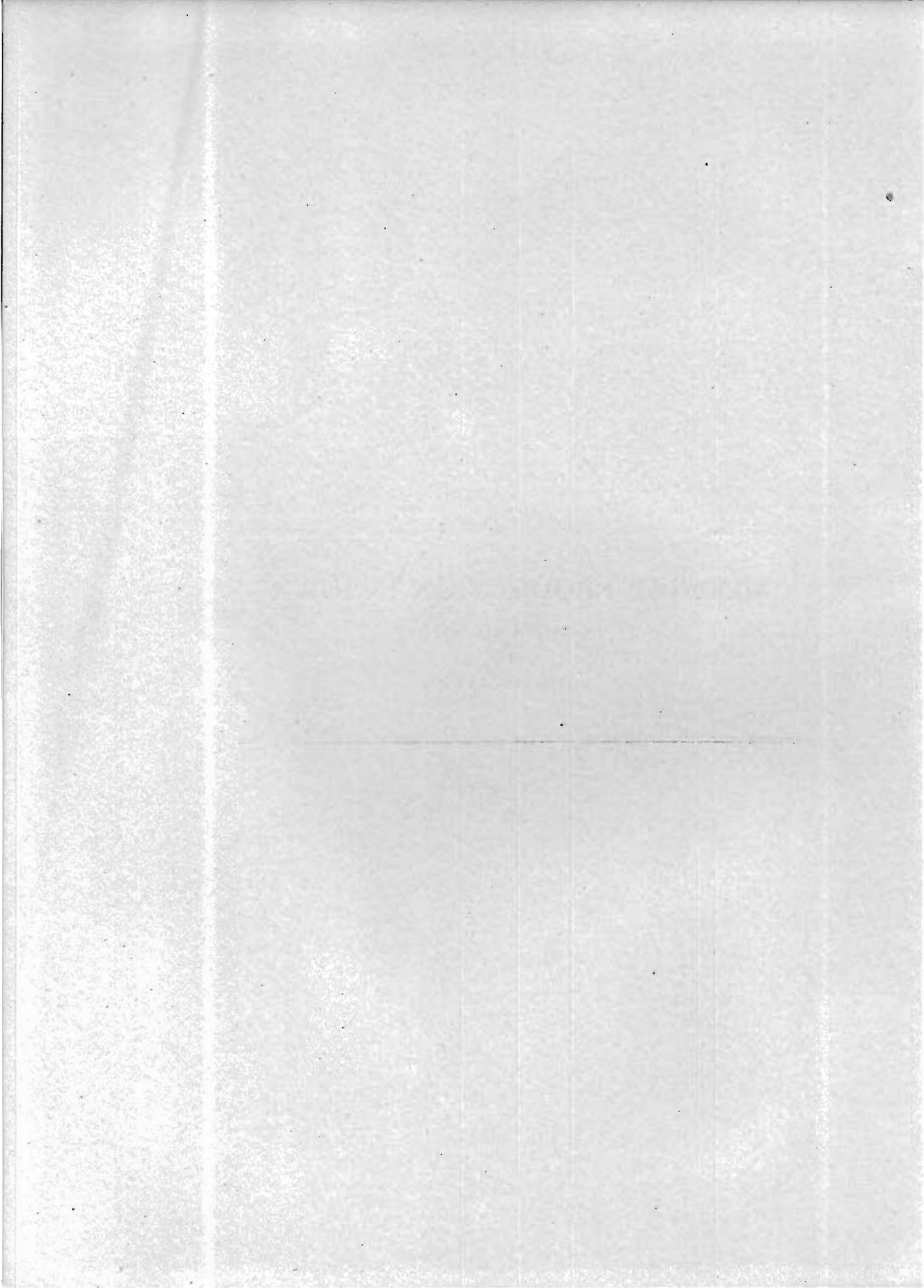

MINERAL PRODUCTION IN IOWA

IN 1911 AND 1912

By

GEORGE F. KAY



MINERAL PRODUCTION IN IOWA FOR 1911 AND 1912¹

BY GEORGE F. KAY.

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

1911.

Coal	\$12,663,507
Clay and clay products.....	4,436,839
Stone and lime.....	817,121
Gypsum	871,752
Lead and zinc.....	5,400
Sand-lime brick.....	25,300
Mineral waters.....	20,500
Sand and gravel.....	393,649
Cement	1,881,253
Other products.....	3,790
Total	\$21,119,111

1912

Coal	\$13,152,088
Clay and clay products.....	4,524,492
Stone and lime.....	998,236
Gypsum	845,628
Lead and zinc.....	5,670
Sand-lime brick.....	*
Mineral waters.....	11,325
Sand and gravel.....	563,409
Cement	2,790,396
Other products.....	18,822
Total	\$22,910,066

The total value of the mineral production in Iowa in 1911 was \$21,119,111 and in 1912 \$22,910,066. The value in 1912 was

¹The mineral statistics were compiled by the Iowa Geological Survey in co-operation with the United States Geological Survey.

*Included in other products.

higher than any previous figure of record. The following table shows the value of Iowa's mineral output during each of the past ten years.

VALUE OF MINERAL PRODUCTION IN IOWA FOR THE YEARS 1903
TO 1912 INCLUSIVE.

1903	-----	\$14,637,480
1904	-----	14,955,000
1905	-----	15,103,046
1906	-----	16,414,447
1907	-----	17,627,925
1908	-----	18,090,447
1909	-----	20,365,721
1910	-----	22,744,572
1911	-----	21,119,111
1912	-----	22,910,066

Previous to 1912, the year 1910 held the record, the value of the output for that year having been \$22,744,572. In 1912 there was an increase over 1911 in the value of all mineral products except gypsum, sand-lime brick and mineral waters. The most marked increase was in connection with the cement industry, the value of the output of 1912 exceeding that of 1911 by nearly 50 per cent.

The number of mineral producers in Iowa was 726 in 1911 and 665 in 1912.

The total production, by counties, for 1911 and 1912 is given in Table I.

MINERAL PRODUCTS BY COUNTIES

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TABLE I.

VALUE OF TOTAL MINERAL PRODUCTION, BY COUNTIES, FOR 1911.

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total
Adair	1		*				
Adams	7	\$ 18,779	*				\$ 18,779
Allamakee	4			\$ 5,572			5,572
Appanoose	69	2,102,485	*	*	*		2,134,037
Audubon	7		*		\$ 10,648		10,648
Benton	7		\$ 16,050	12,316			28,366
Black Hawk	12			10,898	20,990	*	31,888
Boone	10	413,548	81,294				494,842
Bremer	4				4,917		4,917
Buchanan	1			*			
Buena Vista	5		20,010		*		20,010
Butler	3		*		*		898
Calhoun	1		*				
Carroll	2		*		*		
Cass	2		*				
Cedar	3		*	*			13,735
Cerro Gordo	13		731,834	50,598		*	782,432
Cherokee	5				14,554		14,554
Clarke	1		*				
Clay	1		*				
Clayton	9		*	1,964	*		9,264
Clinton	15		21,600	*	19,251	*	52,604
Crawford	2		*				
Dallas	9	731,805	180,994				912,799
Decatur	2		*	*			
Delaware	5		7,840	*			7,840
Des Moines	4		*	*	*		21,608
Dickinson	1				*		
Dubuque	19		41,000	70,951	21,439	\$ 5,400	138,790
Emmet	6				6,175		6,175
Fayette	7		*	*	5,202		24,052
Floyd	7		*	1,867	*		1,867
Franklin	1		*				
Fremont	2		*				
Greene	7	30,400	*		*		72,826
Grundy	3		*		*		24,419
Guthrie	11	29,570	9,420				38,990
Hamilton	1		*				
Hancock	1		*				
Hardin	10		55,450	28,301	765		84,516
Harrison	1		*				
Henry	4		23,920	*			23,920
Howard	6		*	3,880	*		3,880
Humboldt	2		*	*			
Ida	4				1,609		1,609
Iowa	3		19,600				19,600
Jackson	4		*	*			68,658
Jasper	14	672,532	17,553			*	690,085
Jefferson	8	11,236	36,340			*	47,576
Johnson	9		28,150	*	6,750		34,900
Jones	11		*	40,343	*		47,080

TABLE I—Continued

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total
Keokuk -----	17	23,978	30,202	*			54,180
Kossuth -----	1		*				
Lee -----	15		*	119,654	*		125,574
Linn -----	16		19,234	62,855	22,884		104,973
Louisa -----	7		*	*	*	*	11,885
Lucas -----	4	24,004	*				24,004
Lyon -----	3				8,445		8,445
Madison -----	7			60,224			60,224
Mahaska -----	26	1,200,117	33,001	*			1,233,118
Marion -----	18	265,303	38,280		*		303,583
Marshall -----	10		16,716	*	*		144,211
Mills -----	4		5,500				5,500
Mitchell -----	3			658			658
Monona -----	1				*		
Monroe -----	14	3,402,743					3,402,743
Muscatine -----	8		14,253		*		14,253
O'Brien -----	4				6,868		6,868
Osceola -----	2				*		
Page -----	6	36,189	*		*		55,110
Palo Alto -----	4		*		5,839		5,839
Plymouth -----	10		*		15,198		15,198
Pocahontas -----	2		*	*			
Polk -----	47	2,729,625	587,356		84,058	*	3,401,039
Pottawattamie -----	4		32,209				32,209
Poweshiek -----	4		25,498				25,498
Sac -----	3		*		*		82,464
Scott -----	13		32,230	121,080	*	*	185,310
Shelby -----	1		*				
Sioux -----	6				3,747		3,747
Story -----	10		*		6,803		6,803
Tama -----	7		59,585	*			59,585
Taylor -----	7	22,979	*				22,979
Union -----	1		*				
Van Buren -----	7	20,340	*	*	*		22,370
Wapello -----	22	523,535	70,570	11,474	*	*	619,197
Warren -----	4	*	69,210				69,210
Washington -----	9		42,522	112			42,634
Wayne -----	8	234,761	*				234,761
Webster -----	22	101,949	1,100,237		2,201	875,472	2,079,859
Winnebago -----	2		*		*		
Winneshiek -----	5		*	*	*		9,729
Woodbury -----	9		300,886		5,895		306,781
Worth -----	1		*				
Wright -----	6		31,400		5,354		36,754
County values representing less than three producers, and small coal mines -----		67,629	636,895	214,374	114,057	1,927,123	2,408,080
Total -----	726	\$ 12,663,507	\$ 4,436,839	\$817,121	\$393,649	\$ 2,807,995	\$21,119,111

*Included in "county values" and totals.

MINERAL PRODUCTS BY COUNTIES

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TABLE I—Continued

VALUE OF TOTAL MINERAL PRODUCTION, BY COUNTIES, FOR 1912.

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total Value
Adair	1		*				
Adams	6	\$ 24,690	*				\$ 24,690
Allamakee	4		*	\$ 24,277			24,277
Appanoose	66	2,506,844	*	*	*		2,534,142
Audubon	5		*		\$ 500		500
Benton	6		\$ 48,892	*			48,892
Black Hawk	14			11,389	22,590	*	33,979
Boone	8	454,731	67,096				521,827
Bremer	3				3,283		3,283
Buchanan	1			*			
Buena Vista	6		15,064		1,088		16,152
Butler	3		*		*		19,894
Calhoun	1		*				
Carroll	1		*				
Cass	1		*				
Cedar	1		*				
Cerro Gordo	11		884,337	*		*	3,205,546
Cherokee	4				16,700		16,700
Clarke	1		*				
Clay	2		*				
Clayton	18		*	3,255	24,865		28,120
Clinton	4		16,720			*	16,720
Crawford	1		*				
Dallas	10	810,532	153,340				963,872
Decatur	1			*			
Delaware	6		8,140	*			8,140
Des Moines	7		*	10,562	*		23,261
Dickinson	1					*	
Dubuque	17		48,500	73,333	17,973	\$ 5,670	145,476
Fayette	8		*	*	5,414		29,759
Floyd	4		*	*	*		51,587
Franklin	2		*				
Fremont	1		*				
Greene	6	24,250	*		*		36,052
Grundy	3		*		*		24,600
Guthrie	7	16,191	11,256				27,447
Hamilton	1		*				
Hancock	1		*				
Hardin	9		55,166	*	3,533		58,699
Harrison	1			*			
Henry	3		*	*			35,893
Howard	3		*	*	*		12,820
Ida	2				*		
Iowa	2		*				
Jackson	2		*	*			
Jasper	17	669,936	17,305			*	687,241
Jefferson	8	9,170	34,305			*	43,475
Johnson	8		17,600	*	8,428		26,028
Jones	10		*	91,205	*		106,929
Keokuk	17	26,733	32,819	*			59,552
Kossuth	1		*				

TABLE I—Continued

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total Value
Lee	15		7,250	327,917	5,452		340,619
Linn	15		27,489	55,576	18,680		101,745
Louisa	8		*	*	*	120	9,360
Lucas	3	*	*				32,070
Lyon	6				19,237		19,237
Madison	5		*	42,361			42,361
Mahaska	19	944,156	41,310	*			985,466
Marion	18	315,260	41,800		17,288		374,348
Marshall	11		93,971	*	*		207,008
Mills	4		6,550				6,550
Mitchell	1			*			
Monroe	15	3,757,856					3,757,856
Muscatine	8		13,503		*		13,503
O'Brien	2				*		
Osceola	2				*		
Page	4	*	*				22,600
Palo Alto	4		*		9,943		9,943
Plymouth	9		*		19,707		19,707
Pocahontas	2		*	*			
Polk	48	2,761,723	582,878		148,302	*	3,492,903
Pottawattamie	3		32,172				32,172
Poweshiek	4		29,004				29,004
Sac	4		*		27,722		27,722
Scott	16	*	44,071	128,823	*	*	216,089
Shelby	1		*				
Sioux	6				24,650		24,650
Story	7		*		5,530		5,530
Tama	7		59,619	*			59,619
Taylor	4	12,700	*				12,700
Union	1		*				
Van Buren	7	18,785	*	*	*		28,628
Wapello	20	345,324	68,096	8,900	22,522	*	444,842
Warren	3	*	*				75,602
Washington	5		32,587				32,587
Wayne	6	205,182					2,051,182
Webster	27	107,088	947,748		*	854,178	1,909,014
Winnebago	2		*		*		
Winnesbiek	5		*	*	*		10,606
Woodbury	8		309,466		16,120		325,586
Worth	1		*				
Wright	3		*		*		8,400
County values representing less than three producers, and small coal mines		140,937	776,438	220,638	123,882	2,811,923	1,191,354
Total	665	\$ 13,152,088	\$ 4,524,492	\$998,236	\$563,409	\$ 3,671,891	\$22,910,116

COAL

COAL.

As in previous years, coal was in 1911 and 1912 the leading mineral produced in Iowa. Its value at the mines, in 1911, was \$12,663,507 and in 1912, \$13,152,088. Although the value of the coal was greater in 1912 than in 1911, the total tonnage in 1912 was less than in 1911. The value of the coal mined in 1912 has been exceeded only in 1910 when the value of the coal output was \$13,903,913. There were twenty-one producing counties in 1911 and twenty-two in 1912. In both years the five leading coal producing counties, in order of rank, were Monroe, Polk, Appanoose, Mahaska, and Dallas.

In 1911, the average price of coal at the mine was \$1.73 a ton, and in 1912 the average price was \$1.80 a ton, the latter figure being the highest average price on record in Iowa. In 1911, there were 16,599 men employed in coal mining in Iowa; in 1912 there were 16,370.

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

Year	Total Tons	Value	Average Price	Average Number of days worked	Average Number of Men Employed
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
1911 -----	7,331,648	12,663,507	1.73	203	16,599
1912 -----	7,289,529	13,152,088	1.80	188	16,370

In 1912, during the month of April and a considerable part of May, many of the coal mines were shut down pending the settlement of the wage scale. When the mines were again opened, it was found that many of the miners had left the state and that,

furthermore, there was a great shortage in cars to handle the coal. The railway companies had diverted the cars which were available before the shut-down for the hauling of coal to other lines of traffic. Never, in the history of the state, has there been a greater car shortage than in 1912.

The output, disposition of product, value, average price per ton, average number of days worked and average number of men employed in 1911 and 1912 are given, tabulated by counties, in Table II.

TABLE II.

COAL PRODUCTION FOR IOWA IN 1911, BY COUNTIES, IN SHORT TONS.

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 -----				7,472	\$ 18,779	\$ 2.51	120	52
Appanoose -----	1,023,405	55,051	26,267	1,104,723	2,102,485	1.90	163	4,066
Boone -----	174,932	26,388	13,120	214,440	413,548	1.93	206	653
Dallas -----	371,794	7,204	6,590	385,588	731,805	1.90	257	707
Greene -----				11,800	30,400	2.58	160	43
Guthrie -----		10,390		10,390	29,570	2.84	142	59
Jasper -----				292,427	672,532	2.30	219	648
Jefferson -----				5,129	11,236	2.19	192	22
Keokuk -----		11,697	815	12,512	23,978	1.92	188	29
Lucas -----				13,337	24,004	1.80	184	43
Mahaska -----	733,178	22,152	21,859	777,189	1,200,117	1.54	213	1,425
Marion -----	149,803	15,446	6,080	171,329	265,303	1.55	225	327
Monroe -----	2,140,265	55,181	63,793	2,259,239	3,402,743	1.51	217	4,266
Page -----		12,396		12,396	36,189	2.92	126	62
Polk -----	1,302,029	173,288	56,693	1,532,010	2,729,625	1.78	217	2,995
Taylor -----	4,565	5,385		9,950	22,979	2.32	135	58
Van Buren -----				8,656	20,340	2.35	208	15
Wapello -----	268,784	38,690	4,858	312,332	523,535	1.68	226	572
Wayne -----				116,382	234,761	2.00	203	379
Webster -----	37,749	6,425	1,852	46,026	101,949	2.13	173	169
Counties with less than three producers and small mines -----	388,895	92,826	2,303	28,321	67,629			9
Total -----	6,594,899	532,519	204,230	7,331,648	\$ 12,663,507	\$ 1.73	203	16,599

COAL

COAL PRODUCTION FOR IOWA IN 1912, BY COUNTIES, IN SHORT TONS.

12

Counties	No. of Producers	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 -----	5		9,868		9,868	\$ 24,690			55
Appanoose -----	63	1,168,776	65,969	17,921	1,252,666	2,506,844			4,166
Boone -----	5	172,585	35,683	3,900	212,168	454,731			776
Dallas -----	5	420,990	8,969	6,247	436,206	810,532			957
Greene -----	3				9,590	24,250			32
Guthrie -----	4		5,870		5,870	16,191			28
Jasper -----	10	237,221	19,530	14,550	271,301	669,936			584
Jefferson -----	3		4,248		4,248	9,170			16
Keokuk -----	5		14,240		14,290	26,733			31
Mahaska -----	15	546,100	20,669	12,074	578,843	944,156			983
Marion -----	12	161,655	16,434	3,979	182,068	315,260			428
Monroe -----	15	2,272,658	48,297	72,457	2,393,412	3,757,856			4,281
Polk -----	22	1,226,294	221,240	38,519	1,486,053	2,761,723			2,912
Taylor -----	3		2,520		5,120	12,700			31
Van Buren -----	3		3,529		9,154	18,785			14
Wapello -----	9	175,031	25,877	5,194	206,102	345,324			488
Wayne -----	6		10,631		99,168	205,182			377
Webster -----	5	42,320	3,054	2,700	48,074	107,088			151
Counties with less than three producers ¹ and small mines -----		95,677	73,578	2,475	65,328	140,937			60
Total -----		6,519,307	590,206	180,016	7,289,529	\$ 13,152,088	\$ 1.80	188	16,370

¹Lucas, Page, Scott and Warren.

MINERAL PRODUCTION IN IOWA FOR 1911 AND 1912

Iowa's rank as a coal producing state, in 1912, is given in the table which follows. It will be seen that Iowa ranked eleventh in tonnage and ninth in value. In 1911, Iowa ranked ninth in tonnage and ninth in value.

RANK OF LEADING COAL-PRODUCING STATES IN 1912, WITH QUANTITY AND VALUE OF PRODUCT AND PERCENTAGE OF EACH.¹

Production.			
Rank	State	Quantity (Short Tons)	Percentage of Total Production
1	Pennsylvania:		
	Anthracite -----	84,361,598	15.8
	Bituminous -----	161,865,488	30.3
2	West Virginia -----	66,786,687	12.5
3	Illinois -----	59,885,226	11.2
4	Ohio -----	34,528,727	6.4
5	Kentucky -----	16,490,521	3.1
6	Alabama -----	16,100,600	3.0
7	Indiana -----	15,285,718	2.8
8	Colorado -----	10,977,824	2.0
9	Virginia -----	7,846,638	1.5
10	Wyoming -----	7,368,124	1.4
11	Iowa -----	7,289,529	1.4
	Total for United States -----	534,466,580	100.0

Value.			
Rank	State	Value	Percentage of Total Value
1	Pennsylvania:		
	Anthracite -----	\$177,622,626	25.6
	Bituminous -----	169,370,497	24.4
2	Illinois -----	70,294,338	10.1
3	West Virginia -----	62,792,234	9.0
4	Ohio -----	37,083,363	5.3
5	Alabama -----	20,829,252	3.0
6	Indiana -----	17,480,546	2.5
7	Kentucky -----	16,854,207	2.4
8	Colorado -----	16,345,336	2.4
9	Iowa -----	13,152,088	1.9
10	Wyoming -----	11,648,088	1.7
11	Kansas -----	11,324,130	1.6
	Total for United States -----	\$ 695,606,071	100.0

¹From Advance Chapters of Mineral Resources of the United States for 1912.

CLAY AND CLAY PRODUCTS.

The value of clay and clay products in Iowa in 1911 was \$4,436,839 and in 1912, \$4,524,492. In both years the value fell below the record value of 1910, which was \$5,335,036.

The output of clay products during 1911 and 1912 was distributed as follows:

Product	1911		1912	
	Quantity in Thousands	Value	Quantity in Thousands	Value
Common brick.....	154,434	\$1,025,011	148,472	\$1,017,097
Paving brick.....	8,879	103,384	15,033	197,035
Face brick.....	9,241	114,178	11,912	142,637
Drain tile.....	-----	2,468,962	-----	2,293,084
Sewer pipe.....	-----	284,817	-----	291,672
Fireproofing, terra cotta lum- ber, hollow building block or tile.....	-----	374,628	-----	535,254
Pottery.....	-----	36,319	-----	30,141
Other products.....	-----	25,575	-----	15,406
Clay.....	-----	3,965	-----	2,166
Total	-----	\$4,436,839	-----	\$4,524,492

In the production of clay products in 1912, Webster county with ten producers, ranked first; Cerro Gordo county with seven producers, second; Polk county with eleven producers, third, and Woodbury county with three producers, fourth. These four counties contributed 60 per cent of the total value of the clay industry. Iowa continues to be the premier state in the manufacture of drain tile, the value of this product in 1911 having been \$2,468,962 and in 1912, \$2,293,084. The two leading producers of drain tile are Cerro Gordo and Webster counties. In 1912, there was a marked increase over 1911 in the quantity produced and the value of paving or vitrified brick.

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 1911,
TABULATED BY COUNTIES.

Counties	No. of Pro- ducers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Pro- ducts†	Total Value
Adair	1	*			*		
Adams	2	*			*	*	
Appanoose	2	*			*		
Audubon	2	*			*	*	
Benton	4	\$ 4,450			\$ 11,600		\$ 16,050
Boone	3	40,685	*	*	*	*	81,294
Buena Vista	3	*			*		20,010
Butler	1	*					
Calhoun	1	*			*		
Carroll	1	*			*		
Cass	2	*		*	*	*	
Cedar	1	*			*		
Cerro Gordo	7	52,090			603,891	\$ 75,853	731,834
Clarke	1	*					
Clay	1	*			*		
Clayton	2	*			*	*	
Clinton	3	*			*		21,600
Crawford	2	*					
Dallas	5	8,512			167,512	4,970	180,994
Decatur	1	*			*		
Delaware	3	*			*		5,620
Des Moines	1	*			*		
Dubuque	3	41,000					41,000
Fayette	1	*					
Floyd	1	*			*	*	
Franklin	1	*			*		
Fremont	2	*					
Greene	2	*			*		
Grundy	2	*		*	*		
Guthrie	3	1,519			*	*	9,420
Hamilton	1	*			*		
Hancock	1	*			*		
Harrison	1	*			*		
Hardin	2	*	*		*		
Henry	3	*			*		23,920
Howard	1	*			*		
Humboldt	1	*			*		
Iowa	3	*			*		19,600
Jackson	2	*			*		
Jasper	6	*			*		17,553
Jefferson	4	*	*		27,712	*	36,340
Johnson	4	*			*		28,150
Jones	2	*			*		
Keokuk	10	*			23,591	*	30,202
Kossuth	1	*			*	*	
Lee	2	*		*			
Linn	5	*			*		19,234
Louisa	2	*			*		
Lucas	1	*					

TABLE III—Continued

Counties	No. of Producers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Products†	Total Value
Mahaska -----	3	10,101	*	*	13,100	*	33,001
Marion -----	3	*			13,340	*	38,280
Marshall -----	6	7,224		*	*		16,716
Mills -----	4	*			*		5,500
Muscatine -----	4	*			*	*	7,537
Page -----	2	*			*	*	
Palo Alto -----	1				*	*	
Plymouth -----	1	*					
Pocahontas -----	1				*		
Polk -----	11	167,983	*	*	153,174	155,255	587,356
Pottawattamie -----	3	32,209					32,209
Poweshiek -----	4	*			23,099	*	25,498
Sac -----	1	*			*		
Scott -----	3	7,194	*		*	*	32,230
Shelby -----	1	*					
Story -----	2	*		*	*	*	34,262
Tama -----	6	19,839		*	*		59,585
Taylor -----	1	*					
Union -----	1	*			*	*	
Van Buren -----	1	*					
Wapello -----	3	*		*	*	*	43,187
Warren -----	3	2,110			*	*	69,210
Washington -----	6	14,350			23,522	*	42,522
Wayne -----	1	*					
Webster -----	11	61,320	*		708,287	319,990	1,096,297
Winnebago -----	1	*			*		
Winneshiek -----	1	*					
Woodbury -----	4	234,472		*	*	*	300,886
Worth -----	1			*			
Wright -----	3	*			*		31,400
**Pottery -----	5						36,319
***Clay sold -----	3						3,965
Counties with less than three producers -----		319,953	103,384	114,178	700,134	128,952	658,058
Total -----	217	\$ 1,025,011	\$ 103,384	\$114,178	\$ 2,468,962	\$685,020	\$ 4,436,839

†Includes fancy brick, sewer pipe, fireproofing, etc.

**Includes Delaware, Muscatine and Wapello counties.

***Includes Hardin and Webster counties.

CLAY AND CLAY PRODUCTS

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TABLE III—Continued
 VALUE OF IOWA CLAY AND CLAY PRODUCTS FOR 1912,
 TABULATED BY COUNTIES.

Counties	No. of Producers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Products	Total Value
Adair	1	*					
Adams	1	*			*		
Allamakee	1	*			*	*	
Appanoose	1	*			*		
Audubon	2	*			*		
Benton	5	\$ 18,498			\$ 19,044	*	\$ 48,892
Boone	3	33,807	*	*	*	*	67,096
Buena Vista	3	*			12,664		15,064
Butler	1	*			*		
Calhoun	1	*			*	*	
Carroll	1	*					
Cass	1	*			*	*	
Cedar	1	*			*		
Cerro Gordo	7	82,282			621,224	\$180,831	884,337
Clarke	1	*			*		
Clay	2	*			*		
Clayton	1	*					16,720
Clinton	3	*			*		
Crawford	1	*					
Dallas	5	2,007			141,145	10,188	153,340
Delaware	3	2,880			*	*	6,800
Des Moines	1	*			*		
Dubuque	3	48,500					48,500
Fayette	1	*				*	
Floyd	1	*			*	*	
Franklin	2	*			*	*	
Fremont	1	*					
Greene	2	*			*	*	
Grundy	2	*		*	*		
Guthrie	3	*			7,993	*	11,256
Hamilton	1	*			*	*	
Hancock	1	*			*		
Hardin	2	*			*		
Henry	2	*			*	*	
Howard	1	*			*	*	
Iowa	2	*			*		
Jackson	1	*			9,850	*	17,305
Jasper	6	*					
Jefferson	4	*			23,434	4,608	34,305
Johnson	3	*			*		17,600
Jones	2	*			*	*	
Keokuk	10	5,578			26,228	*	32,819
Kossuth	1	*		*	*		
Lee	3	*		*			7,250
Linn	6	21,169			6,320		27,489
Louisa	2	*			*	*	
Lucas	1	*					
Madison	1	*			*		
Mahaska	3	15,710	*		17,300	*	41,310

TABLE III—Continued

Counties	No. of Pro- ducers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Pro- ducts	Total Value
Marion -----	3	*			9,500	*	41,800
Marshall -----	7	9,311		*	55,360	*	93,971
Mills -----	4	6,550					6,550
Muscatine -----	4	*			*		8,191
Page -----	2	*					
Palo Alto -----	1				*	*	
Plymouth -----	1	*					
Pocahontas -----	1				*		
Polk -----	11	135,891	*	*	*	161,697	582,878
Pottawattamie -----	3	32,172					32,172
Poweshiek -----	4	*			24,974	*	29,004
Sac -----	1	*			*	*	
Scott -----	4	16,518			*	*	44,071
Shelby -----	1	*					
Story -----	2	*		*	*	*	
Tama -----	6	*		*	25,857		59,619
Taylor -----	1	*					
Union -----	1	*			*	*	
Van Buren -----	2	*			*		
Wapello -----	3	28,486	*	*	*	*	44,607
Warren -----	2	*			*	*	
Washington -----	5	*			20,292	*	32,587
Winnebago -----	1	*			*		
Winneshiek -----	1	*					
Webster -----	10	90,334	*		587,808	257,917	946,058
Woodbury -----	3	*	*	*	*	*	309,466
Worth -----	1			*			
Wright -----	1	*			*		
**Pottery -----	4						30,141
***Clay sold -----	4						2,166
Counties with less than three producers -----		467,404	197,035	\$142,637	684,091	227,091	831,128
Total -----	207	\$ 1,017,097	\$ 197,035	142,637	684,091	227,091	831,128

†Includes fancy brick, sewer pipe, fireproofing, etc.

**Includes Delaware, Muscatine and Wapello counties.

***Includes Hardin and Webster counties.

The following table shows the rank of the ten leading states in value of clay products in 1911 and 1912. It includes, also, the number of operating firms and the percentage of the total value produced by each of the ten states:

TEN LEADING STATES IN VALUE OF CLAY PRODUCTION IN
1911 AND 1912.¹

1911.

State	Rank	Number of Operating Firms Report'g	Value not including raw clay sold	Percentage of Total Product
Ohio	1	633	\$ 32,663,895	20.13
Pennsylvania	2	423	20,270,033	12.49
New Jersey	3	162	18,178,228	11.21
Illinois	4	330	14,333,011	8.83
New York	5	222	10,184,376	6.28
Indiana	6	302	7,000,771	4.32
Missouri	7	122	6,274,353	3.87
California	8	92	4,915,866	3.03
West Virginia	10	55	4,333,420	2.67
Iowa	9	214	4,432,874	2.73
Total for United States.....		4,628	\$ 162,236,181	100.00

1912.

State	Rank	No. of Operat'g Firms Report'g	Value not including raw clay sold	Percentage of Total Product
Ohio	1	596	\$ 34,811,508	20.14
Pennsylvania	2	393	21,537,221	12.46
New Jersey	3	155	19,838,553	11.48
Illinois	4	301	15,210,990	8.80
New York	5	219	12,058,858	6.98
Indiana	6	278	7,935,251	4.59
Missouri	7	110	6,412,861	3.71
California	8	91	5,912,450	3.42
West Virginia	9	54	4,775,874	2.76
Iowa	10	200	4,522,326	2.62
Total for United States.....		4,284	\$ 172,811,275	100.00

It will be seen from this table that in 1911 Iowa ranked ninth and in 1912, tenth.

¹Advance chapter from Mineral Resources of the United States for 1912.

STONE AND LIME.

The quarry production for 1911 and 1912 showed a marked increase over 1910. The value of the output in 1910 was \$639,831, in 1911 the value reached \$817,121, and in 1912 the record figure of \$998,236 was reached. The output for 1911 and 1912 was distributed as follows:

	1911	1912
Limestone—		
Building	\$ 39,350	\$ 54,809
Riprap and rubble.....	118,471	155,945
Crushed stone—		
Road making.....	39,496	30,821
Railroad ballast.....	162,704	235,326
Concrete	267,936	404,302
*Other purposes.....	51,938	63,682
Lime	80,914	51,800
Total limestone and lime.....	\$760,809	\$996,685
Sandstone	\$ 56,312	\$ 1,551
Total stone and lime.....	\$817,121	\$998,236

*Paving, curbing, flagging, etc.

The distribution of limestone and lime is given, by counties, in Table IV.

TABLE IV.
PRODUCTION OF LIMESTONE AND LIME IN 1911.

Counties	No. of Pro- ducers	Building Stone	Riprap and Rubble	Crushed Stone			Lime	Other Uses	Total Value
				Road- making	Railroad Ballast	Concrete			
Allamakee	4	\$ 1,159	*			*		\$ 5,572	
Appanoose	1	*				*			
Benton	3	*	*			*	\$ 12,200	12,316	
Black Hawk	3	*		*		*		10,763	
Buchanan	1	*							
Cedar	2	*	*		*	*	*		
Cerro Gordo	3	*	*			\$ 29,309	*	50,598	
Clayton	4	749					*	1,814	
Clinton	2	*	*				*		
Delaware	1	*	*						
Des Moines	1	*							
Dubuque	10	6,350	\$ 35,925	\$ 8,100	*	4,830	*	70,951	
Fayette	2	*						1,867	
Floyd	5	1,691	*				*		
Hardin	3	*				*			
Henry	1	*				*			
Howard	4	1,235	*			*	*	3,880	
Humboldt	1	*							
Jackson	1	*	*				*		
Johnson	1	*	*	*		*			
Jones	8	2,199	21,598	*	*	8,983	*	40,343	
Keokuk	2	*	*	*		*			
Lee	9	*	20,935	17,475	*	75,734	*	119,054	
Linn	4	*		*	*	11,458		62,855	
Louisa	2	*	*			*			
Madison	7	*		*		46,557	10,153	60,224	
Mahaska	1	*	*	*		*	*		
Marshall	1	*	*		*				
Mitchell	3	*				*	*		

STONE AND LIME

TABLE IV—Continued

Counties	No. of Producers	Building Stone	Riprap and Rubble	Crushed Stone			Lime	Other Uses	Total Value
				Road-making	Railroad Ballast	Concrete			
Pocahontas	1					*			
Scott	6	428	16,394	4,130	\$ 39,538	39,327		120,677	
Tama	1	*	*				20,860		
Van Buren	1	*							
Wapello	3		5,230						
Washington	3	87				*	*		
Winneshiek	2	*							
Counties with less than three producers		25,452	18,389	9,791	123,166	51,738	80,914	8,725	199,895
Total		\$ 39,350	\$ 118,471	\$ 39,496	\$ 162,704	\$ 267,936	\$ 80,914	\$ 51,938	\$ 760,809

TABLE IV—Continued
 PRODUCTION OF LIMESTONE AND LIME IN 1912.

Counties	No. of Producers	Building Stone	Riprap and Rubble	Crushed Stone			Lime	Other Uses	Total Value
				Road-making	Railroad Ballast	Concrete			
Allamakee	3		*			*		\$ 24,277	
Appanoose	1			*					
Benton	1			*					
Black Hawk	4	\$ 1,664		*	*	*	*	11,289	
Buchanan (Cedar)	1	*							
Cerro Gordo	2	*	*			*	*		
Clayton	6	1,471	*	*		*		3,056	
Delaware	2	*	*						
Des Moines	4	*	*	*			*	10,562	
Dubuque	9	10,700	\$ 37,673	\$ 12,460	*	*	*	73,333	
Fayette	2	*							
Floyd	2	*	*				*		
Hardin	2	*				*			
Harrison	1						*		
Henry	1	*				*			
Howard	1	*				*			
Jackson	1						*		
Johnson	1	*	*			*			
Jones	7	22,827	18,533	*	*	\$ 41,839		91,205	
Keokuk	2	*	*			*			
Lee	9	*	24,662	8,920		245,550	*	327,917	
Linn	4			*	*	*		55,576	
Louisa	2		*			*			
Madison	4	*				38,868	*	42,361	
Mahaska	1		*	*					
Marshall	2				*	*			
Mitchell	1	*				*			
Pocahontas	1			*		*	*		

STONE AND LIME

TABLE IV—Continued

Counties	No. of Producers	Building Stone	Riprap and Rubble	Crushed Stone			Lime	Other Uses	Total Value
				Road-making	Railroad Ballast	Concrete			
Scott -----	6	*	33,233	*	*	21,200		*	127,661
Tama -----	1	*	*						
Van Buren -----	1	*	*			*			
Wapello -----	3	*	*			*			8,900
Winneshiek -----	2	*							
Counties with less than three producers -----		18,147	41,844	9,441	235,326	56,845		63,682	220,548
Total -----		\$ 54,809	\$ 155,945	\$ 30,821	\$ 235,326	\$ 404,302	\$ 51,800	\$ 63,682	\$ 996,685

The tables show that a large part of the stone was used for concrete and railroad ballast. Lee county produced, in 1912, more than one-third of the total output. This was due, to a considerable extent, to the large amount of limestone used by the Mississippi Power Company in the construction of the Keokuk dam.

SAND AND GRAVEL.

The value of the sand and gravel industry in 1911 was \$393,649 and in 1912, \$563,409, the latter figure being higher than that of any previous year on record.

The sand and gravel sold during 1911 and 1912 may be classified as follows:

Kind—	1911	1912
	Value	Value
Sand used for—		
Molding -----	\$ 4,582	\$ 3,572
Building -----	226,675	328,882
Engine -----	5,527	4,556
Other sand -----	31,842	68,543
Gravel -----	125,023	157,856
Total sand and gravel -----	\$393,649	\$563,409

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

TABLE V.
VALUE OF SAND AND GRAVEL PRODUCED IN IOWA IN 1911.

County	No. of Producers	Molding Sand	Building Sand	Engine Sand	Other Sand	Gravel	Total
Appanoose	1	*					
Audubon	5		\$ 10,525		*	*	\$ 10,648
Black Hawk	7	\$ 950	13,340		\$ 6,700		20,990
Bremer	4		*		*	\$ 3,709	4,917
Buena Vista	2					*	
Butler	2		*			*	
Carroll	1		*	*		*	
Cherokee	5		3,440	*	1,741	9,355	14,554
Clayton	1				*		
Clinton	9		2,998	*	*	15,405	19,251
Des Moines	2		*		*	*	
Dickinson	1		*				
Dubuque	5	*	8,601	*	*	*	21,439
Emmet	5	*	5,425		*	*	6,175
Fayette	4		4,855	*		*	5,202
Floyd	1					*	
Greene	1						
Grundy	1		*				
Hardin	3		*	*	*		
Howard	1		*				
Ida	4		*		*		1,609
Johnson	4		5,202			*	
Jones	1		*				
Lee	2		*	*			
Linn	7		17,034	*	*	5,575	22,884
Louisa	1		*				
Lyon	3		5,445		*		8,445
Marion	2		*		*	*	
Marshall	2	*				*	
Monona	1		*				
Muscatine	1		*		*	*	
O'Brien	4		6,840			*	6,868
Osceola	2		*			*	
Page	1		*		*		
Palo Alto	3		*		*	*	5,839
Plymouth	9		13,686		*	*	15,198
Polk	13	*	55,096	\$ 939	*	23,070	84,058
Sac	2		*	*	*	*	
Scott	2		*		*	*	
Sioux	6		3,060		*	*	3,747
Story	8		5,122		*	1,531	6,803
Van Buren	1		*				
Wapello	2	*	*	*	*	*	
Webster	4	*	1,624		*	*	2,201
Winnebago	1		*		*	*	
Winneshiek	2	*	*			*	
Woodbury	5		4,995		*	*	5,895
Wright	3		*	*		*	5,354

SAND AND GRAVEL

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TABLE V—Continued

County	No. of Producers	Molding Sand	Building Sand	Engine Sand	Other Sand	Gravel	Total
Counties with less than three producers -----	-----	3,632	59,387	4,588	23,401	66,378	121,572
Total -----	157	\$ 4,582	\$ 226,675	\$ 5,527	\$ 31,842	\$125,023	\$ 393,649

TABLE V—Continued
 VALUE OF SAND AND GRAVEL PRODUCED IN IOWA IN 1912.

County	No. of Producers	Molding Sand	Building Sand	Engine Sand	Other Sand	Gravel	Total
Appanoose	1	*	*			*	
Audubon	3		*			*	
Black Hawk	8	*	\$ 14,900		\$ 6,940	*	\$ 22,590
Bremer	3					\$ 3,283	3,283
Buena Vista	3		*		*	*	1,088
Butler	2					*	
Cherokee	4		7,900		2,970	5,830	16,700
Clayton	8		*	*	*	17,158	24,865
Des Moines	2		*			*	
Dubuque	4		*	*		10,081	17,973
Fayette	5		5,125			289	5,414
Floyd	1					*	
Greene	1					*	
Grundy	1				*		
Hardin	3		*		*	*	3,533
Howard	1				*	*	
Ida	2		*				
Johnson	4		*			*	8,428
Jones	1		*				
Lee	3		*	*			5,452
Linn	5		15,290	*		*	18,680
Louisa	1					*	
Lyon	6		13,175	*	*	5,324	19,237
Marion	3		*		*	*	17,288
Marshall	2	*	*	*	*	*	
Muscatine	2		*		*	*	
O'Brien	2		*				
Osceola	2		*			*	
Palo Alto	3					9,943	9,943
Plymouth	8		15,257		*	*	19,707
Polk	14	*	105,172	*	*	29,359	148,302
Sac	3		*	*	*	*	27,722
Scott	2		*		*	*	
Sioux	6		16,725			7,925	24,650
Story	5		2,033		*	*	5,530
Van Buren	1		*				
Wapello	3	*	*				
Webster	2		*			*	22,522
Winnebago	1				*		
Winneshiek	2		*		*	*	
Woodbury	5		12,650		*	*	16,120
Wright	2				*		
Counties with less than three producers		\$ 3,572	120,655	\$ 4,556	58,633	68,664	124,382
Total	140	\$ 3,572	\$ 328,882	\$ 4,556	\$ 68,543	\$ 157,856	\$ 563,409

GYPSUM.

The value of the gypsum industry in Iowa, in 1911, was \$871,752 and in 1912, \$845,628. The figures for both of these years are smaller than for 1910 when the value of the output of gypsum was \$943,849, the largest figure in the history of the industry in the state.

The principal items of production and distribution were as follows:

	1911		1912	
	Short tons	Value	Short tons	Value
Crude gypsum mined.....	354,204		411,186	
Distributed as follows—				
Sold crude—				
To Portland cement mills, paint mills, plaster mills, and as land plas- ter	11,032	\$ 14,465	42,443	\$ 40,824
Sold calcined—				
As hard wall plaster.....	195,274	777,095	223,756	708,198
As plaster of Paris, etc....	26,501	60,546	1,282	4,575
Other purposes.....	8,115	19,646	48,078	92,031
Total sold calcined.....	229,890	\$857,287	273,116	\$804,804
Total sold.....	240,922	\$871,752	315,559	\$845,628

In both years, 1911 and 1912, there were seven mines and six mills in operation. No gypsum has yet been mined from the deposit at Centerville which was found in 1910, by the Scandinavian Coal Company while prospecting for coal. A company has been formed and a shaft is being sunk of sufficient size to be used in hoisting the gypsum to the surface.

LEAD AND ZINC.

During 1911 and 1912 there was little activity in the lead and zinc region in the vicinity of Dubuque. The Avenue Top mine

which was in operation in 1910 was closed during 1911 and 1912. The lead derived from lead concentrates obtained from small mines, as a result of development work, was sixty tons, valued at \$5,400, in 1911, and sixty-three tons, valued at \$5,670, in 1912.

The outlook for any marked improvement in the lead and zinc industry in Iowa, in the near future, is not promising.

MINERAL WATERS.

The value of mineral waters sold in 1911 was \$20,500, and in 1912, \$11,325. These figures show a decrease when compared with 1910, when the value of mineral water was \$27,175. In 1911 the total quantity sold was 176,000 gallons, and in 1912, 84,300 gallons. About one-fifth of the output was sold for medicinal purposes, the remainder for table use. The Crystal Spring, at Estherville, reported for the first time in 1911, and in 1912 the Egralharve, on the west shore of Lake Okoboji, began to produce. The six reporting springs in 1912 were as follows:

- Crystal Spring, Estherville, Emmet County.
- Egralharve Spring, Montgomery, Dickinson County.
- Fry's Spring, Colfax, Jasper County.
- Heston's Spring, Fairfield, Jefferson County.
- Red Mineral Springs, Eddyville, Wapello County.
- White Sulphur Spring, Davenport, Scott County.

PORTLAND CEMENT.

Iowa now has three up-to-date Portland cement plants, two of which are at Mason City and the third at Des Moines. The Lehigh Portland Cement Company, of Mason City, first began to produce in 1911. The output of the three plants in 1911 was 1,952,590 barrels with a value of \$1,881,253. In 1912 these same plants shipped 3,190,354 barrels with a value of \$2,790,396, which is an increase of nearly 50 per cent over the value of 1911. Iowa has an abundance of raw material for Portland cement and hence, year by year, larger and larger productions may be confidently expected.

The growth of the Portland cement industry in the United States has been exceedingly rapid. The figures for the quantity and value of the Portland cement shipped by the ten leading states in 1912 are as follows:

SHIPMENT OF PORTLAND CEMENT BY STATES, 1912.¹

State	Shipping Plants	Quantity (Barrels)	Value	Average Price per Barrel
Pennsylvania -----	26	27,539,076	\$18,918,165	\$0.687
Indiana -----	5	9,634,582	7,237,591	.751
California -----	8	6,093,790	8,215,894	1.348
Missouri -----	5	4,614,547	3,700,776	.802
Illinois -----	5	4,602,617	3,444,085	.748
New York -----	7	4,543,060	3,448,735	.759
New Jersey -----	3	4,490,645	3,052,098	.680
Michigan -----	10	3,651,094	3,145,001	.861
Kansas -----	12	3,592,148	2,815,113	.784
Iowa -----	3	3,190,354	2,790,396	.875
Total (ten states) -----		71,951,913	\$56,767,854	
Total (other states) -----		13,060,643	\$12,341,946	
Total, United States -----		85,012,556	\$69,109,800	

SAND-LIME BRICK.

The production of sand-lime brick in Iowa has declined rapidly during the past few years. In 1909 the value of the output was \$48,210, in 1910 it had decreased to \$31,269. In 1911 and in 1912 there were only two producers and during each of these years the production was considerably less than in 1910.

NATURAL GAS.

In Louisa county small amounts of gas continue to be obtained from pockets of sand in the drift. This gas is used for illuminating purposes. In 1911, the total value of the gas was \$70 and in 1912, \$120.

¹From advance chapter of Mineral Resources for 1912.

IRON ORE.

Although the Missouri Iron Company has been carrying forward experimental work on an extensive scale in connection with the Waukon iron ore, no ore has yet been mined for commercial purposes.