
MINERAL PRODUCTION IN IOWA

IN 1909 AND 1910

MINERAL PRODUCTION IN IOWA FOR 1909 AND 1910*

VALUE OF MINERAL PRODUCTION.

1910.

Coal	\$13,903,913
Clay and clay products	5,335,036
Stone and lime	639,831
Gypsum	943,849
Lead and zinc	12,128
Sand-lime brick	31,269
Mineral waters	27,175
Sand and gravel	464,863
Other products	1,386,508
Total	\$22,744,572

1909.

Coal	\$12,793,628
Clay and clay products	4,916,513
Stone and lime	609,922
Gypsum	655,602
Lead and zinc	6,876
Sand-lime brick	48,210
Mineral waters	14,116
Sand and gravel	458,829
Other products	862,025
Total	\$20,365,721

The mineral production for 1910 shows a splendid increase in production over 1909 for every department with the single exception of sand-lime brick. Coal shows the greatest total increase. The value of "other products," which includes Portland cement, was more than 60 per cent greater for 1910 than for 1909. Prices continued high for all mineral products, coal reaching the highest average price since the organization of the present survey. The number of producers is still on the decrease, especially in clay products and stone.

*The mineral statistics for 1909 were collected by the United States Census Bureau in co-operation with the Federal Geological Survey. The statistics for 1910 were compiled by the Iowa Geological Survey through co-operation with the United States Geological Survey.

Table number I gives the total production by counties:

TABLE I.

Value of Total Mineral Production by Counties for 1910.

Counties	No. of producers	Coal	Clay and clay products	Stone and lime	Other products	Total value
Adair	2					
Adams	11	\$ 34,706	\$ 49,558			\$ 84,264
Allamakee	3			\$ 1,915		1,915
Appanoose	55	2,813,578				2,813,578
Audubon	5				\$ 250	250
Benton	8		24,168	6,235		30,403
Black Hawk	12				48,475	48,475
Boone	11	550,178	72,250			622,428
Bremer	4				6,215	6,215
Buena Vista	8		34,250		4,081	38,331
Calhoun	2					
Carroll	1					
Cass	1					
Cedar	3					
Cerro Gordo	12		1,040,034	41,279		1,081,313
Cherokee	6				12,278	12,278
Clarke	2					
Clay	2					
Clayton	11		8,801	1,879		10,680
Clinton	14		21,840	880	42,180	64,900
Crawford	2					
Dallas	11	447,817	218,027			665,844
Decatur	1					
Delaware	5			238		238
Des Moines	2					
Dickinson	1					
Dubuque	23		42,000	44,324	27,807	114,131
Emmet	5				4,452	4,452
Fayette	10			5,579	5,263	10,842
Floyd	5			3,745		3,745
Franklin	1					
Fremont	3		4,600			4,600
Greene	6	26,175				26,175
Grundy	3					
Guthrie	11	53,665	19,313			72,978
Hamilton	1					
Hancock	1					
Hardin	11		54,110	44,267		98,377
Harrison	2					
Henry	5		38,510			38,510
Howard	3					
Humboldt	2					
Ida	3					
Iowa	5		40,960			40,960

MINERAL PRODUCTS BY COUNTIES

TABLE I—CONTINUED

Counties	No. of producers	Coal	Clay and clay products	Stone and lime	Other products	Total value
Jackson	3					
Jasper	15	740,132	25,107			765,239
Jefferson	6		54,779			54,779
Johnson	12		47,300		19,018	66,318
Jones	13			63,741		63,741
Keokuk	18	25,447	69,804			95,247
Kossuth	1					
Lee	17		4,510	48,284	7,398	60,192
Linn	15		16,116	25,516	23,081	64,713
Louisa	6			605		605
Lucas	2					
Lyon	3				8,337	8,337
Madison	7			48,559		48,559
Mahaska	39	1,131,408	57,885	3,961	46,416	1,239,670
Marion	23	348,992	48,169			397,161
Marshall	10		33,364			33,364
Mills	3		6,645			6,645
Mitchell	3			990		990
Monona						
Monroe	10	3,506,140				3,506,140
Montgomery	1					
Muscatine	9		17,039			17,039
O'Brien	3				4,020	4,020
Osceola	1					
Page	4		33,100			33,100
Palo Alto	4				6,228	6,228
Plymouth	8				29,832	29,832
Pocahontas	1					
Polk	52	3,140,598	678,608		383,001	4,202,207
Pottawattamie	3		24,211			24,211
Poweshiek	4		52,225			52,225
Sac	3					
Scott	12		28,148	134,061		162,209
Shelby	1					
Sioux	7				9,421	9,421
Story	9		47,275		8,700	55,975
Tama	7		64,185			64,185
Taylor	6	24,233				24,233
Union	1					
Van Buren	8	23,960	10,130			34,090
Wapello	22	498,210	102,546			600,756
Warren	4					
Washington	7		47,900			47,900
Wayne	5	280,100				280,100
Webster	32	111,720	981,389		950,819	2,043,928
Winnebago	2					
Winneshiek	4					
Woodbury	6		369,010			369,010
Worth	1					
Wright	4					

TABLE I—CONTINUED

Counties	No. of producers	Coal	Clay and clay products	Stone and lime	Other products	Total value
Counties with less than three producers .....	...	146,858	847,170	163,773	1,218,520	2,376,321
Total	728	\$13,903,913	\$5,335,036	\$ 639,831	\$2,865,792	\$22,744,572

Coal

Twelve counties produced more than 50,000 tons each during 1909. Of these, eight show an increase and four a decrease for 1910. Appanoose and Monroe made the greatest gains, while Mahaska suffered the greatest loss. The total production for the year increased over 2 per cent and the total value increased 8 per cent over 1909. The average price per ton was \$1.75 as compared with \$1.65 and \$1.63 for 1909 and 1908 respectively. The production for 1909, in turn, shows a substantial increase both in quantity and price over that of 1908.

The table below gives the tonnage, value, average price per ton, average number of days worked and average number of men employed during the past ten years, according to the United States Geological Survey:

Year	Total tons	Value	Average price	Average number of days worked	Average number of men employed
1901	5,617,499	\$ 7,822,805	\$ 1.39	218	12,653
1902	5,904,766	8,660,287	1.47	227	12,434
1903	6,419,811	10,563,910	1.65	226	14,162
1904	6,519,933	10,504,406	1.61	213	15,629
1905	6,798,609	10,586,381	1.56	209	15,113
1906	7,266,224	11,619,455	1.60	224	15,260
1907	7,574,322	12,258,012	1.62	230	15,585
1908	7,161,310	11,706,402	1.63	214	16,021
1909	7,757,762	12,793,628	1.65	...	17,286
1910	7,928,120	13,903,913	1.75	218	16,666

The strike in the Illinois coal field greatly stimulated coal production in Iowa and is largely responsible for the increase both in production and price.

The output, disposition of product, value, average price per ton, average number of days worked and average number of men employed during 1909 and 1910 are given, tabulated by counties, in Table II:

TABLE II.

COAL PRODUCTION FOR IOWA IN 1909 AND 1910, BY COUNTIES, IN SHORT TONS.

1910.

Counties	Loaded at mine for shipment	Sold to local trade and used by employees	Used at mine for steam and heat	Total quantity	Total value	Average price per ton	Average number days active	Average number of employees
Adams	100	12,615	30	12,745	\$ 34,706	\$ 2.72	175	42
Appanoose	1,344,843	54,497	14,556	1,413,896	2,813,578	1.99	200	4,578
Boone	237,479	27,198	11,205	275,882	550,178	1.99	222	762
Dallas	245,255	5,510	4,320	255,085	447,817	1.76	210	530
Greene	600	9,300	250	10,150	26,175	2.58	183	47
Guthrie		17,324		17,324	53,665	3.10	185	27
Jasper	334,966	14,087	10	349,063	740,132	2.12	228	718
Keokuk	800	11,841	500	13,141	25,443	1.94	219	30
Mahaska	787,714	36,365	24,120	848,199	1,131,408	1.33	229	1,583
Marion	190,520	21,766	2,995	215,281	348,992	1.62	198	599
Monroe	2,079,205	48,567	56,258	2,184,030	3,506,140	1.61	233	3,401
Polk	1,536,133	193,406	48,725	1,778,264	3,140,598	1.77	217	3,022
Taylor	5,622	4,092	35	9,749	24,233	2.49	154	47
Van Buren	5,000	5,152	132	10,284	23,960	2.33	215	21
Wapello	234,963	44,298	4,239	283,500	498,210	1.76	236	599
Wayne	125,926	9,453	60	135,439	280,100	2.07	230	402
Webster	39,913	8,707	1,353	49,973	111,720	2.24	169	183
Other counties ^a and small mines ^b		64,693	1,422	66,115	146,858	2.22	193	75
Total	7,169,039	588,871	170,210	7,928,120	\$ 13,903,913	\$ 1.75	218	16,666

MINERAL PRODUCTION IN IOWA FOR 1909-10

1909.

Adams	650	12,297	247	13,194	\$ 33,040	\$ 2.50	.....
Appanoose	1,154,143	55,030	26,836	1,236,009	2,283,604	1.85	.....
Bacon	234,489	31,767	9,455	275,711	523,272	1.90	.....
Greene	750	8,950	.....	9,700	24,450	2.52	.....
Guthrie .....	.....	6,720	10	6,730	18,785	2.79	.....
Jasper	299,801	12,337	10,954	323,092	529,868	1.64	.....
Keokuk	1,200	12,786	444	14,430	28,429	1.97	.....
Mahaska	857,684	48,660	19,094	925,438	1,416,250	1.53	.....
Marion	267,251	51,472	10,630	329,353	458,733	1.39	.....
Monroe	1,918,938	56,681	49,940	2,025,559	2,949,413	1.46	.....
Page .....	.....	15,923	211	16,134	48,408	3.00	.....
Polk	1,505,808	210,539	71,782	1,788,129	3,065,139	1.71	.....
Taylor	6,126	7,351	59	13,536	32,351	2.39	.....
Van Buren	10,100	5,699	156	15,955	33,316	2.09	.....
Wapello	176,943	80,164	4,413	261,520	411,310	1.57	.....
Warren	280	15,921	.....	16,201	42,527	2.62	.....
Wayne	114,012	11,717	2,275	128,004	248,790	1.94	.....
Webster	54,068	11,462	1,054	66,584	130,312	1.96	.....
Other counties ^c and small mines	234,528	52,939	5,016	292,483	515,631	1.76	.....
Total	6,836,771	708,415	212,576	7,757,762	\$ 12,793,628	\$ 1.65	..... 17,286

COAL

^aJefferson, Lucas, Page, Scott and Warren.

^bOf this, 34,410 tons, valued at \$71,124, are from local banks.

^cDallas, Jefferson, Lucas and Scott.

Iowa's rank as a coal producer in 1910 is given in the table which follows. The state holds ninth place as a producer and ninth place in the spot cash value of the product, on the authority of the United States Geological Survey:

THE LEADING COAL PRODUCING STATES FOR 1910.

Rank	State	Total tons	Total value	Average price per ton	Average number of days active	Average number of men employed
1	Pennsylvania	150,521,526	\$153,029,510	\$ 1.02	238	175,043
2	West Virginia.....	61,671,019	56,665,061	.92	228	68,663
3	Illinois	45,900,246	52,405,897	1.14	160	72,645
4	Ohio	34,209,668	35,932,288	1.05	203	46,641
5	Indiana	18,389,815	20,813,659	1.13	229	21,878
6	Alabama	16,111,462	20,236,853	1.26	249	22,230
7	Kentucky	14,623,319	14,405,887	.99	221	20,316
8	Colorado	11,973,736	17,026,934	1.42	236	15,864
9	Iowa	7,928,120	13,903,913	1.75	218	16,666
10	Wyoming	7,533,088	11,706,187	1.55	248	7,771
	Total for United States	501,596,378	\$629,557,021	\$ 1.25	220	725,030

The outlook in Iowa for 1911 is for a falling off both in production and price.

Clay and Clay Products

The production and sale of clay and clay products for 1910 shows an increase of about 10 per cent over the preceding year and the state still ranks an easy first in the manufacture of drain tile. The output of clay products was distributed as follows:

Article	1909		1910	
	Quantity in thousands	Value	Quantity in thousands	Value
Common brick	153,065	\$ 1,072,340	148,903	\$ 1,088,266
Paving brick and block.....	18,586	198,780	18,110	223,273
Front brick	12,015	138,218	8,969	109,911
Drain tile .....	.....	2,830,910	.....	3,457,455
Sewer pipe .....	.....	282,637	.....	313,430
Fire proofing .....	.....	304,398	.....	94,366
Pottery .....	.....	51,990	.....	17,535
Other products .....	.....	19,423	.....	25,647
Clay .....	.....	17,817	.....	5,153
Total .....	.....	\$ 4,916,513	.....	\$ 5,335,036

The clay product is tabulated by counties in Table III in which the distribution of the leading products is given:

TABLE III.

VALUE OF IOWA CLAY AND CLAY PRODUCTS FOR 1909 AND 1910,
TABULATED BY COUNTIES.

1910.

Counties	Number of producers	Common brick	Paving brick or block	Face brick	Drain tile	Other products	Total value
Adair	1						
Adams	3	\$ 3,950			\$ 25,100	\$ 20,508	\$ 49,558
Appanoose	2						
Audubon	2						
Benton	5	3,080			21,088		24,168
Boone	3	45,124			27,126		72,250
Buena Vista	3	1,000			33,250		34,250
Calhoun	2						
Carroll	1						
Cass	1						
Cedar	1						
Cerro Gordo	7	59,068			974,616	6,350	1,040,034
Clarke	1						
Clay	2						
Clayton	3	8,801					8,801
Clinton	3	17,640			4,200		21,840
Crawford	2						
Dallas	7	9,314			207,685	1,028	218,027
Decatur	1						
Delaware	1						
Des Moines	1						
Dubuque	3	42,000					42,000
Fayette	1						
Franklin	1						
Fremont	3	4,600					4,600
Greene	2						
Grundy	2						
Guthrie	3	1,278			17,070	965	19,313
Hamilton	1						
Hancock	1						
Harrison	2						
Hardin	3	2,703			51,377		54,080
Henry	4	2,680			35,830		38,510
Howard	1						
Humboldt	1						
Ida	1						
Iowa	5	4,860			36,100		40,960
Jackson	2						
Jasper	6	9,975			15,092	40	25,107
Jefferson	3	3,457			51,322		54,779

TABLE III—CONTINUED

Counties	Number of producers	Common brick	Paving brick or block	Face brick	Drain tile	Other products	Total value
Johnson	5	22,100			25,200		47,300
Jones	2						
Keokuk	11	4,523			65,281		69,804
Kossuth	1						
Lee	3	3,410		900	200		4,510
Linn	5	9,090			7,026		16,116
Louisa	2						
Lucas	1						
Madison	2						
Mahaska	3	15,000		16,000	22,500		57,885
Marion	3	24,729			23,440		48,169
Marshall	7	15,664			17,700		33,364
Mills	3	6,645					6,645
Montgomery	1						
Muscatine	5	10,084			810		10,894
Page	3	28,250			4,850		33,100
Palo Alto	1						
Plymouth	1						
Pocahontas	1						
Polk	13	118,097	206,095	14,530	216,325	123,561	678,608
Pottawat- tamie	3	24,011			200		24,211
Poweshiek	4	2,725			48,250	1,250	52,225
Sac	1						
Scott	3	4,943	848		7,250	15,107	28,148
Shelby	1						
Story	3	3,225		260	43,640	150	47,275
Tama	6	23,910		13,130	27,145		64,185
Taylor	1						
Union	1						
Van Buren	3	2,000			8,130		10,130
Wapello	3	42,462			45,274	5,365	93,101
Warren	2						
Washington	7	6,602			40,148	1,150	47,900
Webster	11	56,786		5,000	668,445	246,035	976,266
Winnebago	1						
Winneshek	1						
Woodbury	4	303,111	16,330	45,276	4,293		369,010
Worth	1						
Wright	2						
Pottery	5						17,535
Clay sold	4						5,153
Counties with less than three pro- ducers	...	141,369		10,430	681,493	11,934	845,225
Total	237	\$1,088,266	\$ 223,273	\$ 109,911	\$3,457,455	\$ 433,443	\$5,335,036

CLAY AND CLAY PRODUCTS

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TABLE III—CONTINUED

1909.

Counties	Number of producers	Common brick	Paving brick or block	Face brick	Drain tile	Other products **	Total value
Adair	2	*	.....	.....	*	.....	.....
Adams	2	*	.....	.....	*	*	.....
Appanoose ..	2	*	.....	.....	*	.....	\$ 31,003
Audubon	2	*	.....	.....	*	.....	.....
Benton	6	\$ 6,025	.....	.....	\$ 31,530	.....	37,555
Boone	3	24,559	*	*	*	*	82,861
Buena Vista..	3	*	.....	.....	*	.....	40,384
Butler	1	*	.....	.....	*	.....	.....
Calhoun	2	*	.....	.....	*	.....	.....
Carroll	1	*	.....	.....	*	.....	.....
Cass	3	9,465	.....	*	6,653	*	16,783
Cedar	1	*	.....	.....	*	.....	.....
Cerro Gordo..	7	21,219	.....	.....	807,748	\$ 115,877	944,844
Clarke	1	*	.....	.....	*	.....	.....
Clay	2	*	.....	.....	*	*	.....
Clayton	2	*	.....	.....	.....	.....	.....
Clinton	2	*	.....	.....	*	.....	.....
Crawford	1	*	.....	.....	.....	.....	.....
Dallas	7	11,459	.....	.....	176,868	.....	188,327
Delaware	2	*	.....	.....	*	.....	.....
Des Moines..	1	*	.....	.....	*	.....	.....
Dubuque	3	37,800	.....	.....	.....	.....	37,800
Emmet	1	*	.....	.....	*	.....	.....
Fayette	1	*	.....	.....	*	.....	.....
Franklin	2	*	.....	.....	*	*	.....
Fremont	3	*	.....	.....	.....	*	6,821
Greene	2	*	.....	.....	*	.....	.....
Grundy	2	*	.....	*	*	.....	.....
Guthrie	2	*	.....	.....	*	*	.....
Hamilton	1	*	.....	.....	*	.....	.....
Hancock	1	.....	.....	.....	*	.....	.....
Harrison	2	*	.....	.....	.....	.....	.....
Hardin	3	*	*	.....	*	.....	58,604
Henry	4	3,960	.....	.....	*	.....	44,320
Howard	1	*	.....	.....	*	*	.....
Humboldt ..	1	.....	.....	.....	*	.....	.....
Ida	1	*	.....	.....	*	.....	.....
Iowa	5	*	.....	.....	*	.....	37,563
Jackson	1	.....	.....	.....	*	.....	.....
Jasper	6	*	.....	.....	*	.....	27,590
Jefferson	4	*	.....	.....	*	.....	65,529
Johnson	4	*	.....	.....	*	.....	30,350
Jones	2	*	.....	.....	*	.....	.....
Keokuk	10	*	.....	.....	*	*	70,746
Kossuth	1	*	.....	.....	*	.....	.....
Lee	4	36,225	.....	*	*	.....	38,281
Linn	5	*	.....	.....	*	.....	15,245
Louisa	2	*	.....	.....	*	.....	.....
Lucas	1	*	.....	.....	.....	.....	.....

TABLE III—CONTINUED

Counties	Number of producers	Common brick	Paving brick or block	Face brick	Drain tile	Other products **	Total Value
Madison	2	*	.....	.....	*	.....	.....
Mahaska	3	18,200	20,025	*	33,438	.....	73,163
Marion	3	10,197	.....	.....	31,450	*	52,847
Marshall	7	13,420	.....	*	16,200	*	37,880
Mills	4	8,830	.....	.....	.....	.....	8,830
Montgomery	2	*	.....	.....	*	*	.....
Muscatine	6	14,030	.....	.....	*	.....	15,230
Page	3	27,975	.....	.....	*	.....	30,290
Palo Alto	1	*	.....	.....	*	.....	.....
Plymouth	1	*	.....	.....	.....	.....	.....
Pocahontas	1	.....	.....	.....	*	.....	.....
Polk	14	129,875	133,328	21,348	159,705	135,666	579,922
Pottawat- tamie	5	46,250	.....	.....	*	.....	46,650
Poweshiek	5	*	.....	.....	43,712	.....	46,472
Sac	1	*	.....	.....	*	.....	.....
Scott	4	25,611	.....	.....	*	*	38,146
Shelby	1	*	.....	.....	*	.....	.....
Story	3	3,805	*	*	27,500	.....	32,525
Tama	6	22,700	.....	*	*	.....	67,220
Taylor	2	*	.....	.....	*	.....	.....
Union	2	*	.....	.....	*	*	.....
Van Buren	3	*	.....	.....	*	.....	10,600
Wapello	3	52,100	.....	*	*	.....	82,085
Warren	3	3,474	.....	.....	59,420	.....	62,894
Washington	6	*	.....	.....	*	.....	44,515
Wayne	1	*	.....	.....	.....	.....	.....
Webster	11	53,892	.....	*	405,441	314,362	785,695
Winnebago	1	*	.....	.....	*	.....	.....
Winneshek	1	*	.....	.....	.....	.....	.....
Woodbury	4	272,546	11,000	42,000	3,093	.....	328,639
Worth	1	*	.....	*	.....	.....	.....
Wright	2	*	.....	.....	*	.....	.....
Other counties . . . . .	...	218,723	34,427	74,870	1,028,152	40,553	728,497
Total	241	\$1,072,340	\$ 198,780	\$ 138,218	\$2,830,910	\$ 606,458	\$4,846,706

POTTERY.

	No. Prod.	Red earthenware	Stoneware, yellow or Rockingham ware, and miscel.	Total value
Delaware	1	*	.....	.....
Marshall	1	.....	*	.....
Muscatine	3	*	*	.....
Wapello	1	.....	*	.....
Total	6	\$ 8,175	\$ 43,815	\$ 51,990

CLAY MINED AND SOLD.

	Fire clay	Brick clay	Short tons	Total value
***	*	*	43,428	\$ 17,817
Total clay and clay products.....				\$ 4,916,513

*Included in "other counties" and totals.

**Includes: sewer pipe, \$282,637; fire-proofing, \$304,398; fancy brick, fire brick and miscellaneous products, \$19,423.

***Includes: Black Hawk, Hardin, Palo Alto and Webster counties.

In 1909 and 1910 Iowa ranked eighth in value of clay products. The ten leading producers for 1910, with number of firms in operation, value and percentage of total products are given below:

TEN LEADING STATES IN VALUE OF CLAY PRODUCTS IN 1910.

State	Number firms reporting	Value, not including raw clay sold*	Percentage of total product	Brick, including fire brick	Drain tile	Sewer pipe	Other products
Ohio	683	\$ 31,525,948	18.53	\$ 8,615,027	\$ 1,869,823	\$ 3,289,537	\$ †17,751,561
Pennsylvania	451	22,094,285	12.99	15,069,094	11,480	583,418	6,430,293
New Jersey	167	17,834,309	10.48	3,826,536	23,147	.....	‡13,984,626
Illinois	346	15,176,161	8.92	8,966,495	1,613,698	538,633	4,057,333
New York	240	11,871,949	6.98	7,874,608	272,836	136,576	3,587,929
Indiana	249	8,100,010	4.76	2,729,886	2,071,564	406,543	2,892,017
Missouri	150	7,087,766	4.17	4,532,461	121,068	1,210,348	1,223,889
Iowa	232	5,328,241	3.13	1,430,825	3,337,851	313,430	246,135
California	107	4,842,391	2.85	2,640,030	55,386	1,031,061	1,115,914
West Virginia	56	3,998,045	2.35	1,105,003	2,330	.....	||2,890,712
Total for United States.....	4,915	\$ 170,115,974	100.00	\$ 93,937,478	\$ 10,389,822	\$ 11,428,696	\$ ¶54,359,978

*Value of raw clay, \$3,625,485.

†Includes pottery, \$14,294,712.

‡Includes pottery, \$ 8,588,455.

||Includes pottery, \$ 2,675,558.

¶Includes pottery, \$33,784,678.

The outlook for 1911 is for a diminished output, especially for drain tile on account of the protracted drouth. The decrease ought to be transient, or until the weather conditions return to the normal. A few large plants are in process of building, notably at Belle Plaine, Mason City, and What Cheer. Cerro Gordo was the ranking county in clay production during 1910. All of the plants in the county are located in Mason City and immediate vicinity.

Stone and Lime

The quarry production for 1910 shows a slight increase over the production for the preceding year. The increase in the use of crushed stone for concrete continues. The output for the two years is as follows:

1910.		Value
Limestone—		
Building		\$ 85,834
Rubble and riprap.....		108,612
Crushed stone—		
Roadmaking		57,168
Railway ballast		35,434
Concrete		259,035
Other purposes		10,319
Lime		81,775
Total limestone and lime.....		\$ 638,177
Sandstone		1,654
Total stone and lime.....		\$ 639,831

1909.		
Limestone—	Quantity in short tons	Value
Rough building		\$ 41,866
Dressed building		7,765
Curbing		420
Rubble		49,947
Riprap		43,094
Crushed stone—		
Roadmaking	143,009	116,246
Railroad ballast	24,418	16,329
Concrete	350,343	246,054
Sugar factories		675
Other uses		2,881
2 Total		\$ 525,277

STONE AND LIME, 1909—CONTINUED

Lime—

Number of operators	5	
Plants producing hydrated lime.....	1	
Quantity, short tons.....	15,739	
Average price per ton	\$ 5.22	
Value		\$ 82,202

Sandstone—

Rough building	1,357	
Dressed building	831	
Rubble	55	
Riprap	100	
Crushed stone:		
Roadmaking	100	
Total		\$ 2,443
Total stone and lime.....		\$ 609,922

The distribution of quarry products by counties is given in Table IV:

TABLE IV.

PRODUCTION OF LIME AND LIMESTONE IN 1910.

Counties	Number of producers	Building stone	Rubble, riprap	Crushed Stone			Lime	Other uses	Total value
				Road-making	Railroad ballast	Concrete			
Allamakee	3	\$ 1,340	\$ 125	\$ 450	.....	.....	.....	\$ 1,915
Appanoose	1	.....	.....	.....	.....	.....	.....	.....
Benton	3	98	10	6,034	.....	\$ 50	\$ 43	6,235
Black Hawk	2	.....	.....	.....	.....	.....	.....	.....
Cedar	2	.....	.....	.....	.....	.....	.....	.....
Cerro Gordo	4	2,137	3,619	13,516	\$ 16,755	4,252	41,279
Clarke	1	.....	.....	.....	.....	.....	.....	.....
Clayton	4	1,344	.....	.....	.....	.....	240	1,584
Clinton	3	255	610	.....	.....	.....	15	880
Delaware	3	73	18	147	.....	.....	.....	238
Des Moines	1	.....	.....	.....	.....	.....	.....	.....
Dubuque	9	10,847	3,867	10,683	5,920	12,780	227	44,324
Fayette	5	5,579	5,579
Floyd	4	1,345	2,400	3,745
Hardin	4	600	20	43,642	2	44,264
Henry	1	.....	.....	.....	.....	.....	.....	.....
Howard	1	.....	.....	.....	.....	.....	.....	.....
Humboldt	1	.....	.....	.....	.....	.....	.....	.....
Jackson	1	.....	.....	.....	.....	.....	.....	.....
Johnson	1	.....	.....	.....	.....	.....	.....	.....
Jones	8	11,083	26,890	2,814	\$ 252	22,278	63,317
Keokuk	2	.....	.....	.....	.....	.....	.....	.....
Lee	9	4,376	8,085	12,240	22,765	215	47,681
Linn	3	500	7,375	14,138	3,503	25,516
Louisa	3	500	5	100	605

STONE AND LIME

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TABLE IV—CONTINUED

Counties	Number of producers	Building stone	Rubble riprap	Crushed Stone			Lime	Other uses	Total value
				Road-making	Railroad ballast	Concrete			
Madison	5	3,050	250	8,553	9,853	25,553	.....	1,300	48,559
Mahaska	4	2,348	206	1,182	.....	.....	.....	225	3,961
Marshall	1	.....	.....	.....	.....	.....	.....	.....	.....
Mitchell	2	640	275	.....	.....	.....	.....	75	990
Scott	5	33,272	28,438	4,550	7,128	56,629	.....	3,725	133,742
Tama	1	.....	.....	.....	.....	.....	.....	.....	.....
Van Buren	2	.....	.....	.....	.....	.....	.....	.....	.....
Wapello	2	.....	.....	.....	.....	.....	.....	.....	.....
Winneshiek	1	.....	.....	.....	.....	.....	.....	.....	.....
Counties with less than three producers .....	...	5,447	33,814	3,020	4,063	65,179	52,240	.....	163,763
Total	103	\$ 85,834	\$ 108,612	\$ 57,168	\$ 35,434	\$ 259,035	\$ 81,775	\$ 10,319	\$ 638,177

The number of producers shows a marked falling off. A few large plants were established during the year mainly for the purpose of producing crushed stone. The plant at Quarry in Marshall county was rebuilt and greatly enlarged. A new plant of large capacity has been built at Gilmore City in Humboldt county. Here the stone is of excellent quality for crushed stone purposes, especially for road and concrete work. The outlook for 1911 is for a small increase in total stone production, but a large increase in the output of crushed stone.

Sand and Gravel

The sand and gravel industry continues to grow. Accurate statistics are difficult to obtain and the figures for production given herewith are below the real production.

The sand and gravel sold during 1909 and 1910 may be classified as follows:

Kind	1909		1910
	Short tons	Value	Value
Sand used for—			
Building	774,101	\$ 260,727	\$ 302,486
Molding	26,463	35,340	9,900
Engine	21,895	5,280	7,033
Furnace	3,700	1,480	
Other purposes	49,794	9,722	9,524
Gravel	654,951	146,280	135,920
Total sand and gravel	1,530,904	\$ 458,829	\$ 464,863

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Table V shows the distribution of sand and gravel by counties:

TABLE V.

VALUE OF SAND AND GRAVEL PRODUCED IN IOWA FOR 1910.

County	No. of producers	Molding sand	Building sand	Engine sand	Other sand	Gravel	Total
Appanoose	1						
Audubon	3		\$ 150			\$ 100	\$ 250
Black Hawk	9	\$ 5,600	20,935	\$ 1,000	\$ 3,915	6,525	37,975
Bremer	4					6,215	6,215
Buena Vista	5		3,675			406	4,081
Cedar	2						
Cherokee	6		6,189			6,089	12,278
Clayton	1						
Clinton	7		4,438	1,000		16,061	21,499
Dickinson	1						
Dubuque	5	1,079	7,181	720		6,699	15,679
Emmet	5		2,647			1,805	4,452
Fayette	4	7	4,893		23	340	5,263
Floyd	1						
Grundy	1						
Hardin	2						
Howard	1						
Ida	2						
Johnson	6		16,548		312	2,158	19,018
Jones	2						
Lee	3		6,985	413			7,398
Linn	6		20,476	2,250		267	22,993
Louisa	1						
Lyon	3		6,100			2,237	8,337
Mahaska	4	925	45,341	150			46,416
Marion	1						
Marshall	2						
Muscatine	1						
O'Brien	3		1,500			2,520	4,020
Osceola	1						
Palo Alto	3		5,000			1,228	6,228
Plymouth	7		29,682		150		29,832
Polk	14	1,184	51,673	900		18,939	72,696
Sac	2						
Scott	2						
Sioux	7		9,421				9,421
Story	6	100	4,525		25	4,050	8,700
Webster	4		5,575				5,575
Winnebago	1						
Winneshiek	2						
Woodbury	2						
Wright	2						

TABLE V—CONTINUED

County	No. of producers	Molding sand	Building sand	Engine sand	Other sand	Gravel	Total
R. R. Producers (Counties not given)	.....	.....	.....	.....	.....	32,501	32,501
Counties having less than 3 producers .		1,005	49,552	600	5,099	27,780	84,036
	145	\$ 9,900	\$ 302,486	\$ 7,033	\$ 9,524	\$ 135,920	\$ 464,863

Gypsum

The production of gypsum for 1910 was the greatest in the history of the industry in the state. The number of producers has not increased, but the plants in the field were unusually active. The principal items of production and distribution are as follows:

	Short tons	Value
Crude gypsum mined	322,713	.....
Distributed as follows—		
Sold crude:		
To Portland cement mills	16,173	\$ 21,224
As land plaster	6,159	8,312
Other purposes	14,359	17,459
Total	36,691	\$ 46,995
Sold calcined:		
As hard wall plaster	202,131	\$ 816,989
As plaster of Paris, etc.	27,211	75,860
Other purposes	1,590	4,005
Total	230,932	\$ 896,854
Total sold	267,623	\$ 943,849

The production during 1909 is shown by the following table. Number of mills reporting, six:

	Short tons	Value
Crude gypsum mined	319,577	
Sold crude—		
As land plaster	9,676	\$ 14,633
To Portland cement mills and for other purposes.....	8,452	11,466
Sold as calcined plaster	188,389	629,503
Total value		\$ 655,602

During the year a new gypsum field was discovered in Appanoose county. The Scandinavian Coal Company, while prospecting for coal, drilled a hole which entirely penetrated the Coal Measures and reached a seam of pure gypsum at 537 feet below the surface. The drill core displayed five feet of gypsum and about the same thickness of anhydrite above it. Both gypsum and anhydrite are essentially free from impurities. Two additional holes have been put down in order to determine the extent of the field. Hole number two, located 1,000 feet southwest of the original hole, penetrated gypseous material, but failed to show a solid ledge of gypsum. Hole number three, located 1,000 feet northwest of hole number one, penetrated eighteen feet of first class crystalline gypsum. The driller's log of the first hole is given herewith. The hole is located about sixty feet southwest of the shaft of the Scandinavian Coal Company. Two samples of the gypsum and three samples of the anhydrite were analyzed and the results are given herewith:

	Gypsum		Anhydrite		
	No. 1	No. 2	No. 1	No. 2	No. 3
Sulfur trioxide, SO ₃	46.56	45.65	54.12	55.29	54.45
Lime, CaO	33.37	32.76	40.20	40.67	39.58
Loss on ignition	20.03	20.75	6.62	4.66	5.13
Total	99.96	99.16	100.94	100.62	98.16

DRILLER'S LOG.

Scandinavian Coal Company, Centerville, Iowa.

DESCRIPTION	THICKNESS OF STRATA		DEPTH	
	FT.	IN.	FT.	IN.
Filled ground	3		3	
Yellow clay	28		31	
Limestone	1		32	
Limestone with shale	8		40	
Soft blue shale (banded)	10		50	
Soft blue shale	14		64	
Limestone	3		67	
Sandy shale	21		88	
Old workings	4		92	
Fire clay	2		94	
Limestone	1	6	95	6
Soft clay shale	1	6	97	
Dark shale	9		106	
Gray shale	7		113	
Fossiliferous shale	1		114	
Black shale	3		117	
Gray shale, very soft	2		119	
Gray shale	13		132	
Black shale	2	6	134	6
Soft clay shale	15	6	150	
Shaly sandstone	38		188	
Sandstone	1		189	
Black shale	2		191	
Coal		2	191	2
Gray shale	8	2	199	4
Black shale		8	200	
Coal	1		201	
Limestone	1	6	202	6
Soft clay shale	7	6	210	
Clay shale		10	210	10
Limestone	2		212	10
Black shale	2	10	215	8
Limestone	4		216	
Black shale	9	2	225	2
Coal		10	226	
Fire clay	1		227	
Clay shale	2		229	
Soft blue shale	3		232	
Soft clay shale, gray	1	6	233	6
Blue shale	3	6	237	
Black shale	1	4	238	4
Soft clay shale, gray		8	239	
Blue shale	3		242	
Blue shale with red shale bands	1	6	243	6
Blue shale	3	8	247	2
Black shale	4	6	251	8
Coal	1	8	253	4
Black shale		8	254	
Gray shale	6		260	
Black shale	4		264	
Clay shale	8		272	
Gray shale	13		285	
Sandy shale	4	6	289	6
Sandstone	2	6	292	

GYPSUM—CONTINUED

DESCRIPTION	THICKNESS OF STRATA		DEPTH	
	FT.	IN.	FT.	IN.
Black shale	2		294	
Blue shale	6		300	
Gray shale	5		305	
Sand shale	2		307	
Red and blue shale	8	6	315	6
Blue shale	4	6	320	
Black shale	6		320	6
Gray shale	3	9	324	3
Black shale	1		325	3
Coal		2	325	5
Black shale		6	325	11
Sandy shale	15	3	341	2
Coal	1	5	342	7
Sandy shale	4	5	347	
Sandstone	5		352	
Gray shale	3	9	355	9
Black shale	2	9	358	6
Gray shale	6		364	6
Dark shale	2	6	367	
Gray shale	5		372	
Black shale	9		381	
Sandstone	7		388	
Sandy shale	2		390	
Black shale	3		393	
Gray shale	12	6	405	6
Black shale		10	406	4
Coal (A)		8	407	
Gray shale	4		411	
Blue shale	4		415	
Coal (B)		3	415	3
Blue shale	3	9	419	
Clay shale	2		421	
Gray shale	6		427	
Red and gray shale	2		429	
Gray shale	1		430	
Clay shale	2		432	
Gray shale	7		439	
Shaly limestone	6		445	
Limestone	14		459	
Lime shale	9	6	468	6
Sandstone	8	6	477	
Limestone		6	477	6
Lime shale	6	6	484	
Limestone	16		500	
Conglomeration of sand and limestone	6		506	
Limestone with spots of shale	17		523	
Limestone	14		537	
Anhydrite, compact	5		542	
Gypsum, white, crystalline	5		547	
Limestone, dolomitic, buff	2	3	549	3
Green shale		9	550	

Lead and Zinc

The production of lead and zinc in 1910 was largely the result of development work. The two mills in the district were idle during the year. The Watter's smelter has not been rebuilt and all of the ore is shipped out of the district. The production for the year was as follows:

	Quantity. Tons	Value	Metal Content	
			Tons	Amount
Lead—				
Concentrates	25	\$ 1,320	20	\$ 1,760
Zinc—				
Concentrates	245	5,740	96	10,368
Total				\$ 12,128

Figures for 1909 give a production of lead of 15 tons, valued at \$1,290. Mine reports give an estimated output of zinc of 35 tons, none of which, apparently, went to the smelter during the year. The outlook for an increased production under the existing conditions is not bright.

Mineral Waters

The production and sale of mineral waters show a substantial increase for 1910 over the preceding year. Six springs reported a sale of 253,100 gallons, (not including 82,000 gallons used for soft drinks) valued at \$27,175. The value of the water sold for table purposes was \$19,775, and for medicinal purposes \$7,400.

During the year 1909, 184,000 gallons of mineral water were sold from six springs. The value of the water sold for medicinal purposes was \$3,200 and that sold for table use was valued at \$10,916, making a total amount of \$14,116. The average retail price at the spring was 6 cents per gallon. In addition 81,000 gallons were used for soft drinks.

Sand-Lime Brick

The extension of the sand-lime brick industry in Iowa appears to be at a standstill. The output for 1910 shows a marked

decrease when compared with preceding years. The value of the output was \$31,269 as compared with \$48,210 for 1909 and \$42,881 for 1908.

Three plants produced \$48,210 worth of sand-lime brick for the year 1909. The product was distributed as follows:

	Thou- sands	Value
Common brick	4,794	\$ 34,025
Front and fancy brick	431	8,430
Other products		5,755
Total		\$ 48,210

Iron

The Missouri Iron Company continued experimental work during 1909 and 1910. They have constructed an expensive and up-to-date plant for the treatment of the ore, but did not ship ore for other than experimental purposes during the two years.

Portland Cement

Three up-to-date Portland cement plants are now in operation, two of which were in operation during 1910 and only one during 1909. Each of the plants when fully installed will have a capacity of from 4,000 to 5,000 barrels per day. The building of a fourth plant at Gilmore City is contemplated. Rock crushing machinery is already installed and crushed stone is being produced. The price of Portland cement in 1910 was much higher than for the preceding year.

The outlook for 1911 is for greatly increased production for Iowa, but the product will command a lower price.

Peat

The plant at Fertile was idle during most of the year 1910. The outlook for the peat industry in Iowa is not encouraging. The bulky character of peat makes shipping unprofitable. The hope of the industry rests on transforming the peat into gas or electrical energy at the swamp and its distribution to industrial centers.