
MINERAL PRODUCTION IN IOWA
FOR 1913 AND 1914

BY GEORGE F. KAY

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VALUE OF MINERAL PRODUCTION.

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
Mineral waters	11,325
Sand and gravel	563,409
Cement	2,790,396
*Other products	18,822
Total	\$22,910,066

1913.

Coal	\$13,496,710
Clay and clay products	5,575,581
Stone and lime	854,814
Gypsum	1,157,939
Lead and zinc	4,150
Mineral waters	7,369
Sand and gravel	528,066
Cement	3,972,876
*Other products	14,840
Total	\$25,612,345

1914.

Coal	\$13,864,070
Clay and clay products	6,405,995
Stone and lime	594,681
Gypsum	1,821,457
Lead and zinc	
Mineral waters	30,179
Sand and gravel	556,868
Cement	4,008,915
*Other products	19,700
Total	\$26,301,865

*Sand-lime brick, mineral paints and natural gas.

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

MINERAL PRODUCTION IN 1913 AND 1914

In 1913 the total value of the mineral production in Iowa was \$25,612,345, and in 1914 it was \$26,301,865. The value in 1913 exceeded that in 1912 by \$2,702,279, and in 1914 the highest figure of record was reached. 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 1905 TO 1914 INCLUSIVE.

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
1913	25,612,345
1914	26,301,865

A comparison of the value of the output in 1914 with that in 1905 shows that the value in 1914 exceeded that in 1905 by \$11,198,819, which is an increase of nearly seventy-five per cent in the decade. With the exception of the year 1911, the value of each year of the past ten years has been higher than that of the preceding year.

Coal continues to be the chief mineral produced in Iowa, clay and clay products ranks second in value, cement ranks third, and gypsum, fourth. In 1914 these four products had a value of \$25,100,437, which is 95 per cent of the total value of all the mineral products. The values for coal, and stone and lime, were less in 1914 than in 1913, but the values of clay and clay products, cement, sand and gravel, and mineral waters, were greater in 1914 than in 1913, and, moreover, the values of all these products except sand and gravel were the highest figures of record for the state.

The number of mineral producers in Iowa was 614 in 1913, and 563 in 1914.

The total production, by counties, for 1913 and 1914 is given in Table I.

TABLE I.

VALUE OF TOTAL MINERAL PRODUCTION, BY COUNTIES, FOR 1913.

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total
Adair	1		*				
Adams	4	\$ 17,536					\$ 17,536
Allamakee	3		*	*			20,310
Appanoose	58	2,436,279	*	*	*		2,457,017
Audubon	4		*		*		19,525
Benton	6		\$ 60,164	*			60,164
Black Hawk	14		*	\$ 11,617	\$ 30,906	*	47,543
Boone	12	522,929	91,924				614,853
Bremer	3				2,613		2,613
Buena Vista	5		27,000		*		27,000
Butler	3		*		*		2,905
Calhoun	1		*				
Carroll	1				*		
Cass	1		*				
Cedar	1		*				
Cerro Gordo	10		1,401,015	*		*	4,505,031
Cherokee	2				*		
Clay	2		*				
Clayton	9			13,622	*		13,622
Clinton	8		13,900	*	17,236		31,136
Dallas	9	1,077,293	225,311				1,302,604
Decatur	1			*			
Delaware	4		4,576				4,576
Des Moines	4		*	*	*		20,152
Dickinson	2				*		
Dubuque	18		50,500	86,092	30,546	\$ 4,150	171,288
Emmet	3				*		1,208
Fayette	5		*	*	*		27,140
Floyd	6		*	4,217	*		60,936
Franklin	2		*		*		
Fremont	1		*				
Greene	4	26,400			*		26,400
Grundy	3		*		*		26,875
Guthrie	6	11,890	*				11,890
Hamilton	1		*				
Hancock	1		*				
Hardin	10		*	*	3,171		91,303
Harrison	1			*			
Henry	3		*	*			24,186
Howard	3		*	*	*		9,048
Humboldt	1		*				
Ida	1				*		
Iowa	2		*				
Jackson	5		*	*	*		54,436
Jasper	15	567,211	27,156			*	596,551
Jefferson	7	*	25,774			*	32,709
Johnson	6		22,300		10,189		32,489
Jones	10		*	105,230	*		120,006
Keokuk	14	*	120,218	*			132,959

TABLE I.—CONTINUED.

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total
Kossuth	1		*				
Lee	15		12,528	62,258	8,305		83,091
Linn	16		37,960	80,008	31,579		149,547
Louisa	5		*	*		120	7,670
Lucas	4	44,913	*				44,913
Lyon	6				12,890		12,890
Madison	4		*	36,925			36,925
Mahaska	20	568,314	*				568,314
Marion	18	487,151	53,231		*		540,382
Marshall	7		79,918	*	*		236,323
Mills	4		8,179				8,179
Mitchell	3			5,058			5,058
Monona	1				*		
Monroe	19	4,087,032					4,087,032
Muscatine	7		14,705		*		14,705
O'Brien	3				2,277		2,277
Osceola	2				*		
Page	4	*	*		*		26,528
Palo Alto	3				10,890		10,890
Plymouth	4		*		992		992
Pocahontas	1			*			
Polk	45	2,984,919	692,710		136,649	*	4,689,545
Pottawattamie	3		34,207				34,207
Poweshiek	4		37,145				37,145
Sac	3		*		*		125,115
Scott	14		58,511	172,278	*	*	276,609
Sioux	4				8,387		8,387
Story	5		*		1,162		1,162
Tama	6		45,169				45,169
Taylor	3	*	*				15,955
Union	1		*				
Van Buren	9	32,772	*	*	*		36,970
Wapello	18	259,099	67,332	*	*		342,973
Warren	2	*	*				
Washington	5		30,570				30,570
Wayne	5	172,531					172,531
Webster	27	101,078	1,078,255		*	1,167,939	2,347,272
Winnebago	2		*		*		
Winneshiek	5		*	*	971		7,516
Woodbury	6		*		15,985		15,985
Wright	4		*		3,631		3,631
County values represent'g less than three producers and small coal mines		99,363	1,255,323	277,509	199,687	3,984,965	1,019,876
Total	614	\$ 13,496,710	\$ 5,575,581	\$854,814	\$528,066	\$ 5,157,174	\$25,612,345

*Included in County values and totals.

TOTAL MINERAL PRODUCTION IN 1914

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TABLE I.—CONTINUED.

VALUE OF TOTAL MINERAL PRODUCTION BY COUNTIES, FOR 1914.

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total
Adair	1						
Adams	4	*					
Allamakee	2		*	*			
Appanoose	58	\$ 2,505,646	*	*	*		\$ 2,529,737
Audubon	5		*		\$ 355		21,900
Benton	8		\$ 55,914	\$ 16,733			72,647
Black Hawk	11		*	9,214	43,843	\$ 7,000	60,307
Boone	12	368,175	93,873				462,048
Bremer	6			*	2,811		
Buena Vista	4		25,585		*		
Butler	4		*		2,752		3,277
Calhoun	1		*				
Carroll	1				*		
Cass	1		*				
Cedar	1		*				
Cerro Gordo	10		1,555,944	*		*	4,644,955
Cherokee	2				*		
Clay	1		*				
Clayton	3			*	*		3,069
Clinton	8		*	*	*		29,830
Dallas	9	877,565	244,042				1,121,607
Delaware	3		*	*			3,748
Des Moines	5		*	*	7,339		13,739
Dickinson	1				*		
Dubuque	15		42,000	59,806	*		111,906
Emmett	1						
Fayette	5		*	*	7,297		24,193
Floyd	2		*	*			
Franklin	4		*		935		
Fremont	1		*				
Greene	1	*					
Grundy	1		*				
Guthrie	6	10,793	*				
Hamilton	2		*				
Hancock	1		*				
Hardin	8		60,350	*	*		82,603
Harrison	1			*			
Henry	4		*	*			
Howard	2		*	*			
Humboldt	1		*				
Ida	2				*		
Iowa	2		*				
Jackson	4		*	*	*		59,759
Jasper	14	532,396	28,203			25,123	585,722
Jefferson	5	*	25,440				
Johnson	6		16,100		11,157		27,257
Jones	9		*	80,942	*		96,905
Keokuk	11	*	269,601	*			279,607
Kossuth	10		*		*		14,324

TABLE I.—CONTINUED.

Counties	No. of Producers	Coal	Clay and Clay Products	Stone and Lime	Sand and Gravel	Other Products	Total
Lee	14		11,561	51,230	*		68,177
Linn	8		50,760	*	18,611		77,144
Louisa	5		*	*		*	6,649
Lucas	3	*	*				504,298
Lyon	3				32,811		32,811
Madison	3		*	*			33,925
Mahaska	14	400,722	*				439,732
Marion	17	*	*		11,283		586,682
Marshall	6		26,417	*	*		123,004
Mills	3		5,975				5,975
Mitchell	2			*			
Monroe	18	3,646,662	*				3,651,512
Muscatine	9		17,945	*	*		54,086
O'Brien	5				3,398		3,398
Osceola	1				*		
Page	3	*	*				17,367
Palo Alto	2				*		
Plymouth	5		*		9,751		
Pocahontas	1			*			
Polk	43	3,219,218	856,967		148,313	*	5,147,887
Pottawattamie	3		24,029				24,029
Poweshiek	4		40,356				40,356
Sac	3		*		*		180,463
Scott	13		46,013	118,818	*	*	210,666
Shelby	1		*				
Sioux	5				16,100		16,100
Story	7		28,875		4,692		33,567
Tama	5		69,208				69,208
Taylor	2	*					
Union	1		*				
Van Buren	7	17,750	*	*	*		24,115
Wapello	21	409,177	92,691	*	*	*	521,781
Warren	2	*	*				
Washington	4		28,688				28,688
Wayne	3	151,096					151,096
Webster	25	76,614	1,182,813		*	1,333,957	2,596,848
Winnebago	2		*		*		
Winneshiek	3		*		*		12,531
Woodbury	4				*	*	373,838
Wright	4		*		2,634		11,234
County values represent'g less than three producers, and small coal mines		1,148,256	1,531,733	262,116	235,420	4,054,280	993,578
Totals	563	\$ 13,364,070	\$ 6,405,995	\$594,681	\$556,868	\$ 5,380,251	\$26,301,865

*Included in County values and totals.

COAL.

For many years coal has been the chief mineral mined in Iowa, the yearly production for several years having varied up and down between 7,000,000 and 8,000,000 tons. In 1913 the production was 7,525,936 tons, with a value of \$13,496,710; in 1914 there was mined 7,451,022 tons, with a value of \$13,364,070 at the mines. The five leading coal producing counties in 1914, in order of tonnage, were Monroe, Polk, Appanoose, Dallas, and Marion. These five counties produced more than six million tons; Monroe county alone produced 2,273,066 tons. The first three of the five counties named have retained the same order of production for more than ten years. For many years previous to 1913 Mahaska county ranked fourth, but in 1914 this county ranked sixth. The production of coal in Lucas county in 1914 greatly exceeded the production in 1913. This increase in production was due to the activity of the Central Iowa Coal Company, which began extensive developments on properties recently acquired.

The total quantity of coal washed in Iowa in 1914 was 25,706 tons, which yielded 18,000 tons of cleaned coal and 7,706 tons of refuse. The plant is located at Lakonta and is owned by the Iowa Coal Washing Company.²

The average price of coal during each of the years 1913 and 1914 was \$1.79.

In 1913 there were 15,757 men employed in coal mining in Iowa; in 1914 there were 16,057.

The output, disposition of product, value, average price per ton, average number of days worked and average number of men employed in 1913 and 1914 are given, tabulated by counties, in Table II.

²Kay, George F., The first coal-washing plant in Iowa: Iowa Academy of Science, Vol. XXII, pp. 225-227.

TABLE II.

COAL PRODUCTION FOR IOWA IN 1913, 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 -----		6,971		6,971	\$ 17,536	\$ 2.52	182	48
Appanoose -----	1,130,383	64,104	12,900	1,207,387	2,436,279	2.02	170	4,186
Boone -----	216,189	35,243	4,780	256,212	522,929	2.04	179	754
Dallas -----	546,832	8,348	19,006	574,186	1,077,293	1.88	245	889
Greene -----	200	9,400		9,600	26,400		186	25
Guthrie -----		4,492		4,492	11,890	2.65	147	29
Jasper -----	255,200	8,867	3,500	267,567	567,211	2.12	156	800
Lucas -----	20,167	6,937	800	27,904	44,913		44	231
Mahaska -----	327,655	21,748	6,334	355,737	568,314	1.60	199	698
Marion -----	276,064	16,249	6,239	298,552	487,151	1.63	193	581
Monroe -----	2,457,050	50,226	64,001	2,571,277	4,087,032	1.59	215	4,138
Polk -----	1,345,237	213,296	42,482	1,601,015	2,984,919	1.86	212	2,591
Van Buren -----	6,000	8,381		14,381	32,772	2.28	224	29
Wapello -----	124,845	25,969	2,891	153,705	259,099	1.69	240	309
Wayne -----	73,215	11,760	800	85,775	172,531	2.01	193	253
Webster -----	42,373	1,553	1,750	45,676	101,078	2.21	215	130
Counties with less than three producers and small mines -----	3,523	41,626	350	45,499	99,363		150	66
Total -----	6,824,933	535,170	165,833	7,525,936	\$ 13,496,710	\$ 1.79	195	15,757

TABLE II.—CONTINUED.

COAL PRODUCTION FOR IOWA IN 1914, 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 -----		6,660		6,660	\$ 16,650	\$ 2.50	232	47
Appanoose -----	1,195,603	64,383	12,290	1,272,276	2,505,646	1.97	168	4,084
Boone -----	125,462	46,970	9,520	181,952	368,175	2.02	177	556
Dallas -----	449,092	7,794	9,811	466,697	877,565	1.88	228	861
Guthrie -----		3,925		3,925	10,793	2.75	136	31
Jasper -----	214,166	22,325	5,500	241,991	532,396	2.20	190	531
Mahaska -----	243,885	23,975	5,008	272,868	400,722	1.47	206	522
Marion -----	284,791	15,805	10,587	311,183	498,894	1.60	225	573
Monroe -----	2,147,252	61,719	64,095	2,273,066	3,646,662	1.60	211	4,165
Polk -----	1,413,350	262,863	30,566	1,706,779	3,219,218	1.89	228	3,188
Van Buren -----		6,672		6,672	17,750			15
Wapello -----	206,458	26,508	4,210	237,176	409,177	1.73	231	596
Wayne -----	70,420	4,904	1,200	76,524	151,096	1.97	192	243
Webster -----	31,569	873	1,250	33,692	76,614	2.27	208	109
*Counties with less than three producers and small mines -----	294,344	62,392	2,825	359,561	632,712			536
Total -----	6,676,392	617,768	156,862	7,451,022	\$ 13,364,070	\$ 1.79		16,057

*Greene, Lucas, Keokuk, Jefferson, Page, Taylor and Warren Counties.

COAL

Iowa's rank as a coal producing state in 1914 is given in the following table. From this table it is seen that Iowa ranked tenth in tonnage, and ninth in value. The same relations prevailed in 1913.

RANK OF LEADING COAL-PRODUCING STATES IN 1914, WITH QUANTITY AND VALUE OF PRODUCT AND PERCENTAGE OF EACH.³

Production.			
Rank	State	Quantity (short tons)	Percentage of Total Production
1	Pennsylvania:		
	Anthracite -----	90,821,507	17.7
	Bituminous -----	147,983,294	28.8
2	West Virginia -----	71,707,626	14.0
3	Illinois -----	57,589,197	11.2
4	Kentucky -----	20,382,763	4.0
5	Ohio -----	18,843,115	3.7
6	Indiana -----	16,641,132	3.2
7	Alabama -----	15,593,422	3.0
8	Colorado -----	8,170,559	1.6
9	Virginia -----	7,959,535	1.5
10	Iowa -----	7,451,022	1.4

Value.			
Rank	State	Value	Percentage of Total Value
1	Pennsylvania:		
	Anthracite -----	\$188,181,399	27.6
	Bituminous -----	159,006,296	23.3
2	West Virginia -----	71,391,408	10.5
3	Illinois -----	64,693,529	9.5
4	Ohio -----	21,250,642	3.1
5	Kentucky -----	20,852,463	3.0
6	Alabama -----	20,849,919	3.0
7	Indiana -----	18,290,928	2.7
8	Colorado -----	13,601,718	2.0
9	Iowa -----	13,364,070	2.0
10	Kansas -----	11,238,253	1.6

³From Advance Chapters of Mineral Resources of the United States for 1914.

CLAY AND CLAY PRODUCTS.

The value of clay and clay products in Iowa in 1913 was \$5,575,581, and in 1914, \$6,405,995. These figures have never been exceeded in the history of the clay industry of the state. The highest value recorded prior to 1913 was in 1910, when the value was \$5,335,036. The following table shows the value of the clay and clay products of Iowa during each year of the past decade:

PRODUCTION OF CLAY AND CLAY PRODUCTS IN IOWA FROM
1905-1914.

Year	Value
1905	\$3,408,547
1906	3,477,237
1907	3,733,476
1908	4,078,627
1909	4,916,513
1910	5,335,036
1911	4,436,839
1912	4,524,492
1913	5,575,581
1914	6,405,995

The output of clay and clay products in 1913 and 1914 was distributed as follows:

Product	1913		1914	
	Quantity in Thousands	Value	Quantity in Thousands	Value
Common brick	143,263	\$1,052,036	143,534	\$1,067,746
Paving brick or block	16,398	222,105	14,997	211,905
Face brick	14,078	181,911	11,183	148,394
Drain tile		2,798,816		3,180,836
Sewer pipe		503,360		558,751
Fireproofing		762,563		1,083,397
Pottery		20,698		
Other products		32,192		150,716
Clay		1,900		4,250
Total		\$5,575,581		\$6,405,995

In 1913 the three principal clay products in order of value were drain tile, common brick, and fireproofing; in 1914 drain tile again ranked first, but in this year the value of fireproofing exceeded that of common brick. In both 1913 and 1914 Iowa was the leading state in the production of drain tile, the chief producing counties being Cerro Gordo and Webster.

The value of drain tile and common brick sold in Iowa in the past ten years has been as follows:

PRODUCTION OF DRAIN TILE AND COMMON BRICK IN IOWA FROM
1905-1914.

Year	Drain Tile	Common Brick
1905	\$1,531,376	\$1,367,742
1906	1,721,614	1,125,009
1907	2,011,793	1,085,883
1908	2,522,363	896,890
1909	2,830,910	1,072,340
1910	3,457,455	1,088,266
1911	2,468,962	1,025,011
1912	2,293,084	1,017,097
1913	2,798,816	1,052,036
1914	3,180,836	1,067,746

The clay product in 1913 and in 1914 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 1913,
TABULATED BY COUNTIES.

Counties	No. of Producers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Products†	Total Value
Adair	1	*			*		
Allamakee	1	*				*	
Appanoose	1	*					
Audubon	2	*			*	*	
Benton	5	\$ 12,275			\$ 32,416	*	\$ 60,164
Boone	3	43,359	*	*	*	*	91,924
Buena Vista	3	*			*		27,000
Butler	1	*					
Calhoun	1	*			*	*	
Cass	1	*			*	*	
Cedar	1	*			*		
Cerro Gordo	7	48,151			1,043,440	\$ 309,424	1,401,015
Clay	2	*			*		
Clinton	3	*			*		13,900
Dallas	5	9,657			194,842	20,812	225,311
Delaware	3	2,770			*	*	4,426
Des Moines	1	*					
Dubuque	3	50,500			*		50,500
Fayette	1	*				*	
Floyd	1	*			*	*	
Franklin	1	*				*	
Fremont	1	*					
Grundy	2	*		*	*	*	
Guthrie	2	*			*	*	
Hamilton	1				*	*	
Hancock	1				*		
Hardin	2	*			*	*	
Henry	2	*			*		
Howard	1	*			*	*	
Humboldt	1				*		
Iowa	2	*			*		
Jackson	2	*			*		
Jasper	6	10,010			16,825	*	27,156
Jefferson	4	5,137			15,740	4,897	25,774
Johnson	3	*			*		22,300
Jones	2	*			*		
Keokuk	10	3,941			80,451	35,826	120,218
Kossuth	1				*	*	
Lee	3	*		*			12,528
Linn	5	30,190			7,370	*	37,960
Louisa	1	*			*		
Lucas	1	*					
Madison	1	*					
Mahaska	2	*	*	*	*	*	
Marion	4	10,675			12,500	*	53,231
Marshall	4	12,174		*	39,700	*	79,918
Mills	4	8,179					8,179

TABLE III.—CONTINUED.

Counties	No. of Producers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Products†	Total Value
Muscatine -----	4	*			*		10,505
Page -----	2	*	*		*		
Plymouth -----	1	*					
Polk -----	11	154,468	*	*	137,628	*	692,710
Pottawattamie -----	3	34,207					34,207
Poweshiek -----	4	1,566			33,612	*	37,145
Sac -----	1	*			*		
Scott -----	4	15,108	*		*	*	58,511
Story -----	2	*		*	*	*	
Tama -----	6	14,904		*	16,266	*	45,169
Taylor -----	1	*					
Union -----	1	*			*	*	
Van Buren -----	2	*			*		
Wapello -----	3	*		*	*	*	50,984
Warren -----	1	*			*	*	
Washington -----	5	9,308			15,447	5,815	30,570
Winnebago -----	1	*			*		
Winneshiek -----	1	*					
Webster -----	12	54,906	*	*	631,726	377,111	1,077,059
Woodbury -----	2	*	*	*		*	
Wright -----	1	*			*		
**Pottery -----							20,698
***Clay sold -----							1,900
Counties with less than three producers -----		520,551	222,105	181,911	520,853	544,230	1,254,619
Total -----	183	\$ 1,052,036	\$222,105	\$181,911	\$ 2,798,816	\$ 1,298,115	\$ 5,575,581

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

*Included in "Counties with less than three producers."

**Includes Delaware, Muscatine and Wapello Counties.

***Includes Black Hawk, Hardin and Webster Counties.

TABLE III.—CONTINUED.

VALUE OF IOWA CLAY AND CLAY PRODUCTS FOR 1914,
TABULATED BY COUNTIES.

Counties	No. of Producers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Products†	Total Value
Adair	1	*			*		*
Allamakee	1	*			*	*	*
Appanoose	1	*					*
Audubon	2	*			*	*	*
Benton	5	\$ 8,473			\$ 33,593	*	*
Boone	3	44,100	*	*	*	*	\$ 93,873
Buena Vista	2	*			*		*
Butler	1	*			*		*
Calhoun	1	*			*		*
Cass	1	*			*	*	*
Cedar	1	*			*		*
Cerro Gordo	7	39,976			990,933	\$ 525,035	1,555,944
Clay	1	*			*		*
Clinton	2	*			*		*
Dallas	5	3,420		*	224,697	*	*
Delaware	2	*			*	*	*
Des Moines	1	*			*	*	*
Dubuque	3	42,000					42,000
Fayette	1	*				*	*
Floyd	1	*			*		*
Franklin	2	*			*	*	*
Fremont	1	*		*			*
Grundy	2	*					*
Guthrie	2	*			*	*	*
Hamilton	2	*			*	*	*
Hancock	1	*			*		*
Hardin	2	*			*	*	*
Henry	2	*			*	*	*
Howard	1	*			*	*	*
Humboldt	1	*			*		*
Iowa	2	*			*		*
Jackson	2	*		*			*
Jasper	5	8,253			18,950	*	*
Jefferson	3	*			15,028	7,119	25,440
Johnson	3	7,100			*	*	*
Jones	2	*			*	*	*
Keokuk	8	6,299			208,187	*	*
Kossuth	1	*			*	*	*
Lee	4	7,733		*	*		*
Linn	4	43,470			6,940	*	*
Louisa	1	*			*	*	*
Lucas	1	*			*		*
Madison	1	*			*		*
Mahaska	2	*	*		*	*	*
Marion	4	12,400			21,021	*	*
Marshall	5	12,300		*	*	*	26,417
Mills	4	5,975					*

TABLE III.—CONTINUED.

Counties	No. of Producers	Common Brick	Paving Brick or Block	Face Brick	Drain Tile	Other Products†	Total Value
Monroe -----	1	*			*	*	*
Muscatine -----	4	11,575		*		*	13,195
Page -----	2	*			*	*	*
Plymouth -----	1	*					*
Polk -----	12	216,903	*	*	157,088	*	856,967
Pottawattamie -----	3	24,029					24,029
Poweshiek -----	4	*			30,932	*	40,356
Sac -----	1	*			*	*	*
Scott -----	4	9,349	*		*	*	46,013
Shelby -----	1	*					*
Story -----	3	*		*	*	*	*
Tama -----	5	22,491		*	32,091	*	69,208
Union -----	1	*			*	*	*
Van Buren -----	2	*			*	*	*
Wapello -----	3	22,559		*	*	*	64,691
Warren -----	1				*	*	*
Washington -----	5	9,286			11,417	7,985	28,688
Winnebago -----	1				*		*
Winneshiek -----	1	*					*
Webster -----	11	79,199	*		621,284	474,748	*
Woodbury -----	1	*	*		*	*	*
Wright -----	1	*					*
**Pottery and clay sold -----							37,000
Counties with less than three producers -----		428,856	\$211,905	\$148,394	808,675	745,227	2,343,057
Total -----		\$1,067,746	\$211,905	\$148,394	\$3,180,836	\$1,760,114	\$6,405,995

†Includes sewer pipe, fireproofing, etc.

*Included in "Counties with less than three producers."

**Black Hawk, Hardin, Webster, Muscatine and Wapello counties.

The following table shows the rank of the ten leading states in value of clay products in 1913 and 1914. 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
1913 AND 1914.*

1913.

State	Rank	Number of Operating Firms Report'g	Value not including Raw Clay Sold	Percentage of Total Value
Ohio	1	563	\$38,388,296	21.18
Pennsylvania	2	377	24,231,482	13.37
New Jersey	3	149	19,705,378	10.87
Illinois	4	281	15,195,874	8.38
New York	5	215	11,469,476	6.33
Indiana	6	257	8,498,646	4.69
Missouri	7	105	6,602,076	3.64
Iowa	8	186	5,573,681	3.07
California	9	91	5,344,958	2.95
West Virginia	10	58	5,208,270	2.87

1914.

State	Rank	Number of Operating Firms Report'g	Value not including Raw Clay Sold	Percentage of Total Value
Ohio	1	543	\$37,166,768	22.53
Pennsylvania	2	369	21,846,996	13.24
New Jersey	3	148	16,484,652	9.99
Illinois	4	263	13,318,953	8.07
New York	5	205	9,078,933	5.50
Indiana	6	240	7,655,285	4.64
Iowa	7	171	6,401,745	3.88
Missouri	8	98	6,077,284	3.68
West Virginia	9	58	5,761,411	3.49
California	10	84	4,461,661	2.70

It will be seen from this table that in 1913 Iowa ranked eighth and in 1914, seventh.

*Advance chapter from Mineral Resources of the United States for 1914.

STONE AND LIME.

The value of stone and lime in Iowa produced in 1913 was \$854,814, and in 1914, \$594,681. The output was distributed as follows:

	1913	1914
Limestone—		
Building	\$ 41,421	\$ 32,332
Riprap and rubble	128,342	96,482
Crushed Stone—		
Road making	81,351	17,438
Railroad ballast	218,573	97,747
Concrete	300,767	278,071
*Other purposes	33,228	15,292
Lime	49,520	56,000
Total limestone and lime.....	\$853,202	\$593,362
Sandstone	1,612	1,319
Total stone and lime.....	\$854,814	\$594,681

*Paving, curbing, flagging, etc.

The distribution of limestone and lime in 1913 and 1914 is given by counties in Table IV.

TABLE IV.

PRODUCTION OF LIMESTONE AND LIME IN 1913.

Counties	No. of Producers	Building Stone	Riprap and Rubble	Crushed Stone			Lime	Other Uses	Total Value
				Road-making	Railroad Ballast	Concrete			
Allamakee	2	*	*			*			
Benton	1	*	*						
Black Hawk	3	*		*		*		\$ 11,529	
Appanoose	1	*		*		*			
Cerro Gordo	1	*	*	*		*	*		
Clayton	7	\$ 1,262	*			*		13,382	
Clinton	1	*	*						
Des Moines	1		*						
Dubuque	11	8,376	\$ 40,099	\$ 9,485		\$ 13,250	*	\$ 882	86,092
Fayette	2	*					*		
Floyd	4	2,207	*				*		4,217
Hardin	2	*				*			
Harrison	1					*			
Henry	1	*				*			
Howard	1		*	*				*	
Jackson	2						*	*	
Jones	7	13,988	28,353	*	*	42,283		*	105,230
Keokuk	2	*	*			*			
Lee	8	1,661	6,839	15,181		31,953		6,584	62,218
Linn	3			*	*	*			80,008
Louisa	1					*			
Madison	3	*	*	*		27,533		*	36,925
Marshall	2		*	*	*				
Mitchell	3	1,145						3,913	5,058
Pocahontas	1			*		*			
Scott	6	*	38,524	*	*	107,435		6,198	171,040

LIMESTONE 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			
Van Buren -----	1	*							
Wapello -----	2	*	*			*		*	
Winnesheik -----	1	*							
Counties with less than three producers -----		12,782	14,527	56,685	\$ 218,573	78,313	49,520	15,651	277,503
Total -----		\$ 41,421	\$ 128,342	\$ 81,351	\$ 218,573	\$ 300,767	\$ 49,520	\$ 33,228	\$ 853,202

*Included in "Counties with less than three producers."

TABLE IV.—CONTINUED.

PRODUCTION OF LIMESTONE AND LIME IN 1914.

Counties	No. of Producers	Building Stone	Riprap and Rubble	Crushed Stone			Lime	Other Uses	Total Value
				Road-making	Railroad Ballast	Concrete			
Allamakee	1	*	*						
Appanoose	1			*					
Benton	4	*	\$ 1,061			\$ 15,557		\$ 16,733	
Black Hawk	2	*		*		*			
Bremer	1					*			
Cerro Gordo	1	*	*				*		
Clayton	1	*							
Clinton	1	*							
Delaware	1	*							
Des Moines	1	*	*			*			
Dubuque	10	\$ 7,635	11,122	\$ 4,705		23,130	*	\$ 2,214	
Fayette	1	*							
Floyd	1						*		
Hardin	2					*			
Harrison	1	*							
Henry	2	*				*			
Howard	1	*				*	*		
Jackson	2	*	*				*		
Jones	5	*	29,879		*	41,073		* 80,908	
Keokuk	1					*	*		
Lee	8	478	12,774			31,759		6,181	
Linn	1			*		*			
Lcuisa	1		*			*			
Madison	2		*			*			
Mahaska	1	*							
Marshall	2				*				

LIMESTONE 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			
Muscatine -----	1		*						
Mitchell -----	2	*							
Pocahontas -----	1					*			
Scott -----	5	*	32,206	4,816	*	70,855		6,249	117,893
Van Buren -----	1	*							
Wapello -----	2	*	*			*			
Counties with less than three producers -----		24,219	9,440	7,917	\$ 97,747	95,697	\$ 56,000	648	291,668
Total -----		\$ 32,332	\$ 96,482	\$ 17,438	\$ 97,747	\$ 278,071	\$ 56,000	\$ 15,292	\$ 593,362

*Included in "Counties with less than three producers."

SAND AND GRAVEL.

The value of sand and gravel produced in Iowa in 1913 was \$528,066, and in 1914 \$556,868. In both years the values were less than in 1912, when the output had a value of \$563,409, the record figure for the state.

The sand and gravel sold in 1913 and 1914 may be classified as follows:

Kind—	1913	1914
	Value	Value
Sand used for—		
Molding	\$ 1,560	\$ 2,365
Building	231,784	272,445
Engine	3,162	3,250
Other sand	91,536	72,988
Gravel	200,024	205,820
Total sand and gravel.....	\$528,066	\$556,868

Table V shows the distribution of sand and gravel by counties in 1913 and 1914.

TABLE V.

VALUE OF SAND AND GRAVEL PRODUCED IN IOWA IN 1913.

Counties	No. of Producers	Molding Sand	Building Sand	Engine Sand	Other Sand	Gravel	Total
Appanoose	1	*					
Audubon	2		*			*	
Black Hawk	8	*	\$ 14,605		\$ 15,950	*	\$ 30,906
Bremer	3		*			*	2,613
Buena Vista	2					*	
Butler	2					*	
Carroll	1					*	
Cherokee	2		*		*	*	
Clayton	1				*	*	
Clinton	4		*	*	*	\$ 12,250	17,236
Des Moines	2	*	*		*	*	
Dickinson	1		*				
Dubuque	3		3,973	*		*	30,546
Emmet	2		*			*	
Fayette	2		*			*	
Floyd	1					*	
Franklin	1		*				
Greene	1					*	
Grundy	1		*				
Hardin	4		*			*	3,171
Howard	1					*	
Ida	1		*				
Jackson	1		*		*	*	
Johnson	3		*			*	10,189
Jones	1					*	
Lee	3		*	*			8,305
Linn	8	*	6,828	*	*	23,876	31,579
Lyon	6		*	*	5,405	4,365	12,890
Marion	2		*			*	
Marshall	1		*	*	*	*	
Monona	1		*				
Muscatine	1		*			*	
O'Brien	3		*		*		2,277
Osceola	2		*		*	*	
Page	1				*	*	
Palo Alto	3				*	*	10,890
Plymouth	3		*			*	992
Polk	13	*	76,597	*	39,438	18,775	136,649
Sac	2		*			*	
Scott	2		*			*	
Sioux	4		5,310		*	*	8,387
Story	3		*			*	1,162
Van Buren	1		*				
Wapello	2	*	*	*	*	*	
Webster	2		*				
Winnebago	1		*				
Winneshieck	3		*		*	*	971
Woodbury	4		*		*	4,235	15,985
Wright	3		*	*	*	*	3,631

SAND AND GRAVEL

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TABLE V.—CONTINUED.

Counties	No. of Producers	Molding Sand	Building Sand	Engine Sand	Other Sand	Gravel	Total
Counties with less than three producers -----		\$ 1,560	124,471	\$ 3,162	30,743	136,523	199,687
Total -----		\$ 1,560	\$ 231,784	\$ 3,162	\$ 91,536	\$ 200,024	\$ 528,066

*Included in "Counties with less than three producers."

TABLE V.—CONTINUED.

VALUE OF SAND AND GRAVEL PRODUCED IN IOWA IN 1914.

Counties	No. of Producers	Molding Sand	Building Sand	Engine Sand	Other Sand	Gravel	Total
Appanoose	1	*					
Audubon	3		*			*	\$ 355
Black Hawk	7		\$ 35,988		*	*	43,843
Bremer	5		*			\$ 2,686	2,811
Buena Vista	1					*	
Butler	3		2,752				2,752
Carroll	1		*	*			
Cherokee	2		*		*	*	
Clayton	1				*		
Clinton	5		4,138	*	*	11,052	16,958
Des Moines	3		*		*	*	7,339
Dickinson	1		*			*	
Dubuque	2		*	*	*	*	
Emmet	1				*		
Fayette	3		*			*	7,297
Franklin	3		890		*		935
Hardin	3		*		*	*	2,025
Ida	2		*				
Jackson	1		*			*	
Johnson	3		*			7,117	11,157
Jones	1		*				
Lee	2		*	*		*	
Kossuth	1		*				
Linn	3					18,611	18,611
Lyon	3		*		*	9,512	32,811
Marion	2		*		*	*	
Marshall	1		*	*	*	*	
Muscatine	2		*		*	*	
O'Brien	5		3,248		*		3,398
Osceola	1					*	
Palo Alto	2					*	
Plymouth	4		9,451			*	9,751
Polk	13	*	52,268	*	\$ 48,828	44,518	148,313
Sac	2		*			*	
Scott	2		*			*	
Sioux	5		16,030			*	16,100
Story	4		790			3,902	4,692
Van Buren	1		*				
Wapello	2	*	*	*	*	*	
Webster	2		*			*	
Winnebago	1		*				
Winneshiek	2				*	*	
Woodbury	2		*			*	

TABLE V.—CONTINUED.

Counties	No. of Producers	Molding Sand	Building Sand	Engine Sand	Other Sand	Gravel	Total
Wright	3	-----	-----	*	*	*	2,634
Counties with less than three producers	-----	\$ 160	117,850	\$ 1,446	16,479	89,156	224,686
Total	-----	\$ 2,365	\$ 272,445	\$ 3,250	\$ 72,988	\$ 205,820	\$ 556,868

*Included in "Counties with less than three producers."

GYPSUM.

In 1913 the value of gypsum produced in Iowa was \$1,157,939, and in 1914 \$1,321,457. These figures have never been exceeded since gypsum began to be produced in the state. In 1914 Iowa ranked first in the production of gypsum, exceeding the production of New York, which ranked second, by a value of \$84,265. The value of the production in Iowa in each of the past ten years is as follows:

PRODUCTION OF GYPSUM IN IOWA FROM 1905-1914 INCLUSIVE.

Year	Value
1905	\$ 589,055
1906	573,498
1907	730,383
1908	564,688
1909	655,602
1910	943,849
1911	871,752
1912	845,628
1913	1,157,939
1914	1,321,457

The principal items of production and distribution in 1913 and 1914 were as follows:

	1913		1914	
	Short Tons	Value	Short Tons	Value
Crude gypsum mined.....	456,031	-----	480,404	-----
Distributed as follows:				
Sold crude—				
To Portland cement mills, as land plaster, etc.....	52,057	\$ 45,551	65,185	\$ 60,486
Sold calcined—				
As hard wall plaster.....	252,719	942,198	265,619	1,109,570
As stucco, plaster of Paris, etc.	80,638	170,190	69,446	151,401
Total sold calcined.....	333,357	\$1,112,388	335,065	\$1,260,971
Total sold	385,414	\$1,157,939	400,250	\$1,321,457

In both years 1913 and 1914 there were five mines and five mills in operation. The deposit of gypsum at Centerville has not yet been developed to the stage of production. The main reason for this fact is the difficulty in handling the large amount of water which enters the shaft a few feet above the gypsum.

LEAD AND ZINC.

In 1913 the value of lead concentrates obtained from small lots of galena mined from shallow shafts was \$4,150. In 1914 there was no production.

MINERAL WATERS.

The value of mineral waters sold in Iowa was \$7,369 in 1913 and \$30,179 in 1914. The sale of the mineral waters was for medicinal and table uses. There were three producing springs in 1913 and five in 1914. The largest output was from the Colfax Springs in Jasper county. In 1914 two new springs began to produce, one of which is located at Colfax and the other at Sioux City.

PORTLAND CEMENT.

Since the year 1911 there have been three large modern cement plants in Iowa, two of which are located at Mason City, the third at Des Moines. In 1913 the output of these three plants had a value of \$3,972,876, and in 1914, \$4,008,915. Although the output in Iowa has been increasing year by year, there is every reason to believe that the maximum yearly output has not yet been reached. The three plants are thoroughly equipped and there are abundant supplies of limestone and shale which are the materials being used in Iowa for cement making.

The growth of the cement industry in the United States has been phenomenal. Year after year during the past decade the output exceeded that of the preceding year until in 1913 the maximum production of 89,541,348 barrels was reached. In 1914 the output was 87,257,552 barrels.

The figures for the quantity and value of the Portland cement shipped by the ten leading states in 1914 are as follows:

SHIPMENT OF PORTLAND CEMENT BY STATES, 1914.⁵

State	Shipping Plants	Quantity (barrels)	Value	Average Price per Barrel
Pennsylvania -----	20	25,985,106	\$20,944,787	\$.806
Indiana -----	5	9,540,288	8,342,164	.874
New York -----	8	5,474,191	5,020,720	.917
Illinois -----	5	5,284,022	4,848,522	.918
California -----	7	5,004,633	6,698,905	1.339
Missouri -----	5	4,706,389	4,485,744	.953
Michigan -----	11	4,218,429	4,064,781	.964
Iowa -----	3	4,224,076	4,008,915	.949
New Jersey -----	3	3,530,476	3,081,205	.873
Kansas -----	10	3,237,906	2,643,415	.816
Total (ten states)-----	77	71,205,516	\$64,159,158	-----
Total (other states)-----	34	15,232,440	15,959,317	-----

NATURAL GAS.

For many years small amounts of natural gas have been obtained from pockets of sand and gravel in the Pleistocene de-

⁵From advance chapter of Mineral Resources for 1914.

posits of the state. The best known localities are in the neighborhood of Letts, Louisa county, and of Herndon, Guthrie county. The value of the natural gas in Iowa was \$120 in 1913 and \$200 in 1914. The gas was used for illuminating purposes.

IRON ORE.

During the years 1913 and 1914 the Missouri Iron Company continued to carry forward considerable work on the Waukon iron ore, but no ores were shipped for commercial purposes.