279,084	[4] 12,762,213	[4] 9,091,355	294,425,516	[5] 48,175,461	7,512,084	[5] 40,663,377	12,086,088	[4] 20,115,260	[4] 4,493,265	[4] 2,423,982	[4] 13,198,013
8	748,867	281,701	37,795	14,878	229,028	166,814	2,137	164,677	3,600	296,752	11,449	214,310	70,993
9	[5] 395,907,026	[4] 315,997,383	[4] 12,724,418	[4] 9,076,477	294,196,488	[5] 48,008,647	7,509,947	[5] 40,498,700	12,082,488	[4] 19,818,508	[4] 4,481,816	[4] 2,209,672	[4] 13,127,020
10	[5] 16,868,435	12,270,925	687,371	560,841	11,022,713	[5] 2,348,650	585,984	[5] 1,762,666	224,829	2,024,031	139,448	751,384	1,133,199
11	3,630,526	[4] 2,924,194	[4] 109,071	[4] 56,996	2,758,127	362,212	89,981	272,231	163,896	[4] 180,224	[4] 10,250	[4] 26,511	[4] 143,463
12	[5] 14,279,495	[4] 11,096,066	[4] 413,970	[4] 298,330	10,383,766	[5] 2,167,167	303,980	[5] 1,863,187	430,136	[4] 586,126	[4] 133,126	[4] 9,139	[4] 443,861
13	51,697,504	[4] 44,074,914	[4] 1,324,355	[4] 759,313	41,991,246	4,944,371	1,005,253	3,939,118	744,860	[4] 1,933,359	[4] 171,582	[4] 51,480	[4] 1,710,297
14	14,906,831	[4] 12,877,655	[4] 381,914	[4] 222,197	12,273,544	1,198,974	214,621	984,353	240,494	[4] 589,708	[4] 83,230	[4] 10,674	[4] 495,804
15	12,816,076	[4] 10,851,841	[4] 280,146	[4] 188,023	10,383,672	1,330,436	125,214	1,205,222	322,673	[4] 311,126	[4] 38,484	[4] 38,266	[4] 234,376
16	9,778,297	[4] 8,303,193	[4] 154,291	[4] 132,232	8,016,670	609,521	100,975	508,546	266,545	[4] 509,038	[4] 18,304	[4] 49,793	[4] 440,851
17	10,171,949	[4] 7,943,284	[4] 523,880	[4] 266,042	7,153,362	1,198,120	173,453	1,024,667	325,239	[4] 705,306	[4] 67,946	[4] 86,660	[4] 550,700
18	3,941,359	[4] 2,935,410	[4] 111,261	[4] 110,855	2,713,294	408,227	35,719	372,508	95,757	[4] 501,965	[4] 79,726	[4] 1,653	[4] 420,586
19	2,985,802	2,392,412	87,445	37,695	2,267,272	325,517	30,266	295,251	61,555	206,318	14,439	2,203	189,676
20	5,715,727	[4] 4,905,202	[4] 148,745	[4] 60,485	4,695,972	397,068	75,688	321,380	160,182	[4] 253,275	[4] 6,911	[4] 23,903	[4] 222,461
21	4,584,674	3,695,048	117,661	97,493	3,479,894	665,804	125,967	539,837	96,151	127,671	33,718	415	93,538
22	3,275,025	2,704,421	97,588	147,430	2,459,397	358,489	29,850	328,639	6,712	205,403	27,071	7,521	170,811
23	523,410	417,290	32,752	27,317	357,221	75,187	12,835	62,352	10,647	20,286	4,265	1,325	14,696
24	27,153,497	[4] 22,289,075	[4] 911,606	[4] 455,430	20,922,039	2,681,281	388,466	2,292,815	892,398	[4] 1,290,743	[4] 234,021	[4] 52,854	[4] 1,003,868
25	6,535,441	[4] 5,105,722	[4] 187,087	[4] 115,243	4,803,392	912,614	166,630	745,984	269,651	[4] 247,454	[4] 36,589	[4] 22,266	[4] 188,599
26	238,246	164,559	6,050	5,664	152,845	62,590	43,067	19,523	438	10,659	2,642	2,000	6,017
27	[5] 128,161,063	[4] 99,861,056	[4] 3,517,425	[4] 2,647,494	93,696,137	[5] 17,317,225	2,302,679	[5] 15,014,546	3,996,568	[4] 6,986,214	[4] 2,344,575	[4] 787,163	[4] 3,854,476
28	[5] 6,859,204	5,400,104	329,706	232,105	4,838,293	[5] 713,984	100,792	[5] 613,192	404,429	340,687	48,704	6,036	285,947
29	2,812,079	[4] 2,303,146	[4] 115,072	[4] 62,031	2,126,043	334,867	41,603	293,264	36,247	[4] 137,819	[4] 12,340	[4] 21,214	[4] 104,265
30	3,217,579	2,524,073	118,347	77,426	2,328,300	603,920	110,661	493,259	2,169	87,417	55,183	2,500	29,734
31	5,286,920	3,587,503	202,349	180,385	3,204,769	789,082	230,282	558,800	251,824	658,511	117,232	114,453	426,826
32	6,533,164	[4] 5,286,890	[4] 132,530	[4] 113,910	5,040,450	862,697	195,163	667,534	103,330	[4] 280,247	[4] 85,484	[4] 10,162	[4] 184,601
33	45,469,759	[4] 34,000,488	[4] 1,596,534	[4] 1,408,251	30,995,703	5,845,954	707,151	5,138,803	2,870,850	[4] 2,752,467	[4] 485,161	[4] 62,279	[4] 2,205,027
34	8,146,526	[4] 6,219,817	[4] 230,015	[4] 180,954	5,808,248	1,435,465	307,831	1,127,634	104,908	[4] 386,336	[4] 55,969	[4] 10,644	[4] 319,723
35	318,438	249,739	8,700	6,830	234,209	59,225	5,836	53,389	.....	9,474	2,389	.....	7,085
36	7,806,117	5,966,251	415,349	264,560	5,286,342	1,140,858	255,130	885,728	210,008	489,000	58,959	93,439	336,602
37	9,394,037	[4] 7,364,973	[4] 342,409	[4] 190,757	6,831,807	1,234,149	197,334	1,036,815	332,219	[4] 462,696	[4] 65,889	[4] 9,139	[4] 387,668
38	9,140,144	[4] 7,144,573	[4] 479,019	[4] 242,562	6,422,992	984,049	136,842	847,207	325,239	[4] 686,283	[4] 57,083	[4] 86,660	[4] 542,540
39	79,351,941	[4] 62,311,534	[4] 1,972,404	[4] 1,683,853	58,655,277	10,057,493	1,517,684	8,539,809	3,209,038	[4] 3,773,876	[4] 1,301,289	[4] 393,320	[4] 2,079,267
40	5,185,588	4,055,674	260,401	183,805	3,611,468	500,909	69,897	431,012	399,649	229,356	35,285	6,036	188,035
41	1,628,096	1,194,785	82,481	41,876	1,070,428	125,973	30,664	95,309	99,364	207,974	55,787	114,453	37,734
42	6,205,090	[4] 5,017,095	[4] 115,160	[4] 107,823	4,794,112	824,851	190,205	634,646	90,993	[4] 272,151	[4] 81,339	[4] 10,162	[4] 180,650
43	24,327,363	[4] 18,194,203	[4] 1,009,940	[4] 700,682	16,483,581	3,200,654	379,157	2,821,497	1,575,439	[4] 1,357,067	[4] 213,655	[4] 58,123	[4] 1,085,289
44	[5] 9,062,318	6,304,674	272,022	296,281	5,736,371	[5] 1,207,792	330,854	[5] 876,938	14,821	1,535,031	80,489	657,945	796,597
45	[5] 4,885,458	3,731,093	71,561	107,573	3,551,959	[5] 933,018	106,646	[5] 826,372	97,917	123,430	67,237	.....	56,193
46	1,031,805	798,711	44,861	23,480	730,370	214,071	36,611	177,460	.....	19,023	10,863	.....	8,160
47	[5] 48,809,122	37,549,522	1,545,021	963,641	35,040,860	[5] 7,259,732	784,995	[5] 6,474,737	787,530	3,212,338	1,043,286	393,843	1,775,209
48	[5] 1,673,616	1,344,430	69,395	48,300	1,226,735	[5] 213,075	30,895	[5] 182,180	4,780	111,331	13,419	.....	97,912
49	3,658,824	2,392,718	119,868	138,509	2,134,341	663,109	199,618	463,491	152,460	450,537	61,445	.....	389,092
50	328,074	269,795	17,370	6,087	246,338	37,846	4,958	32,888	12,337	8,096	4,145	.....	3,951
51	21,142,396	15,806,285	586,594	707,569	14,512,122	2,645,300	327,994	2,317,306	1,295,411	1,395,400	271,506	4,156	1,119,738

[5] The totals for the United States include $433,801, cost of coal purchased for coking at mines, of which $128,176 are included in the statistics for Alabama, $261,475 in those for Colorado, $27,804 in those for Pennsylvania, and $16,346 in those for Tennessee.

[6] The total number of producing anthracite mines given for Pennsylvania includes 63 river dredges and 52 washeries.

[7] Gross expenses for all anthracite mines were $139,587,968, of which $263,501 were for nonproducing mines and $139,324,467 for producing mines; of this latter amount, $139,110,444 relates to Pennsylvania and $214,023 to Colorado and New Mexico. Deductions from the wages shown in the foregoing totals were made on account of explosives, oil, and blacksmithing, as follows: For all anthracite mines, $4,892,269, of which $19,356 were for nonproducing mines and $4,872,913 were for producing mines; of this latter amount the deductions for Pennsylvania were $4,864,844, and for Colorado and New Mexico $8,069.

[8] Includes California, Georgia, and Idaho.

COAL MINES—GENERAL STATISTICS, BY STATES: 1909.

Table 62—Continued.

	STATE.	PRODUCTS. Number of tons produced (2,000 pounds). Coal. Total.	Loaded at mines for shipment, or used in other departments by producers.	Sold locally.	Used at mines for steam and heat.	Made into coke at mines.	Mined by machines. Quantity.	Mined by machines. Per cent.	Coke made at mines.
1	**UNITED STATES—All mines**	**457,833,640**	[1] **378,254,214**	**11,514,926**	**17,991,897**	[2] **50,072,603**			**32,450,482**
	ANTHRACITE								
2	**All mines**	**80,968,130**	**70,246,074**	**2,105,772**	**8,616,284**				
3	Nonproducing mines								
4	Producing mines	80,968,130	70,246,074	2,105,772	8,616,284				
5	Pennsylvania	80,881,106	70,161,446	2,105,772	8,613,888				
6	Colorado and New Mexico	87,024	84,628		2,396				
	BITUMINOUS								
7	**All mines**	**376,865,510**	[1] **308,008,140**	**9,409,154**	**9,375,613**	[2] **50,072,603**	**144,775,410**	**38.4**	**32,450,482**
8	Nonproducing mines								
9	Producing mines: **United States**	**376,865,510**	[1] **308,008,140**	**9,409,154**	**9,375,613**	[2] **50,072,603**	**144,775,410**	**38.4**	**32,450,482**
10	Alabama	13,676,561	8,236,595	139,375	536,495	[2] 4,764,096	2,295,500	16.8	2,883,774
11	Arkansas	2,373,619	2,269,395	13,810	90,414		4,444	0.2	
12	Colorado	10,642,868	8,407,618	249,959	328,572	[2] 1,656,719	2,046,645	19.2	1,061,868
13	Illinois	50,570,503	46,002,733	2,508,463	1,459,307		18,140,591	35.9	
14	Indiana	14,723,231	13,484,475	803,871	434,885		7,450,091	50.6	
15	Iowa	7,725,679	6,834,088	679,579	212,012		8,414	0.1	
16	Kansas	6,895,600	6,575,258	174,067	146,335		54,976	0.8	
17	Kentucky	10,561,276	9,812,859	401,182	261,926	85,309	6,494,960	61.5	38,503
18	Maryland	4,001,272	3,915,794	36,493	48,985		117,568	2.9	
19	Michigan	1,772,315	1,611,182	91,057	70,076		628,211	35.4	
20	Missouri	3,596,691	3,237,360	293,160	66,171		798,878	22.2	
21	Montana	2,643,383	[3] 2,338,464	91,849	113,070	(4)	854,771	33.6	(4)
22	New Mexico	2,774,912	[3] 2,712,022	30,492	32,398	(4)	1,089,119	39.2	(4)
23	North Dakota	364,536	242,628	109,356	12,552		164,365	45.1	
24	Ohio	27,518,764	26,166,148	747,807	604,809		22,112,063	80.4	
25	Oklahoma	3,113,149	2,879,113	44,935	189,101		50,811	1.6	
26	Oregon	83,704	44,236	22,128	17,340		22,000	26.3	
27	Pennsylvania	137,304,760	98,472,107	2,097,098	2,959,862	[2] 33,775,693	57,574,954	41.9	22,499,706
28	Tennessee	5,972,930	5,399,092	79,568	98,978	[2] 395,292	1,024,398	17.2	213,759
29	Texas	1,824,742	1,770,504	6,330	47,908		17,230	0.9	
30	Utah	2,259,789	[3] 2,136,533	22,637	100,619	(4)			(4)
31	Virginia	4,949,341	2,802,693	50,232	183,433	1,912,983	1,439,811	29.1	1,264,213
32	Washington	3,601,213	3,331,087	56,828	143,590	69,708	48,690	1.4	42,980
33	West Virginia	51,495,666	43,817,088	582,420	927,729	6,168,429	20,945,819	40.7	3,809,028
34	Wyoming	6,294,596	5,941,776	68,324	284,496		1,391,101	22.1	
35	All other states [5]	224,350	[6] 211,666	8,134	4,550	[9] 1,244,374			[9] 636,651
	Producing bituminous mines without coke manufacture								
36	Alabama	6,515,922	6,142,266	116,763	256,893		1,151,808	17.7	
37	Colorado	6,994,756	6,536,517	235,697	222,542		2,046,645	29.3	
38	Kentucky	9,386,178	8,809,170	378,949	198,059		5,512,263	58.7	
39	Pennsylvania	85,103,949	81,604,471	1,690,930	1,808,548		46,873,329	55.1	
40	Tennessee	4,657,257	4,531,058	58,173	68,026		944,599	20.3	
41	Virginia	1,490,135	1,437,249	21,707	31,179		616,076	41.3	
42	Washington	3,496,242	3,300,078	56,236	139,928		48,690	1.4	
43	West Virginia	27,166,931	26,320,796	375,591	470,544		13,871,026	51.1	
	Producing bituminous mines with coke manufacture								
44	Alabama	7,160,639	2,094,329	22,612	279,602	[2] 4,764,096	1,143,692	16.0	2,883,774
45	Colorado	3,648,112	1,871,101	14,262	106,030	[2] 1,656,719			1,061,868
46	Kentucky	1,175,098	1,003,689	22,233	63,867	85,309	982,697	83.6	38,503
47	Pennsylvania	52,200,811	16,867,636	406,168	1,151,314	[2] 33,775,693	10,701,625	20.5	22,499,706
48	Tennessee	1,315,673	868,034	21,395	30,952	[2] 395,292	79,799	6.1	213,759
49	Virginia	3,459,206	1,365,444	28,525	152,254	1,912,983	823,735	23.8	1,264,213
50	Washington	104,971	31,009	592	3,662	69,708			42,980
51	West Virginia	24,328,735	17,496,292	206,829	457,185	6,168,429	7,074,793	29.1	3,809,028

[1] Exclusive of 1,244,374 tons of coal made into coke at mines, which are included in this column in the statistics for Georgia, Montana, New Mexico, and Utah, to avoid disclosing individual operations.

[2] The total for the United States excludes 418,225 tons of coal purchased for coking at mines, of which 102,487 tons are excluded from the total for Alabama, 262,789 tons from the total for Colorado, 36,684 tons from the total for Pennsylvania, and 16,265 from the total for Tennessee.

[3] Exclusive of $2,328,122, value of coke made at mines, which is included in this column in the statistics for Georgia, Montana, New Mexico, and Utah, to avoid disclosing individual operations.

[4] The total for the United States includes 1 water wheel of 4 horsepower in Kansas, 4 water wheels of 320 horsepower and 2 water motors of 14 horsepower in Washington, and 2 water wheels of 10 horsepower in West Virginia.

COAL MINES—GENERAL STATISTICS, BY STATES: 1909—Continued.

	PRODUCTS—continued.					POWER.									COKE OVENS AT MINES.	
	Value at mines.				Valuation of coal made into coke at mines (not charged to expense nor added to value of product).	Primary.						Secondary.		Number of mining machines.		
	Total.	Coal (exclusive of coal made into coke).	Coke made at mines.	Other products.		Total horsepower.	Steam engines.		Gas engines.		Electric motors operated by purchased current.		Electric motors run by current generated by the mine operators.			Built.	Building.
							Number.	Horsepower.	Number.	Horsepower.	Number.	Horsepower.	Number.	Horsepower.			
1	$577,142,935	[3]$509,232,811	$67,483,162	$426,962	$41,281,055	[4]1,908,708	19,373	1,878,555	374	3,101	872	26,704	10,872	375,626	13,585	86,379	1,403
2	149,180,471	149,180,471	.....	.....	.....	678,698	7,601	676,516	25	772	32	1,410	1,152	46,088	.....	.....	.....
3	.....	.....	.....	.....	.....	1,945	21	1,945	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	149,180,471	149,180,471	.....	.....	.....	676,753	7,580	674,571	25	772	32	1,410	1,152	46,088	.....	.....	.....
5	148,957,894	148,957,894	.....	.....	.....	676,128	7,567	673,946	25	772	32	1,410	1,152	46,088	.....	.....	.....
6	222,577	222,577	.....	.....	.....	625	13	625	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	427,962,464	[3]360,052,340	67,483,162	426,962	41,281,055	[4]1,230,010	11,772	1,202,039	349	2,329	840	25,294	9,720	329,538	13,585	86,379	1,403
8	.....	.....	.....	.....	.....	2,609	34	2,609	.....	.....	.....	.....	3	240	.....	.....	.....
9	427,962,464	[3]360,052,340	67,483,162	426,962	41,281,055	[5]1,227,401	11,738	1,199,430	349	2,329	840	25,294	9,717	329,298	13,585	86,379	1,403
10	18,459,433	10,777,476	7,670,711	11,246	5,396,802	54,084	503	53,334	10	87	15	663	366	11,584	300	8,607	.....
11	3,508,590	3,508,490	.....	100	.....	10,508	140	10,508	.....	.....	.....	.....	20	1,746	12	.....	.....
12	15,782,197	12,483,536	3,296,590	2,071	1,620,732	34,085	404	32,132	2	7	52	1,946	281	9,816	259	3,281	.....
13	53,030,545	52,999,918	.....	30,627	.....	166,174	1,957	165,441	71	484	16	249	298	12,165	1,372	24	.....
14	15,018,123	14,984,616	.....	33,507	.....	45,910	577	45,739	19	91	4	80	187	7,476	672	10	.....
15	12,682,106	12,679,225	.....	2,881	.....	19,118	354	18,746	76	329	2	43	32	1,375	7	.....	.....
16	9,835,614	9,835,567	.....	47	.....	[4]19,707	330	19,604	12	56	4	43	15	960	16	.....	.....
17	10,003,481	9,921,441	80,633	1,407	17,637	44,314	563	43,230	10	49	34	1,035	354	11,736	907	374	.....
18	4,483,137	4,445,041	.....	38,096	.....	9,845	194	9,795	2	35	3	15	40	1,273	39	.....	.....
19	3,175,102	3,175,102	.....	.....	.....	7,912	94	7,900	2	12	.....	.....	47	2,162	115	.....	.....
20	5,881,034	5,879,972	.....	1,062	.....	11,898	238	11,619	30	144	6	135	78	2,042	103	.....	.....
21	5,117,444	[7]5,117,444	([6])	.....	([6])	16,173	109	16,066	1	3	6	104	86	2,801	82	.....	.....
22	3,984,660	[7]3,974,250	([6])	10,410	([6])	9,387	53	7,866	2	21	44	1,500	72	4,068	8	980	.....
23	563,212	563,212	.....	.....	.....	2,025	37	2,014	2	11	.....	.....	26	565	20	.....	.....
24	27,353,663	27,274,403	.....	79,260	.....	97,422	1,003	95,545	26	159	91	1,718	1,211	35,501	1,537	4	.....
25	6,185,078	6,184,420	.....	658	.....	26,316	277	25,881	.....	.....	9	435	31	1,700	34	.....	.....
26	225,026	225,026	.....	.....	.....	1,109	15	1,109	.....	.....	.....	.....	9	200	27	.....	.....
27	147,466,417	103,315,679	43,937,062	213,676	26,197,001	404,654	2,993	393,371	50	541	308	10,742	3,617	115,195	5,725	49,510	1,227
28	6,688,454	6,102,769	585,685	.....	445,746	16,075	153	16,027	9	48	.....	.....	103	4,054	191	1,457	.....
29	3,136,004	3,134,720	.....	1,284	.....	6,217	92	6,217	.....	.....	.....	.....	.....	.....	11	.....	.....
30	4,111,987	[7]4,111,987	([6])	.....	([6])	6,929	60	6,914	.....	.....	1	15	68	3,211	7	650	.....
31	4,988,328	2,776,965	2,211,363	.....	1,559,220	16,630	128	16,451	2	9	9	170	296	9,775	112	5,130	50
32	9,226,793	8,986,189	240,604	.....	153,518	[4]16,812	133	16,300	1	7	6	171	169	5,834	18	185	.....
33	46,929,592	39,797,027	7,132,392	173	4,546,867	[4]155,576	1,114	149,815	20	146	222	5,605	2,232	81,598	1,890	15,966	126
34	9,721,134	9,721,134	.....	.....	.....	28,071	172	27,356	2	90	8	625	79	2,461	121	.....	.....
35	405,310	[7]404,853	[9]2,328,122	457	[9]1,343,532	450	15	450	.....	.....	.....	.....	.....	.....	.....	201	.....
36	8,125,811	8,114,565	.....	11,246	.....	18,776	226	18,719	5	57	.....	.....	50	1,999	182	.....	.....
37	10,208,042	10,208,042	.....	.....	.....	27,350	348	25,477	2	7	50	1,866	185	5,721	258	.....	.....
38	9,006,946	9,005,539	.....	1,407	.....	38,409	503	37,325	10	49	34	1,035	330	10,016	783	.....	.....
39	85,773,883	85,749,052	.....	24,831	.....	238,250	1,688	232,459	45	501	159	5,290	2,601	77,810	4,471	.....	.....
40	5,130,791	5,130,791	.....	.....	.....	11,580	111	11,537	7	43	.....	.....	78	3,314	167	.....	.....
41	1,379,924	1,379,924	.....	.....	.....	5,214	43	5,035	2	9	9	170	46	1,145	57	.....	.....
42	8,915,528	8,915,528	.....	.....	.....	[4]16,252	127	16,100	1	7	5	96	158	5,554	18	.....	.....
43	23,330,421	23,330,248	.....	173	.....	[4]79,238	571	76,610	16	124	110	2,494	1,022	32,525	1,387	.....	.....
44	10,333,622	2,662,911	7,670,711	.....	5,396,802	35,308	277	34,615	5	30	15	663	316	9,585	118	8,607	.....
45	5,574,155	2,275,494	3,296,590	2,071	1,620,732	6,735	56	6,655	.....	.....	2	80	96	4,095	1	3,281	.....
46	996,535	915,902	80,633	.....	17,637	5,905	60	5,905	.....	.....	.....	.....	24	1,720	124	374	.....
47	61,692,534	17,566,627	43,937,062	188,845	26,197,001	166,404	1,305	160,912	5	40	149	5,452	1,016	37,385	1,254	49,510	1,227
48	1,557,663	971,978	585,685	.....	445,746	4,495	42	4,490	2	5	.....	.....	25	740	24	1,457	.....
49	3,608,404	1,397,041	2,211,363	.....	1,559,220	11,416	85	11,416	.....	.....	.....	.....	250	8,630	55	5,130	50
50	311,265	70,661	240,604	.....	153,518	[4]560	6	200	.....	.....	1	75	11	280	.....	185	.....
51	23,599,171	16,466,779	7,132,392	.....	4,546,867	76,338	543	73,205	4	22	112	3,111	1,210	49,073	503	15,966	126

[5] Includes coal made into coke at mines, to avoid disclosing individual operations.
[4] See "All other states."
[7] Includes value of coke made at mines, to avoid disclosing individual operations.
[8] Includes California, Georgia, and Idaho.
[9] Includes Montana, New Mexico, and Utah, to avoid disclosing individual operations.

COAL MINES—GENERAL STATISTICS, BY STATES: 1909—Continued.

Table 62—Continued.

	STATE.	PERSONS ENGAGED IN INDUSTRY.											
		Aggregate.	Proprietors and officials.				Clerks and other subordinate salaried employees.			Wage earners, December 15, or nearest representative day.			
			Total.	Proprietors and firm members.		Salaried officers of corporations.	Superintendents and managers.	Total.	Male.	Female.	Total.	Engineers, firemen, and mechanics.		Miners and miners' helpers (all inside).
				Total.	Performing manual labor.							Total.	Outside.	Inside.	
1	**UNITED STATES—All mines**	[1] 771,773	[1] 12,991	3,936	1,790	[1] 2,505	[1] 6,550	[1] 14,483	[1] 13,373	[1] 1,110	744,299	42,191	34,230	7,961	467,685
	ANTHRACITE.														
2	**All mines**	178,331	1,321	188	72	171	962	3,185	3,127	58	173,825	12,287	9,767	2,520	83,337
3	Nonproducing mines	327	6	.....	.....	.....	6	.....	.....	.....	321	15	15	.....	181
4	Producing mines	178,004	1,315	188	72	171	956	3,185	3,127	58	173,504	12,272	9,752	2,520	83,156
5	Pennsylvania	177,753	1,310	188	72	171	951	3,180	3,122	58	173,263	12,248	9,728	2,520	83,030
6	Colorado and New Mexico	251	5	.....	.....	.....	5	5	5	.....	241	24	24	.....	126
	BITUMINOUS.														
7	**All mines**	[1] 593,442	[1] 11,670	3,748	1,718	[1] 2,334	[1] 5,588	[1] 11,298	[1] 10,246	[1] 1,052	570,474	29,904	24,463	5,441	384,348
8	Nonproducing mines	765	50	9	5	19	22	30	30	.....	685	78	74	4	325
9	Producing mines: United States	[1] 592,677	[1] 11,620	3,739	1,713	[1] 2,315	[1] 5,566	[1] 11,268	[1] 10,216	[1] 1,052	569,789	29,826	24,389	5,437	384,023
10	Alabama	24,822	556	40	6	135	381	787	746	41	23,479	1,959	1,587	372	13,478
11	Arkansas	5,678	135	38	20	27	70	81	76	5	5,462	392	350	42	3,800
12	Colorado	16,166	417	165	10	73	179	288	256	32	15,461	966	770	196	9,647
13	Illinois	76,761	1,364	528	359	243	593	952	847	105	74,445	3,699	2,974	725	53,503
14	Indiana	23,109	458	202	110	99	157	294	246	48	22,357	1,017	933	84	17,129
15	Iowa	18,332	514	298	225	79	137	195	158	37	17,623	752	600	152	13,073
16	Kansas	13,374	401	283	152	40	78	182	155	27	12,791	512	387	125	9,972
17	Kentucky	20,632	537	118	39	173	246	440	400	40	19,655	997	857	140	14,614
18	Maryland	6,069	130	28	13	20	82	141	136	5	5,798	252	212	40	3,833
19	Michigan	3,782	154	104	70	17	33	56	41	15	3,572	209	186	23	2,796
20	Missouri	9,991	381	244	208	32	105	84	68	16	9,526	356	347	9	7,015
21	Montana	4,793	93	41	28	14	38	88	80	8	4,612	403	341	122	3,096
22	New Mexico	3,688	52	13	8	14	25	146	127	19	3,490	207	122	85	2,324
23	North Dakota	954	77	51	19	5	21	20	18	2	857	48	42	6	581
24	Ohio	46,046	993	421	203	201	371	648	551	97	44,405	1,946	1,690	256	33,155
25	Oklahoma	9,124	143	35	22	39	69	167	160	7	8,814	790	666	124	5,414
26	Oregon	271	14	9	9	1	4	6	6	.....	251	28	13	15	196
27	Pennsylvania	190,602	2,996	808	183	475	1,713	3,198	2,883	315	184,408	8,083	6,549	1,534	123,059
28	Tennessee	11,729	235	20	9	78	137	340	325	15	11,154	534	377	157	7,348
29	Texas	4,416	79	8	.....	22	49	103	95	8	4,234	234	202	32	3,192
30	Utah	3,263	50	5	.....	18	27	53	48	5	3,160	330	255	75	1,941
31	Virginia	10,418	128	15	.....	42	71	248	237	11	10,042	772	623	149	4,970
32	Washington	6,348	69	6	2	16	47	124	110	14	6,155	502	426	76	3,834
33	West Virginia	72,477	1,038	59	12	287	692	1,773	1,700	73	69,666	4,285	3,435	850	40,710
34	Wyoming	8,267	272	185	4	24	63	156	149	7	7,839	455	407	48	5,054
35	All other states [2]	562	22	15	2	3	4	7	6	1	533	38	38	.....	289
	Producing bituminous mines without coke manufacture.														
36	Alabama	12,427	320	40	6	109	171	386	367	19	11,721	733	641	92	8,162
37	Colorado	10,942	381	165	10	65	151	193	168	25	10,368	595	535	60	6,972
38	Kentucky	18,869	517	118	39	170	229	417	380	37	17,935	872	746	126	13,177
39	Pennsylvania	119,972	1,971	724	179	336	911	1,927	1,687	240	116,074	5,229	3,887	1,342	87,778
40	Tennessee	8,931	191	20	9	69	102	270	258	12	8,470	418	304	114	5,850
41	Virginia	3,197	68	10	.....	26	32	68	61	7	3,061	155	131	24	1,941
42	Washington	6,035	61	6	2	15	40	117	103	14	5,857	473	401	72	3,748
43	West Virginia	38,107	726	57	12	104	475	918	882	36	36,463	2,213	1,801	412	22,966
	Producing bituminous mines with coke manufacture.														
44	Alabama	12,395	236	.....	.....	26	210	401	379	22	11,758	1,226	946	280	5,316
45	Colorado	5,224	36	.....	.....	8	28	95	88	7	5,093	371	235	136	2,675
46	Kentucky	1,763	20	.....	.....	3	17	23	20	3	1,720	125	111	14	1,437
47	Pennsylvania	70,630	1,025	84	4	139	802	1,271	1,196	75	68,334	2,854	2,662	192	35,281
48	Tennessee	2,798	44	.....	.....	9	35	70	67	3	2,684	116	73	43	1,498
49	Virginia	7,221	60	5	.....	16	39	180	176	4	6,981	617	492	125	3,029
50	Washington	313	8	.....	.....	1	7	7	7	.....	298	29	25	4	86
51	West Virginia	34,370	312	2	.....	93	217	855	818	37	33,203	2,072	1,634	438	17,744

[1] The United States totals include 592 male and 99 female clerks, 174 superintendents and managers, and 138 salaried officers of corporations employed in general offices who could not be distributed among the individual states; the states concerned are Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Montana, Ohio, Oklahoma, Pennsylvania, Texas, Washington, West Virginia, and Wyoming. See Introduction, "Administrative expenses of general offices."

COAL MINES—GENERAL STATISTICS, BY STATES: 1909—Continued.

	PERSONS ENGAGED IN INDUSTRY—continued.																
	Wage earners, December 15, or nearest representative day—Continued.						Wage earners employed 15th day of—										
	Other wage earners 16 years of age and over.			Boys under 16 years of age.													
	Total.	Outside.	Inside.	Total.	Outside.	Inside.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1	**227,455**	**104,931**	**122,524**	**6,968**	**4,051**	**2,917**	**691,510**	**686,653**	**680,232**	**650,344**	**647,044**	**653,440**	**660,072**	**667,813**	**685,999**	**705,742**	**721,175**	**730,184**
2	**74,954**	**35,833**	**39,121**	**3,247**	**3,234**	**13**	**173,059**	**172,775**	**173,297**	**168,295**	**168,402**	**169,261**	**167,731**	**166,063**	**166,351**	**170,302**	**170,925**	**169,492**
3	125	66	59	.....	.....	.....	212	270	272	286	265	297	306	323	348	341	324	308
4	74,829	35,767	39,062	3,247	3,234	13	172,847	172,505	173,025	168,009	168,137	168,964	167,425	165,740	166,003	169,961	170,601	169,184
5	74,746	35,716	39,030	3,239	3,226	13	172,679	172,417	172,906	167,928	168,007	168,715	167,166	165,486	165,760	169,729	170,358	168,943
6	83	51	32	8	8	.....	168	88	119	81	130	249	259	254	243	232	243	241
7	**152,501**	**69,098**	**83,403**	**3,721**	**817**	**2,904**	**518,451**	**513,878**	**506,935**	**482,049**	**478,642**	**484,179**	**492,341**	**501,750**	**519,648**	**535,440**	**550,250**	**560,672**
8	282	214	68	.....	.....	.....	54	61	169	188	187	249	332	344	417	462	510	583
9	**152,219**	**68,884**	**83,335**	**3,721**	**817**	**2,904**	**518,397**	**513,817**	**506,766**	**481,861**	**478,455**	**483,930**	**492,009**	**501,406**	**519,231**	**534,978**	**549,740**	**560,089**
10	7,622	4,368	3,254	420	200	220	22,403	21,338	21,478	20,968	20,507	20,334	20,463	20,863	21,626	22,462	22,456	24,627
11	1,257	350	907	13	1	12	4,840	4,192	3,681	2,674	2,789	3,607	4,060	4,736	4,914	5,099	5,253	5,151
12	4,791	2,607	2,184	57	23	34	14,043	13,582	13,327	12,536	11,859	11,703	11,707	12,344	13,370	14,246	14,650	15,396
13	17,166	4,262	12,904	77	4	73	69,376	68,760	67,569	61,266	60,852	58,799	59,637	59,571	64,177	68,032	70,074	71,193
14	4,158	1,169	2,989	53	.....	53	19,309	19,117	18,813	17,394	17,515	16,670	18,144	18,635	20,033	20,626	21,267	21,318
15	3,674	1,178	2,496	124	5	119	16,552	16,518	16,033	14,379	13,787	13,381	13,709	14,410	15,336	16,132	16,861	17,235
16	2,302	735	1,567	5	1	4	12,354	12,362	11,971	10,255	9,906	11,032	10,970	11,158	11,673	12,078	12,445	12,586
17	3,980	1,860	2,120	64	15	49	16,992	16,884	16,165	15,189	14,662	14,609	15,191	15,651	16,743	17,874	18,568	19,127
18	1,549	739	810	164	21	143	5,825	5,753	5,716	5,570	5,528	5,533	5,383	5,257	5,409	5,445	5,505	5,772
19	567	132	435	.....	.....	.....	3,703	3,644	3,611	3,305	3,112	3,213	3,254	3,320	3,382	3,386	3,414	3,496
20	2,136	644	1,492	19	.....	19	8,689	8,392	7,910	5,795	5,616	6,231	6,511	7,057	7,955	8,680	8,917	9,370
21	1,053	597	456	.....	.....	.....	4,095	3,905	3,940	3,828	3,950	3,842	3,741	3,828	4,088	4,261	4,498	4,594
22	911	641	270	48	18	30	3,530	3,676	3,576	3,662	3,516	3,461	3,589	3,543	3,623	3,417	3,444	3,455
23	227	157	70	1	.....	1	739	724	624	411	348	321	384	391	434	694	753	848
24	9,110	2,383	6,727	194	10	184	40,463	40,405	39,375	36,910	36,684	37,235	37,680	39,281	40,418	40,784	43,770	43,126
25	2,607	850	1,757	3	.....	3	7,545	7,274	6,676	6,451	6,377	6,621	7,296	7,543	7,794	8,373	8,544	8,720
26	27	27	.....	.....	.....	.....	258	270	245	199	171	121	112	141	178	229	212	235
27	52,128	27,961	24,167	1,138	291	847	162,715	163,261	163,765	158,820	159,902	164,889	167,634	169,672	171,748	175,066	178,367	182,146
28	3,036	1,434	1,602	236	38	198	10,971	10,726	10,646	10,372	10,216	10,005	9,958	10,205	10,264	10,636	11,117	11,119
29	808	378	430	.....	.....	.....	4,032	4,067	4,011	4,075	3,904	3,910	4,015	3,896	3,988	4,174	4,093	4,118
30	861	523	338	28	17	11	2,912	2,800	2,653	2,021	2,473	2,463	2,581	2,638	2,667	2,599	2,670	3,120
31	4,173	2,527	1,646	127	25	102	9,014	8,789	8,620	8,734	8,727	9,078	9,075	9,168	9,032	9,206	9,596	9,967
32	1,788	880	908	31	31	.....	5,722	5,795	5,658	5,674	5,802	5,763	5,762	5,708	5,988	6,044	6,062	6,020
33	23,834	11,485	12,349	837	114	723	63,980	63,461	62,932	63,308	62,983	63,906	64,080	65,276	66,965	67,704	69,161	68,986
34	2,325	868	1,457	5	3	2	7,726	7,620	7,265	6,956	6,764	6,699	6,563	6,593	6,898	7,200	7,504	7,825
35	129	129	.....	77	.....	77	519	502	506	509	505	504	510	521	528	531	539	539
36	2,690	990	1,700	136	76	60	11,136	10,362	10,043	10,046	9,913	10,042	9,884	10,120	10,557	10,975	11,053	11,456
37	2,755	1,164	1,591	46	14	32	9,166	8,682	8,318	7,943	7,509	7,390	7,235	7,732	8,786	9,416	9,731	10,303
38	3,822	1,702	2,120	64	15	49	15,143	15,038	14,446	13,445	12,984	13,014	13,521	13,967	15,046	16,132	16,826	17,435
39	22,255	8,226	14,029	812	114	698	101,876	102,025	102,504	100,236	101,296	103,976	105,806	106,475	107,653	109,464	111,855	113,913
40	2,055	887	1,168	147	24	123	8,559	8,257	8,064	7,909	7,794	7,647	7,633	7,821	7,905	8,024	8,400	8,445
41	936	252	684	29	6	23	2,595	2,472	2,663	2,954	3,074	3,248	3,343	3,315	3,071	3,176	3,204	2,986
42	1,605	798	807	31	31	.....	5,434	5,494	5,376	5,376	5,472	5,461	5,453	5,406	5,705	5,731	5,752	5,722
43	10,776	3,997	6,779	508	63	445	32,463	32,383	31,862	32,313	31,888	32,846	33,005	33,853	34,966	35,110	35,901	35,750
44	4,932	3,378	1,554	284	124	160	11,357	10,976	11,435	10,922	10,594	10,292	10,579	10,743	11,069	11,487	11,403	13,171
45	2,036	1,443	593	11	9	2	4,877	4,900	5,009	4,593	4,350	4,313	4,472	4,612	4,584	4,830	4,919	5,093
46	158	158	.....	.....	.....	.....	1,849	1,846	1,719	1,744	1,678	1,595	1,670	1,684	1,697	1,742	1,742	1,692
47	29,873	19,735	10,138	326	177	149	60,839	61,236	61,261	58,584	58,606	60,913	61,828	63,197	64,095	65,602	66,512	68,233
48	981	547	434	89	14	75	2,412	2,469	2,582	2,463	2,422	2,358	2,325	2,384	2,359	2,612	2,717	2,674
49	3,237	2,275	962	98	19	79	6,419	6,317	5,957	5,780	5,653	5,830	5,732	5,853	5,961	6,030	6,392	6,981
50	183	82	101	.....	.....	.....	288	301	282	298	330	302	309	302	283	313	310	298
51	13,058	7,488	5,570	329	51	278	31,517	31,078	31,070	30,995	31,095	31,060	31,075	31,423	31,999	32,594	33,260	33,236

[2] Includes California, Georgia, and Idaho.

THIRTEENTH CENSUS OF THE UNITED STATES: 1910

DEPARTMENT OF COMMERCE

BULLETIN

BUREAU OF THE CENSUS
WM. J. HARRIS, DIRECTOR

MINING : UNITED STATES

IRON MINES

Prepared under the supervision of ISAAC A. HOURWICH, Expert Special Agent for Mining

INTRODUCTION.

Definitions and explanations.—In order that the text and tables of this report may be entirely clear, the following definitions and explanations are presented:

Scope of census.—The statistics of iron mining relate to the United States exclusive of all outlying possessions. The Thirteenth Census did not extend to the Philippine Islands nor were iron mines reported from the other noncontiguous territory of the United States.

The census returns cover two general classes of operations: First, those which produced iron ore during the year 1909, and second, those which were in course of development during that year. In a few cases, however, where an operator controlled a number of mines, some of which were producing and some nonproducing, the expenses of development of the nonproducing mines have been included in the expenses of the producing enterprises.

Period covered.—The returns for the iron mines cover the calendar year 1909 or the business year which corresponded most nearly to that calendar year, with the exception of those mines which operated only a portion of the year.

Number of operators.—In determining the number of operators in the United States subsidiary companies have not been considered separate operators, but each holding or owning company, together with all its subsidiary concerns in any part of the United States, has been counted as one operator. In the statistics for districts or states, however, enterprises situated in different districts or states, though controlled by the same operator, were counted as separate operators.

Capital.—The operators were required to report the total amount of capital, both owned and borrowed, which they had invested in the business on the last day of the business year. However, the accuracy of the returns to this inquiry is open to question, owing to the fact that the valuation of mining properties contains an element of uncertainty inherent in the estimate of the value of the ore deposit. Again, a considerable proportion of the mining properties form a part of larger enterprises which combine mining with the manufacture of iron and steel, and the segregation of capital in such instances is often a matter of estimate with the operator.

Expenses.—The expenses reported include all direct expenses of operation and development. Interest payments are not included, nor has any allowance been made for depreciation.

Salaries.—The amount of salaries shown includes all payments to officers, superintendents, managers, and salaried employees in general offices, as well as the payments to salaried employees at the mines.

Wages.—The wages shown in the tables of this report represent the net earnings of the men. The census schedule called for the amount of net wages; that is, the amount remaining after deductions had been made from the gross earnings on account of blacksmithing, explosives, oil, etc., furnished by the operators, and also called for the amount of such deductions made. Deductions aggregating $1,207,772 were reported by the operators, and an examination of the returns, as well as correspondence with the operators in cases where there was doubt as to the method pursued, showed that the operators had deducted the charges in all cases where they had reported the same. Some operators who reported no charges to the men furnished all supplies free of charge. The amount expended for supplies of this nature, whether charged to the men or not, is included in the item of supplies and materials. In cases where the operator failed to include the same in supplies and materials the amount was ascertained by correspondence.

Supplies and materials.—This item covers all materials and supplies of every description, including fuel used for any purpose in connection with the operation or development of the iron mines. It includes the cost of the following materials: Lumber and timber used for repairs, mine supports, track ties, and all other purposes; iron and steel for blacksmithing; rails, frogs, sleepers, etc., for tracks and repairs; renewals and repairs of tools; explosives and oil used directly or sold to employees; water for boilers and other purposes; machinery, supplies; etc. It also includes freight (if any) paid on materials. The amount expended for fuel by iron mines in 1909 includes an insignificant amount paid for rent of power, which formed about 1 per cent of the total power used in 1909.

Miscellaneous expenses.—The figures for miscellaneous expenses include royalties and rent of mines, taxes, cost of contract work, rent of offices, use of patents, insurance, ordinary repairs to buildings and machinery, advertising, damages, traveling expenses, and all other sundry expenses.

Value of products.—The schedule called for the value of products at the mine. However, the value reported was probably not always the actual value which would have resulted from sales in the open market, since a considerable part of the output of iron mines was produced by operators affiliated with blast furnaces or other industrial enterprises, and the value reported by such operators may have been a matter of intercorporate accounting rather than an expression of market value. The value of products reported is that of the ore used and sold, and not the value of the ore actually mined. This value also includes the value of by-products, most of which was manganiferous ore.

Persons engaged in the industry.—The statistics of the number of operators, salaried employees, and wage earners are based on the returns for December 15, 1909, or the nearest representative day. The number of wage earners reported includes overseers performing work similar to that of men over whom they had charge, but foremen whose duties were wholly supervisory are included among salaried employees.

Primary horsepower.—The figures given under this heading represent the total primary power generated by steam engines, gas or gasoline engines, and water wheels owned by the operators. They are exclusive of a small quantity of rented electric power which was reported by two operators and amounted to but slightly over 1 per cent of the total power used. The horsepower of electric motors run by current generated by the primary power of the mine operators is not included, since this would obviously result in duplication.

IRON MINES.

GENERAL SUMMARY: 1909.

Producing mines—General summary, by districts.—The following summary presents, by districts, the principal statistics for producing iron mines in 1909. The Lake Superior district, which comprises Minnesota, Wisconsin, and Michigan, and the Southern district, which comprises Alabama, Georgia, and Tennessee, were the principal producing districts, the combined production of these two districts representing 91.9 per cent of the total tonnage of ore used by the operators in their own blast furnaces or sold in the market.

Table 1 PRODUCING IRON MINES: 1909

	United States.	Lake Superior district.[1]	Southern district.[2]	Other states.[3]
Number of operators	[4] 176	38	47	95
Number of mines	483	195	116	172
Persons engaged in industry	55,176	35,886	8,629	10,661
Proprietors and firm members	76	.....	15	61
Salaried employees	2,870	2,088	474	308
Wage earners	52,230	33,798	8,140	10,292
Primary horsepower owned	342,069	262,305	40,915	38,849
Capital	$300,735,917	$237,386,821	$28,475,259	$34,873,837
Expenses of operation and development	$74,071,830	$61,552,979	$5,762,991	$6,755,860
Services	$33,121,418	$25,236,687	$3,797,740	$4,086,991
Salaries	$3,389,962	$2,628,989	$428,043	$332,930
Wages	$29,731,456	$22,607,698	$3,369,697	$3,754,061
Supplies and materials	$17,229,717	$13,901,022	$1,356,956	$1,971,739
Royalties and rent of mines	$15,174,735	$14,784,131	$136,723	$253,881
Contract work	$2,698,842	$2,613,823	$5,700	$79,319
Taxes	$3,970,355	$3,818,377	$46,979	$104,999
Rent of offices and sundries	$1,876,763	$1,198,939	$418,893	$258,931
Iron ore:				
Gross production (long tons)	51,947,129	42,095,627	5,556,838	4,294,664
Production after concentration	51,717,920	42,095,627	5,556,838	4,065,455
Used and sold—				
Quantity (long tons)	50,521,208	41,242,374	5,181,605	4,097,229
Value (including by-products)	$106,947,082	$92,216,852	$6,085,508	$8,644,722
Average per operator:				
Number of mines	3	5	2	2
Salaried employees	16	55	10	3
Wage earners	297	889	173	108
Tons used and sold	287,052	1,085,320	110,247	43,129
Average per mine:				
Wage earners	108	173	70	60
Primary horsepower	708	1,345	353	226
Tons used and sold	104,599	211,499	44,669	23,821

[1] Embraces Michigan, Minnesota, and Wisconsin.
[2] Embraces Alabama, Georgia, and Tennessee.
[3] Embraces Colorado, Connecticut, Kentucky, Maryland, Massachusetts, Missouri, Nevada, New Mexico, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah, Virginia, West Virginia, and Wyoming.
[4] The difference of four between the total number of operators for the United States and the sum of the numbers for the districts and "Other states," is due to the elimination of the duplication in the United States total of those operators who had mines in more than one district.

There were 176 operators of iron mines in the United States in 1909. Where a number of mining properties were controlled by a holding company and operated through subsidiary companies, this holding company, together with all its subsidiaries, was counted as one operator.

The number of iron mines in the United States in 1909 was 483. The number of persons engaged in the industry, December 15, 1909, or the nearest representative day, was 55,176, of whom 52,230 were wage earners. The expenses of operation and development were $74,071,830, of which the payments for salaries and wages constituted somewhat less than half. The production of iron ore in crude form was 51,947,129 tons, but some of the ore produced in New York (882,548 tons) was concentrated at the mines, and the net production for the country as a whole after this concentration was 51,717,920 tons. It has been found impossible to assign any value to the ore produced which was added to the stock at the mine or lake port. The quantity used by blast furnaces at the mines or shipped from the mines for use in affiliated blast furnaces at a distance or for sale was 50,521,208 tons, and its value at the mine was $106,539,574, besides which manganiferous ore and other by-products to the value of $407,508 were produced, making the total value of products $106,947,082.

It should be noted that in some later tables the gross production of iron ore is shown; in some, the production after concentration; and in some, the quantity used and sold. The differences in practice in this respect depend upon the purpose of each table, and, particularly in certain cases, are determined by the nature of the figures for previous censuses with which comparison must be made.

The predominance of the Lake Superior district in the iron-mining industry is shown conspicuously by Table 1. More than four-fifths of the ore used and sold in 1909 came from this district, and the value of this ore, including by-products, represented nearly seven-eighths of the total for the country.

An examination of Table 1 shows that the scale of production in the Lake Superior district was much larger than that in the Southern district or in "Other states." In the Lake Superior district the average number of salaried employees per operator was 55, while in the Southern district it was only 10 and in "Other states," only 3. In the Lake Superior district the average number of wage earners per operator was 889, as compared with 173 in the Southern district and 108 in the rest of the country. The average output (based on the ore used and sold) per operator in the three divisions shows a still greater contrast. In the Lake Superior district the average was nearly ten times as great as in the Southern district and more than twenty-five times as great as in all the other states taken together. The contrast between the districts in respect to the scale of operations was due only in part to greater concentration of ownership, the average number of mines per operator in the Lake Superior district being 5, whereas in the Southern district and in "Other states" it was 2. On the average,

a mine in the Lake Superior district gave employment to more than twice as many wage earners as one in the Southern district and to nearly three times as many as one in "Other states," while the average production (amount used and sold) per mine in the Lake Superior district was nearly five times as great as that in the Southern district and nearly nine times as great as that in the rest of the country. In the Lake Superior district the use of mechanical power was also much more extensive than elsewhere, the average primary horsepower in that district being 1,345 per mine, in the Southern district 353, and in "Other states" 226.

Table 2 shows the output of iron ore in the United States and in the five iron-mining states, with a production in 1909 of more than 1,000,000 tons.

Table 2

STATE.	IRON ORE USED AND SOLD: 1909	
	Quantity (long tons).	Per cent of total.
United States	**50,521,208**	**100.0**
Minnesota	28,314,713	56.0
Michigan	11,924,995	23.6
Alabama	4,312,360	8.5
New York	1,024,173	2.0
Wisconsin	1,002,666	2.0
All other states	3,942,301	7.8

Producing and nonproducing enterprises.—A certain amount of development work is incidental to the operation of every mine. In the report for the operations of each mine were included the number of wage earners employed on development work, their wages, the cost of supplies and materials used, and other incidental expenses of such work. In addition to producing mines, there were some mines where development work only was carried on. Table 3 shows the relative importance of producing and nonproducing enterprises.

Table 3

	IRON MINES: 1909		
	Total.	Producing enterprises.	Nonproducing enterprises.
Number of operators	191	176	[1] 19
Land controlled, acres	1,343,634	1,313,214	30,420
Average per operator	7,035	7,461	1,601
Capital	$305,586,756	$300,735,917	$4,850,839
Expenses of operation and development	$74,934,131	$74,071,830	$862,301
Wage earners	52,983	52,230	753
Average per operator	277	297	40

[1] Includes 4 operators who also operated producing mines.

The preceding table shows that nonproducing mines operated as separate enterprises represented a very small part of the iron-mining industry. They were also much smaller than the producing properties. The average number of wage earners per operator was 297 for producing and only 40 for nonproducing enterprises.

PROGRESS OF THE INDUSTRY.

Summary for producing mines in the United States: 1879–1909.—Table 4 presents for producing iron mines, in the United States as a whole, all comparable statistics as reported at the Thirteenth and the three preceding censuses.

Table 4

CENSUS YEAR.	PRODUCING IRON MINES.									
	Salaries and wages.	Cost of supplies and materials.	Gross quantity of ore produced (long tons).	Total steam power (horsepower).	Per cent of increase over preceding census.				Average expenditure per ton for—	
					Salaries and wages.	Supplies.	Ore produced.	Steam power.	Salaries and wages.	Supplies and materials.
1909	$33,121,418	$17,229,717	51,047,129	[1] 326,753	40.1	92.0	46.1	217.6	$0.64	$0.33
1902	23,641,599	8,973,168	35,567,410	[1] 102,878	64.1	79.5	145.0	77.4	0.66	0.25
1889	14,409,151	4,998,988	14,518,041	[2] 57,976	51.1	72.7	130.2	104.0	0.99	0.34
1879	9,538,117	2,894,011	[3] 6,307,883	[2] 23,422	....	....	.....	.....	1.51	0.46

[1] Horsepower of steam engines. [2] Horsepower of steam boilers.
[3] Exclusive of the production of irregular producers.

This table shows an exceedingly rapid increase in the iron-mining industry. The gross amount of ore produced was more than eight times as great in 1909 as in 1879, and the expenditure for salaries and wages about three and a half times as great. The production of ore more than doubled between 1879 and 1889, and again more than doubled between 1889 and 1902, while between 1902 and 1909 there was an increase of 46.1 per cent.

The amount expended per ton for services decreased greatly from 1879 to 1902, but remained practically stationary from 1902 to 1909. On the other hand, the cost per ton of supplies and materials decreased considerably between 1879 and 1902, but increased from $0.25 to $0.33 between 1902 and 1909. The increase in the average expenditure for supplies and materials was apparently due to the increased use of mechanical power, but, as the increase in the quantity of ore produced did not keep pace with this increased use of mechanical power, it is probable that the expenditure for services in 1909 represented compensation for a smaller amount of labor than in 1902, as is further shown by Table 12.

The increase in the use of mechanical power is the most conspicuous feature of the development of iron mining brought out by Table 4. The horsepower shown in Table 4 for 1879 and 1889 represents the rated power of steam boilers, while that reported for 1902 and 1909 represents the rated power of steam engines. It must be borne in mind that the power of a boiler is always greater than that of the engine to which it supplies steam. The rate of increase from 1889 to 1902 was, accordingly, greater than that indicated by Table 4.

The increase in the number of steam engines and their horsepower is shown in Table 5.

Table 5 STEAM ENGINES USED IN PRODUCING IRON MINES.

CENSUS YEAR.	Number of engines.			Horsepower.			Average horsepower per engine.
	Number.	Increase over preceding census.		Amount.	Increase over preceding census.		
		Number.	Per cent.		Amount.	Per cent.	
1909	3,563	2,431	214.8	326,753	233,875	217.6	92
1902	1,132	311	37.9	102,878	78,040	314.2	91
1879	821	.....	.....	24,838	.....	.....	30

The absolute and relative increases in the number and horsepower of steam engines during the 7 years from 1902 to 1909 were far greater than during the preceding 23 years.

The progress in the use of mechanical power since 1902 has manifested itself not only in the increased use of steam power but also in the utilization of new sources of power. At the special census of 1902 the use of gas engines and water wheels was negligible, while in the seven years from 1902 to 1909 there was considerable development of these sources of power, although even in 1909 they were still comparatively unimportant. Moreover, there was a marked increase in the utilization of electric motors as a means of applying primary power. Table 6 presents comparative statistics of mechanical power, classified according to character.

Table 6 PRODUCING IRON MINES.

	Census year.	Primary power.[1]				Electric motors run by current generated by enterprise using.
		All classes.	Steam engines.	Gas or gasoline engines.	Water wheels.	
Number	1909	3,620	3,563	27	[2] 30	326
	1902	1,154	1,132	11	11	35
Horsepower	1909	342,069	326,753	2,651	[2] 12,665	13,295
	1902	103,974	102,878	86	1,010	937
Per cent of increase		229.0	217.6	2,982.6	1,154.0	1,318.9
Average per engine, etc.	1909	.....	92	98	422	41
	1902	.....	91	8	92	27

[1] Exclusive of a small amount of rented electric power reported by two operators.
[2] Includes 1 water motor of 115 horsepower.

In 1902 one unit of horsepower was used for every 342 gross tons mined, as compared with one for every 152 gross tons mined in 1909, and during the seven years the horsepower per mine increased from 198 to 708. It must, however, be kept in mind, that the power actually used is less than the rated horsepower of engines and other motors. These figures, therefore, do not necessarily represent precisely the increase in the amount of power actually used. The table shows not only a great increase in the number of each class of power generators, but also a marked increase in the average horsepower of gas engines and water wheels. The utilization of water power was practically confined to the state of Michigan, while Pennsylvania and New York employed 92.8 per cent of the total power supplied by gas and gasoline engines. Michigan and Minnesota are the only states in which extensive use is made of electric motors.

The accuracy of the returns concerning capital made by the mine operators in reply to census inquiries is open to question. The valuation of a mining property contains an element of uncertainty inherent in the estimate of the value of the ore deposit. Moreover, a large proportion of the mining properties form part of larger enterprises which combine mining with the manufacture of iron and steel products, and the segregation of the capital for the mines is often a matter of estimate. It was deemed advisable at the special census of 1902 to omit the inquiry concerning capital, but this inquiry was required by law in 1909. A comparison of the capital with the quantities of ore produced, as reported for 1879, 1889, and 1909, is presented in Table 7. The ratio of capital reported to the quantity of ore produced declined from about $10 per ton in 1879 to about $8 per ton in 1889 and to about $6 per ton in 1909. It is worthy of note that in Minnesota the returns for capital, amounting to 58.1 per cent of the total for the United States, were considerably less than the assessed valuation of iron-mining properties. The total capital on December 31, 1909, or at the end of the business year corresponding most nearly to the calendar year 1909, was $174,863,000, although the assessed valuation of iron-mining properties in the state in 1909 was $200,593,578.[1]

Table 7 PRODUCING IRON MINES.

CENSUS YEAR.	Capital.	Gross quantity of ore mined (long tons).	Per cent of increase over preceding census.	
			Capital.	Ore mined.
1909	$300,735,917	51,947,129	174.0	257.8
1889	109,766,199	14,518,041	77.7	130.2
1879	61,782,287	6,307,883	.....	.....

There are no comparable statistics of the number of wage earners at different censuses. The number reported for 1879 was called the average number, but the method by which this average was obtained by different operators was not explained in the report for that census. For 1889 the average number reported was computed by dividing the sum of the numbers employed each month by the number of months during which the mine was in operation. The total for 1889 purported to include also wage earners employed by contractors and subcontractors, but as these figures were reported by operators who did not directly employ the men the returns could not have been accurate. At the special census of 1902 the sum of the average numbers reported for each month during which the mine was in operation

[1] Report of Minnesota Tax Commission, 1910.

was divided by 12 and the result taken to represent the average number employed throughout the year, while at the census of 1909 no attempt was made to obtain the average number for the year, the actual number employed on the 15th day of each month or the nearest representative day being ascertained. While it is therefore impossible to make comparisons between the absolute numbers for the different censuses, the distribution of the reported number of wage earners between those employed above ground and those employed below ground is affected in only comparatively slight degree by the change in the method of reporting the number of wage earners. The distribution at each census was as follows:

Table 8

CENSUS YEAR.	PER CENT OF WAGE EARNERS IN PRODUCING MINES EMPLOYED—	
	Above ground.	Below ground.
1909	47.7	52.3
1902	40.6	59.4
1889	47.7	52.3
1879	54.0	46.0

The percentages relating to the employment in the mines of boys under the age of 16 are likewise fairly comparable. In 1879, 5.2 per cent of all wage earners in iron mines were boys under 16; in 1889, 2.2 per cent; in 1902, 1.3 per cent; and in 1909 only 0.9 per cent.

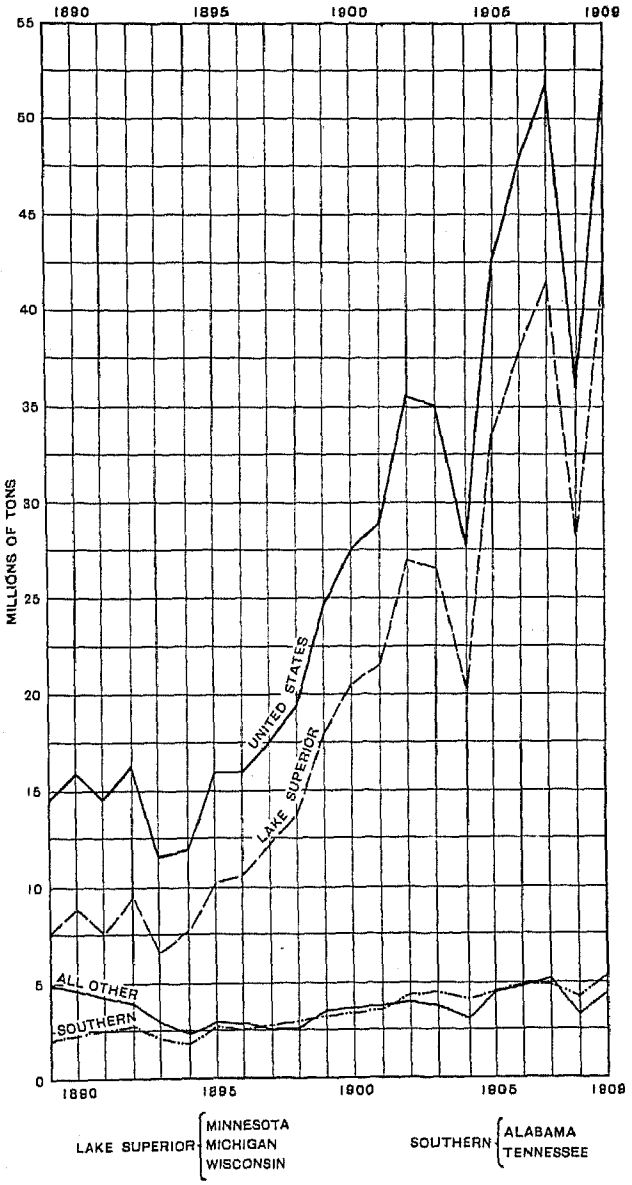
Comparison of ore production and pig-iron production, by five-year periods: 1890–1909.—As appears from Table 9, compiled from the annual reports of the United States Geological Survey,[1] the 20-year period between 1889 and 1909 witnessed the utilization of lower-grade ores. The percentage which the quantity of pig iron produced formed of the estimated consumption of iron ore shows a regular decline during each five-year period. As the great bulk of the ore consumed is domestic ore, this decline must be attributed to a change in the grade of such ore.

Table 9

PERIOD.	Domestic production of iron ore (long tons).	Apparent consumption of iron ore (long tons).	PIG IRON PRODUCED.		
			Quantity (long tons).	Per cent of—	
				Apparent consumption.	Domestic production.
1890–1894	70,391,195	71,028,500	40,421,463	56.9	57.4
1895–1899	93,597,998	96,571,074	53,116,752	55.0	56.7
1900–1904	154,658,413	156,423,984	81,995,188	52.4	53.0
1905–1909	229,274,087	229,224,029	115,812,421	50.5	50.5

Annual production of iron ore, by states: 1879–1909.—Table 10, compiled from the census reports and from the annual reports of the United States Geological Survey for intercensal years since 1889, shows the development of iron mining in the United States since 1879. The data presented in that table are shown graphically by Diagrams 1, 2, and 3. The curve shows the production of iron ore in the United States, in the Lake Superior and Southern districts, and in "All other states," from year to year. The bar diagram shows the growth of production of iron ore in the principal states by decennial periods from 1879 to 1909. The circle shows the comparative importance of the iron mining states in 1909.

DIAGRAM 1.—PRODUCTION OF IRON ORE—UNITED STATES AND PRINCIPAL PRODUCING REGIONS: 1890–1909.



In 1879 Pennsylvania was the principal iron-mining state, and Michigan held second place, followed by New York and New Jersey; the industry in Alabama was in its infancy, and no iron mining was reported for Minnesota. The production of ore doubled during the decade 1879–1889, the increase being due chiefly to the development of the Lake Superior district, but partly to increased activity in the industry in Alabama and Tennessee. In 1889 Pennsylvania was outranked by Michigan and Alabama in the

[1] Mineral Resources of the United States, 1909, Part I, p. 80.

production of iron ore. In the 20-year period from 1889 to 1909 the production of iron ore increased from 14,500,000 to 52,000,000 tons, the increase being due primarily to the remarkable development of the industry in Minnesota and Michigan and to its continued development in Alabama. During this period Pennsylvania showed a decline of 57.3 per cent in its production of iron ore.

Table 10 IRON ORE MINED (THOUSANDS OF TONS).

YEAR.	United States.	Minnesota.	Michigan.	Wisconsin.	Alabama.	Tennessee.	New York.	Pennsylvania.	New Jersey.	All other states.
1879	7,120	.....	1,641	37	171	93	1,127	1,951	676	1,424
1889	14,518	865	5,856	837	1,570	473	1,248	1,560	416	1,693
1890	16,036	892	7,142	949	1,898	466	1,253	1,362	496	1,578
1891	14,591	945	6,127	589	1,987	544	1,017	1,273	526	1,583
1892	16,297	1,255	7,544	790	2,312	407	891	1,084	465	1,549
1893	11,588	1,500	4,668	439	1,742	373	534	698	356	1,278
1894	11,880	2,968	4,419	348	1,493	233	243	532	277	1,307
1895	15,958	3,866	5,812	649	2,199	520	307	900	282	1,423
1896	16,005	4,284	5,707	607	2,042	535	385	748	265	1,432
1897	17,518	5,601	6,087	554	2,099	604	336	724	254	1,259
1898	19,434	5,964	7,347	510	2,402	593	180	773	275	1,390
1899	24,683	8,161	9,146	580	2,663	632	444	1,009	256	1,792
1900	27,553	9,834	9,927	746	2,759	594	441	878	344	2,030
1901	28,887	11,110	9,654	739	2,802	789	420	1,041	402	1,930
1902	35,567	15,138	11,135	784	3,574	875	555	823	442	2,241
1903	35,019	15,371	10,600	675	3,685	853	540	645	485	2,165
1904	27,644	12,729	7,090	483	3,700	501	842	397	500	1,402
1905	42,526	21,735	10,886	859	3,783	735	1,140	809	526	2,053
1906	47,750	25,364	11,823	848	3,995	871	1,042	949	543	2,315
1907	51,721	28,970	11,830	839	4,039	814	1,375	837	550	2,467
1908	35,983	18,652	8,839	734	3,734	635	697	443	395	1,854
1909	51,947	29,128	11,993	975	4,687	649	1,239	666	537	2,073

DIAGRAM 2.—PRODUCTION OF IRON ORE, BY PRINCIPAL STATES: 1909, 1899, 1889, AND 1879.

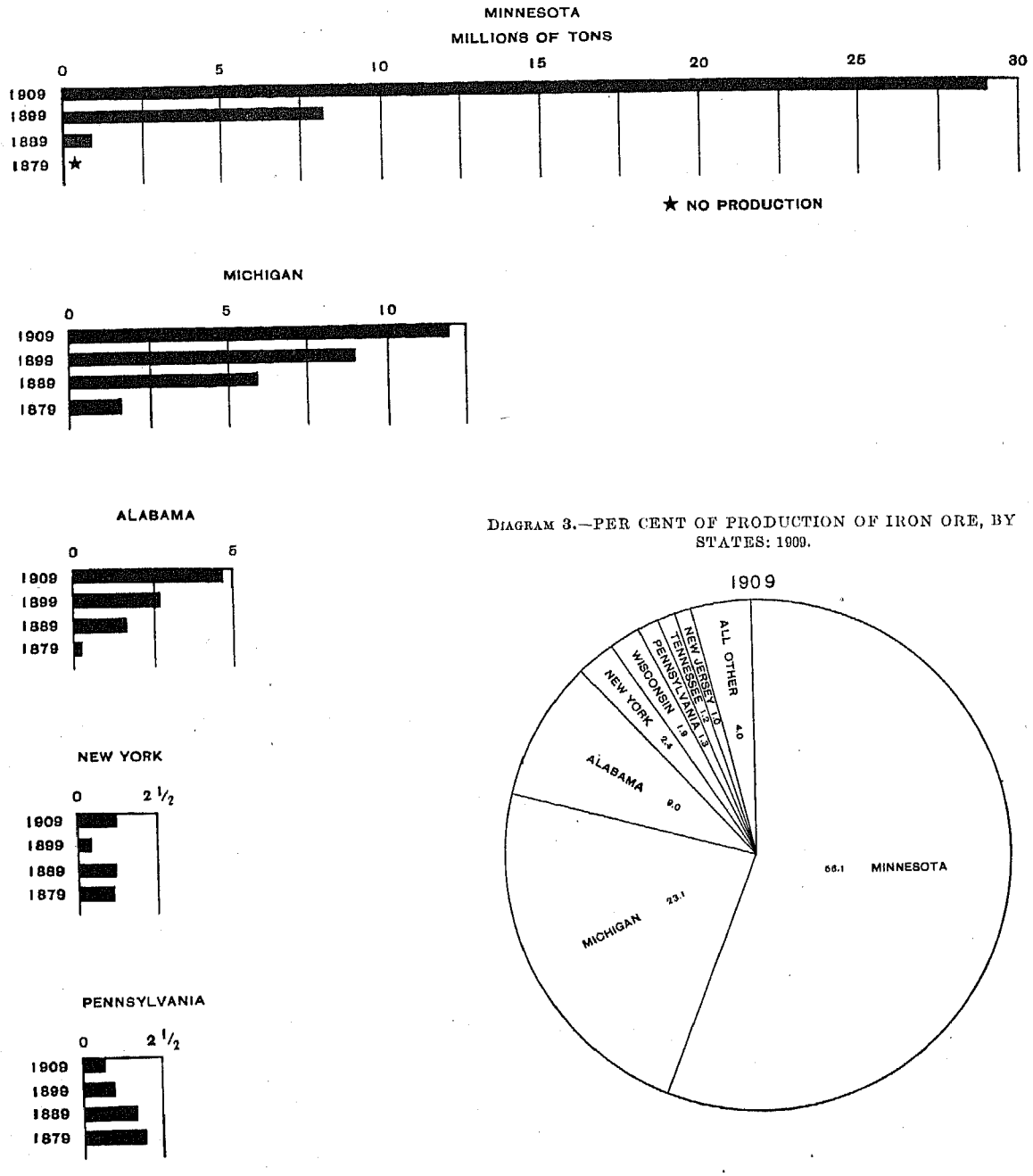


DIAGRAM 3.—PER CENT OF PRODUCTION OF IRON ORE, BY STATES: 1909.

Average expenses per ton, by states: 1879–1909.—Table 11 presents, for the United States and the principal iron-mining states, the average expenses for services and for supplies and materials per long ton of ore mined (gross).

Table 11

STATE.	PRODUCING IRON MINES.							
	Average expense for salaries and wages per long ton of ore.				Average cost of supplies and materials per long ton of ore.			
	1909	1902	1889	1879	1909	1902	1889	1879
United States	$0.64	$0.66	$0.99	$1.51	$0.33	$0.25	$0.34	$0.46
Alabama	0.64	0.62	0.66	0.75	0.23	0.17	0.03	0.11
Michigan	0.98	0.89	1.03	1.57	0.41	0.33	0.41	0.57
Minnesota	0.43	0.38	1.13	.....	0.29	0.18	0.48	.....
Missouri	1.26	1.09	1.07	1.21	0.29	0.39	0.17	0.30
New York	0.92	0.90	0.87	1.37	0.61	0.53	0.46	0.48
Pennsylvania	0.28	0.62	0.73	1.34	0.17	0.20	0.19	0.32
Tennessee	0.90	0.67	0.75	1.04	0.28	0.17	0.18	0.11
Virginia	1.07	1.09	[1] 1.12	1.23	0.39	0.21	[1] 0.25	0.25

[1] Includes West Virginia.

The average expense for salaries and wages per ton of ore mined shows a decrease from 1879 to 1902 in each of the principal iron-mining states (excluding Minnesota), and an increase between 1902 and 1909 for all states named except Pennsylvania and Virginia. The decrease in the average for the United States as a whole between 1902 and 1909, notwithstanding increases in most individual states, was due to changes in the relative importance of the states in the production of ore. The cost of supplies and materials per ton varied considerably from census to census. From 1902 to 1909, however, all the states named except Missouri and Pennsylvania show a marked increase. As previously stated, the increased expense per ton for supplies and materials is directly related to the increased use of mechanical power.

The fact that there was between 1902 and 1909 an increase in the average expense per ton for salaries and wages in most states, despite the increased use of mechanical power, suggests that the saving in the amount of labor resulting from the increased use of machinery must have been attended by an increase in the rates of compensation. It is possible, however, that the increase in this average, as well as in the average cost of supplies and materials per ton, was due partly to an unusually large amount of development work done by the producing mines in 1909.

The state of Pennsylvania presents peculiar conditions. The unusually low expense per ton for salaries and wages, as well as for supplies and materials, shown by the census of 1909, was due to the predominance of open-pit mining in that state, as will be brought out later in this report.

Comparative summary for producing mines, by districts and states: 1909 and 1902.—Table 12 gives, by states, more detailed comparative data for 1909 and 1902 than have been presented in preceding tables.

The item of "all other" expenses shows a greater relative increase between 1902 and 1909 than any other except that of payments for contract work. In reality, the increase in this class of expenses was still greater than is shown in Table 12, because of the fact that the figures for 1902 include interest on bonds amounting to the sum of $521,111, as well as interest on other forms of indebtedness, the amount of which was not specified, while in 1909 interest was not included among the expenses reported. If the interest on bonds be deducted from the figures shown for 1902, the increase in this item from 1902 to 1909 becomes 374.3 per cent. The principal item among these expenses in 1909 was taxes, amounting to $3,970,355. These consisted largely of payments on holdings of land, only a portion of which were under actual operation. (See also pages 10 and 11.)

The total reported expenses show an increase of 79.4 per cent between 1902 and 1909, while the quantity of ore mined increased only 46.1 per cent. The value of ore mined increased 67.9 per cent during the same period. The value of ore mined, however, for 1909 was estimated from the average value at the mine of the ore sold and used.

Notwithstanding the introduction of labor-saving devices, as indicated by the great increase in horsepower, the cost of mining apparently increased considerably. As already stated, this may perhaps be accounted for by unusually large expenditures for development work in 1909.

COMPARATIVE STATISTICS FOR PRODUCING IRON MINES IN THE UNITED STATES, BY DISTRICTS AND STATES: 1909 AND 1902.

Table 12

DISTRICT AND STATE.	Census year.	Number of mines.	EXPENSES OF OPERATION AND DEVELOPMENT. Total.	Salaries and wages.	Supplies and materials.	Royalties and rent of mines.	Contract work.	All other.[1]	PRODUCTS. Ore mined (long tons).	Value.[2]	Primary horsepower owned.
United States[3]	**1909**	**483**	**$74,071,830**	**$33,121,418**	**$17,229,717**	**$15,174,735**	**$2,698,842**	**$5,847,118**	**[4] 51,947,129**	**$109,881,000**	**342,069**
	1902	**524**	**$41,294,525**	**$23,641,599**	**$8,973,168**	**$6,503,908**	**$422,044**	**$1,753,806**	**35,567,410**	**$65,460,985**	**103,974**
Per cent of increase[5]		**−7.8**	**79.4**	**40.1**	**92.0**	**133.3**	**539.5**	**233.4**	**46.1**	**67.9**	**229.0**
LAKE SUPERIOR DISTRICT	1909	195	$61,552,979	$25,236,687	$13,901,022	$14,784,131	$2,613,823	$5,017,316	42,095,627	$94,104,000	262,305
	1902	155	$31,160,230	$16,639,527	$6,736,268	$6,084,857	$398,376	$1,301,202	27,056,861	$52,485,951	68,873
Per cent of increase		25.8	97.5	51.7	106.4	143.0	556.1	285.6	55.6	79.3	280.9
Michigan	1909	83	$22,459,011	$11,764,957	$4,909,979	$3,827,852	$436,148	$1,520,075	11,992,693	$32,380,000	108,262
	1902	80	$16,631,637	$9,908,077	$3,661,194	$2,254,864	$57,382	$749,520	11,135,215	$26,695,860	39,101
Per cent of increase		3.8	35.0	18.7	34.1	69.8	660.1	102.8	7.7	21.3	176.9
Minnesota	1909	101	$37,295,373	$12,530,232	$8,548,861	$10,686,407	$2,157,075	$3,372,798	29,127,918	$58,838,000	145,068
	1902	59	$12,979,812	$5,807,927	$2,699,115	$3,648,750	$338,244	$485,776	15,137,650	$23,989,227	23,938
Per cent of increase		71.2	187.3	115.7	216.7	192.9	537.7	594.3	92.4	145.3	506.0
Wisconsin	1909	11	$1,798,595	$941,498	$442,182	$209,872	$20,600	$124,443	975,016	$2,886,000	8,975
	1902	16	$1,548,781	$922,923	$375,959	$181,243	$2,750	$65,906	783,996	$1,800,864	5,834
Per cent of increase[5]		−31.2	16.1	2.0	17.6	48.9	649.1	88.8	24.4	60.3	53.8
SOUTHERN DISTRICT	1909	116	$5,762,991	$3,797,740	$1,356,956	$136,723	$5,700	$465,872	5,556,828	$6,540,000	40,915
	1902	100	$4,152,726	$3,073,984	$801,758	$139,961	$500	$136,523	4,779,570	$5,513,056	11,731
Per cent of increase[5]		16.0	38.8	23.5	69.2	−2.3	1,040.0	241.2	16.3	18.6	248.8
Alabama	1909	52	$4,624,284	$3,022,435	$1,100,591	$90,190	$5,700	$405,368	4,687,468	$5,391,000	31,838
	1902	59	$2,899,042	$2,218,248	$592,286	$37,938	$500	$50,070	3,574,474	$3,936,812	7,440
Per cent of increase[5]		−11.9	59.5	36.3	85.8	137.7	1,040.0	709.6	31.1	36.9	327.9
Georgia	1909	18	$304,529	$191,428	$75,190	$18,468	.....	$19,443	219,976	$331,000	3,496
	1902	19	$413,053	$271,499	$64,932	$8,351	.....	$68,271	330,554	$452,717	2,521
Per cent of increase[5]		−5.2	−26.3	−29.5	15.8	121.1	.....	−71.5	−33.5	−26.9	38.7
Tennessee	1909	46	$834,178	$583,877	$181,175	$28,065	.....	$41,061	649,394	$818,000	5,581
	1902	22	$840,631	$584,237	$144,540	$93,672	.....	$18,182	874,542	$1,123,527	1,770
Per cent of increase[5]		109.1	−0.8	−0.1	25.3	−70.0	.....	125.8	−25.7	−27.2	215.3
OTHER STATES	1909	172	$6,755,860	$4,086,991	$1,971,739	$253,881	$79,319	$363,930	[4] 4,294,664	$9,237,000	38,849
	1902	269	$5,981,569	$3,928,088	$1,435,142	$279,090	$23,168	$316,081	3,730,979	$7,461,978	23,370
Per cent of increase[5]		−36.1	12.9	4.0	37.4	−9.0	242.4	15.1	15.1	23.8	66.2
Maryland	1909	13	$41,106	$28,319	$8,503	$1,343	$395	$2,546	22,704	$44,500	391
	1902	29	$39,212	$24,259	$2,639	$2,271	.....	$10,043	24,367	$46,911	315
Per cent of increase[5]		−55.2	4.8	16.7	222.2	−40.9	.....	−74.6	−6.8	−5.1	24.1
Missouri	1909	33	$150,836	$109,904	$25,191	$12,033	$1,099	$2,609	87,079	$204,000	403
	1902	34	$102,166	$72,241	$26,052	$2,538	$500	$835	66,308	$106,379	535
Per cent of increase[5]		−2.9	47.6	52.1	−3.3	374.1	119.8	212.4	31.3	91.8	−24.7
New Jersey	1909	10	$1,321,915	$907,016	$368,075	$7,091	.....	$39,733	536,958	$1,584,000	6,585
	1902	15	$1,345,271	$875,156	$429,231	$7,915	$10,770	$22,199	441,879	$1,228,664	6,584
Per cent of increase[5]		−33.3	−1.7	3.6	−14.2	−10.4	.....	79.0	21.5	28.9	[6]
New York	1909	19	$2,118,267	$1,140,235	$756,814	$62,668	$20,632	$137,918	[4] 1,238,720	$3,741,000	18,220
	1902	15	$990,807	$497,270	$293,950	$12,385	.....	$187,202	555,321	$1,362,987	5,930
Per cent of increase[5]		26.7	113.8	129.3	157.5	406.0	.....	−26.3	123.1	174.5	207.3
Ohio	1909	4	$22,701	$12,830	$3,225	$176	$5,254	$1,216	13,468	$24,500	.....
	1902	12	$42,839	$40,938	$345	$1,503	.....	$53	22,657	$41,976	50
Per cent of increase[5]		−66.7	−47.0	−68.7	834.8	−88.3	.....	2,194.3	−40.6	−41.6	−100.0
Pennsylvania	1909	19	$377,583	$189,282	$110,800	$3,084	$50,994	$23,423	665,642	$792,000	3,971
	1902	47	$740,021	$510,995	$166,422	$26,343	$1,228	$35,033	822,932	$1,225,453	3,760
Per cent of increase[5]		−59.6	−49.0	−63.0	−33.4	−88.3	4,052.6	−33.1	−19.1	−35.4	5.6
Virginia	1909	58	$1,511,243	$900,756	$325,242	$148,130	$945	$136,170	841,709	$1,692,000	6,458
	1902	62	$1,391,711	$1,062,992	$201,426	$93,429	$6,730	$27,134	973,301	$1,652,799	4,378
Per cent of increase[5]		−6.5	8.6	−15.3	61.5	58.5	−86.0	401.8	−13.5	2.4	47.5
All other[7]	1909	16	$1,212,209	$798,649	$373,889	$19,356	.....	$20,315	888,384	$1,155,000	2,821
	1902	55	$1,329,542	$844,237	$315,077	$132,706	$3,940	$33,582	824,214	$1,796,809	1,818
Per cent of increase[5]		−70.9	−8.8	−5.4	18.7	−85.4	.....	−39.5	7.8	−35.7	55.2

[1] Includes interest for 1902, of which $521,111 was interest paid on bonds.
[2] The value of ore mined for 1909 has been estimated from the average value per ton at the mine of ore used and sold.
[3] Exclusive of governmental institutions.
[4] Of this ore, 882,548 tons were concentrated at the mines, from which 653,339 tons of concentrate were derived.
[5] A minus sign (−) denotes decrease.
[6] Less than one-tenth of 1 per cent.
[7] Embraces Colorado, Connecticut, Kentucky, Massachusetts, Nevada, New Mexico, North Carolina, Texas, Utah, West Virginia, and Wyoming in 1909, and Colorado, Connecticut, Kentucky, Massachusetts, Montana, New Mexico, North Carolina, Texas, Utah, Vermont, West Virginia, and Wyoming in 1902.

In Table 13 the items of expense shown in Table 12 are reduced to averages per ton of iron ore mined.

Table 13

DISTRICT AND STATE.	Census year.	PRODUCING IRON MINES. Average expense per ton mined. Total.	Salaries and wages.	Supplies and materials.	Royalties and rent of mines.	Contract work.	All other.	Average value per ton of ore at mine.[1]
United States	**1909**	**$1.43**	**$0.64**	**$0.33**	**$0.29**	**$0.05**	**$0.11**	**$2.12**
	1902	**1.16**	**0.66**	**0.25**	**0.18**	**0.01**	**0.05**	**1.84**
Increase[2]		**0.27**	**−0.02**	**0.08**	**0.11**	**0.04**	**0.06**	**0.28**
LAKE SUPERIOR DIST.	1909	1.46	0.60	0.33	0.35	0.06	0.12	2.24
	1902	1.15	0.61	0.25	0.22	0.01	0.05	1.94
Increase[2]		0.31	−0.01	0.08	0.13	0.05	0.07	0.30
Michigan	1909	1.87	0.98	0.41	0.32	0.04	0.13	2.70
	1902	1.49	0.89	0.33	0.20	0.01	0.07	2.40
Increase		0.38	0.09	0.08	0.12	0.03	0.06	0.30
Minnesota	1909	1.28	0.43	0.29	0.37	0.07	0.12	2.02
	1902	0.86	0.38	0.18	0.24	0.02	0.03	1.58
Increase		0.42	0.05	0.11	0.13	0.05	0.09	0.44
Wisconsin	1909	1.84	0.97	0.45	0.28	0.02	0.13	2.96
	1902	1.98	1.18	0.48	0.23	[3]	0.08	2.30
Increase[2]		−0.14	−0.21	−0.03	0.05	0.02	0.05	0.66
SOUTHERN DISTRICT	1909	1.04	0.68	0.24	0.02	[3]	0.08	1.17
	1902	0.87	0.64	0.17	0.03	[3]	0.03	1.15
Increase[2]		0.17	0.04	0.07	−0.01	.....	0.05	0.02
Alabama	1909	0.99	0.65	0.23	0.02	[3]	0.09	1.15
	1902	0.81	0.62	0.17	0.01	[3]	0.01	1.10
Increase		0.18	0.03	0.06	0.01	.....	0.08	0.05
Georgia	1909	1.38	0.87	0.34	0.08	.....	0.08	1.51
	1902	1.25	0.82	0.20	0.03	.....	0.21	1.37
Increase[2]		0.13	0.05	0.14	0.05	.....	−0.13	0.14
Tennessee	1909	1.28	0.90	0.28	0.04	.....	0.06	1.26
	1902	0.96	0.67	0.17	0.11	.....	0.02	1.28
Increase[2]		0.32	0.23	0.11	−0.07	.....	0.04	−0.02
OTHER STATES[4]	1909	1.57	0.95	0.46	0.06	0.02	0.08	2.11
	1902	1.60	1.05	0.38	0.07	0.01	0.08	2.00
Increase[2]		−0.03	−0.10	0.08	−0.01	0.01	.....	0.11
Maryland	1909	1.81	1.25	0.37	0.06	0.02	0.11	1.96
	1902	1.61	1.00	0.11	0.09	.....	0.41	1.93
Increase[2]		0.20	0.25	0.26	−0.03	0.02	−0.30	0.03
Missouri	1909	1.73	1.26	0.29	0.14	0.01	0.03	2.34
	1902	1.54	1.09	0.39	0.04	0.01	0.01	1.60
Increase[2]		0.19	0.17	−0.10	0.10	.....	0.02	0.74
New Jersey	1909	2.46	1.69	0.69	0.01	.....	0.07	2.95
	1902	3.04	1.98	0.97	0.02	0.02	0.05	2.78
Increase[2]		−0.58	−0.29	−0.28	−0.01	−0.02	0.02	0.17
New York	1909	1.71	0.92	0.61	0.05	0.02	0.11	3.02
	1902	1.78	0.90	0.53	0.02	.....	0.34	2.45
Increase[2]		−0.07	0.02	0.08	0.03	0.02	−0.23	0.57
Ohio	1909	1.69	0.95	0.24	0.01	0.39	0.09	1.81
	1902	1.89	1.81	0.02	0.07	.....	[3]	1.85
Increase[2]		−0.20	−0.86	0.22	−0.06	0.39	0.09	−0.04
Pennsylvania	1909	0.57	0.28	0.17	[3]	0.08	0.04	1.19
	1902	0.90	0.62	0.20	0.03	[3]	0.04	1.49
Increase[2]		−0.33	−0.34	−0.03	−0.03	0.08	.....	−0.30
Virginia	1909	1.80	1.07	0.39	0.18	[3]	0.16	2.01
	1902	1.43	1.09	0.21	0.10	0.01	0.03	1.70
Increase[2]		0.37	−0.02	0.18	0.08	−0.01	0.13	0.31

[1] The 1909 averages are based on the quantity of ore used and sold (see Table 50) while the 1902 averages are obtained from the quantity of ore mined as shown by Table 12. The two sets of averages are, however, sufficiently comparable for all practical purposes.

[2] A minus sign (−) denotes decrease.

[3] Less than 1 cent.

[4] Embraces, in addition to the states shown separately below, Colorado, Connecticut, Kentucky, Massachusetts, Nevada, New Mexico, North Carolina, Texas, Utah, West Virginia, and Wyoming in 1909, and Colorado, Connecticut, Kentucky, Massachusetts, Montana, New Mexico, North Carolina, Texas, Utah, Vermont, West Virginia, and Wyoming in 1902.

Attention has already been called in connection with Table 11 to the changes which took place between 1902 and 1909 in the average expenses per ton for salaries and wages and for supplies and materials. The present table shows that in the United States as a whole the total reported expense increased from $1.16 per ton in 1902 to $1.43 per ton in 1909, notwithstanding the fact that the expenses for 1902 included interest, which was excluded in 1909. Increases appear in all of the items except the average expense for salaries and wages, which decreased in the United States as a whole, although increasing in most of the individual states. The average expenditure per ton for royalties and rent of mines (based on total tonnage, including that not produced under royalty) increased from $0.18 to $0.29, that for contract work from $0.01 to $0.05, and that for other miscellaneous objects from $0.05 to $0.11. Decreases are shown in one or more items for most of the states, the most important decreases, among the states with any considerable production, being in Wisconsin, New Jersey, and Pennsylvania, although in each of these states there was an increase in the average for one or more classes of expenses.

In the United States as a whole the average value of ore per ton at the mine increased from $1.84 in 1902 to $2.12 in 1909, or $0.28 per ton—an increase slightly greater in absolute amount than that in the total reported expense per ton ($0.27). There were considerable differences, however, among the individual states with respect to the relation between the increase in expenses and the increase in the value of ore at the mine. Pennsylvania and Tennessee were the only important producing states in which the average value of ore at the mine was less in 1909 than in 1902, and in Tennessee the decrease was only $0.02 per ton.

As already stated, the increase in the average cost of production per ton between 1902 and 1909 may possibly be attributable in part to large expenditures for development work in the later year. This inference is suggested by the extraordinary increase in the average expenditure for contract work, while the average for salaries and wages decreased.

Comparative summary for nonproducing mines: 1909 and 1902.—Table 14 presents comparative statistics for 1909 and 1902 for those nonproducing mines for which separate reports were secured. It must be borne in mind that development work was pursued also by operators of producing mines, that some operators made combined reports covering at the same time producing and nonproducing mines, and that such combined reports were necessarily tabulated with those relating exclusively to producing mines.

Table 14

	NONPRODUCING IRON MINES. United States. 1909	1902	Minnesota. 1909	1902	All other states.[1] 1909	1902
Number of mines	21	37	9	19	12	18
Number of salaried employees	46	28	31	6	15	22
Expenses of development work	$862,301	$605,559	$630,425	$360,460	$231,876	$245,099
Salaries and wages	350,560	177,317	274,204	75,936	76,356	101,381
Supplies and materials	321,556	143,541	223,217	66,310	98,339	77,231
Contract work	63,775	216,168	34,900	215,868	28,875	300
All other	126,410	68,533	98,104	2,346	28,306	66,187
Average expenses per mine	41,062	16,366	70,047	18,972	19,323	13,617

[1] Embraces Iowa, Michigan, Missouri, Pennsylvania, Tennessee, Utah, Virginia, and Wisconsin in 1909, and Alabama, California, Colorado, Iowa, Michigan, New Jersey, New York, Pennsylvania, and Utah in 1902.

The preceding table shows a marked increase in the scale of operations, particularly in Minnesota, where during the seven-year period the average expenses per mine increased nearly 300 per cent.

LAND TENURE, ROYALTIES, AND TAXES.

Land tenure—Summary for the United States.—Table 15 presents for 1909 statistics of land acreage and tenure for all mines, for producing mines, and for nonproducing mines, in the United States as a whole. The table distinguishes mineral land (that is, land definitely known to contain ore) from "Other land," but there is no doubt that much of the latter was acquired by operators in the belief that it would prove to contain ore.

Table 15

FORM OF TENURE AND CHARACTER OF LAND.	ACREAGE CONTROLLED: 1909		
	All mines.	Producing mines.	Nonproducing mines.
Total	[1] 1,343,634	[1] 1,313,214	30,420
Owned	1,087,865	1,064,227	23,638
Leased	255,769	248,987	6,782
Mineral land:			
Total	416,016	387,608	28,408
Owned	306,257	282,661	23,596
Leased	109,759	104,947	4,812
Other land:			
Total	927,618	925,606	2,012
Owned	781,608	781,566	42
Leased	146,010	144,040	1,970

[1] Thirteen operators failed to report acreage.

The table shows that 97.7 per cent of the total acreage controlled by operators of iron mines was connected with producing mines. Less than one-third of the total area held represented known mineral land. Of the land of both classes combined, more than four-fifths was owned by the mine operators, the rest being held under lease.

Land tenure, by states.—Table 16 gives statistics of land tenure, for producing and nonproducing mines combined, for each state reporting 1,000 or more acres of mineral land as held by iron-mine operators.

There is no apparent connection between the amount of land of all kinds, or the amount of mineral land, held by mine operators in a given state and the production of iron ore in the state. Thus, in 1909, the amount of mineral land held by operators of iron mines in New York was greater than in any other state, although the production of iron ore in New York was equal to but a small fraction of the production in Minnesota or Michigan.

There are wide differences among the states with respect to the relative importance of owned land and leased land. Thus, of all the land controlled by mine operators in Minnesota more than one-third was held under lease, while in Michigan less than one-tenth was held under lease, and in Georgia, Missouri, New York, and Ohio a very much smaller proportion still. In several states the proportion of the known mineral land held under lease is very different from the proportion of the land of all classes combined held under lease. In Michigan, Minnesota, New Jersey, and Virginia the acreage of mineral land held under lease was much greater than the acreage owned; but in the other states named in the table, except North Carolina, for which no owned land was reported, the owned mineral land greatly exceeded the leased.

ACREAGE CONTROLLED BY PRODUCING AND NONPRODUCING MINES, CLASSIFIED BY FORM OF TENURE AND CHARACTER OF LAND, BY STATES: 1909.[1]

Table 16

STATE.	ACREAGE CONTROLLED: 1909											
	All land.			Mineral land.			Timber land.			Other land.		
	Total.	Owned.	Leased.	Total.	Owned.	Leased.	Total.	Owned.	Leased.	Total.	Owned.	Leased.
United States	[2] 1,343,634	1,087,865	255,769	416,016	306,257	109,759	456,682	376,409	80,273	470,936	405,199	65,737
Alabama	63,226	53,419	9,807	52,000	42,337	9,663	4,746	4,746	.....	6,480	6,336	144
Georgia	73,683	72,273	1,410	70,570	69,160	1,410	.....	.....	.....	3,113	3,113	.....
Kentucky	9,600	5,600	4,000	6,600	5,600	1,000	3,000	.....	3,000	.....	.....	.....
Michigan	249,542	225,205	24,337	19,091	6,250	12,841	162,248	154,384	7,864	68,203	64,571	3,632
Minnesota	333,822	201,586	132,236	15,805	2,710	13,095	86,302	22,970	63,332	231,715	175,906	55,809
Missouri	115,968	111,425	4,543	36,721	32,335	4,386	957	880	77	78,290	78,210	80
New Jersey	13,608	5,169	8,499	12,968	4,469	8,499	660	660	.....	40	40	.....
New York	247,783	239,564	8,219	95,920	87,701	8,219	131,633	131,633	.....	20,230	20,230	.....
North Carolina	4,000	.....	4,000	1,000	.....	1,000	.....	.....	.....	3,000	.....	3,000
Ohio	4,390	4,310	80	4,390	4,310	80	.....	.....	.....	.....	.....	.....
Pennsylvania	18,234	13,376	4,858	12,165	7,307	4,858	6,065	6,065	.....	4	4	.....
Tennessee	77,156	65,007	12,149	14,300	10,001	4,299	21,250	15,250	6,000	41,606	39,756	1,850
Virginia	99,445	58,453	37,992	64,272	26,450	37,822	22,953	22,953	.....	9,220	9,050	170
Wisconsin	20,474	17,623	2,851	8,163	6,364	1,799	4,163	4,163	.....	8,148	7,096	1,052
All other states [3]	15,643	14,855	788	2,051	1,263	788	12,705	12,705	.....	887	887	.....

[1] Thirteen operators failed to report acreage.
[2] Includes a possible duplication of 755 acres which were sublet by operators of mines to other persons who may have been operators.
[3] Embraces states reporting less than 1,000 acres of mineral land, as follows: Colorado, Connecticut, Iowa, Maryland, Massachusetts, Nevada, New Mexico, Texas, Utah, West Virginia, and Wyoming.

Concentration of control.—Table 17 classifies the operators who reported the amount of land controlled according to the number of acres held by each. The classification is based on the land of all kinds combined, and the table covers both producing and nonproducing mines.

Table 17 — ACRES PER OPERATOR.	PRODUCING AND NONPRODUCING IRON MINES: 1909		
	Number of operators.	Land controlled.	
		Amount (acres).	Per cent of total.
Total	[1] 178	1,343,634	100.0
Less than 100	40	2,276	0.2
100 but less than 1,000	76	25,665	1.9
1,000 but less than 10,000	47	166,120	12.4
10,000 but less than 50,000	11	315,062	23.4
50,000 and over	4	834,502	62.1

[1] Thirteen operators failed to report acreage.

As appears in the table, 4 operators, each with more than 50,000 acres, controlled over three-fifths of all land connected with iron mines, and 11 other operators, holding more than 10,000 acres each, controlled nearly one-fourth of the total acreage. The very large holders, however, usually have a great deal of land not yet proved to contain iron ore. Moreover, of the known mineral land controlled by such operators, a great deal is held in reserve. The small holders, on the other hand, are in general mining out their ore at a relatively rapid rate. These conditions are indicated by Table 18, in which the operators of producing mines are classified according to acreage controlled, and the value of the ore and by-products produced in 1909 by operators of each group is shown in comparison with the acreage controlled. As a means of convenient comparison, averages have been computed for the respective groups by dividing the value of ore produced by the acreage of all land held, but in considering these averages it should not be forgotten that much of the land is not known to contain ore.

Table 18 — ACRES PER OPERATOR.	PRODUCING IRON MINES: 1909					
	Number of operators.	Acreage of all land controlled.		Value of iron ore and by-products.		
		Amount.	Per cent of total.	Amount.	Per cent of total.	Average per acre of land controlled.
Total	[1] 163	1,313,214	100.0	[1] $105,635,628	100.0	$80
Less than 100	36	1,854	0.2	2,215,719	2.1	1,195
100 but less than 1,000	68	23,613	1.8	8,433,756	8.0	357
1,000 but less than 10,000	45	159,183	12.1	41,605,987	39.4	261
10,000 but less than 50,000	10	294,062	22.4	3,405,856	3.2	12
50,000 and over	4	834,502	63.5	49,974,310	47.3	60

[1] Thirteen operators with an aggregate value of products amounting to $1,311,454 failed to report acreage.

The average value of the iron-ore production per acre of land for the several groups of operators was in the main in inverse ratio to the acreage controlled per operator. The operators who controlled less than 100 acres each on the average produced ore valued at nearly $1,200 per acre of land (of all classes) controlled, as compared with $60 per acre for operators holding 50,000 acres or over, and only $12 per acre for operators controlling 10,000 to 50,000 acres.

Royalties.—Mining on leased land has increased in importance, both absolutely and relatively, since 1879. In that year the total amount paid in royalties was $1,020,429, as compared with $6,503,908 in 1902 and $15,174,735 in 1909. The amount of royalties paid in 1889 is not available. Table 19 presents comparative statistics of tonnage on which royalties were paid in 1909 and 1879.

Table 19	1909	1879
Ore mined upon which royalties were paid (long tons)	35,543,717	2,084,396
Per cent of tonnage mined in the United States	68.4	33.0
Royalties	[1] $14,880,282	$1,020,429
Average per ton mined	$0.42	$0.49

[1] The variation between this figure and that for the total royalties shown in other tables is due to the absence of data for the quantities of ore upon which royalties were paid by some operators who mined ore both from owned and from leased land. The amount of royalties paid upon ore of this sort was less than 2 per cent of the total, and may, therefore, be disregarded.

In 1909 royalties were paid on more than two-thirds of all ore mined, but in 1879 on less than one-third. The average royalty per ton decreased during the 30 years, from $0.49 to $0.42.

Practically all of the ore (96.9 per cent) upon which royalties were paid in 1909 was mined in the Lake Superior district. The amount reported as produced under royalty in that district was 34,447,782 tons, being 81.8 per cent of the total output of the district. The royalties paid on this ore were $14,637,203, in addition to which a small amount was paid in royalties on ore the tonnage of which was not reported separately. The average royalty per ton in the Lake Superior district was the same as in the United States taken as a whole.

Taxes.—Taxes constitute an important item in the total expense of iron mines. In recent years the extensive lands held by the operators of iron mines, particularly in the Lake Superior district, have been taxed at much higher rates than formerly.

Table 20 — STATE.	PRODUCING MINES WHICH REPORTED BOTH THE AMOUNT OF TAXES PAID AND THE ACREAGE OF LAND CONTROLLED: 1909								
	Taxes paid.		Acreage controlled.[1]						
	Amount.	Average per ton of ore mined.	All classes of land.			Mineral land.			
			Total.	Owned.	Leased.	Total.	Owned.	Leased.	
United States	$3,963,251	$0.08	1,176,100	937,133	238,967	352,574	257,567	95,007	
Alabama	[2] 30,092	0.01	53,216	48,810	4,406	41,990	37,728	4,262	
Georgia	3,065	0.01	69,957	69,767	190	66,844	66,654	190	
Maryland	582	0.03	10,570	10,490	80	170	90	80	
Missouri	810	0.01	2,430	2,147	283	1,263	1,057	206	
Michigan	961,401	0.08	247,656	223,419	24,237	17,205	4,464	12,741	
Minnesota	2,810,266	0.10	332,153	201,386	130,767	14,256	2,510	11,746	
New Jersey	7,350	0.01	13,640	5,141	8,499	12,940	4,441	8,499	
New York	51,491	0.04	247,783	239,564	8,219	95,920	87,701	8,219	
Ohio	389	0.03	4,310	4,230	80	4,310	4,230	80	
Pennsylvania	19,415	0.03	17,468	12,733	4,735	11,399	6,664	4,735	
Tennessee	6,863	0.01	49,756	40,007	9,749	12,750	9,001	3,749	
Utah	502	0.01	268	268		268	268		
Virginia	[2] 16,420	0.02	94,003	57,437	36,566	61,830	25,434	36,396	
Wisconsin	46,710	0.05	15,150	12,379	2,771	2,839	1,120	1,719	
All other[3]	7,895	0.01	17,740	9,355	8,385	8,590	6,205	2,385	

[1] In addition to the acreage shown in the preceding table, 137,114 acres were held by operators who reported no taxes. It is probable that the taxes may have been included by them in the amounts reported for "Sundry expenses." Of those holdings, 127,094 acres represented land owned and 10,020 acres land leased. The holdings of mineral land aggregated 35,034 acres, the rest being timber and other land.

[2] In Alabama the sum of $6,959, and in Virginia the sum of $145, was reported by operators who failed to report acreage.

[3] Embraces Connecticut, Kentucky, Massachusetts, Nevada, New Mexico, North Carolina, Texas, West Virginia, and Wyoming.

The taxes on lands held under lease are ordinarily paid by the operators and not by the owners. In the preceding table the taxes paid are shown in comparison with the acreage of land held. This table includes only producing mines for which both acreage of land controlled and taxes were reported.

The largest amount of taxes was paid in Minnesota and Michigan, the total for these two states ($3,772,000) being 95.2 per cent of the total for the United States. The taxes in Minnesota were equal to $0.10 per ton of ore mined during the year, or to nearly $9 per acre of the land held (by ownership or lease) by the operators, and in Michigan the taxes were equal to $0.08 per ton mined, or to nearly $4 per acre held, whereas in other states the average amount of taxes ranged from $0.01 to $0.05 per ton. For all states taken together, except Minnesota and Michigan, the taxes averaged only $0.32 per acre controlled by the operators. It should be noted in this connection that in Minnesota less than 5 per cent of the total acreage owned or held under lease was reported as known mineral land, and in Michigan only about 7 per cent.

PERSONS ENGAGED IN THE INDUSTRY.

Salaried employees.—Table 21 shows the number of salaried employees classified according to grade for all mines in 1909 and their total salaries. The number of salaried employees, 2,916, constituted only 5.2 per cent of the total number of persons engaged in the industry.

Table 21

CLASS.	SALARIED EMPLOYEES, ALL MINES: 1909	
	Number.	Salaries.
Total	**2,916**	**$3,423,992**
Officers of corporations	134	425,914
Superintendents and managers	917	1,342,143
Clerks and other subordinate salaried employees	1,865	1,655,935

Wage earners, by age and occupation: 1909.—Table 22 shows the number of wage earners employed in producing mines on December 15, 1909, or the nearest representative day, according to age and occupation. The distinction between miners and miners' helpers is not always very definite, and in all other tables these two classes are therefore combined.

Table 22

CLASS.	WAGE EARNERS IN PRODUCING IRON MINES: 1909	
	Number.	Per cent of total.
Total	**52,230**	**100.0**
Men 16 years of age and over:		
Engineers, firemen, machinists, carpenters, and other mechanics	7,073	13.5
Miners	21,708	41.6
Miners' helpers	3,218	6.2
All other	19,742	37.8
Boys under 16 years of age	489	0.9

The usual division of wage earners into skilled and unskilled is indicated only indirectly in the preceding classification. The group of engineers, firemen, machinists, carpenters, and other mechanics, comprising 13.5 per cent of all employees in 1909, belong to the skilled class. On the other hand, miners' helpers and other employees, aggregating 44.9 per cent of the total force, may be classed as unskilled. Between these two extremes are the miners, who in 1909 constituted 41.6 per cent of all wage earners. Probably some of these should be classed as skilled and some as unskilled.

Wage earners employed, by months.—Table 23 shows, for the United States as a whole, the number of wage earners reported as employed on the 15th day of each month in all mines and in producing mines and non-producing mines separately, together with percentages showing the ratio between the number reported for each month and the number reported for the month of maximum employment.

Table 23

MONTH.	WAGE EARNERS EMPLOYED IN IRON MINES ON THE 15TH DAY OF EACH MONTH: 1909					
	Number.[1]			Per cent of maximum.		
	All mines.	Producing mines.	Non-producing mines.	All mines.	Producing mines.	Non-producing mines.
January	43,746	43,491	255	84.7	85.2	33.9
February	44,373	44,076	297	85.9	86.3	39.5
March	44,795	44,446	349	86.7	87.1	46.4
April	43,807	43,580	317	85.0	85.4	42.2
May	46,029	45,712	317	89.1	89.5	42.2
June	46,589	46,233	356	90.2	90.6	47.3
July	48,254	47,794	460	93.4	93.6	61.2
August	49,326	48,763	563	95.5	95.5	74.9
September	50,748	50,191	557	98.2	98.3	74.1
October	51,639	51,055	584	99.9	100.0	77.7
November	**51,654**	51,031	623	100.0	99.9	82.8
December	51,326	50,574	**752**	99.4	99.1	**100.0**

[1] The figures in boldface type represent the maximum number employed.

In the industry as a whole, November was the month of maximum employment in 1909, 51,654 wage earners being reported. The month of minimum employment was January, the 43,746 wage earners reported for that month constituting 84.7 per cent of the maximum.

It will be noted that the number of wage earners reported for all mines on a representative day, which is presented in various other tables, aggregated 52,983, or somewhat more than the number shown for November 15, which was the largest number reported for the 15th of any month. While for many mines the representative day selected for reporting wage earners in detail was December 15, there were numerous cases in which December was not a representative month and in which reports were made for some other date. It must be borne in mind that the month of maximum employment varied for the several states. The aggregate number reported by the mine operators for the representative day may be accepted as more nearly approximating the actual number of wage earners who derived a livelihood from iron mining in

1909 than the number reported for November. This conclusion is suggested by the statistics presented in Table 24, which relate to producing mines in those states where at least 500 wage earners were employed during the month of maximum employment.

Table 24 WAGE EARNERS IN PRODUCING IRON MINES: 1909

STATE.	Maximum.		Minimum.		Per cent of maximum.
	Month.	Number.	Month.	Number.	
Alabama	November	5,652	June	4,760	84.2
Georgia	December	734	May	380	51.8
Michigan	December	16,052	April	14,128	88.0
Minnesota	October	16,740	January	12,679	75.7
New Jersey	October	2,130	May	1,749	82.1
New York	December	2,510	May	1,792	71.4
Pennsylvania	December	696	March	437	62.8
Tennessee	December	1,523	April	1,136	74.6
Virginia	September	3,019	January	2,590	85.8
Wisconsin	November	1,446	January	1,039	71.9

The fluctuations of employment are largely dependent upon the character of operations, the method of working, and climatic conditions. Table 25 shows the monthly fluctuations of employment separately for open-pit and underground mines, so far as separate reports for each class were secured.

As can be seen from Table 25, in the Lake Superior district the range of fluctuation of employment in underground mines did not exceed 12 per cent, as compared with a fluctuation of 15.1 per cent in the Southern district. In open-pit mining, on the other hand, the force employed in August in the Lake Superior district was more than twice as large as that employed in January, February, or March, while in the Southern district the variation between the months of maximum and of minimum employment was only 18.8 per cent of the maximum.

Table 25 WAGE EARNERS EMPLOYED IN PRODUCING IRON MINES ON 15TH OF EACH MONTH: 1909

MONTH.	Number.[1]						Per cent of maximum.					
	United States.		Lake Superior district.		Southern district.		United States.		Lake Superior district.		Southern district.	
	Open-pit mining only.	Underground mining only.	Open-pit mining only.	Underground mining only.	Open-pit mining only.	Underground mining only.	Open-pit mining only.	Underground mining only.	Open-pit mining only.	Underground mining only.	Open-pit mining only.	Underground mining only.
January	6,762	26,281	879	17,506	3,071	3,843	79.4	88.6	43.8	88.0	95.2	87.7
February	6,627	26,700	877	17,956	2,821	3,754	77.8	90.0	43.7	90.3	87.4	85.6
March	6,806	26,956	878	18,142	2,912	3,953	79.9	90.9	43.7	91.2	90.2	90.2
April	7,207	25,822	1,099	17,589	2,848	3,795	84.6	87.0	54.7	88.4	88.3	86.6
May	7,587	26,121	1,829	17,789	2,621	3,879	89.0	88.0	91.0	89.4	81.2	88.5
June	7,798	26,066	1,983	17,766	2,628	3,722	91.5	87.9	98.7	89.3	81.4	84.9
July	8,067	26,995	1,962	18,307	2,785	3,957	94.7	91.0	97.7	92.0	86.3	90.3
August	8,388	27,504	**2,009**	18,628	2,951	4,033	98.5	92.7	100.0	93.6	91.4	92.0
September	8,505	28,694	1,953	19,316	3,079	4,173	99.8	96.7	97.2	97.1	95.4	95.2
October	8,463	29,252	1,985	19,690	3,175	4,258	99.3	98.6	98.8	99.0	98.4	97.1
November	**8,520**	29,509	1,938	19,763	**3,227**	**4,384**	100.0	99.5	96.5	99.3	100.0	100.0
December	8,501	**29,668**	1,799	**19,895**	**3,227**	4,284	99.8	100.0	89.5	100.0	100.0	97.7

[1] The figures in boldface type represent the maximum number employed.

Days in operation.—The number of working days during the year varies considerably for different enterprises. Table 26 gives the distribution of producing enterprises according to the number of days in operation during 1909.

Table 26

DAYS IN OPERATION.	PRODUCING IRON-MINING ENTERPRISES: 1909	
	Number.	Per cent of total.
Total	[1] 299	100.0
30 or less	10	3.3
31 to 60	4	1.3
61 to 90	17	5.7
91 to 120	15	5.0
121 to 150	20	6.7
151 to 180	18	6.0
181 to 210	9	3.0
211 to 240	17	5.7
241 to 270	15	5.0
271 to 300	64	21.4
301 to 330	100	33.4
331 to 365	10	3.3

[1] Exclusive of 1 enterprise for which the number of days in operation was not reported.

The variation in the number of working days is largely dependent upon the method of working, as appears from Table 27, which classifies according to the number of days in operation, so far as the information is available, open-pit and underground mines separately.

Table 27

DAYS IN OPERATION.	PRODUCING IRON-MINING ENTERPRISES: 1909	
	Open-pit mining exclusively.	Underground mining exclusively.
Total	[1] 137	138
270 days or less	85	31
Over 270 days	52	107

[1] Exclusive of 1 enterprise for which the number of days in operation was not reported.

Prevailing hours of labor.—Table 28 classifies all mines according to the prevailing hours of labor, and gives the number and percentage in each group. The wage earners of each mine are classed as a total, regardless of the fact that some may work more or fewer hours than those prevailing for the majority.

Table 28

PREVAILING HOURS PER DAY.	ALL IRON MINES: 1909			
	Mines with prevailing hours specified.		Wage earners in mines where the prevailing hours were as specified.	
	Number.	Per cent of total.	Number.	Per cent of total.
Total	[1] 494	100.0	52,983	100.0
8 hours	[2] 25	5.1	2,344	4.4
9 hours	32	6.5	2,132	4.0
10 hours	[3] 426	86.2	47,555	89.8
11 hours	9	1.8	805	1.5
12 hours	2	0.4	147	0.3

[1] Exclusive of 6 mines operated by contract work and 4 that employed no wage earners.
[2] Includes 7 mines which were run by 2 shifts of 8 and 10 hours, respectively.
[3] Exclusive of 7 mines which were run by 2 shifts.

The 10-hour working day (for all or most employees) is customary in a large majority of the iron mines of the United States, and was the rule, without exception, in the states of Iowa, Kentucky, New Mexico, New York, North Carolina, Ohio, Texas, West Virginia, Wisconsin, and Wyoming. The 11-hour day was reported for 2 mines in New Jersey, 6 in Tennessee, and 1 in Alabama; and a 12-hour day was reported for 2 mines in Georgia. On the other hand, the 8-hour day was reported for all mines in Utah, 5 mines in Alabama, 6 in Michigan, 3 in Minnesota, 2 in New Jersey, and 1 each in Pennsylvania, Virginia, and Nevada. A 9-hour day was reported by a considerable number of mines distributed quite generally among the states.

PRODUCTION AND CONSUMPTION OF ORE.

Summary for the United States: 1909.—The following statement shows in detail the quantity and value of the products of iron mines in 1909, and also the value of iron ore produced by concerns in other industries.

Production of iron mines:	
Gross production, long tons	51,947,129
Production after concentration, long tons	51,717,920
Ore used or shipped for use in affiliated furnaces and sold—	
Quantity, long tons	50,521,208
Gross value	$159,464,353
Deductions for haulage and freight	51,969,424
Deductions for commissions and storage	955,355
Net value at mines	106,539,574
Value of by-products	407,508
Total net value of ore used or shipped for use and sold, and of by-products	106,947,082
Value of iron ore produced in other industries	175,965
Total net value of iron ore	106,715,539

The gross production of iron ore in 1909 in iron mines was 51,947,129 tons. The amount of ore used or shipped for use in blast furnaces affiliated with the mines and of ore sold was somewhat less, 50,521,208 tons. Only to such ore was a value assigned in the returns. The value of much of this ore was reported on a basis which included cost of delivery. The gross value of the ore as reported, including delivery and other charges, was $159,464,353, but the expenditures for haulage and freight and for commissions and storage amounted to $52,924,779, so that the net value of the ore at the mines was $106,539,574. In addition to iron ore, the mines produced various by-products, the most important of which was manganiferous ore, the total value of such by-products being $407,508, so that the net value of iron ore used or shipped for use and sold and of by-products combined was $106,947,082.[1] The value of iron ore produced in other industries (gold and silver mining, limestone quarrying, and brick and tile manufacturing) in 1909 was reported as $175,965, which, added to the net value of ore at the iron mines ($106,539,574), gives a total value of iron ore for 1909 amounting to $106,715,539.

Comparison with the report of the United States Geological Survey.—The statistics relating to the quantity and value of products were collected by the Bureau of the Census in cooperation with the United States Geological Survey. The schedule called for the quantity of ore mined, of ore sold, and of ore used by the mine operator in his own blast furnaces, and the stocks of iron ore on hand at the mine, at lake ports, or elsewhere, on January 1, and December 31, 1909. Many of the answers to these inquiries were found, on examination, to be inconsistent. The statistics of production in the present report, therefore, represent primarily ore shipments from the mines, comprising the ore sold in the market, as well as that used by blast furnaces affiliated with the mines. Wherever the quantity of ore actually mined is shown it represents the figures reported by the mine operators, these figures being less liable to error than would be those computed from the quantities reported as in stock at the mines at the beginning and at the end of the year and as used or sold.

The United States Geological Survey, on the other hand, has computed the annual production from the shipments and the stocks at lake ports and other transportation terminals. Furthermore, the statistics of the United States Geological Survey include a small amount of iron ore obtained as a by-product of other than iron mines, whereas the quantities of iron ore shown in the present report relate solely to the product of iron mines. The total quantity mined, after concentration of 882,548 tons in New York, as shown in the present report, was 51,717,920 long tons, whereas the total production shown in the report of the United States Geological Survey for 1909 was 51,294,271 tons, the former quantity being 423,649 tons, or slightly less than 1 per cent, in excess of the latter. All of this difference except 57,433 tons is

[1] It may be noted that some of the expenditure for haulage, freight, commissions, and storage applied to the by-products, particularly manganiferous ore, but, since the great bulk of it undoubtedly applied to the iron ore itself, it has been considered preferable to deduct the entire amount for haulage, freight, commissions, and storage from the gross value of iron ore in order to give a net value for this product.

found in the figures for the state of Alabama. The total of the United States Geological Survey for that state represents virtually the shipments of ore plus the consumption by blast furnaces at the mines. The variation between this figure and the total shipments and consumption at the mines, as shown in this report, amounts to only 8,892 tons. The variation between the two reports for all other states is equal to only 0.1 per cent.

As already stated, however, the reports of the Geological Survey are intended primarily to represent shipments, and should therefore be compared with the statistics of the Census Bureau as to the amount of ore used or shipped for use by blast furnaces affiliated with the iron mines or sold, rather than with those as to the quantity produced. The amount reported in the census returns as so used, shipped, and sold was 50,521,208 tons, as compared with the Geological Survey report of 51,294,271 tons, the difference being about 1.5 per cent. The difference is not sufficient to cast any doubt upon the approximate correctness of either set of figures.

Disposition of ore.—Table 29 shows, for the United States as a whole, for the two principal districts into which it is divided, and for individual states, the disposition of the ore which was produced by iron mines in 1909 and either used or shipped for use in affiliated blast furnaces or sold.

DISPOSITION OF ORE USED AND SOLD, BY DISTRICTS AND STATES: 1909.

Table 29

DISTRICT AND STATE.	IRON ORE USED AND SOLD (LONG TONS).								
	Total.	Used in blast furnaces affiliated with mines.			Sold.	Per cent of total.			
						Used in affiliated blast furnaces.			Sold.
		Total.	At mine.	At a distance.		Total.	At mine.	At a distance.	
United States	**50,521,208**	**32,239,481**	**4,432,808**	**27,806,673**	**18,281,727**	**63.8**	**8.8**	**55.0**	**36.2**
LAKE SUPERIOR DISTRICT	41,242,374	25,467,822	103,574	25,364,248	15,774,552	61.8	0.3	61.5	38.2
Michigan	11,924,995	4,224,631	31,265	4,193,366	7,700,364	35.4	0.3	35.1	64.6
Minnesota	28,314,713	21,047,279	.....	21,047,279	7,267,434	74.3	.....	74.3	25.7
Wisconsin	1,002,666	195,912	72,309	123,603	806,754	19.5	7.2	12.3	80.5
SOUTHERN DISTRICT	5,181,605	4,632,318	3,467,984	1,164,334	549,287	89.4	66.9	22.5	10.6
Alabama	4,312,360	4,087,350	3,281,579	805,771	225,010	94.8	76.1	18.7	5.2
Georgia	219,976	157,525	19,622	137,903	62,451	71.6	8.9	62.7	28.4
Tennessee	649,269	387,443	166,783	220,660	261,826	59.7	25.7	34.0	40.3
OTHER STATES	4,097,229	2,139,341	861,250	1,278,091	1,957,888	52.2	21.0	31.2	47.8
Maryland	22,675	15,790	73	15,717	6,885	69.6	0.3	69.3	30.4
Missouri	86,954	50,981	.....	50,981	35,973	58.6	.....	58.6	41.4
New Jersey	559,828	294,075	148,729	145,346	265,753	52.5	26.6	25.9	47.5
New York	1,024,173	87,156	87,156	.....	937,017	8.5	8.5	.....	91.5
Ohio	13,468	5,839	5,839	.....	7,629	43.4	43.4	.....	56.6
Pennsylvania	664,813	146,520	23,789	122,731	518,293	22.0	3.6	18.4	78.0
Utah	33,784	.....	.....	.....	33,784	.....	.....	.....	100.0
Virginia	837,625	785,673	546,223	239,450	51,952	93.8	65.2	28.6	6.2
All other[1]	853,909	753,307	49,441	703,866	100,602	88.2	5.8	82.4	11.8

[1] Embraces Colorado, Connecticut, Kentucky, Massachusetts, Nevada, New Mexico, North Carolina, Texas, West Virginia, and Wyoming.

Of the 50,521,208 tons of ore reported as used or sold, 32,239,481 tons, or 63.8 per cent, were used or shipped for use in blast furnaces affiliated with the mines and 18,281,727 tons, or 36.2 per cent, were sold. There was considerable variation among the districts and states with respect to the disposition of ore. In the Southern district nearly nine-tenths of the ore was used in or shipped to blast furnaces affiliated with the mines—being largely used in furnaces located immediately at the mines—while of the ore of the Lake Superior district the proportion so used or shipped was 61.8 per cent, practically none being used in blast furnaces located at the mines. There was, however, a conspicuous difference between the conditions in Minnesota, on the one hand, and in Michigan and Wisconsin, on the other. Most of the ore produced in New York was sold, but in the majority of the states the ore sold constituted less than half of the total in 1909.

Value of ore disposed of in different ways, with average values.—Table 30 shows, for the United States as a whole, for the two principal producing districts, and for selected states, the quantity, value, and average value of ore disposed of in different ways. In the case of ore sold it distinguishes that sold on the basis of prices "f. o. b. mine" and that sold "f. o. b. market"—that is, on the basis of prices including cost of delivery. The table also shows the gross value, including that of by-products, of all ore used or shipped for use in affiliated furnaces or sold, the amount of deductions for haulage, freight, commissions, and storage, and the net value of all products at the mines.

The average values per ton in which delivery charges are included are, of course, not comparable with those based on mine prices. Moreover, in the case of average values in which delivery charges are included, comparisons between different districts have little significance on account of the differences in the distances which the ore is transported. The value of most of the ore shipped for use in blast furnaces affiliated with the

mines but located at a distance, was reported on the delivered basis, but comparisons between the average values per ton shown for such ore, and the average values per ton shown for ore sold f. o. b. market, are of doubtful significance because the value reported for some of the ore shipped for use in affiliated furnaces represented the net value at the mine, and also because the ore shipped for use in affiliated blast furnaces may have been shipped a greater or less distance than that sold f. o. b. market.

DISPOSITION OF IRON ORE USED AND SOLD, WITH AVERAGE VALUES, BY DISTRICTS AND STATES: 1909.

Table 30	United States.	LAKE SUPERIOR DISTRICT.			SOUTHERN DISTRICT.			OTHER STATES.			
		Total.	Minnesota.	Other states.[1]	Total.	Alabama.	Other states.[2]	Total.	Pennsylvania.	Virginia.	All other.[3]
Ore used in blast furnaces affiliated with the mines:											
Total—											
Long tons	32,239,481	25,467,822	21,047,279	4,420,543	4,632,318	4,087,350	544,968	2,139,341	146,520	785,673	1,207,148
Value	$102,804,183	$91,974,470	$75,466,965	$16,507,505	$5,516,743	$4,767,062	$749,681	$5,312,970	$230,720	$1,574,100	$3,508,150
Average value per ton	$3.19	$3.61	$3.59	$3.73	$1.19	$1.17	$1.38	$2.48	$1.57	$2.00	$2.91
At mine—											
Long tons	4,432,808	103,574	.....	103,574	3,467,984	3,281,579	186,405	861,250	23,789	546,223	291,238
Value	$6,151,262	$137,583	.....	$137,583	$4,019,523	$3,755,975	$263,548	$1,994,156	$64,171	$1,031,213	$898,772
Average value per ton	$1.39	$1.33	.....	$1.33	$1.16	$1.14	$1.41	$2.32	$2.70	$1.89	$3.09
At a distance—											
Long tons	27,806,673	25,364,248	21,047,279	4,316,969	1,164,334	805,771	358,563	1,278,091	122,731	239,450	915,910
Value	$96,652,921	$91,836,887	$75,466,965	$16,369,922	$1,497,220	$1,011,087	$486,133	$3,318,814	$166,549	$542,887	$2,609,378
Average value per ton	$3.48	$3.62	$3.59	$3.79	$1.29	$1.25	$1.36	$2.60	$1.36	$2.27	$2.85
Ore sold:											
Total—											
Long tons	18,281,727	15,774,552	7,267,434	8,507,118	549,287	225,010	324,277	1,957,888	518,293	51,952	1,387,643
Value	$56,660,170	$51,195,872	$22,435,862	$28,760,010	$675,831	$254,946	$420,885	$4,788,467	$560,587	$134,535	$4,093,345
Average value per ton	$3.10	$3.25	$3.09	$3.38	$1.23	$1.13	$1.30	$2.45	$1.08	$2.59	$2.95
F. o. b. mine—											
Long tons	4,350,695	2,133,504	443,977	1,689,527	544,701	222,374	322,327	1,672,490	515,781	48,752	1,107,957
Value	$9,117,482	$4,719,094	$649,360	$4,069,734	$665,764	$248,689	$417,075	$3,732,624	$554,314	$126,535	$3,051,775
Average value per ton	$2.10	$2.21	$1.46	$2.41	$1.22	$1.12	$1.29	$2.23	$1.07	$2.60	$2.75
F. o. b. market—											
Long tons	13,931,032	13,641,048	6,823,457	6,817,591	4,586	2,636	1,950	285,398	2,512	3,200	279,686
Value	$47,542,688	$46,476,778	$21,786,502	$24,690,276	$10,067	$6,257	$3,810	$1,055,843	$6,273	$8,000	$1,041,570
Average value per ton	$3.41	$3.41	$3.19	$3.62	$2.20	$2.37	$1.95	$3.70	$2.50	$2.50	$3.72
Total ore used in affiliated blast furnaces or sold.											
Long tons	50,521,208	41,242,374	28,314,713	12,927,661	5,181,605	4,312,360	869,245	4,097,229	664,813	837,625	2,594,791
Gross value, including that of by-products[4]	$159,871,861	$143,568,304	$97,902,827	$45,665,477	$6,192,574	$5,022,008	$1,170,566	$10,110,983	$795,322	$1,708,835	$7,606,826
Deductions for haulage, freight, commissions, and storage	52,924,779	51,351,452	40,826,692	10,524,760	107,066	82,859	24,207	1,466,261	6,026	25,832	1,434,403
Net value at mine	106,947,082	92,216,852	57,076,135	35,140,717	6,085,508	4,939,149	1,146,359	8,644,722	789,296	1,683,003	6,172,423
Average value per ton	2.12	2.24	2.02	2.72	1.17	1.15	1.32	2.11	1.19	2.01	2.38

[1] Embraces Michigan and Wisconsin.
[2] Embraces Georgia and Tennessee.
[3] Embraces Colorado, Connecticut, Kentucky, Maryland, Massachusetts, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Texas, Utah, West Virginia, and Wyoming.
[4] The value of by-products of iron mines has been included in the gross value of iron ore in order that statistics for individual operators might not be disclosed.

It is noteworthy that in some of the states the average values given for ore used in blast furnaces affiliated with and located at the mines are materially lower than the values of ore sold f. o. b. mine, but that the opposite is the case in other states. These variations may be due to differences in practice as to the assignment of values to ore used in blast furnaces affiliated with the mines, which may in some cases be based on market prices and in other cases on arbitrary prices. There are, however, differences in the qualities of ores which affect the values and render all such comparisons of little significance unless much more detailed information is available than appears in Table 30.

According to the table the average net value at the mine of all ore of the Lake Superior district was, in 1909, $2.24, while the average for all ore of the southern district was very much lower, $1.17. This difference is largely attributable to difference in the quality of the ore, that of the Lake Superior district containing in general a larger percentage of iron.

With reference to the value of by-products, it may be noted that the great bulk of the total value of by-products shown for the United States ($407,508) was reported from Wisconsin and largely represented manganiferous ore.

Haulage, freight, commissions, and storage.—The total deductions shown in Table 30 were charged against by-products as well as against the iron ore itself. Table 31 shows, by states, the expenses of haulage and freight, the quantity of ore shipped upon which these expenses were charged, and the average expense per ton. The figures as to the amount of ore represent iron ore and also manganiferous ore reported as a by-product in the state of Wisconsin.

As is shown in Table 31, the highest average expense per ton for haulage and freight, $1 49, was borne by ore from Minnesota, and the lowest, $0.13, by ore from Alabama. This difference is due to the fact that most of the ore from Minnesota was transported a long distance to blast furnaces located in the vicinity of coal mines, mainly in Illinois, Indiana, Ohio, Pennsylvania, and New York, while in Alabama the iron and coal mines are in close proximity and the blast furnaces are therefore at or not very far from the mines.

Table 31

DISTRICT AND STATE.	PRODUCING IRON MINES: 1909		
	Ore shipped on which freight and haulage were reported (long tons).	Expenses for haulage and freight.	
		Amount.	Average per ton.
United States	[1] 40,129,382	$51,969,424	$1.30
LAKE SUPERIOR DISTRICT:			
Michigan	10,334,415	9,387,925	0.91
Minnesota	27,115,947	40,347,573	1.49
Wisconsin	[1] 808,759	663,020	0.82
SOUTHERN DISTRICT:			
Alabama	637,325	82,859	0.13
Tennessee	69,195	23,172	0.33
OTHER STATES:			
Maryland	1,614	839	0.52
Missouri	25,818	6,198	0.24
New Jersey	141,406	108,438	0.77
New York	152,012	72,746	0.48
Pennsylvania	11,660	6,026	0.52
Utah	33,784	13,527	0.40
Virginia	79,623	25,832	0.32
All other [2]	717,824	1,231,269	1.72

[1] Includes manganiferous ore reported as a by-product of iron mines in Wisconsin.
[2] Embraces Colorado, Georgia, Nevada, New Mexico, North Carolina, Ohio, and Wyoming.

The deductions for storage and commissions were practically confined to ore shipped from Minnesota and Michigan, as is shown by Table 32, which gives for the United States, for Minnesota, and for Michigan, the tonnage of ore shipped upon which storage and commissions were reported, and the total amounts paid and the average per ton.

Table 32

STATE.	PRODUCING IRON MINES: 1909		
	Ore shipped on which commissions and storage were reported (long tons).	Commissions and storage charges.	
		Amount.	Average per ton.
United States	13,670,820	$955,355	$0.07
Minnesota	7,271,294	479,119	0.07
Michigan	6,071,129	450,627	0.07

Consumption of domestic ore compared with production.—Table 33 shows for 1909 the aggregate amount of ore reported by the mine operators as used or shipped for use in affiliated blast furnaces or sold, in comparison with the consumption as reported by the blast furnaces. The consumption shown for each district is not the consumption of the ore from that district, but that of the blast furnaces located in them.

Table 33

DISTRICT.	IRON ORE (LONG TONS): 1909	
	Output of mines in districts specified (quantity used and sold).	Consumption as reported by blast furnaces in the districts specified.
United States	50,521,208	47,429,236
Lake Superior district	41,242,374	1,324,447
Southern district	5,181,605	5,245,488
Other states	[1] 4,097,229	[2] 40,859,301

[1] Represents output for Colorado, Connecticut, Kentucky, Maryland, Massachusetts, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah, Virginia, West Virginia, and Wyoming.
[2] Represents consumption in Colorado, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Missouri, New Jersey, New York, Ohio, Pennsylvania, Texas, Virginia, and West Virginia.

It is noteworthy that the consumption reported by blast furnaces was considerably less than the output (used or sold) reported by mines. A good deal of the ore shipped from the Lake Superior district, whether for sale or for use in affiliated blast furnaces, was evidently stored for later consumption either at the furnaces or at lower lake ports. The preceding table emphasizes the fact that most of the iron ore in the United States is consumed at a distance from the mines producing it. Of the ore produced in the Lake Superior district the great bulk is shipped to other districts. The Southern district is exceptional in that most of the ore is consumed near the point of production.

Affiliation of mines with blast furnaces.—Table 34 shows, by districts and states, the number of mines affiliated with blast furnaces, either adjoining or at a distance, and the number without blast furnaces affiliated.

Table 34

DISTRICT AND STATE.	NUMBER OF PRODUCING IRON MINES: 1909			
	Total.	With affiliated blast furnaces adjoining.	With affiliated blast furnaces at a distance.	Without affiliated blast furnaces.
United States	433	114	184	135
LAKE SUPERIOR DISTRICT	195	16	118	61
Michigan	83	13	35	35
Minnesota	101		80	21
Wisconsin	11	3	3	5
SOUTHERN DISTRICT	116	43	35	38
Alabama	52	17	18	17
Georgia	18	1	7	10
Tennessee	46	25	10	11
OTHER STATES	172	55	31	86
Colorado	1			1
Connecticut	1	1		
Kentucky	2	1		1
Maryland	13	1	1	11
Massachusetts	1	1		
Missouri	33		3	30
Nevada	1			1
New Jersey	10	4	2	4
New Mexico	1		1	
New York	19	5		14
North Carolina	1		1	
Ohio	4	1	1	2
Pennsylvania	19	6	7	6
Texas	1	1		
Utah	5			5
Virginia	58	34	13	11
West Virginia	1		1	
Wyoming	1		1	

From this table it can be seen that the majority of iron mines were connected with blast furnaces, although in most cases the furnaces were located at a considerable distance from the mines. The connection is usually one of common ownership or control only, each branch of the business being operated independently.

Not all of the ore produced from mines affiliated with blast furnaces is used in these blast furnaces. It is often necessary, for metallurgical reasons, to mix ores of different composition, which may necessitate the purchase of ore by blast furnaces which control mines. Even apart from this condition it often happens that blast furnaces supplied in the main from mines operated under the same control nevertheless find it necessary

to buy ore in the market, and conversely the mines may produce more ore than the affiliated furnaces can use. The disposition of the ore derived from mines connected with blast furnaces is shown for 1909 in Table 35.

Table 35 IRON ORE PRODUCED IN MINES AFFILIATED WITH BLAST FURNACES (LONG TONS): 1909

DISTRICT.	With blast furnaces adjoining.			With blast furnaces at a distance.		
	Total.	Used by affiliated furnaces.	Sold.	Total.	Shipped for use by affiliated furnaces.	Sold.
United States	**7,069,067**	**4,432,808**	**2,636,259**	**32,332,448**	**27,806,673**	**4,525,775**
Lake Superior dist.	2,031,891	103,574	1,928,317	29,268,327	25,354,248	3,904,079
Southern district	3,499,062	3,467,984	31,078	1,186,598	1,164,334	22,264
Other states[1]	1,538,114	861,250	676,864	1,877,523	1,278,091	599,432

[1] Embraces Connecticut, Kentucky, Maryland, Massachusetts, Missouri, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Texas, Virginia, West Virginia, and Wyoming.

As appears from Table 35, in the Lake Superior district more than nine-tenths of the total output of mines with affiliated blast furnaces adjoining was sold in the market, but in the Southern district only about 1 per cent. Of the mines which shipped their ore to distant furnaces operated under the same ownership, those of the Lake Superior district sold nearly 4,000,000 tons, or 13.3 per cent of their total shipments, whereas those of the Southern district sold but 1.9 per cent of the ore shipped. Of the total products of "Other states" 1,538,114 tons were reported by mines with blast furnaces adjoining.

Table 36 shows, by districts, the amount of iron ore sold in 1909 by operators of mines with affiliated blast furnaces, whether adjoining the mines or at a distance, and by operators of mines with no affiliated blast furnaces.

Table 36 IRON ORE SOLD BY OPERATORS (LONG TONS): 1909

DISTRICT.	Total.	With affiliated blast furnaces adjoining mines.	With affiliated blast furnaces at a distance from mines.	Not affiliated with blast furnaces.
United States	**18,281,727**	**2,636,259**	**4,525,775**	**11,119,693**
Lake Superior district	15,774,552	1,928,317	3,904,079	9,942,156
Southern district	549,287	31,078	22,264	495,945
Other states[1]	1,957,888	676,864	599,432	681,592

[1] Embraces Colorado, Kentucky, Maryland, Missouri, Nevada, New Jersey, New York, Ohio, Pennsylvania, Texas, Utah, and Virginia.

As shown by the table, about two-thirds of the total quantity of ore sold was shipped from mines not affiliated with blast furnaces, and about one-fourth from mines affiliated with blast furnaces located at a distance.

Consumption of domestic and foreign ore.—The domestic mines supplied practically the entire demand for iron ore in 1909, although foreign ore was imported to a limited extent, particularly for use in Pennsylvania. Small quantities of imported ore were also used in some of the states on the Atlantic seaboard, in California, in Ohio, and in Illinois. The details are shown in Table 37.

Table 37 IRON ORE CONSUMED IN BLAST FURNACES (LONG TONS): 1909

STATE.	Total.	Domestic ore.	Foreign ore.
United States	**49,189,015**	**47,429,236**	**1,759,779**
Pennsylvania	20,267,712	18,978,892	1,288,820
All other states:			
States using imported ore[1]	18,789,706	18,318,747	470,959
States using no imported ore[2]	10,131,597	10,131,597	.....

[1] Embraces California, Delaware, Illinois, Maryland, New Jersey, New York, and Ohio.
[2] Embraces Colorado, Connecticut, Georgia, Indiana, Kentucky, Massachusetts, Michigan, Minnesota, Missouri, Tennessee, Texas, Virginia, West Virginia, and Wisconsin.

SCALE OF PRODUCTION.

Classification of operators according to the number of wage earners employed.—Table 38, relating to the United States as a whole, classifies according to the number of wage earners employed all operators and operators of producing and of nonproducing mines separately, and gives the number of wage earners employed by each group. In many cases a single operator has several mines.

Table 38 IRON MINES: 1909

WAGE EARNERS PER OPERATOR.	Number of operators.	Wage earners. Number.	Wage earners. Per cent distribution.
All mines	**191**	**52,983**	**100.0**
No wage earners	4	.....	.....
Contract work	3	.....	.....
1 to 5	16	53	0.1
6 to 20	34	421	0.8
21 to 50	41	1,510	2.8
51 to 100	25	1,939	3.7
101 to 500	50	11,611	21.9
501 to 1,000	9	7,132	13.5
Over 1,000	9	30,317	57.2
Producing mines	**176**	**52,230**	**100.0**
No wage earners	4	.....	.....
Contract work	3	.....	.....

Table 38 IRON MINES: 1909

WAGE EARNERS PER OPERATOR.	Number of operators.	Wage earners. Number.	Wage earners. Per cent distribution.
Producing mines—Continued.			
1 to 5	12	39	0.1
6 to 20	30	374	0.7
21 to 50	36	1,227	2.3
51 to 100	24	1,742	3.3
101 to 500	49	11,399	21.8
501 to 1,000	9	7,132	13.7
Over 1,000	9	30,317	58.0
Nonproducing mines	[1] 19	**753**	**100.0**
1 to 5	4	14	1.9
6 to 20	4	47	6.2
21 to 50	7	261	34.7
Over 50 and less than 500	4	431	57.2

[1] Includes 4 operators who also operated producing mines.

Table 39 classifies, by districts, all operators (including nonproducing operators) according to the number of wage earners employed, and gives the number of wage earners employed by each group.

Table 39 — PRODUCING AND NONPRODUCING IRON MINES: 1909

WAGE EARNERS PER OPERATOR.	Number of operators.	Wage earners. Number.	Wage earners. Per cent distribution.
United States	[1] 191	52,983	100.0
No wage earners	4	.....	.....
Contract work	3	.....	.....
1 to 5	16	53	0.1
6 to 20	34	421	0.8
21 to 50	41	1,510	2.8
51 to 100	25	1,939	3.7
101 to 500	50	11,611	21.9
501 to 1,000	9	7,132	13.5
Over 1,000	9	30,317	57.2
Lake Superior district [2]	48	34,395	100.0
20 or less	6	61	0.2
21 to 50	6	243	0.7
51 to 100	3	231	0.7
101 to 500	21	4,950	14.4
Over 500	10	28,910	84.0
Southern district [3]	47	8,190	100.0
20 or less	7	91	1.1
21 to 50	12	399	4.9
51 to 100	11	876	10.7
101 to 500	13	2,920	35.6
Over 500	4	3,904	47.7
Other states [4]	101	10,398	100.0
No wage earners	4	.....	.....
Contract work	3	.....	.....
1 to 5	15	49	0.5
6 to 20	22	273	2.6
21 to 50	23	796	7.6
51 to 100	10	677	6.5
101 to 500	18	4,009	38.6
Over 500	6	4,594	44.2

[1] The difference of three between the total number of operators for the United States and the sum of the numbers for the districts and "Other states" is due to the elimination of the duplication in the United States total of those operators who had mines in more than one district.
[2] Embraces Michigan, Minnesota, and Wisconsin.
[3] Embraces Alabama, Georgia, and Tennessee.
[4] Embraces Colorado, Connecticut, Kentucky, Maryland, Massachusetts, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah, Virginia, West Virginia, and Wyoming.

The greatest degree of concentration was reported from the Lake Superior district, where 10 operators with over 500 wage earners each, employed 28,910, or over five-sixths of the total number of wage earners for that district. In the Southern district, and also in "Other states" taken together, between two-fifths and one-half of all wage earners were employed by operators employing more than 500 wage earners each. On the other hand, in each district, operators employing 20 wage earners or less reported but a small percentage of the total number employed.

Classification of operators according to value of products.—Table 40 classifies all operators of producing mines in 1909 according to value of products, and gives the value of products for each group.

As shown by the table, 15 operators, with an output valued at over $1,000,000 each, reported over 80 per cent of the total value of the products of iron mines, while operators with an output valued at less than $100,000 each reported less than 3 per cent of the total. In the Lake Superior district 13 operators, with products valued at $1,000,000 or more each, reported an aggregate output exceeding $85,000,000 in value, and representing 92.3 per cent of the total for the district. In the Southern district and in "Other states," however, operators with products less than $100,000 in value, contributed over one-sixth of the total product as measured by value.

Table 40 — IRON MINES: 1909

VALUE OF PRODUCTS PER OPERATOR.	Number of operators.	Value of products. Amount.	Value of products. Per cent distribution.
United States	[1] 176	$106,947,082	100.0
Less than $1,000	21	11,007	[2]
$1,000 but less than $10,000	39	175,581	0.2
$10,000 but less than $100,000	63	2,647,340	2.5
$100,000 but less than $500,000	26	6,446,697	6.0
$500,000 but less than $1,000,000	12	7,577,126	7.1
$1,000,000 and over	15	90,089,331	84.2
Lake Superior district [3]	38	92,216,852	100.0
Less than $100,000	8	281,614	0.3
$100,000 but less than $500,000	11	2,701,133	2.9
$500,000 but less than $1,000,000	6	4,073,860	4.4
$1,000,000 and over	13	85,160,245	92.3
Southern district [4]	47	6,085,508	100.0
Less than $1,000	5	4,061	0.1
$1,000 but less than $10,000	11	54,960	0.9
$10,000 but less than $100,000	22	965,077	15.8
$100,000 but less than $500,000	5	1,155,211	19.0
$500,000 and over	4	3,906,199	64.2
Other states [5]	95	8,644,722	100.0
Less than $1,000	16	6,946	0.1
$1,000 but less than $10,000	28	117,698	1.4
$10,000 but less than $100,000	35	1,482,939	17.2
$100,000 but less than $500,000	11	3,030,533	35.0
$500,000 and over	5	4,006,606	46.3

[1] The difference of four between the total number of operators for the United States and the sum of the numbers for the districts and "Other states" is due to the elimination of the duplication in the United States total of those operators who had mines in more than one district.
[2] Less than one-tenth of 1 per cent.
[3] Embraces Michigan, Minnesota, and Wisconsin.
[4] Embraces Alabama, Georgia, and Tennessee.
[5] Embraces Colorado, Connecticut, Kentucky, Maryland, Massachusetts, Missouri, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah, Virginia, West Virginia, and Wyoming.

Mines operated by proprietors who perform manual labor.—Notwithstanding the large scale on which iron mining is usually conducted, a few operators were reported who personally performed manual labor in the mines, and in some few cases they had no hired labor to assist them. The mines so operated were distributed among the following states: Missouri, 19; Maryland, 9, of which 4 were operated by the proprietors alone without hired labor; Ohio, 1; and Pennsylvania, 1. A summary of the statistics for mines of this class of operators is presented in Table 41.

Table 41 — PRODUCING IRON MINES OPERATED BY PROPRIETORS PERFORMING MANUAL LABOR: 1909

	Total.	Without hired labor.	With hired labor.
umber of operators	16	4	12
Number of mines	30	4	26
Persons engaged in the industry	168	7	161
Proprietors and firm members	25	7	18
Number performing manual labor	24	7	17
Salaried employees	4	.....	4
Wage earners	139	.....	139
Primary horsepower owned	24	.....	24
Capital	$79,540	$115	$79,425
Expenses of operation and development	$24,621	$205	$24,416
Salaries	$1,075	.....	$1,075
Wages	$17,572	.....	$17,572
Supplies and materials	$2,868	$26	$2,842
Royalties and rent of mines	$2,074	$154	$1,920
Taxes	$77	.....	$77
Contract work	$50	.....	$50
All other	$905	$25	$880
Products sold:			
Quantity (long tons)	12,095	373	11,722
Value	$24,920	$1,045	$23,875

As appears from the preceding table every proprietor of mines of this class except one performed some manual labor in the mines. In addition, such proprietors did nearly all of the supervisory and clerical work, only 4 salaried employees being employed by the 16 operators. There were 4 operators who performed the work connected with their mines without hired labor. Where wage earners were employed the average number was 12 per operator. These mines were operated practically without mechanical power, and most of them were in operation only a small part of the year. One operator ran his mines 30 days or less; 2 between 30 and 60 days; 1 between 60 and 90 days; 5 between 90 and 120 days; 2 between 120 and 150 days; 2 between 150 and 180 days; 2 between 180 and 210 days; and 1 between 240 and 270 days.

CHARACTER OF ORGANIZATION.

Comparative summary for the United States: 1909 and 1902.—Table 42 presents a comparative summary for producing operators by character of organization in 1909 and 1902. This table does not include one governmental institution for 1902; there were none reported for 1909.

Table 42

PRODUCING IRON MINES: 1909 AND 1902

CHARACTER OF ORGANIZATION.	Census year.	Number of mines.	Expenses of operation and development.						Value of products.
			Total.	Salaries.	Wages.	Supplies and materials.	Contract work.	All other.[1]	
Total[2]	**1909**	**483**	**$74,071,830**	**$3,389,962**	**$29,731,456**	**$17,229,717**	**$2,698,842**	**$21,021,853**	**$106,947,082**
	1902	**524**	**41,294,525**	**2,109,807**	**21,531,792**	**8,973,168**	**422,044**	**8,257,714**	**65,460,985**
Incorporated operators[3]	1909	417	73,751,594	3,374,806	29,551,434	17,152,414	2,674,798	20,998,142	106,581,936
	1902	392	39,606,977	2,000,456	20,504,967	8,538,596	418,176	8,144,782	63,303,407
Per cent of total	1909	86.3	99.6	99.6	99.4	99.6	99.1	99.9	99.7
	1902	74.8	95.9	94.8	95.2	95.2	99.1	98.6	96.7
Unincorporated operators	1909	66	320,236	15,156	180,022	77,303	24,044	23,711	365,146
	1902	132	1,687,548	109,351	1,026,825	434,572	3,868	112,932	2,157,578

[1] Includes interest in 1902, of which $521,111 was interest paid on bonds.
[2] Exclusive of governmental institutions.
[3] Includes 1 limited partnership and 1 cooperative association.

The corporate was the predominant form of organization in iron mines in both 1909 and 1902. During the seven years a marked absolute decrease occurred in the business of enterprises not under corporate control. Unincorporated operators reported in 1909 only a fraction of 1 per cent of the value of products.

General summary, by states: 1909.—Table 43 presents a general summary of the statistics for operators of producing mines, classified by character of organization, for the United States and for the principal states having both incorporated and unincorporated operators in 1909. In Connecticut, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New Mexico, North Carolina, Tennessee, Texas, Utah, Wisconsin, and Wyoming all the mines were operated by incorporated companies.

GENERAL SUMMARY FOR OPERATORS OF PRODUCING MINES, CLASSIFIED ACCORDING TO CHARACTER OF ORGANIZATION, FOR THE UNITED STATES AND FOR THE PRINCIPAL STATES HAVING BOTH INCORPORATED AND UNINCORPORATED OPERATORS: 1909.

Table 43

STATE AND CHARACTER OF ORGANIZATION.	Number of operators.	Number of mines.	LAND CONTROLLED (ACRES). Total.	Owned.	Leased.	Capital.	EXPENSES OF OPERATION AND DEVELOPMENT. Total.	Salaries.	Wages.	Supplies and materials.	Royalties and rent of mines.
United States:											
Incorporated [1]	**130**	**417**	**1,274,785**	**1,038,623**	**236,162**	**$299,862,084**	**$73,751,594**	**$3,374,806**	**$29,551,434**	**$17,152,414**	**$15,166,190**
Unincorporated	**46**	**66**	**38,429**	**25,604**	**12,825**	**873,833**	**320,236**	**15,156**	**180,022**	**77,303**	**8,545**
Alabama:											
Incorporated	20	46	57,901	53,134	4,767	22,370,318	4,604,857	322,087	2,687,855	1,096,335	89,351
Unincorporated	5	6	5,325	285	5,040	126,000	19,427	1,400	11,093	4,256	839
Georgia:											
Incorporated	6	12	72,343	72,153	190	3,997,192	277,235	32,710	141,448	72,778	16,893
Unincorporated	5	6	1,340	120	1,220	21,200	27,294	2,160	15,110	2,412	1,575
Missouri:											
Incorporated	6	9	89,503	89,120	383	3,016,000	105,835	9,495	66,729	16,420	10,576
Unincorporated	10	24	2,097	1,137	960	151,225	45,001	750	32,930	8,771	1,457
Pennsylvania:											
Incorporated [2]	9	12	5,659	864	4,795	7,053,458	282,308	20,179	139,705	70,423	1,480
Unincorporated	6	7	12,499	12,436	63	71,489	95,275	2,070	27,328	40,377	1,604
Virginia:											
Incorporated	12	53	95,295	58,255	37,040	6,323,807	1,478,382	55,094	817,308	323,659	146,877
Unincorporated	5	5	1,084	132	952	151,580	32,861	2,656	25,698	1,583	1,253

STATE AND CHARACTER OF ORGANIZATION.	EXPENSES OF OPERATION AND DEVELOPMENT—continued. Taxes.	Contract work.	Rent of offices and sundries.	Ore used and sold (long tons).	Value of all products.	PERSONS ENGAGED IN INDUSTRY. Aggregate.	Proprietors and officials. Total.	Proprietors and firm members.	Salaried officers of corporations, superintendents and managers.	Clerks and other subordinate salaried employees.	Wage earners.	Primary horsepower owned.
United States:												
Incorporated [1]	**$3,966,721**	**$2,674,798**	**$1,865,231**	**50,338,481**	**$106,581,936**	**54,149**	**1,019**	**.....**	**1,019**	**1,825**	**51,305**	**338,875**
Unincorporated	**3,634**	**24,044**	**11,532**	**182,727**	**365,146**	**1,027**	**90**	**76**	**14**	**12**	**925**	**3,194**
Alabama:												
Incorporated	36,962	3,950	368,317	4,297,467	4,915,743	5,874	171	.....	171	184	5,519	31,101
Unincorporated	89	1,750	.....	14,893	23,406	158	9	7	2	2	147	737
Georgia:												
Incorporated	3,045	.....	10,361	204,780	308,324	696	21	.....	21	13	662	3,345
Unincorporated	20	.....	6,017	15,196	22,854	166	11	8	3	2	153	151
Missouri:												
Incorporated	262	654	1,699	58,996	140,022	212	7	.....	7	6	199	255
Unincorporated	548	445	100	27,958	63,827	146	18	16	2	.....	128	148
Pennsylvania:												
Incorporated [2]	18,097	30,285	2,139	623,699	692,454	635	15	.....	15	8	612	3,171
Unincorporated	1,318	20,709	1,869	41,114	96,842	129	13	12	1	2	114	800
Virginia:												
Incorporated	16,329	700	118,415	825,647	1,657,857	3,029	36	.....	36	38	2,955	6,130
Unincorporated	236	245	1,190	11,978	25,146	131	7	6	1	2	122	328

[1] Includes 1 cooperative association in Pennsylvania and 1 limited partnership in Tennessee. [2] Includes 1 cooperative association.

Land tenure, by character of organization.—Table 44 presents statistics as to the land held by incorporated and unincorporated operators, respectively.

Of the total land reported (1,313,214 acres) 1,274,785 acres, or 97.1 per cent, were connected with the enterprises controlled by incorporated companies.

Table 44

TENURE AND CHARACTER OF LAND.	ACREAGE CONTROLLED BY OPERATORS OF PRODUCING IRON MINES: 1909. Total.	Incorporated.[1]	Unincorporated.	TENURE AND CHARACTER OF LAND.	ACREAGE CONTROLLED BY OPERATORS OF PRODUCING IRON MINES: 1909. Total.	Incorporated.[1]	Unincorporated.
Total	**1,313,214**	**1,274,785**	**38,429**	**Leased**	**248,987**	**236,162**	**12,825**
				Mineral	104,947	95,279	9,668
				Timber	80,273	77,196	3,077
Owned	**1,064,227**	**1,038,623**	**25,604**	Other	63,767	63,687	80
Mineral	282,661	273,755	8,906				
Timber	376,409	360,321	16,088				
Other	405,157	404,547	610				

[1] Includes 1 limited partnership and 1 cooperative association.

METHODS OF MINING.

Open-pit and underground mines.—The principal division of iron mines according to the method of mining is that between open-pit and underground mines. Table 45 shows the total production of ore (gross) in 1909 according to method of mining.

Table 45

STATE.	IRON ORE MINED (LONG TONS): 1909		
	Total.	Open-pit mines.	Underground mines.
United States	[1] 51,947,129	[2] 24,150,491	27,796,638
Alabama	4,687,468	1,128,984	3,558,484
Maryland	22,704	22,704	.....
Michigan	11,992,693	319,681	11,673,012
Minnesota	29,127,918	19,869,105	9,258,813
New Jersey	536,958	.....	536,958
New York	[1] 1,238,720	123,893	1,114,827
Pennsylvania	665,642	621,169	44,473
Tennessee	649,394	374,875	274,519
Utah	33,784	.....	33,784
Virginia	841,709	570,677	271,032
All other states [3]	2,150,139	1,119,403	1,030,736

[1] This quantity represents crude ore as it came from the mine. A part of it was concentrated before shipment, the reduction in weight amounting to 229,209 tons.

[2] Includes a small quantity of ore (less than 1 per cent of the total output of the state) in Minnesota which was classified as "milling" ore by the operator.

[3] Embraces Georgia, Kentucky, Missouri, Nevada, New Mexico, Ohio, Texas, West Virginia, Wisconsin, and Wyoming for open-pit mines, and Colorado, Connecticut, Georgia, Massachusetts, Missouri, North Carolina, Ohio, and Wisconsin for underground mines.

It appears from the table that in the United States as a whole about one-half of the total production was contributed by open-pit mines, about five-sixths of this amount being produced in Minnesota.[1]

Table 46 gives a comparative summary of the statistics as to expenses and other subjects for open-pit and underground mines, for the United States as a whole and for the Lake Superior and Southern districts separately, so far as separate reports were secured. In a good many cases a single operator had both classes of mines and made only a combined report for both, except that the quantity mined by each method was distinguished. As the table comprises 385 of the 483 producing iron mines, with an aggregate output of 56.8 per cent of the total for the United States, the data may be regarded as fairly representative for each method of mining.

[1] The total production of open-pit mines in Minnesota included a small quantity of ore—less than 1 per cent of the total output of the state—which was classified as "milling" ore. Under the "milling" system the surface earth is removed, and the ore is thrown into drifts located below the top of the ore, thus making large sinks or craters.

SUMMARY FOR PRODUCING MINES, CLASSIFIED ACCORDING TO METHOD OF MINING, BY DISTRICTS: 1909.[1]

Table 46

	UNITED STATES.		LAKE SUPERIOR DISTRICT.		SOUTHERN DISTRICT.	
	Open-pit mines.	Underground mines.	Open-pit mines.	Underground mines.	Open-pit mines.	Underground mines.
Number of mines	175	210	23	110	57	42
Number of wage earners	9,045	30,136	1,863	20,130	3,445	4,463
Average number per mine	52	144	81	183	60	106
Primary horsepower owned	51,229	165,314	22,679	121,350	16,129	24,676
Capital	$46,412,586	$97,570,820	$18,033,857	$66,429,767	$11,547,985	$16,993,274
Expenses of operation and development	$7,822,656	$35,760,448	$3,094,325	$27,996,084	$1,955,061	$3,725,171
Services	$3,810,401	$19,317,982	$1,211,307	$14,419,214	$1,303,836	$2,438,749
Salaries	$435,761	$1,742,846	$161,595	$1,289,210	$167,977	$255,481
Wages	$3,374,640	$17,575,136	$1,049,712	$13,130,004	$1,135,859	$2,183,268
Supplies and materials	$1,581,166	$8,234,566	$586,353	$6,080,283	$453,061	$888,556
Royalties and rent of mines	$1,345,064	$5,194,624	$1,136,155	$5,050,772	$55,750	$73,002
Taxes	$388,919	$1,167,462	$324,584	$1,087,484	$20,133	$26,229
Contract work	$347,041	$509,122	$304,078	$526,906	$5,700	.....
Miscellaneous	$350,065	$1,276,692	$131,248	$831,365	$116,581	$298,635
Ore used and sold (long tons)	8,601,936	20,075,010	4,866,570	14,775,431	1,700,040	3,430,778
Value of ore used and sold and of by-products	$11,745,593	$48,235,771	$6,633,315	$39,269,115	$2,341,922	$3,673,564
Ore mined:						
Quantity (long tons)	8,540,709	20,745,490	4,799,060	15,040,384	1,677,238	3,819,324
Estimated value [2]	$11,701,000	$49,789,000	$6,527,000	$40,007,000	$2,315,000	$4,087,000
Average tonnage per mine	48,804	98,788	208,655	136,731	29,425	90,936
Average expenses per ton mined	$0.92	$1.72	$0.77	$1.86	$1.16	$0.98
Salaries	0.05	0.08	0.03	0.09	0.10	0.07
Wages	0.40	0.85	0.22	0.87	0.68	0.57
Supplies and materials	0.19	0.40	0.12	0.40	0.27	0.23
Royalties and rent of mines	0.16	0.25	0.24	0.34	0.03	0.02
Taxes	0.05	0.06	0.07	0.07	0.01	0.01
Contract work	0.04	0.03	0.06	0.04	[3]	.....
Miscellaneous	0.04	0.06	0.03	0.06	0.07	0.08

[1] Exclusive of operators using both methods of mining and making combined reports.

[2] This value has been estimated from the average value per ton at the mine of ore used and sold.

[3] Less than 1 cent.

The economy naturally resulting from open-pit mining appears from the table. For the United States as a whole the average wages per ton mined amounted to $0.40 for open-pit mines, as compared with $0.85 for underground mines, and the cost of supplies and materials averaged $0.19 per ton in open-pit mines and $0.40 per ton in underground mines. The differences appear in a still more marked degree when the Lake Superior district is considered by itself. In that district the average wages per ton for open-pit mines were about one-fourth, and the average expenses for supplies and materials less than one-third, of the corresponding averages for underground mines. In the Southern district, on the other hand, the average expenses for open-pit mines were somewhat higher than for underground mines.

Use of machinery in mining.—The increase in the production of iron ore has been due largely to the introduction of improved machinery, namely, steam shovels in open-pit mines and power drills in underground mines. Some mines, however, still use hand drills. A comparative summary of the principal data for mines classified according to the character of machinery used is presented in Table 47.

Table 47

CHARACTER OF MACHINERY USED.	PRODUCING IRON MINES: 1909				
	Number of mines.	Wage earners.	Capital.	Primary horsepower owned.	Ore mined (long tons).
Total	483	52,230	$300,735,917	342,069	51,947,129
Mines using:					
Steam shovels or power drills, or both	335	47,645	280,429,944	332,035	49,048,469
Hand drills, with mechanical power for other purposes	94	3,828	12,687,085	10,034	2,764,649
Hand drills, without mechanical power	54	757	1,618,888	.....	134,011
Per cent of total reported for mines using:					
Steam shovels or power drills, or both	69.4	91.2	95.2	97.1	94.4
Hand drills, with mechanical power for other purposes	19.5	7.3	4.2	2.9	5.3
Hand drills, without mechanical power	11.2	1.4	0.5	.....	0.3
Average per mine for mines using:					
Total	.....	108	$622,642	708	107,551
Steam shovels or power drills, or both	.....	142	855,015	991	146,413
Hand drills, with mechanical power for other purposes	.....	41	134,969	107	29,411
Hand drills, without mechanical power	.....	14	29,979	.....	2,482

The preceding table shows that steam shovels or power drills or both were used in about seven-tenths of the iron mines, and that these mines produced 94.4 per cent of the ore mined and gave employment to 91.2 per cent of all wage earners engaged in iron mining. Hand drilling exclusively was reported from 30.6 per cent of all mines, but their production formed only 5.6 per cent of the total ore mined and the wage earners employed by them constituted only 8.7 per cent of the total number of wage earners engaged in the industry. The mines using hand drills and without mechanical power for other purposes were all small mines, their average output being less than 2,500 tons in 1909. These mines produced only 0.3 per cent of the total quantity of ore mined in 1909 and gave employment to 1.4 per cent of the total number of wage earners engaged in iron mining.

Mines using steam shovels.—Table 48 gives a summary for open-pit mines using exclusively steam shovels for shoveling ore. This table does not include the statistics of open-pit mines which were operated under the same management as underground mines and were not reported separately. A comparative study of the principal items of expense shows that the average wages per ton mined were $0.48 for open-pit mines using steam shovels, as compared with an average of $0.57 per ton for all producing mines, open-pit and underground; and that the average cost of supplies and materials per ton of ore mined by steam shovels was $0.23, as compared with $0.33 per ton for all producing mines.

Table 48

	Number or amount.
Number of operators	37
Number of mines	59
Number of wage earners, Dec. 15, 1909, or nearest representative day:	
Total	4,475
Average per mine	76
Primary horsepower owned:	
Total	17,351
Average per mine	294
Capital:	
Total	$25,797,420
Average per mine	$437,244
Expenses of operation and development	$3,776,517
Services	$1,919,201
Salaries	$220,035
Wages	$1,699,116
Supplies and materials	$816,669
Royalties and rent of mines	$577,138
All other	$463,509
Quantity of ore mined (long tons):	
Total	3,511,770
Average per mine	59,522
Value of products used and sold	$5,937,373

Mines without mechanical power.—A survival of the primitive methods of mining appears in the case of 54 mines in which, in 1909, all the drilling was done by hand and no power was used for hoisting or other purposes. While the value of the total output of these mines was less than $250,000, yet they are of interest as affording a comparison between modern methods of mining and those of an earlier day. The amount of wages per ton mined in these 54 mines averaged $1.10, as compared with $0.48 per ton for mines using exclusively steam shovels for shoveling ore, and with $0.57 for all producing mines. The cost of supplies for these 54 mines averaged $0.41 per ton, as compared with $0.23 per ton for the mines using steam shovels covered by Table 48, and with $0.33 for all producing mines.

A summary of the statistics for mines without mechanical power is presented in Table 49.

Table 49

	Number or amount.
Number of operators	48
Number of mines	54
Number of wage earners, Dec. 15, 1909, or nearest representative day:	
Total	757
Average per mine	14
Capital:	
Total	$1,618,888
Average per mine	$29,979
Expenses of operation and development	$256,183
Services	$169,010
Salaries	$21,263
Wages	$147,747
Supplies and materials	$55,212
Royalties and rent of mines	$5,297
All other	$26,664
Quantity of ore mined (long tons):	
Total	134,011
Average per mine	2,482
Value of products used and sold	$248,073

GENERAL TABLE.

Table 50 contains a detailed presentation, for 1909, of the statistics for iron mines in the United States as a whole, in each of the main producing districts, and in each state of any importance in the industry. It shows separately those mines which produced ore in 1909, and those in which all operations were confined to development work. It gives the number of operators and of mines; the acreage of land controlled, according to tenure; the expenses of operation and development; the quantity and value of products; and detailed statistics with regard to persons engaged in the industry and with regard to power and machinery.

DETAILED STATISTICS OF IRON MINES, BY

Table 50

	DISTRICT AND STATE.	Number of operators.	Number of mines.	LAND CONTROLLED (ACRES). All land. Total.	All land. Owned.	All land. Leased.	Mineral land. Total.	Mineral land. Owned.	Mineral land. Leased.	Timber land. Total.	Timber land. Owned.	Timber land. Leased.	Other land. Total.	Other land. Owned.	Other land. Leased.
1	**All mines**	[3] 191	504	**1,343,634**	**1,087,865**	**255,769**	**416,016**	**306,257**	**109,759**	**456,682**	**376,409**	**80,273**	**470,936**	**405,199**	**65,737**
2	**Producing**	[5] 176	483	**1,313,214**	**1,064,227**	**248,987**	**387,608**	**282,661**	**104,947**	**456,682**	**376,409**	**80,273**	**468,924**	**405,157**	**63,767**
3	**Nonproducing**	[5] 19	21	**30,420**	**23,638**	**6,782**	**28,408**	**23,596**	**4,812**				**2,012**	**42**	**1,970**
	Producing:														
4	LAKE SUPERIOR DIST.	50	195	600,283	442,428	157,855	39,624	13,338	26,286	252,713	181,517	71,196	307,946	247,573	60,373
5	Michigan	24	83	247,656	223,419	24,237	17,205	4,464	12,741	162,248	154,384	7,864	68,203	64,571	3,632
6	Minnesota	20	101	332,233	201,386	130,847	14,336	2,510	11,826	86,302	22,970	63,332	231,595	175,906	55,689
7	Wisconsin	6	11	20,394	17,623	2,771	8,083	6,364	1,719	4,163	4,163		8,148	7,096	1,052
8	SOUTHERN DISTRICT	51	116	212,165	190,699	21,466	136,820	121,498	15,322	25,996	19,996	6,000	49,349	49,205	144
9	Alabama	25	52	63,226	53,419	9,807	52,000	42,337	9,663	4,746	4,746		6,480	6,336	144
10	Georgia	11	18	73,683	72,273	1,410	70,570	69,160	1,410				3,113	3,113	
11	Tennessee	15	46	75,256	65,007	10,249	14,250	10,001	4,249	21,250	15,250	6,000	39,756	39,756	
12	OTHER STATES	100	172	500,766	431,100	69,666	211,164	147,825	63,339	177,973	174,896	3,077	111,629	108,379	3,250
13	Maryland	12	13	10,580	10,490	90	180	90	90	10,000	10,000		400	400	
14	Missouri	16	33	91,600	90,257	1,343	12,353	11,167	1,186	957	880	77	78,290	78,210	80
15	New Jersey	8	10	13,668	5,169	8,499	12,968	4,469	8,499	660	660		40	40	
16	New York	14	19	247,783	239,564	8,219	95,920	87,701	8,219	131,633	131,633		20,230	20,230	
17	Ohio	4	4	4,390	4,310	80	4,390	4,310	80						
18	Pennsylvania	15	19	18,158	13,300	4,858	12,089	7,231	4,858	6,065	6,065		4	4	
19	Utah	3	5	268	268		268	268							
20	Virginia	17	58	96,379	58,387	37,992	64,206	26,384	37,822	22,953	22,953		9,220	9,050	170
21	All other [7]	11	11	17,940	9,355	8,585	8,790	6,205	2,585	5,705	2,705	3,000	3,445	445	3,000
	Nonproducing:														
22	Minnesota	8	9	1,589	200	1,389	1,469	200	1,269				120		120
23	Missouri	3	4	24,368	21,168	3,200	24,368	21,168	3,200						
24	All other [8]	8	8	4,463	2,270	2,193	2,571	2,228	343				1,892	42	1,850

	DISTRICT AND STATE.	PERSONS ENGAGED IN INDUSTRY. Aggregate.	Proprietors and officials. Total.	Proprietors and firm members.	Salaried officers of corporations, superintendents, and managers.	Clerks and other subordinate salaried employees.	Wage earners, December 15, or nearest representative day. Aggregate. Total.	Aggregate. Above ground.	Aggregate. Below ground.	Men 16 years of age and over. All classes. Total.	All classes. Above ground.	All classes. Below ground.	Engineers, firemen, and mechanics. Total.	Engineers, firemen, and mechanics. Above ground.	Engineers, firemen, and mechanics. Below ground.	Miners and miners' helpers. Total.	Miners and miners' helpers. Above ground.	Miners and miners' helpers. Below ground.	Other wage earners. Total.	Other wage earners. Above ground.	Other wage earners. Below ground.	Boys under 16 years of age. Total.	Boys under 16 years of age. Above ground.	Boys under 16 years of age. Below ground.
1	**All mines**	**55,980**	**1,132**	**81**	**1,051**	**1,865**	**52,983**	**25,453**	**27,530**	**52,494**	**25,133**	**27,361**	**7,270**	**6,783**	**487**	**25,191**	**4,854**	**20,337**	**20,033**	**13,496**	**6,537**	**489**	**320**	**169**
2	**Producing**	**55,176**	**1,109**	**76**	**1,033**	**1,837**	**52,230**	**24,889**	**27,341**	**51,741**	**24,569**	**27,172**	**7,073**	**6,597**	**476**	**24,926**	**4,736**	**20,190**	**19,742**	**13,236**	**6,506**	**489**	**320**	**169**
3	**Nonproducing**	**804**	**23**	**5**	**18**	**28**	**753**	**564**	**189**	**753**	**564**	**189**	**197**	**186**	**11**	**265**	**118**	**147**	**291**	**260**	**31**	....	....	....
	Producing:																							
4	LAKE SUPERIOR DIST.	35,886	660	....	660	1,428	33,798	14,357	19,441	33,773	14,345	19,428	4,515	4,286	229	14,349	446	13,903	14,909	9,613	5,296	25	12	13
5	Michigan	16,931	312	....	312	494	16,125	4,665	11,460	16,104	4,657	11,447	1,705	1,544	161	7,853	87	7,766	6,546	3,026	3,520	21	8	13
6	Minnesota	17,438	330	....	330	890	16,218	9,280	6,938	16,214	9,276	6,938	2,660	2,610	50	5,625	289	5,336	7,929	6,377	1,552	4	4	....
7	Wisconsin	1,517	18	....	18	44	1,455	412	1,043	1,455	412	1,043	150	132	18	871	70	801	434	210	224	....	....	....
8	SOUTHERN DISTRICT	8,629	250	15	235	239	8,140	4,894	3,246	7,769	4,662	3,107	1,230	1,100	130	3,840	1,436	2,404	2,699	2,126	573	371	232	139
9	Alabama	6,032	180	7	173	186	5,666	3,044	2,622	5,404	2,907	2,497	972	845	127	2,391	528	1,863	2,041	1,534	507	262	137	125
10	Georgia	862	32	8	24	15	815	750	65	788	723	65	101	101	....	358	293	65	329	329	.....	27	27	....
11	Tennessee	1,735	38	....	38	38	1,659	1,100	559	1,577	1,032	545	157	154	3	1,091	615	476	329	263	66	82	68	14
12	OTHER STATES	10,661	199	61	138	170	10,292	5,638	4,654	10,190	5,562	4,637	1,328	1,211	117	6,737	2,854	3,883	2,134	1,497	637	93	76	17
13	Maryland	146	20	18	2	1	125	125	.....	114	114	.....	6	6	....	65	65	.....	43	43	.....	11	11	....
14	Missouri	358	25	16	9	6	327	284	43	324	281	43	15	15	....	281	238	43	28	28	.....	3	3	....
15	New Jersey	2,148	23	....	23	30	2,095	553	1,542	2,095	553	1,542	302	249	53	1,134	.....	1,134	659	304	355	....	....	....
16	New York	2,637	34	1	33	61	2,542	1,049	1,493	2,541	1,049	1,492	356	322	34	1,400	158	1,242	785	569	216	1	....	1
17	Ohio	39	3	2	1	.....	36	19	17	36	19	17	1	1	....	26	9	17	9	9	.....	....	....	....
18	Pennsylvania	764	28	12	16	10	726	620	106	714	608	106	161	159	2	478	400	78	75	49	26	12	12	....
19	Utah	81	3	....	3	3	75	12	63	75	12	63	12	12	....	63	.....	63	.....	.....	.....	....	....	....
20	Virginia	3,160	43	6	37	40	3,077	2,232	845	3,011	2,182	829	363	349	14	2,346	1,562	784	302	271	31	66	50	16
21	All other [7]	1,328	20	6	14	19	1,289	744	545	1,289	744	545	112	98	14	944	422	522	233	224	9	....	....	....
	Nonproducing:																							
22	Minnesota	559	13	2	11	20	526	380	146	526	380	146	139	134	5	186	62	124	191	184	17	....	....	....
23	Missouri	54	3	2	1	1	50	46	4	50	46	4	4	4	....	44	40	4	2	2	.....	....	....	....
24	All other [8]	191	7	1	6	7	177	138	39	177	138	39	54	48	6	35	16	19	98	74	14	....	....	....

[1] Includes a small amount reported for rent of power, which forms approximately 1 per cent of the total.
[2] Includes by-products with value of $407,508, of which the greater part was manganiferous ore.
[3] The difference of 4 existing between the number of operators for all mines and the sum of the numbers for producing and nonproducing mines is due to the fact that 4 operators reported both classes of mines.
[4] Of this ore, 882,548 tons were concentrated at the mines, from which 653,339 tons of concentrate were derived.
[5] The difference of 25 existing between the number of operators for producing mines and the sum of the numbers for the several states, is due to the elimination of the duplication in the United States total of those operators who had mines in more than one state.

DISTRICTS AND STATES: 1909.

	Capital.	EXPENSES OF OPERATION AND DEVELOPMENT.										PER CENT OF TOTAL.			ORE.		
		Total.	Services.			Supplies.		Miscellaneous.							Total mined (long tons).	Used, shipped, and sold.	
			Salaries.		Wages.	Supplies and materials.	Fuel.[1]	Royalties and rent of mines.	Taxes.	Contract work.	Rent of offices and sundries.	Services.	Supplies.	Miscellaneous.		Quantity (long tons).	Value, including by-products.[2]
			Salaried officers of corporations, superintendents, and managers.	Clerks and other subordinate salaried employees.													
1	$305,586,756	$74,934,131	$1,768,057	$1,655,935	$30,047,986	$12,835,310	$4,715,963	$15,210,335	$4,004,319	$2,762,617	$1,933,609	44.7	23.4	31.9	[4] 51,947,129	50,521,208	$106,947,082
2	300,735,917	74,071,830	1,749,989	16,39,973	29,731,456	12,597,428	46,32,289	15,174,735	3,970,355	26,98,842	1,876,763	44.7	23.3	32.0	[4] 51,947,129	50,521,208	106,947,082
3	4,850,839	862,301	18,068	15,962	316,530	237,882	83,974	35,600	33,964	63,775	56,846	40.7	37.3	22.0	.....	.....	.....
4	237,336,821	61,552,979	1,284,163	1,344,826	22,607,698	10,359,986	3,541,036	14,784,131	3,818,377	2,613,823	1,198,939	41.0	22.6	36.4	42,095,627	41,242,374	92,216,852
5	58,544,068	22,459,011	645,761	451,127	10,668,069	3,452,519	1,457,460	3,827,852	961,401	436,148	558,674	52.4	21.9	25.7	11,992,693	11,924,995	32,168,133
6	174,863,024	37,295,373	609,187	852,393	11,068,652	6,597,440	1,951,421	10,686,407	2,810,266	2,157,075	562,532	33.6	22.9	43.5	29,127,918	28,314,713	57,076,135
7	3,979,729	1,798,595	29,215	41,306	870,977	310,027	132,155	269,872	46,710	20,600	77,733	52.3	24.6	23.1	975,016	1,002,666	2,972,584
8	23,475,259	5,762,991	243,777	184,266	3,369,697	872,102	484,854	136,723	46,979	5,700	418,893	65.9	23.5	10.6	5,556,838	5,181,605	6,085,508
9	22,496,318	4,624,284	176,678	146,809	2,698,948	718,281	382,310	90,190	37,051	5,700	368,317	65.4	23.8	10.8	4,687,468	4,312,360	4,939,149
10	4,018,392	304,529	25,610	9,260	156,558	40,665	34,525	18,468	3,065	.....	16,378	62.9	24.7	12.4	219,976	219,976	331,178
11	1,960,549	834,178	42,489	28,197	514,191	113,156	68,019	28,065	6,863	.....	34,198	70.0	21.7	8.3	649,394	649,269	815,181
12	34,873,837	6,755,860	222,049	110,881	3,754,061	1,365,340	606,399	253,881	104,999	79,319	258,931	60.5	20.2	10.3	4,294,664	4,097,229	8,644,722
13	62,658	41,106	2,520	810	24,989	3,893	4,610	1,343	582	395	1,964	68.9	20.7	10.4	22,704	22,675	44,341
14	3,167,225	150,836	6,325	3,920	99,659	15,984	9,207	12,033	810	1,099	1,799	72.9	16.7	10.4	87,079	86,954	203,849
15	3,612,024	1,321,915	49,798	16,251	840,967	199,707	168,368	7,091	7,350	.....	32,383	68.6	27.9	3.5	536,958	559,828	1,651,091
16	12,613,215	2,118,267	81,987	57,223	1,001,025	556,997	199,317	62,668	51,491	20,632	86,427	53.8	35.7	10.5	[4] 1,238,720	1,024,173	3,095,023
17	53,401	22,701	1,320	.....	11,510	3,225	.....	176	389	5,254	827	56.5	14.2	29.3	13,468	13,468	24,419
18	7,124,947	377,583	17,841	4,408	167,033	87,340	23,460	3,084	19,415	50,994	4,008	50.1	29.4	20.5	665,642	664,813	789,296
19	206,077	185,429	1,000	1,050	104,823	72,834	5,160	.....	502	.....	60	57.6	42.1	0.3	33,784	33,784	100,844
20	6,475,387	1,511,243	39,438	18,312	843,006	208,213	117,029	148,130	16,565	945	119,605	59.6	21.5	18.9	841,709	837,625	1,683,003
21	1,558,903	1,026,780	21,820	8,907	661,049	217,147	78,748	19,356	7,895	.....	11,858	67.4	28.8	3.8	854,600	853,909	1,052,856
22	2,274,826	630,425	9,918	12,722	251,564	156,167	67,050	33,750	26,982	34,900	37,372	43.5	35.4	21.1	.....	.....	.....
23	1,006,900	15,352	900	300	6,544	1,552	595	.....	1,163	20	4,278	50.4	14.0	35.6	.....	.....	.....
24	1,569,113	216,524	7,250	2,940	58,422	80,163	16,029	1,850	5,819	28,855	15,196	31.7	44.4	23.9	.....	.....	.....

	PERSONS ENGAGED IN INDUSTRY—continued.												PRIMARY POWER OWNED.						ELECTRIC MOTORS RUN BY CURRENT GENERATED BY THE ENTERPRISE USING.		MACHINERY.		
	Wage earners employed 15th day of—												Total horsepower.	Steam engines.		Gas or gasoline engines.		Water wheels.			Power drills (number).		Steam shovels (number).
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		Number.	Horsepower.	Number.	Horsepower.	Number.	Horsepower.	Number.	Horsepower.	Compressed air.	Other.	
1	43,746	44,373	44,795	43,897	46,029	46,589	48,254	49,326	50,748	51,639	51,654	51,326	345,540	3,610	329,784	29	3,091	[9] 30	[9] 12,665	335	13,642	3,082	70	321
2	43,491	44,076	44,446	43,580	45,712	46,233	47,794	48,763	50,191	51,055	51,031	50,574	342,069	3,563	326,753	27	2,651	[9] 30	[9] 12,665	326	13,295	3,061	63	319
3	255	297	349	317	317	356	460	563	557	584	623	752	3,471	47	3,031	2	440	.....	.....	9	347	21	7	2
4	28,069	28,768	28,866	28,386	30,863	31,327	32,235	32,533	33,228	33,012	33,645	32,909	262,305	2,739	249,986	11	109	24	12,210	271	11,687	1,832	21	209
5	14,351	14,456	14,557	14,128	14,476	14,656	15,020	15,145	15,494	15,803	15,734	16,052	108,262	1,205	96,017	4	35	24	12,210	149	7,341	1,395	4	51
6	12,679	13,046	13,065	13,109	15,199	15,529	15,947	16,084	16,324	16,740	16,465	15,550	145,068	1,412	145,010	5	58	.....	.....	121	4,338	318	13	152
7	1,039	1,266	1,244	1,149	1,188	1,142	1,268	1,304	1,410	1,369	1,446	1,307	8,975	122	8,959	2	16	.....	.....	1	8	119	4	6
8	7,019	6,980	6,975	6,753	6,615	6,470	6,867	7,110	7,382	7,568	7,756	7,743	40,915	383	40,905	1	10	.....	.....	7	75	730	3	62
9	5,055	4,811	5,117	5,189	5,026	4,760	5,027	5,129	5,350	5,515	5,652	5,486	31,838	268	31,838	.....	.....	.....	.....	6	50	670	.....	39
10	504	513	491	423	380	427	418	506	527	551	603	734	3,496	41	3,496	.....	.....	.....	.....	.....	.....	7	.....	10
11	1,460	1,356	1,367	1,136	1,209	1,283	1,422	1,475	1,505	1,502	1,501	1,523	5,581	74	5,571	1	10	.....	.....	1	25	53	3	13
12	8,403	8,628	8,605	8,441	8,234	8,436	8,692	9,120	9,581	9,575	9,630	9,922	38,849	441	35,862	15	2,532	6	455	48	1,533	499	39	48
13	110	106	111	110	117	119	114	120	121	125	125	128	391	8	391	.....	.....	.....	.....	.....	.....	.....	.....	2
14	207	220	245	260	235	297	228	208	244	198	173	243	403	13	391	1	12	.....	.....	.....	.....	.....	6	2
15	2,017	2,057	1,980	1,794	1,749	1,780	1,840	1,818	2,014	2,130	2,111	2,095	6,585	82	6,585	.....	.....	.....	.....	10	525	129	.....	.....
16	1,885	1,922	1,909	1,832	1,792	1,884	2,008	2,175	2,333	2,353	2,387	2,510	18,220	124	17,223	6	747	2	250	30	966	192	20	7
17	26	27	33	34	34	31	31	31	35	33	31	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18	533	508	437	513	468	491	508	531	509	648	637	696	3,971	38	2,257	4	1,714	.....	.....	.....	.....	18	.....	8
19	75	75	75	75	67	67	67	67	67	67	48	48	200	2	200	.....	.....	.....	.....	.....	.....	8	.....	.....
20	2,590	2,688	2,793	2,733	2,662	2,605	2,703	2,950	3,019	2,753	2,837	2,932	6,458	141	6,200	3	53	[9] 4	[9] 205	1	20	74	9	25
21	960	1,025	1,022	1,090	1,110	1,162	1,193	1,220	1,239	1,268	1,281	1,239	2,621	33	2,615	1	6	.....	.....	7	22	78	4	4
22	183	205	220	225	221	246	260	292	339	352	385	534	1,724	31	1,724	.....	.....	.....	.....	.....	.....	17	6	2
23	4	7	6	.....	.....	.....	84	105	52	74	62	48	102	2	102	.....	.....	.....	.....	.....	.....	.....	1	.....
24	68	85	123	92	96	110	116	166	166	158	176	170	1,645	14	1,205	2	440	.....	.....	9	347	4	.....	.....

[6] Includes 4 operators who are also included in the number shown for producing mines.
[7] Embraces Colorado, Connecticut, Kentucky, Massachusetts, Nevada, New Mexico, North Carolina, Texas, West Virginia, and Wyoming.
[8] Embraces Iowa, Michigan, Pennsylvania, Tennessee, Utah, Virginia, and Wisconsin.
[9] Includes 1 water motor of 115 horsepower.