THIRTEENTH CENSUS OF THE UNITED STATES: 1910

DEPARTMENT OF COMMERCE

BULLETIN

U.S.

BUREAU OF THE CENSUS

MINING : UNITED STATES

COAL

Text and tables prepared by JOHN D. A. MORROW, Special Agent, under the supervision of ISAAC A. HOURWICH, Expert Special Agent for Mining

CONTENTS.

INTRODUCTION.

	Page.
Definitions and explanations	3
Scope of census	3
Period covered	3
Coal mining and coke manufacture at the mines	3
Number of operators	3
Coal land controlled	3
Capital	3
Expenses	4
Salaries	4
Administrative expenses of general offices	4
Wages	4
Supplies	4
Miscellaneous expenses	4
Use of long and short tons	4
Value of products	4
Persons engaged in the industry	4
Primary horsepower	4

PART I.—THE INDUSTRY AS A WHOLE.

General summary for the United States	5
Geographical distribution of coal mining	6
Producing fields of the United States	6
Production by geographic divisions and leading states	6
Statistics of coal mining by geologic regions	6
Map showing coal mining fields in the United States: 1909	7
Progress of the coal mining industry	8
Production by geographic divisions and leading states: 1909, 1902, and 1889	8
Production by geologic regions: 1909 and 1889	9
Statistics for the United States: 1909 and 1889	10
Population and coal production: 1849–1909	11
Statistics of engines and power: 1909 and 1902	11
Character of organization	12
General summary	12
Statement for incorporated and unincorporated operators	12
Industrial affiliations of operators	13
Scale of production	14
Size of mines	14
Classification of operators according to value of products	14
Classification of operators according to the number of wage earners employed	15
Classification of operators according to acreage controlled	15
Distribution of expenses	16
Persons engaged in the industry	16
Occupational status	16
Classification of wage earners according to occupation	17
Wage earners employed, by months	18
Hours of labor	18
Power	19

PART II.—PENNSYLVANIA ANTHRACITE COAL.

Introduction	20
Location of the anthracite deposits	20
Methods of production	20
Number of collieries	20
General summary	20
Progress of the industry	21
Railway affiliation of operators	21
Scale of production	22
Classification of operators according to value of products	22
Classification of operators according to number of wage earners employed	22
Classification of operators according to coal land acreage	22
Expenses	23
Distribution of expenses for all collieries	23
Expenses and related data for mines and washeries	23
Royalty payments	24
Wage earners	24
Employment of wage earners above and below ground for different classes of collieries	24
Number of days collieries were operated	25
Map showing anthracite fields of Pennsylvania	25

PART III.—BITUMINOUS COAL.

General summary	26
Statistics for mines with and without coke manufacture, by states	26
Map showing relative production, by states	27
Coal mining exclusive of coke manufacture at the mines, by states	28
Statistics of different kinds of bituminous coal	28
Progress of the industry	29
Comparative statistics, by states: 1909 and 1889	29
Statistics of land held by operators	31
Extent of holdings	31
Production according to tenure of land, by states	32
Statistics of holdings, by states: 1909 and 1889	32
Mines classified according to the relation of total expenses to value of products	33
Methods of mine operation	34
Pick and machine mining	34
Kind of mine opening	35
Disposition of coal	36
Statistics of commercial and of local operators	37
Statistics of operators classified according to their industrial affiliation	38
Scale of production	38
Size of mines	38
Classification of operators according to value of products	39
Classification of operators according to acreage controlled	40
Expenses	40
Average expenses per ton of coal, by states	40
Average expenses per ton of coal, for selected mines, by states	41
Expenses and related data for mines classified according to method of mining, selected states	41
Expenses and related data for mines classified according to kind of opening, selected states	43
Royalty payments, by states	44
Persons engaged in the industry	44
Classification according to general occupational status, by states	44
Classification of wage earners according to occupation, by states	45
Maximum and minimum numbers of wage earners reported, by states	45
Hours of labor, by states	46
Power	47
Mines operated with and without mechanical power, by states	47
Comparative statistics of power, by states: 1909 and 1902	47

PART IV.—GENERAL STATISTICS: 1909.

Introduction	49
General statistics, by states: 1909	50

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	$246,928,078	$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	770,681	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	$412,898,346	$96,900,963	$315,997,383	$244,595,955	$71,401,428
Salaries	26,384,199	4,583,304	21,800,895	16,501,064	5,299,831
Wages	386,514,147	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 10,975 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.

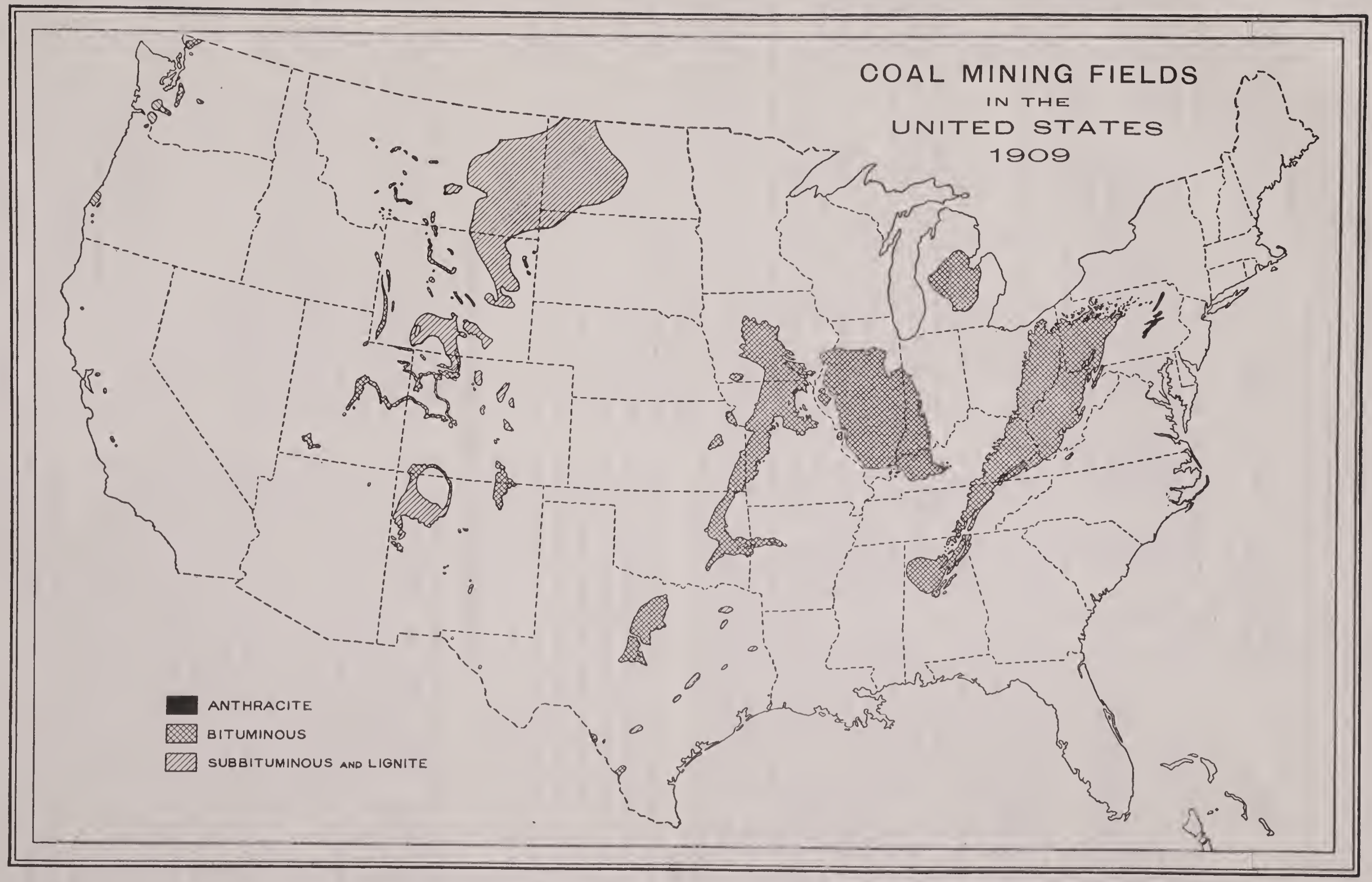
[Includes coal made into coke at the mines.]

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	99,249	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	44,668	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	16,197	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	10,008	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	330,906,966	387,106,056	507,418	1,447,300
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	250,025,860	238,148,162	334,155	771,172
Northern Interior	28	23,135	6,865,156	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	33,631,095	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	8,904	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	66,264	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	45,992	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	45,769	[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	24,749	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	33,946	11,755	17,957	54.5	20,835	172.1	19,483	57.4	22,191	188.8
Ohio	27,863	23,520	9,977	27,628	26,954	9,355	4,343	18.5	13,543	135.7	674	2.5	17,599	188.1
Indiana	14,735	9,446	2,845	14,996	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	3,844	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	6,667	2,374	3,816	56.4	4,367	182.0	3,293	49.4	4,293	180.8
Iowa	7,732	5,905	4,095	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	4,429	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	6,869	5,400	2,338	1,967	44.9	2,457	127.6	1,469	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	46,576	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.	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	$92,317,659	$37,854,273	$54,463,386	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 11,689 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]		COAL PRODUCTION.		
	Number.	Per cent of increase over preceding census.	Quantity (ton of 2,000 pounds).	Per cent of increase over preceding census.	Tons per capita.
1849	23,191,876	.....	6,445,681	.....	0.28
1859	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. Number.	STEAM ENGINES. Horsepower.	ELECTRIC MOTORS. Total horsepower.	Run by current generated by operator. Number.	Run by current generated by operator. Horsepower.	Run by purchased current. Horsepower.	Run by purchased current. 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. Number of operators.	TOTAL. Number of mines.	TOTAL. Number of wage earners.	TOTAL. Tons of coal, including coal coked at mines (in thousands).	TOTAL. Value of products (in thousands).	ANTHRACITE. Number of operators.	ANTHRACITE. Number of mines.	ANTHRACITE. Number of wage earners.	ANTHRACITE. Tons of coal (in thousands).	ANTHRACITE. Value of products (in thousands).	BITUMINOUS. Number of operators.	BITUMINOUS. Number of mines.	BITUMINOUS. Number of wage earners.	BITUMINOUS. Tons of coal, including coal coked at mines (in thousands).	BITUMINOUS. 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	24,699	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	356,613	403,331
Other	31	43	5,134	3,083	4,656	6	[1] 6	1,825	763	1,589	25	[2] 37	3,309	2,320	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	1,676	1,646	161	20	105	87
Capital	$681,353,862	$16,003,275	$345,521,191	$19,318,755	$241,638,086	$5,289,992
Net expenses	$284,333,946	$17,117,950	$90,837,416	$3,617,714	[1] $127,586,768	[1] $6,864,786
Salaries	$15,883,421	$617,643	$5,059,504	$240,327	$4,363,423	$219,881
Wages	$214,680,729	$13,414,162	$63,425,551	$2,676,046	$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	.....	3,648	.....	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	$296,081,343	$19,813,592	$107,249,662	$4,817,867	$141,554,636	$7,625,835
Coal (exclusive of coal made into coke)	$295,875,314	$19,784,032	$44,219,327	$173,667	$141,554,636	$7,625,835
Coke made at mines	.....	.....	$62,838,962	$4,644,200	.....	.....
Other products	$206,029	$29,560	$191,373	.....	.....	.....
Average per ton:						
Net expenses	$1.08	$1.04	$0.98	$0.97	$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.		ANTHRACITE.		BITUMINOUS.	
	Number of operators.	Value of all products.	Number of operators.	Value of products.	Number of operators.	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	46,377,776	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	215,997,253	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.		PER CENT OF TOTAL.	
	Operators.	Wage earners (including those making coke at mines).	Operators.	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	12,764	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	152,149	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.		PER CENT OF TOTAL.	
	Operators.	Acres of coal and other land controlled.	Operators.	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	61,803	19.7	13.0
10,000 to 100,000 acres [3]	8	393,462	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

CLASS OF EXPENSES.	PER CENT OF TOTAL REPORTED 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	42,098	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	74,829	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	39,062	22.5	83,335	14.6	63,772	14.6	19,563	14.6
Boys under 16 years of age	6,968	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

MONTH.	WAGE EARNERS EMPLOYED AT COAL MINES.									
	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	99.9	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	659,434	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	268	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	$96,742,395	$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	26,662,088	26,640,773	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
				Other	23,472,809	23,456,865	15,944
Total net expenses	$134,245,600	$134,183,967	$61,633	Royalties	7,969,785	7,967,209	2,576
Coal:				Miscellaneous	7,736,176	7,730,540	5,636
Total tons produced (2,240 pounds)	72,215,273	72,109,034	106,239				
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.	INCREASE. 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	316,711	107,282	209,429	195.2
Held under lease	159,188	106,656	52,532	49.3
Capital	$246,599,761	$161,784,473	$84,815,288	52.4
Gross expenses	$139,048,811	$61,109,958	$77,938,853	127.5
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	$145,791,493	$65,721,578	$80,069,915	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 11,689 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	$148,866,422	$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	$7,967,209	$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]	273,499	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	327,556	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	56,536,922	3,550,314
Value at mines	$121,248,635	$2,274,004
Wage earners, number [1]	144,639	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	106,395	.....
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	574,360	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	122,938
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.

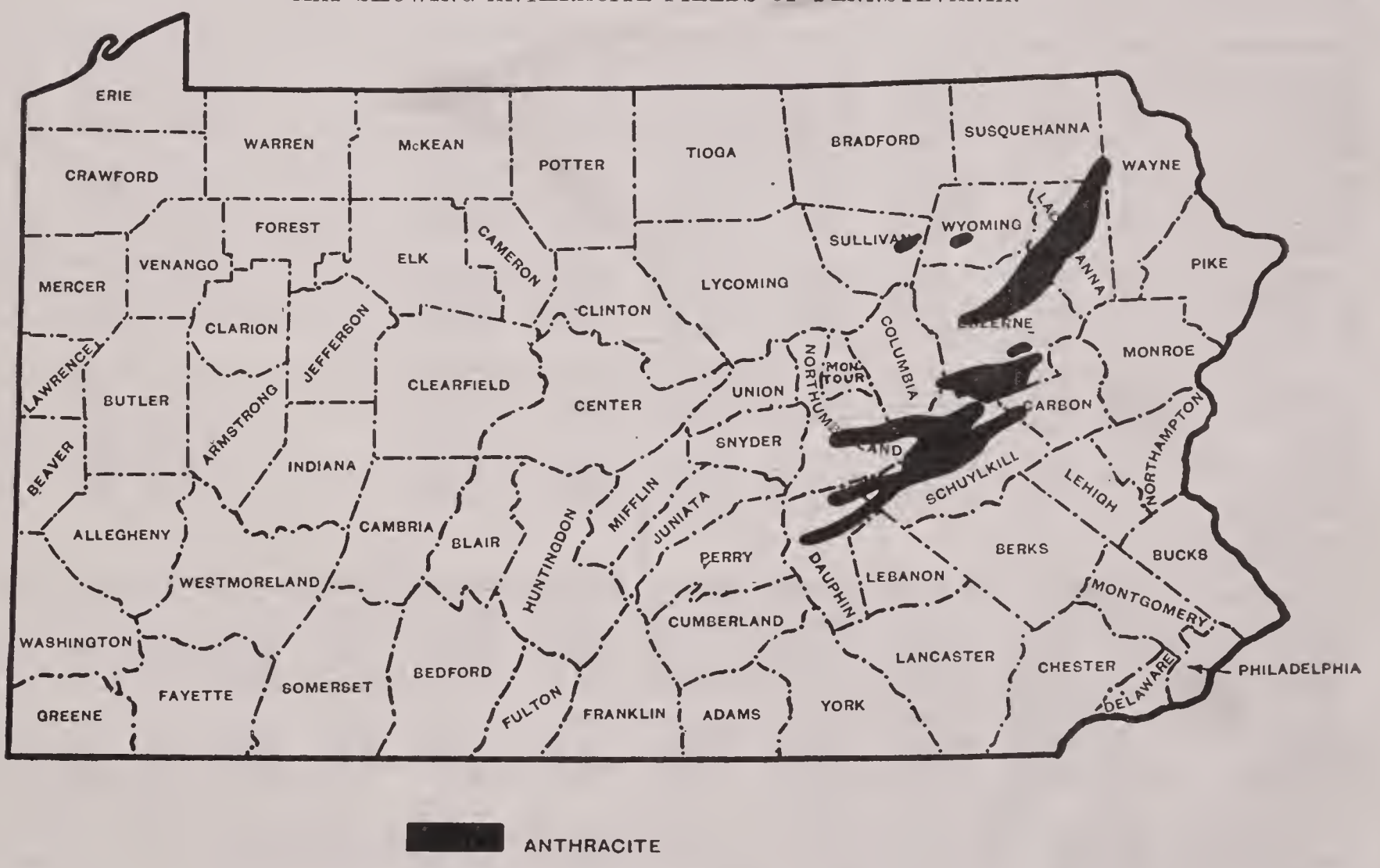
The table indicates the irregularity of employment in the anthracite collieries from day to day. Of the total number reported, 30.5 per cent were in operation more than 240 days, 54.9 per cent more than 210 days, and 74.2 per cent more than 180 days. Except in a few cases time was not lost in one continuous 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	8,114,565	.....	.....	11,721	18,776	182	.....
Arkansas	69	54,359	[1] 2,256,942	3,630,526	3,508,590	2,373,619	3,508,490	.....	.....	5,462	10,508	12	.....
Colorado	140	65,047	18,046,592	9,394,037	10,208,042	6,994,756	10,208,042	.....	.....	10,368	27,350	258	.....
Illinois	631	552,396	[1] 75,257,667	51,697,504	53,030,545	50,570,503	52,999,918	.....	.....	74,445	166,174	1,372	.....
Indiana	322	140,244	[1] 35,937,961	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	80,459	[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	.....	.....	9,526	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	406,336	64,131,141	27,153,497	27,353,663	27,518,764	27,274,403	.....	.....	44,405	97,422	1,537	.....
Oklahoma	104	75,744	[1] 5,672,886	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	329,650	9,830,983	5,185,588	5,130,791	4,657,257	5,130,791	.....	.....	8,470	11,580	167	.....
Texas	47	125,774	5,894,898	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	1,379,924	1,490,135	1,379,924	.....	.....	3,061	5,214	57	.....
Washington	51	83,313	[1] 13,040,936	6,205,090	8,915,528	3,496,242	8,915,528	.....	.....	5,857	16,252	18	.....
West Virginia	479	565,457	[1] 77,677,068	24,327,363	23,330,421	27,166,931	23,330,248	.....	.....	36,463	79,238	1,387	.....
Wyoming	65	64,783	[1] 7,609,229	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	367,494	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	8,607
Colorado	15	27,895	12,488,341	[2] 4,885,458	5,574,155	1,991,393	2,275,494	1,061,868	3,296,590	5,093	6,735	1	3,281
Kentucky	11	32,585	1,892,818	1,031,805	996,535	1,089,789	915,902	38,503	80,633	1,720	5,905	124	374
Pennsylvania	330	335,534	189,851,892	[2] 48,809,122	61,692,534	18,425,118	17,566,627	22,499,706	43,937,062	68,334	166,404	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	129,274	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	298	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.

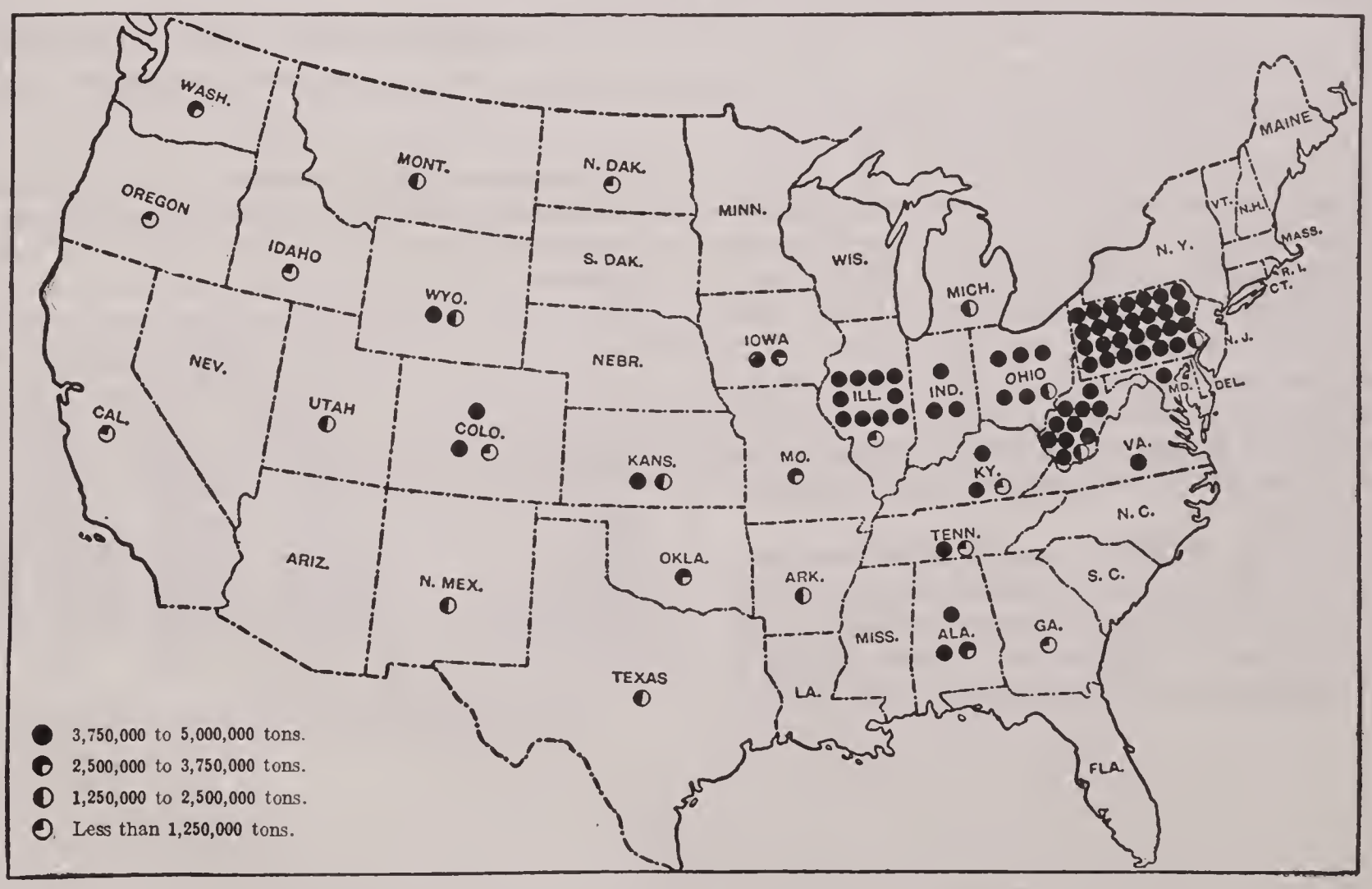
These data can not be taken as showing accurately the amount of profit or loss in the coal mining industry of the several states, but they do seem to indicate clearly that in many states the industry obtains only a very low rate of profit, if any. The remarks made in the Introduction to this report as 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.	Royaltics.	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	223,933	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	362,212	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	10,642,868
Illinois	470	[3] 75,257,667	51,697,504	[4] 2,083,668	41,991,246	4,944,371	744,860	[4] 1,933,359	[5] 1,788	74,445	53,030,545	50,570,503
Indiana	223	[3] 35,937,961	14,906,831	[4] 604,111	12,273,544	1,198,974	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	12,682,106	7,725,679
Kansas	118	[3] 6,262,203	9,778,297	[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	325,239	[4] 704,465	[5] 855	19,583	9,940,485	10,561,276
Maryland	40	22,871,136	3,941,359	[4] 222,116	2,713,294	408,227	95,757	[4] 501,965	[5] 243	5,798	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	106	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	563,212	364,536
Ohio	441	64,131,141	27,153,497	[4] 1,367,036	20,922,039	2,681,281	892,398	[4] 1,290,743	[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	3,950,876	[4] 6,018,193	[5] 4,716	168,513	129,545,547	137,304,760
Connellsville dist	76	78,517,182	24,966,514	1,203,489	17,683,509	4,043,656	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	404,429	322,216	535	10,832	6,548,515	5,972,930
Texas	29	5,894,898	2,812,079	[4] 177,103	2,126,043	334,867	36,247	[4] 137,819	[5] 174	4,234	3,136,004	1,824,742
Virginia	42	36,189,055	4,392,440	278,099	2,689,685	685,830	251,824	487,002	243	8,480	4,336,185	4,949,341
Washington	32	[3] 13,663,880	6,474,630	[4] 239,502	4,991,561	861,700	103,330	[4] 278,537	[5] 181	6,094	9,139,707	3,601,213
West Virginia	307	[3] 136,244,496	43,024,716	[4] 2,742,374	29,420,055	5,563,192	2,870,850	[4] 2,428,245	[5] 2,451	64,780	44,344,067	51,495,666
Wyoming	35	[3] 7,609,229	8,146,526	[4] 411,569	5,808,248	1,435,465	104,908	[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 $18,229,388 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.
[4] The United States total for salaries includes $1,523,356, 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	5,769	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	$26,358
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	1,793,011	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	396

[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**	**822,051**	**95,629,026**	**94,346,809**						
Alabama.....	1909	43,337,899	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	12,535,194	3,726,939	3,063,059	261,512	36,524	3,572,983	3,961,491						
Arkansas.....	1909	[2] 2,256,942	3,630,526	2,758,127	362,212	26,511	2,373,619	3,508,490	([3])	1,076.0	1,052.2	825.0	749.0	786.3
	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	91,689	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	9,778,297	8,106,670	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	349.5	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	1,653	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	13,727.1	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	1,436.9	2,307.6	2,336.0	2,492.7	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	20,922,039	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	4,803,392	912,614	22,266	3,113,149	6,184,420	([3])	457.2	434.0	1,608.9	313.5	367.2
	1889	1,492,009	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	129,512,680	([3])	352.1	337.8	562.5	279.6	363.3
	1889	53,322,330	25,977,106	19,686,240	2,393,386	282,222	36,174,089	27,953,315						
Tennessee.....	1909	19,471,452	6,691,482	4,751,419	665,884	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	5,894,898	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	340,620						
Virginia.....	1909	36,189,055	4,392,440	2,689,685	685,830	114,453	4,949,341	4,336,185	3,328.6	543.7	356.5	1,366.9	471.7	439.0
	1889	1,055,516	682,408	589,236	46,754	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] 136,244,496	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	3,592,292	462,591	47,099	6,231,880	5,086,584						
Wyoming.....	1909	[2] 7,609,229	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	12,848,970	790.8	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 Utahin 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	$0.12	$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	1.59	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	0.93
Washington	1.80	2.19	1.39	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	1.29	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	54,359	23,885	30,474	54,359	23,885	30,474	.....	.....	.....	43.9	56.1	43.9	56.1	.....	.....
Colorado	92,942	65,101	27,841	65,047	41,226	23,821	27,895	23,875	4,020	70.0	30.0	63.4	36.6	85.6	14.4
Illinois	552,396	395,965	156,431	552,396	395,965	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	458,924	353,954	104,970	329,650	232,680	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]	200,235	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	1,639,539	1,676,605
Arkansas	19	35	15	1,178,105	550,642	644,872
Colorado	48	54	53	1,999,949	1,660,106	6,982,813
Illinois	237	256	138	26,638,767	5,940,057	17,991,679
Indiana	147	115	60	7,220,506	2,506,029	4,996,696
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	5,597,607	3,056,051	1,907,618
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	1,065,589	1,351,579
Montana	42	12	11	1,287,913	282,190	973,280
New Mexico	18	3	7	1,652,254	32,690	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	155,867
Oregon	4	3	2	29,067	[6]	[7] 54,637
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	383,663	158,593
Utah	21	1	.....	[1] 2,259,789	[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	2,134,972
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	**7,717,615**	**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	54,686	17,064	220.5	24,137	15,969	30,549	1,095
Colorado	113,636	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	77,796	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	399,846	128,100	212.1	280,053	106,622	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	170,479	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**	**39,961,589**	[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	829,316	629,523	77.6	12.7	9.7						
Arkansas	32	19	18	1,075,722	889,034	408,863	45.3	37.5	17.2						
Colorado	94	12	34	4,832,791	426,035	1,735,930	69.1	6.1	24.8						
Illinois	408	140	83	32,382,469	12,194,725	5,993,309	64.0	24.1	11.9						
Indiana	224	54	44	8,684,863	3,429,569	2,608,799	59.0	23.3	17.7						
Iowa	236	30	45	4,558,946	960,501	2,206,232	59.0	12.4	28.6						
Kansas	125	58	19	4,390,216	2,005,829	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	855,662	966,028	49.4	23.8	26.9						
North Dakota	39	1	13	[5] 289,251	(6)	75,285	[6] 79.3	(6)	20.7						
Ohio	451	116	73	18,342,526	7,083,559	2,092,679	66.7	25.7	7.6						
Oklahoma	42	33	29	1,454,089	1,002,020	657,040	46.7	32.2	21.1						
Oregon	5	.....	4	30,512	.....	53,192	36.5	.....	63.5						
Pennsylvania	873	165	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	66.5	9.0	24.5						
Washington	29	.....	22	3,054,624	.....	441,618	87.4	.....	12.6						
West Virginia	260	100	119	17,863,418	4,927,035	4,376,478	65.8	18.1	16.1						
Wyoming	51	4	10	5,896,150	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	348,927	991,700	96.5	0.9	2.6	19,388,382	226,274	592,698	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	62.9	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

STATE.	TONS (2,000 POUNDS) OF COAL PRODUCED AT—									PER CENT OF COAL PRODUCED AT—					
	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	13,676,561	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	10,642,868	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**	**62,959,748**	**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	5,064,356	2,647,616	.....	479,818	23.0	47.6	24.9	.....	4.5
Illinois	50,570,503	48,780,105	540,393	529,564	70,570	649,871	96.5	1.1	1.0	0.1	1.3
Indiana	14,723,231	13,732,135	307,604	95,638	20,825	567,029	93.3	2.1	0.6	0.1	3.9
Iowa	7,725,679	5,737,697	224,484	81,246	.....	[4] 1,682,252	74.3	2.9	1.0	.....	21.8
Kansas	6,895,660	6,670,924	51,631	.....	93,342	79,763	96.7	0.7	.....	1.4	1.2
Kentucky	10,561,276	2,470,286	2,035,391	5,189,910	.....	[4] 865,689	23.4	19.3	49.1	.....	8.2
Michigan	1,772,315	[5] 1,772,315	.....	.....	.....	.....	100.0	.....	.....	.....	.....
Missouri	3,596,691	2,890,940	232,213	219,657	58,256	195,625	80.4	6.5	6.1	1.6	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	901,566	.....	[6] 54,964	.....	65.5	32.5	.....	2.0
Ohio	27,518,764	7,816,286	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	.....	[6] 281,077	.....	8.7	86.5	.....	4.7
Texas	1,824,742	1,408,924	276,823	.....	.....	138,995	77.2	15.2	.....	.....	7.6
Virginia	4,949,341	.....	114,291	3,906,467	.....	[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	3,867,076	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 460,268 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	29.2	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	$67,483,162	.....	.....	$67,483,162	100.0
Coal, including coal coked at mines—					
Tons (2,000 pounds)	376,865,510	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	$1.06	$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, 186; 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, 191; 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— Railroad companies.	Iron and steel companies.	Other industrial companies.	Unaffiliated commercial operators.
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]	7,585,797	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	$65,626,550	$47,203,171	$47,226,716	$231,218,217
Number of wage earners	560,717	93,692	62,806	63,490	340,729
Coal produced for use or sale as fuel:					
Tons (2,000 pounds)	323,114,587	57,162,392	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]	$67,666,042	$5,256,579	$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	1,294,089	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	198,907
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	34,069	31,392	106,827
Maryland	57,161	57,161	.....
Michigan	63,297	63,297	.....
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	66,689	68,554	34,990
West Virginia	77,906	56,716	133,674
Wyoming	96,840	96,840	.....
All other states [2]	63,434	47,002	165,896

[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.		OPERATORS AFFILIATED WITH RAILROADS AND INDUSTRIAL CONCERNS.				UNAFFILIATED COMMERCIAL OPERATORS.				UNAFFILIATED LOCAL OPERATORS.			
			Operators.		Value of all products.		Operators.		Value of all products.		Operators.		Value of all products.	
	Number.	Value of all products.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
All classes	**3,503**	**$427,962,464**	**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	2,826,603	30	15.0	84,460	(1)	335	15.1	888,001	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	1,597	1,590	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	0.16	0.98	0.21	0.08
Ohio	0.99	0.05	0.76	0.10	0.08
Oklahoma	2.10	0.10	1.54	0.29	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	1.29	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	0.16	0.05
Ohio	0.91	0.04	0.72	0.08	0.07
Oklahoma	1.85	0.09	1.36	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	0.79	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	1.04	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	1,097,152	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	519,042	629,407	0.89	0.03	0.67	0.02	0.08	0.10
Pick mining with mechanical power	309	15,696,995	666,340	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	2,619,410	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]	66	825,722	72,600	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	18,690,529	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	192,561	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. Tons.	Per cent distribution. Loaded at mines for shipment or used in other departments by producers.	Sold locally.	Used at mines for steam and heat.	Value at mines.	WAGE EARNERS. Maximum number. Month.	Number.	Minimum number. Month.	Number.	Per cent of maximum.	Primary horsepower.	AVERAGE PER MINE. Tons produced.	Wage earners.	Primary horsepower.
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	29,949,150	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	13,682,767	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 ..	20,803	87.2	35,372	50,866	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]	21,596,304	97.0	1.2	1.8	18,296,613	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...	589	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	$48,805,106	$1.01	48,097,159	94,493	37.5	4.4	$50,082,859	69,523	137	157,302	309
Slope mines	56	589,531	1.14	517,281	9,237	.....	33.5	624,524	1,001	18	1,504	27
Drift mines	22	229,619	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	2,272,146	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	6,079,058	0.95	6,430,217	84,608	59.7	1.9	6,363,768	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	29	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	4,039,252	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

STATE.	MINES ON LEASED LAND.		
	Total tons of coal produced (2,000 pounds).	Royalties.	
		Amount.	Average per ton.
United States	**82,912,956**	**$6,882,568**	**$0.08**
Alabama	1,639,539	112,892	0.07
Arkansas	550,642	74,974	0.14
Colorado	1,660,106	192,528	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	173,652	0.09
Kentucky	3,056,051	247,677	0.08
Missouri	1,065,589	87,963	0.08
Ohio	4,022,418	272,013	0.07
Oklahoma	2,906,888	260,517	0.09
Pennsylvania:			
Without coke made at mines	19,222,867	1,650,285	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	191,646	0.07
West Virginia:			
Without coke made at mines	15,538,143	1,222,914	0.08
With coke made at mines	10,573,269	759,180	0.07
Wyoming	688,717	68,379	0.10
All other states [1]	1,324,836	142,839	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]	**592,677**	**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	109	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	195	17,623	225
Kansas	13,374	283	40	78	182	12,791	152
Kentucky	18,869	118	170	229	417	17,935	39
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	9,526	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	9
Pennsylvania	119,972	724	336	911	1,927	116,074	179
Tennessee	8,931	20	69	102	270	8,470	9
Texas	4,416	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	36,463	12
Wyoming	8,267	185	24	63	156	7,839	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—		PER CENT OF WAGE EARNERS EMPLOYED AS—				Average number of miners and miners' helpers per mine.
	Outside.	Inside.	Engineers, firemen, and mechanics.	Miners and miners' helpers.	Others 16 years and over.	Boys under 16 years.	
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]	49
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	9.0	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	75.6	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]	20.4	79.6	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[3]	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.	MINIMUM MONTH. 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	12,791	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	7,839	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	167	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	9,763,417	96.5	3.5
Alabama	167	128	39	147	6,042,774	473,148	92.7	7.3
Arkansas	69	60	9	175	2,336,613	37,006	98.4	1.6
Colorado	140	117	23	234	6,855,459	139,297	98.0	2.0
Illinois	631	564	67	295	50,241,053	329,450	99.3	0.7
Indiana	322	266	56	173	14,582,185	141,046	99.0	1.0
Iowa	311	219	92	87	7,391,029	334,650	95.7	4.3
Kansas	202	154	48	128	6,771,665	123,995	98.2	1.8
Kentucky	299	205	94	187	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	1,772,315	.....	100.0	.....
Missouri	220	142	78	84	3,360,805	235,886	93.4	6.6
North Dakota	53	19	34	107	280,191	84,345	76.9	23.1
Ohio	640	390	250	250	26,495,762	1,023,002	96.3	3.7
Oklahoma	104	92	12	286	3,057,934	55,215	98.2	1.8
Oregon	9	7	2	158	80,104	3,600	95.7	4.3
Pennsylvania	1,179	759	420	314	81,211,428	3,892,521	95.4	4.6
Tennessee	129	90	39	129	4,081,751	575,506	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	104,565	93.0	7.0
Washington	51	48	3	339	3,486,890	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	530	6,241,860	52,736	99.2	0.8
All other states[1]	106	64	42	367	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	36	36	.....	981	7,160,639	.....	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	104,971	.....	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	16,192	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	45,910	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

STATE.	Census.	Total primary horsepower.	STEAM ENGINES.		ELECTRIC MOTORS RUN BY CURRENT GENERATED BY THE MINE OPERATORS.	
			Number.	Horsepower.	Number.	Horsepower.
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	1,700
	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	200
	1902	527	11	527	.....	.....
Per cent of increase	.....	110.4	36.4	110.4	.....	.....
Pennsylvania	1909	404,654	2,993	393,371	3,617	115,195
	1902	136,666	1,440	134,932	432	20,508
Per cent of increase	.....	196.1	107.8	191.5	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	296	9,775
	1902	6,221	52	5,846	28	1,280
Per cent of increase	.....	167.3	146.2	181.4	957.1	663.7
Washington	1909	16,812	133	16,300	169	5,834
	1902	10,146	85	9,116	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	32,939	237	31,296	226	10,080
	1902	13,833	161	13,790	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).								Capital.
			All land.			Coal land.			Timber land.	Other land.	
			Total.	Owned.	Held under lease.	Total.	Owned.	Held under lease.			
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
9	Producing mines: **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	552,396	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 [3]	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	232,680	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.			
	Aggregate.	Total.	Salaries.		Wages.	Total.	Fuel and rent of power.	Other.	Royalties.	Total.	Taxes.	Contract work.	Rent of offices and sundries.
			Salaried officers of corporations, superintendents, and managers.	Clerks and other subordinate salaried employees.									
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] 8,393,193	[4] 154,291	[4] 132,232	8,106,670	609,521	100,975	508,546	266,545	[4] 509,038	[4] 18,394	[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	147,436	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	329,796	232,105	4,838,203	[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] 230,615	[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	46,602,733	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	6,895,660	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	2,543,383	[5] 2,338,464	91,849	113,070	([6])	854,771	33.6	([6])
22	New Mexico	2,774,912	[5] 2,712,022	30,492	32,398	([6])	1,089,119	39.2	([6])
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	[5] 2,136,533	22,637	100,619	([6])	.....	.....	([6])
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	.....	1,391,161	22.1	.....
35	All other states[8]	224,350	[5] 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	1,143,632	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	[4] 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	1,987	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

[6] Includes coal made into coke at mines, to avoid disclosing individual operations.
[6] 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
	Producing mines:														
9	**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	463	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	194	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**	**730,164**
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**	**166,068**	**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	22,493	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	2,621	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.